

Technical manual

Application description – Temperature- / Humidity- / Air quality controller



General Information

The device fits for the particular use of the following tasks: monitoring of the temperature /humidity/ 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.

Please note that the functions differ depending on the product used:

GS 48.11 KNX

	CO2	Humidity	Temperature	Heat index	Manual set-point adjustment	External inputs	CO2/Humidity LED front light	Party function
GS 48.11 knx	X	X	X	X	X	X	X	X
GS 47.11 knx	X	X	X	X	o	X	X	X
GS 38.11 knx	o	X	X	X	X	X	X	X
GS 37.11 knx	o	X	X	X	o	X	X	X
TS 38.11 knx	o	o	X	X	X	X	X	X
TS 37.11 knx	o	o	X	X	o	X	X	X

The air quality sensor GS 48.11 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
Heat index:	Value output Alarm
Air pressure:	Value output
VAV control:	Value output Control (PI control)

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, Karlstraße 90, D-78054 VS-Schwenningen
 Program name: GS 48.11 ets
 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-produktdatenbank/>

Technical Data

Power supply:	via KNX bus voltage
Bus current:	< 12,5 mA
Bus system:	KNX
Sensors:	CO ₂ , relative humidity, temperature, dew point, air pressure, VAV control
Measuring range CO ₂ concentration:	390–5,000 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, UKCA
Housing:	Self-extinguishing thermoplastic
Dimensions:	55 x 55 mm
Mounting:	Flush mounting
Type of connection:	Push-in connector, KNX connector

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Overview parameters

Parameters	Subcategory parameters	Description
General commands	General commands	Send „in operation “(incl. cycle time), request status (active/inactive, request with...), send delay after bus voltage recovers in seconds.
	CO₂	CO ₂ sensor Settings CO ₂ -sensor: Enable – disable, send measured values, CO ₂ offset adjustment, notification of sensor error, external value enabled/disabled. CO ₂ control Settings CO ₂ -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
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.
Heat Index	Heat Index temperature	Setting heat index temperature: Diasable – enable, sending the measured values
	Heat Index alarm	Setting heat index alarm: Disable – enable, sending rom measured values, alarm limit, switching command at alarm
Air pressure	Air pressure sensor	Air pressure sensor settings: enable- disable, send the measured values, report sensor error, location altitude
VAV Controller	Settings	VAV controller settings : Enable and disable the various PI controllers already active ,send the control values according to defined procedure and values
Inputs	General	Limitation number of telegrams
	11...15 General	Input designation, function /analog/binary/temperature input (depending on input) Binary Input, switching / alarm, dimming shutter, value, scene, switching sequences, multiple actuation, pulse counter

I1 ...I5 Function parameters

Analog input 1 only: Voltage, measuring limit up/ down, output value, threshold value, limit values changeable via bus, temperature input (I4/5 only), function temperature / limiter floor heating, sensor type, offset, error compensation, output value, threshold 1, threshold 2

Communication objects

Number	Text	Function Text	Object Size	R	W	C	T	U	Datapoint Type
1	Send '0' in operation	Output	1 Bit	-	-	C	T	-	1-bit, boolean
1	Send '1' in operation	Output	1 Bit	-	-	C	T	-	1-bit, boolean
2	Request status	Input	1 Bit	-	W	C	T	-	1-bit, trigger
3	operating hours counter[s]	Output (read only)	4 Bytes	R	-	C	T	-	4-byte signed value, time lag (s)
4	Enable/disable CO2 and RH LEDs	Input	1 Bit	-	W	C	T	-	1-bit, enable
16	T: heat alarm	Output	1 Bit	-	-	C	T	-	1-bit, switch
17	T: frost alarm	Output	1 Bit	-	-	C	T	-	1-bit, switch
18	RTC: external temperature value 1	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
19	RTC: external temperature value 2	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
20	RTC: external temperature value 3	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
21	RTC: external temperature value 4	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
22	RTC: comfort temperature	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
23	RTC: standby setback when heating	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
24	RTC: eco setback when heating	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
25	RTC: standby increment when cooling	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
26	RTC: eco increment when cooling	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
27	RTC: frost protection temperature when heating	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
28	RTC: heat protection temperature when cooling	Input	2 Bytes	R	W	C	T	-	2-byte float value, temperature (°C)
29	RTC: current set point temperature	Output	2 Bytes	R	-	C	T	-	2-byte float value, temperature (°C)
30	RTC: average comfort set point temperature (symmetrical)	Output	2 Bytes	R	-	C	T	-	2-byte float value, temperature (°C)
31	RTC: comfort temperature +/- 0,1K	Input	1 Bit	-	W	C	T	-	1-bit, up/down
32	RTC: comfort temperature +/- 0,5K	Input	1 Bit	-	W	C	T	-	1-bit, up/down
33	RTC: standby setback when heating +/- 0,1K	Input	1 Bit	-	W	C	T	-	1-bit, up/down
34	RTC: eco setback when heating +/- 0,1K	Input	1 Bit	-	W	C	T	-	1-bit, up/down
35	RTC: standby increment when cooling +/- 0,1K	Input	1 Bit	-	W	C	T	-	1-bit, up/down
36	RTC: eco increment when cooling +/- 0,1K	Input	1 Bit	-	W	C	T	-	1-bit, up/down
37	RTC: heating(1)/cooling(0)	Input	1 Bit	-	W	C	T	-	1-bit, switch
38	RTC: status heating/cooling	Output	1 Bit	R	-	C	T	-	1-bit, switch
39	RTC: Dead zone between heating and cooling (0...10K)	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature difference (K)
40	RTC: HVAC Mode: 1=comf, 2=stdb, 3=eco, 4=b-prot	Input	1 Byte	-	W	C	T	-	1-byte, HVAC mode
41	RTC: HVAC Mode: 1=comf, 2=stdb, 3=eco, 4=b-prot	Output	1 Byte	R	-	C	T	-	1-byte, HVAC mode
42	RTC: comfort mode enable	Input	1 Bit	-	W	C	T	-	1-bit, trigger
43	RTC: standby mode enable	Input	1 Bit	-	W	C	T	-	1-bit, trigger
44	RTC: eco mode enable	Input	1 Bit	-	W	C	T	-	1-bit, trigger
45	RTC: Frost-/heat protection enable	Input	1 Bit	-	W	C	T	-	1-bit, trigger
46	RTC: setpoint override value	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)

47	RTC: status heating	Output	1 Bit	-	-	C	T	-	1-bit, switch
48	RTC: status cooling	Output	1 Bit	-	-	C	T	-	1-bit, switch
49	RTC: RHCC status	Output	2 Bytes	R	-	C	T	-	16-bit set, RHCC status
50	RTC: control value main level heating	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
50	RTC: control value main level heating	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
50	RTC: control value main level heating	Output	1 Bit	-	-	C	T	-	1-bit, switch
50	RTC: control value main level heating	Output	1 Bit	-	-	C	T	-	1-bit, switch
51	RTC: control value extra level heating	Output	1 Bit	-	-	C	T	-	1-bit, switch
51	RTC: control value extra level heating	Output	1 Bit	-	-	C	T	-	1-bit, switch
51	RTC: control value extra level heating	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
51	RTC: control value extra level heating	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
52	RTC: control value main level cooling	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
52	RTC: control value main level cooling	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
52	RTC: control value main level cooling	Output	1 Bit	-	-	C	T	-	1-bit, switch
52	RTC: control value main level cooling	Output	1 Bit	-	-	C	T	-	1-bit, switch
53	RTC: control value extra level cooling	Output	1 Bit	-	-	C	T	-	1-bit, switch
53	RTC: control value extra level cooling	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
53	RTC: control value extra level cooling	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
53	RTC: control value extra level cooling	Output	1 Bit	-	-	C	T	-	1-bit, switch
54	RTC: guide value [°C]	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
55	RTC: blocking object heating	Input	1 Bit	-	W	C	T	-	1-bit, enable
56	RTC: blocking object cooling	Input	1 Bit	-	W	C	T	-	1-bit, enable
57	RTC: blocking object extra level heating	Input	1 Bit	-	W	C	T	-	1-bit, enable
58	RTC: blocking object extra level cooling	Input	1 Bit	-	W	C	T	-	1-bit, enable
59	RTC: Reset manual offset	Input	1 Bit	-	W	C	T	-	1-bit, trigger
60	RTC: Block manual offset	Input	1 Bit	-	W	C	T	-	1-bit, enable
61	RTC: Manual offset value	Output	2 Bytes	-	-	C	T	-	2-byte float value, temperature difference (K)
62	Party start/stop/retrigger	Input	1 Bit	-	W	C	T	-	1-bit, start/stop
66	HUMCMP: Absolute humidity value 1 [g/m3]	Input	2 Bytes	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
66	HUMCMP: Relative humidity value 1 [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
67	HUMCMP: Temperature value 1 [°C]	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
68	HUMCMP: Absolute humidity value 2 [g/m3]	Input	2 Bytes	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
68	HUMCMP: Relative humidity value 2 [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
69	HUMCMP: Temperature value 2 [°C]	Input	2 Bytes	-	W	C	T	-	2-byte float value, temperature (°C)
70	HUMCMP: Humidity comparator output	Output	1 Bit	-	-	C	T	-	1-bit, enable
71	DEWP: dew point temperature [°C]	Output	2 Bytes	-	-	C	T	-	2-byte float value, temperature (°C)
72	DEWP: dew point alarm enabled (0...100%)	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
72	DEWP: dew point alarm enabled (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch

