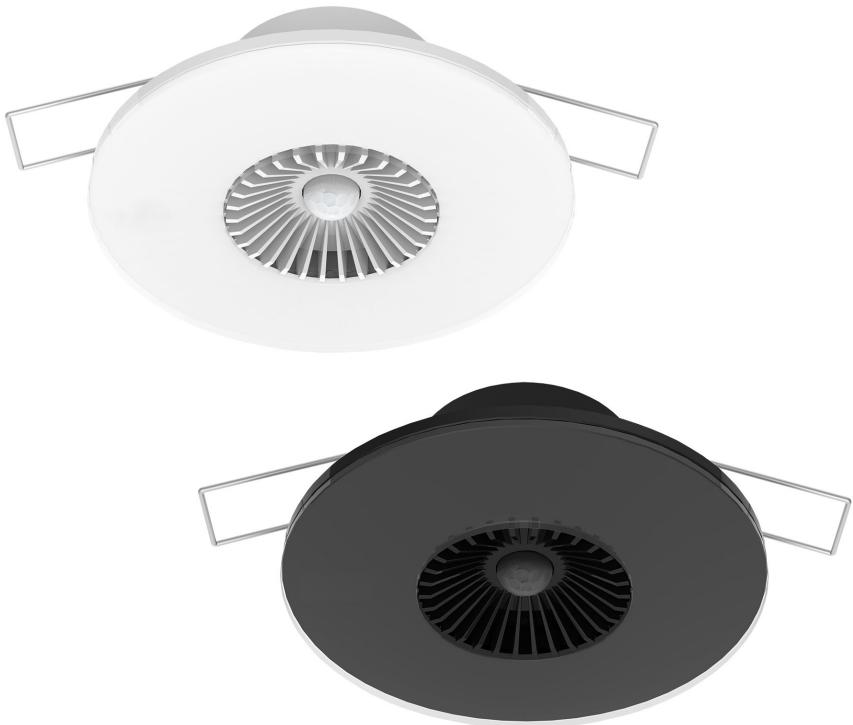# Intra-Sewi KNX L-Pr and Intra-Sewi KNX TH-L-Pr
Brightness and Presence Detectors

Item numbers
70671 Intra-Sewi KNX L-Pr, white
70672 Intra-Sewi KNX L-Pr, black
70681 Intra-Sewi KNX TH-L-Pr, white
70682 Intra-Sewi KNX TH-L-Pr, black

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Installation and Adjustment

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

Clarification of signs used in this manual

⚠️	Safety advice.
⚡	Safety advice for working on electrical connections, components, etc.
DANGER!	... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.
WARNING!	... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.
CAUTION!	... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.
🛑 **ATTENTION!**	... indicates a situation which may lead to damage to property if it is not avoided.
ETS	In the ETS tables, the parameter default settings are marked by underlining.

1.　Description

The **Sensor Intra-Sewi KNX L-Pr** for the KNX building bus system captures brightness and the presence of persons in rooms.

The **Sensor Intra-Sewi KNX TH-L-Pr** *additionally* measures the temperature and the air humidity and calculates the dew-point. Via the bus, the indoor sensor can receive external values of temperature and humidity and process them further with its own data to a total value (mixed value, e.g. room average). Integrated PI-controllers control ventilation (humidification/dehumidification according to humidity) and heating/cooling (according to temperature).

The **Sensor Intra-Sewi KNX TH-L-Pr** can output a warning to the bus as soon as the comfort field, as per DIN 1946, is left. Actuating variable comparators can compare and output variables that were received via communication objects.

All measurement values can be used for the control of limit-dependent switching outputs. States can be linked via AND logic gates and OR logic gates.

Functions:
- **Brightness measurement** with **brightness control**
- **Presence of persons is detected**
- **Threshold values** can be adjusted per parameter or via communication objects
- **4 AND and 4 OR logic gates**, each with 4 inputs. All switching events as well as 16 logic inputs (in the form of communications objects) can be used as inputs for the logic gates. The output of each gate can be configured optionally as 1-bit or 2 x 8-bit

Additional functions Intra-Sewi KNX TH-L-Pr:
- Measuring the **temperature** and **air humidity** (relative, absolute), each with **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage
- Bus message, whether the values for temperature and air humidity are within the **comfort field** (DIN 1946). **Dew point** calculation
- **PI-controller for heating** (one or two-stage) and **cooling** (one or two-stage) according to temperature. Regulation according to separate setpoints or basic setpoint temperature
- **PI controller for humidity** according to humidity: Ventilate/Air (one-stage) or Ventilate (one or two-stage)
- **2 actuation variable comparators** to output minimum, maximum or average values. 5 inputs each for values received via communication objects

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

1.0.1. Scope of delivery

- Sensor

- Pre-assembled clamps for false ceiling installation
- Support ring for connector socket installation

For socket installation you will need *in addition* (not supplied):

- Socket Ø 60 mm, 42 mm deep

1.1. Technical data

General:	
Housing	Plastic, glass
Colour	• similar to pure white RAL 9010 • similar to jet black RAL 9005
Assembly	built-in, in false ceiling or connector socket
Dimensions Ø x height above wall	approx. 80 mm x approx. 5 mm height in wall (installation) approx. 31 mm (incl. clamps)
Degree of protection	IP 30
Weight	approx. 50 g
Ambient temperature	-20…+60°C
Ambient humidity	5...95% RH, non-condensing
Storage temperature	-30…+70°C
KNX bus:	
KNX medium	TP1-256
Configuration mode	S-Mode
Group addresses	max. 254
Assignments	max. 254
Communication objects	Intra-Sewi KNX TH-L-Pr: 252 Intra-Sewi KNX L-Pr: 122
Nominal voltage KNX	30 V ⎓ SELV
Power consumption KNX	max. 10 mA
Connection	KNX plug terminals
Duration after bus voltage restoration until data is received	approx. 5 seconds
Sensors:	
Brightness sensor:	
Measurement range	0 lux … 2,000 lux (higher values can be measured and output)
Resolution	1 lux at 0…2,000 lux
Presence sensor:	
Detection method	Passive infrared method (PIR)
Coverage angle	approx. 94° × 82° (see also *Coverage area of the presence detector*)
Range	approx. 5 m
Temperature sensor (only Intra-Sewi KNX TH-L-Pr):	

Measurement range	-20°C … +60°C
Resolution	0.1°C
Humidity sensor (only Intra-Sewi KNX TH-L-Pr):	
Measurement range	0% rH … 100% rH
Resolution	0.1% rH

The product is compliant with the provisions of the EU guidelines.

1.1.1. Measuring accuracy

Deviations in measured values due to interfering sources (see chapter *installation lo-cation*) must be corrected in the ETS in order to achieve the specified accuracy of the sensor (offset).

During the **Temperature measurement**, the self-heating of the device is taken into consideration by the electronics. It is compensated by the software, therefore the dis-played/output indoor temperature measuring value is correct.

2.   Safety and use instructions

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

CAUTION!
Live voltage!
There are unprotected live components inside the device.
• Inspect the device for damage before installation. Only put undamaged devices into operation.
• Comply with the locally applicable directives, regulations and provisions for electrical installation.
• Immediately take the device or system out of service and secure it against unintentional switch-on if risk-free operation is no longer guaranteed.

Use the device exclusively for building automation and observe the operating instructions. Improper use, modifications to the device or failure to observe the operating instructions will invalidate any warranty or guarantee claims.

Operate the device only as a fixed-site installation, i.e. only in assembled condition and after conclusion of all installation and operational start-up tasks, and only in the surroundings designated for it.

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

3. Installation

3.1. Installation location and preparation

Install and use only in dry interior rooms! Avoid condensation.

The Sensor is installed in a false ceiling or a standard connection socket (Ø 60 mm, 42 mm deep).

The device must be installed on the ceiling, so that the **presence of people is detected** from above. Make sure that the desired area is covered by the sensor's coverage angle and that no obstacles obstruct the recording.

When selecting an installation location for **Intra-Sewi KNX TH-L-Pr**, please ensure that the measurement results of **temperature and humidity** are affected as little as possible by external influences. Possible sources of interference include:
- Direct sunlight
- Drafts from windows and doors
- Draughts from ducts coming from other rooms or the outdoors
- Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
- Connection lines and empty ducts which lead from warmer or colder areas to the sensor

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

3.1.1. Coverage area of the presence detector

Abb. 1

Angle of coverage: approx. 94° × 82°
Range: approx. 5 m
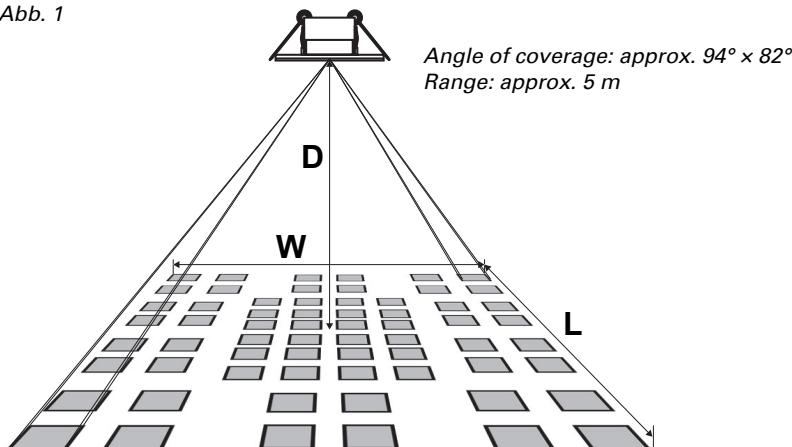
Distance D	Length L	Width W
2.50 m	approx. 5.40 m	approx. 4.30 m
3.50 m	approx. 7.50 m	approx. 6.10 m

3.2. Connection

⚠ **For installation and wiring at the KNX connection, the provisions and standards applicable to SELV circuits must be complied with!**

