

Technical manual GS 4x.10 knx

Application description – air quality sensor & control

General Information

The device fits for the particular use of the following tasks: monitoring of the air quality in building systems technology (schools, offices, hotels, conference venue etc.), data transfer and regulation via bus system. The device is intended for use in accordance with the defined technical data. Operate the device exclusively in a dry room! The device is not qualified for security relevant tasks such as emergency doors, fire protection equipment, fermenting cellars etc.

The air quality sensor GS 4x.10 knx can provide the following data and control for the KNX bus:

CO2:	Value output Control (step and PI control)
Relative humidity:	Value output Control (step and PI control)
Temperature:	Value output Control heating / cooling (2-point and PI control) Alarms
Dew point:	Value output Alarm
Air pressure:	Value output



GS 40.10 knx



GS 41.10 knx

Please consider that handling and installation of the device is explained in the instruction manual enclosed to the product!

Please take into account the resolution of the 2 Bytes data type (see KNX Specification)!

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Application program

Manufacturer: Hugo Müller GmbH & Co KG, Sturmbühlstraße 145-149, D-78054 VS-Schwenningen
 Program name: GS 4x.10 knx
 Installation: Add the device to your device list and open a new project. You can download the ETS database on our webpage:

<http://www.hugo-mueller.de/de/downloads/knx-produkt Datenbank/>

Number of communication objects:	179	Number of group addresses:	254	Number of allocations:	255
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Technische Daten

Power supply:	via KNX bus voltage
Bus current:	< 10 mA
Bus system:	KNX
Sensors:	CO ₂ , relative humidity, temperature, dew point, VAV control
Measuring range CO ₂ concentration:	390–10,000 ppm
Measuring range rel. humidity:	0–100%
Measuring range temperature:	0–50°C
Measuring range atmospheric pressure:	300-1,100 hPa
Class of protection:	IP 20 to DIN EN 60529
Permitted ambient temperature:	0°C ... +50°C
Test mark:	CE
Housing:	Self-extinguishing thermoplastic
Dimensions:	80,5 x 80,5 x 17 mm
Mounting:	Wall
Type of connection:	Push-in terminal

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Overview parameters

Parameters	Subcategory parameters	Description
Global settings	Global settings	Send „in operation “(incl. cycle time), request status (active/inactive, request with...), send delay after bus voltage recovers in seconds.
	CO₂	<p>CO₂ sensor Settings CO₂-sensor: Enable – disable, send measured values, CO₂ offset adjustment, notification of sensor error, external value enabled/disabled.</p> <p>CO₂ control Settings CO₂-control: Type (inactive, 1-/2-/3-step, PI), output format, send on change / send cyclically, hysteresis (symmetrical). Threshold 1,2,3, switching command above / below threshold, control value, blocking object</p>
Relative humidity sensor	Relative humidity sensor	Settings humidity sensor: Enable – disable, send measured values, offset adjustment, notification of sensor error, external value enabled/disabled.
	Relative humidity control	Settings humidity control: Type (inactive, 1-/2-/3-step, PI), output format, send on change / send cyclically, hysteresis (symmetrical). Threshold 1,2,3, switching command above / below threshold, control value, blocking object
Temperature	Temperature sensor	Settings temperature sensor: Enable – disable, send measured values, offset adjustment, notification of sensor error, external value enabled/disabled.
	Temperature alarms	Settings frost- and/or heat alarms: Enable – disable, send measured values.
	Temperature control	Settings temperature control: Type (inactive, heating, cooling, heating & cooling), different control values (extra cooling level & guide).
Dew point	Dew point temperature	Settings dew point: Enable – disable, send measured values.
	Dew point alarm	Settings dew point alarm: Enable – disable, send measured values., hysteresis (symmetrical), switching command on alarm.
Air pressure	Air pressure sensor	Settings Air pressure-Sensor: Enable – disable, send measured values, notification of sensor error, elevation.
VAV control	Settings	Settings VAV control: Enable – disable for different (already configured) PI controls, send control values according to defined parameters and values.
Inputs	General	Limitation of number and interval of telegrams to be send
	E1...E5 general	Labeling of inputs, selection of function as analogue-/binary-/temperature input (functions depending on input)
	E1...E5 parameters	<p>Binary input: switching/alarm, dimming, blinds/shutters, value, scene, switching sequences, multiple operation, pulse counter</p> <p>Analogue input (E1 only): Voltage, upper/lower measuring limits, output value, threshold, limits changeable via bus</p> <p>Temperature sensor input (E4/5 only): Function temperature / temperature limiter floor heater, sensor type, offset, error compensation, threshold 1, threshold 2</p>

Communication objects

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
1	Send '0' in operation	output	C	-	-	T	-	1 Bit	Boolean
1	Send '1' in operation	output	C	-	-	T	-	1 Bit	Boolean
2	Request status	input	C	-	W	-	-	1 Bit	switching
3	CO2: CO2 value [ppm]	output	C	-	-	T	-	2 Bytes	float value, pieces/million (ppm)
4	CO2: CO2 value external [ppm]	input	C	-	W	-	-	2 Bytes	float value, pieces/million (ppm)
5	CO2: request CO2 value	input	C	-	W	-	-	1 Bit	trigger
6	CO2: sensor error	output	C	-	-	T	-	1 Bit	Boolean
7	CO2R: Control value (0...255)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
7	CO2R: Control value (0...100%)	output	C	-	-	T	-	1 Byte	percent (0...100%)
7	CO2R: Scene (1...64)	output	C	-	-	T	-	1 Byte	Scenen Nummer
8	CO2R: Control value level 1 (switching object)	output	C	-	-	T	-	1 Bit	switching
8	CO2R: Control value level 1 (priority)	output	C	-	-	T	-	2 Bit	priority switching
9	CO2R: Control value level 2 (switching object)	output	C	-	-	T	-	1 Bit	switching
9	CO2R: Control value level 2 (priority)	output	C	-	-	T	-	2 Bit	priority switching
10	CO2R: Control value level 3 (switching object)	output	C	-	-	T	-	1 Bit	switching
10	CO2R: Control value level 3 (priority)	output	C	-	-	T	-	2 Bit	priority switching
11	CO2R: Base set point [ppm]	input	C	-	W	-	-	2 Bytes	float value, pieces/million (ppm)
12	CO2R: Blocking object threshold 1	input	C	-	W	-	-	1 Bit	enable
13	CO2R: Blocking object threshold 2	input	C	-	W	-	-	1 Bit	enable
14	CO2R: Blocking object threshold 3	input	C	-	W	-	-	1 Bit	enable
15	CO2R: Blocking object	input	C	-	W	-	-	1 Bit	enable
15	CO2R: Blocking object	input	C	-	W	-	-	1 Bit	enable
16	rF: Humidity value [%]	output	C	-	-	T	-	2 Bytes	humidity (%)
17	rF: Humidity value (1 Byte) [%]	output	C	-	-	T	-	1 Byte	percent (0...100%)
18	rF: Humidity value external [%]	input	C	-	W	-	-	2 Bytes	humidity (%)
19	rF: Request humidity value	input	C	-	W	-	-	1 Bit	trigger
20	rF: Sensor error	output	C	-	-	T	-	1 Bit	Boolean
21	RFR: Control value (0...255)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
21	RFR: Control value (0...100%)	output	C	-	-	T	-	1 Byte	percent (0...100%)
21	RFR: Scene (1...64)	output	C	-	-	T	-	1 Byte	Scenen Nummer
22	RFR: Control value level 1 (switching object)	output	C	-	-	T	-	1 Bit	switching
22	RFR: Control value level 1 (priority)	output	C	-	-	T	-	2 Bit	priority switching
23	RFR: Control value level 2 (switching object)	output	C	-	-	T	-	1 Bit	switching
23	RFR: Control value level 2 (priority)	output	C	-	-	T	-	2 Bit	priority switching

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
24	RFR: Control value level 3 (switching object)	output	C	-	-	T	-	1 Bit	switching
24	RFR: Control value level 3 (priority)	output	C	-	-	T	-	2 Bit	priority switching
25	RFR: Base set point [%]	input	C	-	W	-	-	2 Bytes	humidity (%)
26	RFR: Base set point (1 Byte) [%]	input	C	-	W	-	-	1 Byte	percent (0...100%)
27	RFR: Blocking object threshold 1	input	C	-	W	-	-	1 Bit	enable
28	RFR: Blocking object threshold 2	input	C	-	W	-	-	1 Bit	enable
29	RFR: Blocking object threshold 3	input	C	-	W	-	-	1 Bit	enable
30	RFR: Blocking object	input	C	-	W	-	-	1 Bit	enable
30	RFR: Blocking object	input	C	-	W	-	-	1 Bit	enable
31	T: Temperature value [°C]	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
32	T: Temperature value external [°C]	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
33	T: Request temperature value	input	C	-	W	-	-	1 Bit	trigger
34	T: Sensor error	output	C	-	-	T	-	1 Bit	Boolean
35	T: Heat alarm	output	C	-	-	T	-	1 Bit	Boolean
36	T: Frost alarm	output	C	-	-	T	-	1 Bit	Boolean
37	RTR: Comfort temperature	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
38	RTR: Standby setback when heating	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
39	RTR: Eco setback when heating	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
40	RTR: Standby increment when cooling	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
41	RTR: Eco increment when cooling	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
42	RTR: Current set point temperature	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
43	RTR: Comfort temperature +/- 0,1K	input	C	-	W	-	-	1 Bit	up/down
44	RTR: Standby setback when heating +/- 0,1K	input	C	-	W	-	-	1 Bit	up/down
45	RTR: Eco Setback when heating +/- 0,1K	input	C	-	W	-	-	1 Bit	up/down
46	RTR: Standby increment when cooling +/- 0,1K	input	C	-	W	-	-	1 Bit	up/down
47	RTR: Eco increment when cooling +/- 0,1K	input	C	-	W	-	-	1 Bit	up/down
48	RTR: HVAC mode: 1=comf, 2=stdb, 3=eco	output/input	C	-	-	-	-	1 Byte	HVAC mode
49	RTR: Comfort mode enabled	input	C	-	W	-	-	1 Bit	trigger
50	RTR: Standby mode enabled	input	C	-	W	-	-	1 Bit	trigger
51	RTR: Eco mode enabled	input	C	-	W	-	-	1 Bit	trigger
52	RTR: Status heating	output	C	-	-	T	-	1 Bit	switching
53	RTR: Status cooling	output	C	-	-	T	-	1 Bit	switching
54	RTR: Control value main level heating	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
54	RTR: Control value main level heating	output	C	-	-	T	-	1 Byte	percent (0...100%)
54	RTR: Control value main level heating	output	C	-	-	T	-	1 Bit	switching