72	DEWP: dew point alarm enabled (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
72	DEWP: dew point alarm enabled (0...255)	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
72	DEWP: dew point alarm enabled scene (1...64)	Output	1 Byte	-	-	C	T	-	scene number, scene number
73	DEWP: request dew point temperature	Input	1 Bit	-	W	C	T	-	1-bit, trigger
74	P: absolute air pressure [Pa]	Output	2 Bytes	-	-	C	T	-	2-byte float value, pressure (Pa)
75	P: relative air pressure [Pa]	Output	2 Bytes	-	-	C	T	-	2-byte float value, pressure (Pa)
76	P: air pressure sensor error	Output	1 Bit	-	-	C	T	-	1-bit, boolean
77	P: request absolute air pressure	Input	1 Bit	-	W	C	T	-	1-bit, trigger
78	P: request relative air pressure	Input	1 Bit	-	W	C	T	-	1-bit, trigger
79	VAVC: control value (0...100%)	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
79	VAVC: control value (0...255)	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
80	VAVC: external object (0...100%)	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
81	VAVC: Input set selection.	Input	1 Bit	-	W	C	T	-	1-bit, switch
82	VAVC: blocking object	Input	1 Bit	-	W	C	T	-	1-bit, enable
86	CO2C: external CO2 value 1 [ppm]	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
87	CO2C: external CO2 value 2 [ppm]	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
88	CO2C: external CO2 value 3 [ppm]	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
89	CO2C: external CO2 value 4 [ppm]	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
90	CO2C: control value level 1 (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
90	CO2C: scene (1...64)	Output	1 Byte	-	-	C	T	-	scene number, scene number
90	CO2C: control value (0...255)	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)
90	CO2C: control value level 1 (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch
90	CO2C: control value (0...100%)	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
91	CO2C: control value level 2 (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
91	CO2C: control value level 2 (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch
92	CO2C: control value level 3 (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
92	CO2C: control value level 3 (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch
93	CO2C: base set point [ppm]	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
95	CO2C: blocking object level 1	Input	1 Bit	-	W	C	T	-	1-bit, enable
96	CO2C: blocking object level 2	Input	1 Bit	-	W	C	T	-	1-bit, enable
97	CO2C: blocking object level 3	Input	1 Bit	-	W	C	T	-	1-bit, enable
98	CO2C: blocking object	Input	1 Bit	-	W	C	T	-	1-bit, enable
98	CO2C: blocking object	Input	1 Bit	-	W	C	T	-	1-bit, enable
99	RHC: humidity external value 1 [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
100	RHC: external humidity value 2 [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
101	RHC: external humidity value 3 [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
102	RHC: external humidity value 4 [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
103	RHC: control value (0...255)	Output	1 Byte	-	-	C	T	-	1-byte, counter pulses (0..255)

103	RHC: control value (0...100%)	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
103	RHC: scene (1...64)	Output	1 Byte	-	-	C	T	-	scene number, scene number
103	RHC: control value level 1 (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch
103	RHC: control value level 1 (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
104	RHC: control value level 2 (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch
104	RHC: control value level 2 (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
105	RHC: control value level 3 (switching object)	Output	1 Bit	-	-	C	T	-	1-bit, switch
105	RHC: control value level 3 (priority)	Output	2 Bit	-	-	C	T	-	1-bit controlled, switch control
106	RHC: base set point [%]	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
107	RHC: base set point (1 byte) [%]	Input	1 Byte	-	W	C	T	-	8-bit unsigned value, percentage (0..100%)
108	RHC: blocking object level 1	Input	1 Bit	-	W	C	T	-	1-bit, enable
109	RHC: blocking object level 2	Input	1 Bit	-	W	C	T	-	1-bit, enable
110	RHC: blocking object level 3	Input	1 Bit	-	W	C	T	-	1-bit, enable
111	RHC: blocking object	Input	1 Bit	-	W	C	T	-	1-bit, enable
111	RHC: blocking object	Input	1 Bit	-	W	C	T	-	1-bit, enable
112	CO2: CO2 value [ppm]	Output	2 Bytes	-	-	C	T	-	2-byte float value, parts/million (ppm)
114	CO2: request CO2 value	Input	1 Bit	-	W	C	T	-	1-bit, trigger
115	CO2: sensor error	Output	1 Bit	-	-	C	T	-	1-bit, boolean
116	CO2: start/stop calibration	Input	1 Bit	-	W	C	T	-	1-bit, start/stop
117	CO2: adopt CO2 calibration value	Input	2 Bytes	-	W	C	T	-	2-byte float value, parts/million (ppm)
118	CO2: CO2 value external [ppm]	Input	2 Bytes	-	-	C	T	-	2-byte float value, parts/million (ppm)
119	CO2: min value	Output	2 Bytes	-	-	C	T	-	2-byte float value, parts/million (ppm)
120	CO2: max value	Output	2 Bytes	-	-	C	T	-	2-byte float value, parts/million (ppm)
121	CO2: request min/max values	Input	1 Bit	-	W	C	T	-	1-bit, trigger
122	CO2: reset min/max values	Input	1 Bit	-	W	C	T	-	1-bit, trigger
123	rH: humidity value [%]	Output	2 Bytes	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
124	rH: humidity value (1 byte) [%]	Output	1 Byte	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
125	rH: request humidity value	Input	1 Bit	-	W	C	T	-	1-bit, trigger
126	rH: sensor error	Output	1 Bit	-	-	C	T	-	1-bit, boolean
129	rH: humidity value external [%]	Input	2 Bytes	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
130	rH: min value	Output	2 Bytes	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
131	rH: max value	Output	2 Bytes	-	-	C	T	-	8-bit unsigned value, percentage (0..100%)
132	rH: request min/max values	Input	1 Bit	-	W	C	T	-	1-bit, trigger
133	rH: reset min/max values	Input	1 Bit	-	W	C	T	-	1-bit, trigger
134	T: temperature value [°C]	Output	2 Bytes	-	-	C	T	-	2-byte float value, temperature (°C)
136	T: request temperature value	Input	1 Bit	-	W	C	T	-	1-bit, trigger
137	T: sensor error	Output	1 Bit	-	-	C	T	-	1-bit, boolean
140	T: Temperature value external [°C]	Input	2 Bytes	-	-	C	T	-	2-byte float value, temperature (°C)

141	T: temperature min value	Output	2 Bytes	-	-	C	T	-	2-byte float value, temperature (°C)
142	T: temperature max value	Output	2 Bytes	-	-	C	T	-	2-byte float value, temperature (°C)
143	T: request min/max temperature values	Input	1 Bit	-	W	C	T	-	1-bit, trigger
144	T: reset min/max temperature values	Input	1 Bit	-	W	C	T	-	1-bit, trigger
152	E1 Scene (event 0)	Output	1 Byte	-	-	C	T	-	scene control, scene control
152	E1 2-byte value (-32,768 to 32,767) (event 0)	Output	2 Bytes	-	-	C	T	-	2-byte signed value, pulses difference
152	E1 2-byte value (0 to 65,535) (event 0)	Output	2 Bytes	-	-	C	T	-	2-byte unsigned value, pulses
152	E1 4-byte value (-2,147,483,648 to 2,147,483,647) (event 0)	Output	4 Bytes	-	-	C	T	-	4-byte signed value, counter pulses (signed)
152	E1 4-byte value (0 to 4294967295) (event 0)	Output	4 Bytes	-	-	C	T	-	4-byte unsigned value, counter pulses (unsigned)
152	E1 2-byte floating point (event 0)	Output	2 Bytes	-	-	C	T	-	2-byte float value, temperature (°C)
152	E1 1-byte value (-128 to 127)	Output	1 Byte	-	-	C	T	-	8-bit signed value, counter pules (-128..127)
152	E1 Scene	Output	1 Byte	-	W	C	T	U	scene control, scene control
152	E1 HZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
152	E1 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
152	E1 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
152	E1 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
152	E1 Switching 1 actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
152	E1 1-byte value (0 to 255) (event 0)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
152	E1 Switching step 1	Output	1 Bit	-	W	C	T	U	1-bit, switch
152	E1 1-byte value (-128 to 127) (event 0)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
152	E1 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
152	E1 Priority (event 0)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
152	E1 Switching sensor	Output	1 Bit	-	W	C	T	U	1-bit, switch
152	E1 Alarm sensor	Output	1 Bit	-	W	C	T	U	1-bit, alarm
152	E1 4-byte floating point	Output	4 Bytes	-	-	C	T	U	4-byte float value, acceleration (m/s ²)
152	E1 Switching	Output	1 Bit	-	W	C	T	U	1-bit, switch
152	E1 Blind UP/DOWN	Output	1 Bit	-	W	C	T	U	1-bit, up/down
152	E1 2-byte value (0 to 65,535)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
152	E1 2-byte value (-32,768 to 32,767)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
152	E1 2-byte floating point	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
152	E1 1-byte value (0 to 255)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
152	E1 Switch (event 0)	Output	1 Bit	-	-	C	T	U	1-bit, switch
153	E1 2-byte value (0 to 65,535) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
153	E1 Switching 2 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
153	E1 1-byte value (-128 to 127) (event 1)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
153	E1 Switch (event 1)	Output	1 Bit	-	-	C	T	U	1-bit, switch
153	E1 1-byte value (0 to 255) (event 1)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
153	E1 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)