The connection is made with the KNX terminal (red/black) to KNX TP.
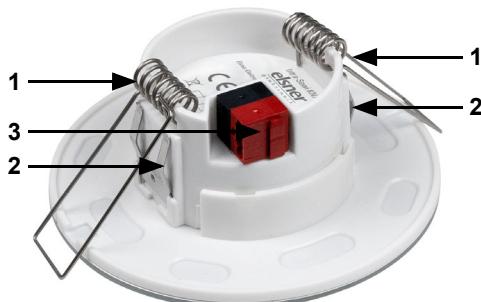
Fig. 2
1 Clamps for installation in false ceiling
2 Springs for installation in support ring
3 KNX terminal

3.2.1. Assembly
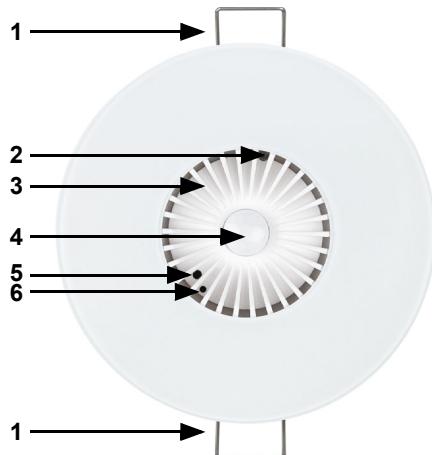
Fig. 3
1   Clamps for installation in false
    ceiling
2   Brightness sensor
3   Airing lamella
4   Presence sensor
5   Programming button
    (recessed, larger opening)
6   Programming LED
    (recessed, smaller opening)

Installation in false ceiling

Connect the bus line to the KNX terminal (red/black).

Place the device in the installation opening in the ceiling. For this, fold the clamps up-
wards and guide the device through the installation opening with the clamps first.

The device is automatically fixed by the clamps.

Fig. 4
1   Clamps for installation in false ceiling
A   Height in wall (built-in): approx. 31 mm
B   Space behind the false ceiling, necessary for insertion (clear dimension):
    approx. 31 mm
C   Maximum wall thickness: 20 mm
D   Hole size for installation: 50...65 mm
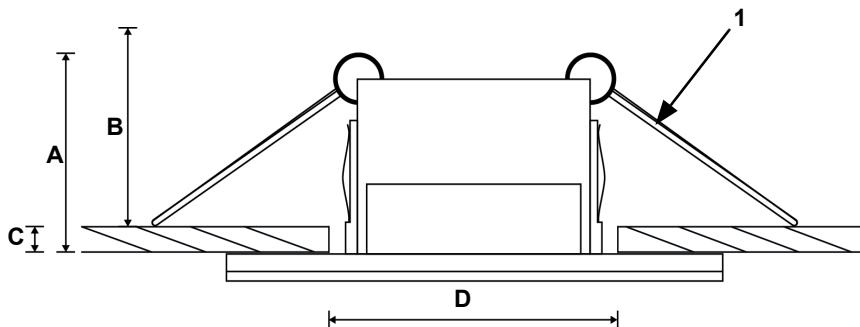
Installation in connector socket

Before socket installation, remove the clamps for the false ceiling installation.

Screw the support ring onto the socket. Pay attention to the orientation as shown in the chapter *Coverage area of the presence detector*.

Connect the bus line to the KNX terminal (red/black).

Clamp the device in the support ring so that the springs on the device snap over the tabs of the support ring.
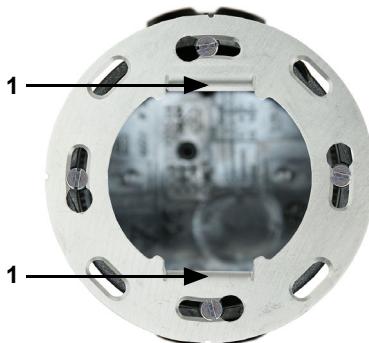
Fig. 5: Tragring
1   Tabs

Fig. 6
Connector socket with Ø 60 mm, 42 mm deep.
1   Support ring, screwed to the socket
2   Springs hold the device firmly on the support ring
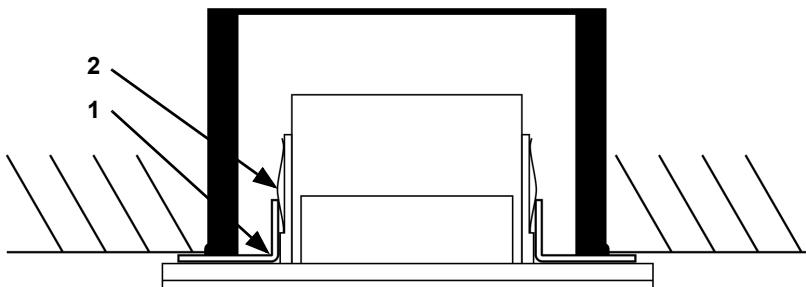
4.   Commissioning

Brightness sensor, presence sensor and ventilation slots on the side must not be dirty, painted over or covered.

After the bus voltage has been applied, the device will enter an initialisation phase lasting approx. 5 seconds. During this phase no information can be received or sent via the bus.

The presence sensor has a start-up phase of approx. 15 seconds during which the presence of persons is not detected.

4.1. Addressing the equipment

The individual address is assigned via the ETS. For this purpose there is a button with a control LED on the unit (Fig. 3, No. 5+6).

The equipment is delivered with the bus address 15.15.255. Another address can be programmed using the ETS.

5. Maintenance

As a rule, it is sufficient to wipe the device with a soft, dry cloth twice a year.

6. Disposal

After use, the device must be disposed of in accordance with the legal regulations. Do not dispose of it with the household waste!

7. Transfer protocol

Units:

Temperatures in degrees Celsius
Brightness in Lux
Air humidity in %
Absolute air humidity in g/kg and/or g/m³
Variables in %

7.1. List of all communication objects

Abbreviation flags:

C Communication
R Read
W Write
T Transfer
U Update

No.	Text	Function	Flags	Data Point Type	Size
For all models:					
0	Software version	Output	R-CT	[217.1] DPT_Version	2 Bytes
3	Brightness measurement	Output	R-CT	[9.4] DPT_Value_Lux	2 bytes
4	Brightness correction factor	Input/ Output	RWC T	[14.5] DPT_-Value_Amplitude	4 bytes
5	Brightness threshold value: Absolute value	Input/ Output	RWC T	[9.4] DPT_Value_Lux	2 bytes
6	Brightness threshold value: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 bit
7	Brightness threshold value: Delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriod-Sec	2 bytes
8	Brightness threshold value: Delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriod-Sec	2 bytes
9	Brightness threshold value: Switching output	Output	R-CT	[1.1] DPT_Switch	1 bit
10	Brightness threshold value: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 bit
11	Light controller: Brightness set-point value	Input/ Output	RWC T	[9.4] DPT_Value_Lux	2 bytes
12	Light controller: Stop delay	Input/ Output	RWC T	[7.5] DPT_TimePeriod-Sec	2 bytes
13	Light controller: Start / Stop (1 = Start | 0 = Stop)	Input	-WC-	[1.1] DPT_Switch	1 bit
14	Light controller: Dimmer increments	Input	RWC T	[5.1] DPT_Scaling	1 byte

No.	Text	Function	Flags	Data Point Type	Size
15	Light controller: Target-actual-difference	Input/Output	RWCT	[9.4] DPT_Value_Lux	2 bytes
16	Light controller: Reset time	Input/Output	RWCT	[7.5] DPT_TimePeriod-Sec	2 bytes
17	Light controller: Actuating variable	Input/Output	R-CT	[5.1] DPT_Scaling	1 byte
18	Light controller: Switching	Output	R-CT	[1.1] DPT_Switch	1 bit
19	Light controller: Dimming	Output	R-CT	[3.7] DPT_Control_-Dimming	4 bit
20	Light controller: Brightness in %	Output	R-CT	[5.1] DPT_Scaling	1 byte
21	Light controller: Switching feed-back	Input	-WC-	[1.1] DPT_Switch	1 bit
22	Light controller: Dim response	Input	-WC-	[3.7] DPT_Control_-Dimming	4 bit
23	Light controller: Brightness in % response	Input	-WCT	[5.1] DPT_Scaling	1 byte
24	Light controller: Interruption waiting period	Input/Output	RWCT	[7.5] DPT_TimePeriod-Sec	2 bytes
25	Light controller: Continued	Input	-WC-	[1.1] DPT_Switch	1 bit
26	Light controller: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 bit
27	Motion sensor: Test object	Output	R-CT	[14] 14.xxx	4 Bytes
28	Motion sensor: Test object release (1 = release)	Input	-WC-	[1.1] DPT_Switch	1 Bit
29	Motion sensor: Slave: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
30	Motion sensor: Slave: Message	Output	R-CT	[1.1] DPT_Switch	1 Bit
31	Motion sensor: Slave: Cycle reset	Input	-WC-	[5.1] DPT_Scaling	1 Byte
32	Motion sensor: Master 1: brightness	Input	-WCT	[9.4] DPT_Value_Lux	2 Bytes
33	Motion sensor: Master 1: Brightn. thresh. val. On	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
34	Motion sensor: Master 1: Brightness hysteresis	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
35	Motion sensor: Master 1: Brightness waiting time	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
36	Motion sensor: Master 1: Output	Output	R-CT	Depending on setting	1 Bit - 4 Bytes
37	Motion sensor: Master 1: Switch on delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes

No.	Text	Function	Flags	Data Point Type	Size
38	Motion sensor: Master 1: Switch off delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
39	Motion sensor: Master 1: Slave message	Input	-WC-	[1.1] DPT_Switch	1 Bit
40	Motion sensor: Master 1: Slave cycle reset	Output	--CT	[5.1] DPT_Scaling	1 Byte
41	Motion sensor: Master 1: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
42	Motion sensor: Master 1: Central Off	Input	-WC-	[1.1] DPT_Switch	1 Bit
43	Motion sensor: Master 2: brightness	Input	-WCT	[9.4] DPT_Value_Lux	2 Bytes
44	Motion sensor: Master 2: Brightn. thresh. val. On	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
45	Motion sensor: Master 2: Brightness hysteresis	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
46	Motion sensor: Master 2: Brightness waiting time	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
47	Motion sensor: Master 2: Output	Output	R-CT	Depending on setting	1 Bit - 4 Bytes
48	Motion sensor: Master 2: Switch on delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
49	Motion sensor: Master 2: Switch off delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
50	Motion sensor: Master 2: Slave message	Input	-WC-	[1.1] DPT_Switch	1 Bit
51	Motion sensor: Master 2: Slave cycle reset	Output	--CT	[5.1] DPT_Scaling	1 Byte
52	Motion sensor: Master 2: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
53	Motion sensor: Master 2: Central Off	Input	-WC-	[1.1] DPT_Switch	1 Bit
54	Motion sensor: Master 3: brightness	Input	-WCT	[9.4] DPT_Value_Lux	2 Bytes
55	Motion sensor: Master 3: Brightn. thresh. val. On	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
56	Motion sensor: Master 3: Brightness hysteresis	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
57	Motion sensor: Master 3: Brightness waiting time	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
58	Motion sensor: Master 3: Output	Output	R-CT	Depending on setting	1 Bit - 4 Bytes
59	Motion sensor: Master 3: Switch on delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes

No.	Text	Function	Flags	Data Point Type	Size
60	Motion sensor: Master 3: Switch off delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
61	Motion sensor: Master 3: Slave message	Input	-WC-	[1.1] DPT_Switch	1 Bit
62	Motion sensor: Master 3: Slave cycle reset	Output	--CT	[5.1] DPT_Scaling	1 Byte
63	Motion sensor: Master 3: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
64	Motion sensor: Master 3: Central Off	Input	-WC-	[1.1] DPT_Switch	1 Bit
65	Motion sensor: Master 4: brightness	Input	-WCT	[9.4] DPT_Value_Lux	2 Bytes
66	Motion sensor: Master 4: Brightn. thresh. val. On	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
67	Motion sensor: Master 4: Brightness hysteresis	Input / Output	-WCT	[9.4] DPT_Value_Lux	2 Bytes
68	Motion sensor: Master 4: Brightness waiting time	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
69	Motion sensor: Master 4: Output	Output	R-CT	Depending on setting	1 Bit - 4 Bytes
70	Motion sensor: Master 4: Switch on delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
71	Motion sensor: Master 4: Switch off delay	Input	RWC-	[7.5] DPT_TimePeriodSec	2 Bytes
72	Motion sensor: Master 4: Slave message	Input	-WC-	[1.1] DPT_Switch	1 Bit
73	Motion sensor: Master 4: Slave cycle reset	Output	--CT	[5.1] DPT_Scaling	1 Byte
74	Motion sensor: Master 4: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
75	Motion sensor: Master 4: Central Off	Input	-WC-	[1.1] DPT_Switch	1 Bit
Only for model TH-L-Pr:					
76	Temperature sensor: malfunction	Output	R-CT	[1.1] DPT_Switch	1 Bit
77	Temperature sensor: measured value external	Input	-WCT	[9.1] DPT_Value_Temp	2 Bytes
78	Temperature sensor: measured value	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
79	Temperature sensor: measured value total	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
80	Temperature sensor: measured value min./max. query	Input	-WC-	[1.17] DPT_Trigger	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
81	Temperature sensor: measured value minimum	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
82	Temperature sensor: measured value maximum	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
83	Temperature sensor: measured value min./max. reset	Input	-WC-	[1.17] DPT_Trigger	1 Bit
84	Temp. thresholdV 1: Absolute value	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
85	Temp. thresholdV 1: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
86	Temp. thresholdV 1: Switching delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
87	Temp. thresholdV 1: Switching delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
88	Temp. thresholdV 1: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
89	Temp. thresholdV 1: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
90	Temp. thresholdV 2: Absolute value	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
91	Temp. thresholdV 2: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
92	Temp. thresholdV 2: Switching delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
93	Temp. thresholdV 2: Switching delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
94	Temp. thresholdV 2: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
95	Temp. thresholdV 2: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
96	Temp. thresholdV 3: Absolute value	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
97	Temp. thresholdV 3: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
98	Temp. thresholdV 3: Switching delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
99	Temp. thresholdV 3: Switching delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
100	Temp. thresholdV 3: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
101	Temp. thresholdV 3: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
102	Temp. threshold value 4: Absolute value	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes

No.	Text	Function	Flags	Data Point Type	Size
103	Temp. threshold value 4: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
104	Temp. thresh. val. 4: Switching delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
105	Temp. thresh. val. 4: Switching delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
106	Temp. threshold value 4: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
107	Temp. threshold value 4: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
108	Temp.control: HVAC mode (priority 1)	Input	-WC-	[20.102] DPT_HVACMode	1 Byte
109	Temp.control: HVAC mode (priority 2)	Input	-WCT	[20.102] DPT_HVACMode	1 Byte
110	Temp.control: Mode frost/heat protection activt.	Input	-WCT	[1.1] DPT_Switch	1 Bit
111	Temp.control: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
112	Temp.control: Current setpoint	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
113	Temp.control: Switch. (0: Heating | 1: Cooling)	Input	-WC-	[1.1] DPT_Switch	1 Bit
114	Temp.control: Setpoint Comfort heating	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
115	Temp.control: Setpoint Comfort heat.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
116	Temp.control: Setpoint Comfort cooling	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
117	Temp.control: Setpoint Comfort cool.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
118	Temp.control: Basic 16-bit setpoint shift	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
119	Temp.control: Setpoint Standby heating	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
120	Temp.control: Setpoint Standby heat.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
121	Temp.control: Setpoint Standby cooling	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
122	Temp.control: Setpoint Standby cool. (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
123	Temp.control: Setpoint Eco heating	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
124	Temp.control: Setpoint Eco heating (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
125	Temp.control: Setpoint Eco cooling	Input / Output	-WCT	[9.1] DPT_Value_Temp	2 Bytes
126	Temp.control: Setpoint Eco cooling (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
127	Temp.control: Control variable heating (level 1)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
128	Temp.control: Control variable heating (level 2)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
129	Temp.control: Control variable cooling (level 1)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
130	Temp.control: Control variable cooling (level 2)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
131	Temperature control: Variable for 4/6-way valve	Output	R-CT	[5.1] DPT_Scaling	1 Byte
132	Temp.control: Status Heat. level 1 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
133	Temp.control: Status Heat. level 2 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
134	Temp.control: Status Cool. level 1 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
135	Temp.control: Status Cool. level 2 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
136	Temp.control: Comfort extension status	Input / Output	-WCT	[1.1] DPT_Switch	1 Bit
137	Temp.control: Comfort Extension time	Input	-WCT	[7.5] DPT_TimePeriodSec	2 Bytes
138	Humidity sensor: malfunction	Output	R-CT	[1.1] DPT_Switch	1 Bit
139	Humidity sensor: measured value external	Input	-WCT	[9.7] DPT_Value_Humidity	2 Bytes
140	Humidity sensor: measured value	Output	R-CT	[9.7] DPT_Value_Humidity	2 Bytes
141	Humidity sensor: measured value total	Output	R-CT	[9.7] DPT_Value_Humidity	2 Bytes
142	Humidity sensor: measured value min./max. query	Input	-WC-	[1.17] DPT_Trigger	1 Bit
143	Humidity sensor: measured value minimum	Output	R-CT	[9.7] DPT_Value_Humidity	2 Bytes
144	Humidity sensor: measured value maximum	Output	R-CT	[9.7] DPT_Value_Humidity	2 Bytes
145	Humidity sensor: measured value min./max. reset	Input	-WC-	[1.17] DPT_Trigger	1 Bit
146	Humidity thresholdV 1: Absolute value	Input / Output	-WCT	[9.7] DPT_Value_Humidity	2 Bytes