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
54	RTR: Control value main level heating	output	C	-	-	T	-	1 Bit	switching
55	RTR: Control value extra level heating	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
55	RTR: Control value extra level heating	output	C	-	-	T	-	1 Byte	percent (0...100%)
55	RTR: Control value extra level heating	output	C	-	-	T	-	1 Bit	switching
55	RTR: Control value extra level heating	output	C	-	-	T	-	1 Bit	switching
56	RTR: Control value main level cooling	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
56	RTR: Control value main level cooling	output	C	-	-	T	-	1 Byte	percent (0...100%)
56	RTR: Control value main level cooling	output	C	-	-	T	-	1 Bit	switching
56	RTR: Control value main level cooling	output	C	-	-	T	-	1 Bit	switching
57	RTR: Control value extra level cooling	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
57	RTR: Control value extra level cooling	output	C	-	-	T	-	1 Byte	percent (0...100%)
57	RTR: Control value extra level cooling	output	C	-	-	T	-	1 Bit	switching
57	RTR: Control value extra level cooling	output	C	-	-	T	-	1 Bit	switching
58	RTR: Guide value [°C]	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
59	RTR: Blocking object heating	input	C	-	W	-	-	1 Bit	enable
60	RTR: Blocking object cooling	input	C	-	W	-	-	1 Bit	enable
61	RTR: Blocking object extra level heating	input	C	-	W	-	-	1 Bit	enable
62	RTR: Blocking object extra level cooling	input	C	-	W	-	-	1 Bit	enable
63	DEWP: Dew point temperature [°C]	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
64	DEWP: Dew point alarm enabled (switching object)	output	C	-	-	T	-	1 Bit	switching
64	DEWP: Dew point alarm enabled (priority)	output	C	-	-	T	-	2 Bit	priority switching
64	DEWP: Dew point alarm enabled (0...100%)	output	C	-	-	T	-	1 Byte	percent (0...100%)
64	DEWP: Dew point alarm enabled (0...255)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
64	DEWP: Dew point alarm enabled Scene (1...64)	output	C	-	-	T	-	1 Byte	Scenen Nummer
65	DEWP: Request dew point temperature	input	C	-	W	-	-	1 Bit	trigger
66	P: Air pressure absolute [Pa]	output	C	-	-	T	-	2 Bytes	2-Byte float value, Druck (Pa)
67	P: Air pressure relative [Pa]	output	C	-	-	T	-	2 Bytes	2-Byte float value, Druck (Pa)
68	P: Air pressure sensor error	output	C	-	-	T	-	1 Bit	Boolean
69	P: Request absolute air pressure	input	C	-	W	-	-	1 Bit	trigger
70	P: Request relative air pressure	input	C	-	W	-	-	1 Bit	trigger
71	VAVR: Control value (0...255)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
71	VAVR: Control value (0...100%)	output	C	-	-	T	-	1 Byte	percent (0...100%)
81	E1 switching sensor	output	C	-	-	T	-	1 Bit	switching
81	E1 Alarm sensor	output	C	-	-	T	-	1 Bit	1-Bit, Alarm
81	E1 switching	output	C	-	-	T	-	1 Bit	switching

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
81	E1 Blinds UP/DOWN	output	C	-	-	T	-	1 Bit	up/down
81	E1 Switch (event 0)	output	C	-	-	T	-	1 Bit	switching
81	E1 Priority (event 0)	output	C	-	-	T	-	2 Bit	priority switching
81	E1 1-Byte value (-128...127) (Event 0)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
81	E1 1-Byte value (0...255) (Event 0)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
81	E1 Scene (Event 0)	output	C	-	-	T	-	1 Byte	scene control
81	E1 2-Byte value (-32.768...32.767) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
81	E1 2-Byte value (0...65.535) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
81	E1 4-Byte value (-2.147.483.648...2.147.483.647) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
81	E1 4-Byte value (0...4.294.967.295) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
81	E1 2-Byte Floating point (Event 0)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
81	E1 Scene	output	C	-	-	T	-	1 Byte	scene control
81	E1 switching level 1	output	C	-	-	T	-	1 Bit	switching
81	E1 switching 1 actuation	output	C	-	-	T	-	1 Bit	switching
81	E1 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
81	E1 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
81	E1 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
81	E1 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
81	E1 HZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
81	E1 1-Byte value (-128...127)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
81	E1 1-Byte value (0...255)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
81	E1 2-Byte value (-32.768...32.767)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
81	E1 2-Byte value (0...65.535)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
81	E1 2-Byte Floating point	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
81	E1 4-Byte Floating point	output	C	-	-	T	-	4 Bytes	4-Byte float value, Beschleunigung (m/s ²)
82	E1 dimming	output	C	-	-	T	-	4 Bit	3-Bit controlled, Dimmer step
82	E1 STOP/slat adjustment	output	C	-	-	T	-	1 Bit	step
82	E1 switch (Event 1)	output	C	-	-	T	-	1 Bit	switching
82	E1 priority (Event 1)	output	C	-	-	T	-	2 Bit	priority switching
82	E1 1-Byte value (-128...127) (Event 1)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
82	E1 1-Byte value (0...255) (Event 1)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
82	E1 Scene (Event 1)	output	C	-	-	T	-	1 Byte	scene control
82	E1 2-Byte value (-32.768...32.767) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
82	E1 2-Byte value (0...65.535) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
82	E1 4-Byte value (-2.147.483.648...2.147.483.647) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
82	E1 4-Byte value (0...4.294.967.295) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
82	E1 2-Byte Floating point (Event 1)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
82	E1 switching level 2	output	C	-	-	T	-	1 Bit	switching
82	E1 switching 2 actuation	output	C	-	-	T	-	1 Bit	switching
82	E1 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
82	E1 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
82	E1 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
82	E1 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
82	E1 ZZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
82	E1 request	input	C	-	W	-	-	1 Bit	switching
83	E1 start event 0/1	input	C	-	W	-	-	1 Bit	switching
83	E1 End position top	input	C	-	W	-	-	1 Bit	Boolean
83	E1 Display storing scene	output	C	-	-	T	-	1 Bit	enable
83	E1 switching level 3	output	C	-	-	T	-	1 Bit	switching
83	E1 switching 3 actuation	output	C	-	-	T	-	1 Bit	switching
83	E1 HZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
83	E1 out of range	output	C	-	-	T	-	1 Bit	switching
84	E1 End position bottom	input	C	-	W	-	-	1 Bit	Boolean
84	E1 switching level 4	output	C	-	-	T	-	1 Bit	switching
84	E1 switching 4 actuation	output	C	-	-	T	-	1 Bit	switching
84	E1 HZ: Maximum level exceeded	output	C	-	-	T	-	1 Bit	Boolean
84	E1 threshold	output	C	-	-	T	-	1 Bit	switching
84	E1 threshold	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
84	E1 threshold	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
84	E1 threshold	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
85	E1 Store scene	input	C	-	W	-	-	1 Bit	enable
85	E1 Enable save	input	C	-	W	-	-	1 Bit	enable
85	E1 switching level 5	output	C	-	-	T	-	1 Bit	switching
85	E1 switching long actuation	output	C	-	-	T	-	1 Bit	switching
86	E1 switching level up/down	input	C	-	W	-	-	1 Bit	switching
86	E1 ZZ: Maximum level exceeded	output	C	-	-	T	-	1 Bit	Boolean
86	E1 Change threshold lower minimum	input	C	-	W	-	-	1 Byte	percent (0...100%)
87	E1 Number of actuations	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
87	E1 ZZ: Request counter reading	input	C	-	W	-	-	1 Bit	switching
87	E1 Change threshold upper maximum	input	C	-	W	-	-	1 Byte	percent (0...100%)

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
88	E1 ZZ: Reverse direction	input	C	-	W	-	-	1 Bit	Boolean
88	E1 Send when below threshold	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
88	E1 Send when below threshold	input	C	-	W	-	-	2 Bytes	2-Byte unsigned value, pulse
88	E1 Send when below threshold	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
89	E1 ZZ: Reset	input	C	-	W	-	-	1 Bit	Boolean
89	E1 Send when above threshold	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
89	E1 Send when above threshold	input	C	-	W	-	-	2 Bytes	2-Byte unsigned value, pulse
89	E1 Send when above threshold	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
90	E1 ZZ: Stop	input	C	-	W	-	-	1 Bit	Boolean
99	E1 Block	input	C	-	W	-	-	1 Bit	enable
101	E2 switching sensor	output	C	-	-	T	-	1 Bit	switching
101	E2 Alarm sensor	output	C	-	-	T	-	1 Bit	1-Bit, Alarm
101	E2 switching	output	C	-	-	T	-	1 Bit	switching
101	E2 Blinds UP/DOWN	output	C	-	-	T	-	1 Bit	up/down
101	E2 Switch (event 0)	output	C	-	-	T	-	1 Bit	switching
101	E2 Priority (event 0)	output	C	-	-	T	-	2 Bit	priority switching
101	E2 1-Byte value (-128...127) (Event 0)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
101	E2 1-Byte value (0...255) (Event 0)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
101	E2 Scene (Event 0)	output	C	-	-	T	-	1 Byte	scene control
101	E2 2-Byte value (-32.768...32.767) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
101	E2 2-Byte value (0...65.535) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
101	E2 4-Byte value (-2.147.483.648...2.147.483.647) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
101	E2 4-Byte value (0...4.294.967.295) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
101	E2 2-Byte Floating point (Event 0)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
101	E2 Scene	output	C	-	-	T	-	1 Byte	scene control
101	E2 switching level 1	output	C	-	-	T	-	1 Bit	switching
101	E2 switching 1 actuation	output	C	-	-	T	-	1 Bit	switching
101	E2 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
101	E2 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
101	E2 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
101	E2 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
101	E2 HZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
102	E2 dimming	output	C	-	-	T	-	4 Bit	3-Bit controlled, Dimmer step
102	E2 STOP/slat adjustment	output	C	-	-	T	-	1 Bit	step
102	E2 switch (Event 1)	output	C	-	-	T	-	1 Bit	switching

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
102	E2 priority (Event 1)	output	C	-	-	T	-	2 Bit	priority switching
102	E2 1-Byte value (-128...127) (Event 1)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
102	E2 1-Byte value (0...255) (Event 1)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
102	E2 Scene (Event 1)	output	C	-	-	T	-	1 Byte	scene control
102	E2 2-Byte value (-32.768...32.767) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
102	E2 2-Byte value (0...65.535) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
102	E2 4-Byte value (-2.147.483.648...2.147.483.647) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
102	E2 4-Byte value (0...4.294.967.295) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
102	E2 2-Byte Floating point (Event 1)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
102	E2 switching level 2	output	C	-	-	T	-	1 Bit	switching
102	E2 switching 2 actuation	output	C	-	-	T	-	1 Bit	switching
102	E2 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
102	E2 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
102	E2 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
102	E2 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
102	E2 ZZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
103	E2 Start event 0/1	input	C	-	W	-	-	1 Bit	switching
103	E2 End position top	input	C	-	W	-	-	1 Bit	Boolean
103	E2 Scene storage display	output	C	-	-	T	-	1 Bit	enable
103	E2 Switching level 3	output	C	-	-	T	-	1 Bit	switching
103	E2 Switching 3 actuation	output	C	-	-	T	-	1 Bit	switching
103	E2 HZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
104	E2 End position bottom	input	C	-	W	-	-	1 Bit	Boolean
104	E2 Switching level 4	output	C	-	-	T	-	1 Bit	switching
104	E2 Switching 4 actuation	output	C	-	-	T	-	1 Bit	switching
104	E2 HZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
105	E2 Store scene	input	C	-	W	-	-	1 Bit	enable
105	E2 Enable save	input	C	-	W	-	-	1 Bit	enable
105	E2 switching level 5	output	C	-	-	T	-	1 Bit	switching
105	E2 Switching long actuation	output	C	-	-	T	-	1 Bit	switching
106	E2 Level up/down switching	input	C	-	W	-	-	1 Bit	switching
106	E2 ZZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
107	E2 Number actuations	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
107	E2 ZZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
108	E2 ZZ: Reverse direction	input	C	-	W	-	-	1 Bit	Boolean