153	E1 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
153	E1 Switching step 2	Output	1 Bit	-	W	C	T	U	1-bit, switch
153	E1 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
153	E1 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
153	E1 ZZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
153	E1 Dimming	Output	4 Bit	-	-	C	T	U	3-bit controlled, dimming control
153	E1 Priority (event 1)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
153	E1 2-byte floating point (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
153	E1 Scene (event 1)	Output	1 Byte	-	-	C	T	U	scene control, scene control
153	E1 4-byte value (0 to 4294967295) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
153	E1 STOP/slat adjustment	Output	1 Bit	-	-	C	T	U	1-bit, step
153	E1 4-byte value (-2,147,483,648 to 2,147,483,647) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
153	E1 2-byte value (-32,768 to 32,767) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
153	Request E1	Input	1 Bit	-	W	C	T	U	1-bit, trigger
154	E1 HZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
154	E1 Outside of range	Output	1 Bit	-	-	C	T	U	1-bit, switch
154	E1 Start event 0/1	Input	1 Bit	-	W	C	T	U	1-bit, switch
154	E1 Switching 3 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
154	E1 Switching step 3	Output	1 Bit	-	W	C	T	U	1-bit, switch
154	E1 Top end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
154	E1 Scene storage display	Output	1 Bit	-	-	C	T	U	1-bit, enable
155	E1 Bottom end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
155	E1 Threshold value	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
155	E1 Threshold value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
155	E1 Threshold value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
155	E1 Threshold value	Output	1 Bit	-	-	C	T	U	1-bit, switch
155	E1 Switching 4 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
155	E1 Switching step 4	Output	1 Bit	-	W	C	T	U	1-bit, switch
155	E1 HZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
156	E1 Switching, long actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
156	E1 Enable save	Input	1 Bit	-	W	C	T	U	1-bit, enable
156	E1 Save scene	Input	1 Bit	-	W	C	T	U	1-bit, enable
156	E1 Switching step 5	Output	1 Bit	-	W	C	T	U	1-bit, switch
157	E1 ZZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
157	E1 Switch step UP/DOWN	Input	1 Bit	-	W	C	T	U	1-bit, switch
157	E1 Change threshold, tolerance band lower limit	Input	1 Byte	-	W	C	T	U	8-bit unsigned value, percentage (0..100%)
158	E1 Actuating number	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
158	E1 Change threshold, tolerance band upper limit	Input	1 Byte	-	W	C	T	U	8-bit unsigned value, percentage (0..100%)

158	E1 ZZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
159	E1 Send if threshold value undershot	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
159	E1 Send if threshold value undershot	Input	2 Bytes	-	W	C	T	U	2-byte unsigned value, pulses
159	E1 Send if threshold value undershot	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
159	E1 ZZ: Reverse direction	Input	1 Bit	-	W	C	T	U	1-bit, boolean
160	E1 Send if threshold value exceeded	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
160	E1 Send if threshold value exceeded	Input	2 Bytes	-	W	C	T	U	2-byte unsigned value, pulses
160	E1 ZZ: Reset	Input	1 Bit	-	W	C	T	U	1-bit, boolean
160	E1 Send if threshold value exceeded	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
161	E1 ZZ: Stop	Input	1 Bit	-	W	C	T	U	1-bit, boolean
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
170	E1 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
172	E2 Scene (event 0)	Output	1 Byte	-	-	C	T	U	scene control, scene control
172	E2 4-byte value (0 to 4294967295) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
172	E2 2-byte value (-32,768 to 32,767) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
172	E2 2-byte value (0 to 65,535) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
172	E2 4-byte value (-2,147,483,648 to 2,147,483,647) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
172	E2 2-byte floating point (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
172	E2 HZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
172	E2 Switching 1 actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
172	E2 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
172	E2 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
172	E2 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
172	E2 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
172	E2 1-byte value (0 to 255) (event 0)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
172	E2 Switching step 1	Output	1 Bit	-	W	C	T	U	1-bit, switch
172	E2 1-byte value (-128 to 127) (event 0)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
172	E2 Scene	Output	1 Byte	-	W	C	T	U	scene control, scene control
172	E2 Switch (event 0)	Output	1 Bit	-	-	C	T	U	1-bit, switch
172	E2 Switching sensor	Output	1 Bit	-	W	C	T	U	1-bit, switch
172	E2 Alarm sensor	Output	1 Bit	-	W	C	T	U	1-bit, alarm

172	E2 Switching	Output	1 Bit	-	W	C	T	U	1-bit, switch
172	E2 Priority (event 0)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
172	E2 Blind UP/DOWN	Output	1 Bit	-	W	C	T	U	1-bit, up/down
173	E2 Priority (event 1)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
173	E2 ZZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
173	E2 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
173	E2 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
173	E2 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
173	E2 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
173	E2 Switching step 2	Output	1 Bit	-	W	C	T	U	1-bit, switch
173	E2 Dimming	Output	4 Bit	-	-	C	T	U	3-bit controlled, dimming control
173	E2 2-byte floating point (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
173	E2 Switching 2 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
173	E2 4-byte value (0 to 4294967295) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
173	E2 2-byte value (-32,768 to 32,767) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
173	E2 Scene (event 1)	Output	1 Byte	-	-	C	T	U	scene control, scene control
173	E2 1-byte value (0 to 255) (event 1)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
173	E2 STOP/slat adjustment	Output	1 Bit	-	-	C	T	U	1-bit, step
173	E2 1-byte value (-128 to 127) (event 1)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
173	E2 2-byte value (0 to 65,535) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
173	E2 Switch (event 1)	Output	1 Bit	-	-	C	T	U	1-bit, switch
173	E2 4-byte value (-2,147,483,648 to 2,147,483,647) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
174	E2 Top end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
174	E2 Switching step 3	Output	1 Bit	-	W	C	T	U	1-bit, switch
174	E2 HZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
174	E2 Start event 0/1	Input	1 Bit	-	W	C	T	U	1-bit, switch
174	E2 Scene storage display	Output	1 Bit	-	-	C	T	U	1-bit, enable
174	E2 Switching 3 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
175	E2 HZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
175	E2 Switching 4 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
175	E2 Bottom end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
175	E2 Switching step 4	Output	1 Bit	-	W	C	T	U	1-bit, switch
176	E2 Switching, long actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
176	E2 Switching step 5	Output	1 Bit	-	W	C	T	U	1-bit, switch
176	E2 Enable save	Input	1 Bit	-	W	C	T	U	1-bit, enable
176	E2 Save scene	Input	1 Bit	-	W	C	T	U	1-bit, enable
177	E2 ZZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
177	E2 Switch step UP/DOWN	Input	1 Bit	-	W	C	T	U	1-bit, switch

178	E2 Actuating number	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
178	E2 ZZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
179	E2 ZZ: Reverse direction	Input	1 Bit	-	W	C	T	U	1-bit, boolean
180	E2 ZZ: Reset	Input	1 Bit	-	W	C	T	U	1-bit, boolean
181	E2 ZZ: Stop	Input	1 Bit	-	W	C	T	U	1-bit, boolean
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
190	E2 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
192	E3 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
192	E3 Priority (event 0)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
192	E3 1-byte value (-128 to 127) (event 0)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
192	E3 Switching 1 actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
192	E3 1-byte value (0 to 255) (event 0)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
192	E3 2-byte value (-32,768 to 32,767) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
192	E3 Switching step 1	Output	1 Bit	-	W	C	T	U	1-bit, switch
192	E3 Scene	Output	1 Byte	-	W	C	T	U	scene control, scene control
192	E3 2-byte value (0 to 65,535) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
192	E3 4-byte value (-2,147,483,648 to 2,147,483,647) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
192	E3 Scene (event 0)	Output	1 Byte	-	-	C	T	U	scene control, scene control
192	E3 Switch (event 0)	Output	1 Bit	-	-	C	T	U	1-bit, switch
192	E3 4-byte value (0 to 4294967295) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
192	E3 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
192	E3 2-byte floating point (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
192	E3 Switching sensor	Output	1 Bit	-	W	C	T	U	1-bit, switch
192	E3 Alarm sensor	Output	1 Bit	-	W	C	T	U	1-bit, alarm
192	E3 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
192	E3 Switching	Output	1 Bit	-	W	C	T	U	1-bit, switch
192	E3 Blind UP/DOWN	Output	1 Bit	-	W	C	T	U	1-bit, up/down
192	E3 HZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
192	E3 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
193	E3 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
193	E3 Switching step 2	Output	1 Bit	-	W	C	T	U	1-bit, switch
193	E3 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference

