KNX Technical Manual
Busch-Presence Detector KNX / Busch-Watchdog Sky KNX

Busch-Presence detector mini, KNX

6131/20-xxx-500

Busch-Presence detector mini, premium, KNX

6131/21-xxx-500

Busch-Presence detector KNX

6131/30-xxx-500

Busch-Presence detector KNX premium, KNX

6131/31-xxx-500

Busch-Watchdog Sky KNX

6131/40-24-500

Power and productivity
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ABB

Contents

Contents

1 Notes on the instruction manual

Please read this manual through carefully and adhere to the information contained therein. This will assist you in preventing damage to persons and property and ensure reliable operation and long service life of the device.

Please keep this manual in a safe place.

If you pass the device on, also include this manual.

Busch-Jaeger accepts no liability for failure to observe the instructions in this manual.

If you require additional information or have questions about the device, please contact Busch-Jaeger or visit our Internet site at:

www.BUSCH-JAEGER.com

2 Safety

The device has been constructed according to the latest valid regulations governing technology and is operationally reliable. It has been tested and left the factory in a technically safe and reliable state.

However, residual hazards remain. Read and adhere to the safety instructions to prevent such hazards.

Busch-Jaeger accepts no liability for failure to observe the safety instructions.

2.1 Used symbols

The following symbols point to particular dangers involved in the use of the device and provide practical instructions.

Warning

This symbol in connection with the signal word "Warning" indicates a dangerous situation which could lead to immediate death or to serious injury.

Attention - damage to property

This symbol indicates a possibly damaging situation for the product. Non-observance can lead to damage or destruction of the product.

Note ...
This symbol indicates information or references to additional useful topics. This is not a signal word for a dangerous situation.

This symbol indicates information on the protection of the environment.

The following symbols are used in the manual to draw attention to special dangers:

	This symbol indicates a dangerous situation due to electric current. If such a sign is ignored, it can lead to serious injuries or even death.

2.2   Intended use

The presence/movement detector is designed only for interior areas of buildings. The devices serve for switching and regulating lighting systems and/or HKL (HVAC) systems in dependence of brightness and/or movement.

The devices are not suitable for use as an intrusion or attack alarm since they lack the required security against sabotage in accordance with the German VdS (Authority on Safety and Security) regulations.

The device is intended for the following:

» operation according to the listed technical data,

» installation in dry interior rooms,

» installation on the ceiling and can be concealed "Flush-mounted" (e.g. in suspended ceilings), or "Surface-mounted" (optional housing, article no. 6131/x09).

» use with the connecting options available on the device.

The intended use also includes adherence to all specifications in this manual.

2.3   Improper use

Each use not listed in chapter 2.2 is deemed improper use and can lead to personal injury and damage to property.

Busch-Jaeger is not liable for damages caused by use deemed contrary to the intended use of the device. The associated risk is borne exclusively by the user/operator.

The device is not intended for the following:

» unauthorized structural changes,

» repairs,

» use outdoors or in bathroom areas,

» use with an additional bus coupler,

» installation in the BS and VDE flush-mounted box.

2.4   Target group / qualification of personnel

Installation, commissioning and maintenance of the product must only be carried out by trained and properly qualified electrical installers.

The electrical installer must have read and understood the manual and follow the instructions provided.

The electrical installers must adhere to the valid national regulations in their country governing the installation, functional test, repair and maintenance of electrical products.

The electrical installers must be familiar with and correctly apply the "Five safety regulations" (DIN VDE 0105, EN 50110):

1. Disconnect the power;

2. Secure against being reconnected;

3. Ensure there is no voltage;

4. Connect to earth and short-circuit;

5. Cover or barricade adjacent live parts.

2.5 Safety instructions

Warning

Electric voltage! Risk of death and fire due to electric voltage of 230 V.

Dangerous currents flow through the body when coming into direct or indirect contact with live components. This can result in electric shock, burns or even death.

» Work on the 230 V supply system may only be performed by authorised and qualified electricians!

» Disconnect the mains power supply before installation / disassembly.

» Never use the device with damaged connecting cables.

» Do not open covers firmly bolted to the housing of the device.

» Use the device only in a technically faultless state.

» Do not make changes to or perform repairs on the device, on its components or its accessories.

» Keep the device away from water and wet surroundings.

Attention - damage to property

Risk of damaging the device due to external factors! Moisture and contamination can damage the device.

» Protect the device against humidity, dirt and damage during transport, storage and operation.

3 Information on protection of the environment

All packaging materials and devices bear the markings and test seals for proper disposal.

The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance (EU Directive 2002/96/EG WEEE and 2002/95/EG RoHS), (EU-REACH Directive and Law for the Execution of the Directive (EG) No.1907/2006).

The device contains valuable raw materials which can be recycled. Used electric and electronic devices must not be disposed of with domestic waste.

» Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.

4 Product description

4.1 Device overview

> **Note ...**
> The following description applies to all types of the Busch-Presence detector KNX / Busch-Watchdog Sky KNX.
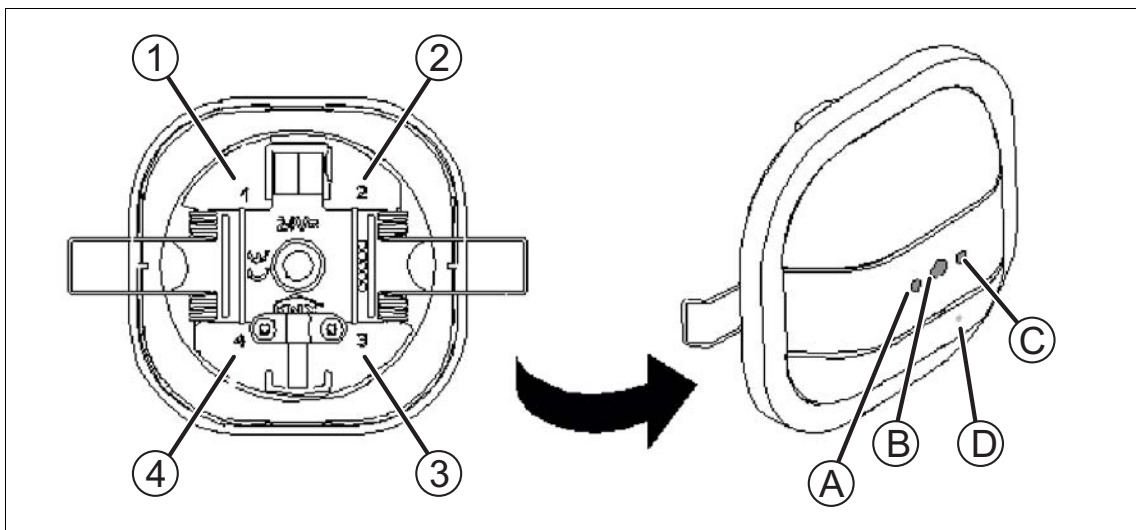
Fig. 1: Product overview

[A]   IR receiver (only premium)

[B]   Programming button

[C]   Sensor for brightness detection

[D]   Programming LED

[1-4]   Individual sectors with switch-off function (via parameter setting).

        For numbering see the rear of the device

This device is a presence or movement detector which is designed only for interior areas of buildings. The devices serve for switching and regulating lighting systems and/or HKL (HVAC) systems in dependence of brightness and/or movement. It makes possible the specific deactivation and activation of light rows in dependence of the brightness of the room. Also dimming/regulating the brightness to a defined value in a designated detection range with the corresponding device is possible. The premium version additionally contains a room temperature controller object.

The integrated bus coupler makes possible the connection of a KNX bus line.

The device can be mounted either in the ceiling via hollow-wall mounting or on the ceiling via the optionally available surface-mounted housing (article number 6131/x9). The mounting instructions are enclosed with the surface-mounted housing. The overall function of the device also depends on the mounting height.

> **Note ...**
>
> The device does not fit in the BS and VDE flush-mounted box.
>
> Recommendation:
>
> - HaloX-O flush-mounted box from Kaiser (article no. 1290-40) with corresponding cover (article no. 1290-47 or article no. 1290-85 for exposed concrete)
> - IBTronic H120-68 from Spelsberg (article no. 97600501)

The detection range can additionally be adapted via individual sectors with switch-off function (via parameter setting).

> **Note ...**
>
> The unit contains highly sensitive sensors and lens systems.
>
> » Do not cover or mask lens segments since this will interfere with the function of the device.
> » Do not clean the device and the lens system with abrasive or aggressive cleaning agents.

4.2   Scope of supply

The scope of supply only contains the flush-mounted device insert (see chapter 4.1). The surface-mounted housing (article no. 6131/x9) for surdace mounting must be ordered separately!

4.3 Overview of types

Article no.	Product name	Detection range	Usage	Mounting height
6131/20-xxx-500	Busch-Presence detector mini, KNX	**Circular (details under 'Technical Data')**	**For detection range of up to 8 m individual rooms (e.g. office, living room, etc.). Wherever functionality is not greatly in demand.**	2.5 m, 3 m and **4 m**
6131/21-xxx-500	Busch-Presence detector mini, premium, KNX	**Circular (details under 'Technical Data')**	**For detection range of up to 8 m individual rooms (e.g. office, living room, etc.). Wherever increased functionality is required.**	2.5 m, 3 m and **4 m**
6131/30-xxx-500	Busch-Presence detector KNX	Circular (details under 'Technical Data')	For detection range of up to 12 m large rooms (e.g. large-scale office, classrooms, etc.). Wherever functionality is not greatly in demand.	2.5 m, 3 m and 4 m
6131/31-xxx-500	Busch-Presence detector, premium, KNX	Circular (details under 'Technical Data')	For detection range of up to 12 m large rooms (e.g. large-scale office, classrooms, etc.). Wherever increased functionality is required.	2.5 m, 3 m and 4 m
6131/40-24-500	Busch-Watchdog Sky KNX	Circular (details under 'Technical Data')	For detection range of up to 24 m halls (e.g. sports halls, factory halls, etc.). Wherever functionality is not greatly in demand, but a large mounting height.	6 m and 12 m

4.4 Table1: Function overview

The following tables provide an overview of the possible functions and applications of the devices.

» **Busch-Presence detector mini, KNX**

Normal (6131/20-xxx-500)	Premium (6131/21-xxx-500)
Detector incl. monitoring [1]	Detector incl. monitoring [1]
Constant light switch [2]	**HVAC (Heating, air-conditioning, ventilation) [4]**
Brightness detection [3]	Constant light switch [2]
-	Constant light controller [5]
-	**Brightness detection [6]**
	Room temperature controller object [7]
-	IR reception (24 free IR channels) [8]
	Logics (5 logic functions) [9]

Table 2: Function overview of Busch-Presence detector mini, KNX

1) Detector application with 2-stage switch-off function or with integrated monitoring function.
2) Constant light switch with up to 2 independent channels or with a maximum of 2 outputs for brightness-dependent switching of 2 light rows in the room.

3) For the specific switch-on and switch-off of light rows dependent on room brightness.
4) HVAC function for activating heating and/or cooling systems as well as ventilation systems in the designated detection range.
5) Constant light controller with up to 2 independent channels or with a maximum of 2 outputs for brightness-dependent dimming/regulating of 2 light rows in a room.

6) For dimming/regulating the brightness to a defined value in a designated detection range.
7) Integrated room temperature controller object with temperature sensor
8) 24 freely programmable IR channels (blue and/or white).
9) Logic gate, gate, delay and staircase lighting

Other features of premium (6131/31-xxx-500):

» The programming mode can be activated with the IR remote control (6010-25-500). This makes it possible to activate the programming mode without manually operating the programming button and without the use of a ladder.

» **Busch-Presence detector, KNX**

Normal (6131/30-xxx-500)	Premium (6131/31-xxx-500)
Detector incl. monitoring [1]	Detector incl. monitoring [1]
Constant light switch [2]	**HVAC (Heating, air-conditioning, ventilation) [4]**
Brightness detection [3]	Constant light switch [2]
-	Constant light controller [5]
-	**Brightness detection [6]**
	Room temperature controller object [7]
-	IR reception (24 free IR channels) [8]
	Logics (5 logic functions) [9]

Table 3: Function overview of Busch-Presence detector KNX

1) Detector application with 2-stage switch-off function or with integrated monitoring function.
2) Constant light switch with up to 2 independent channels or with a maximum of 2 outputs for brightness-dependent switching of 2 light rows in the room.

3) For the specific switch-on and switch-off of light rows dependent on room brightness.
4) HVAC function for activating heating and/or cooling systems as well as ventilation systems in the designated detection range.
5) Constant light controller with up to 2 independent channels or with a maximum of 2 outputs for brightness-dependent dimming/regulating of 2 light rows in a room.

6) For dimming/regulating the brightness to a defined value in a designated detection range.
7) Integrated room temperature controller object with temperature sensor
8) 24 freely programmable IR channels (blue and/or white).
9) Logic gate, gate, delay and staircase lighting

Other features of premium (6131/31-xxx-500):

» The programming mode can be activated with the IR remote control (6010-25-500). This makes it possible to activate the programming mode without manually operating the programming button and without the use of a ladder.

» **Busch-Watchdog Sky KNX**

6131/40-24-500
Detector incl. monitoring **1)**
Constant light switch **2)**
Brightness detection **3)**

Table 4: Function overview of Busch-Presence detector KNX

1) Detector application with 2-stage switch-off function or with integrated monitoring function.
2) Constant light switch with up to 2 independent channels or with a maximum of 2 outputs for brightness-dependent switching of 2 light rows in the room.
3) For the specific switch-on and switch-off of light rows dependent on room brightness.

Other features of 6131/40-24-500:

» The programming mode can be activated with the IR remote control (6010-25-500). This makes it possible to activate the programming mode without manually operating the programming button and without the use of a ladder.

4.5 Description of functions

Note ...
A more detailed description is available in the Description of parameters and objects.

The devices described here can, depending on the device type, be used either as presence and/or movement detector.

The difference between movement detector and presence detector:

The main application of the movement detector is the switching of light when persons are moving toward something. The main application of the presence detector serves for presence monitoring and makes it possible to switch lighting, heating or similar.

In a deactivated state the movement detector also switches without brightness. In an activated state it operates independent of the brightness.

Both movement detector and presence detector are based on the same detection principle. However, the detection segments of the presence detector have a finer mesh and can therefore also detect persons that are seated as being present and respond accordingly. In addition, a presence detector, different to the movement detector, can distinguish between artificial light (which has been activated by it) and natural light; this makes functions such as constant light control possible, for which the amount of artificial light is added to obtain a certain overall brightness.

Main applications:

- BW: Movement, detection range, detection of walking persons.

- PM: Also activities while seated.

The **Busch-Presence detector KNX / Busch-Presence detector mini KNX** is available in two versions:

» The standard version **(6131/30-xxx-500 + 6131/20-xxx-500)** offers movement detection with 2 channels, as well as constant light switching. Constant light switching adds light when persons move within the detection range and the daylight does not meet the required brightness level in the room. For this the device detects the luminosity of the lamps used. As soon as the natural light is adequate, the connected light sources are deactivated.

  The combination of these two functions results in two advantages:

  - Energy is being saved since the lamps are deactivated as soon as the natural light has reached sufficient brightness.

  - Additional energy is saved since the lights are only switched on when persons are inside the room.

» The premium version **(6131/31-xxx-500 + 6131/21-xxx-500)** does not only switch lamps but can also dim them. This makes constant light control much more precise and maintains the brightness level in the room at the desired level. The integrated HVAC function makes it possible to control heating, ventilation and air-conditioning in the respective detection range when someone is present. This additionally saves energy. Two channels are available for this function. Special comfort is made possible with the integration of the IR remote control (6010/25-500). The device receives the signals and converts them on the KNX bus. **The device also contains an integrated room temperature controller object with temperature sensor.** In addition, the device has numerous general functions (see Description of parameters and objects).

Available also is the **Busch-Watchdog Sky KNX**. This device has the same functions as the standard version of the Busch-Presence detector KNX / Busch-Presence detector mini KNX. However, this device can be mounted in higher locations due to its greater sensitivity. It is better suited as movement detector.

Constant light
Depending on the version, the devices offer various options to ensure that the brightness in the room is maintained at a more pleasant level. There is a difference between the functions of the constant light switch and the constant light controller. Both functions ensure that the brightness does not drop below a certain level when persons are in the room. The use of a presence detector is especially practical for work stations in an office, since even small movements are detected.

The constant light switch can switch lamps on and off. The constant light controller can additionally dim lights, to maintain a level that is as constant as possible. Both functions work in dependence of light conditions and movement in the detection range. The devices can operate either in "Automatic" or "Automatic switch-off" mode. If automatic switch-off is selected, for example, the light must be switched on manually via a control element. The light remains on as long as movement is detected and daylight is not sufficient. If no movement is detected, the switch-off delay expires. Only then is an OFF telegram sent to the bus via the output. In automatic mode the movement sensor also takes over the switch-on function as soon as someone enters the room.

» **Constant light switch**

The constant light switch switches on lamps in the room as soon as movement of a person is detected and the desired brightness value is not attained by the entering daylight alone. The programmed setpoint minus hysteresis is maintained as long as people are in the detection range. The application detects when the entering daylight is sufficient. The lamps are then switched off again to save energy.
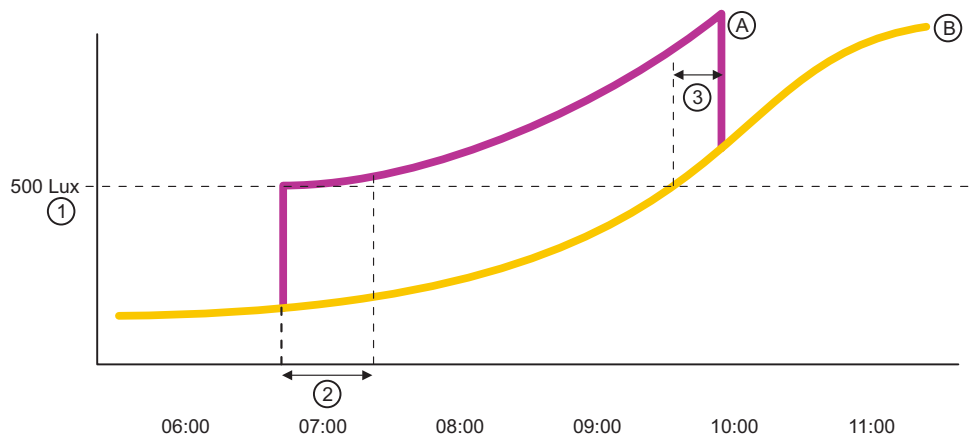
Fig. 2: Control parameters of constant light switch for one light row

[A] Artificial light curve

[B] Sunlight curve

Control parameters:

[1] Setpoint (lx)

[2] Delay time after switch-on up to measurement of the artificial light component

[3] Minimum time above the switch-off threshold (minutes)

To set up a constant light switch function certain parameters settings must be made which lead to dependencies. These dependencies are displayed in the above diagram. A switch-off delay can be set. This time expires when the presence detector no longer senses movement. After expiry, an OFF telegram is sent on the output. Connected lamps are switched off. The switch-off delay should always be higher than the "Delay after switch-on up to measurement of the artificial light component" (2). In the worst case the light sensor would measure the artificial light component when the lamps are switched off. This should be avoided since the entire constant light switching function is based on this value. The "Delay after switch-on up to measurement of the artificial light component" (2) is to be used especially with lamps that take a few seconds to reach their full brightness. Fluorescent lamps require up to around 250 seconds, whereas incandescent lamps reach their full brightness almost immediately. The "Minimum time above the switch-off threshold" (3) ensures that the natural light component attains a stable value before the artificial light is switched off. If this time is too short, this could lead to an unwanted activation and deactivation of the lamps in the room.
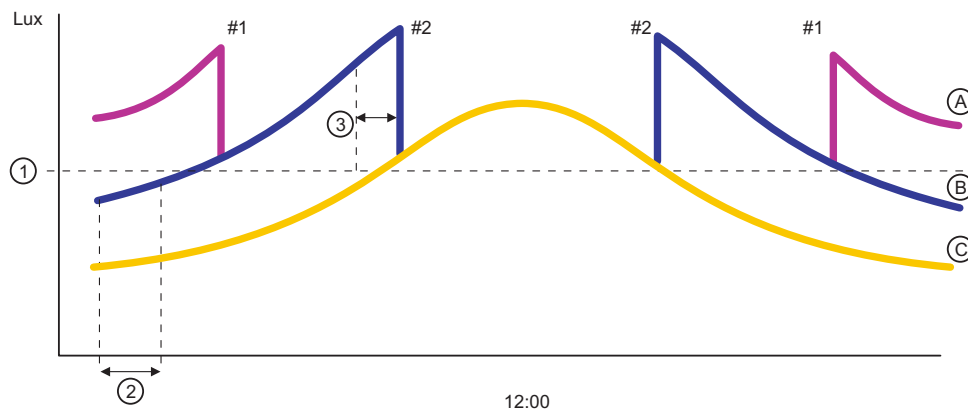
Fig. 3: Control parameters of constant light switch for two light rows

[A] Artificial light curve of light row 1

[B] Artificial light curve of light row 2

[C] Sunlight curve

Control parameters:

[1] Setpoint (lx)

[2] Delay time after switch-on up to measurement of the artificial light component

[3] Minimum time above the switch-off threshold (minutes)

Note: Also the hysteresis must be taken into account. However, this is not displayed for reasons of simplicity.