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
109	E2 ZZ: reset	input	C	-	W	-	-	1 Bit	Boolean
110	E2 ZZ: Stop	input	C	-	W	-	-	1 Bit	Boolean
119	E2 Disable	input	C	-	W	-	-	1 Bit	enable
121	E3 switching sensor	output	C	-	-	T	-	1 Bit	switching
121	E3 Alarm sensor	output	C	-	-	T	-	1 Bit	1-Bit, Alarm
121	E3 switching	output	C	-	-	T	-	1 Bit	switching
121	E3 Blinds UP/DOWN	output	C	-	-	T	-	1 Bit	up/down
121	E3 Switch (event 0)	output	C	-	-	T	-	1 Bit	switching
121	E3 Priority (event 0)	output	C	-	-	T	-	2 Bit	priority switching
121	E3 1-Byte value (-128...127) (Event 0)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
121	E3 1-Byte value (0...255) (Event 0)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
121	E3 Scene (Event 0)	output	C	-	-	T	-	1 Byte	scene control
121	E3 2-Byte value (-32.768...32.767) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
121	E3 2-Byte value (0...65.535) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
121	E3 4-Byte value (-2.147.483.648...2.147.483.647) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
121	E3 4-Byte value (0...4.294.967.295) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
121	E3 2-Byte Floating point (Event 0)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
121	E3 Scene	output	C	-	-	T	-	1 Byte	scene control
121	E3 switching level 1	output	C	-	-	T	-	1 Bit	switching
121	E3 switching 1 actuation	output	C	-	-	T	-	1 Bit	switching
121	E3 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
121	E3 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
121	E3 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
121	E3 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
121	E3 HZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
122	E3 dimming	output	C	-	-	T	-	4 Bit	3-Bit controlled, Dimmer step
122	E3 STOP/slat adjustment	output	C	-	-	T	-	1 Bit	step
122	E3 switch (Event 1)	output	C	-	-	T	-	1 Bit	switching
122	E3 priority (Event 1)	output	C	-	-	T	-	2 Bit	priority switching
122	E3 1-Byte value (-128...127) (Event 1)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
122	E3 1-Byte value (0...255) (Event 1)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
122	E3 Scene (Event 1)	output	C	-	-	T	-	1 Byte	scene control
122	E3 2-Byte value (-32.768...32.767) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
122	E3 2-Byte value (0...65.535) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
122	E3 4-Byte value (-2.147.483.648...2.147.483.647) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
122	E3 4-Byte value (0...4.294.967.295) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
122	E3 2-Byte Floating point (Event 1)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
122	E3 switching level 2	output	C	-	-	T	-	1 Bit	switching
122	E3 switching 2 actuation	output	C	-	-	T	-	1 Bit	switching
122	E3 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
122	E3 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
122	E3 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
122	E3 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
122	E3 ZZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
123	E3 Start event 0/1	input	C	-	W	-	-	1 Bit	switching
123	E3 End position top	input	C	-	W	-	-	1 Bit	Boolean
123	E3 Scene storage display	output	C	-	-	T	-	1 Bit	enable
123	E3 switching level 3	output	C	-	-	T	-	1 Bit	switching
123	E3 switching 3 actuation	output	C	-	-	T	-	1 Bit	switching
123	E3 HZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
124	E3 End position bottom	input	C	-	W	-	-	1 Bit	Boolean
124	E3 switching level 4	output	C	-	-	T	-	1 Bit	switching
124	E3 switching 4 actuation	output	C	-	-	T	-	1 Bit	switching
124	E3 HZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
125	E3 Store scene	input	C	-	W	-	-	1 Bit	enable
125	E3 Enable save	input	C	-	W	-	-	1 Bit	enable
125	E3 switching level 5	output	C	-	-	T	-	1 Bit	switching
125	E3 Switching long actuation	output	C	-	-	T	-	1 Bit	switching
126	E3 Level up/down switching	input	C	-	W	-	-	1 Bit	switching
126	E3 ZZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
127	E3 Number actuations	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
127	E3 ZZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
128	E3 ZZ: Reverse direction	input	C	-	W	-	-	1 Bit	Boolean
129	E3 ZZ: reset	input	C	-	W	-	-	1 Bit	Boolean
130	E3 ZZ: Stop	input	C	-	W	-	-	1 Bit	Boolean
139	E3 Disable	input	C	-	W	-	-	1 Bit	enable
141	E4 switching sensor	output	C	-	-	T	-	1 Bit	switching
141	E4 Alarm sensor	output	C	-	-	T	-	1 Bit	1-Bit, Alarm
141	E4 switching	output	C	-	-	T	-	1 Bit	switching
141	E4 Blinds UP/DOWN	output	C	-	-	T	-	1 Bit	up/down

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
141	E4 Switch (event 0)	output	C	-	-	T	-	1 Bit	switching
141	E4 Priority (event 0)	output	C	-	-	T	-	2 Bit	priority switching
141	E4 1-Byte value (-128...127) (Event 0)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
141	E4 1-Byte value (0...255) (Event 0)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
141	E4 Scene (Event 0)	output	C	-	-	T	-	1 Byte	scene control
141	E4 2-Byte value (-32.768...32.767) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
141	E4 2-Byte value (0...65.535) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
141	E4 4-Byte value (-2.147.483.648...2.147.483.647) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
141	E4 4-Byte value (0...4.294.967.295) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
141	E4 2-Byte Floating point (Event 0)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
141	E4 Scene	output	C	-	-	T	-	1 Byte	scene control
141	E4 switching level 1	output	C	-	-	T	-	1 Bit	switching
141	E4 switching 1 actuation	output	C	-	-	T	-	1 Bit	switching
141	E4 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
141	E4 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
141	E4 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
141	E4 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
141	E4 HZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
141	E4 Output value	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
141	E4 Output value	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
142	E4 dimming	output	C	-	-	T	-	4 Bit	3-Bit controlled, Dimmer step
142	E4 STOP/slat adjustment	output	C	-	-	T	-	1 Bit	step
142	E4 switch (Event 1)	output	C	-	-	T	-	1 Bit	switching
142	E4 priority (Event 1)	output	C	-	-	T	-	2 Bit	priority switching
142	E4 1-Byte value (-128...127) (Event 1)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
142	E4 1-Byte value (0...255) (Event 1)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
142	E4 Scene (Event 1)	output	C	-	-	T	-	1 Byte	scene control
142	E4 2-Byte value (-32.768...32.767) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
142	E4 2-Byte value (0...65.535) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
142	E4 4-Byte value (-2.147.483.648...2.147.483.647) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
142	E4 4-Byte value (0...4.294.967.295) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
142	E4 2-Byte Floating point (Event 1)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
142	E4 switching level 2	output	C	-	-	T	-	1 Bit	switching
142	E4 switching 2 actuation	output	C	-	-	T	-	1 Bit	switching
142	E4 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
142	E4 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
142	E4 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
142	E4 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
142	E4 ZZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
142	E4 Output value request	input	C	-	W	-	-	1 Bit	switching
142	E4 Output value request	input	C	-	W	-	-	1 Bit	switching
143	E4 Start event 0/1	input	C	-	W	-	-	1 Bit	switching
143	E4 End position top	input	C	-	W	-	-	1 Bit	Boolean
143	E4 Scene storage display	output	C	-	-	T	-	1 Bit	enable
143	E4 switching level 3	output	C	-	-	T	-	1 Bit	switching
143	E4 switching 3 actuation	output	C	-	-	T	-	1 Bit	switching
143	E4 HZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
143	E4 Measured value out of range	output	C	-	-	T	-	1 Bit	switching
143	E4 Measured value out of range	output	C	-	-	T	-	1 Bit	switching
144	E4 End position bottom	input	C	-	W	-	-	1 Bit	Boolean
144	E4 switching level 4	output	C	-	-	T	-	1 Bit	switching
144	E4 switching 4 actuation	output	C	-	-	T	-	1 Bit	switching
144	E4 HZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
144	E4 Heating temperature limit	output	C	-	-	T	-	1 Bit	switching
145	E4 Store scene	input	C	-	W	-	-	1 Bit	enable
145	E4 Enable save	input	C	-	W	-	-	1 Bit	enable
145	E4 switching level 5	output	C	-	-	T	-	1 Bit	switching
145	E4 Switching long actuation	output	C	-	-	T	-	1 Bit	switching
145	E4 Bit threshold 1	output	C	-	-	T	-	1 Bit	switching
145	E4 Byte threshold 1	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
145	E4 2 Byte threshold 1	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
145	E4 Temperature threshold 1	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
146	E4 Level up/down switching	input	C	-	W	-	-	1 Bit	switching
146	E4 ZZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
146	E4 Send when below threshold 1	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
146	E4 Send when below threshold 1	input	C	-	W	-	-	2 Bytes	2-Byte unsigned value, pulse
146	E4 Send when below threshold 1	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
147	E4 Number actuations	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
147	E4 ZZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
147	E4 Send when above threshold 1	input	C	-	W	-	-	1 Byte	counter pulses (0...255)

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
147	E4 Send when above threshold 1	input	C	-	W	-	-	2 Bytes	2-Byte unsigned value, pulse
147	E4 Send when above threshold 1	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
148	E4 ZZ: Reverse direction	input	C	-	W	-	-	1 Bit	Boolean
149	E4 ZZ: reset	input	C	-	W	-	-	1 Bit	Boolean
149	E4 Change temperature, tolerance band 1 lower limit	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
150	E4 ZZ: Stop	input	C	-	W	-	-	1 Bit	Boolean
150	E4 Change temperature, tolerance band 1 upper limit	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
151	E4 Bit threshold 2	output	C	-	-	T	-	1 Bit	switching
151	E4 Byte threshold 2	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
151	E4 2 Byte threshold 2	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
151	E4 Temperature threshold 2	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
152	E4 Send when below threshold 2	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
152	E4 Send when below threshold 2	input	C	-	W	-	-	2 Bytes	2-Byte unsigned value, pulse
152	E4 Send when below threshold 2	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
153	E4 Send when above threshold 2	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
153	E4 Send when above threshold 2	input	C	-	W	-	-	2 Bytes	2-Byte unsigned value, pulse
153	E4 Send when above threshold 2	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
155	E4 Change temperature, tolerance band 2 lower limit	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
156	E4 Change temperature, tolerance band 2 upper limit	input	C	-	W	-	-	2 Bytes	float value, Temperature (°C)
159	E4 Disable	input	C	-	W	-	-	1 Bit	enable
161	E5 switching sensor	output	C	-	-	T	-	1 Bit	switching
161	E5 Alarm sensor	output	C	-	-	T	-	1 Bit	1-Bit, Alarm
161	E5 switching	output	C	-	-	T	-	1 Bit	switching
161	E5 Blinds UP/DOWN	output	C	-	-	T	-	1 Bit	up/down
161	E5 Switch (event 0)	output	C	-	-	T	-	1 Bit	switching
161	E5 Priority (event 0)	output	C	-	-	T	-	2 Bit	priority switching
161	E5 1-Byte value (-128...127) (Event 0)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
161	E5 1-Byte value (0...255) (Event 0)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
161	E5 Scene (Event 0)	output	C	-	-	T	-	1 Byte	scene control
161	E5 2-Byte value (-32.768...32.767) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
161	E5 2-Byte value (0...65.535) (Event 0)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
161	E5 4-Byte value (-2.147.483.648...2.147.483.647) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
161	E5 4-Byte value (0...4.294.967.295) (Event 0)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
161	E5 2-Byte Floating point (Event 0)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
161	E5 Scene	output	C	-	-	T	-	1 Byte	scene control