No.	Text	Function	Flags	Data Point Type	Size
147	Humidity thresholdV 1: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
148	Humidity thresholdV 1: Delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
149	Humidity thresholdV 1: Delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
150	Humidity thresholdV 1: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
151	Humidity thresholdV 1: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
152	Humidity thresholdV 2: Absolute value	Input / Output	-WCT	[9.7] DPT_Value_Humidity	2 Bytes
153	Humidity thresholdV 2: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
154	Humidity thresholdV 2: Delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
155	Humidity thresholdV 2: Delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
156	Humidity thresholdV 2: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
157	Humidity thresholdV 2: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
158	Humidity thresholdV 3: Absolute value	Input / Output	-WCT	[9.7] DPT_Value_Humidity	2 Bytes
159	Humidity thresholdV 3: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
160	Humidity thresholdV 3: Delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
161	Humidity thresholdV 3: Delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
162	Humidity thresholdV 3: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
163	Humidity thresholdV 3: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
164	Humidity thresholdV 4: Absolute value	Input / Output	-WCT	[9.7] DPT_Value_Humidity	2 Bytes
165	Humidity thresholdV 4: (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
166	Humidity thresholdV 4: Delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
167	Humidity thresholdV 4: Delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
168	Humidity thresholdV 4: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
169	Humidity thresholdV 4: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
170	Humidity control: Block (1: blocking)	Input	-WC-	[1.2] DPT_Bool	1 Bit
171	Humidity control: Target value	Input / Output	-WCT	[9.7] DPT_Value_Humidity	2 Bytes
172	Humidity control: Target value (1:+ | 0:-)	Input	-WC-	[1.2] DPT_Bool	1 Bit
173	Humidity control: Act. variable dehumidification	Output	R-CT	[5.1] DPT_Scaling	1 Byte
174	Humidity control: Act. variable dehumid. 2nd stage	Output	R-CT	[5.1] DPT_Scaling	1 Byte
175	Humidity control: Act. variable humidification	Output	R-CT	[5.1] DPT_Scaling	1 Byte
176	Humidity control: Status dehumidif. (1:ON | 0:OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
177	Humidity control: Status dehumidif.2 (1:ON|0:OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
178	Humidity control: Status humidif. (1:ON | 0:OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
179	Dew point: Measurement	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
180	Cooling medium temp.: Threshold value	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
181	Cooling medium temp.: Actual value	Input	-WCT	[9.1] DPT_Value_Temp	2 Bytes
182	Cooling medium temp.: Offset change (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
183	Cooling medium temp.: Offset current	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
184	Cooling medium temp.: Switching delay from 0 to 1	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
185	Cooling medium temp.: Switching delay from 1 to 0	Input	-WC-	[7.5] DPT_TimePeriodSec	2 Bytes
186	Cooling medium temp.: Switching output	Output	R-CT	[1.1] DPT_Switch	1 Bit
187	Cooling medium temp.: Switching output block	Input	-WC-	[1.1] DPT_Switch	1 Bit
188	Absolute humidity [g/kg]	Output	R-CT	[14.5] DPT_Value_Amplitude	4 Bytes
189	Absolute humidity [g/m³]	Output	R-CT	[14.17] DPT_Value_Density	4 Bytes
190	Ambient climate status: 1=comfortable|0=uncomfort.	Output	R-CT	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
191	Ambient climate status: Text	Output	R-CT	[16.0] DPT_String_ASCII	14 Bytes
192	Actuating variable comparator 1: Input 1	Input	-WC-	[5.1] DPT_Scaling	1 Byte
193	Actuating variable comparator 1: Input 2	Input	-WC-	[5.1] DPT_Scaling	1 Byte
194	Actuating variable comparator 1: Input 3	Input	-WC-	[5.1] DPT_Scaling	1 Byte
195	Actuating variable comparator 1: Input 4	Input	-WC-	[5.1] DPT_Scaling	1 Byte
196	Actuating variable comparator 1: Input 5	Input	-WC-	[5.1] DPT_Scaling	1 Byte
197	Actuating variable comparator 1: Output	Output	R-CT	[5.1] DPT_Scaling	1 Byte
198	Actuating variable comparator 1: Block (1: block)	Output	-WC-	[1.2] DPT_Bool	1 Bit
199	Actuating variable comparator 2: Input 1	Input	-WC-	[5.1] DPT_Scaling	1 Byte
200	Actuating variable comparator 2: Input 2	Input	-WC-	[5.1] DPT_Scaling	1 Byte
201	Actuating variable comparator 2: Input 3	Input	-WC-	[5.1] DPT_Scaling	1 Byte
202	Actuating variable comparator 2: Input 4	Input	-WC-	[5.1] DPT_Scaling	1 Byte
203	Actuating variable comparator 2: Input 5	Input	-WC-	[5.1] DPT_Scaling	1 Byte
204	Actuating variable comparator 2: Output	Output	R-CT	[5.1] DPT_Scaling	1 Byte
205	Actuating variable comparator 2: Block (1: block)	Output	-WC-	[1.2] DPT_Bool	1 Bit
For all models:					
206	Logic input 1	Input	-WC-	[1.2] DPT_Bool	1 Bit
207	Logic input 2	Input	-WC-	[1.2] DPT_Bool	1 Bit
208	Logic input 3	Input	-WC-	[1.2] DPT_Bool	1 Bit
209	Logic input 4	Input	-WC-	[1.2] DPT_Bool	1 Bit
210	Logic input 5	Input	-WC-	[1.2] DPT_Bool	1 Bit
211	Logic input 6	Input	-WC-	[1.2] DPT_Bool	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
212	Logic input 7	Input	-WC-	[1.2] DPT_Bool	1 Bit
213	Logic input 8	Input	-WC-	[1.2] DPT_Bool	1 Bit
214	Logic input 9	Input	-WC-	[1.2] DPT_Bool	1 Bit
215	Logic input 10	Input	-WC-	[1.2] DPT_Bool	1 Bit
216	Logic input 11	Input	-WC-	[1.2] DPT_Bool	1 Bit
217	Logic input 12	Input	-WC-	[1.2] DPT_Bool	1 Bit
218	Logic input 13	Input	-WC-	[1.2] DPT_Bool	1 Bit
219	Logic input 14	Input	-WC-	[1.2] DPT_Bool	1 Bit
220	Logic input 15	Input	-WC-	[1.2] DPT_Bool	1 Bit
221	Logic input 16	Input	-WC-	[1.2] DPT_Bool	1 Bit
222	AND logic 1: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
223	AND logic 1: 8 bit output A	Output	R-CT	[5.010] DPT_-Value_1_Ucount	1 Bit - 2x1 Byte
224	AND logic 1: 8 bit output B	Output	R-CT	[5.010] DPT_-Value_1_Ucount	1 Bit - 2x1 Byte
225	AND logic 1: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit
226	AND logic 2: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
227	AND logic 2: 8 bit output A	Output	R-CT	[5.010] DPT_-Value_1_Ucount	1 Bit - 2x1 Byte
228	AND logic 2: 8 bit output B	Output	R-CT	[5.010] DPT_-Value_1_Ucount	1 Bit - 2x1 Byte
229	AND logic 2: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit
230	AND logic 3: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
231	AND logic 3: 8 bit output A	Output	R-CT	[5.010] DPT_-Value_1_Ucount	1 Bit - 2x1 Byte
232	AND logic 3: 8 bit output B	Output	R-CT	[5.010] DPT_-Value_1_Ucount	1 Bit - 2x1 Byte
233	AND logic 3: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	Data Point Type	Size
234	AND logic 4: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
235	AND logic 4: 8 bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
236	AND logic 4: 8 bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
237	AND logic 4: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit
238	OR logic 1: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
239	OR logic 1: 8 bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
240	OR logic 1: 8 bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
241	OR logic 1: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit
242	OR logic 2: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
243	OR logic 2: 8 bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
244	OR logic 2: 8 bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
245	OR logic 2: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit
246	OR logic 3: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
247	OR logic 3: 8 bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
248	OR logic 3: 8 bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
249	OR logic 3: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit
250	OR logic 4: 1 bit switching output	Output	R-CT	[1.2] DPT_Bool	1 Bit
251	OR logic 4: 8 bit output A	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
252	OR logic 4: 8 bit output B	Output	R-CT	[5.010] DPT_Value_1_Ucount	1 Bit - 2x1 Byte
253	OR logic 4: Block	Input	-WC-	[1.1] DPT_Switch	1 Bit

8. Parameter setting

8.1. Behaviour on power failure/ restoration of power

Behaviour following a failure of the bus power supply:

The device sends nothing.

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

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

8.2. General settings

Set basic characteristics for the data transfer.

Send delay after reset/bus restoration for:	
Measured values	5 s • ... • 300 s
Threshold values and switching outputs	5 s • ... • 300 s
Controller objects	5 s • ... • 300 s
Comparator and logic objects	5 s • ... • 300 s
Maximum telegram rate	• 1 message per second • ... • 10 messages per second • ... • 50 messages per second

8.3. Brightness Measurement

The sensor detects the brightness in rooms, for example for controlling lights.

Set the **sending pattern** for the measured brightness.

Sending pattern	• never • periodically • on change • on change and periodically
at and above change in % *(if sent on change)*	1 ... 100; 20
Send cycle *(if sent periodically)*	5 s ... 2 h

The brightness reading can be **corrected** in order to compensate for a dull or bright point of installation for the sensor.

Use reading correction	No • Yes

Set, in which cases the correction factor received via object is to be retained. Please note that the setting "After power supply restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first communication (setting via objects is ignored).

Specify the starting correction factor.

Maintain the	
correction factor received via communication object	• never • after power supply restoration • after power supply restoration and programming
Start correction factor in 0.001 valid till first communication	1 ... 10000; 1000

Examples:

For a factor of 1.234 the parameter value is 1234.

For a factor of 0.789 the parameter value is 789.

For a factor of 1.2 and a reading of 1000 Lux the transmitted value is 1200 Lux.

8.4. Brightness threshold value

Activate the required brightness threshold value. The menus for setting the threshold value are displayed.

Threshold value 1	No • Yes

Threshold value

Set, in which cases threshold values and delay times received are to be kept per object. The parameter is only taken into consideration if the specification/ setting by object is activated further down. Please note that the setting "After power restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first call (setting via objects is ignored).

Maintain the	
threshold values and delays received via communication objects	• never • after power supply restoration • after power supply restoration and programming

Select whether the threshold value is to be specified per parameter or via a communication object.

Threshold value setpoint using	Parameter • Communications object

When the **threshold value per parameter** is specified, then the value is set.

Threshold value in kLux	1 … 5000; 200

When the **threshold value per communication object** is specified, the starting value, object value limit and type of change to the threshold value are then set.

Start threshold value in Lux valid until first call	1 … 5000; <u>200</u>
Object value limit (min.) in Lux	<u>1</u> … 5000
Object value limit (max.) in Lux	1 … <u>5000</u>
Type of threshold change	<u>Absolute value</u> • Increase/decrease
Increment in Lux *(upon increase/decrease change)*	1 • 2 • 5 • 10 • 20 • 50 • <u>100</u> • 200

With both of the methods for specifying the threshold values the hysteresis is set.

Hysteresis setting	in % • <u>absolute</u>
Hysteresis in % of the threshold value *(for setting in %)*	0 … 100; <u>50</u>
Hysteresis in Lux *(for absolute setting)*	0 … 5000; <u>200</u>

Switching output

Define which value the output transmits if the threshold value is exceeded or undercut. Set the delay for the switching and in which cases the switch output transmits.