Here the special parameter settings for 2 light rows must be observed.

» **Constant light controller**

In contrast to the constant light switch, there is the possibility of switching in several stages. Both the constant light controller and the constant light switch ensure that the level of brightness in the room does not drop below the desired level. However, the brightness controller is additionally able to send telegrams for dimming lamps to the KNX bus. This enables a constant level to be attained due to the dimming of lights brighter and darker, always in dependence of the natural light in the room. And the accuracy of the control increases with the operating time. The constant light controller remembers the luminosity of the lamps used, it measures this continuously (see also chapter 7.2.6, 'Information on calibrating the internal light controller). That is why the lights used later must also be used during commissioning of the presence detector with the constant light controller function. **The artificial light component relative to daylight is also determined during commissioning.** Next to the brightness the constant light controller also responds to the presence of persons in the room. This function can also be operated with 2 light rows.
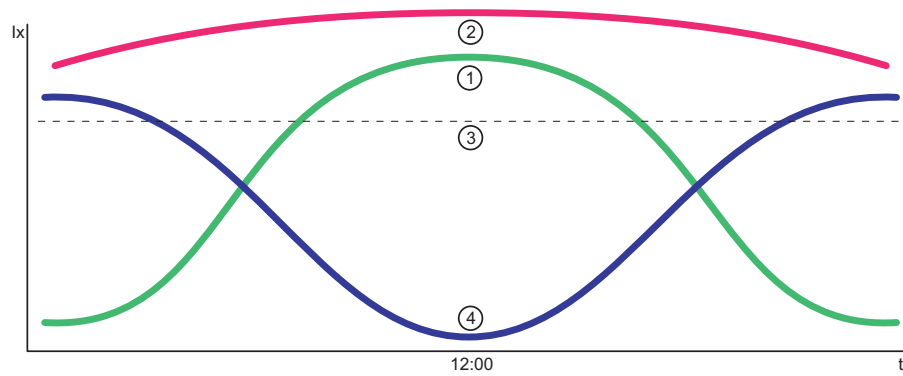
Fig. 4: Influences of the constant light controller

[1] Natuaral light

[2] Brightness in the room

[3] Programmed brightness-value threshold

[4] Artificial light

4.6   Detection range

○
╥   Note ...
╨   The mounting instructions contain the explanations for the detection
     ranges specific to the devices.

The detection range of the KNX presence detector depends on the movement of persons and the mounting height in the room. The movement sensor detects the smallest of movements, e.g. at PC work stations, at desks, etc. Here it must be distinguished between the inner and outer detection range and the mounting height of the presence detector.

» **Inner detection range (seated persons)**

Seated persons must be completely within the detection range. The shorter the distance between the person to be detected and the presence detector, the smaller the movement can be that is still detected. The reference level for the detection of seated activities is approx. 0.8 m. At this height, the detection range, such as for the Busch-Presence detector mini KNX is 6.5 m in diameter (mounting height of the presence detector = 3 m). At a higher mounting height, the detection range becomes larger, but the precision of detection gets smaller.
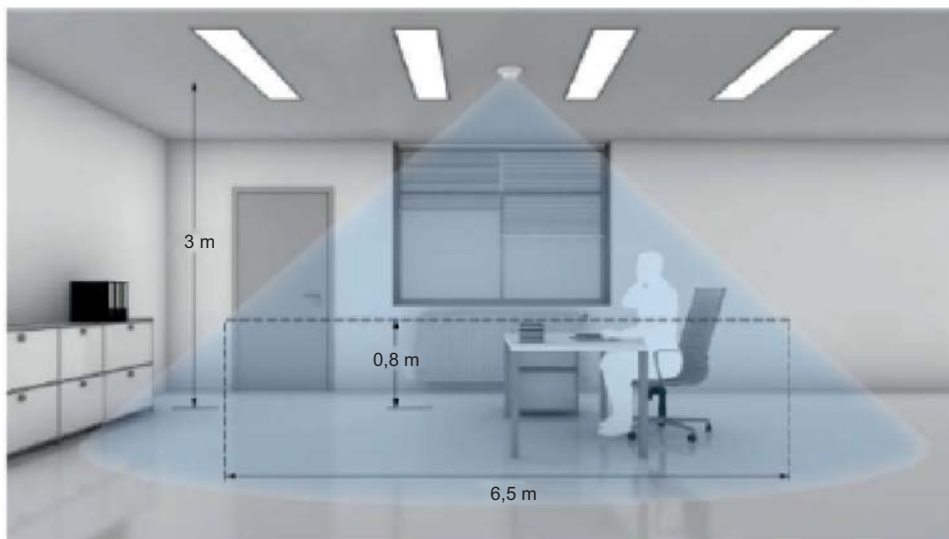
Fig. 5: Inner detection range

» **Outer detection range (walking persons)**

For the detection of walking persons, a larger detection range is available. The reference level for detection is the floor. A mounting height of 3 m results, as example for the Busch-Presence detector mini KNX, in a diameter of approx. 8 m for the detection range.

8 m

Fig. 6 Outer detection range

Note ...

Limited detection

The detection range of the presence detector can be restricted. The device does not need to be covered mechanically for this. Individual sectors can be deactivated in the application.

5 Technical data

5.1 General overview

» **Busch-Presence detector mini KNX (6131/20-xxx-500) / Busch-Presence detector mini premium KNX (6131/21-xxx-500)**

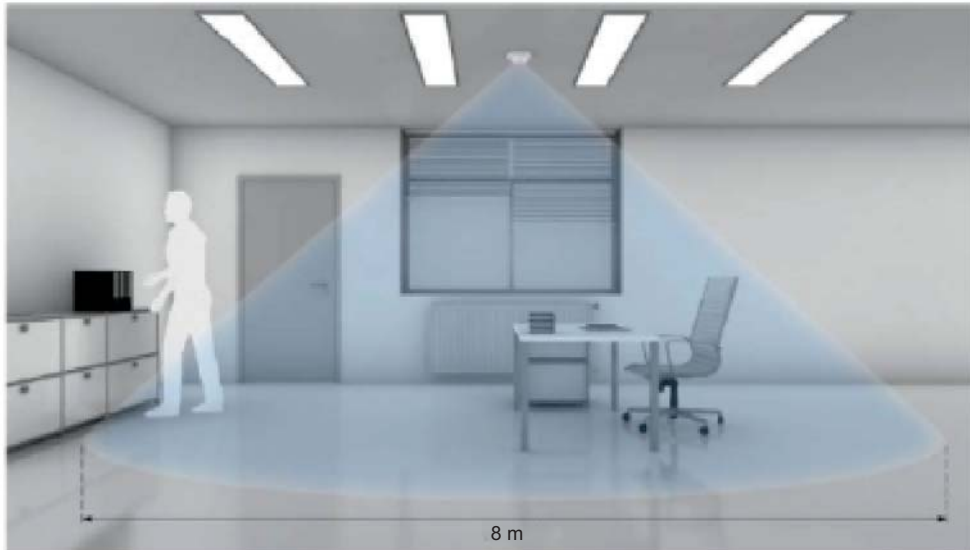» **Busch-Presence detector KNX (6131/30-xxx-500) / Busch-Presence detector premium KNX (6131/31-xxx-500)**

» **Busch-Watchdog Sky KNX (6131/40-24-500)**

Parameters	Value
Supply voltage	24 V
Max. current consumption	< 12 mA
KNX connection	Bus connection terminal, screwless
Switch-on time after switch-off (programmable)	Approx. 1 second
Adjustable brightness range	Approx. 1 - 1000 lux
Opening angle for brightness measurement	Approx. 20°
Light control channels	Standard + **6131/40-24-500**: 2 for light control Premium: 4 for light control
Mounting height	**6131/20-xxx-500 + 6131/21-xxx-500:** 16 mm **6131/30-xxx-500 + 6131/31-xxx-500: 23 mm** **6131/40-24-500: 23 mm**
Temperature range	-5°C - +45°C
Protection	IP 20
Remote operation (*)	Only Premium + **6131/40-24-500**
Storage temperature	-20°C – +70°C

) Programming mode can be switched on and off via remote control (red button). This mode switches itself off automatically after 5 minutes.*

Table 5: Technical data

5.2 Dimensions

○ **Note ...**
All dimensions are in mm.

» **Busch-Presence detector mini KNX (6131/20-xxx-500) / Busch-Presence detector mini premium KNX (6131/21-xxx-500)**
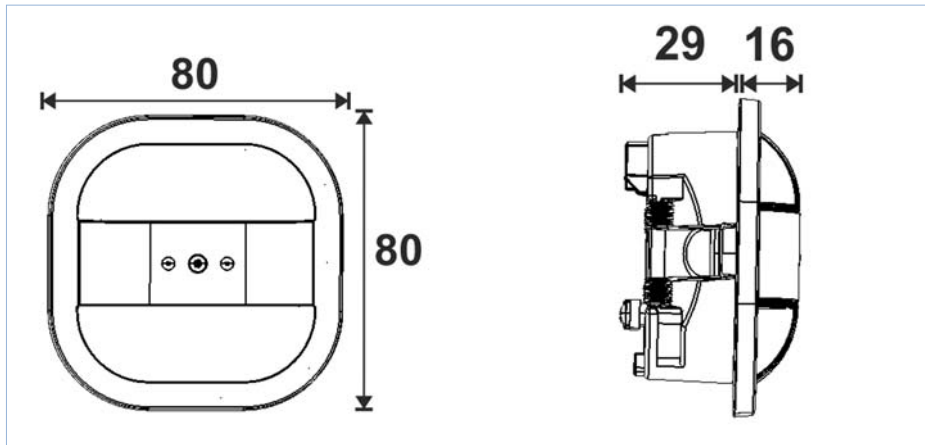
Fig. 7: Dimensions of Busch-Presence detector mini KNX / Busch-Presence detector mini, premium KNX

» **Busch-Presence detector KNX (6131/30-xxx-500) / Busch-Presence detector premium KNX (6131/31-xxx-500)**

Fig. 8: Dimensions of Busch-Presence detector KNX / Busch-Presence detector premium KNX

» **Busch-Watchdog Sky KNX (6131/40-24-500)**
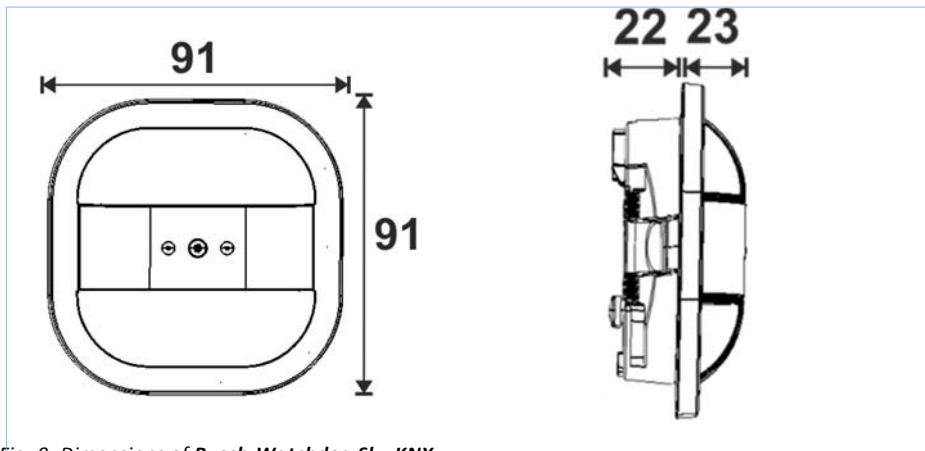
Fig. 9: Dimensions of Busch-Watchdog Sky KNX

5.3   Connection
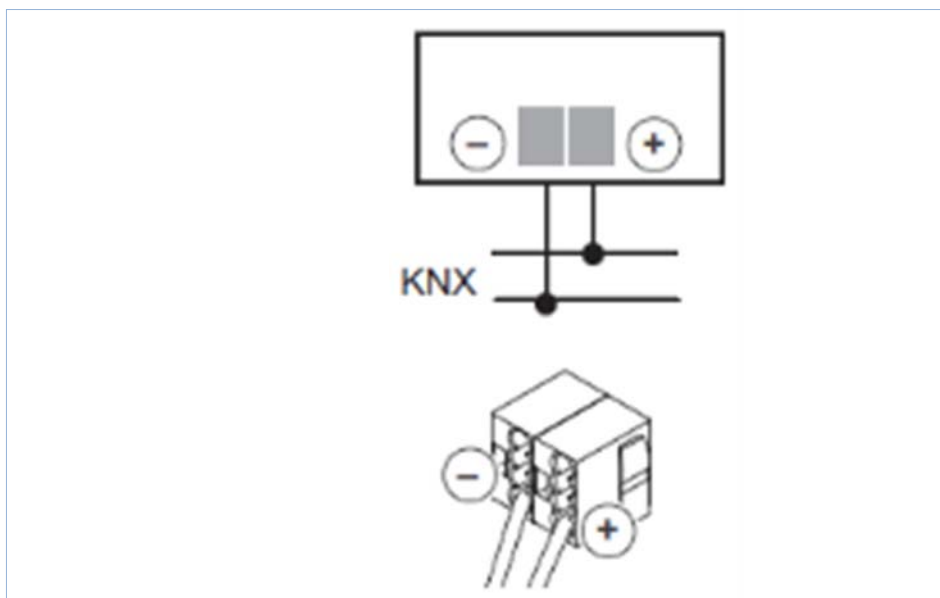
Fig. 10: Electrical connection

6 Mounting

6.1 Safety instructions for mounting

Warning - Risk of death due to electrical voltage

Dangerous currents flow through the body when coming into direct or indirect contact with live components. This results in electric shock, burns or even death.

Work improperly carried out on electrical systems is a hazard to one's own life and that of the user. Also fires and serious damage to property can result.

» Install the device only if you have the necessary electrical engineering knowledge and experience (see chapter 2.4).

» Use suitable personal protective clothing.

» Use only suitable tools and measuring devices.

» Check the type of supply network (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

6.2   Detection ranges

○
ĭ   Note ...
If the height of installation is greater than 2.5 m, the detection range is extended while the precision of detection and the sensitivity are reduced.

»   **Busch-Presence detector mini KNX (6131/20-xxx-500) / Busch-Presence detector mini premium KNX (6131/21-xxx-500)**
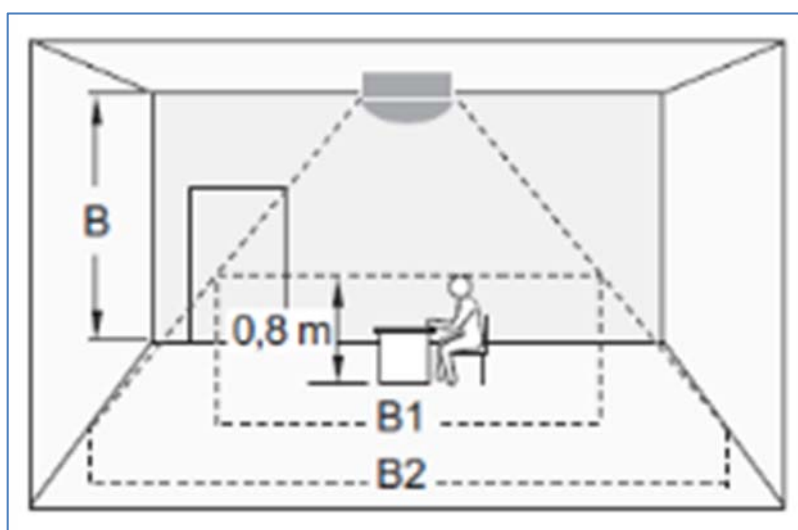
*Fig. 11: Detection ranges of **Busch-Presence detector mini KNX / Busch-Presence detector mini premium KNX***

[B] Mounting height

[B1] *Wide inner detection range (seated person)*

[B2] *Wide outer detection range (walking person)*

Mounting height (B)	Wide inner detection range (B1) (seated person)	Wide outer detection range (B2) (walking person)
2.5 m	5 m max.	6.5 m max.
3 m	max. 6.5 m	8 m max.
4 m	9 m max.	10.5 m max.

*Table. 6: Detection range of **Busch-Presence detector mini KNX / Busch-Presence detector mini premium KNX***

» **Busch-Presence detector KNX (6131/30-xxx-500) / Busch-Presence detector premium KNX (6131/31-xxx-500)**
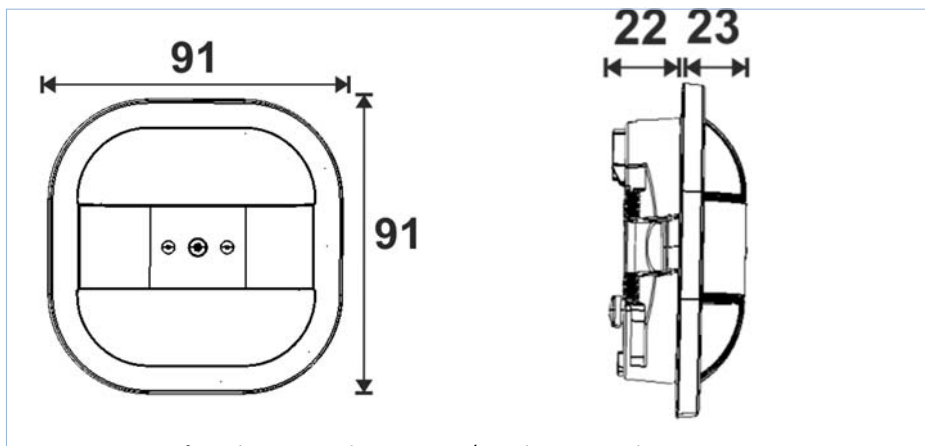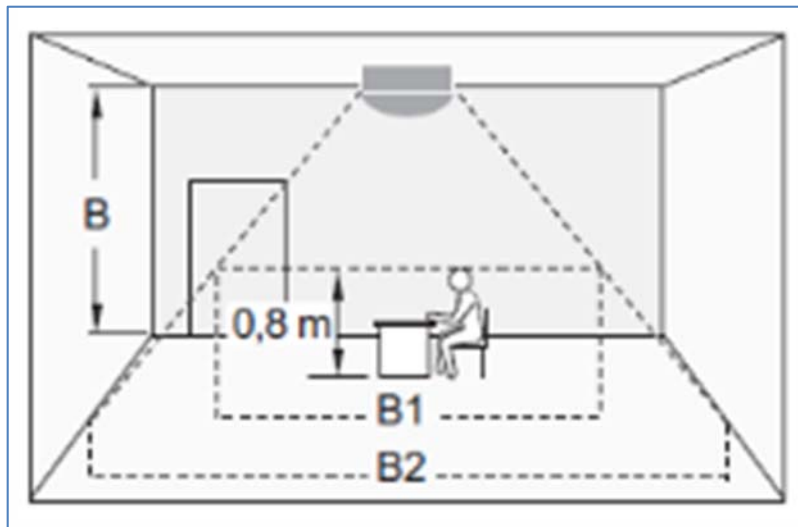

*Fig. 12: Detection range of **Busch-Presence detector KNX / Busch-Presence detector premium KNX***

[B] Mounting height

[B1] *Wide inner detection range (seated person)*

[B2] *Wide outer detection range (walking person)*

Mounting height (B)	Wide inner detection range (B1) (seated person)	Wide outer detection range (B2) (walking person)
2.5 m	8 m max.	10 m max.
3 m	max. 10 m	12 m max.
4 m	14 m max.	16 m max.