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
161	E5 switching level 1	output	C	-	-	T	-	1 Bit	switching
161	E5 switching 1 actuation	output	C	-	-	T	-	1 Bit	switching
161	E5 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
161	E5 HZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
161	E5 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
161	E5 HZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
161	E5 HZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
162	E5 dimming	output	C	-	-	T	-	4 Bit	3-Bit controlled, Dimmer step
162	E5 STOP/slat adjustment	output	C	-	-	T	-	1 Bit	step
162	E5 switch (Event 1)	output	C	-	-	T	-	1 Bit	switching
162	E5 priority (Event 1)	output	C	-	-	T	-	2 Bit	priority switching
162	E5 1-Byte value (-128...127) (Event 1)	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
162	E5 1-Byte value (0...255) (Event 1)	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
162	E5 Scene (Event 1)	output	C	-	-	T	-	1 Byte	scene control
162	E5 2-Byte value (-32.768...32.767) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
162	E5 2-Byte value (0...65.535) (Event 1)	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
162	E5 4-Byte value (-2.147.483.648...2.147.483.647) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
162	E5 4-Byte value (0...4.294.967.295) (Event 1)	output	C	-	-	T	-	4 Bytes	4-Byte unsigned value, counter pulses
162	E5 2-Byte Floating point (Event 1)	output	C	-	-	T	-	2 Bytes	float value, Temperature (°C)
162	E5 switching level 2	output	C	-	-	T	-	1 Bit	switching
162	E5 switching 2 actuation	output	C	-	-	T	-	1 Bit	switching
162	E5 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	8-Bit unsigned value, counter pulses (0...255)
162	E5 ZZ: Counter reading 1-Byte-value	output	C	-	-	T	-	1 Byte	counter pulses (0...255)
162	E5 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte signed value, pulses difference
162	E5 ZZ: Counter reading 2-Byte-value	output	C	-	-	T	-	2 Bytes	2-Byte unsigned value, pulse
162	E5 ZZ: Counter reading 4-Byte-value	output	C	-	-	T	-	4 Bytes	4-Byte signed value, counter pulses
163	E5 Start event 0/1	input	C	-	W	-	-	1 Bit	switching
163	E5 End position top	input	C	-	W	-	-	1 Bit	Boolean
163	E5 Scene storage display	output	C	-	-	T	-	1 Bit	enable
163	E5 switching level 3	output	C	-	-	T	-	1 Bit	switching
163	E5 switching 3 actuation	output	C	-	-	T	-	1 Bit	switching
163	E5 HZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
164	E5 End position bottom	input	C	-	W	-	-	1 Bit	Boolean
164	E5 switching level 4	output	C	-	-	T	-	1 Bit	switching
164	E5 switching 4 actuation	output	C	-	-	T	-	1 Bit	switching

Number	Name	Object function	C	R	W	T	U	Objekt size	Data type
164	E5 HZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
165	E5 Store scene	input	C	-	W	-	-	1 Bit	enable
165	E5 Enable save	input	C	-	W	-	-	1 Bit	enable
165	E5 switching level 5	output	C	-	-	T	-	1 Bit	switching
165	E5 Switching long actuation	output	C	-	-	T	-	1 Bit	switching
166	E5 Level up/down switching	input	C	-	W	-	-	1 Bit	switching
166	E5 ZZ: Limit value exceeded	output	C	-	-	T	-	1 Bit	Boolean
167	E5 Number actuations	input	C	-	W	-	-	1 Byte	counter pulses (0...255)
167	E5 ZZ: Counter reading request	input	C	-	W	-	-	1 Bit	switching
168	E5 ZZ: Reverse direction	input	C	-	W	-	-	1 Bit	Boolean
169	E5 ZZ: reset	input	C	-	W	-	-	1 Bit	Boolean
170	E5 ZZ: Stop	input	C	-	W	-	-	1 Bit	Boolean
179	E5 Disable	input	C	-	W	-	-	1 Bit	enable

Communication flags

Flag	Name	Meaning
C	Communication	Object can communicate
R	Read	Object status can be requested (ETS, display etc.)
W	Write	Object can receive information
T	Transmit	Object can send information
U	Update	Object can request a value from another bus participant. The answer is interpreted as write command and updates the value of the communication object. This is typically used to request external sensor data after a bus voltage recovery.

1. Global Settings

(Picture shows modified parameters)

Send in operation	Sends '0'
Cycle time [s] in operation	60
Request status	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Request status with	'1'
Send delay after bus voltage recovery ... s	2

Designation	Options	Description
Send in operation	Inactive Sends „0“ Sends „1“	No function. „In operation“ (0 or 1) will be send in the configured cycle time (see next parameter).
	Cycle time [s] in operation 0 to 65535 seconds	Configuration of interval (in seconds) for transmitting the value „in operation“
Request status	Inactive Active Request status with „0“ Request status with „1“ Request status with „0“ and „1“	No function. Status (in operation) can be requested via communication object “0”. Status (in operation) can be requested via communication object “1”. Status (in operation) can be requested via communication object “0” and “1”.
Send delay after bus voltage recovery ...s	2 to 255 seconds	Configuration of time delay (in seconds) before sending “in operation” after a bus voltage recovery.

2. CO₂ Sensor

CO₂ sensor disabled enabled

value offset

error CO₂ sensor don't notify notify

send CO₂ value when changing

send CO₂ value cyclically

external value disabled enabled

percentage

Designation	Options	Description																		
CO ₂ Sensor	Inactive	CO ₂ sensor disabled.																		
	Active	<table border="0"> <tr> <td>Error CO₂ sensor</td> <td>notify</td> <td>If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.</td> </tr> <tr> <td></td> <td>don't notify</td> <td>No sensor errors will be reported.</td> </tr> <tr> <td>Send CO₂ value when changing</td> <td>Inactive</td> <td>No function.</td> </tr> <tr> <td></td> <td>If change above 10 – 500 ppm</td> <td>The new value is sent if the difference between old and new value is above the defined sending threshold.</td> </tr> <tr> <td>Send CO₂ value cyclically</td> <td>Inactive</td> <td>No function.</td> </tr> <tr> <td></td> <td>Every minute – once a day</td> <td>Cyclic sending of the recent value.</td> </tr> </table>	Error CO ₂ sensor	notify	If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.		don't notify	No sensor errors will be reported.	Send CO ₂ value when changing	Inactive	No function.		If change above 10 – 500 ppm	The new value is sent if the difference between old and new value is above the defined sending threshold.	Send CO ₂ value cyclically	Inactive	No function.		Every minute – once a day	Cyclic sending of the recent value.
	Error CO ₂ sensor	notify	If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.																	
	don't notify	No sensor errors will be reported.																		
Send CO ₂ value when changing	Inactive	No function.																		
	If change above 10 – 500 ppm	The new value is sent if the difference between old and new value is above the defined sending threshold.																		
Send CO ₂ value cyclically	Inactive	No function.																		
	Every minute – once a day	Cyclic sending of the recent value.																		
Value offset	-500 to +500 ppm	The value is adjusted by this offset. A correction might be necessary in different causes. (e.g. sensor is placed at an unfavorable position, next to a window.																		
External value	Inactive	No function.																		
	Active	<table border="0"> <tr> <td>Percentage:</td> <td>With xx% proportion</td> <td>The internal and an external value are taken pro rata to calculate an overall value. This value is relevant for the control and the sending procedure is as defined above.</td> </tr> <tr> <td></td> <td>Only use external value</td> <td>It only uses the value from the external sensor. The internal (integrated) sensor will not be used.</td> </tr> </table>	Percentage:	With xx% proportion	The internal and an external value are taken pro rata to calculate an overall value. This value is relevant for the control and the sending procedure is as defined above.		Only use external value	It only uses the value from the external sensor. The internal (integrated) sensor will not be used.												
Percentage:	With xx% proportion	The internal and an external value are taken pro rata to calculate an overall value. This value is relevant for the control and the sending procedure is as defined above.																		
	Only use external value	It only uses the value from the external sensor. The internal (integrated) sensor will not be used.																		

3. CO₂ Control

type of CO₂ control 3-step ▼

allow to change base set point via bus no yes

control value Output format switching command ▼

send control value when change-over disabled enabled

send control value cyclically every minute ▼

hysteresis (symmetrical) 50 ppm ▼

Designation	Options	Description
Type of CO ₂ control	Inactive 1-step 2-step 3-step PI	CO ₂ control disabled. One threshold available – see description chapter 3.1. Two thresholds available – see description chapter 3.1. Three thresholds available – see description chapter 3.1. PI-Control – see description chapter 3.2.
Control value output format	Switching command Priority Percent Byte Scene	A switching telegram is sent. There is one object available for every stage. A priority telegram is sent. There is one object available for every stage. A percentage value is sent. All steps are sending via one object. A byte value is sent. All steps are sending via one object. A scene value is sent. All steps are sending via one object.
Send control value when change-over	Disabled Enabled	No function. When exceeding or falling below a threshold, a defined object is sent.
Send control value when changing (PI control only)	Disabled If change above 1% ... 25%	No function. If there is a change, the recent control value is sent.
Send control value cyclically	Disabled Every two minutes up to 12 hours, once a day	No function. Cyclic sending of the recent control value.
Hysteresis (symmetrical) (single-stage, two-stage, three-stage)	50 to 300 ppm	The hysteresis can prevent a frequent switching for fast and small changing values.
Allow to change base set point via bus	No Yes	Does not allow changes of base set point via bus. Allows changes of base set point via bus.

3.1 Switching commands / priority CO₂ – Thresholds 1 / 2 / 3

CO₂ threshold 1

switching command below threshold 1 off on

switching command above threshold 1 off on

control value in case of sensor error off on

blocking object disabled enabled

behavior when unblocking don't send send current value

behavior when blocking don't send send value

switching command when blocking off on

Designation	Options	Description	
CO ₂ threshold 1/2/3	400 to 1500 ppm	Definition of threshold 1, 2 or 3 for the CO ₂ value.	
Switching command below threshold 1/2/3	off on	Definition of the switching command below threshold 1/2/3.	
Switching command above threshold 1/2/3	off on	Definition of the switching command above threshold 1/2/3.	
Control value in case of sensor error	off on	Definition of the switching command in case of sensor error.	
Blocking object	Disabled	No reaction.	
	Enabled		
	Behavior when unblocking	Don't send Send recent value	There is no control value sent when unblocking. The recent value is sent when unblocking.
	Behavior when blocking	Don't send Send value	There is no control value sent when blocking. A switching command is sent when blocking.
Switching command when blocking	off on	Definition of the switching command when blocking.	

3.2 PI-control for CO₂

set point

proportional band

reset time (15...240min)

min. control value

max. control value

control value in case of sensor error

blocking object disabled enabled

Designation	Options	Description
Set point	400 to 2000 ppm	Definition of the setpoint.
Proportional band	100 to 2000 ppm	Definition of the proportional band.
Reset time (15...240 min.)	15 to 240 Min.	Definition of the reset time.
Min. control value	0% to 95%	Definition of the minimal control value. The control value is limited to this minimum value.
Max. control value	5% to 100%	Definition of the maximum control value. The control value is limited to this maximum value.
Control value in case of sensor error	0% to 100%	Definition of the control value in case of sensor error.
Blocking object	Inactive	No function.
	Active	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented.
	Behavior when unblocking	Don't send Send recent value
	Behavior when blocking	Don't send Send value
	Percent when blocking (0...100%)	Selection: 0 to 100%
		Definition of the percentage value when blocking.

4. Relative humidity sensor

relative humidity sensor disabled enabled

value offset

error humidity sensor don't notify notify

send relative humidity when changing

send relative humidity cyclically

external value disabled enabled

percentage

Designation	Options	Description
Relative humidity sensor	Inactive	Relative humidity sensor disabled. If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.
	Active Error humidity sensor notify	No sensor errors will be reported.
	Active Error humidity sensor don't notify	No function. The new value is sent if the difference between old and new value is above the defined sending threshold.
	Active Send relative humidity when changing Disabled If change above 1% – 25%	No function. Cyclic sending of the recent value.
Active Send relative humidity cyclically Disabled Every minute – once a day		
Value offset	-5% to +5% ppm	The value is adjusted by this offset. A correction might be necessary in different causes. (e.g. sensor is placed at an unfavorable position, next to a window).
External value	Inactive	No function.
	Active Percentage: With xx% proportion	The internal and an external value are taken pro rata to calculate an overall value. This value is relevant for the control and the sending procedure is as defined above.
	Only use external value	It only uses the value from the external sensor. The internal (integrated) sensor will not be used.