193	E3 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
193	E3 Switching 2 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
193	E3 2-byte floating point (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
193	E3 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
193	E3 ZZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
193	E3 2-byte value (-32,768 to 32,767) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
193	E3 4-byte value (-2,147,483,648 to 2,147,483,647) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
193	E3 2-byte value (0 to 65,535) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
193	E3 4-byte value (0 to 4294967295) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
193	E3 STOP/slat adjustment	Output	1 Bit	-	-	C	T	U	1-bit, step
193	E3 Switch (event 1)	Output	1 Bit	-	-	C	T	U	1-bit, switch
193	E3 Dimming	Output	4 Bit	-	-	C	T	U	3-bit controlled, dimming control
193	E3 Priority (event 1)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
193	E3 Scene (event 1)	Output	1 Byte	-	-	C	T	U	scene control, scene control
193	E3 1-byte value (0 to 255) (event 1)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
193	E3 1-byte value (-128 to 127) (event 1)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
194	E3 Switching 3 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
194	E3 Start event 0/1	Input	1 Bit	-	W	C	T	U	1-bit, switch
194	E3 HZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
194	E3 Top end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
194	E3 Switching step 3	Output	1 Bit	-	W	C	T	U	1-bit, switch
194	E3 Scene storage display	Output	1 Bit	-	-	C	T	U	1-bit, enable
195	E3 Bottom end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
195	E3 Switching step 4	Output	1 Bit	-	W	C	T	U	1-bit, switch
195	E3 HZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
195	E3 Switching 4 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
196	E3 Switching, long actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
196	E3 Enable save	Input	1 Bit	-	W	C	T	U	1-bit, enable
196	E3 Save scene	Input	1 Bit	-	W	C	T	U	1-bit, enable
196	E3 Switching step 5	Output	1 Bit	-	W	C	T	U	1-bit, switch
197	E3 ZZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
197	E3 Switch step UP/DOWN	Input	1 Bit	-	W	C	T	U	1-bit, switch
198	E3 ZZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
198	E3 Actuating number	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
199	E3 ZZ: Reverse direction	Input	1 Bit	-	W	C	T	U	1-bit, boolean
200	E3 ZZ: Reset	Input	1 Bit	-	W	C	T	U	1-bit, boolean
201	E3 ZZ: Stop	Input	1 Bit	-	W	C	T	U	1-bit, boolean
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable

210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
210	E3 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
212	E4 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
212	E4 1-byte value (-128 to 127) (event 0)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
212	E4 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
212	E4 1-byte value (0 to 255) (event 0)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
212	E4 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
212	E4 2-byte value (-32,768 to 32,767) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
212	E4 4-byte value (0 to 4294967295) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
212	E4 2-byte value (0 to 65,535) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
212	E4 Switching 1 actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
212	E4 4-byte value (-2,147,483,648 to 2,147,483,647) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
212	E4 Priority (event 0)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
212	E4 Switching step 1	Output	1 Bit	-	W	C	T	U	1-bit, switch
212	E4 Scene (event 0)	Output	1 Byte	-	-	C	T	U	scene control, scene control
212	E4 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
212	E4 Scene	Output	1 Byte	-	W	C	T	U	scene control, scene control
212	E4 HZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
212	E4 Output value	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
212	E4 2-byte floating point (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
212	E4 Switching sensor	Output	1 Bit	-	W	C	T	U	1-bit, switch
212	E4 Alarm sensor	Output	1 Bit	-	W	C	T	U	1-bit, alarm
212	E4 Switch (event 0)	Output	1 Bit	-	-	C	T	U	1-bit, switch
212	E4 Output value	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
212	E4 Blind UP/DOWN	Output	1 Bit	-	W	C	T	U	1-bit, up/down
212	E4 Switching	Output	1 Bit	-	W	C	T	U	1-bit, switch
213	E4 Switching 2 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
213	E4 ZZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
213	E4 Request output value	Input	1 Bit	-	W	C	T	U	1-bit, trigger
213	E4 Request output value	Input	1 Bit	-	W	C	T	U	1-bit, trigger
213	E4 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
213	E4 Switching step 2	Output	1 Bit	-	W	C	T	U	1-bit, switch
213	E4 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference

213	E4 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
213	E4 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
213	E4 2-byte value (-32,768 to 32,767) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
213	E4 2-byte floating point (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
213	E4 Dimming	Output	4 Bit	-	-	C	T	U	3-bit controlled, dimming control
213	E4 STOP/slat adjustment	Output	1 Bit	-	-	C	T	U	1-bit, step
213	E4 Switch (event 1)	Output	1 Bit	-	-	C	T	U	1-bit, switch
213	E4 Priority (event 1)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
213	E4 1-byte value (-128 to 127) (event 1)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
213	E4 Scene (event 1)	Output	1 Byte	-	-	C	T	U	scene control, scene control
213	E4 2-byte value (0 to 65,535) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
213	E4 1-byte value (0 to 255) (event 1)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
213	E4 4-byte value (0 to 4294967295) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
213	E4 4-byte value (-2,147,483,648 to 2,147,483,647) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
214	E4 Start event 0/1	Input	1 Bit	-	W	C	T	U	1-bit, switch
214	E4 Scene storage display	Output	1 Bit	-	-	C	T	U	1-bit, enable
214	E4 Measured value outside of range	Output	1 Bit	-	-	C	T	U	1-bit, switch
214	E4 HZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
214	E4 Top end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
214	E4 Switching step 3	Output	1 Bit	-	W	C	T	U	1-bit, switch
214	E4 Measured value outside of range	Output	1 Bit	-	-	C	T	U	1-bit, switch
214	E4 Switching 3 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
215	E4 Switching 4 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
215	E4 Bottom end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
215	E4 Heating temperature limit	Output	1 Bit	-	-	C	T	U	1-bit, switch
215	E4 Switching step 4	Output	1 Bit	-	W	C	T	U	1-bit, switch
215	E4 HZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
216	E4 Bit threshold value 1	Output	1 Bit	-	-	C	T	U	1-bit, switch
216	E4 Save scene	Input	1 Bit	-	W	C	T	U	1-bit, enable
216	E4 Byte threshold value 1	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
216	E4 2-byte threshold value 1	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
216	E4 Switching, long actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
216	E4 Temperature threshold value 1	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
216	E4 Enable save	Input	1 Bit	-	W	C	T	U	1-bit, enable
216	E4 Switching step 5	Output	1 Bit	-	W	C	T	U	1-bit, switch
217	E4 Send if threshold value 1 undershot	Input	2 Bytes	-	W	C	T	U	2-byte unsigned value, pulses
217	E4 ZZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
217	E4 Send if threshold value 1 undershot	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)

217	E4 Send if threshold value 1 undershot	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
217	E4 Switch step UP/DOWN	Input	1 Bit	-	W	C	T	U	1-bit, switch
218	E4 Send if threshold value 1 exceeded	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
218	E4 Send if threshold value 1 exceeded	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
218	E4 Send if threshold value 1 exceeded	Input	2 Bytes	-	W	C	T	U	2-byte unsigned value, pulses
218	E4 ZZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
218	E4 Actuating number	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
219	E4 ZZ: Reverse direction	Input	1 Bit	-	W	C	T	U	1-bit, boolean
220	E4 ZZ: Reset	Input	1 Bit	-	W	C	T	U	1-bit, boolean
220	E4 Change temperature, tolerance band 1 lower limit	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
221	E4 ZZ: Stop	Input	1 Bit	-	W	C	T	U	1-bit, boolean
221	E4 Change temperature, tolerance band 1 upper limit	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
222	E4 2-byte threshold value 2	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
222	E4 Temperature threshold value 2	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
222	E4 Bit threshold value 2	Output	1 Bit	-	-	C	T	U	1-bit, switch
222	E4 Byte threshold value 2	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
223	E4 Send if threshold value 2 undershot	Input	2 Bytes	-	W	C	T	U	2-byte unsigned value, pulses
223	E4 Send if threshold value 2 undershot	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
223	E4 Send if threshold value 2 undershot	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
224	E4 Send if threshold value 2 exceeded	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
224	E4 Send if threshold value 2 exceeded	Input	2 Bytes	-	W	C	T	U	2-byte unsigned value, pulses
224	E4 Send if threshold value 2 exceeded	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
226	E4 Change temperature, tolerance band 2 lower limit	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
227	E4 Change temperature, tolerance band 2 upper limit	Input	2 Bytes	-	W	C	T	U	2-byte float value, temperature (°C)
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
230	E4 Disable	Input	1 Bit	-	W	C	T	U	1-bit, enable
232	E5 Switching step 1	Output	1 Bit	-	W	C	T	U	1-bit, switch
232	E5 Switching 1 actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
232	E5 1-byte value (-128 to 127) (event 0)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pulses (-128..127)
232	E5 1-byte value (0 to 255) (event 0)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)