*Table 7: Detection range of **Busch-Presence detector KNX / Busch-Presence detector premium KNX***

» **Busch-Wächter® Sky KNX (6131/40-24-500)**
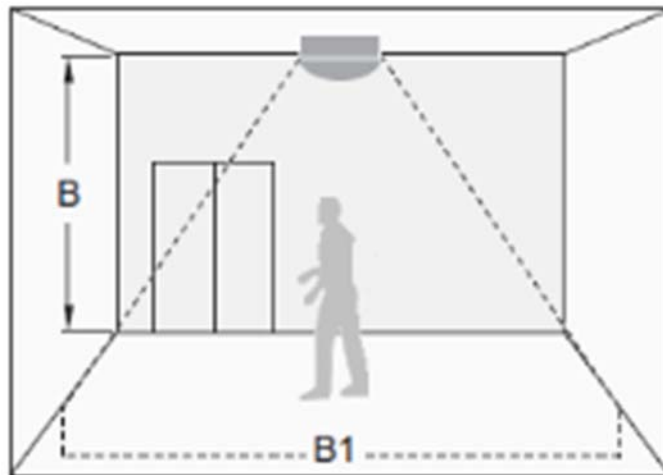
*Fig. 13: Detection range of **Busch-Watchdog Sky KNX***

[B] Mounting height

[B1] *Wide outer detection range (walking person)*

Mounting height (B)	Wide outer detection range (B1) (walking person)
6 m	18 m max.
12 m	max. 24 m

*Table 8: Detection range of **Busch-Watchdog Sky KNX***

6.3   Sources of interference

The presence detector detects the movement of heat sources. If a foreign heat source is in close proximity, this can cause false triggering. Here a distinction must be made between foreign heat sources and limited visibility as a source of interference.

Limited view of the device
The detection range of the device may be obstructed by various objects, e.g.:

- Lamp strip that have been installed lower than the device.

- Large plants

- Partitions

- Glass panes

Foreign heat sources
Rapid changes in temperature surrounding the device can also trigger unwanted switching,
E.g.:

- Additional fan

- Switching on/off of lamps in the direct vicinity (< 1.5 m) of the device, in particular incandescent lamps and halogen lamps

- Moving machines, printers, etc.

Heat sources without interference effect
If the temperature changes only slowly, this will not affect the switching behaviour of the device, e.g. on:

- Radiators (distance > 1.5 m)

- Surfaces heated by the sun

- EDP systems (computers, monitors)

- Ventilation systems, when warm air does not flow directly into the device

6.4   Mounting / Installation

The device is designed for mounting on ceilings. The overall function of the device also depends on the mounting height (see chapter 6.2).

○
Note ...

The device does not fit in the BS and VDE flush-mounted box.

Recommendation:

- HaloX-O flush-mounted box from Kaiser (article no. 1290-40) with corresponding cover (article no. 1290-47 or article no. 1290-85 for exposed concrete)
- IBTronic H120-68 from Spelsberg (article no. 97600501)

» **"Flush-mounted" ceiling mounting (e.g. suspended ceilings)**

» First a recess with a diameter of approx. 68 mm must drilled into the ceiling.
» A sufficient length of KNX bus line must project from the hole.
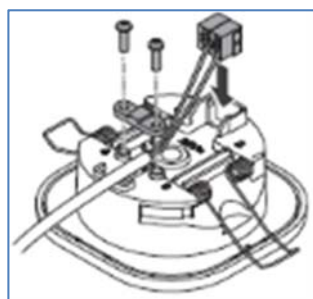
» Connection of the integrated KNX bus coupler (rear of the device):

- Connect the KNX bus line with the enclosed 2-pole bus connection terminal (see connection diagram in chapter 5.3). **The connection is reverse polarity protected!**

- Slide the bus connection terminal into the push-on fixture provided. Screw on the enclosed strain relief as an option.
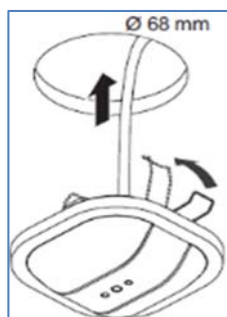
» Carefully slide the connected device into the recess. The clamps must be pressed toward the top.
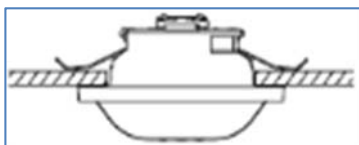
» After the insertion the clamps fold down automatically and hold the device in the correct position.
» A subsequent alignment is still possible!

» **"Surface-mounted" ceiling mounting with surface -mounted housing (optional housing, article no. 6131/x9)**
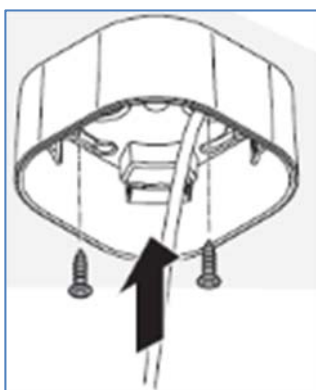
» Slide the KNX bus line into the surface-mounted housing via one of the specified openings. A sufficient length of KNX bus line must project from the hole.
» Fasten the surface-mounting housing with screws.
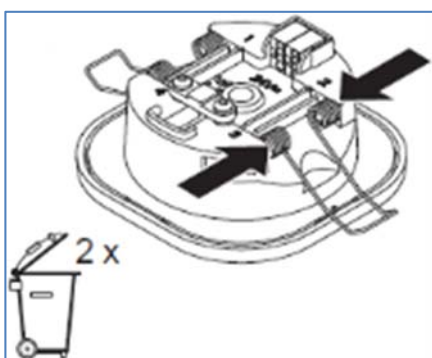
» Remove the two clamps on the device with the aid of a screwdriver and dispose of them.
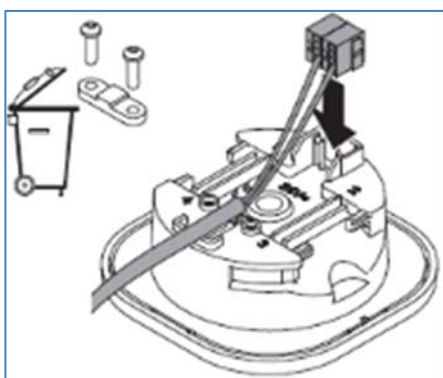
» Connection of the integrated KNX bus coupler (rear of the device):

- Connect the KNX bus line with the enclosed 2-pole bus connection terminal (see connection diagram in chapter 5.3). **The connection is reverse polarity protected!**

- Slide the bus connection terminal into

the push-on fixture provided.

» Now slide the connected device into the surface mounted housing according to the illustration shown opposite. Take note of the guide rails. This is the only way the device can be inserted!

» Now turn the device in a clock-wise direction until it is aligned with the surface-mounted housing.
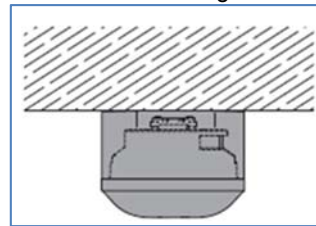
Note ...
Dismantling is carried out in the reverse order!

7   Commissioning

> **Note ...**
> The devices are a product of the KNX system and meet KNX guidelines. Detailed expert knowledge by means of KNX training sessions for a better understanding is assumed.

7.1   Hardware

> **Note ...**
> Please observe the mounting instructions in chapter 6.

The detection range can additionally be adapted via individual sectors with switch-off function (via parameter setting).

> **Note ...**
> The device contains highly sensitive sensors and lens systems.
> » Do not cover or mask lens segments since this will interfere with the function of the device.

7.2   Software

To start the device a physical address must be assigned first. The assignment of a physical address and setting of parameters is carried out with the ETS commissioning software (from ETS version 3.0 f/Power Tool, ETS 4/Power Tool with native application; ETS 5/ only native application).

7.2.1   Preparatory steps

1. Connect a PC via the KNX interface, e.g. the commissioning interface / adapter 6149/21-500, to the KNX bus line. The ETS commissioning software (from version ETS 3.0 f/Power Tool; ETS 4/Power Tool with native application; ETS 5/ only native application) must have been installed.
2. Switch on the bus voltage.

7.2.2 Assigning a physical address

1. Press the programming button (see the illustration opposite)

   The red (programming) LED goes on.

2. After the physical address has been programmed, the red (programming) LED goes off.

Fig. 14:Position of the programming button and the (programming) LED

> **Note ...**
> The programming mode on the premium versions and the Busch-Watchdog Sky KNX can also be switched on and off via remote control (red button). This mode switches itself off automatically after 5 minutes.

7.2.3 Assigning the group address(es)

The group addresses are assigned in connection with the ETS.

7.2.4 Selection of software application

Please contact our Internet support unit (www.Busch-Jaeger.com). The application is loaded into the device via the ETS.

7.2.5 Description of software applications

Various functions can be implemented via the ETS commissioning software. The function of the device is dependent on the parameters selected via the respective software application. Detailed description of applications with explanation of parameters see starting from chapter 11 (only in the following languages: DE, EN, ES, FR, NL, IT).

7.2.6 Instructions on the calibration of the internal light controller

To commission the presence detector with a constant light function you have various parameters available in the ETS. These parameters allow numerous options for setting, in order to adapt the working mode of the device to individual requirements and circumstances. Therefore, the type of furniture, floor coverings or sources of interference in the room is of significance. The value to be set in a room with dark furniture will be less than in a room with a light-coloured floor and light-coloured furniture. Also the effect of the size of the interference, such as heat sources or short-term changes in brightness, such as passing clouds, can be taken into consideration.

For an optimum function of the constant light control a calibration of the sensor for the brightness detection is required. The following needs to be observed:

- The detection range of the sensor for brightness detection (see the following graphics; does not apply to the **Busch-Watchdog Sky KNX**).

- Reflection characteristics of the ground material within the detection range.
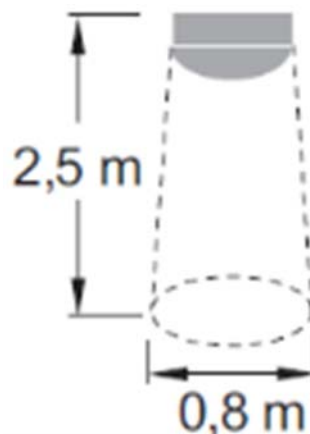

*Fig. 15: Detection range of the sensor for brightness detection (does not apply to the **Busch-Watchdog Sky KNX**).*

The sensor is calibrated via the respective software application. Observe the following applicable explanations.

There are two options for adjusting the brightness via the brightness detection application (see parameter "Correcting process fo internal brightness"):

» **Use objects for brightness adjustment**

There is the option of carrying out a brightness adjustment for daylight and artificial light via the brightness detection application with the aid of the following three objects:

(a) Brightness adjustment (daylight)

(b) Brightness adjustment (output 1)

(c) Brightness adjustment (output 2)

In the event that artificial light and daylight are perceived similarly by the sensor, or the movement detector application is used exclusively, only the absolute brightness value need be corrected. For this the brightness value can be sent via the *brightness adjustment* object *(daylight),* which is to be displayed by the actual brightness measured by the device. This is then used to internally calculate a correcting factor, which will then be used for scaling / adjusting the internally measured brightness. This adjustment is sufficient for the movement detector application. For constant light controller and switch further step may be necessary, which are described in the following.

For the event that daylight and artificial light must be corrected separately, the following procedure is recommended:

(a) Daylight adjustment
- Carry out the measurement during sufficient daylight (> 1/2 * Setpoint)
- Switch of the artificial light
- Carry out the measurement of brightness at a defined location with a luxmeter - for example, lying down at the workplace with a view toward the ceiling - and wait until the light is close to being constant.
 Send the value to the device via the *brightness adjustment (daylight)* object. As little time as possible should pass between measuring and sending, to keep the probability of a change in light conditions at a minimum.

(b) Adjustment for channel 1

-- Darken the room
- Switch on channel 1 (max. brightness) and wait until the brightness is virtually constant.

-- Measure the brightness with the luxmeter as previously. Send the value to the device via the "Brightness adjustment" object (output 1).

(c) Adjustment for channel 2

Repeat measurement (b) for channel 2. Switch off channel 1.

To complete the adjustment for the constant light controller, a further step is required during which the characteristic of the connected lamp is automatically measured in

dependence of the output value of the controller.

To be able to carry out the brightness calibration, the device must have been already programmed in such a way that aside from the "Start brightness calibration" object, also the output object(s) is/are connected with the corresponding actuators. Also the actuators should be programmed in such a way that the values received are set immediately, to ensure that the calibration process runs properly.

Here too, as in item (b), the room is to be darkened, to minimize the effect of changing daylight conditions during the measurement. If this is not possible, the adjustment should be carried out in the dark or at night. To obtain excellent results, the lamps should be turned on prior to the calibration. The calibration can start when the measured brightness is constant, i.e. the heat-up of the lamps has been completed.

The process of calibration now proceeds as follows:

1. Brightness calibration is started by sending a "1" to the *Brightness calibration* object *(in the constant light application under extended parameters)*.

2. The lamps are switched on at 100%. Then comes a waiting period of 60 seconds for the lamps to warm up and reach their full brightness. Then the brightness is checked to see how much it has changed since the last measurement. If the change drops below a certain percentage in comparison to the measured value, it is assumed that the brightness is stable and the actual calibration can begin. Otherwise a new measurement is carried out after a certain time to again determine the percentage of change. This process is repeated until a stable brightness value has been reached. However, only up to a maximum of ten times.

3. Then the output values are reduced separately into steps of 10% and the corresponding brightness is determined for each value; and here, too, a waiting period is necessary until the brightness values have become stable:

   - A1: 100%   A2: 100%
   - A1: 100%   A2: 90%
   - A1: 90%   A2: 90%
   - …   …
   - A1: 0%   A2: 0%

4. After completion of the measurement the output characteristics are calculated and stored in the device. Then a successful measurement is confirmed in form of a "1" on the *Start brightness calibration* object.

5. If the calibration cannot be completed within a period of 6 minutes due to unfavourable light conditions (extremely fluctuating brightness values), the measurement is interrupted and a "0" is sent via the *Start brightness calibration* object.

Note ...
The calibration can be terminated by sending a "0" via the "Start brightness calibration" object. The calibration is similar if only one output is used, but only with the A1 output values.

7.2.7 Additional comments

Setpoint

Note ...
The following information is relevant only if no adjustment of brightness has been carried out.

Please note that the lux value to be set in the parameters does not correspond to the value required at the height of the desk. The light sensor is installed on the ceiling and can only measure the luminosity that is reflected from the opposite surfaces. The setpoint to be entered is therefore lower than the light value at the height of the work station. Dim the lights to the desired intensity. Then save the measured light value via the memory object of the presence detector. The stored value can also be read via the object for the setpoint.

Outputs

The presence detector can also regulate two independent light circuits per channel via the two outputs. The value of output 2 results from the value of output 1 and the respective proportionality factor. If the required setpoint is not reached, control continues beyond the factor.

For example:

An office is fitted with two light rows. Output 1 controls the light row in the darker part of the room. Light row 2 in the front window area is connected to output 2. For the maximum brightness during the day a proportional factor of 70% is sufficient for output 2. During the night the full brightness in the room is not sufficient for output 1 and output 2. Output 2 would now control beyond the proportional factor until the setpoint or the full brightness of the lamp has been reached.

Switch-off delay

The presence detector will switch off or dim the lamps in the room if no movement is detected. A switch-off delay can be set to prevent the lamp from being switched off immediately. This time starts as soon as movement is no longer detected. If movement is detected again within this period, the switch-off delay is reset.

Hysteresis

The hysteresis is a percentage value (+/-) that is related to the setpoint in lux. The hysteresis is a tolerance for maintaining the setpoint. The preset value is sufficient for most applications.

8   Updating options

Always use the latest firmware. The latest download files for the firmware update are contained in the electronic catalogue (www. Busch-jaeger-catalogue.com). They are also available via the KNX online shop. A firmware update is carried by means of an ETS application via the bus.

Note ...
Please adhere to the current information about the download files. These also contain instructions for the installation of the firmware update.

9   Operation

9.1   Operation via IR remote control

The premium version and the Busch-Watchdog Sky KNX have a sensor for receiving infrared signals. This allows the IR remote control 6010-25-500 to be used, for example.

Two channels that can be selected on the transmitter are available for operation: the blue and the white channel.

The following example is to serve as an aid for commissioning. The infrared functions can be programmed in the device. For button M1 (blue and / or white) the function "Switching, rocker switch left / right" is selected. The parameter "Reaction to rising edge" is shown within this function. This parameter is to be set on "ON". The function has the communication object "Switching". This object must now be connected with the object "Save setpoint" of the constant light application. This stores the current light value as setpoint as soon as button M1 is pressed. The light can, for example, be set with the remote control. For this, one or several button pairs are occupied with the function "Dimming rocker switch total" and connected directly with the dimming actuator. Now use the button pair selected to set the desired brightness and save the value with button M1.

RC-5 Code

Channel 29 (white)	Designation	Command no. (decimal)
1	ON / BRIGHT	57
1	OFF / DARK	58
2	ON / BRIGHT	61
2	OFF / DARK	62
3	ON / BRIGHT	59
3	OFF / DARK	60
4	ON / BRIGHT	49
4	OFF / DARK	50
5	ON / BRIGHT	53
5	OFF / DARK	54
M1		51
M2		52
M3		48
M4		55
(Red)		63
MEMO		56

Channel 30 (blue)	Designation	Command no. (decimal)
1	ON / BRIGHT	57
1	OFF / DARK	58
2	ON / BRIGHT	61
2	OFF / DARK	62
3	ON / BRIGHT	59
3	OFF / DARK	60
4	ON / BRIGHT	49
4	OFF / DARK	50
5	ON / BRIGHT	53
5	OFF / DARK	54
M1		51
M2		52
M3		48
M4		55
(Red)		63
MEMO		56

Note ...

Please observe also the supplement and the technical reference manual of the IR remote control. These can be downloaded via the electronic catalogue at (www.busch-jaeger-catalogue.com)

10 Maintenance

The device is maintenance-free. In case of damage (e.g., during transport or storage), do not perform repairs. Once the device is opened, the warranty is void!

Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs (according to DIN VDE 0100-520).

10.1 Cleaning

Dirty devices can be cleaned with a dry cloth. If this is not sufficient, a cloth slightly moistened with a soap solution can be used. Caustic / aggressive or scouring cleaning agents or solvents must not be used.

11 Description of application and parameters

11.1 Applications program

The following applications program is available:

- Presence detector xxx KNX TP/1

11.2 Overview of applications

The application program for the devices contains the KNX applications listed in the following:

- Detector
- Constant light switch
- Constant light controller
- Heating, air conditioning, ventilation
- Brightness detection
- Objekt RTC

11.3 "Detector" application

11.3.1 General parameters - Type of output

Options:	Master
	Slave

Master: In master mode On and Off telegrams are sent (to an actuator) dependent on movement.

Slave: In slave mode On telegrams are sent cyclically (to the extension unit input of a master detector) when movement is detected.

11.3.2 General parameters - Slave input

Options:	No
	Yes

– *No*: The option of receiving telegrams from a slave is not available.

– *Yes*: A 1-bit slave communication object (input) is being enabled. Via this input the master detector receives the (On) telegrams of the connected slaves or of a push-button. An On telegram from a slave is comparable with a detected movement.