5. Relative humidity control

control type	<input type="text" value="3-step"/>
allow to change base set point via bus	<input type="radio"/> no <input checked="" type="radio"/> yes
control value Output format	<input type="text" value="switching command"/>
send control value when change-over	<input type="radio"/> disabled <input checked="" type="radio"/> enabled
send control value cyclically	<input type="text" value="every 2 minutes"/>
hysteresis (symmetrical)	<input type="text" value="5%"/>

Designation	Options	Description
Control type	Disabled 1-step 2-step 3-step PI	Relative humidity control disabled. One threshold available – see description chapter 5.1. Two thresholds available – see description chapter 5.1. Three thresholds available – see description chapter 5.1. PI-Control – see description chapter 5.2.
Control value output format	Switching command Priority Percent Byte Scene	A switching telegram is sent. There is one object available for every stage. A priority telegram is sent. There is one object available for every stage. A percentage value is sent. All steps are sending via one object. A byte value is sent. All steps are sending via one object. A scene value is sent. All steps are sending via one object.
Send control value when change-over	Disabled Enabled	No function. When exceeding or falling below a threshold, a defined object is sent.
Send control value when changing (PI control only)	Disabled If change above 1% ... 25%	No function. If there is a change, the recent control value is sent.
Send control value cyclically	Disabled Every two minutes up to 12 hours, once a day	No function. Cyclic sending of the recent control value.
Hysteresis (symmetrical) (single-stage, two-stage, three-stage)	1% to 10%	The hysteresis can prevent a frequent switching for fast and small changing values.
Allow to change base set point via bus	No Yes	Does not allow changes of base set point via bus. Allows changes of base set point via bus.

5.1 Switching commands and priority relative humidity control – Threshold 1 / 2 / 3

rH threshold 1

switching command below threshold 1 off on

switching command above threshold 1 off on

control value in case of sensor error off on

blocking object disabled enabled

behavior when unblocking don't send send current value

behavior when blocking don't send send value

switching command when blocking off on

Designation	Options	Description
rF threshold 1/2/3	20% to 50%	Definition of threshold 1, 2 or 3 for the relative humidity value.
Switching command below threshold 1/2/3	off on	If measured value is below threshold 1/2/3, switching command will not be send. If measured value is below threshold 1/2/3, switching command will be send.
Switching command above threshold 1/2/3	off on	If measured value is above threshold 1/2/3, switching command will not be send. If measured value is above threshold 1/2/3, switching command will be send.
Control value in case of sensor error	off on	If sensor error, a switching command will not be send. If sensor error, a switching command will be send.
Blocking object	Disabled	No function.
	Enabled	
	Behavior when unblocking	Don't send Send recent value
Behavior when blocking	Don't send Send value	There is no control value sent when blocking. A switching command is sent when blocking.
Switching command when blocking	off on	Definition of the switching command when blocking.

5.2 PI control for relative humidity

set point (10...95%rH)

proportional band (10...40%rH)

reset time (15...240Min)

min. control value

max. control value

control value in case of sensor error

blocking object disabled enabled

Designation	Options	Description
Set point	10% to 95% relative humidity	Definition of the setpoint.
Proportional band	10% to 40% relative humidity	Definition of the proportional band.
Reset time	15 to 240 min.	Definition of the reset time.
Min. control value	0% to 95%	Definition of the minimal control value. The control value is limited to this minimum value.
Max. control value	5% to 100%	Definition of the maximum control value. The control value is limited to this maximum value.
Control value in case of sensor error	0% to 100%	Definition of the control value in case of sensor error.
Blocking object	Inactive	No function.
	Active	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented.
	Behavior when unblocking	Don't send Send recent value
	Behavior when blocking	Don't send Send value
	Percent when blocking	Selection: 0% to 100%

6. Temperature Sensor

temperature sensor disabled enabled

value offset [0,1K], (-5K...+5K)

error temperature sensor don't notify notify

send temperature when changing

send temperature cyclically

external value disabled enabled

percentage

Designation	Options	Description
Temperature Sensor	Disabled	Temperature sensor disabled.
	Enabled	If there are no new values provided from the sensor for more than 10 minutes, a sensor failure will be reported. No report on sensor failure.
	Error Temperature sensor	
	Notify	
	Don't notify	No function.
	Send temperature when changing	Disabled Change from 0,1 K – 10,0 K The new value is sent if the difference between old and new value is above the defined sending threshold.
	Send temperature cyclically	Disabled Every minute – once a day No function. Cyclic sending of the recent value.
Value offset	-5 K to + 5 K	The value is adjusted by this offset. A correction might be necessary in different causes. (e.g. sensor is placed at an unfavorable position, next to a window).
External value	Disabled	No function.
	Enabled	The internal and an external value are taken pro rata to calculate an overall value. This value is relevant for the control and the sending procedure is as defined above.
	Percentage:	
	With xx% proportion	
	Only use external value	It only uses the value from the external sensor. The internal (integrated) sensor will not be used.

7. Temperature Alarme

frost alarm disabled enabled

frost alarm when temperature

send frost alarm when change of status disabled enabled

send frost alarm cyclically

heat alarm disabled enabled

heat alarm when temperature

send heat alarm when change of status disabled enabled

send heat alarm cyclically

Designation	Options	Description
Frost alarm	Disabled	No function.
	Enabled	If the alarm function is activated an alarm in the form of an object is sent when the temperature falls below a defined temperature threshold for frost alarm.
	Frost alarm when temperature < 1 °C to < 10 °C	When falling below the defined temperature the object frost alarm is sent.
	Send frost alarm when change of status	Disabled Enabled No function. If there is a change the recent control value is sent.
Send frost alarm cyclically	Disabled Every minute – once a day No function. Cyclic sending of the recent control value.	
Heat alarm	Disabled	No function.
	Enabled	If the alarm function is activated an alarm in the form of an object is sent when the temperature exceeds a defined temperature threshold for heat alarm.
	Heat alarm when temperature > 20 °C to > 30 °C	When exceeding the defined temperature, the object heat alarm is sent.
	Send heat alarm when change of status	Disabled Enabled No function. If there is a change the recent control value is sent.
Send heat alarm cyclically	Disabled Every minute – once a day No function. Cyclic sending of the recent control value.	

8. Temperature control

8.1 Temperature control – heating and cooling

select heating and/or cooling heating and cooling ▼

extra level heating enable disabled enabled

guide heating disabled enabled

extra level cooling enable disabled enabled

guide cooling disabled enabled

PI control: A PI control is a constant control that comprises a proportional part (P-part) and an integral share (I-share). The size of the P-part is indicated in Kelvin, the I-share in minutes. At a constant PI control, the manipulated variables are operated in proportional steps up to a maximum value.

2-stage-control: A two-stage control only sends two conditions for the manipulated variable, on and off. The control turns on when falling below a desired temperature and turns off when exceeding it. Set point and switching hysteresis are defined in advance.

Main level and Extra level: In addition to the main level (e.g. underfloor heating) an extra level (e.g. electric heating) can be helpful for slow systems controlled by main level. This can shorten in the mentioned example the slow heat-up phase of an underfloor heating. You can choose between a PI or two-stage controller for the additional object.

Designation	Options	Description
Select heating and/or cooling	Disabled Heating Cooling Heating and cooling	Temperature controller disabled. Operating mode: Heating only. Operating mode: Cooling only. Operating mode: Heating and cooling.
Extra level heating / Extra level cooling	Disabled Enabled	Extra level heating / cooling disabled. In addition to the main level (e.g. underfloor heating) an extra level (e.g. electric heating) can be helpful for lazy systems. It can shorten the slow heat-up phase of an underfloor heating. You can choose between a PI or two-stage controller for the additional object.
Guide heating / Guide cooling	Disabled Enabled	Guide heating / cooling disabled. With the parameter guiding it is possible to adjust the set point linearly depending on any reference variable which is captured through an external sensor. In general, an outdoor temperature reset control is realized. With an appropriate parameterization, the constant raising or lowering of the set value is possible. The parameterization is carried-out together with the definition of the set points.

8.2 Temperature control – General

- blocking object heating mode: enable disabled enabled
- blocking object cooling mode: enable disabled enabled
- blocking object extra level heating: enable disabled enabled
- blocking object extra level cooling: enable disabled enabled
- heating demand for display no yes
- cooling demand for display no yes

Designation	Options	Description
Blocking object heating mode: enable	Disabled	Blocking object disabled.
	Enabled	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented (e.g. do not heat if a window is open).
Blocking object cooling mode: enable	Disabled	Blocking object disabled.
	Enabled	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented (e.g. do not heat if a window is open).
Blocking object extra level heating: enable	Disabled	Blocking object disabled.
	Enabled	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented (e.g. do not cool if a window is open).
Blocking object extra level cooling: enable	Disabled	Blocking object disabled.
	Enabled	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented (e.g. do not cool if a window is open).
Heating demand for display	Disabled	Status object disabled.
	Enabled	This object is a status object to send the status of heating (active or not). It can be used to visualize the status on a display.
Cooling demand for display	Disabled	Status object disabled.
	Enabled	This object is a status object to send the status of cooling (active or not). It can be used to visualize the status on a display.

8.3 Temperature control – Set points

comfort temperature [0,1°C], (18...30°C)	180	▲▼	send set point temperature cyclically	disabled	▼
standby setback heating [0,1K], (0..10K)	0	▲▼	dead zone between heating and cooling [0,1K], (0...10K)	20	▲▼
eco setback heating [0,1K], (0..10K)	0	▲▼	min. guide value heating (-50°C...+50°C)	0	▲▼
standby increment cooling [0,1K], (0..10K)	0	▲▼	max. guide value heating (-50°C...+50°C)	0	▲▼
eco increment cooling [0,1K], (0..10K)	0	▲▼	max. increment of set point for min. guide value heating (0K...+10K)	0	▲▼
interval to main level heating [0,1K], (0...-10K)	-10	▲▼	min. guide value cooling (-50°C...+50°C)	0	▲▼
interval to main level cooling [0,1K], (0...10K)	10	▲▼	max. guide value cooling (-50°C...+50°C)	0	▲▼
send set point temperature when changing	disabled	▼	max. setback of set point for max. guide value cooling (0K...+10K)	0	▲▼

Designation	Options		Description
Comfort temperature	18° to 30°C	In 0,1 °C Steps	Definition of the comfort temperature.
Setback of standby heating and increment of standby cooling	0 K to 10 K	In 0,1 K Steps	Definition of the difference to the comfort temperature in Kelvin.
Setback of eco heating and increment of eco cooling	0 K to 10 K	In 0,1 K Steps	Definition of the difference to the comfort temperature in Kelvin.
Interval to main level heating and cooling	0 K to -10 K	In 0,1 K Steps	To get a faster compensation for big differences between the recent value and setpoint, an extra level for heating / cooling can be activated. The distance to the main level gives the difference of recent value and setpoint at which the extra level should be activated.
Send setpoint temperature when changing	Disabled Enabled		No function. If there is a change the recent control value is sent.
Send setpoint temperature cyclically	Disabled	Every minute – once a day	No function. Cyclic Sending of the recent control value.
Dead zone between heating and cooling	0 to 10K	In 0,1 K Steps	Definition of the dead zone between heating and cooling. Recent value < Set point = Heating Recent value > Set point + dead zone = Cooling
Min. guide value heating	-50°C to +50°C	In 0,1 °C Steps	Lower guide value for outdoor temperature reset.
Max. guide value heating	-50°C to +50°C	In 0,1 °C Steps	Upper guide value for outdoor temperature reset.
Max. increment min. guide value heating	0 to 10K	In 0,1 K Steps	Increment of the set temperature at minimum guide value.
Min. guide value cooling	-50°C to +50°C	In 0,1 °C Steps	Lower guide value for outdoor temperature reset.
Max. guide value cooling	-50°C to +50°C	In 0,1 °C Steps	Upper guide value for outdoor temperature reset.
Max. setback for max. guide value cooling	0 to 10K	In 0,1 K Steps	Setback of the set temperature at maximum guide value.