232	E5 Scene (event 0)	Output	1 Byte	-	-	C	T	U	scene control, scene control
232	E5 4-byte value (0 to 4294967295) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
232	E5 2-byte value (-32,768 to 32,767) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
232	E5 2-byte value (0 to 65,535) (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
232	E5 2-byte floating point (event 0)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
232	E5 Priority (event 0)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
232	E5 Scene	Output	1 Byte	-	W	C	T	U	scene control, scene control
232	E5 Switch (event 0)	Output	1 Bit	-	-	C	T	U	1-bit, switch
232	E5 Blind UP/DOWN	Output	1 Bit	-	W	C	T	U	1-bit, up/down
232	E5 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
232	E5 HZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
232	E5 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
232	E5 4-byte value (-2,147,483,648 to 2,147,483,647) (event 0)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
232	E5 HZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
232	E5 HZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
232	E5 Switching	Output	1 Bit	-	W	C	T	U	1-bit, switch
232	E5 Alarm sensor	Output	1 Bit	-	W	C	T	U	1-bit, alarm
232	E5 Switching sensor	Output	1 Bit	-	W	C	T	U	1-bit, switch
233	E5 Switching 2 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
233	E5 Switching step 2	Output	1 Bit	-	W	C	T	U	1-bit, switch
233	E5 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
233	E5 ZZ: Counter reading 1-byte value	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
233	E5 2-byte floating point (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte float value, temperature (°C)
233	E5 ZZ: Counter reading 4-byte value	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
233	E5 4-byte value (0 to 4294967295) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte unsigned value, counter pulses (unsigned)
233	E5 2-byte value (-32,768 to 32,767) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
233	E5 4-byte value (-2,147,483,648 to 2,147,483,647) (event 1)	Output	4 Bytes	-	-	C	T	U	4-byte signed value, counter pulses (signed)
233	E5 Dimming	Output	4 Bit	-	-	C	T	U	3-bit controlled, dimming control
233	E5 STOP/slat adjustment	Output	1 Bit	-	-	C	T	U	1-bit, step
233	E5 Switch (event 1)	Output	1 Bit	-	-	C	T	U	1-bit, switch
233	E5 Priority (event 1)	Output	2 Bit	-	-	C	T	U	1-bit controlled, switch control
233	E5 1-byte value (-128 to 127) (event 1)	Output	1 Byte	-	-	C	T	U	8-bit signed value, counter pules (-128..127)
233	E5 1-byte value (0 to 255) (event 1)	Output	1 Byte	-	-	C	T	U	1-byte, counter pulses (0..255)
233	E5 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
233	E5 2-byte value (0 to 65,535) (event 1)	Output	2 Bytes	-	-	C	T	U	2-byte unsigned value, pulses
233	E5 ZZ: Counter reading 2-byte value	Output	2 Bytes	-	-	C	T	U	2-byte signed value, pulses difference
233	E5 Scene (event 1)	Output	1 Byte	-	-	C	T	U	scene control, scene control
234	E5 Switching 3 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch

234	E5 Start event 0/1	Input	1 Bit	-	W	C	T	U	1-bit, switch
234	E5 Switching step 3	Output	1 Bit	-	W	C	T	U	1-bit, switch
234	E5 Top end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
234	E5 HZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
234	E5 Scene storage display	Output	1 Bit	-	-	C	T	U	1-bit, enable
235	E5 Bottom end position	Input	1 Bit	-	W	C	T	U	1-bit, boolean
235	E5 Switching 4 actuations	Output	1 Bit	-	W	C	T	U	1-bit, switch
235	E5 HZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
235	E5 Switching step 4	Output	1 Bit	-	W	C	T	U	1-bit, switch
236	E5 Switching, long actuation	Output	1 Bit	-	W	C	T	U	1-bit, switch
236	E5 Switching step 5	Output	1 Bit	-	W	C	T	U	1-bit, switch
236	E5 Save scene	Input	1 Bit	-	W	C	T	U	1-bit, enable
236	E5 Enable save	Input	1 Bit	-	W	C	T	U	1-bit, enable
237	E5 Switch step UP/DOWN	Input	1 Bit	-	W	C	T	U	1-bit, switch
237	E5 ZZ: Limit value exceeded	Output	1 Bit	-	-	C	T	U	1-bit, boolean
238	E5 ZZ: Request counter reading	Input	1 Bit	-	W	C	T	U	1-bit, trigger
238	E5 Actuating number	Input	1 Byte	-	W	C	T	U	1-byte, counter pulses (0..255)
239	E5 ZZ: Reverse direction	Input	1 Bit	-	W	C	-	-	1-bit, boolean
240	E5 ZZ: Reset	Input	1 Bit	-	W	C	-	-	1-bit, boolean
241	E5 ZZ: Stop	Input	1 Bit	-	W	C	-	-	1-bit, boolean
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
250	E5 Disable	Input	1 Bit	-	W	C	-	-	1-bit, enable
252	CO2: absolute air pressure [Pa]	Input	2 Bytes	-	W	C	-	-	2-byte float value, pressure (Pa)

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. General commands

(Picture shows modified parameters)

Send in operation

Send 'in operation' cyclically

Send delay after bus voltage recovery (2...255s)

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).
	Send 'in operation' cyclically 1 minute up to once a day	Configuration of interval for transmitting the value „in operation“
Send delay after bus voltage recovery	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

Enable calibration via bus no yes

Send CO₂ value when changing

Send CO₂ value cyclically

Send CO₂ min/max values when changing

Send CO₂ min/max values cyclically

Designation	Options	Description
CO ₂ Sensor	disabled	CO ₂ sensor disabled.
	enabled	If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.
	Error CO ₂ sensor	notify
		don't notify
	Enable calibration via bus	no
		yes
	Send CO ₂ value when changing	No function. The new value is sent if the difference between old and new value is above the defined sending threshold.
	Send CO ₂ value cyclically	No function. Cyclic sending of the recent value.
	Send CO ₂ min/max values when changing	No function. The min/max value is sent if the difference between old and new value is above the defined sending threshold.
	Send CO ₂ min/max values cyclically	No function. The min/max value is sent if the difference between old and new value is above the defined sending threshold.
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.

LED Display Type	LED off			No reaction
	LED green/yellow/red	Level 1 (yellow)	400-1500ppm	LED lights up in the specified color after reaching the corresponding easured values (thresholds)
		Level 2 (red)	equal to thresold 1 thresold 1+1000ppm	
	LED green in comfort zone otherwise red	Comfort zone lower limit	400-1500ppm	LED lights up green in the set comfort range, otherwiese red
		Comfort zone upper limit	equal to thresold 1 thresold 1+1000ppm	

2.1 CO₂ sensor compensation

Air pressure compensation of CO₂ sensor compensation with internal air pressure value ▼

Designation	Options		Description
Air pressure compensation of CO ₂ sensor	Without compensation		To obtain a correct CO ₂ value, it is advantageous to compensate the air pressure conditions of the installation location. The sensor measures mass per volume, to convert the value in parts per million (ppm) air pressure value is needed. If no separate value is entered the air pressure at sea level with 1,013 mbar is used.
	Compensation with internal air pressure value		Other compensation values can be selected via the internal air pressure sensor, an external air pressure sensor (via communication object) or by specifying the altitude.
	Compensation with external air pressure value		No additional compensation of the air pressure. 1,013 mbar is used. Compensates the air pressure of the installation location of the CO ₂ sensor via the internal air pressure sensor.
	Compensation with altitude	Altitude a.s.l. 0 – 5000m	Compensates the air pressure of the installation location of the CO ₂ sensor with an external absolute air pressure value (via communication object). Compensation with altitude a.s.l. of the installation location.