11.3.3 General parameters - Output is of type

Options:	1 Bit
	1 Byte 0 - 100%
	1 Byte (0 - 255)
	Light scene number 1 - 64
	RTC operating mode switchover (1 byte)

– *1 Bit*: Intended for switch actuators.

– *1 Byte 0 - 100%*: For activating dimmers.

– *1 Byte 0 - 255*: For actuators, which are activated with a value of between 0 and 255.

– *Light scene number 1 - 64*: For activating light scenes.

– *RTC operating mode switchover (1 Byte)*: To directly switch room temperature controllers into a specific operating mode.

- Auto
- Comfort
- Standby
- ECO
- Frost/heat protection

Note

If the type of output is changed, also the options for setting the parameters change.
- Value for switching on
- Value for switching off

In this manual only values for the 1-bit setting are described.

11.3.4 General parameters - Output object sends at

Options:	Switching on/off
	Switching on
	Switching off

– *Switch-on/switch-off*: Sends a telegram at the start of movement and at the end of switch-off delay.
– *Switch-on*: Only sends a telegram at the start of movement.
– *Switch-off*: Only sends a telegram at the end of switch-off delay.

Note

If switch-on or switch-off has been selected, the following parameters are not displayed:
▪ Value for switching on
▪ Cyclic sending of value for switch-on
▪ Value for switching off
▪ Cyclic sending of value for switch-off

11.3.5 General parameters - Value for switch-on

Options:	On
	Off

– *On*: When the detector detects movement, value 1 is sent via the bus.
– *Off*: When the detector detects movement, value 0 is sent via the bus.

11.3.6 General parameters - Cyclic sending of value for switch-on

Options:	No
	Yes

– *No*: The set value is sent only once via the bus.
– *Yes*: The set value is sent cyclic via the bus.
  – Parameter "cyclic repeat time" is also displayed.

Cyclic repeat time (hh:mm:ss)

Options:	00:00:10 ... 00:00:30 ... 18:12:15

– Here the time which lies between the sending of two telegrams (no change in value) is set.

11.3.7 General parameters - Value for switch-off

Options:	Off
	On

– *Off*: If movement is no longer detected and the switch-off delay has expired, value 0 is sent via the bus.
– *On*: If movement is no longer detected and the switch-off delay has expired, value 1 is sent via the bus.

11.3.8 General parameters - Cyclic sending of value for switch-off

Options:	No
	Yes

– *No*: The set value is sent only once via the bus.
– *Yes*: The set value is sent cyclic via the bus.
  – Parameter "cyclic repeat time" is also displayed.

Cyclic repeat time (hh:mm:ss)

Options:	00:00:10 ... 00:00:30 ... 18:12:15

- Here the time which lies between the sending of two telegrams is set.

11.3.9 General parameters - Switch-off delay (hh:mm:ss)

Options:	00:00:10 .. 00:05:00 .. 18:12:15

– The switch-off delay is the time period between the last movement detected and the sending of the telegram "Value for switch-off". If movement is detected again within this period, the switch-off delay timer is started again.

11.3.10 General parameters - Brightness-value threshold internal (lux)

Options:	1 .. 400 .. 1000

– The brightness-value threshold is used to specify the lux value at which the detector is to start to respond. If the detector does not switch on and the measured brightness lies above the set threshold, no telegram is sent during movement.

11.3.11 General parameters - Sensitivity of the watchdog

Options:	High
	Medium
	Low

– *High*: Standard - intended for indoor use.
– *Medium*: To be used when there are small interfering heat sources within the detection area.
– *Low*: To be used when there are large interfering heat sources within the detection area.

Note
The transmission range can NOT be changed via the sensitivity.

11.3.12 General parameters - Fade in extended parameters

Options:	No
	Yes

– *No*: Only the most important parameters for setting the detector are displayed
– *Yes:* All parameters are displayed, also those that are not required in most cases. Examples:
  - Extended parameter settings
  - Status display parameter
  - Brightness parameter
  - External button parameter

11.3.13 Extended parameter settings - Operating mode

Options:	Automatic mode
	Automatic switch-off
	Automatic switch-on
	Monitoring

– *Automatic* = automatic switch-on and switch-off
– *Automatic switch-off* = manual switch-on and automatic switch-off
– *Automatic switch-on* = automatic switch-on and manual switch-off
– *Monitoring* = automatic switch-on when there is sufficient movement within a specific time period and automatic switch-off after a fixed switch-off delay of 2 seconds
  - *Automatic*: In "Automatic" mode the detector switches on automatically when detecting a movement. The switch-off is effected after the set switch-off delay beginning from the most recent detection.

- *Automatic switch-off*: In "Automatic switch-off" mode the detector must be switched on manually via object "External push-button (input)". The switch-off is effected automatically under consideration of the switch-off delay.

- *Automatic switch-on*: In "Automatic switch-on" mode the detector switches on automatically when detecting a movement. The switch-off is effected by the receipt of an Off telegram on object "External push-button (input)". Note: The detector switches off automatically after 6 hours.

- *Monitoring*: In "Monitoring" mode the detector switches on brightness-dependent if an adjustable component of movement has been recorded within the time period set. The switch-off occurs 2 seconds after switch-on and the last detection of movement.

Note

Manual switch-on and switch-off is possible in operating modes automatic, automatic switch-on and automatic switch-off via the external push-button (input). This external push-button is activated under the "External push-button" parameter. During manual switch-off the detection of movement is suppressed for the pause time. The purpose of pause time is to prevent an immediate re-activation.

Example:

The person switches the light off manually when leaving the room. Without the pause time the detected movement would cause a renewed switch-on during exiting.

11.3.14 Extended parameter settings - Use of a two-stage switch-off

Note

This parameter is only displayed when "Output is of type" is set on 1 byte 0 - 100% or 1 byte 0 - 255.

Options:	No
	Yes

- *No*: The detector has a switch-off delay and, following the switch-off delay, transmits what has been set under the "Value for switch-off" parameter.

- *Yes*: After the switch-off delay the detector first switches to the set reduced brightness and only then sends the value set under the "Value for switch-off" parameter after brightness reduced according to switch-off delay.

Example: Switch-off delay = 5 minutes

- Value for switching off = 0%

- Value for reduced brightness = 20%

- Brightness reduced according to switch-off delay = 3 minutes

If movement is now no longer detected, the light is dimmed to 20% after 5 minutes and then to 0% after a further 3 minutes (switch-off).

11.3.15 Extended parameter settings - Value for reduced brightness (%)

Options:	0 .. 20 .. 100

– Here the value for the reduced brightness is set. After the switch-off delay has expired the detector is to dimm the light to this value.

11.3.16 Extended parameter settings - Brightness reduced according to switch-off delay (hh:mm:ss)

Options:	00:00:10 .. 00:05:00 .. 18:12:15

– Here the value for the switch-off delay of the reduced brightness is set. The total switch-off delay then consists of the switch-off delay + brightness reduced according to switch-off delay

11.3.17 Extended parameter settings - Use of forced switch-off

Options:	No
	Yes

– *No*: The detector does not switch off after a specific time to carry out a new brightness measurement

– *Yes*: The detector switches off once after 3x switch-off delay or at a minimum of 90 minutes or a maximum of 24 hours to carry out a new brightness measurement

If the presence detector is switched on, it operates independent of brightness. Problem: When movement is detected the light remains on even though the brightness may be sufficient. This effect can be prevented by activating this parameter.

11.3.18 Extended parameter settings - Use of object for switch-off delay

Options:	No
	Yes

– *No*: The only option available is to change the switch-off delay via the switch-off delay parameter setting

– *Yes*: There is a separate 2-byte switch-off delay object (input) for changing the switch-off delay of the detector. The time entered is in seconds. A switch-off delay of 4 minutes, for example, has a value of 240 seconds.

Note

The values which can be sent are between 10 and 65535 seconds. If a value that is too small or too large is sent, the value is automatically adjusted to the limit value:

▪ Value < 10 -> Value = 10
▪ Value > 65535-> Value = 65535

11.3.19 Extended parameter settings - Use of object for brightness reduced according to switch-off delay

Options:	No
	Yes

- *No*: The only option available is to change the switch-off delay via the "Brightness reduced according to switch-off delay" parameter setting.

- *Yes*: There is a separate 2-byte brightness reduced according to switch-off delay object (input) for changing the switch-off delay for the reduced brightness of the detector. The time entered is in seconds. A switch-off delay of 4 minutes, for example, has a value of 240 seconds.

Note

The values which can be sent are between 10 and 65535 seconds. If a value that is too small or too large is sent, the value is automatically adjusted to the limit value:

- Value < 10 -> Value = 10
- Value > 65535-> Value = 65535

11.3.20 Extended parameter settings - Use of object for test mode

Options:	No
	Yes

- *No*: There is no possibility to set the detector to test mode to test the detection range.

- *Yes*: There is a separate 1-bit test mode activation object (input) for activating the test mode with a 1. The function is reset again with the receipt of a 0 on this object or automatically after 10 minutes. During the test mode the LED functions as movement detection indicator.

11.3.21 Extended parameter settings - Use of the actuator status object

Options:	No
	Yes

- *No*: There is no separate actuator status object for connecting with the status of an actuator.

- *Yes*: A 1-bit actuator status communication object (input) is being enabled. This connected with the status of a switch actuator, for example. When this actuator is switched off via a central command, the detector is informed and is ready again for switch-on after the pause time.

11.3.22 Extended parameter settings - Use of the status manually on/off object

Note

This parameter is displayed only when automatic switch-on/switch-off has been activated and/or when the external push-button has been activated.

Options:	No
	Yes

– *No*: The is no separate status manual on/off object for monitoring the status of the control.

– *Yes*: A 1-bit status manual on/off communication object (output) is being enabled. This object sends an On telegram when the movement detector is deactivated and only one manual operation is possible via the external push-button input. If this object sends an Off telegram, the movement detector switches back to automatic mode.

11.3.23 Extended parameter settings - Pause time (ss.fff)

Options:	00.100 .. 01,250 .. 59,999

– The set pause time is started after the detector has been switched off due to expiry of the switch-off delay or when a switch-off telegram is received on objects external push-button or actuator status.

If movement is detected during this time, the detector is not switched on immediately. The pause time is first extended by 7 seconds. If there is still movement after these 7 seconds, the detector switches back on.

If no movement is detected during the pause time, the detector is ready for activation again after the pause time.

This behaviour can, for example, be important when the lamp cools down drastically and is located within the detection range of the detector. Without a blockage there would be an unintentional switch-on. The purpose of pause time is to prevent an immediate re-activation.

Example:

The person switches the light off manually when leaving the room. Without the pause time the detected movement would cause a renewed switch-on during exiting.

Note
- The external push-button object is activated under the "External push-button" parameter.
- The actuator status object is activated under the status display parameter.

11.3.24 Extended parameter settings — Overwriting settings during a download

Options:	Yes
	No

– *Yes*: When the application is reloaded into the detector, the values changed via the bus are overwritten with the parameterized values of the ETS application.

– *No*: When the application is reloaded into the detector, the values changed via the bus are not overwritten with the parameterized values of the ETS application.

Values:

• Switch-off delays

• External/internal brightness threshold

• Brightness correction (daylight), see "Brightness detection" application

11.3.25 Brightness parameter - Use of object for detection independent of brightness

Options:	No
	Yes

– *No*: There is no separate object for detection independent of brightness.

– *Yes*: A 1-bit communication object for brightness-independent detection (input) is being enabled. This object allows the detector to be switched independent of brightness.

11.3.26 Brightness parameter - Activating detection independent of brightness with

Options:	On telegram
	Off telegram

– *On telegram*: Detection independent of brightness is activated with a 1 telegram and deactivated with a 0 telegram.

– *Off telegram*: Detection independent of brightness is activated with a 0 telegram and deactivated with a 1 telegram.

11.3.27 Brightness parameter - Detection independent of brightness after bus voltage recovery

Options:	No
	Yes

▪ *No*: Detection independent of brightness is deactivated after a bus voltage recovery, reprogramming or a reset.

▪ *Yes*: Detection independent of brightness is activated after a bus voltage recovery, reprogramming or a reset.

11.3.28 Brightness parameter - Input Slave takes the brightness into consideration

Options:	No
	Yes

– *No*: Every ON telegram to the input slave object ensures that the detector is switched on or the switch-off delay is reset. This is independent of whether the actual brightness is below or above the brightness-value threshold.

– *Yes*: The detector is switched on or the switch-off delay is reset only when the actual brightness is below the brightness-value threshold.

11.3.29 Brightness parameter - Used brightness

Options:	Brightness-independent
	Only internal
	Only external
	Internal or external

– *Brightness-independent*: The detector functions independent of brightness and will switch during each movement.

– *Only internal*: The detector uses its own measured brightness and brightness-value threshold internally to decide whether to switch on during movement.

– *Only external*: A 2-byte external brightness (input) communication object is enabled. The detector uses this externally measured brightness and the external brightness-value threshold parameter (lux) to decide whether to switch on during movement.

– *Internal or external*: The detector is activated only when the internally measured brightness drops below the internal brightness-value threshold or the externally measured brightness drops below the external brightness-value threshold.

11.3.30 Brightness parameter - Use object for internal brightness-value threshold

Options:	No
	Yes

– *No*: There is no separate internal brightness-value threshold object.

– *Yes*: A 2-byte internal brightness-value threshold communication object (input) is being enabled. This can be used to change the switching threshold at which the detector is activated. The value is sent to this object in lux.

Note

The range of values lies between 0.5 – 1100 lux.

11.3.31 Brightness parameter - Use object for external brightness-value threshold

Options:	No
	Yes

– *No*: There is no separate external brightness-value threshold object.

– *Yes*: A 2-byte external brightness-value threshold communication object (input) is being enabled. This can be used to change the switching threshold at which the detector is activated. The value is sent to this object in lux.

Note
The range of values lies between 0.5 – 1100 lux.

11.3.32 Brightness parameters - Brightness-value threshold external (lux)

Options:	1 .. 500 .. 1000

– The brightness-value threshold is used to specify the lux value at which the detector is to start to respond. If the detector does not switch on and the measured brightness lies above the set threshold, no telegram is sent during movement. The threshold applies only to the external brightness.

11.3.33 External push-button parameter - Use of external push-button object

Options:	No
	Yes

– *No*: There is no separate external push-button object.

– *Yes*: A 1-bit external push-button communication object (input) is being enabled. Via this object it is possible to manually change the (output) status of the detector with the aid of a 1-bit telegram. It is used especially in the "Automatic switch-on" mode for switching off and in "Automatic switch-off" mode for switching on.

11.3.34 External push-button parameter - Use of external push-button switches on with

Options:	On telegram
	Off telegram

– *On telegram*: The detector is activated with a 1 telegram and deactivated with a 0 telegram.

– *Off telegram*: The detector is activated with a 0 telegram and deactivated with a 1 telegram.

11.3.35 External push-button parameter — Use of switchover to manual mode object

Options:	No
	Yes

– *No*: There is no separate switchover to manual mode object.

– *Yes*: A 1-bit switchover to manual mode communication object (input) is being enabled. If an ON telegram is received on this input, the detector is deactivated. In this case only manual operation is possible via the "External push-button input". The receipt of an OFF telegram resets the detector to detector mode.

11.3.36 External push-button parameter - Manual mode is activated with

Options:	On telegram
	Off telegram

– *On telegram*: The detector is deactivated with a 1 telegram and activated with a 0 telegram.

– *Off telegram*: The detector is deactivated with a 0 telegram and activated with a 1 telegram.

11.3.37 Sensor selection - Use of sensors 1 - 4

Options:	Yes
	No

– *Yes*: This sensor is active and detects movement.

– *No*: This sensor is switched off and movement is no longer detected in this area.

11.3.38 Enable - Use of enable detector object

Options:	No
	Yes

– *No*: There is no object with which the detector can be blocked or enabled.

– *Yes*: A 1-bit enable movement communication object (input) is being enabled. This object allows the detector to be enabled or blocked. No telegrams are sent by the detector during blockage.

11.3.39 Enable - Enable with

Options:	ON telegram
	OFF telegram

–   O*N telegram*: With the receipt of value 1 on the enable movement (input) object the detector is enabled and blocked with value 0.

–   OFF *telegram*: With the receipt of value 0 on the enable movement (input) object the detector is enabled and blocked with value 1.

11.3.40 nable - After bus voltage recovery detector is

Options:	Enabled
	Blocked

▪   *Enabled*: The device is enabled and functions normally when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.

▪   *Blocked*: The device is blocked and must be enabled for normal function when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.

11.3.41 Enable - Output sends at enable

Options:	No telegram
	Current status
	Single value for switching on
	Single value for switching off

–   *No telegram*: no telegram is sent during enable.

–   *Current status*: During enable the detector checks whether a movement has occurred and the brightness is below the brightness-value threshold. If yes, the single value for switch-on is sent. Otherwise the single value for switch-off is sent.

–   *Single value for switch-on*: During enable the single value which has been parameterized under the value for switch-on parameter is sent.

–   *Single value for switch-off*: During enable the single value which has been parameterized under the value for switch-off parameter is sent.

11.3.42 Enable - Output sends at blockage

Options:	No telegram
	Off after expiry of switch-off delay
	Single value for switching off
	Single value for switching on

– *No telegram*: no telegram is sent during blockage.

– *Off after expiry of switch-off delay*: During blockage the switch-off delay is started anew and the detector sends the value that has been parameterized under the value for switch-off parameter only after this time has expired.

– *Single value for switch-off*: During blockage the single value which has been parameterized under the value for switch-off parameter is sent.

– *Single value for switch-on*: During blockage the single value which has been parameterized under the value for switch-on parameter is sent.

11.3.43 Extended parameter settings (monitoring) - Monitoring time window

Options:	00:00:01 .. 00:00:30 .. 00:10:00 hh:mm:ss

– The monitoring time window correlates with minimum activity in the monitoring time window. The telegram is only sent when a movement is detected within the monitoring time window, e.g. 50% minimum activity.

Example:

▪ Monitoring time window = 30 seconds

▪ Minimum activity in the monitoring time window = 50%

If someone now moves for 15 seconds within the 30 seconds, the value for switch-on is sent to the bus. Warning!: Depending on the strength of the signal, the sensor will post-oscillate more or less.

11.3.44 Extended parameter settings (monitoring) - Minimum activity in the monitoring time window

Options:	10% .. 50% .. 100%

– See parameter "Monitoring time window".

11.3.45 Extended parameter settings (monitoring) - Pause time (ss.fff)

Options:	00.100 .. 01,250 .. 59,999

– The set pause time is started after the detector has been switched off due to expiry of the switch-off delay or when a switch-off telegram is received on objects external push-button or actuator status.

If movement is detected during this time, the detector is not switched on immediately. The pause time is first extended by 7 seconds. If there is still movement after these 7 seconds, the detector switches back on.

If no movement is detected during the pause time, the detector is ready for activation again after the pause time.

This behaviour can, for example, be important when the lamp cools down drastically and is located within the detection range of the detector. Without a blockage there would be an unintentional switch-on. The purpose of pause time is to prevent an immediate re-activation.

Example:

The person switches the light off manually when leaving the room. Without the pause time the detected movement would cause a renewed switch-on during exiting.

Note
- The external push-button object is activated under the "External push-button" parameter.
- The actuator status object is activated under the status display parameter.

11.3.46 Extended parameter settings (monitoring) — Overwriting settings during a download

Options:	Yes
	No

– *Yes*: When the application is reloaded into the detector, the values changed via the bus are overwritten with the parameterized values of the ETS application.

– *No*: When the application is reloaded into the detector, the values changed via the bus are not overwritten with the parameterized values of the ETS application.

Values:

• Switch-off delays

• External/internal brightness-value threshold

• Brightness correction (daylight), see "Brightness detection" application

11.4 Constant light switch application

11.4.1 General parameters - Output is of type

Options:	1 bit
	1 byte 0 - 100%
	1 Byte (0 - 255)
	Light scene number (1-64)
	RTC operating mode switchover (1 byte)
	2-byte float

– *1 Bit*: Intended for switch actuators.
– *1 Byte 0 - 100%*: For activating dimmers.
– *1 Byte 0 - 255*: For actuators, which are activated with a value of between 0 and 255.
– *Light scene number 1 - 64*: For activating light scenes.
– *RTC operating mode switchover (1 Byte)*: To directly switch room temperature controllers into a specific operating mode.
  ▪ Auto
  ▪ Comfort
  ▪ Standby
  ▪ ECO
  ▪ Frost/heat protection
– 2-byte float: To send a specific temperature for example.