8.4 Temperature control – Main level and extra level heating / cooling

control type PI 2-point

control direction of control value normal inverted

proportional band (1...8K)

reset time (15...240Min)

control value Output format

PWM cycle (5...30Min)

min. control value

max. control value

control value in case of sensor error

send control value when changing disabled enabled

send control value cyclically

(Picture shows main level heating, PI control with output: PWM)

Designation	Options	Description	
Control type	PI control	Selection of control type.	
	Proportional band	1 to 8 K	
	Reset time	15 to 240 Min.	
	Control value output format	Percent Byte PWM	Definition of the control value output format.
	PWM cycle	5 to 30 Min.	Depending on the output format the cycle is defined in percent, byte or minutes.
	Min. control value	0% to 95% 0 to 240 Byte	Depending on the output format the minimum control value is defined in percent or byte here.
	Max. control value	5% to 100% 0 to 255 Byte	Depending on the output format the maximum control value is defined in percent or byte here.
	Control value in case of sensor error	0% to 100% 0 to 255 Byte	Depending on the output format the control value is defined in percent or byte here.
	Send control value when changing	Disabled Enabled	No function. If there is a change the recent control value is sent.
	2-point	Hysteresis (symmetrical)	0,5 K to 5 K
Control value in case of sensor error		Off On	In case of sensor error, the value „off“ is sent. In case of sensor error, the value „on“ is sent.
Send control value when change-over		Disabled Enabled	No function. Bei einer Umschaltung (Änderung) wird die aktuelle Stellgröße gesendet.
Control direction of control value	Normal Inverted		
Send control value cyclically	Disabled Every minute – once a day	No function. Cyclic sending of the recent control value.	

9. Dew point Temperature

dew point sensor disabled enabled

send dew point temp. when changing

send dew point temp. cyclically

Designation	Options	Description
Dew point sensor	Disabled Enabled	No function. Sending of the recent condition.
Send dew point temperature when changing	Disabled If change above ... 0,1 K bis 10 K	No function. If there is a change the recent control value is sent.
Send dew point temperature cyclically	Disabled jede Minute - einmal am Tag	No function. Cyclic sending of the recent control value.

10. Dew point Alarm

dew point alarm disabled enabled

dew point alarm advance 1K ▼

dew point alarm hysteresis (symmetrical) 1K hysteresis ▼

send dew point alarm when change of status disabled enabled

send dew point alarm cyclically every minute ▼

type of telegram for dew point alarm switching command ▼

switching command when dew point alarm off on

switching command at the end of dew point alarm off on

Designation	Options	Description
Dew point alarm	Disabled Enabled	No function. If the alarm function is activated an alarm in form of an object is sent when the defined dew point is exceeded or fallen below.
Dew point alarm advance	Without 1K to 5K	The dew point alarm can be initiated in advance with a defined offset.
Dew point alarm hysteresis (symmetrical)	Without hysteresis Hysteresis 1 K to 5 K	No function. If there is a change, the recent control value is sent.
Send dew point alarm when change of status	Disabled Enabled	No function. Upon change of status dew point alarm is sent.
Send dew point alarm cyclically	Disabled Every minute – once a day	No function. Cyclic sending of the recent control value.
Type of telegram for dew point alarm	Switching command Priority Percent Byte Scene	Definition of the type of telegram which is used.
value when dew point alarm	Depending on the type of telegram	Definition of the value that is sent when the dew point alarm starts.
value at the end of dew point alarm	Depending on the type of telegram	Definition of the value that is sent when the dew point alarm ended.

11. Air pressure sensor

air pressure sensor disabled enabled

error air pressure sensor don't notify notify

send absolute air pressure when changing

send absolute air pressure cyclically

send relative air pressure when changing

send relative air pressure cyclically

height [m. a. s. l.] (0...5000m)

Designation	Options	Description
Air pressure sensor	Disabled	Temperature sensor disabled.
	Enabled	
	Error air pressure Sensor	Notify Don't notify
	Send absolute air pressure when changing	Disabled If change above 1 hPa – 50 hPa
	Send absolute air pressure cyclically	Disabled Every minute – once a day
	Send relative air pressure when changing	Disabled If change above 1 hPa – 50 hPa
	Send relative air pressure cyclically	Disabled Every minute – once a day
	Height [m. a. s. l.]	0 m to 5000 m

12. VAV control

CO2 control include disabled enabled

relative humidity control include disabled enabled

main level heating include disabled enabled

extra level heating include disabled enabled

main level cooling include disabled enabled

extra level cooling include disabled enabled

control value Output format percent byte

min. control value

max. control value

send VAVC control value when changing

send VAVC control value cyclically

Function of the VAV control:

The highest value of all activated PI controls of the values from CO₂, relative humidity and temperature is sent in one object.

Designation	Options	Description
CO ₂ control include	Disabled Enabled	No function. Sending of the CO ₂ PI controller values if they are valid.
Relative humidity control include	Disabled Enabled	No function. Sending of the relative humidity PI controller values if they are valid.
Main level heating include	Disabled Enabled	No function. Sending of the main level PI controller values if they are valid.
Extra level heating include	Disabled Enabled	No function. Sending of the extra level PI controller values if they are valid.
Main level cooling Include	Disabled Enabled	No function. Sending of the main level cooling PI controller values if they are valid.
Extra level cooling Include	Disabled Enabled	No function. Sending of the extra level cooling PI controller values if they are valid.
Control value output format	Percent Byte	Definition des Ausgabeformates (percent oder Byte) für die Stellgröße.
	Min. control value	Percent: 0% to 95% Byte: 0 to 240
	Max. control value	Percent: 5% to 100% Byte: 10 to 255
Send VAVC control value when changing	Disabled If change above	No function. The values of the PI controllers are limited to the maximum value.
Send VAVC control value cyclically	Disabled	No function. Cyclic sending of the recent value.

13. Inputs

13.1 General

Limit number of telegrams

Inactive Active

Maximum number of sent telegrams

20

Maximum number of sent telegrams per

1 second

Designation	Options	Description	
Limit number of telegrams	Inactive	No function.	
	Active	Number of telegrams to be sent is limited to the configured maximum.	
	Maximum number of sent telegrams	1 to 255	Maximum number of telegrams to be sent.
	Maximum number of sent telegrams per	50 milliseconds to 60 seconds	Base for number of telegrams.

13.2 E1 – E5 General

Designation	<input type="text"/>
Function	Binary input ▼
Binary function	Switching/alarm ▼ Switching/alarm ✓ Dimming Blind Value Scene Switching sequences Multiple operation Pulse counter

Designation	Options	Description
Designation		Possibility to name each input individually.
Function	Inactive	Input disabled.
	Binary input (available for E1-E5) Switching / Alarm Dimming Blind Value Scene Switching sequences Multiple operation Pulse counter	Available for inputs E1 to E5 (in total up to 5x). Definition of the desired use each specific input. Depending on the selected function, different parameters are available. Details about the configuration of binary inputs see chapter 13.2.1.
	Analogue input (E1 only)	Function available for input E1 only (in total only 1x). Details about the configuration of the analogue input see chapter 13.2.2.
	External temperature sensor (E4 only)	Function available for input E4 only (in total only 1x). Important: By activating the external temperature sensor input on input E4, the inputs E4 and E5 will be combined. E5 will not be available as binary input while E4 is set as temperature input. Details about the configuration of the external temperature sensor input see chapter 13.2.3.

13.2.1 E1 – E5 as binary inputs

13.2.1.1 Switching/Alarm function

Switching/alarm sensor	<input checked="" type="radio"/> Switch <input type="radio"/> Alarm
Communication object DPT 1.001	<---
Differentiation between short and long actuation	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Short actuation -> event 0 long actuation -> event 1	<---
Long actuation from ... s	0,4 ▼
Input is being actuated	<input checked="" type="radio"/> closed <input type="radio"/> Opened
Enable object 'Start event 0/1'	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Reaction in case of event 0	Off/alarm ▼
Reaction in case of event 1	On/no alarm ▼
Cyclical sending	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Telegram repeated every ... s	60 ▲▼
at object value	Off/on ▼
Debouncing time ... ms	50 ▼
Enable object 'Disable'	<input type="radio"/> Inactive <input checked="" type="radio"/> Active

(Picture shows input 1, with function as binary input. Configuration windows for inputs E2...E5 are similar).

Description of functions and parameters see next page.

Designation	Options			Description
Switching / alarm sensor	Switch Alarm			Communication object type DPT 1.001 Communication object type DPT 1.005
Differentiation between short and long actuation	Inactive	Activate minimum signal duration	Inactive Active	Function inactive. Definition of minimum signal duration (in 0,1s steps) for open / close.
		Query input after download, ETS reset and bus voltage recovery	Inactive Active	Function inactive. Input status will be checked after a reboot of the device. A delay (in seconds) before the check can be configured.
	Active	Long actuation from ... s	0,3 to 10,0 sec.	If active, definition of when to count the actuation as a „long actuation“ can be done.
		Input is being actuated	Closed Opened	Definition of function of input either as NO or NC contact.
Enable object „start event 0/1“	Inactive Active			No function. If active, additional object (start event 0/1) is made available, which can emulate e.g. an actuation from external and triggers event (0/1).
Reaction in case of event 0	On / no alarm Off / Alarm Switchover Inactive Cycle off			Action on event 0 = ON Action on event 0 = OFF Action on event 0 = SWITCHOVER Function disabled. Action on event 0 = CYCLE OFF
Reaction in case of event 1	On / no alarm Off / Alarm Switchover Inactive Cycle off			Action on event 0 = ON Action on event 0 = OFF Action on event 0 = SWITCHOVER Function disabled. Action on event 0 = CYCLE OFF
Cyclical sending	Inactive Active	Telegramm repeated every ... s.	1 to 65535 In seconds	No cyclical sending. Cyclical sending according to the defined parameters (see left column).
		At object value:	On Off On / Off	Setting, under what conditions a cyclical sending shall be performed.
Debouncing time... in ms	10 to 150 ms			Definition of debouncing time for the input.
Enable object „disable“	Inactive Active			Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.

13.2.1.2 Dimming

Switching/dimming sensor Dimmer/switch Dimmer

Input is being actuated closed Opened

Long actuation from ... s

At short actuation: switching

At long actuation: dimming direction

Dimming procedure Start/stop Steps

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Switching/dimming sensor Dimmer/switch Dimmer

Input is being actuated closed Opened

At actuation: dimming direction

Dimming procedure Start/stop Steps

Brightness change per sent telegram

Telegram repeated every ... s

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Designation	Options	Description
Switching/ Dimming sensor	Dimmer / switch	Selection of operating mode as dimmer / switch.
	Long actuation from ... in s	0,3 to 10,0 seconds Configuration of time before input signal is registered as a "long actuation".
	At short actuation (switching):	On Off Switchover Inactive Selection of value to be sent upon short actuation.
	At long actuation (dimming direction):	More brightness Less brightness Switchover Switchover, after switching brighter Switchover, after switching darker Selection of value to be sent upon long actuation.
	Dimmer	Selection of operating mode as dimmer only.
	Input is being actuated	Closed Opened Definition of function of input either as NO or NC contact.
	At actuation: dimming direction	More brightness Less brightness Switchover Switchover, after switching brighter Switchover, after switching darker Selection of value to be sent upon actuation.
Dimming procedure	Start / Stop Steps	Selection of desired dimming procedure. Possibility of choosing start/stop or steps.
	Brightness change per sent telegram	1,56%, 3,13%, 6,25%, 12,5%, 25%, 50%, 100%
	Telegram repeated every ... s	0,3 to 10,0 seconds By changing the telegram repetition time, the dimming speed can be varied.
Debouncing time	10 to 150 ms	Definition of debouncing time for the input.
Enable object „disable“	Inactive Active	Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.