3. CO₂ control

Type of CO ₂ control	3-step ▼
Allow to change base set-point via bus	<input checked="" type="radio"/> no <input type="radio"/> yes
Control value output format	switching command ▼
Send control value when change-over	<input checked="" type="radio"/> disabled <input type="radio"/> 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 3.2. Two thresholds available – see description chapter 3.2. Three thresholds available – see description chapter 3.2. PI-Control – see description chapter 3.3.
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 CO₂ control– Actual value source

Sensor value 1 internal sensor
 via bus (communication object)

Sensor value 2

Sensor value 3

Sensor value 4

Value calculation type

Weight value 1 (0...10)

Weight value 2 (0...10)

Weight value 3 (0...10)

Weight value 4 (0...10)

Designation	Options	Description
Sensor value 1	Internal sensor Via bus (communication object)	Value of the internal CO2 sensor is used. Value which is sent via bus (communication object) is used.
Sensor value 2-4	Disabled Internal sensor Via bus (communication object)	No function. Value of the internal CO2 sensor is used. Value which is sent via bus (communication object) is used.
Value calculation type	Average Weighted average Weight value 1-4 [0-10] Min Value Max Value	Calculates the value by average. Calculates the value by weighted average. Each value can get a different weight from 0 to 10. Selects the sensor with the lowest CO2.value Selects the sensor with the highest t CO2.value.

3.2 CO₂ control - PI control

Set-point	400 ppm
Proportional band	500 ppm
Reset time	15 min. (15...240min.)
Min. control value	0%
Max. control value	100%
Control value in case of sensor error	0%
Blocking object	<input type="radio"/> disabled <input checked="" type="radio"/> enabled
Behavior when unblocking	<input type="radio"/> don't send <input checked="" type="radio"/> send current value
Behavior when blocking	<input type="radio"/> don't send <input checked="" type="radio"/> send value
Percent when blocking	0 (0...100%)

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	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.
Percent when blocking (0...100%)	Selection: 0 to 100%	Definition of the percentage value when blocking.	

3.3 CO₂ control - 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	No function below threshold 1/2/3. Switching command below threshold 1/2/3.	
Switching command above threshold 1/2/3	off on	No function above threshold 1/2/3. Switching command below threshold 1/2/3.	
Control value in case of sensor error	off on	No function in case of sensor error. Switching command in case of sensor error.	
Blocking object	Disabled	No function.	
	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.	

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

Send rH min/max values when changing

Send rH min/max values cyclically

Designation	Options	Description
Relative humidity sensor	Inactive	Relative humidity sensor disabled.
	Active	Error humidity sensor notify If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.
		Error humidity sensor don't notify No sensor errors will be reported.
	Send relative humidity when changing	Disabled If change above 1% – 25% No function. The new value is sent if the difference between old and new value is above the defined sending threshold.
	Send relative humidity cyclically	Disabled Every minute – once a day No function. Cyclic sending of the recent value.
	Send rH min/max values when changing Disabled If change above 1% – 25% No function. The min/max values is sent if the difference between old and new value is above the defined sending threshold	
	Send rH min/max values cyclically Disabled Every minute – once a day No function. Cyclic sending of the min/max values.	
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).

LED Display Type	LED off			No reaction
	LED green/yellow/red	Level 1 (ellow)	20-50%	LED lights up in the specified color after reaching the corresponding easured values (thresholds)
		Level 2 (red)	equal to thresold 1 thresold 1+30%	
	LED green in comfort zone otherwise red	Comfort zone lower limit	20-50%	LED lights up green in the set comfort range, otherwiese red
		Komfortzone upper Limit	equal to thresold 1 thresold 1+30%	

5. Relative humidity control

Control type	3-step
Allow to change base set-point via bus	<input checked="" type="radio"/> no <input type="radio"/> yes
Control value output format	switching command
Send control value when change-over	<input checked="" type="radio"/> disabled <input type="radio"/> enabled
Send control value cyclically	every minute
Hysteresis (symmetrical)	5%

Designation	Options	Description
Control type	Disabled 1-step 2-step 3-step PI	Relative humidity control disabled. One threshold available – see description chapter 5.2. Two thresholds available – see description chapter 5.2. Three thresholds available – see description chapter 5.2. PI-Control – see description chapter 5.3.
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 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 Relative humidity control – Actual value source

Sensor value 1 internal sensor
 via bus (communication object)

Sensor value 2

Sensor value 3

Sensor value 4

Value calculation type

Weight value 1 (0...10)

Weight value 2 (0...10)

Weight value 3 (0...10)

Weight value 4 (0...10)

Designation	Options	Description
Sensor value 1	Internal sensor Via bus (communication object)	Value of the internal humidity sensor is used. Value which is sent via bus (communication object) is used.
Sensor value 2-4	Disabled Internal sensor Via bus (communication object)	No function. Value of the internal humidity sensor is used. Value which is sent via bus (communication object) is used.
Value calculation type	Average Weighted average Weight value 1-4 [0-10] Min Value Max Value	Calculates the value by average. Calculates the value by weighted average. Each value can get a different weight from 0 to 10. Selects the sensor with the lowest humidity.value Selects the sensor with the highest humidity value.

5.2 PI control for relative humidity

Set-point	30% ▼ (10...95%rH)
Proportional band	20% ▼ (10...40%rH)
Reset time	15 min. ▼ (15...240min.)
Min. control value	0% ▼
Max. control value	100% ▼
Control value in case of sensor error	0% ▼
Blocking object	<input type="radio"/> disabled <input checked="" type="radio"/> enabled
Behavior when unblocking	<input checked="" type="radio"/> don't send <input type="radio"/> send current value
Behavior when blocking	<input checked="" type="radio"/> don't send <input type="radio"/> send value

Designation	Options	Description	
Set point	10% to 95% relative humidity	Definition of the set point.	
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	Disabled	No function. 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.	
	Enabled		
	Behavior when unblocking		Don't send Send recent value
	Behavior when blocking		Don't send Send value
Percent when blocking	Selection: 0% to 100%	Definition of the percentage value when blocking.	

5.3 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 Enabled	No function.
	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.

6. Humidity comparator

Comparator disabled enabled

Value 1

Value 2

Output when Value 1 < Value 2 0 (unblock) 1 (block)

Output when error 0 (unblock) 1 (block)

Send output value when changing disabled enabled

Send output value cyclically

Designation	Options	Description
Comparator	Disable Enable	No function. If comparator is enabled two rH values can be compared and selected which has a higher priority.
	Value 1 / 2	Internal Sensor Absolute humidity in [g/m ³] via bus Relative humidity in [%] and temperature in [°C] via bus
	Output when Value 1 < Value 2	0 1 Unblock Block
	Output when error	0 1 Unblock Block
	Send output when changing	Disabled Enabled No function. Output value is sent when changing
	Send output value cyclically	Disabled Every minute – once a day No function. Cyclic sending of the recent value.

7. Temperature sensor

Temperature sensor disabled enabled

Value offset [×0.1K]
(-5...+5K)

Error temperature sensor don't notify notify

Send temperature when changing

Send temperature cyclically

Send min/max temperature values when changing

Send min/max temperature values cyclically

Designation	Options	Description	
Temperature Sensor	Disabled	Temperature sensor disabled.	
	Enabled		
	Error Temperature sensor	Notify Don't notify	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.
	Send temperature when changing	Disabled Change from 0,1 K – 10,0 K	No function. 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.
	Send min/max temperature values when changing	Disabled If change above 0,1K – 10,0K	No function. The min/max values are sent if the difference between old and new value is above the defined sending threshold
	Send min/max temperature values cyclically	Disabled Every minute – once a day	No function. Cyclic sending of the min/max values.
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.	

8. Temperature alarms

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 Enabled	No function. 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 Enabled	No function. 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.