Note

If the type of output is changed, also the options for setting the parameters change.
  ▪ Value for switching on output 1
  ▪ Value for switching off output 1
and when they are activated also for:
  ▪ Value for switching on output 2
  ▪ Value for switching off output 2
In this manual only values for the 1-bit setting are described.

11.4.2 General parameters - Cyclic sending of value for switch-on

Options:	No
	Yes

– *No*: The set value is sent only once via the bus.
– *Yes*: The set value is sent cyclic via the bus.
  – Parameter "cyclic repeat time" is also displayed.

11.4.3   General parameters - Cyclic repeat time (hh:mm:ss)

Options:	00:00:10 .. 00:00:30 .. 18:12:15

-    Here the time which lies between the sending of two telegrams is set.

11.4.4   General parameters - Value for switching on output 1

Options:	<u>On</u>
	Off

–   *On*: When the presence detector detects movement, value 1 is sent via the bus.

–   *Off*: When the presence detector detects movement, value 0 is sent via the bus.

11.4.5   General parameters - Value for switching off output 1

Options:	<u>Off</u>
	On

–   *Off*: If movement is no longer detected and the switch-off delay has expired, value 0 is sent via the bus.

–   *On*: If movement is no longer detected and the switch-off delay has expired, value 1 is sent via the bus.

11.4.6   General parameters - Brightness-value threshold internal (lux)

Options:	1 .. 20 .. 1000

This is used to set the desired brightness of the room. Below this threshold - hysteresis the presence detector switched at movement. The presence detector switches off again when the measured brightness - artificial light component = brightness-value threshold + hysteresis.

Note

The value entered here is smaller than the control value set in the room via the luxmeter. This depends on the calibration of the brightness sensor for brightness detection settings. When the brightness adjustment is used there, the desired brightness must be set here for the working area.

Example:

The brightness at the top of the desk is to be 500 lux. The presence detector, however, measures the required brightness at the position it is mounted(e.g. on the ceiling it only measures 20 lux). This means that there is a difference between the brightness of light at the desk and the ceiling.

If the object is now used for brightness adjustment (daylight) or the objects brightness adjustment (output 1 / 2), one can enter 500 lux here (after calibration of the brightness sensor).

11.4.7 General parameters - Hysteresis (%)

Options:	10 .. 12 .. 100

– Switching threshold = brightness threshold ± hysteresis

The hysteresis prevents excessive switching when the current ambient brightness is close to the brightness threshold.

11.4.8 General parameters - Switch-off delay (hh:mm:ss)

Options:	00:00:10 .. 00:03:00 .. 18:12:15

– The switch-off delay is slightly different here than for the movement detector. Here the switch-off delay is started when the sensors no longer detect movement. When the presence detector detects movement after the switch-off delay, the switch-off delay timer is re-triggered.

11.4.9 General parameters - Fade in extended parameters

Options:	<u>No</u>
	Yes

– *No*: One only sees the most important parameters for setting the presence detector.
– *Yes:* One sees all parameters, also those one may not need in most cases, e.g.:
  ▪ Extended parameters
  ▪ Sensor selection
  ▪ Enable
– No: Only the most important parameters for setting the presence detector are displayed.
– Yes: All parameters are displayed, also those that are not required in most cases.
  Examples:
  ▪ Extended parameters
  ▪ Sensor selection
  ▪ Enable

11.4.10 Extended parameters - Operating mode

Options:	Automatic mode
	Automatic switch-off
	Movement-dependent operation

– Automatic = automatic switch-on and switch-off

– Automatic switch-off = manual switch-on and automatic switch-off

– Operation independent of movement = switch-on and switch-off independent of brightness

    – Automatic: In "Automatic" mode, in case it is too dark, the presence detector switches on automatically when detecting a movement. The switch-off is effected after the set switch-off delay beginning from the most recent detection.

    ■ Automatic switch-off: In "Automatic switch-off" mode the presence detector must be switched on manually via the automatic/manual object. The switch-off is effected automatically under consideration of the switch-off delay.

    – Operation independent of movement: In operating mode "Operation independent of movement" the presence detector switches On and Off only on the basis of brightness ± hysteresis. Activation / deactivation via object automatic/manual off.

Used movement detection

Options:	Only internal
	Only external
	Internal and external

– *Only internal*: The presence detector responds only to movement measured internally.

– *Only external*: The presence detector responds only to telegrams that are received via the slave object (input).

– *Internal and external*: The presence detector responds to movements measured internally and to external telegrams that are received via the slave object (input).

Slave sends

Options:	Cyclic On telegram
	On/off telegram

– *Cyclic On telegram*: The presence detector, which is connected to the master as slave, sends only On telegrams cyclically.

– *On/Off telegram*: The presence detector, which is connected to the master as slave, sends only On/Off telegrams.

Use output 2

Options:	No
	Yes

– *No*: There is only output 1, which sends its telegrams to an actuator.

– *Yes*: An output 2 communication object (output) is being enabled. The lighting can be now switched on and off in two stages. First, output 1 is switched on, and when the artificial light is then not sufficient, also output 2 is switched on. When the outside brightness increases, output 2 is switched off, and when the outside light is sufficient, also output 1 is switched off.
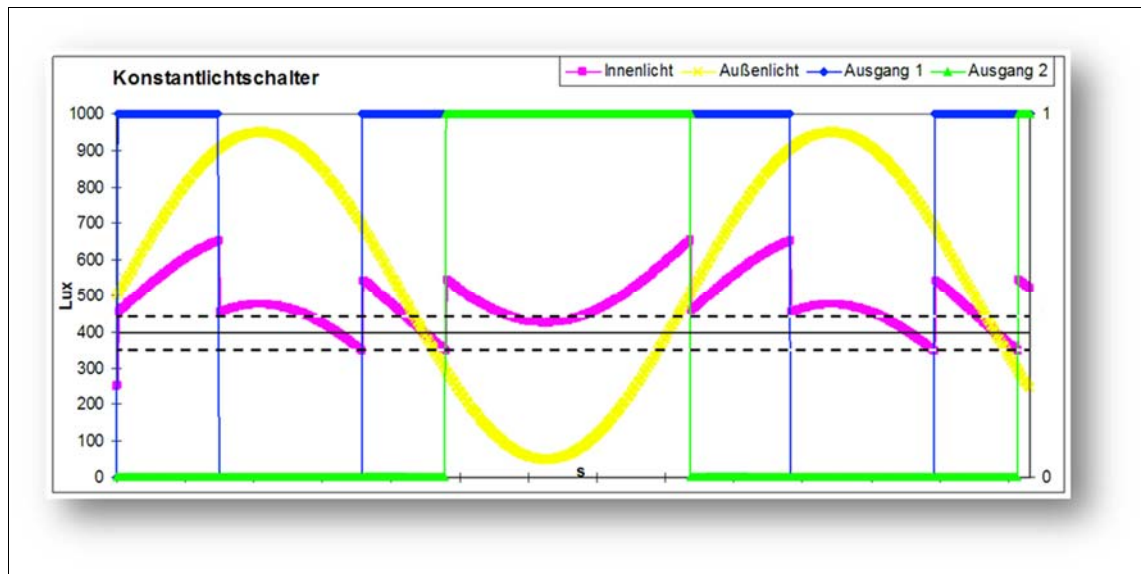
Fig. 16: Time sequence of the constant light switch.

[Outside light (here yellow)]

The outside light (here yellow) in this situation has a sinusoidal path with an amplitude of 1000 lux. The magenta-coloured curve is the resulting inside light in lux. The brightness-value threshold is 400 lux with a hysteresis of 10%.

Value for switching on output 2

Options:	On
	Off

– *On*: When the presence detector detects movement, value 1 is sent via the bus.
– *Off*: When the presence detector detects movement, value 0 is sent via the bus.

Value for switching off output 2

Options:	Off
	On

– *Off*: If movement is no longer detected and the switch-off delay has expired, value 0 is sent via the bus.
– *On*: If movement is no longer detected and the switch-off delay has expired, value 1 is sent via the bus.

Used brightness

Options:	Internal
	External

– *Internal*: The presence detector uses its own measured brightness and brightness-value threshold to decide whether the presence detector is to be activated or deactivated.
– *External*: A 2-byte external brightness (input) communication object is enabled. The presence detector uses this external measured brightness and the brightness-value threshold (lux) parameter to decide whether the presence detector is to be activated or deactivated.

11.4.11 Extended parameters - Use of object for switch-off delay

Options:	No
	Yes

– *No*: The only option available is to change the switch-off delay via the switch-off delay parameter setting.

– *Yes*: There is a separate 2-byte switch-off delay object (input) for changing the switch-off delay of the presence detector. The time entered is in seconds. A switch-off delay of 4 minutes, for example, has a value of 240 seconds.

Note

The values which can be sent are between 10 and 65535 seconds. If a value that is too small or too large is sent, the value is automatically adjusted to the limit value:

- Value < 10 -> Value = 10
- Value > 65535-> Value = 65535

11.4.12 Extended parameters - Use of object for brightness-value threshold

Options:	No
	Yes

– *No*: There is no separate brightness-value threshold object.

– *Yes*: A 2-byte brightness-value threshold communication object (input/output) is being enabled. This can be used to change the switching threshold, while the presence detector is activated or deactivated. The value is sent to this object in lux.

11.4.13 Extended parameters - Use of object for saving brightness-value threshold

Options:	No
	Yes

- *No*: There is no extra saving brightness-value threshold object.

- *Yes*: A 1-bit saving brightness-value threshold communication object (input) is being enabled. This can be used to save the current measured brightness with a 1 telegram as new switching threshold.

11.4.14 Extended parameters - Use of actual brightness object

Options:	No
	Yes

– *No*: There is no extra actual brightness object

– *Yes*: A 2-byte actual brightness (output) communication object is being enabled. This object outputs the corrected measured brightness (corrected daylight + corrected artificial light) which is used by the constant light switch.

11.4.15 Extended parameters - Cyclic sending of actual brightness

Options:	No
	Yes

- – *No*: The actual brightness is only made available for reading. The value is not sent automatically.
- – *Yes*: The actual brightness is sent each time to the "Actual brightness is sent every (hh:mm:ss)" parameter. The value can also be read.

11.4.16 Extended parameters - Actual brightness is sent every (hh:mm:ss)

Options:	00:00:10 .. 00:05:00 .. 00:30:00

- - Here the time which lies between the sending of two telegrams is set.

11.4.17 Extended parameters - Start measurement of artificial light component after (hh:mm:ss)

Options:	00:00:40 .. 00:04:00 .. 00:05:00

- – Here the time is set for when the constant light switch starts to subtract the artificial light component. This time is determined from the lamps used. Some lamps require a lot of time to reach maximum brightness, e.g. fluorescent lamps.

  Measuring….switching..time..measuring; artificial light = Δ brightness

11.4.18 Extended parameters - Minimum time above the switch-off threshold (hh:mm)

Options:	00:01 .. 00:04 .. 01:00

- – To prevent the light from switching off immediately after switching on (when the outside brightness has increased), a minimum switch-on time can be entered here. When the outside brightness drops below the brightness-value threshold within this time period, the time is set back.

11.4.19 Extended parameters - Use of object for automatic / manual off

Options:	No
	Yes

- – *No*: There is no separate automatic/manual off object.
- – *Yes*: A 1-bit automatic/manual off communication object (input) is being enabled. With this object one has the option of manually switching off the constant light switch with a 0 telegram for the time "Exiting manual off mode after (hh:mm)". The constant light switch will function again automatically after this time period. The constant light switch can be set on automatic again with a 1 telegram. This also important for regulating and automatic switch-off independent of movement.

11.4.20 Extended parameters - Exiting manual off mode after (hh:mm)

Options:	00:05 .. 01:00 .. 12:00

– Here the time is set for when the constant light switch switches again to automatic mode after a manual switch-off.

11.4.21 Extended parameters - Pause time (ss.fff)

Options:	00.100 .. 01,250 .. 59,999

– The set pause time is started after the detector has been switched off due to expiry of the switch-off delay or when a switch-off telegram is received on objects external push-button or actuator status.

If movement is detected during this time, the detector is not switched on immediately. The pause time is first extended by 7 seconds. If there is still movement after these 7 seconds, the detector switches back on.

If no movement is detected during the pause time, the detector is ready for activation again after the pause time.

This behaviour can, for example, be important when the lamp cools down drastically and is located within the detection range of the detector. Without a blockage there would be an unintentional switch-on. The purpose of pause time is to prevent an immediate re-activation. Example: The person switches the light off manually when leaving the room. Without the pause time the detected movement would cause a renewed switch-on during exiting.

Note
▪ The external push-button object is activated under the "External push-button" parameter.
▪ The actuator status object is activated under the status display parameter.

11.4.22 Extended parameters - Use of status of control object

Options:	No
	Yes

– No: There is no separate status of control object.
– Yes: A 1-bit status of control communication object (output) is being enabled. This object sends a 1 telegram when the constant light switch functions automatically. The object sends a 0 telegram when manual action takes place, e.g. if a manual switch-off has taken place.

11.4.23 Extended parameters — Overwriting settings during a download

Options:	Yes
	No

– *Yes*: When the application is reloaded into the detector, the values changed via the bus are overwritten with the parameterized values in the ETS application.

– *No*: When the application is reloaded into the detector, the values changed via the bus are not overwritten with the parameterized values in the ETS application.

– *Yes*: When the application is reloaded into the detector, the values changed via the bus are overwritten with the parameterized values of the ETS application.

– *No*: When the application is reloaded into the detector, the values changed via the bus are <u>not</u> overwritten with the parameterized values of the ETS application.

Values:

- Set value
- Switch-off delay
- Determined brightness of the luminous rows/lamps
- Brightness correcting factors

11.4.24 Sensor selection - Use of sensors 1 - 4

Options:	Yes
	No

– *Yes*: This sensor is active and detects movement.

– *No*: This sensor is switched off and movement is no longer detected in this area.

11.4.25 Enable - Use of presence detector enable object

Options:	No
	Yes

– *No*: There is no object with which the constant light switch can be blocked or enabled.

– *Yes*: A 1-bit enable presence communication object (input) is being enabled. This object allows the constant light switch to be enabled or blocked. No telegrams are sent by the detector during blockage.

11.4.26 Enable - Enable with

Options:	ON telegram
	OFF telegram

– *ON telegram*: With the receipt of value 1 on the enable movement (input) object the detector is enabled and blocked with value 0.
– *OFF telegram*: With the receipt of value 0 on the enable movement (input) object the detector is enabled and blocked with value 1.

11.4.27 Enable - After bus voltage recovery the device is

Options:	Enabled
	Blocked

– *Enabled*: The device is enabled and functions normally when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.
– *Blocked*: The device is blocked and must be enabled for normal function when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.

11.4.28 Enable - Behaviour of output during enable

Options:	Control starts with current output value
	Control starts with switch-off value

– *Control starts with the current output value*: during enable it is checked whether a movement has taken place. If yes, the lighting is switched on. If no, the lighting is switched off.
– *Control starts with switch-off value*: during enable the single value which has been parameterized under the value for switch-off parameter is sent.

11.4.29 Enable - Output sends at blockage

Options:	No telegram
	Off after expiry of switch-off delay
	Single value for switching off
	Single value for switching on

– *No telegram*: no telegram is sent during blockage.

– *Off after expiry of switch-off delay*: During blockage the switch-off delay is started anew and the detector sends the value that has been parameterized under the value for switch-off parameter only after this time has expired.

– *Single value for switch-off*: During blockage the single value which has been parameterized under the value for switch-off parameter is sent.

– *Single value for switch-on*: During blockage the single value which has been parameterized under the value for switch-on parameter is sent.

11.5 "Constant light controller" application

11.5.1 General parameters - Output is of type

Options:	1 byte 0 - 100%
	1 Byte (0 - 255)

– *1 Byte 0 - 100%*: For activating dimmers.

– *1 Byte 0 - 255*: For actuators, which are activated with a value of between 0 and 255.

Note

If the type of output is changed, also the options for setting the parameters change:

▪ Bottom limit output 1
▪ Upper limit output 1
▪ Control starts at
▪ Value for switching off

In this manual only values for the 1-byte 0 - 100% setting are described.

11.5.2 General parameters - Bottom limit output 1 (%)

Options:	0 .. 100

– Here the bottom control limit is specified and up to which minimum value a dimmer is controlled.

11.5.3 General parameters - Upper limit output 1 (%)

Options:	0 .. 100

– Here the upper control limit is specified and up to which maximum value a dimmer is controlled.

11.5.4 General parameters - Control starts at (%)

Options:	1 .. 50 .. 100

– Here the value is specified at which the control starts and the lighting is switched on.

11.5.5 General parameters - Control speed (mm:ss)

Options:	02:30 .. 10:00 .. 20:00

– Here the time is specified which the control requires to get from 0 to the upper limit output value. Example: If the control speed is on 10:00 and the lighting is switched on with 50% and the upper limit is 100%, the control requires 5 minutes to get from 50% to 100%. Vice versa, the control requires 10 minutes to regulate from 100% to 0%.

11.5.6 General parameters - Setpoint brightness (lux)

Options:	1 .. 400 .. 1000

– Here the desired brightness of the room is to be set. Below this threshold - hysteresis the presence detector starts the control and starts to adjust the light until the setpoint has been reached again. The presence detector will not switch off but regulate against the bottom control limit. A switch-off takes place only when the limit = 0 or the switch-off delay has expired.

Note

For a well-functioning constant light controller it is absolutely essential to calibrate the brightness sensors. The calibration is carried out via the brightness detection parameter. Here it is to be noted that the presence detector does not measure the brightness of the luxmeter on the working area (table), but the reflected brightness, which can, depending on the reflecting area, can be lower.

Procedure:

- Switch of the artificial light/shield out the daylight
- Send the value measured with the luxmeter via the object

Similar procedure for daylight

Example:

The brightness at the top of the desk is to be 500 lux. The presence detector, however, measures the required brightness at the position it is mounted(e.g. on the ceiling it only measures 20 lux). This means that there is a difference between the brightness of light at the desk and the ceiling. If the object is now used for brightness adjustment, one can (after calibration of the brightness sensor) enter 500 lux here.

11.5.7 General parameters - Hysteresis (%)

Options:	10 .. 12 .. 100

– Switching threshold = setpoint ± hysteresis

The hysteresis prevents excessive switching when the current ambient brightness is close to the brightness threshold.

11.5.8 General parameters - Switch-off delay (hh:mm:ss)

Options:	00:00:10 .. 00:05:00 .. 18:12:15

– The switch-off delay is the time period between the last movement detected and the sending of the telegram "Value for switch-off". If movement is detected again within this period, the switch-off delay is reset to the set value.

11.5.9 General parameters - Value for switch-off (%)

Options:	0 .. 100

– If movement is now no longer detected and the switch-off delay has expired, the value is sent via the bus.

11.5.10 General parameters - Sensitivity of the watchdog

Options:	High
	Medium
	Low

– *High*: Standard - intended for indoor use.
– *Medium*: To be used when there are small interfering heat sources within the detection area.
– *Low*: To be used when there are large interfering heat sources within the detection area.

○ **Note**
The transmission range can NOT be changed via the sensitivity.

11.5.11 General parameters - Fade in extended parameters

Options:	No
	Yes

– *No*: Only the most important parameters for setting the presence detector are displayed.
– *Yes:* All parameters are displayed, also those that are not required in most cases.
  Examples:
  ▪ Extended parameters
  ▪ Sensor selection
  ▪ Enable

11.5.12 Extended parameters - Operating mode

Options:	Automatic mode
	Automatic switch-off
	Light controller (independent of movement)

– *Automatic* = automatic switch-on and switch-off.

– A*utomatic switch-off* = manual switch-on and automatic switch-off.