When the following conditions apply, the output is (LV = Threshold value)	• GW above = 1 | GW - Hyst. below = 0 • GW above = 0 | GW - Hyst. below = 1 • <u>GW below = 1 | GW + Hyst. above = 0</u> • GW below = 0 | GW + Hyst. above = 1
Delays can be set via objects (in seconds)	<u>No</u> • Yes
Delay from 0 to 1	<u>none</u> • 1 s … 2 h
Delay from 1 to 0	<u>none</u> • 1 s … 2 h
Switching output sends	• <u>on change</u> • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Cycle *(if sent periodically)*	<u>5 s</u> … 2 h

Block

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

Use switching output block	<u>No</u> • Yes
Analysis of the blocking object	• <u>At value 1: block | At value 0: release</u> • At value 0: block | At value 1: release

Blocking object value before first call	<u>0</u> • 1
Action when locking	• <u>Do not send message</u> • send 0 • send 1
Action upon release (with 2 seconds release delay)	[Dependent on the "Switching output sends" setting]

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

Switching output sends on change	do not send message • Status object/s send/s
Switching output sends on change to 1	do not send message • If switching output = 1 ➔ send 1
Switching output sends on change to 0	do not send message • If switching output = 0 ➔ send 0
Switching output sends on change and periodically	Send switching output status
Switching output sends on change to 1 and periodically	If switching output = 1 ➔send 1
Switching output sends on change to 0 and periodically	If switching output = 0 ➔send 0

8.5.   Light control

For light control, the sensor detects the brightness in the room. Activate the light control.

Use control	<u>No</u> • Yes

Set, in which cases the **data** received via object for setpoint value, setpoint value-actual difference, dimming increment and times are to be retained. Please note that the setting "After power supply restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first communication.

Maintain the	
data received via object for setpoint, setpoint-actual difference, dimming increment and times	• <u>never</u> • after power supply restoration • after power supply restoration and programming

Set the **setpoint value for the brightness in the room** and specify whether, besides the dimming information defined below, a switching object should also be sent.

Setpoint value in Lux	0...60000; <u>500</u>
Send switching object	<u>No</u> • Yes

Specify, whether the light control **is activated by presence of persons / movement and/or by a start/stop object**. For a regulation by presence of persons / movement, the device's internal motion detector is analysed.

Set the object evaluation and the object value prior to the first communication. Define, for how many seconds the regulation is to continue to run after the end of the presence of persons / movement.
At the end of the regulation, either "nothing" (status remains unchanged), an on or off command (via the activated switching object) or a dim value can be sent.

Regulation starts on	• <u>movement</u> • reception of a start/stop-object • reception of a start/stop-object or movement
Regulation stops on	• movement • <u>reception of a start/stop-object</u> • reception of a start/stop-object or movement
Object evaluation	• <u>1 = start | 0 = stop</u> • 0 = start | 1 = stop
Object value prior to initial communication	<u>0</u> • 1
Stop delay in seconds after the movement has ended	0...1800; <u>120</u>
Reaction to stop	• send nothing • send off command • send on command • send value
Value in %	<u>0</u>...100

Set, at which deviation from the setpoint value a **dim command is to be sent**. Specify the **dimming increment** and the **repetition cycle** for the dim command.
Define, up to which **response value** the dim actuator sends a brighter or darker command. On the one hand, this defines the range of use for the lamp, on the other hand, once the minimum or maximum value has been reached, no unnecessary messages are sent to the bus.

Send the dim command, if	• <u>the actual value deviates from the setpoint value by more than X%</u> • the actual value deviates from the setpoint value by more than X Lux
Target / actual difference in % *(for a deviation in %)*	1...100; <u>20</u>
Target / actual difference in Lux *(for a deviation in Lux)*	1...2500; <u>100</u>
Dimmer increments	100.00% • 50.00% • 25.00% • <u>12.5%</u> • 6.25% • 3.13% • 1.56%
Repetition of the dim command in seconds	1...600; <u>6</u>

Dim brighter with response value in %	1...**100**
Dim darker with response value in %	**0**...99

The light regulation can be **interrupted during switching or dimming** by response objects, i.e. nothing else is transmitted via the dim-output. This results in the manual light operation having priority.

Set, which objects will trigger interruption and when the regulation is to be continued.

Use interruptions	No • **Yes**
Interrupt regulation when	
Reception from response switching object	No • Yes
Reception from response dimming object	No • Yes
Continue regulation	• after a waiting period • at movement after waiting period • at object reception after waiting period • at object reception or after waiting period • at movement after object reception • at object reception or movement after waiting period
Waiting period in seconds	5...72000 *(Standard value depending on the setting of "continue regulation")*
Object value	0 • **1** • 0 or 1

Note: If the criteria for the continuation of the regulation are fulfilled, the regulation, however, has just been stopped by an object or is blocked, then the end of the interruption has no effect on the behaviour of the light.

The light regulation can be **blocked** via the bus. In contrast to the interruption, when blocking, a switching command or brightness value can be sent. Upon release, the output behaviour follows the rule.

Use block	No • **Yes**
Analysis of the blocking object	• at value 1: block | at value 0: release • at value 0: block | at value 1: release
Value prior to initial communication	0 • 1
Output pattern	
On block	• send nothing • send off command • send on command • send value

8.6. Presence detector

The presence detector detects presence of persons by means of temperature differences. Please note that the "no movement" message is only sent to the bus after a 5 second delay. After connecting the operating voltage and after a reset, it takes 15 seconds until the sensor is ready for operation.

Activate the **test object** if you would like to test the presence detection while commis-sioning.

With an active test object, you can enter the settings for analysis of the release object, the value prior to the first communication, and the type and value of the test object.

Use test object	<u>No</u> • Yes
If test object is used:	
Release object analysis	• at value 1: release | at value 0: block • at value 0: release | at value 1: block
Value prior to first communication	0 • <u>1</u>
Type of test object	• 1 bit • 1 byte (0...255) • 1 byte (0%...100%) • 1 byte (0°...360°) • 1 byte 0...63) scenario call-up • 2 byte counter without math. symbol • 2 byte counter with math. symbol • 2 byte floating point • 4 byte counter without math. symbol • 4 byte counter with math. symbol • 4 byte floating point
Test object value for movement	e.g. 0 • <u>1</u> [depending on the type of test object]
Test object value without movement	e.g. <u>0</u> • 1 [depending on the type of test object]

Select whether the presence detector is operated as **master or slave**.
For a master device, the reactions to presence detection are filed in the master settings 1 to 4. The master can thus control up to four different lamps, scenarios etc. and, as an option, also observe incoming presence messages from slave devices.
A slave device sends a presence message to the master via the bus.

Mode	<u>Slave</u> • Master

Presence detector as slave:

Activate the slave in order to use it.

Use slave	<u>No</u> • **Yes**

When a presence of persons is detected, the device periodically sends a 1 to the master via the bus.

> **Information on setting the slave sending cycle and the cycle reset can be found in chapter *Align communication between master and slave*, page 35.**

Set the **sending cycle** shorter than the master's switch-off delay.

Sending cycle in the event of movement (in seconds)	1...240; 2

Set the **object type and value** for the cycle reset input for the slave in the same way as for the cycle reset output for the master.

Cycle reset object type	• 1 bit • 1 byte (0%...100%)
Cycle reset at value	0 • 1 and/or 0...100; 1

The slave can be **blocked** via the bus.

Use block	No • **Yes**
Analysis of the blocking object	• at value 1: block | at value 0: release • at value 0: block | at value 1: release
Value prior to first communication	0 • 1

8.6.1. Master 1/2/3/4

If the device is set as a master, the additional master settings 1 to 4 will appear. This enables the sensor to perform four different control functions for presence detection. Activate the master in order to use it.

Use master 1/2/3/4	No • Yes

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

Maintain the	
threshold values and delays received via communication objects	• never • after power supply restoration • after power supply restoration and programming

Select, whether presence of persons is to be detected **constantly or brightness dependent**.

Motion detection	constantly • brightness dependent

Settings for brightness dependent presence detection:

The **brightness dependent presence / motion detection** can be used via separate threshold values for switch-on and switch-off or dependent on daylight. The separate threshold values are ideal for controlling the light in rooms which are only illuminated

by artificial light. The daylight dependent control is ideal for rooms with daylight and artificial light.

Motion detection	**brightness dependent**
Type of brightness dependency	• separate switch-on and switch-off values • daylight dependent

For **daylight dependent presence / motion detection with separate switch-on and switch-off threshold values** activate, as required, the objects for setting the threshold values. Then specify the switch-on and switch-off values (brightness range). The switch-on value is the value, below which the room should be lit in the event of presence of persons. The switch-off value should be higher than the brightness value of the artificially lit room.

Type of brightness dependency	**• separate switch-on and switch-off values**
Threshold values can be set via objects	No • Yes
Switch on sensor below Lux	1...5000; 200
Switch off sensor below Lux	1...5000; 500

For the **daylight dependent presence / motion detection** activate, as required, the objects for setting the threshold values/hysteresis and waiting period. Then specify the switch-on value. This is the value, below which the room should be lit in the event of presence of persons.

The switch-off value is derived from the brightness measurement that is performed by the sensor at the end of the waiting period. Set the waiting period such that after it all lamps are set to the final brightness. The hysteresis is added to the measured brightness value. If the room brightness later exceeds this total value because the room is illuminated by daylight, the presence control is switched off.

Type of brightness dependency	**• Daylight dependent**
Threshold values and hysteresis can be set via objects	No • Yes
Waiting period can be set via objects	No • Yes
Switch on sensor below Lux	1...5000; 200
Switch off sensor, at the earliest after a waiting period of seconds	0...600; 5
after motion detection and above measured brightness plus hysteresis in Lux	1...5000; 200

Settings for all types of presence detection:

The following settings can be made, independent of the presence detection type, i.e. for "constant" and "brightness dependent" presence recognition.