9. Temperature control

Select heating and/or cooling heating and cooling ▼

Extra level heating enable disabled enabled

Guide heating disabled enabled

Heating demand for display no yes

Extra level cooling enable disabled enabled

Guide cooling disabled enabled

Cooling demand for display no yes

Operating mode after reset Comfort ▼

Operating mode after ETS-download Comfort ▼

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.
Heating demand for display / Cooling demand for display	No Yes	Status object is disabled. This object is a status object to send the status of heating / cooling (active or not). It can be used to visualize the status on a display.
Operating mode after reset	Comfort Eco Standby Frost-/heat protection Last (saved)	Active Operating mode after rest: comfort Active Operating mode after rest: Eco Active Operating mode after rest: Standby Active Operating mode after rest: Frost-/ heat protection Active Operating mode after rest: activates the last saved one
Operating mode after ETS-download	Comfort Eco Standby	Active Operating mode after ETS download: comfort Active Operating mode after ETS download: Eco Active Operating mode after ETS download: Standby

	Frost-/heat protection	Active Operating mode after ETS download: Frost-/ heat protection
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9.1 Temperature control – Set-Points

Comfort temperature	<input type="text" value="210"/>	[×0.1°C] (0...40°C)
Standby setback heating below Comfort temp.	<input type="text" value="0"/>	[×0.1K] (0...10K)
Eco setback heating below Comfort temp.	<input type="text" value="0"/>	[×0.1K] (0...10K)
Frost protection temperature heating	<input type="text" value="70"/>	[×0.1°C] (0...40°C)
Standby increment cooling above Comfort temp. (plus Dead zone)	<input type="text" value="0"/>	[×0.1K] (0...10K)
Eco increment cooling above Comfort temp. (plus Dead zone)	<input type="text" value="0"/>	[×0.1K] (0...10K)
Heat protection temperature cooling	<input type="text" value="350"/>	[×0.1°C] (0...40°C)
Interval to main level heating	<input type="text" value="-10"/>	[×0.1K] (0...-10K)
Interval to main level cooling	<input type="text" value="10"/>	[×0.1K] (0...+10K)
Send set-point temperature when changing	<input type="text" value="disabled"/>	
Send set-point temperature cyclically	<input type="text" value="disabled"/>	

Toggle between heating and cooling	<input checked="" type="radio"/> Automatically (via controller) <input type="radio"/> External (via heating/cooling object)
Dead zone between heating and cooling	<input type="text" value="20"/> [×0.1K] (0...10K)
Min. guide value heating	<input type="text" value="0"/> [×1°C] (-50°C...+50°C)
Max. guide value heating	<input type="text" value="0"/> [×1°C] (-50°C...+50°C)
Max. increment of set-point for min. guide value heating	<input type="text" value="0"/> [×0.1K] (0...+10K)
Min. guide value cooling	<input type="text" value="0"/> [×1°C] (-50°C...+50°C)
Max. guide value cooling	<input type="text" value="0"/> [×1°C] (-50°C...+50°C)
Max. setback of set-point for max. guide value cooling	<input type="text" value="0"/> [×0.1K] (0...+10K)
Set-point override	<input checked="" type="radio"/> disabled <input type="radio"/> enabled

Designation	Options	Description
Comfort temperature	0° to 40°C In 0,1 °C Steps	Definition of the comfort temperature.
Standby setback heating below Comfort temp.	0 K to 10 K In 0,1 K Steps	Definition of the value by which the comfort temperature is to be lowered for standby temperature in Kelvin.
Eco setback heating below Comfort temp.	0 K to 10 K In 0,1 K Steps	Definition of the value by which the comfort temperature is to be lowered for eco temperature in Kelvin.
Frost protection temperature heating	0° to 40°C In 0,1 °C Steps	Definition of the frost protection temperature for heating.
Standby increment cooling above Comfort temp. (plus Dead Zone)	0 K to 10 K In 0,1 K Steps	Definitions of the cooling temperature in standby mode above the comfort temperature, plus Dead Zone
Eco increment cooling above Comfort temp. (plus Dead Zone)	0 K to 10 K In 0,1 K Steps	Definitions of the cooling temperature in eco mode above the comfort temperature, plus Dead Zone
Heat protection temperature cooling	0° to 40°C In 0,1 °C Steps	Definition of the heat protection temperature for cooling.
Interval to main level heating	0 K to -10 k In 0,1 K Steps	Difference between man level heating temperature and extra level heating temperature
Interval to main level cooling	0 K to 10 k In 0,1 K Steps	Difference between main level cooling temperature and extra level cooling temperature

Send set-point temperature when changing	Disabled Enabled		No function. If there is a change the recent control value is sent.
Send set-point temperature cyclically	Disabled Every minute – once a day		No function. Cyclic Sending of the recent control value.
Toggle between heating and cooling	Automatically (via controller) External (via heating/cooling object)		Automatically toggle between heating and cooling External heating/cooling object is used.
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 / cooling	- 50°C to +50°C In 1°C Steps		Lower guide value for heating / cooling
Max. guide value heating / cooling	- 50°C to +50°C In 1°C Steps		Upper guide value for heating / cooling
Max. increment / setback of set-point for min. / max. guide value heating / cooling	0 K to 10 K In 1K Steps		Incrementation / setback of when the guide value is reached
Set-point override	Disabled Enabled		No function. Allows to override the setpoint via communicationobject.

9.2 Temperature control – Blocking objects

Blocking object heating mode 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

Designation	Options	Description
Blocking object Heating/cooling mode	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/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 heat if a window is open).

9.3 Temperature control – Actual value source

Temperature measurement value 1 internal sensor
 via bus (communication object)

Temperature measurement value 2

Temperature measurement value 3

Temperature measurement value 4

Value calculation type

Weight value 1 (0...10)

Weight value 2 (0...10)

Weight value 3 (0...10)

Weight value 4 (0...10)

Designation	Options	Description
Temperature measurement value 1	Internal sensor Via bus (communication object)	Value of the internal temperature sensor is used. Value which is sent via bus (communication object) is used.
Temperature measurement value 2-4	Disabled Internal sensor Via bus (communication object)	No function. Value of the internal temperature sensor is used. Value which is sent via bus (communication object) is used.
Value calculation type	Average Weighted average Weight value 1-4 [0-10] Min Value Max Value	Calculates the value by average. Calculates the value by weighted average. Each value can get a different weight from 0 to 10. Selects the sensor with the lowest temperature. Selects the sensor with the highest temperature.

9.4 Temperature control – Manual set-point adjustment

Man. adjustment range

LED's when blocked all LED's off centered LED on

Send man. offset upon change disabled enabled

Send man. offset cyclically

Designation	Options	Description
Man. adjustment range	Disabled +/-3 K	No function. Value of manual adjustment range.
LED's when blocked	All LED's off Centered LED on	No function. Switch on centered LED.
Send man. offset upon change	Disabled Enabled	No function. Sent manual offset by change
Send man. offset cyclically	Disabled Every minute up to once a day	No function. Cyclic sending of the recent control value.

9.5 Temperature control – Party function

Party function disabled enabled

Party mode

Duration limit disabled enabled

Duration (1...1440min.)

Retrigger disabled enabled

Party function:

Function to activate a defined controller mode, outside of usual modes. This can be limited in time and repeated.

Application example: Outside business hours, Eco mode is activated by default and the temperature is lowered. During an event or party, the temperature can be raised again to comfort mode for a defined period of time without affecting the standard time program.

Designation	Options	Description
Party function	disabled enabled	Party function is not available. Party function is active and can be parameterized.
Party mode	Comfort mode Standby mode Eco mode	Parameters are adopted according to the respective setpoints of the controller. Comfort mode is activated Standby mode is activated Eco mode is activated
Duration limit	Disabled enabled	No time limit for the party mode. Deactivation takes place by sending a "0". Time limit active according to the following parameters. Party mode is activated for the set duration only.
Retrigger	Disabled enabled	Party mode must be activated again after the time has elapsed. Party mode is restarted.

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

Control type	<input checked="" type="radio"/> PI <input type="radio"/> 2-point	
Control direction of control value	<input checked="" type="radio"/> normal <input type="radio"/> inverted	
Proportional band	<input type="text" value="5"/> [x1K] (1...8K)	
Reset time	<input type="text" value="15 min."/> (15...240min.)	
Control value output format	<input type="text" value="PWM"/>	Send control value when changing <input type="radio"/> disabled <input checked="" type="radio"/> enabled
PWM cycle	<input type="text" value="5"/> (5...30min.)	Send control value cyclically <input type="text" value="every minute"/>
Min. control value	<input type="text" value="0%"/>	Send control value when blocked <input type="radio"/> don't send <input checked="" type="radio"/> send value
Max. control value	<input type="text" value="100%"/>	Control value when blocked <input type="text" value="0%"/>
Control value in case of sensor error	<input type="text" value="0%"/>	

(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	The hysteresis can prevent a frequent switching for fast and small changing values.
		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.
Send control value when blocked	Don't send Send value	No function. Control value is sent.
Control value when blocked	0 – 100%	Percentage value when blocked

10. 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.

11. 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.