– *Light controller (independent of movement)* = control dependent on brightness.

  ▪ Automatic: In "Automatic" mode the presence detector switches on automatically when detecting movement. The switch-off is effected after the set switch-off delay beginning from the most recent detection.

  ▪ Automatic switch-off: In "Automatic switch-off" mode the presence detector must be switched on manually via the switching (dimmer) object. The switch-off is effected automatically under consideration of the switch-off delay.

  ▪ Light controller (independent of movement): In "Light controller" mode the presence detector only switches On or Off on the basis of brightness ± hysteresis. Activation/deactivation via the switching (dimmer) object.

11.5.13 Extended parameters - Use of a two-stage switch-off

Options:	<u>No</u>
	Yes

– *No*: The detector has a switch-off delay and, following the switch-off delay, transmits what has been set under the "Value for switch-off" parameter.

– *Yes*: After the switch-off delay the detector first switches to the set reduced brightness and only then sends the value set under the "Value for switch-off" parameter after brightness reduced according to switch-off delay.

Example: Switch-off delay = 5 minutes

▪ Value for switching off = 0%

▪ Value for reduced brightness = 20%

▪ Brightness reduced according to switch-off delay = 3 minutes

If movement is now no longer detected, the light is dimmed to 20% after 5 minutes and then to 0% after a further 3 minutes (switch-off).

11.5.14 Extended parameters - Value for reduced brightness (%)

Options:	0 .. 20 .. 100

– Here the intermediate stage value where the detector is to control the light after the switch-off delay has expired.

– Here the value for the reduced brightness is set. After the switch-off delay has expired the detector is to dimm the light to this value.

Switch-off value ≤ bottom control limit ≤ reduced brightness < upper control or dimming limit.

11.5.15 Extended parameters - Brightness reduced according to switch-off delay (hh:mm:ss)

Options:	00:00:10 .. 00:05:00 .. 18:12:15

– Here the value for the switch-off delay of the reduced brightness is set. The total switch-off delay then consists of the switch-off delay + brightness reduced according to switch-off delay

Used movement detection

Options:	Only internal
	Only external
	Internal and external

– *Only internal*: The presence detector responds only to movement measured internally.
– *Only external*: The presence detector responds only to telegrams that are received via the slave object (input).
– *Internal and external*: The presence detector responds to movements measured internally and to external telegrams that are received via the slave object (input).

Slave sends

Options:	Cyclic On telegram
	On/off telegram

– *Cyclic On telegram*: The presence detector, which is connected to the master as slave, sends only On telegrams cyclically.
– *On/Off telegram*: The presence detector, which is connected to the master as slave, sends only On/Off telegrams.

Used brightness

Options:	Internal
	External

– *Internal*: The presence detector uses its own measured brightness and brightness-value threshold to decide whether the presence detector is to be activated or deactivated.
– *External*: A 2-byte external brightness (input) communication object is enabled. The presence detector uses this external measured brightness and the brightness-value threshold (lux) parameter to decide whether the presence detector is to be activated or deactivated.

11.5.16 Extended parameters — Dimming step size brighter (1 - 15)

Options:	1 .. 2 .. 15

– Here the step size for increasing the dimming value during dimming brighter is specified. The step size is relative to the value range of 1 - 255.

11.5.17 Extended parameters - Dimming step size darker (1 to 15)

Options:	1 .. 2 .. 15

– Here the step size for reducing the dimming value during dimming darker is specified.

Note

If the dimming step size is set too high, the dimming steps will be clearly visible in the lighting.

11.5.18 Extended parameters - Use of output 2

Options:	No
	Yes

– *No*: There is only output 1, which sends its telegrams to an actuator.

– *Yes*: An output 2 communication object (output) is being enabled. The constant light controller now regulates the brightness with two outputs (while the second output is used proportional to the first out) in dependence of brightness. If the measured brightness is less than the setpoint, the value of the first output is increased up to the upper limit of output 1. During this control phase the second output is controlled proportional. If the setpoint still has not been reached, the value of the second output is increased up to the upper limit of output 2.

If the measured brightness is higher than the setpoint, the value of the second output is reduced first up the upper limit of output 1 x proportional factor. If the setpoint still has not been reached, output 1 is lowered up to reaching the lower limit of output 1. During this control phase the second output is controlled proportional. The bottom value of the second output is limited by the lower limit output 2 parameter. When appropriately parameterized the constant light controller can also switch off the associated dimming actuator.

11.5.19 Extended parameters - Bottom limit output 2 (%)

Options:	0 .. 100

– Here the bottom control limit is specified and up to which minimum value a dimmer is controlled.

11.5.20 Extended parameters - Upper limit output 2 (%)

Options:	0 .. 100

– Here the upper control limit is specified and up to which maximum value a dimmer is controlled.

11.5.21 Extended parameters - Proportionality factor output 2 to output 1 (%)

Options:	0 .. 100

– Here it is specified how output 2 behaves proportional in comparison to output 1.

For example:

If a factor of 20% is set here, output 2 will always be 20% behind output 1 or when output 1 is dimmed to 30%, output 2 will be dimmed to 10%. Only when output 1 is on its maximum value and the setpoint has not been reached, output 2 will leave this factor and dim higher until output 2 has also reached its maximum value.

11.5.22 Extended parameters - Use of object for switch-off delay

Options:	No
	Yes

– *No*: The only option available is to change the switch-off delay via the switch-off delay parameter setting.
– *Yes*: There is a separate 2-byte switch-off delay object (input) for changing the switch-off delay of the presence detector. The time entered is in seconds. A switch-off delay of 4 minutes, for example, has a value of 240 seconds. This applies to switch-off delay and reduced switch-off delay.

Note

The values which can be sent are between 10 and 65535 seconds. If a value that is too small or too large is sent, the value is automatically adjusted to the limit value:
▪ Value < 10 -> Value = 10
▪ Value > 65535-> Value = 65535

11.5.23 Extended parameters - Use of object for setpoint brightness

Options:	No
	Yes

– *No*: There is no separate brightness object.

– *Yes*: A 2-byte setpoint brightness (input/output) communication object is being enabled. This can be used to change the switching threshold, while the presence detector is activated or deactivated. The value is sent to this object in lux.

Note

The value which can be sent lie between 1 and 1000 lux. If a value is sent that is too small or too large, this value is adjusted to the limit value automatically:

Value < 1 -> Value = 1

Value > 1000 -> Value = 1000

11.5.24 Extended parameters - Use of object for saving setpoint brightness

Options:	No
	Yes

– *No*: There is no separate save setpoint brightness object.

– *Yes*: A 1-bit save setpoint brightness (input) communication object is being enabled. This can be used to save the current measured brightness with a 1 telegram as new control threshold.

11.5.25 Extended parameters - Use of actual brightness object

Options:	No
	Yes

– *No*: There is no separate actual brightness object.

– *Yes*: A 2-byte actual brightness (output) communication object is being enabled. This object outputs the corrected measured brightness which is used by the constant light switch.

11.5.26 Extended parameters - Cyclic sending of actual brightness

Options:	No
	Yes

– *No*: The actual brightness is only made available for reading. The value is not sent automatically.

– *Yes*: The actual brightness is sent each time to the "Actual brightness is sent every (hh:mm:ss)" parameter. The value can also be read.

11.5.27 Extended parameters - Sending of actual brightness every (hh:mm:ss)

Options:	00:00:05 .. 00:05:00 .. 00:30:00

- Here the time which lies between the sending of two telegrams is set.

11.5.28 Extended parameters - Use of brightness calibration object

Options:	<u>No</u>
	Yes

– *No*: There is no separate brightness calibration object.

– *Yes*: A 1-byte brightness calibration communication object (input/output) is being enabled. If a 1 telegram is sent to this object, the calibration of artificial light starts. This means that the constant light controller sends the maximum value to output 1 and 2 and then the light slightly each time to record the the measured values for a reference table.

11.5.29 Extended parameters - Control speed adjustment through blind inputs

Options:	<u>No</u>
	Yes

– *No*: There are no separate settings for adjusting the control speed when a Venetian blind control unit is available.

– *Yes*: There are separate settings: control parameters for the movement of blinds. If a blind now moves up or down, the control speed is adjusted by the constant light controller during the travel time.

11.5.30 Extended parameters - Total movement time of blind / roller blind (hh:mm:ss)

Options:	00:00:01 .. 00:03:00 .. 01:40:00

– Here the time is specified how long it takes until the shading has been carried out completely (blind/roller blind closed).

11.5.31 Extended parameters - Dimming step size brighter (1 to 15)

Options:	1 .. 15

– Here the step size for increasing the dimming value during blind movement is specified.

Note
If the dimming step size is set too high, the dimming steps will be clearly visible in the lighting.

11.5.32 Extended parameters — Dimming step size darker (1 - 15)

Options:	1 .. 4 .. 15

– Here the step size for reducing the dimming value during blind movement is specified.

Note

If the dimming step size is set too high, the dimming steps will be clearly visible in the lighting.

11.5.33 Extended parameters - Control speed (mm:ss)

Options:	00:45 .. 02:30 .. 20:00

– Here the time is specified which the control requires to get from 0 to the upper limit output value.

Example:

If the control speed is on 10:00 and the lighting is switched on with 50% and the upper limit is 100%, the control requires 5 minutes to get from 50% to 100%. Vice versa, the control requires 10 minutes to regulate from 100% to 0%.

11.5.34 Extended parameters - Actual brightness filter

Options:	Fast, approx. 15 seconds
	Normal, approx. 40 seconds
	Slow, approx. 75 seconds

– The application reacts to brightness fluctuations (e.g. clouds). The more inactive the filter is set, the slower the lighting will respond to such fluctuations.

11.5.35 Extended parameters - Exiting manual off dimming mode after (hh:mm)

Options:	00:05 .. 01:00 .. 12:00

– When the presence detector receives a value via the relative dimming (dimmer) object or a value > 0 via the value (dimmer) object, the presence detector will no longer function automatically. The presence detector is switched back to automatic mode only after the movement detected last and the expiry of the set time.

11.5.36 Extended parameters - Exiting manual off mode after (hh:mm)

Options:	00:05 .. 01:00 .. 12:00

– When the presence detector receives a switch-off value via the switching (dimmer) object or a value = 0 via the value (dimmer) object, the presence detector is switched off and will no longer switch on automatically. The presence detector will function again automatically only after the receipt of value 1 on the switching (dimmer) object or after the movement detected last and the expiry of the set time.

11.5.37 Extended parameters - Pause time (ss.fff)

Options:	00.100 .. 01,250 .. 59,999

– The set pause time is started after the detector has been switched off due to expiry of the switch-off delay or when a switch-off telegram is received on objects external push-button or actuator status.

If movement is detected during this time, the detector is not switched on immediately. The pause time is first extended by 7 seconds. If there is still movement after these 7 seconds, the detector switches back on.

If no movement is detected during the pause time, the detector is ready for activation again after the pause time.

This behaviour can, for example, be important when the lamp cools down drastically and is located within the detection range of the detector. Without a blockage there would be an unintentional switch-on. The purpose of pause time is to prevent an immediate re-activation.

Example:

The person switches the light off manually when leaving the room. Without the pause time the detected movement would cause a renewed switch-on during exiting.

Note
▪ The external push-button object is activated under the "External push-button" parameter.
▪ The actuator status object is activated under the status display parameter.

11.5.38 Extended parameters - Use of status of control object

Options:	No
	Yes

– *No*: There is no separate status of control object.

– *Yes*: A 1-bit status of control communication object (output) is being enabled. This object sends a 1 telegram when the constant light controller functions automatically. The object sends a 0 telegram when manual action takes place, e.g. if a manual switch-off has taken place.

11.5.39 Extended parameters — Overwriting settings during a download

Options:	Yes
	No

– *Yes*: When the application is reloaded into the detector, the values changed via the bus are overwritten with the parameterized values of the ETS application.

– *No*: When the application is reloaded into the detector, the values changed via the bus are not overwritten with the parameterized values of the ETS application.

Values:

- Set value

- Switch-off delays

- Brightness correcting values

11.5.40 Sensor selection - Use of sensors 1 - 4

Options:	Yes
	No

– *Yes*: This sensor is active and detects movement.

– *No*: This sensor is switched off and movement is no longer detected in this area.

11.5.41 Enable - Use of presence detector enable object

Options:	No
	Yes

– *No*: There is no object with which the constant light controller can be blocked or enabled.

– *Yes*: A 1-bit enable presence communication object (input) is being enabled. This object allows the constant light controller to be enabled or blocked. No telegrams are sent by the detector during blockage.

11.5.42 Enable - Enable with

Options:	ON telegram
	OFF telegram

– *ON telegram*: With the receipt of value 1 on the enable movement (input) object the detector is enabled and blocked with value 0.

– OFF *telegram*: With the receipt of value 0 on the enable movement (input) object the detector is enabled and blocked with value 1.

11.5.43 Enable - After bus voltage recovery the device is

Options:	Enabled
	Blocked

▪ *Enabled*: The device is enabled and functions normally when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.

▪ *Blocked*: The device is blocked and must be enabled for normal function when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.

11.5.44 Enable - Behaviour of output during enable

Options:	Current output value
	The start value

– *Current output value*: During enable it is checked whether a movement has taken place. If yes, the lighting is switched on. If no, the lighting is switched off.

– *Control starts with switch-off value*: during enable the single value which has been parameterized under the value for switch-off parameter is sent.

11.5.45 Enable - Output sends at blockage

Options:	No telegram
	Off after expiry of switch-off delay
	Single value for switching off

– *No telegram*: no telegram is sent during blockage.

– *Off after expiry of switch-off delay*: During blockage the switch-off delay is started anew and the detector sends the value that has been parameterized under the value for switch-off parameter only after this time has expired.

– *Single value for switch-off*: During blockage the single value which has been parameterized under the value for switch-off parameter is sent.

11.6 Application "HVAC" (Heating, ventilation, air-conditioning)

11.6.1 General parameters - Output is of type

Options:	1 bit
	1 byte 0 - 100%
	1 Byte (0 - 255)
	Light scene number (1-64)
	RTC operating mode switchover (1 byte)
	2-byte float

– *1 Bit*: Intended for switch actuators.

– *1 Byte 0 - 100%*: For activating dimmers.

– *1 Byte 0 - 255*: For actuators, which are activated with a value of between 0 and 255.

– *Light scene number (1 - 64)*: For activating light scenes.

– *RTC operating mode switchover (1 Byte)*: To directly switch room temperature controllers into a specific operating mode:

  ▪ Auto

  ▪ Comfort

  ▪ Standby

  ▪ ECO

  ▪ Frost/heat protection

– 2-byte float: To send a specific temperature for example.

Note

If the type of output is changed, also the options for setting the parameters change:

  ▪ Value for switching on

  ▪ Value for switching off

  ▪ Value for force-position

In this manual only values for setting the RTC operating mode switchover (1-byte) are described.

11.6.2 General parameters - Use of slave input

Options:	No
	Yes

– *No*: The option of receiving telegrams from a slave is not available.

– *Yes*: A 1-bit slave communication object (input) is being enabled. Via this input the master detector receives the (On) telegrams of the connected slaves or of a push-button.

Slave sends

Options:	Cyclic On telegram
	On/off telegram

– *Cyclic On telegram*: The presence detector, which is connected to this master as slave, sends only On telegrams cyclically.

– *On/Off telegram*: The presence detector, which is connected to this master as slave, sends only On/Off telegrams.

11.6.3 General parameters - Value for switch-on

Options:	Auto
	Comfort
	Standby
	ECO
	Frost/heat protection

– *Auto*: When movement is detected, value 0 (auto) is sent superimposed via the HVAC object on the bus to the operating mode object, to reset the RTC into automatic mode.

– *Comfort*: When movement is detected, value 1 (comfort) is sent via the HVAC object on the bus.

– *Standby*: When movement is detected, value 2 (standby) is sent via the HVAC object on the bus.

– *ECO*: When movement is detected, value 3 (ECO) is sent via the HVAC object on the bus.

– *Frost/heat protection*: When movement is detected, value 4 (ECO) is sent via the HVAC object on the bus.

11.6.4 General parameters - Value for switch-off

Options:	Auto
	Comfort
	Standby
	<u>ECO</u>
	Frost/heat protection

– *Auto*: When movement is no longer detected and the switch-off delay has expired, value 0 (auto) is sent superimposed via the HVAC object on the bus to the operating mode object, to reset the RTC into automatic mode.

– *Comfort*: When movement is no longer detected and the switch-off delay has expired, value 1 (comfort) is sent via the HVAC object on the bus.

– *Standby*: When movement is no longer detected and the switch-off delay has expired, value 2 (standby) is sent via the HVAC object on the bus.

– *ECO*: When movement is no longer detected and the switch-off delay has expired, value 3 (ECO) is sent via the HVAC object on the bus.

– *Frost/heat protection*: When movement is no longer detected and the switch-off delay has expired, value 4 (ECO) is sent via the HVAC object on the bus.

11.6.5 General parameters - Switch-on delay time (hh:mm:ss)

Options:	00:00:10 .. 00:03:00 .. 18:12:15

– The switch-on delay time is a waiting period before the presence detector sends something on the bus. In the standard setting the time is reset if movement is no longer detected during this period. In fan mode (which can be set via the extended parameters) the time is not reset and the HVAC object will always switch on.

11.6.6 General parameters - Switch-off delay (hh:mm:ss)

Options:	00:00:10 .. 00:03:00 .. 18:12:15

– The switch-off delay is the time period between the last movement detected and the sending of the telegram "Value for switch-off". If movement is detected again within this period, the switch-off delay timer is started again.

11.6.7   eneral parameters - Sensitivity of the watchdog

Options:	High
	Medium
	Low

– *High*: Standard - intended for indoor use.
– *Medium*: To be used when there are small interfering heat sources within the detection area.
– *Low*: To be used when there are large interfering heat sources within the detection area.

Note
The transmission range can NOT be changed via the sensitivity.

11.6.8   General parameters - Fade in extended parameters

Options:	No
	Yes

– No: Only the most important parameters for setting the detector are displayed
– Yes: All parameters are displayed, also those that are not required in most cases.
  Examples:
  ▪ Extended parameters
  ▪ Sensor selection
  ▪ Enable

11.6.9   Extended parameters - Operating mode

Options:	Heating/air-conditioning
	Ventilation

– *Heating/air-conditioning*: The switch-on delay time starts with a movement. If movement is no longer detected during the switch-on delay time, the switch-on delay time is reset. If movement continues and the switch-on delay time has expired, the output is activated with the programmed switch-on value. As soon as movement is no longer detected, the switch-off delay starts. The switch-off delay is re-triggered by each movement within the detection range. After the switch-off delay has expired the output is activated with the programmed switch-off value.

– *Ventilation*: A movement in the detection range starts the switch-on delay time. After the switch-on delay time has expired the output is activated with the programmed switch-on value. As soon as movement is no longer detected, the switch-off delay starts. The switch-off delay is re-triggered by each movement within the detection range. After the switch-off delay has expired the output is activated with the programmed switch-off value.

11.6.10 Extended parameters - Switch-on sensitivity

Options:	High
	Medium
	Minimal

–   *High*: During the switch-on delay time the presence detector checks whether there is still movement in the room. With setting "High" this test interval is very high.

–   *Medium*: During the switch-on delay time the presence detector checks whether there is still movement in the room. With setting "Medium" this test interval is high.

–   *Minimal*: During the switch-on delay time the presence detector checks whether there is still movement in the room. With setting "Minimal" this test interval is not high.

11.6.11 Extended parameters - Object for switch-on delay time

Options:	No
	Yes

–   *No*: There is only the option of changing the switch-on delay time via the switch-on delay time parameter.

–   *Yes*: There is a separate 2-byte switch-on delay time (input) object for changing the delay time of the presence detector. The time entered is in seconds. A switch-off delay of 4 minutes, for example, has a value of 240 seconds.