Define the **output type and value**. As a result of the different types, switchable lights (1 bit), dimmer (1 Byte 0-100%), scenarios (1 Byte 0...63 scenario call-up) and other functions can be controlled.

Output type	• 1 bit • 1 byte (0...255) • 1 byte (0%...100%) • 1 byte (0°...360°) • 1 byte (0...63) scenario call-up • 2 byte counter without math. symbol • 2 byte counter with math. symbol • 2 byte floating point • 4 byte counter without math. symbol • 4 byte counter with math. symbol • 4 byte floating point
Output value in the event of motion	e.g. 0 • 1 [depending on the output type]
Output value without motion	e.g. 0 • 1 [depending on the output type]
Output value when blocked	e.g. 0 • 1 [depending on the output type]

Select whether delays can be set via objects and specify the **switching delays**. By setting a **blocking time** after switch-off, you prevent sensors from recognising a switched-off lamp in their detection zone as a temperature change, and sending a presence message.

Delays can be set via objects (in seconds)	No • Yes
Switch on delay (for setting via objects: valid until 1st communication)	0 s • 5 s • 10 s • ... 2 h *(for daylight dependent motion detection:* *fixed value 0s)*
Switch off delay (for setting via objects: valid until 1st communication)	0 s • 5 s • 10 s • ... 2 h
Blocking time for motion detection after switch off delay in seconds	0...600 ; 2

Set the master's output **sending pattern**.

Sending pattern	• on change • on change to movement • on change to no movement • on change and periodically • on change to movement and periodically • on change to no movement periodically
Cycle *(if sent periodically)*	1s • 5 s • ... 2 h

In addition, you can refer to a **slave signal**, i.e. a signal from an additional presence detector, for controlling purposes.

Use slave signal	No • Yes

The slave device periodically sends a 1 to the bus, as long as a presence of persons is detected. The master receives this at the input object "master: slave message" and evaluates the slave message as an own sensor message.

Furthermore, the master has the possibility of triggering a reset of the slave sending cycle.

> **Information on setting the slave sending cycle and the cycle reset can be found in chapter *Align communication between master and slave*, page 35.**

Set the **object type and value** for the master's slave cycle reset output in the same way, as the cycle reset input for the slave.

Slave cycle reset object type	• 1 bit • 1 byte (0%...100%)
Cycle reset at value	0 • 1 and/or 0...100; 1

The master can be **blocked** via the bus.

Use block	No • **Yes**
Analysis of the blocking object	• at value 1: block | at value 0: release • at value 0: block | at value 1: release
Value prior to first communication	0 • 1
Output pattern	
On block	• do not send anything • Send value
For release	• as for transmission pattern • send current value immediately

8.6.2. Align communication between master and slave

Sending cycle slave - switch-off delay master

Set the slave's **sending cycle** shorter than the master's switch-off delay. Thereby it is ensured that the master does not perform a switch-off action, while the slave is still detecting a presence of persons.

Slave cycle reset

The cycle reset for the slave is required, if a master switch action by the "master: central off" object was triggered.

When the master performs a switch-off action, it simultaneously sends a message to the bus via the "master: slave cycle reset". . This message can be received by the slave via the "slave: cycle reset" in order to *immediately* send a message to the bus in the event of a presence detection. The master receives the presence message without having to wait for the next slave transmission cycle.

Please note that object type and value for the slave's cycle reset input and the master's cycle reset output must be set the same.

Application Example:

A person steps into a corridor, the master recognises this presence of person and switches on the corridor lighting. When leaving the corridor, the person wants to switch off the light using a switch.

However, in the meantime a second person has entered the corridor who is detected by a slave. This person would be in darkness and would have to wait for the slave's next transmission cycle before the light would be switched on again.

To prevent this, the switch command is connected to the "master: central off" object. As a result, the master sends a cycle reset command to the slave if the light is switched off manually. In the present example, the master would immediately switch the light back on.

8.7. Temperature Measurement

> The chapter "Temperature Measurement" only applies to the TH-L-Pr model.

Select, whether a **malfunction object** is to be sent if the sensor is faulty.

Use malfunction object	No • Yes

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

Offset in 0.1°C	-50…50; 0

The unit can calculate a **mixed value** from its own reading and an external value. Set the mixed value calculation if desired. If an external portion is used, all of the following settings (threshold values, etc.) are related to the overall reading.

Use external measured value	No • Yes
Ext. Reading proportion of the total reading	5% • 10% • ... • 50% • ... • 100%
Sending pattern for internal and total measured value	• never • periodically • on change • on change and periodically
At and above change of *(if sent on change)*	0.1°C • 0.2°C • 0.5°C • ... • 5.0°C
Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

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

Use minimum and maximum value	No • Yes

8.8.   Temperature threshold values

> The chapter "Temperature threshold values" only applies to the TH-L-Pr model.

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

Use threshold value 1/2/3/4	Yes • <u>No</u>

8.8.1.   Threshold value 1, 2, 3, 4

Threshold value

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

Maintain the	
threshold values and delays received via communication objects	• <u>never</u> • after power supply restoration • after power supply restoration and programming

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

Threshold value setting via parameter:
Set the threshold values and hysteresis directly.

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

Threshold value setting via a communication object:
Define, how the threshold value is to be received from the bus. Basically, a new value can be received, or simply a command to increase or decrease.

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

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

Threshold value setting via	Parameter • **Communication objects**
Start threshold value in 0.1°C valid until first communication	-300 … 800; <u>200</u>
Object value limit (min) in 0.1°C	<u>-300</u>…800
Object value limit (max) in 0.1°C	-300…<u>800</u>
Type of threshold value change	Absolute value • Increase/decrease
Increment *(upon increase/decrease change)*	<u>0.1°C</u> • ... • 5°C

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

Hysteresis setting	in % • <u>absolute</u>
Hysteresis in 0.1°	0...1100; <u>50</u>
Hysteresis in % of the threshold value	0 … 50; <u>20</u>

Switching output

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

When the following conditions apply, the output is (TV = Threshold value)	• <u>TV above = 1 | TV - hyst. below = 0</u> • TV above = 0 | TV - hyst. below = 1 • TV below = 1 |TV + hyst. above = 0 • TV below = 0 |TV + hyst. above = 1
Delays can be set via objects (in seconds)	<u>No</u> • Yes
Switching delay from 0 to 1 *(If delay can be set via objects:* *valid until 1st communication)*	<u>None</u> • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 to 0 *(If delay can be set via objects:* *valid until 1st communication)*	<u>None</u> • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching output sends	• <u>on change</u> • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Cycle *(only if sending periodically is selected)*	<u>5 s</u> • 10 s • 30 s... • 2 h

Block

The switching output can be blocked using an object.

Use switching output block	<u>No</u> • Yes

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

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

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

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

8.9. Temperature PI control

The chapter "Temperature PI control" only applies to the TH-L-Pr model.

Activate the control if you want to use it.

| Use control | No • Yes |

General control

Set, in which cases **setpoint values and extension time** received via object are to be retained. The parameter is only taken into consideration if the setting via object is activated below. Please note that the setting "After power supply restoration and pro-

gramming" should not be used for the initial start-up, as the factory settings are always used until the 1st communication (setting via objects is ignored).

Maintain the	
Target values and extension time received via communication objects	• never • <u>after power supply restoration</u> • after power supply restoration and programming

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

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

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

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

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

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

Mode after reset	• Comfort • <u>Standby</u> • Eco • Building protection

Behaviour of the blocking object with value	• <u>1 = Block | 0 = release</u> • 0 = block | 1 = release
Value of the blocking object after reset	<u>0</u> • 1

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

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

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

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

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

Type of control	• <u>Single level heating</u> • Dual-level heating • Single-level cooling • Dual-level cooling • Single-level heating + single-level cooling • Dual-level heating + single-level cooling • Dual-level heating + dual-level cooling

General setpoint values

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

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

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

Receive changed setpoints after mode change	no • yes
Setting the setpoint values	• with separate setpoint values with Switching object • with separate setpoint values without Switching object • with comfort setpoint as a basis with Switching object • with comfort setpoint as a basis without Switching object
Behaviour of the switching object at value *(with switching object)*	• 0 = Heating | 1 = Cooling • 1 = Heating | 0 = Cooling
Value of the switching object after reset *(with switching object)*	0 • 1

The **increment** for the setpoint changes is predefined. Whether the change only remains temporarily active (not saved) or is also retained after power supply restoration (and programming), is specified in the first section of "General control". This also applies to a comfort extension.

Increment for setpoint changes (in 0.1 °C)	1… 50; 10

The control may be reset to comfort mode from eco mode, which is used as night mode, via the comfort extension. This allows the user to maintain the comfort setpoint value for a longer time, e.g. when having guests. The duration of this comfort extension period is set. After the comfort extension period expires, the system returns to eco mode.

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

Comfort Setpoint

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

Starting heating/cooling setpoint (in 0.1 °C) valid until 1st communication *(not upon saving the setpoint value after programming)*	-300…800; 210

If setpoint values are entered separately:

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

If the comfort setpoint value is used as a basis:

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

Minimum base setpoint (in 0.1°C)	-300…800; <u>160</u>
Maximum base setpoint (in 0.1°C)	-300…800; <u>280</u>
Reduction by up to (in 0.1°C)	0…100; <u>50</u>
Increase by up to (in 0.1°C)	0…100; <u>50</u>

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

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

Standby setpoint

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

If setpoint values are entered separately:

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

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

If the comfort setpoint value is used as a basis:

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

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

Eco setpoint

Eco mode is usually used for night mode.