12. Heat index temperature

Heat index disabled enabled

Send heat index temp. when changing disabled ▼

Send heat index temp. cyclically every minute ▼

Designation	Options	Description
Heat index	Disabled Enabled	No reaction Send the current status
Send heat index temp. when change of status	Disabled In chase of change from...	No reaction Upon change of status heat index is sent.
Send heat index temp. cyclically	Disabled every minute – once a day	No reaction Cyclic transmission of the heat index temp. according tot he set time

13. Heat index alarm

Heat index alarm disabled enabled

Alarm level

Alarm advance

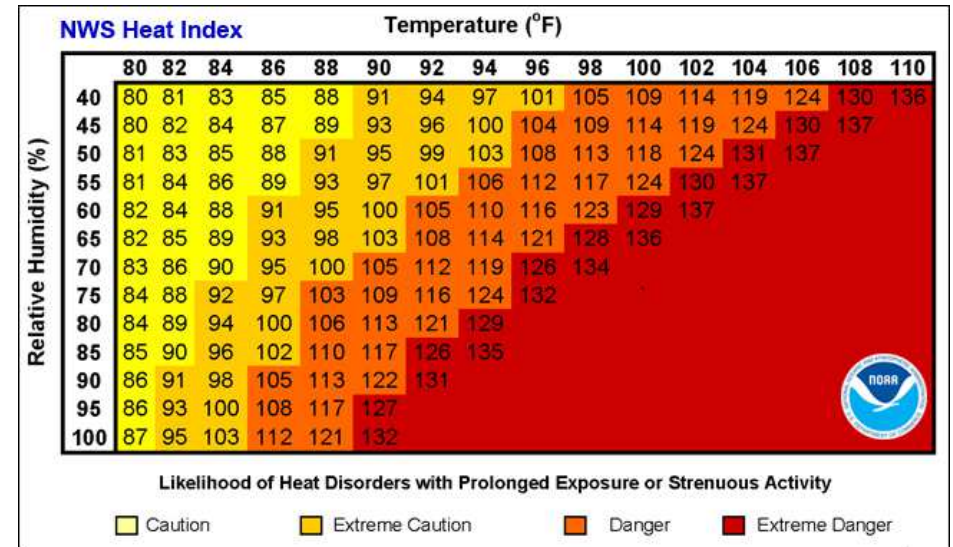
Send alarm when change of status disabled enabled

Send alarm cyclically

Type of telegram for alarm

Switching command when alarm off on

Switching command at the end of alarm off on



Source: <https://www.weather.gov/ama/heatindex>

	Auswahlmöglichkeiten	Beschreibung
Heat index alarm	Disabled Enabled	No reaction If the alarm function is activated, an alarm is sent in form of an object when the heat index temp. is exceeded or not reached.
Alarm level	Caution Extreme caution Danger Extreme Danger	See illustration area yellow See illustration area orange See illustration area dark orange See illustration area red
Alarm advance	1K – 5K	The alarm is triggered 1K-5K before the selected alarm limit
Send alarm when change of status	Disabled Enabled	No reaction When the status changes the heat index alarm is sent
Send alarm cyclically	Enabled Every minute – once a day	No reaction Cyclic sending with active alarm
Telegram type for alarm	Switching command Priority percent Byte Scene	Setting which type of object to use
Switching command when alarm	Depending on the telegram type	Sending of the value that is sent when the heat index alarm is reached
Switching command at the end of alarm	Depending on the telegram type	Setting of the value that will be sent at the end of the heat index alarm

14. 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

Altitude a. s. l. (0...5000m)

Designation	Options	Description
Air pressure sensor	Disabled	Temperature sensor disabled.
	Enabled	
Error air pressure 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 failures are reported.
Send absolute air pressure when changing	Disabled	No function.
	If change above 1 hPa – 50 hPa	The new value is sent if the difference between old and new value is above the defined sending threshold.
Send absolute air pressure cyclically	Disabled	No function.
	Every minute – once a day	Cyclic sending of the recent value.
Send relative air pressure when changing	Disabled	No function.
	If change above 1 hPa – 50 hPa	The new value is sent if the difference between old and new value is above the defined sending threshold.
Send relative air pressure cyclically	Disabled	No function.
	Every minute – once a day	Cyclic sending of the recent value.
Altitude a. s. l.	0 m to 5000 m	Settings for the calculation of the relative air pressure.

15. VAV control – Configuration VAVC

Info: VAVC selects the highest input value.
Only PI controls can be used

Second VAV parameter set inactive active

Input set 1 (default).
Will be selected by sending '0' to 'VAVC: Input set selection'.

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

External object include disabled enabled

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.

Control value output format percent byte

Min. control value

Max. control value

Send VAVC control value when changing

Send VAVC control value cyclically

Blocking object disabled enabled

Designation	Options	Description
Second VAV parameter set	Inactive Active	No function. Parameter of a second VAV controller can be set.
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.
Main level cooling Include	Disabled Enabled	No function. Sending of the main 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 Every minute – once per day	No function. Cyclic sending of the recent value.

Blocking object	Disabled		No function.
	Enabled		
	Behavior when unblocking	Don't send Send current value	No function. Send current value when unblocking.
	Behavior when blocking	Don't send Send value	No function. Send value when blocking.

16. Inputs

16.1 General

Limit number of telegrams

inactive active

Maximum number of sent telegrams

20

Maximum number of sent telegrams per

1 s

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.

16.2 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) <ul style="list-style-type: none"> 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.

16.2.1 E1 – E5 as binary inputs

16.2.1.1 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	On
Debouncing time ... ms	50
Enable object 'Disable'	<input checked="" type="radio"/> inactive <input 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
		Query input after download, ETS reset and bus voltage recovery	Inactive Active
	Active	Long actuation from ... s	0,3 to 10,0 sec.
		Input is being actuated	Closed Opened
			Function inactive. Definition of minimum signal duration (in 0,1s steps) for open / close.
			Function inactive. Input status will be checked after a reboot of the device. A delay (in seconds) before the check can be configured.
			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.
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	Telegram repeated every ... s.	1 to 65535 In seconds
		At object value:	On Off On / Off
			No function. Cyclical sending according to the defined parameters (see left column).
			Setting, under which 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.

16.2.1.2 Dimming

Switching/dimming sensor	<input checked="" type="radio"/> Dimmer/switch <input type="radio"/> Dimmer	Switching/dimming sensor	<input type="radio"/> Dimmer/switch <input checked="" type="radio"/> Dimmer
Input is being actuated	<input checked="" type="radio"/> closed <input type="radio"/> opened	Input is being actuated	<input checked="" type="radio"/> closed <input type="radio"/> opened
Long actuation from ... s	0,4	At actuation: dimming direction	Switchover
At short actuation: switching	Switchover	Dimming procedure	<input checked="" type="radio"/> Start/stop <input type="radio"/> Steps
At long actuation: dimming direction	Switchover after switching darker	Debouncing time ... ms	50
Dimming procedure	<input type="radio"/> Start/stop <input checked="" type="radio"/> Steps	Enable object 'Disable'	<input type="radio"/> inactive <input checked="" type="radio"/> active
Brightness change per sent telegram	3,13%		
Telegram repeated every ... s	0,4		
Debouncing time ... ms	50		

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.

16.2.1.3 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 Up 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
	2-switch, only move (roller blind)	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)	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	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 Active	Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.

16.2.1.4 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

Inactive waiting time after bus voltage
recovery in s (0 - 30,000)

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
	At contact closing in value x 0,1s	1...65535 x 0,1 seconds
	Query input after download, ETS reset and bus voltage recovery	Inactive Active
	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
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.

16.2.1.5 Scene control

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 At long actuation With object value= 1 At long actuation and object value= 1	Scenes cannot be saved. Scene will be saved at long actuation (value configurable from 0,3 ...10,0 seconds) Scene will be saved, when object value = 1 Scene will be saved, when object value = 1 and long actuation (value configurable from 0,3 ...10,0 seconds)
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.

16.2.1.6 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)* 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
Enable object „disable“	Inactive Active	Communication object (blocking object) for input is disabled. Communication object (blocking object) for input is enabled.

16.2.1.7 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.	

16.2.1.8 Pulse counter

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

16.2.1.8.1. 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 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

Counter reading is sent, every 5s ▼

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.

16.2.2 Function analogue input (Only available at input E1)

16.2.2.1 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.

16.2.2.2 E1 Output

Filters low (mean of 4 measurements) ▼

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

Output value is sent, every 5s ▼

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.	
	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.	

16.2.2.3 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.

16.2.2.4 E1 Output threshold value

Send threshold at change disabled enabled

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 threshold in case of change as well as cyclically (adjustable cycle).
	5 seconds	
...		
24 hours		
Send if threshold value exceeded, every...	5 seconds	
...	...	
24 hours	...	

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

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

16.2.3.1 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).

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

Temperature sensor type	PT1000
Temperature offset in K	0
Line fault compensation	Length
Line length, single distance ... in m	10
Cross-section of the busbar, value * 0.01 mm ²	100

Temperature sensor type	PT1000
Temperature offset in K	0
Line fault compensation	Resistance
Line resistance in milliohm [sum of feed and return conductors]	500

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.
	Length	Line length, single distance in meters
		1...30
	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 length and the cross-section of the cable. Value in Meters.
		Value in 0,01 mm ² .
		Line fault compensation based on line resistance of feed and return conductors (in milliohms).

16.2.3.3 E4/5 Output

Filters

Send output value

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

Output value is sent, every

Enable object 'Disable' Inactive Active

Filters

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

Output value is sent, every

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.	
	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.	

16.2.3.4 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

 Send if threshold value undershot disabled enabled

 Send if threshold value undershot, every

 Send if threshold value exceeded disabled enabled

 Send if threshold value exceeded, every

 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.

16.2.3.5 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	

16.2.3.6 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.