13.2.1.3 Blind sensor

Blind operating function

Brief actuation: STOP/stepwise
Long actuation: move UP/DOWN

Reaction at short actuation Stop/slat OPEN Stop/slat CLOSED

Reaction at long actuation High Down

Long actuation from ... s

Input is being actuated closed Opened

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Designation	Options	Description	
Blind operating function	2-push-button, standard	Operating mode with two push buttons for blinds. Blind stops / slat opens step-by-step. Blind stops / slat closes step-by-step.	
	Reaction at shot actuation	Stop / slat OPEN Stop / slat CLOSED	
	Reaktion at long actuation	High Down	
	Long actuation from ... s	0,3 to 10,0 seconds If active, definition of when to count the actuation as a „long actuation“ can be done.	
	2-switch, only move (roller blind)	Reaction at actuation High Down Operating mode with two switches for blinds / shutters without slat function. Move blinds / shutters up. Move blinds / shutters down.	
	2-push-button, move (roller blind)	Reaction at actuation High Down Operating mode with two push buttons for blinds / shutters without slat function. Move blinds / shutters up. Move blinds / shutters down.	
	2-push-button, only slat	Reaction at actuation	Stop/ slat OPEN Stop/ slat CLOSED Operating mode with two push buttons for blinds / shutters (only slat function). Blinds stop / open slat. Blinds stop / close slat.
		„Slat“ telegram repeated every ...s	0,3 to 10,0 seconds Configuration of repetition time for telegram „slat“.
1-push-button, short=slat, long=move	Long actuation from ... s 0,3 to 10,0 seconds Short actuation: STOP / Schrittweise Long actuation: Fahren AUF/AB		
1-push-button, short=move, long=slat	Long actuation from ... s 0,3 to 10,0 seconds Kurze actuation: Move UP/DOWN Lange actuation: STOP/ stepwise		
1-push-button,only move	One after another at actuation: UP, STOP, DOWN, STOP.		
1-switch, only move	At actuation: move UP/DOWN. STOP at end of actuation.		
Input is being actuated	closed opened	Definition of function of input either as NO or NC contact.	
Debouncing time	10 to 150 ms	Definition of debouncing time for the input.	
Enable object „disable“	Inactive	Communication object (blocking object) for input is disabled.	
	Active	Communication object (blocking object) for input is enabled.	

13.2.1.4 Value / forced operation

Differentiation between short and long actuation Inactive Active

Contact opening -> event 0
contact closing -> event 1

Activate minimum signal duration Inactive Active

At contact opening
in value x 0.1 s (1 - 65,535)

At contact closing
in value x 0.1 s (1 - 65,535)

Query input after download,
ETS reset and bus voltage recovery Inactive Active

Reaction in case of event 0

Sent value

Reaction in case of event 1

Sent value

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Differentiation between short and long actuation Inactive Active

Short actuation -> event 0
long actuation -> event 1

Long actuation from ... s

Input is being actuated closed Opened

Reaction in case of event 0

Sent value

Reaction in case of event 1

Sent value

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Description of parameters see next page.

Designation	Options	Description	
Differentiation between short and long actuation	Inactive	No differentiation between short and long actuation of input. Thereby: Opening the contact leads to → event 0. Closing the contact leads to → event 1.	
	Activate minimum signal duration	Inactive Active	
	At contact opening in value x 0,1s	1...65535 x 0,1 seconds	Function disabled. Minimum signal duration for open / close configurable (see the following parameter). Parameter for minimum signal duration of „open contact“.
	At contact closing in value x 0,1s	1...65535 x 0,1 seconds	Parameter for minimum signal duration of „close contact“.
	Query input after download, ETS reset and bus voltage recovery	Inactive Active	Function disabled. Configurable waiting time before transmission after a restart. (0...30000 seconds)
	Active		Differentiation between short and long actuation of input active. Thereby: Short actuation → event 0; Long actuation → event 1
	Long actuation from ...s Input is being actuated	0,3 to 10,0 seconds Closed Opened	If active, definition of when to count the actuation as a „long actuation“ can be done. Definition of function of input either as NO or NC contact.
Reaction in case of event 0 / 1	Inactive Switch Priority 1-Byte value Scene 2-Byte value 2-Byte floating point 4-Byte value	If inactive – function disabled. Selection of the desired data / transmission type.	
	Sent value	Selection depending on configuration of parameter “reaction in case of event 0/1”	
Debouncing time	10 to 150 ms	Definition of debouncing time for the input.	
Enable object „disable“	Inactive Active	Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.	

13.2.1.5 Scene

Input is being actuated closed Opened

Scene number at actuation

Save scene

Long actuation from ... s

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Designation	Options	Description
Input is being actuated	Closed Opened	Definition of function of input either as NO or NC contact.
Scene number at actuation	1...64	Selection of the scene number to be transmitted on actuation of input.
Save scene	No	Scenes cannot be saved.
	At long actuation Long actuation from ...s	Scene will be saved at long actuation (value configurable from 0,3 ...10,0 seconds)
	With object value= 1	Scene will be saved, when object value = 1
Debouncing time	At long actuation and object value= 1 Long actuation from ...s	Scene will be saved, when object value = 1 and long actuation (value configurable from 0,3 ...10,0 seconds)
	10 to 150 ms	Definition of debouncing time for the input.
Enable object „disable“	Inactive	Communication object (blocking object) for input is disabled.
	Active	Communication object (blocking object) for input is enabled.

13.2.1.6 Switching sequences

Input is being actuated closed Opened

Number of steps

Switching sequence type

Direction at actuation Switch up Switch down

Switching sequence like 000>001>011>111

Debouncing time ... ms

Activate minimum signal duration Inactive Active

At contact opening in value x 0.1 s (1 - 65,535)

At contact closing in value x 0.1 s (1 - 65,535)

Enable object 'Disable' Inactive Active

* Information - switching sequence type = „activate/deactivate (several buttons)“:

When using above mentioned option, two binary inputs are to be configured as “switching sequences”. One of these inputs has to be configured as „direction at actuation“ = switch up, the other input has to be configured as “switch down”. In order to assure synchronous function of these two inputs / sequences, the two communication objects „actuating number“ of the two inputs have to be assigned to the same group address.

Example:
 Use of E1 for switching up, E2 for switching down
 E1 actuating number → group address 1/1/5
 E2 actuating number → group address 1/1/5

Designation	Options	Description
Input is being actuated	Closed Opened	Definition of function of input either as NO or NC contact.
Number of steps	2...5	Definition of number of total steps
Switching sequence type	Activate/deactivate (one button) Activate/deactivate (several buttons)* Direction at actuation All possibilities („Gray-Code“)	Switch up Switch down
Debouncing time	10 to 150 ms	Definition of debouncing time for the input.
Activate minimum signal duration	Inactive Active At contact opening in value x 0,1 s At contact closing in value x 0,1 s	1...65535 x 0,1 seconds 1...65535 x 0,1 seconds
Enable object „disable“	Inactive Active	Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.

13.2.1.7 Multiple operation

Input is being actuated closed Opened

Max. number of actuations

Sent value

Update and send at actuation Inactive Active

Maximum time between two actuations ... s

Additional object for long actuation Inactive Active

Long actuation from ... s

Sent value at long actuation

Debouncing time ... ms

Enable object 'Disable' Inactive Active

Designation	Options	Description
Input is being actuated	Closed Opened	Definition of function of input either as NO or NC contact.
Max. number of actuations	1...4	Maximum number of actuations (each actuation will use a separate communication object)
Sent value	On Off Switchover	Selection of the value to be sent when reaching the number of actuations.
Update and send at actuation	Inactive Active	If inactive, the input accumulates the actuations within the maximum time (see below) and sends only the corresponding object, e.g. 4-times actuation object. If active, all actuations will be transmitted, e.g. 1-time, 2-times, 3-times and 4-times.
Maximum time between two actuations ... in s	0,3 ... 10,0 seconds	Definition of time between two actuations, before they are distinguished as separate inputs. Especially relevant when „Update and send at actuation = inactive“.
Additional object for long actuation	Inactive	Function disabled.
	Active	An additional object for long actuation is enabled.
	Long actuation from ... in s	0,3 ... 10,0 seconds If active, definition of when to count the actuation as a „long actuation“ can be done.
Sent value at long actuation	On Off Switchover	Value, which will be sent at long actuation.
Debouncing time	10 to 150 ms	Definition of debouncing time for the input.
Enable object „disable“	Inactive	Communication object (blocking object) for input is disabled.
	Active	Communication object (blocking object) for input is enabled.

13.2.1.8 Pulse counter

Data type (main counter)	4-byte value (-2,147,483,648 to 2,147,483,647)	Send counter reading cyclically	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Communication object DPT 13.001	<---	Counter reading is sent, every	5 seconds
Limit value 1	0	Save counter reading	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Limit value 2	2147483647	Reset counter reading at download	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Counting type	In case of both edges	Activate minimum signal duration	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Number of input pulses for a counting pulse	1	At contact opening in value x 0.1 s (1 - 65,535)	10
Counter reading change per counting pulse	1	At contact closing in value x 0.1 s (1 - 65,535)	10
Send counter reading at download, ETS reset and bus voltage recovery	<input type="radio"/> Inactive <input checked="" type="radio"/> Active	Debouncing time ... ms	50
Send counter reading at change	<input type="radio"/> Inactive <input checked="" type="radio"/> Active	Enable object 'Disable'	<input type="radio"/> Inactive <input checked="" type="radio"/> Active

Designation	Options	Description
Data type (main counter)	1-Byte value 2-Byte value 4-Byte value	Selection of data type to be used.
Limit value 1	Range depending on selected data type.	
Limit value 2	Range depending on selected data type.	
Counting type	Only in case of rising edge Only in case of falling edge In case of both edges	Only count on rising edge. Only count on falling edge. Count on rising as well as on falling edge.
Number of input pulses for a counting pulse	1...10000	Number of input pulses, before increasing the count. Example: If 4 is configured, only after 4 impulses at input, the counter changes (increases).
Counter reading change per counting pulse	-10000...10000	Amount to increase counter after receiving before configured number of impulses. E.g. if 5 is configured, counter will increase in steps of 5.
Send counter reading at download, ETS reset and bus voltage recovery	Inactive Active	Function disabled. If active, the last counter reading after restart of the device oder after ETS reset will be send.
Send counter reading at change	Inactive Active	Function disabled. Counter reading will be sent on change.
Send counter reading cyclically	Inactive Active	Function disabled. Send counter reading every ... seconds / ...minutes / ...hours.
Save counter reading	Inactive Active	Function disabled. Counter reading will be reset after a device restart. Counter reading will be stored and stays available after restart. Counter reading will be stored and stays available after ETS download. Counter reading will be reset after ETS download.
Activate minimum signal duration	Inactive Active	Function disabled. 1...65535 x 0,1 seconds. 1...65535 x 0,1 seconds.
At contact opening	At contact opening	
At contact closing	At contact closing	
Reset counter reading at download	Inactive Active	
Debouncing time	10 to 150 ms	Definition of debouncing time for the input.
Enable object „disable“	Inactive Active	Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.