If setpoint values are entered separately:

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

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

If the comfort setpoint value is used as a basis:

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

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

Setpoint values for frost/heat protection (building protection)

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

Setpoint frost protection (in 0.1°C)	-300…800; <u>70</u>
Activation delay	less than • 5 s • … • <u>5 min</u> • … • 2 h
Setpoint heat protection (in 0.1°C)	-300…800; <u>350</u>
Activation delay	less than • 5 s • … • <u>5 min</u> • … • 2 h

General control variables

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

For heating and cooling	• <u>separate control variables are used</u> • common control variables are used for Level 1 • common control variables are used for Level 2 • common control variable are used for Level 1+2
Use control variable for 4/6-way valve *(only for common control variables in level 1)*	<u>No</u> • Yes

Control type *(for level 2 only)*	• 2-point-control • PI control
Control variable of the 2nd Level is on *(only for level 2 with 2 point controlling)*	• <u>1 bit object</u> • 8 bit object

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

8.9.1. Heating control level 1/2

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

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

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

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

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

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

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

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

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

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

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

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

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

PI control with predetermined application:

This setting provides fixed parameters for frequent applications.

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

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

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

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

2-point-control (only level 2):

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

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

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

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

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

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

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

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

8.9.2. Cooling control level 1/2

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

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

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

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

PI control with control parameters:

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

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

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

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

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

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

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

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

PI control with predetermined application:

This setting provides fixed parameters for a cooling ceiling

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

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

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

2-point-control (only level 2):

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

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

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

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

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

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

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

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

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

8.10. Humidity Measurement

> The chapter "Humidity Measurement" only applies to the TH-L-Pr model.

Select, whether a **malfunction object** is to be sent if the sensor is faulty.

Use malfunction object	<u>No</u> • Yes

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

Offset in 0.1% RH	-100...100; <u>0</u>

The unit can calculate a **mixed value** from its own reading and an external value. Set the mixed value calculation if desired. If an external portion is used, all of the following settings (threshold values, etc.) are related to the overall reading.

Use external measured value	<u>No</u> • Yes
Ext. Reading proportion of the total reading	5% • 10% • ... • <u>50%</u> • ... • 100%

Sending pattern for internal and total mea-sured value	• never • periodically • on change • on change and periodically
At and above change of *(if sent on change)*	0.1% RH • 0.2% RH • 0.5% RH • 1.0% RH • ... • 20.0% RH
Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

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

Use minimum and maximum value	No • Yes

8.11. Humidity threshold values

> The chapter "Humidity threshold values" only applies to the TH-L-Pr model.

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

Use threshold value 1/2/3/4	Yes • No

8.11.1. Threshold value 1, 2, 3, 4

Threshold value

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

Maintain the	
threshold values and delays received via communication objects	• never • after power supply restoration • after power supply restoration and programming

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

Threshold value setting using parameter:

Set the threshold values and hysteresis directly.

Threshold value setting using	**Parameter** • Communication objects
Threshold value in 0.1% RH	1 … 1000; <u>650</u>

Threshold value setting using a communication object:

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

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

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

Threshold value setting using	Parameter • **Communication objects**
Starting threshold value in 0.1% RH valid until first communication	1 … 1000; <u>650</u>
Object value limit (min.) in 0.1%RH	1…1000
Object value limit (max.) in 0.1%RH	1…<u>1000</u>
Type of threshold value change	<u>Absolute value</u> • Increase/decrease
Increment *(upon increase/decrease change)*	0.1% RH • ... • <u>2.0% RH</u> • ... • 20.0% RH

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

Hysteresis setting	in % • <u>absolute</u>
Hysteresis in 0.1% RH	0...1000; <u>100</u>
Hysteresis in % (relative to the threshold value)	0 … 50; <u>20</u>

Switching output

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

When the following conditions apply, the output is (TV = Threshold value)	• <u>TV above = 1 | TV - hyst. below = 0</u> • <u>TV above = 0 | TV - hyst. below = 1</u> • TV below = 1 |TV + hyst. above = 0 • TV below = 0 |TV + hyst. above = 1
Delays can be set via objects (in seconds)	<u>No</u> • Yes
Switching delay from 0 to 1 *(If delay can be set via objects: valid until 1st communication)*	<u>None</u> • 1 s • 2 s • 5 s • 10 s • ... • 2 h

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

Block

The switching output can be blocked using an object.

Use switching output block	<u>No</u> • Yes

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

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

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

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

8.12. Humidity PI control

The chapter "Humidity PI control" only applies to the TH-L-Pr model.

If you activate humidity control, you can use the following settings to define control type, setpoint values, and humidification and dehumidification.

Use humidity control	No • Yes

General control

The sensor can be used to control one- or two-level dehumidification or combined humidification/dehumidification.

Type of control	• One-level dehumidification • Two-level dehumidification • Humidification and dehumidification

Configure a block for the humidity control using the blocking object.

Behaviour of the blocking object with value	• 1 = Block | 0 = release • 0 = block | 1 = release
Blocking object value before first communication	0 • 1

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

Send control variable	• on change • on change and periodically
Send cycle (*is only sent if "periodically" is selected*)	5 s • 10 s • ... • 5 min • ... • 2 h

The status object shows the current status of the output variable (0 = OFF, >0 = ON) and can for example be used for visualisation.

Send status object(s)	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Send cycle (*is only sent if "periodically" is selected*)	5 s • 10 s • ... • 5 min • ... • 2 h

Controller setpoint

Set, in which cases **setpoint values** received via object are to be retained. Please note that the setting "After power supply restoration and programming" should not be used

for the initial start-up, as the factory settings are always used until the first communication (setting via objects is ignored).

Maintain the	
setpoint value received via communication object	• never • after power supply restoration • after power supply restoration and programming

During initial commissioning, a **setpoint value** must be defined which is valid until the first communication of a new setpoint value. For units which have already been taken into service, the last communicated setpoint value can be used. Basically, an air humidity range is specified in which the setpoint value can be changed (**object value limit**).

Enter, how the setpoint value will be received from the bus. Basically, a new value can be received, or simply a command to increase or decrease.

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

Start setpoint in % valid until first communication *(not upon saving the setpoint value after programming)*	0 … 100; 50
Object value limit (min.) in %	0…100; 30
Object value limit (max.) in %	0…100; 70
Type of setpoint value change	Absolute value • Increase/decrease
Increment *(upon increase/decrease change)*	1% • 2% • 5% • 10%

In "Humidification and dehumidification" control mode, a dead zone is specified so that a direct changeover switching between humidification and dehumidification can be avoided.

Dead zone between humidification and dehumidification in % *(only if both humidification and dehumidification are used)*	0…50; 10

Humidification starts, when the relative air humidity is lower or equal to the setpoint value - dead zone value.

Dehumidification and/or humidification

Depending on the control mode, settings sections for humidification and dehumidification appear (level 1/2).

For dual-level dehumidification, the setpoint value difference between the two levels must be defined, i.e. the setpoint value which, when exceeded, triggers the switch to the 2nd level.

Target value difference between level 1 and 2 in % *(for level 2 only)*	0...50; <u>10</u>

Determine the deviation from the setpoint value at which the maximum variable value is reached, i.e. the point at which maximum output is used.
The reset time shows how quickly the controller responds to deviations from the setpoint value. In case of a short reset time, the control responds with a fast increase of the control variable. In case of a long reset time, the control responds somewhat less urgently and needs longer until the necessary control variable for the setpoint value deviation is reached.
You should set the time appropriate for the humidification/dehumidification system at this point (note manufacturer instructions).

Maximum control variable is reached at target/actual difference of %	1...50; <u>5</u>
Reset time in minutes	1...255; <u>3</u>

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

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

8.13. Dewpoint measurement

> The chapter "Dewpoint measurement" only applies to the TH-L-Pr model.

The sensor calculates the dewpoint temperature and can output the value to the bus.

Sending pattern	• <u>never</u> • periodically • on change • on change and periodically
At and above change of *(if sent on change)*	0.1°C • 0.2°C • <u>0.5°C</u> • 1.0°C • 2.0°C • 5.0°C
Send cycle *(if sent periodically)*	5 s • <u>10 s</u> • 30 s • 1 min • ... • 2 h

Activate the monitoring of the coolant temperature if required. The menus for setting the monitoring are displayed.

Use monitoring of the coolant temperature	<u>No</u> • Yes

8.13.1. Cooling medium temp. monitoring

A threshold value can be set for the temperature of the coolant, which is based on the current dewpoint temperature (offset/deviation). The switching output of the coolant temperature monitoring system can provide a warning prior to any build-up of condensation in the system, and/or activate appropriate countermeasures.

Threshold value

Threshold value = dewpoint temperature + offset

Set, in which cases **offset** received via object is to be retained. Please note that the setting "After power supply restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first communication (setting via objects is ignored).

Maintain the	
offset received via communication object	• <u>never</u> • after power supply restoration • after power supply restoration and programming
.	

During initial commissioning, an **offset** must be defined which is valid until the first communication of a new offset. For units which have already been taken into service, the last communicated offset can be used.

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

Start offset in °C valid until first communication	0...200; <u>30</u>
Increment for offset change	<u>0.1°C</u> • 0.2°C • 0.3°C • 0.4°C • 0.5°C • 1°C • 2°C • 3°C • 4°C • 5°C
Hysteresis setting	in % • <u>absolute</u>
Hysteresis of the threshold value in % *(for setting in %)*	0 ... 50; <u>20</u>
Threshold value hysteresis in 0.1°C increments *(at absolute setting)*	0 ... 1000; <u>50</u>
Threshold value sends	• <u>never</u> • periodically • on change • on change and periodically
At and above change of *(if sent on change)*	<u>0.1°C</u> • 0.2°C • 0.5°C • 1.0°C • 2.0°C • 5.0°C
Send cycle *(if sent periodically)*	5 s • <u>10 s</u> • 30 s • 1 min • ... • 2 h

Switching output

The output switching delay can be set using objects or directly as a parameter.