Note

The values which can be sent are between 10 and 65535 seconds. If a value that is too small or too large is sent, the value is automatically adjusted to the limit value:

▪   Value < 10 -> Value = 10

▪   Value > 65535-> Value = 65535

11.6.12 Extended parameters - Use of object for switch-off delay

Options:	No
	Yes

– *No*: The only option available is to change the switch-off delay via the switch-off delay parameter setting

– *Yes*: There is a separate 2-byte switch-off delay object (input) for changing the switch-off delay of the detector. The time entered is in seconds. A switch-off delay of 4 minutes, for example, has a value of 240 seconds.

> **Note**
>
> The values which can be sent are between 10 and 65535 seconds. If a value that is too small or too large is sent, the value is automatically adjusted to the limit value:
> - Value < 10 -> Value = 10
> - Value > 65535-> Value = 65535

11.6.13 Extended parameters - Use of object for force-position

Options:	No
	Yes

– *No*: There is no separate force-position object.

– Y*es*: There is a separate 1-bit force-position object (input). When an On telegram is received via the object, the presence detector is blocked and the value under force-position is sent via the HVAC object. If an Off telegram is received via the object, the presence detector is enabled again. If a movement is then detected, the value for switch-on is sent. If no movement occurs, the value for switch-off is sent.

Value for force-position

Options:	Auto
	Comfort
	Standby
	ECO
	Frost/heat protection

– Here it is specified what is to be sent when the force-position object receives an On telegram.

11.6.14 Extended parameters — Overwriting settings during a download

Options:	Yes
	No

– *Yes*: When the application is reloaded into the detector, the values changed via the bus are overwritten with the parameterized values of the ETS application.

– *No*: When the application is reloaded into the detector, the values changed via the bus are not overwritten with the parameterized values of the ETS application.

Values:

- Switch-on delay
- Switch-off delay

11.6.15 Sensor selection - Use of sensors 1 - 4

Options:	<u>Yes</u>
	No

– *Yes*: This sensor is active and detects movement.

– *No*: This sensor is switched off and movement is no longer detected in this area.

11.6.16 Enable - Use of enable object

Options:	No
	Yes

– *No*: There is no object with which the HVAC control can be blocked or enabled.

– *Yes*: A 1-bit enable heating, ventilation and air-conditioning communication object (input) is being enabled. This object allows the HVAC control to be enabled or blocked. No telegrams are sent by the detector during blockage.

11.6.17 Enable - Enable with

Options:	<u>ON telegram</u>
	OFF telegram

– *ON telegram*: With the receipt of value 1 on the enable movement (input) object the detector is enabled and blocked with value 0.

– OFF *telegram*: With the receipt of value 0 on the enable movement (input) object the detector is enabled and blocked with value 1.

11.6.18 Enable - After bus voltage recovery the device is

Options:	Enabled
	Blocked

- ▪ *Enabled*: The device is enabled and functions normally when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.
- ▪ *Blocked*: The device is blocked and must be enabled for normal function when the bus voltage is interrupted or the device has been re-programmed, as well as after a reset.

11.6.19 Enable - Output sends at enable

Options:	No telegram
	Current status
	Single value for switching on
	Single value for switching off

- – *No telegram*: No telegram is sent during enable.
- – *Current status*: During enable the detector checks whether a movement exists. If yes, the single value for switch-on is sent. Otherwise the single value for switch-off is sent.
- – *Single value for switch-on*: During enable the single value which has been parameterized under the value for switch-on parameter is sent.
- – *Single value for switch-off*: During enable the single value which has been parameterized under the value for switch-off parameter is sent.

11.6.20 Enable - Output sends at blockage

Options:	No telegram
	Off after expiry of switch-off delay
	Single value for switching off

- – No telegram: No telegram is sent during blockage.
- – Off after expiry of switch-off delay: During blockage the switch-off delay is started anew and the detector sends the value that is parameterized under the value for switch-off parameter only after this time has expired.
- – Single value for switch-off: During blockage the single value which is parameterized under the value for switch-off parameter is sent.

11.7   "Brightness detection" application

11.7.1   General parameters - Sending of brightness every (hh:mm:ss)

Options:	00:00:05 .. 00:00:30 .. 18:12:15

–   Here it is specified how often the brightness is sent on the bus.

11.7.2   General parameters - Use of object for LED

Options:	No
	Yes

–   *No*: There is no separate LED object.

–   *Yes:* There is a separate 1-bit LED object (input) for the option of switching on the LED via an On telegram and to switch it off with an Off telegram.

Note

Only the LED has been switched. This does NOT place the device into programming mode.

11.7.3   General parameters - Correction of internal brightness

Options:	No
	with daylight adjustment
	with daylight and artificial light adjustment (1 output)
	with daylight and artificial light adjustment (2 outputs)

–   *No*: It is not necessary to calibrate the internal brightness sensor.

–   *With daylight adjustment*: This adjustment is used mainly for the detector application.

–   *With daylight and artificial light adjustment (1 output):* This adjustment is used for the constant light switch and constant light controller and only for one light row. It starts with the daylight adjustment, and only if the control then does not function optimally can the the artificial light adjustment be carried out.

–   *With daylight and artificial light adjustment (2 outputs):* This adjustment is used for the constant light switch and constant light controller and for two light rows. It starts with the daylight adjustment, and only if the control then does not function optimally can the the artificial light adjustment be carried out.

Note

How the adjustment is carried out is explained in chapter 7.2.6 " Instructions on the calibration of the internal light controller".

11.7.4 General parameters - Fade in extended parameters

Options:	No
	Yes

– *No*: Only the most important parameters for setting the detector are displayed.

– *Yes*: All parameters are displayed, also those that are not required in most cases.
  Examples:

  ▪ Extended parameters

11.7.5 Extended parameters - Use of internal brightness

Options:	Yes
	No

– *Yes*: The internal brightness sensor is used as encoder for the different detector applications.

– *No*: The internal brightness sensor is not used. The brightness values must then be sent from the external brightness sensors.

11.7.6 Extended parameters - Number of external brightness measurement objects

Options:	0
	1
	2

– *0*: There are no separate 2-byte external brightness 1 and 2 (input) objects to link the external brightness sensors with the presence detector.

– *1*: There is a separate external brightness 1 (input) object with which the internal brightness sensor is not used. The brightness values must then be sent from the external brightness sensors.

– *2*: There is a separate external brightness 2 (input) object with which the internal brightness sensor is not used. The brightness values must then be sent from the external brightness sensors.

11.8 "RTC object" application

11.8.1 General - Device function

Options:	Single device
	Master device
	Slave device

– *Single device*: The device is used singly in a room as room temperature controller.

– *Master device*: At least two room temperature controllers are located in one room. One device is to be set up as a master device, while the others are to be programmed as slave devices / temperature sensors. The master device is to be linked to the slave devices using the appropriately labelled communication objects. The master device regulates the temperature.

– *Slave device*/temperature sensor: At least two room temperature controllers are located in one room. One device is to be set up as a master device, while the others are to be programmed as slave devices / temperature sensors. The slave devices are to be linked to the master device with the appropriately labelled communication objects. The slave device serves the room temperature control functions of the master.

11.8.2 General - Control function

Options:	Heating
	Heating with additional stage
	Cooling
	Cooling with additional stage
	Heating and cooling
	Heating and cooling with additional stages

– *Heating*: For operating a heat-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Heating type" can be programmed for optimal control.

– *Heating with additional stage*: In addition to the control function described under heating, the additional stage enables the activation of an additional heating circuit. This type of additional stage is used, for example, to quickly heat up a bathroom with floor heating via a heated towel rack.

– *Cooling*: For operating a cooling-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Cooling type" can be programmed for optimal control.

– *Cooling with additional stage*: In addition to the control function described under cooling, the additional stage enables the activation of an additional cooling device. This type of additional stage is used, for example, to quickly cool a room via an added cooling device.

– *Heating and cooling*: For operating a two-wire or four-wire system used to heat or cool a room. Switching between heating and cooling takes place using a central switch (two-wire system) or is carried out manually and / or automatically via the single room thermostat (four-wire system).

Heating and cooling with an additional stage: In addition to the heating and cooling functions, one additional stage each with an autonomous controller type can be programmed.

Note

This parameter is only available if the "Device function" parameter is set on "Single device" or "Master device".

11.8.3   General - Operating mode after reset

Options:	Comfort
	Standby
	Eco mode
	Cooling with additional stage
	Frost/heat protection

After a reset the device will run in the operating mode after a restart until a new operating mode is set as the result of device operation or by communication objects, as the case may be. This operating mode should be defined during the planning phase. An improperly defined operating mode can result in a loss of comfort or increased energy consumption.

- *Comfort*: If the room temperature is not automatically lowered and the room is therefore controlled independent of its use.
- *Standby*: If the room is controlled automatically, e.g. by a presence detector, as a function of its use.
- *Eco mode*: If the room is controlled automatically or manually as a function of it use.
- *Frost/heat protection*: If only the building protection function is necessary in the room after a reset.

Note

This parameter is only available if the "Device function" parameter is set on "Single device" or "Master device".

11.8.4   General - Additional functions

Options:	No
	Yes

- This parameter enables additional functions and communication objects, e.g. window contact and presence detector.

11.8.5 General - Send cyclic "In operation" (min)

Options:	Setting option between 5 - 3000 minutes

– The "In operation" communication object serves to inform that the controller still operates. Value "1" is sent cyclic. This parameter is used to set the cycle for sending. If the cyclic telegram fails, the function of the device is faulty and the air-conditioning of the room can be maintained with a forced operation. However, for this the system and/or actuator must have "Forced operation" function.

Note

This parameter is only available if the "Additional function" parameter is set to "Yes".

11.8.6 Heating control

Note

Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.7 Heating control - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.8.8 Heating control - Heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. floor heating) 4°C 200 min
	▪ Convector (e.g. heater) 1.5°C 100 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Multiple heating types (panel heating, convector heating or fan coil) with preset parameters are available to the user.

– If the required heating type is not available, individual parameters can be specified in free configuration.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.9 Heating control - P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the set value, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Heating type" parameter must set on "Free configuration".

11.8.10 Heating control - I-component (min.)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Heating type" parameter must set on "Free configuration".

11.8.11 Heating control - Extended settings

Options:	No
	Yes

– This parameter enables additional functions and communication objects, e.g. "Basic stage heating".

11.8.12 Basic stage heating

Note

Only available when the "Extended settings" parameter under "Heating control" is set on "Yes".

11.8.13 Basic stage heating - Status object heating

Options:	No
	Yes

– This parameter enables the "Status heating" communication object.

11.8.14 Basic stage heating - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– *Normal*: Value 0 means "Valve closed".
– *Inverse*: Value 0 means "Valve open".

11.8.15 Basic stage heating - Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or 2-point 1 Byte, 0/100%".

11.8.16 Basic stage heating - Control value difference for sending of heating control value

Options:	2 %
	5 %
	10 %
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.17 Basic stage heating - Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.8.18 Basic stage heating - PWM cycle heating (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an "On-phase" of five minutes and an "Off-phase" of 10 min. The time for a PWM cycle can be specified here.

Note
This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off".

11.8.19 Basic stage heating - Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.20 Basic stage heating - Minimum control value for basic load (0 to 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating floor heating. Even if the controller calculates the control value zero, a heating medium will flow through the floor heating system to prevent the floor from cooling down. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.21 Control of additional heating stage

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating with additional stage" or "Heating and cooling with additional stages".

11.8.22 Control of additional heating stage - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.8.23 Control of additional heating stage - Additional heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. floor heating) 4°C 200 min
	▪ Convector (e.g. heater) 1.5°C 100 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Multiple heating types (panel heating, convector heating or fan coil) with preset parameters are available to the user.

– If the required heating type is not available, individual parameters can be specified in free configuration.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.24 Control of additional heating stage - P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the set value, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Additional heating type" parameter must set on "Free configuration".

11.8.25 Control of additional heating stage - P-component (min)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Additional heating type" parameter must set on "Free configuration".

11.8.26 Control of additional heating stage - Temperature difference to basic stage (x 0.1°C)

Options:	Setting option between 0 - 255

The setpoint temperature of the additional stage is defined as a function of the current setpoint temperature of the base stage and is expressed as a difference. The value represents the setpoint value starting at which the additional stage will operate.

11.8.27 Control of additional heating stage - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Additional heating stage".

11.8.28 Additional Heating Stage

Note
Only available when the "Extended settings" parameter under "Control of additional heating stage" is set on "Yes".

11.8.29 Additional heating stage - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– N*ormal*: Value 0 means "Valve closed".
– *Inverse*: Value 0 means "Valve open".

11.8.30 Additional Heating Stage - Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note
This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or 2-point 1 Byte, 0/100%".

11.8.31 Additional heating stage - Control value difference for sending of heating control value

Options:	2 %
	5 %
	10 %
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.32 Additional heating stage - Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note

This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

Additional heating stage - Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.33 Basic heating stage - Minimum control value for basic load (0 - 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating floor heating. Even if the controller calculates the control value zero, a heating medium will flow through the floor heating system to prevent the floor from cooling down. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note
This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.34 Cooling control

Note
Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.35 Cooling control - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.8.36 Cooling control - Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. cooling ceiling) 5°C 240 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Two cooling types (area or fan coil) with preset parameters are available to the user.

If the required cooling type is not available, individual parameters can be specified in free configuration.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.37 Cooling control - P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the set value, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must set on "Free configuration".

11.8.38 Cooling control - I-component (min.)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must set on "Free configuration".

11.8.39 Cooling control - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Basic stage cooling".

11.8.40 Basic stage cooling

Note

Only available when the "Extended settings" parameter under "Cooling control" is set on "Yes".

11.8.41 Basic stage cooling - Status object cooling

Options:	No
	Yes

This parameter enables the "Status cooling" communication object.

11.8.42 Basic stage cooling - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– *Normal*: Value 0 means "Valve closed".

– *Inverse*: Value 0 means "Valve open".

11.8.43 Basic stage cooling - Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note

This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or 2-point 1 Byte, 0/100%".

Basic stage cooling - Control value difference for sending of cooling control value

Options:	2 %
	5 %
	10 %
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.44 Basic stage cooling - Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note

This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.8.45 Basic stage cooling - PWM cycle cooling (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an "On-phase" of five minutes and an "Off-phase" of 10 min. The time for a PWM cycle can be specified here.

Note

This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off".

11.8.46 Basic stage cooling - Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.47 Basic stage cooling - Minimum control value for basic load (0 to 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating surface cooling. Even if the controller calculates the control value zero, a cooling medium will flow through the cooling area to prevent the floor from heating up. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.48 Control of additional cooling stage

Note

Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Cooling with additional stage" or "Heating and cooling with additional stages".

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

– *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.

– *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).

– *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

– *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.

– *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

11.8.49 Control of cooling additional stage - Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off:
	▪ Area (e.g. cooling ceiling) 5°C 240 min
	▪ Free configuration
	Fan coil:
	▪ Fan coil 4°C 90 min
	▪ Free configuration

Two cooling types (area or fan coil) with preset parameters are available to the user.

If the required cooling type is not available, individual parameters can be specified in free configuration.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.50 Control of cooling additional stage - P-component (x 0.1°C)

Options:	Setting option between 10 - 100

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the set value, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low. A P-component from 0.1 to 25.5 K can be set.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must set on "Free configuration".

11.8.51 Control of additional cooling stage - P-component (min)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must set on "Free configuration".

11.8.52 Control of additional cooling stage - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Additional cooling stage".

11.8.53 Additional cooling stage

Note

Only available when the "Extended settings" parameter under "Control of additional cooling stage" is set on "Yes".

11.8.54 Additional cooling stage - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energised closed (inverse) valves.

– N*ormal*: Value 0 means "Valve closed".

– *Inverse*: Value 0 means "Valve open".

11.8.55 Additional cooling Stage - Hysteresis (x 0.1°C)

Options:	Setting option between 3 - 255

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note

This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or 2-point 1 Byte, 0/100%".

11.8.56 Additional cooling stage - Control value difference for sending of cooling control value

Options:	2 %
	5 %
	10 %

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.57 Additional cooling stage - Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note

This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Byte, 0/100%", "PI continuous, 0-100%" or "Fan coil".

11.8.58 Additional cooling stage - Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.59 Basic cooling stage - Minimum control value for basic load (0 - 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load, e.g. for operating surface cooling. Even if the controller calculates the control value zero, a cooling medium will flow through the cooling area to prevent the floor from heating up. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note

This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

11.8.60 Settings of basic load

Note

Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating with additional stage", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.61 Settings of basic load - Minimum control value for basic load > 0

Options:	Always active
	Activate via object

The function finds application when in the desired area, e.g. with floor heating, the floor is to have a basic warmth The size of the minimum control value specifies the volume of heating medium that flows through the controlled area, even when the calculation of the control value of the controller would indicate a lower value.

– *Always active*: Here it is possible to define whether this basic load will be permanently active or whether it will be switched via the "Basic load" object.

– *Activate via object*: When this parameter is selected, the basic load function, which means the minimum control value with a value higher than zero, can be activated (1) or deactivated (2). If it is activated, then the heating medium will always be fed through the system with at least the minimum control value. If it is deactivated, the control value can be reduced to zero with the controller.

11.8.62 Combined heating and cooling modes

Note

Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating and cooling" or "Heating and cooling with additional stages".

11.8.63 Combined heating and cooling modes - Switchover of heating/cooling

Options:	Automatic
	Only via object
	On-site/via extension unit and via object

This function makes it possible to switch between the heating and cooling mode of the device.

– *Automatic*: E.g. for four-conductor systems which allow the switchover between heating and cooling at all times. The device switches automatically between heating and cooling and to the associated setpoint. "Switchover heating/cooling" is a transmitting object.

– *Only via object*: E.g. for two-conductor systems which are operated in heating mode in the winter and cooling mode in the summer. The switchover between heating and cooling and to the associated setpoint is carried out via the corresponding communication object. This function is used when a central switchover of the single room controllers is required. "Switchover heating/cooling" is a receiving object.

– *Local/ via extension unit and via object*: E.g. for four-conductor systems which allow the switchover between heating and cooling at all times. The switchover between heating and cooling and to the associated setpoint is carried out manually on the device by the user of the room or via the "Switchover heating/cooling" object via the bus. "Switchover heating/cooling" is a transmitting and receiving object.

11.8.64 Combined heating and cooling modes - Operating mode after reset

Options:	Cooling
	Heating

After a bus voltage failure, a system reset, or the attachment of a device to the bus coupler, the device starts in the parameterized "Operating mode after reset". The operating mode can be changed when the system is running using the options set under "Switchover heating/cooling".

11.8.65 Combined heating and cooling modes - Heating/cooling control value output

Options:	Via 1 object
	Via 2 objects

This parameter is used to define whether the control value is transmitted to the climate control actuator using one or two objects. If the climate control actuator has separate control value inputs for heating and cooling, or if separate actuators are used, then the option "Via 2 objects" must be selected. Select the option "Via 1 object" if a single actuator only has one object that receives both the heating and the cooling control values.

11.8.66 Combined heating and cooling modes - Additional heating/cooling stage control value output

Options:	Via 1 object
	Via 2 objects

This parameter is used to define whether the control value is transmitted to the climate control actuator using one or two objects. If the climate control actuator has separate control value inputs for heating and cooling, or if separate actuators are used, then the option "Via 2 objects" must be selected. Select the option "Via 1 object" if a single actuator only has one object that receives both the heating and the cooling control values.

Note

This parameter is only available when the "Control function" parameter is set on "Heating and cooling with additional stages".

11.8.67 Set value settings

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.8.68 Setpoint settings - Setpoint for heating comfort = setpoint for cooling comfort

Options:	No
	Yes

This parameter is used to configure the manner in which the setpoint adjustment functions.

– *Yes*: The device has the same setpoint for heating and cooling in the comfort mode. The system switches to heating when the temperature drops below the setpoint minus hysteresis. It switches to cooling when the temperature exceeds the setpoint plus hysteresis. The hysteresis is parameterizable.

– *No*: The function has two separate setpoints for heating and cooling in the comfort mode. The device will display the currently active setpoint value. Switching between heating and cooling occurs via the "Switchover heating/cooling" parameter setting.