13.2.1.8.1. Intermediate counter (with function pulse counter)

Enable intermediate counter Inactive Active

Data type (intermediate counter) 4-byte value (-2,147,483,648 to 2,147,483,647) ▾

Communication object DPT 13.001 <---

Limit value 1 0 ▾

Limit value 2 2147483647 ▾

Behaviour if a limit value is exceeded/undershot Continue counting along perimeter Stop until ETS reset

Reverse counting direction Inactive Active

Send counter reading at download, ETS reset and bus voltage recovery Inactive Active

Send counter reading at change Inactive Active

Send counter reading cyclically Inactive Active

Counter reading is sent, every 5 seconds ▾

Designation	Options	Description
Data type (intermediate counter)	1-Byte value 2-Byte value 4-Byte value	Selection of data type to be used.
Limit value 1	Range depending on selected data type.	
Limit value 2	Range depending on selected data type.	
Behaviour if a limit value is exceeded / undershot	Continue counting along perimeter Stop until ETS reset	Counter restarts / continues if limit value is reached. Counter stops (value stays fix) until reset via ETS
Reverse counting direction	Inactive Active	Function disabled. Counting direction will be reversed.
Send counter reading at download, ETS reset and bus voltage recovery	Inactive Active	Function disabled. If active, the last counter reading after restart of the device oder after ETS reset will be send.
Send counter reading at change	Inactive Active	Function disabled. Counter reading will be sent on change.
Send counter reading cyclically	Inactive Active	Function disabled. Send counter reading every ... seconds / ...minutes / ...hours.

13.2.2 Function analogue input (Only available at input E1)

13.2.2.1 E1 Voltage

Sensor type 0-10 V 1-10 V

Lower measuring limit in x% of effective range

Upper measuring limit in x% of effective range

Output value

Output value to be sent at lower measuring limit

Output value to be sent at upper measuring limit

Designation	Options	Description
Sensor type	0-10 V 1-10 V	Selection of the connected input signal type (0-10V oder 1-10V). Also defines the effective range.
Lower measuring limit in % of effective range	0...100%	Lower measuring range limit. If signal is below this value, output of „1” on object „E1 out of range”.
Upper measuring limit in % of effective range	0...100%	Upper measuring range limit. If signal is above this value, output of „1” on object „E1 out of range”.
Output value	1-Byte 2-Byte 4-Byte	Selection of output value type for lower / upper measuring limit.
Output value to be sent at lower measuring limit	Range depending on selected data type.	Definition of output value to be sent at lower measuring limit.
Output value to be sent at upper measuring limit	Range depending on selected data type.	Definition of output value to be sent at upper measuring limit.

13.2.2.2 E1 Output

Filters Low (mean of 4 measurements) ▼

Send output value In case of change and cyclic ▼

Output value is sent from x% change in output range 2 ▲▼

Output value is sent, every 5 s ▼

Enable object 'Disable' Inactive Active

Designation	Options	Description	
Filters	Inactive	Filter disabled.	
	Low (mean of 4 measurements)	Filter active with minimum filter function.	
	Medium (mean of 16 measurements)	Filter active with medium filter function.	
	High (mean of 64 measurements)	Filter active with high filter function.	
Send output value	Upon request	Send value only upon request.	
	In case of change	Send value upon change (see following parameters).	
	Cyclically	Send value cyclically (see following parameters).	
	In case of change and cyclic	Send value upon change and cyclically (see following two parameters).	
	Output value is sent from x% change in output range	1...100%	Applies to send „In case of change“ and „Send value upon change and cyclically“: Parameter for necessary change before sending the value.
	Output value is sent every ... s	5 seconds ... 24 hours	Applies to send „cyclically“ and „Send value upon change and cyclically“: Configuration of interval, when value is sent.
Enable object „disable“	Inactive	Communication object (blocking object) for input is disabled.	
	Active	Communication object (blocking object) for input is enabled.	

13.2.2.3 E1 Threshold value

Use threshold value Inactive Active

Tolerance band lower limit in x% of output range

Tolerance band upper limit in x% of output range

Limit value changeable via bus Inactive Active

Data type of threshold value object

Send if threshold value undershot

Send if threshold value exceeded

Minimum duration of undershoot

Minimum duration of overshoot

Designation	Options	Description
Use threshold value	Inactive	Function disabled.
	Active	Function enabled.
Tolerance band lower limit in % of output range	0...100%	Configuration of lower band limit, e.g. 10% for 1 V.
Tolerance band upper limit in % of output range	0...100%	Configuration of upper band limit, e.g. 80% for 8 V.
Limit value changeable via bus	Inactive Active	Limit value fixed via ETS / stored in device. Upper / lower tolerance band can be changed via separate communication objects via bus.
Data type of threshold value object	1 Bit 1 Byte 2 Byte	Selection of desired data type for the thresholds.
Send if threshold value undershot	Depending on selection of data type	e.g. ON / OFF / no telegram (at 1-bit data type).
Send if threshold value exceeded	Depending on selection of data type	e.g. ON / OFF / no telegram (at 1-bit data type).
Minimum duration of overshoot	Inactive 5 seconds... 24 hours	Configurable minimum duration, before „threshold undershoot“ is sent.
Minimum duration of overshoot	Inactive 5 Sek... 24 Std.	Configurable minimum duration, before „threshold exceeded“ is sent.

13.2.2.4 E1 Output threshold value

Send threshold value In case of change
 In case of change and cyclic

Send if threshold value undershot, every

Send if threshold value exceeded, every

Designation	Options	Description	
Send threshold value	In case of change	Send threshold only in case of change.	
	In case of change and cyclic	Send if threshold value undershot, every... 5 seconds ... 24 hours	Send threshold in case of change as well as cyclically (adjustable cycle).
		Send if threshold value exceeded, every... 5 seconds ... 24 hours	

13.2.3 Function external Temperature sensor (input E4/5 only)

Please Note: When using input E4 as temperature sensor, E5 cannot be used as separate input.

13.2.3.1 E4 General

Designation

Function

E4/5 Temperature function Temperature Floor heating thermal limiter

Designation	Options	Description
E4/5 Temperature function	Temperature Floor heating thermal limiter	Connection of an external temperature sensor. Connection of an external floor heating thermal limiter (sensor).

13.2.3.2 E4/5 External temperature sensor / floor heating thermal limiter

Temperature sensor type Pt1000 TF06

Temperature offset in K

Line fault compensation

Line length, single distance ... in m

Cross-section of the busbar, value * 0.01 mm²

Temperature sensor type Pt1000 TF06

Temperature offset in K

Line fault compensation

Line resistance in milliohm [sum of feed and return conductors]

Designation	Options	Description							
Temperature sensor type	PT1000 TF06	Selection of the connected temperature sensor type.							
Temperature offset in K	-5,0...+5,0 K	Adjustable offset for the temperature sensor value.							
Line fault compensation	None	Function disabled.							
	<table border="0"> <tr> <td>Length</td> <td>Line length, single distance in meters</td> <td>1...30</td> <td rowspan="2">Line fault compensation based on length and the cross-section of the cable. Value in Meters.</td> </tr> <tr> <td></td> <td>Cross-section of the busbar (value * 0,01 mm²)</td> <td>1...150</td> </tr> </table>	Length	Line length, single distance in meters	1...30	Line fault compensation based on length and the cross-section of the cable. Value in Meters.		Cross-section of the busbar (value * 0,01 mm ²)	1...150	
Length	Line length, single distance in meters	1...30	Line fault compensation based on length and the cross-section of the cable. Value in Meters.						
	Cross-section of the busbar (value * 0,01 mm ²)	1...150							
	Resistance	Line resistance in milliohms (sum of feed and return conductors)	0...10000	Line fault compensation based on line resistance of feed and return conductors (in milliohms).					

13.2.3.3 E4/5 Output

Filters Inactive ▼

Send output value In case of change and cyclic ▼

Output value sent from a change of [x 0.1°C] 10 ▲▼

Output value is sent, every 5 seconds ▼

Enable object 'Disable' Inactive Active

Designation	Options	Description	
Filters	Inactive	Filter disabled.	
	Low (mean of 4 measurements)	Filter active with minimum filter function.	
	Medium (mean of 16 measurements)	Filter active with medium filter function.	
	High (mean of 64 measurements)	Filter active with high filter function.	
Send output value	Upon request	Send value only upon request.	
	In case of change	Send value upon change (see following parameters).	
	Cyclically	Send value cyclically (see following parameters).	
	In case of change and cyclic	Send value upon change and cyclically (see following two parameters).	
	Output value sent from a change of x 0,1°C	1...200	Applies to send „In case of change“ and „Send value upon change and cyclically“: Parameter for necessary change before sending the value.
	Output value is sent every	5 seconds... 24 hours	Applies to send „cyclically“ and „Send value upon change and cyclically“: Configuration of interval, when value is sent.
Enable object „disable“	Inactive	Communication object (blocking object) for input is disabled.	
	Active	Communication object (blocking object) for input is enabled.	

13.2.3.4 E4/5 Threshold value 1 / 2 (only if E4 General → temperature function = Temperature)

Enable threshold value 1 function Inactive Active

Tolerance band lower limit [0.1°C]

Tolerance band upper limit [0.1°C]

Data type of threshold value object

Send if threshold value undershot

Send if threshold value exceeded

Minimum duration of undershoot

Minimum duration of overshoot

Limits changeable via bus Inactive Active

Designation	Options	Description
Enable threshold value 1/2 function	Inactive	Threshold function 1/2 disabled.
	Active	Threshold function 1/2 enabled.
Tolerance band lower limit in 0,1°C	-500...+1500	Definition of tolerance band lower limit, e.g. 100 for 10 °C.
Tolerance band upper limit in 0,1°C	-500...+1500	Definition of tolerance band upper limit, e.g. 800 for 80 °C.
Data type of threshold value object	1 Bit 1 Byte 2 Byte	Selection of desired data type for threshold value objects.
Send if threshold value undershot	NO telegram ON telegram OFF telegram	e.g. ON / OFF / NO telegram for 1-bit data type.
Send if threshold value exceeded	NO telegram ON telegram OFF telegram	e.g. ON / OFF / NO telegram for 1-bit data type.
Minimum duration of undershoot	Inactive 5 seconds... 24 hours	Adjustable minimum duration, before selected telegram for „threshold undershoot“ is sent.
Minimum duration of overshoot	Inactive 5 seconds... 24 hours	Adjustable minimum duration, before selected telegram for „threshold exceeded“ is sent.
Limits changeable via bus	Inactive	Limits (tolerance band) via bus not changeable (limits fixed in ETS / device).
	Active	Upper / lower limits (tolerance band) are changeable via separate communication objects.

13.2.3.5 E4/5 Output threshold value 1 / 2 (only if E4 general → temperature function = Temperature)

Send threshold value object In case of change
 In case of change and cyclic

Send if threshold value undershot, every 5 s

Send if threshold value exceeded, every 5 s

Designation	Options	Description
Send threshold value object	In case of change	Send threshold only in case of change.
	In case of change and cyclic	Send threshold in case of change as well as cyclically (adjustable cycle time).
	Send if threshold value undershot, every 5 seconds ... 24 hours	
	Send if threshold value exceeded, every 5 seconds ... 24 hours	

13.2.3.6 E4/5 Threshold values (only if E4 general → temperature function = Floor heating thermal limiter)

Value [°C] 35

Hysteresis [°C] 1,5

Designation	Options	Description
Value [°C]	10...60	Adjustment of temperature value for the thermal limiter.
Hysteresis [°C]	0,5...5,0	Configuration of hysteresis of temperature value for thermal limiter.