When the following conditions apply, the output is (TV = Threshold value)	• TV above = 1 | TV - hyst. below = 0 • TV above = 0 | TV - hyst. below = 1 • TV below = 1 |TV + hyst. above = 0 • TV below = 0 |TV + hyst. above = 1
Delays can be set via objects (in seconds)	No • Yes
Switching delay from 0 to 1 *for setting via objects: valid until 1st communication*	None • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 to 0 *for setting via objects: valid until 1st communication*	None • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching output sends	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Send cycle *(is only sent if periodically is selected)*	5 s • 10 s • 30 s... • 2 h

Blocking

The switching output can be blocked using an object. Define specifications here for the behaviour of the output when blocked.

Use switching output block	No • Yes
Analysis of the blocking object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release
Blocking object value before first communication	0 • 1
Behaviour of the switching output	
On block	• Do not send message • send 0 • send 1
On release (with 2 seconds release delay)	[Dependent on the "Switching output sends" setting]

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

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

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

8.14. Absolute humidity

The chapter "Absolute humidity" only applies to the TH-L-Pr model.

The absolute air humidity value is detected by the sensor and can be output to the bus.

Use measured values	No • Yes
Sending pattern	• never • periodically • on change • on change and periodically
At and above change of *(if sent on change)*	0.1 g • 0.2 g • 0.5 g • 1.0 g • 2.0 g • 5.0 g
Send cycle *(if sent periodically)*	5 s • 10 s • 30 s... • 2 h

8.15. Comfort field

The chapter "Comfort field" only applies to the TH-L-Pr model.

The sensor can send a message to the bus if the limits of the comfort field are exceeded. In this way, it is for example possible to monitor compliance with DIN 1946 (standard values) or even to define your own comfort field.

Use comfort field	No • Yes

Specify the **sending pattern**, a **Text** for comfortable and uncomfortable and the **Object value**.

Sending pattern	• <u>not</u> • on change • on change to comfortable • on change to uncomfortable • on change and periodically • on change to comfortable and periodically • on change to uncomfortable and periodically
Text for comfortable	[Free text max. 14 chars.]
Text for uncomfortable	[Free text max. 14 chars.]
Object value is at	• <u>comfortable = 1 | uncomfortable = 0</u> • comfortable = 0 | uncomfortable = 1
Send cycle *(if sent periodically)*	<u>5 s</u> • <u>10 s</u> • 30 s... • 2 h

Define the comfort field by specifying the minimum and maximum values for temperature and humidity. The specified standard values comply with DIN 1946

Maximum temperature in °C (Standard 26°C)	25 ... 40; <u>26</u>
Minimum temperature in °C (Standard 20°C)	10 ... 21; <u>20</u>
Maximum relative humidity in % *(*Standard 65%)	52 ... 90; <u>65</u>
Minimum relative humidity in % (Standard 30%)	10 ... 43; <u>30</u>
Maximum absolute humidity in 0.1 g/kg (Standard 115 g/kg)	50 ... 200; <u>115</u>

Temperature hysteresis: 1°C
Relative humidity hysteresis: 2% RH
Absolute humidity hysteresis: 2 g/kg

8.16. Variable comparator

The chapter "Variable comparator" only applies to the TH-L-Pr model.

The integrated variable comparators can output maximum, minimum and average values.

Use comparator 1/2	<u>No</u> • Yes

8.16.1. Control variable comparator 1/2

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

Output delivers	• Maximum value • Minimum value • Average value
Use input 1 / 2 / 3 / 4 / 5	No • Yes
Output sends	• on change of output • on change of output and periodically • when receiving an input object • when receiving an input object and periodically
Send cycle *(if sent periodically)*	5 s • 10 s • 30 s • ... • 5 min • ... • 2 h
At and above change of *(if sent on change)*	1% • 2% • 5% • 10% • 20% • 25% • 50%
Analysis of the blocking object	• at value 1: block | at value 0: release • at value 0: block | at value 1: release
Blocking object value before 1st communication	0 • 1
Behaviour of the switching output	
On block	• do not send message • Send value
Sent value in %	0 ... 100
output sends on release (with 2 seconds release delay)	• the current value • the current value after receipt of an object

8.17.   Logic

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

Activate the logic inputs and assign object values up to first call.

Use logic inputs	Yes • No
Object value prior to first call for:	
- Logic input 1	0 • 1
- Logic input ...	0 • 1
- Logic input 16	0 • 1

Activate the required logic outputs.

AND logic

AND logic 1	not active • active
AND logic ...	not active • active
AND logic 4	not active • active

OR logic

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

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

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

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

1. / 2. / 3. / 4. Input	• <u>do not use</u> - Logic inputs 1...16 - Logic inputs 1...16 inverted • all switching events that the device provides (see *Connection inputs of the AND/OR logic*)
Output type	• <u>a 1-Bit-object</u> • two 8-bit objects

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

Output value if logic = 1	<u>1</u> • 0
Output value if logic = 0	1 • <u>0</u>
Output value If block is active	1 • <u>0</u>
Output value if monitoring period is exceeded	1 • <u>0</u>

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

Object type	• <u>Value (0…255)</u> • Percent (0…100%) • Angle (0…360°) • Scene call-up (0…63)
Output value object A if logic = 1	0 … 255 / 100% / 360° / 63; <u>1</u>
Output value object B if logic = 1	0 … 255 / 100% / 360° / 63; <u>1</u>
Output value object A if logic = 0	0 … 255 / 100% / 360° / 63; <u>0</u>
Output value object B if logic = 0	0 … 255 / 100% / 360° / 63; <u>0</u>

Output value object A if block is active	0 … 255 / 100% / 360° / 63; 0
Output value object B if block is active	0 … 255 / 100% / 360° / 63; 0
Output value object A if monitoring period is exceeded	0 … 255 / 100% / 360° / 63; 0
Output value object B if monitoring period is exceeded	0 … 255 / 100% / 360° / 63; 0

Set the output send pattern.

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

Block

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

Use block	No • Yes
Analysis of the blocking object	• At value 1: block | At value 0: release • At value 0: block | At value 1: release
Blocking object value before first call	0 • 1
Output pattern On block	• Do not send message • Transmit block value [see above, Output value if blocking active]
On release (with 2 seconds release delay)	[send value for current logic status]

Monitoring

If necessary, activate the input monitoring. Set which inputs are to be monitored, at which intervals the inputs are to be monitored and what value the "monitoring status" should have, if the monitoring period is exceeded without a feedback being given.

Use input monitoring	No • Yes
Input monitoring	• 1 • 2 • 3 • 4 • 1 + 2 • 1 + 3 • 1 + 4 • 2 + 3 • 2 + 4 • 3 + 4 • 1 + 2 + 3 • 1 + 2 + 4 • 1 + 3 + 4 • 2 + 3 + 4 • 1 + 2 + 3 + 4

Monitoring period	5 s • ... • 2 h; <u>1 min</u>
Output behaviour on exceeding the monitoring time	• <u>Do not send message</u> • Send value exceeding [= value of the parameter "monitoring period"]

8.18.   AND logic connection inputs

Do not use
Logic input 1
Logic input 1 inverted
Logic input 2
Logic input 2 inverted
Logic input 3
Logic input 3 inverted
Logic input 4
Logic input 4 inverted
Logic input 5
Logic input 5 inverted
Logic input 6
Logic input 6 inverted
Logic input 7
Logic input 7 inverted
Logic input 8
Logic input 8 inverted
Logic input 9
Logic input 9 inverted
Logic input 10
Logic input 10 inverted
Logic input 11
Logic input 11 inverted
Logic input 12
Logic input 12 inverted
Logic input 13
Logic input 13 inverted
Logic input 14
Logic input 14 inverted
Logic input 15
Logic input 15 inverted
Logic input 16
Logic input 16 inverted
Temperature sensor malfunction ON
Temperature sensor malfunction OFF
Humidity sensor malfunction ON
Humidity sensor malfunction OFF
Motion detector test output
Motion detector test output inverted

Motion detector slave output
Motion detector slave output inverted
Motion detector master 1 output
Motion detector master 1 output inverted
Motion detector master 2 output
Motion detector master 2 output inverted
Motion detector master 3 output
Motion detector master 3 output inverted
Motion detector master 4 output
Motion detector master 4 output inverted
Switching output 1 Temperature
Switching output 1 Temperature inverted
Switching output 2 Temperature
Switching output 2 Temperature inverted
Switching output 3 Temperature
Switching output 3 Temperature inverted
Switching output 4 Temperature
Switching output 4 Temperature inverted
Switching output 1 Humidity
Switching output 1 Humidity inverted
Switching output 2 Humidity
Switching output 2 Humidity inverted
Switching output 3 Humidity
Switching output 3 Humidity inverted
Switching output 4 Humidity
Switching output 4 Humidity inverted
Switching output coolant temperature
Switching output coolant temperature inverted
Ambient climate is comfortable
Ambient climate is uncomfortable
Comfort temperature controller active
Comfort temperature controller inactive
Standby temperature controller active
Standby temperature controller inactive
Eco temperature controller active
Eco temperature controller inactive
Frost protection temperature controller active
Frost protection temperature controller inactive
Heating 1 temperature controller active
Heating 1 temperature controller inactive
Heating 2 temperature controller active
Heating 2 temperature controller inactive
Cooling 1 temperature controller active
Cooling 1 temperature controller inactive
Cooling 2 temperature controller active
Cooling 2 temperature controller inactive
Humidity controller dehumidification 1 active
Humidity controller dehumidification 1 inactive

Humidity controller dehumidification 2 active
Humidity controller dehumidification 2 inactive
Humidity controller humidification active
Humidity controller humidification 1 inactive

8.18.1. Connection inputs of the OR logic

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

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