Note

This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

11.8.69 Setpoint settings - Hysteresis for switchover heating/cooling (x 0.1°C)

Options:	Setting option between 5 - 100

This parameter specifies the one-sided hysteresis for switching between heating and cooling when "Setpoint heating comfort = Setpoint cooling comfort" is active. If the room temperature exceeds the setpoint temperature value plus hysteresis, the system switches to cooling. If the room temperature falls below the setpoint temperature value minus hysteresis, the system switches to heating.

Note

This parameter is only available when the "Setpoint heating comfort = Setpoint cooling comfort" parameter is set on "Yes".

11.8.70 Setpoint settings - Setpoint temperature for heating and cooling (°C)

Options:	Setting option between 10 - 40

Specifies the comfort temperature for heating and cooling when people are present.

Note

This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

11.8.71 Setpoint settings - Setpoint temperature for heating comfort (°C)

Options:	Setting option between 10 - 40

Specifies the comfort temperature for heating when people are present.

Note
This parameter is only available when the "Control function" parameter is set on "Heating" or "Heating with additional stage".

11.8.72 Setpoint settings - Reduction for standby heating (°C)

Options:	Setting option between 10 - 40

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note
This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.73 Setpoint settings - Reduction for ECO heating (°C)

Options:	Setting option between 0 - 15

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

11.8.74 Setpoint settings - Set-point temperature for frost protection (°C)

Options:	Setting option between 5 - 15

Function for protecting the building against the cold. On devices with a display, this mode is indicated by the frost protection icon. Manual operation is blocked.

Note
This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.75 Setpoint settings - Setpoint temperature for cooling comfort (°C)

Options:	Setting option between 10 - 40

Specifies the comfort temperature for cooling when people are present.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling" or "Cooling with additional stage".

11.8.76 Setpoint settings - Increase for standby cooling (°C)

Options:	Setting option between 0 - 15

Specifies the temperature in cooling mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.77 Setpoint settings - Increase for ECO cooling (°C)

Options:	Setting option between 0 - 15

Specifies the temperature in cooling mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.78 Setpoint settings - Set-point temperature for heat protection (°C)

Options:	Setting option between 27 - 45

Function for protecting the building against heat. On devices with a display, this mode is indicated by the heat protection icon. Manual operation is blocked.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.79 Setpoint settings - Display indicates

Options:	Current set value
	Relative set value

The display can indicate either the absolute or relative setpoint value.

–   *Current setpoint*: On devices with a display, the setpoint is shown as an absolute temperature, e.g. 21.0°C.

–   *Relative setpoint*: On devices with display, the setpoint is indicated as a relative value, e.g. -5°C .. + 5°C.

11.8.80 Setpoint settings - Send current setpoint

Options:	Cyclic and during change
	Only for change

The current setpoint value can be sent to the bus either cyclically and after a change, or only after a change.

11.8.81 Setpoint settings - Cyclic sending of the current set-point temperature (min)

Options:	Setting option between 5 - 240

This parameter is used to specify the amount of time that will elapse before the current setpoint value is automatically transmitted.

Note

This parameter is only available when the "Send current setpoint" is set on "Only during change".

11.8.82 Setpoint adjustment

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.8.83 Setpoint adjustment — Maximum manual increase during heating mode (0 - 15°C)

Options:	Setting option between 0 - 15

This preset can be used to limit the manual increase during heating.

Note

This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.84 Setpoint adjustment — Maximum manual reduction during heating mode (0 - 15°C)

Options:	Setting option between 0 - 15

This preset can be used to limit the manual decrease during heating.

Note
This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.85 Setpoint adjustment — Maximum manual increase during cooling mode (0 - 15°C)

Options:	Setting option between 0 - 15

This preset can be used to limit the manual increase during cooling.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.86 Setpoint adjustment — Maximum manual reduction during cooling mode (0 - 15°C)

Options:	Setting option between 0 - 15

This preset can be used to limit the manual decrease during cooling.

Note
This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.87 Setpoint adjustment - Resetting of the manual adjustment for receipt of a basic set value

Options:	No
	Yes

Activating this parameter will cause the manual adjustment to be deleted and the new setpoint value to be provided when a new value is received via the "Basic setpoint" object.

If the parameter is deactivated, the manual adjustment is added to the new base setpoint value. Example: Previous base setpoint value of 21 °C + manual adjustment of 1.5°C = 22.5°C. The object receives a new basic setpoint of 18°C plus the previous manual adjustment of 1.5°C for a total of 19.5°C.

11.8.88 Setpoint adjustment - Resetting the manual adjustment for change of operating mode

Options:	No
	Yes

If the device switches to a new operating mode, the manual adjustment is deleted and the parameterized setpoint temperature for the operating mode plus any change by the base setpoint value object will be applied if this parameter is activated. Example: Comfort temperature of 21°C plus manual adjustment of 1.5°C = 22.5°C. Change to Eco with programmed temperature 17°C. The device regulates the temperature to 17°C, since the manual adjustment is deleted.

If the parameter is deactivated, the manual setpoint adjustment will be added to the temperature in the new operating mode. Example: Comfort temperature of 21°C plus manual adjustment of 1.5°C = 22.5°C. If the system switches to Eco with a parameterized temperature of 17°C, the device regulates the temperature to 18.5°C, since the manual adjustment is added.

11.8.89 Setpoint adjustment - Resetting the manual adjustment via object

Options:	No
	Yes

If this parameter is activated, a separate object can be used to delete the manual adjustment at any time. Example of application: Resetting the manual adjustment on all devices located in a building using a system clock.

11.8.90 Setpoint adjustment - Permanent storage of on-site operation

Options:	No
	Yes

If this parameter is activated, the manual settings for setpoint and, where applicable, fan speed level, as well as the value of the "Basic load" object, will be stored in the device and re-activated after a reset. If the device is re-programmed, the stored setpoint values will also be deleted.

11.8.91 Temperature reading - Inputs of temperature reading

Options:	Internal measurement
	External measurement
	Weighted measurement

The room temperature can be measured at the device or fed to the device by an object via the bus. In addition, weighted measuring is also available, in which the weighted average of up to three temperature values (1 x internal, 2 x external) is calculated and used as an input value for control.

11.8.92 Temperature reading - Inputs of weighted temperature reading

Options:	Internal and external measurement
	2 x external measurement
	Internal and 2x external measurement

Specifies the temperature reading inputs for the weighted measurement, in which the calculated weighted average of the inputs is used as an input value for control

Note
This parameter is only available when the "Inputs of temperature reading" parameter is set on "Weighted measurement".

11.8.93 Temperature reading - Weighting of internal measurement (0 to 100%)

Options:	Setting option between 0 - 15

Specifies the weighting of the internal measurement at a level between 0% and 100%.

Note
This parameter is only available when the "Inputs of weighted temperature reading" parameter is set on "Internal and external measurement" or "Internal and 2x external measurement".

11.8.94 Temperature reading - Weighting of external measurement (0 to 100%)

Options:	Setting option between 0 - 15

Specifies the weighting of the external measurement at a level between 0% and 100%.

Note
This parameter is only available when the "Inputs of weighted temperature reading" parameter is set on "Internal and external measurement","2x external measurement" or "Internal and 2x external measurement".

11.8.95 Temperature reading - Weighting of external measurement 2 (0 to 100%)

Options:	Setting option between 0 - 15

Specifies the weighting of the external measurement 2 at a level between 0% and 100%. When added together with the (0%...100%) weighting of the external measurement, the result must be 100%.

Note
This parameter is only available when the "Inputs of weighted temperature reading" parameter is set on "2x external measurement" or "Internal and 2x external measurement".

11.8.96 Temperature reading - Cyclic sending of the actual temperature (min)

Options:	Setting option between 5 - 240

The current actual temperature used by the device can be cyclically transmitted to the bus.

11.8.97 Temperature reading - Difference of value for sending the actual temperature (x 0.1°C)

Options:	Setting option between 1 - 100

If the change in temperature exceeds the parameterized difference between the measured actual temperature and the previous actual temperature that was sent, the changed value will be transmitted.

11.8.98 Temperature reading - Adjustment value for internal temperature measurement (x 0.1°C)

Options:	Setting option between 1 - 100

Every installation location has different physical conditions (interior or exterior wall, lightweight or solid wall, etc.). In order to use the actual temperature at the installation location as a measured value for the device, a temperature measurement must be performed by an external equalised and / or calibrated thermometer at the installation location. The difference between the actual temperature displayed on the device and the actual temperature determined by the external measurement device must be entered in the parameter field as an "Adjustment value".

Note
- The calibration measurement should not be carried out immediately after the device has been installed. The device should first adjust to the ambient temperature before calibration is carried out. The calibration measurement should be repeated shortly before or after the room is occupied.
- This parameter is only available when the "Inputs of temperature reading" parameter is set on "Internal measurement" or "Weighted measurement".

11.8.99 Temperature reading - Monitoring time for temperature reading (0 = no monitoring) (min)

Options:	Setting option between 0 - 120

If no temperature is read within the parameterized time period, the device switches to error mode. It transmits a telegram to the bus via the "Actual temperature error" object and applies the operating mode and control value for error settings.

11.8.100 Temperature reading — Operating mode for fault

Options:	Cooling
	Heating

In the event of a failure of the actual temperature measurement, the device will no longer be able to independently specify the heating/cooling operating type. As a result, the operating type best suited to protecting the building will be selected.

Note

This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

11.8.101 Temperature reading - Control value for fault (0 - 255)

Options:	Setting option between 0 - 255

In the event of a failure of the actual temperature measurement, the device will no longer be able to independently determine the control value. Therefore, a control value which is suitable for protecting the building will be selected.

11.8.102 Alarm functions

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.8.103 Alarm functions - Condensate water alarm

Options:	No
	Yes

If a fan coil is used, condensation may form during operation as a result of excessive cooling and/or humidity. The associated condensate is typically collected in a container. To protect the container against overflowing, and thus prevent potential damage to devices and/or the building, the container alerts the "Condensation alarm" object (receiving only) that the maximum fill level has been exceeded. This causes the controller to switch to a protective mode. This status is indicated by the corresponding icon on devices that have a display. Local operation is blocked. Operation is only possible again after the alarm has been deactivated.

Note

This parameter is only available when the "Control function" parameter is set either on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.104 Alarm function — Dew point alarm

Options:	No
	Yes

When refrigerating machines are used, dew may appear on the refrigerant supply lines during operation as a result of excessive cooling and/or humidity. The dew indicator reports the dew formation via the "Dew point alarm" object (receiving only). This causes the controller to switch to a protective mode. This status is indicated by the corresponding icon on devices that have a display. Local operation is blocked. Operation is only possible again after the alarm has been deactivated.

Note

This parameter is only available when the "Control function" parameter is set either on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.105 Alarm functions - Frost alarm temperature for HVAC and RHCC status (°C)

Options:	Setting option between 0 - 15

The RHCC status and HVAC objects have a frost alarm bit. It the input temperature of the controller drops below the temperature set in this parameter, then the frost alarm bit is set in the status objects. It is reset when the temperature is exceeded.

11.8.106 Alarm functions - Heat alarm temperature for RHCC status (°C)

Options:	Setting option between 25 - 70

The RHCC status object has a heat alarm bit. If the input temperature of the controller exceeds the temperature set in this parameter, then the heat alarm bit is set in the status object. It is reset when the temperature falls below the set temperature.

11.8.107 Fan coil settings - Fan speed levels

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil".

11.8.108 Fan coil settings - Fan speed levels Number of fan speed levels

Options:	3 levels
	5 levels

This parameter is used to specify the number of fan speed levels the actuator will use to control the fan of the fan coil.

11.8.109 Fan coil settings - Fan speed levels - Format of the level output

Options:	0..5
	0..255
	1 bit m off n
	1 bit m 1 off n

– *0 to 5*: The level values (0..3 or 0..5) are output in the 1-byte format as the counter values 0..3 or 0..5.

– 0 to 255: The level values (0..3 or 0..5) are output as percentage values. Example 5-stage fan: The level value 1 is output as 20%, and 5 is output as 100%.

– *1 Bit m from n*: The level values (0..3 or 0..5) are output using 1-bit objects. The number of objects available is the same as the number of fan speed levels. For level 2, for example, the 1-bit fan speed level objects 1 and 2 are output as the value 1, while the other fan speed level objects use the value 0.

– *1 Bit 1 from n*: The level values (0..3 or 0..5) are output using 1-bit objects. The number of objects available is the same as the number of fan speed levels. For the level 2, for example, only the 1-bit fan speed level object 2 is output as the value 1. The other fan speed level objects use the value 0.

11.8.110 Fan coil settings - Fan speed levels - Level output

Options:	For manual operation and automatic
	Only for manual operation

This parameter is used to specify when the output of the fan speed level values will occur: either only when the fan speed levels are manually adjusted or also in automatic mode. This setting depends on the options for the fan coil actuator. If the actuator itself controls the fan speed levels in automatic mode based on a derivative of the control value, than the "Only for manual operation" option must be selected. Otherwise, the other option should be selected.

11.8.111 Fan coil settings - Fan speed levels - Lowest manually adjustable level

Options:	Level 0
	Level 1

This parameter is used to preselect the lowest fan speed level that can be set by an operation performed at the device. When level 0 is selected, the heating/cooling system will not be in operation (fan speed level and valve control 0) as long as the current operating mode and operation type are maintained. To avoid damage to the building, level 0 is deactivated after 18 hours and the device is returned to automatic mode.

11.8.112 Fan coil settings - Fan speed levels - Level status evaluation

Options:	No
	Yes

The controller obtains the current fan speed level for controlling a fan coil actuator either by calculating it from the table of level values under "Fan coil settings for heating" or "Fan coil settings for cooling", or by receiving feedback from the fan coil actuator. If the "Yes" option is selected, the "Fan coil step status" object is activated for receiving the fan speed level from the fan coil actuator.

11.8.113 Fan coil settings heating

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil". In addition, the "Control function" parameter must be set on either "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.114 Fan coil settings for heating - Speed level 1 to 5 up to control value (0 to 255) heating

Options:	Setting option between 0 - 255

In this parameter, the control values of the controller are assigned to fan speed levels. This assignment is used if the fan speed levels are transmitted together with the control values.

Note

- These level settings should be adjusted to match the settings in the fan coil actuator.
- Setting the "Control value type" to "Fan coil" in the control parameters is only useful for one of either the basic stage or the additional stage. Setting the basic and additional stage parameters to fan coil is not useful, since the control of only one fan coil actuator each for heating and cooling is supported.
- The "Fan speed level 4 - 5 up to control value (0 - 255) heating" parameters are available only when the "Number of fan speed levels" is set on "5 steps".

11.8.115 Fan coil settings for heating - Fan speed level limit heating in eco mode

Options:	No
	Yes

This parameter limits the fan speed level when the system is switched to eco mode.

11.8.116 Fan coil settings for heating - Maximum speed level heating for eco mode

Options:	Setting option between 0 - 5

Specifies the maximum possible fan speed level when the system is switched to eco mode.

11.8.117 Fan coil settings cooling

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil". In addition, the "Control function" parameter must be set on either "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

11.8.118 Fan coil settings for cooling - Speed level 1 to 5 up to control value (0 to 255) cooling

Options:	Setting option between 0 - 255

In this parameter, the control values of the controller are assigned to fan speed levels. This assignment is used if the fan speed levels are transmitted together with the control values.

Note

- These level settings should be adjusted to match the settings in the fan coil actuator.
- Setting the "Control value type" to "Fan coil" in the control parameters is only useful for one of either the basic stage or the additional stage. Setting the basic and additional stage parameters to fan coil is not useful, since the control of only one fan coil actuator each for heating and cooling is supported.
- The "Fan speed level 4 - 5 up to control value (0 - 255) cooling" parameters are available only when the "Number of fan speed levels" is set on "5 steps".

11.8.119 Fan coil settings for cooling - Fan speed level limit cooling in eco mode

Options:	No
	Yes

This parameter limits the fan speed level when the system is switched to eco mode.

11.8.120 Fan coil settings for cooling - Maximum speed level cooling for eco mode

Options:	Setting option between 0 - 5

Specifies the maximum possible fan speed level when the system is switched to eco mode.

11.8.121 Summer compensation

Note

This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

11.8.122 Summer compensation - Summer compensation

Options:	No
	Yes

In order to save energy, and to ensure that the temperature difference occurring during entry and exit of a climate-controlled building stays within comfortable limits, the excessive reduction of room temperature should be prevented during high temperatures in the summer (Summer compensation according to DIN 1946). The room temperature is increased by adjusting the setpoint temperature for cooling.

Raising the room temperature does not, however, mean that you heat up the room. Rather, the adjustment is intended to allow the room temperature to increase to a certain set value without cooling. This, for example, prevents the air-conditioning system from further reducing the room temperature to 24 °C with an outside temperature of 35°C.

However, activation of the summer compensation requires an outside temperature sensor that transmits its measured value to the bus and can be evaluated by the room temperature controller.

The following parameters are available for summer compensation:

- "Lower outside temperature value for summer compensation",
- "Upper outside temperature value for summer compensation",
- "Lower setpoint offset for summer compensation",
- "Upper setpoint offset for summer compensation"

Above the "Upper outside temperature value", the minimum setpoint temperature for cooling is the outside temperature minus the "Upper setpoint offset". The outside temperature has no effect on the minimum setpoint temperature for cooling below the "Lower outside temperature value". Between the "Lower" and "Upper outside temperature value", the minimum setpoint temperature for cooling undergoes floating adjustment by the parameterized setpoint temperature equal to the outside temperature minus the "Lower offset" to a value equal to the outside temperature minus the "Upper setpoint offset" as a function of the outside temperature.

Typical values for summer compensation are:

- 21°C: lower outside temperature value
- 32°C: upper outside temperature value
- 0 K: lower setpoint offset
- 6 K: upper setpoint offset

This means that a continuous increase of the minimum setpoint value for cooling occurs to a value equal to the outside temperature minus a setpoint offset of 0 to 6 K if the outside temperature increases to 32°C from 21°C.

For example:

For an increasing outside temperature, the minimum setpoint value for cooling will be increased

starting at an outside temperature of 21°C. The minimum setpoint temperature for cooling is 25.1°C at an outside temperature of 30°C; 25.5°C at an outside temperature of 31°C; 26°C at an outside temperature of 32°C; and 27°C at an outside temperature of 33°C.

11.8.123 Summer compensation - (Lower) Starting temperature for summer compensation (°C)

Options:	Setting option between -127 - 127

The parameter defines the lower outside temperature value up to which temperature value the set value correction (summer compensation) is performed based on too high an outside temperature.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.8.124 Summer compensation - Offset of the set-point temperature for the entry into summer compensation (x 0.1°C)

Options:	Setting option between -127 - 127

The parameter is used to define how many degrees Kelvin the setpoint value will be increased by during summer compensation when the lower temperature value is reached.

Typical values for summer compensation are:

- 20°C: lower outside temperature value
- 32°C: upper outside temperature value
- 0 K: lower setpoint offset
- 4 K: upper setpoint offset

That means that a flowing set value increase of 0 to 4 K occurs if the outside temperature increases from 20°C to 32°C.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.8.125 Summer compensation - (Upper) exit temperature for summer compensation (°C)

Options:	Setting option between -127 - 127

The parameter defines the upper outside temperature value up to which temperature value the setpoint correction (summer compensation) is performed based on too high an outside temperature.

Note
This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.8.126 Summer compensation - Offset of the set-point temperature for the exit from summer compensation (x 0.1°C)

Options:	Setting option between -127 - 127

The parameter is used to define how many degrees Kelvin the setpoint value will be increased by during summer compensation when the upper temperature value is reached.

Typical values for summer compensation are:

▪ 20°C: lower outside temperature value

▪ 32°C: upper outside temperature value

▪ 0 K: lower setpoint offset

▪ 4 K: upper setpoint offset

That means that a flowing set value increase of 0 to 4 K occurs if the outside temperature increases from 20°C to 32°C.

Note

This parameter is only available if the "Summer compensation" parameter is set to "Yes".

11.9 Communication objects — Presence detector — Master

11.9.1 Px: switchover of manual operation

Number	Name	Object function	Data type
12 | 30 | 48 | 64	Px: Switchover of manual operation	Input	1.001 switch

This object is used to switch over from automatic mode to manual mode (default: 0 = automatic, 1 = manual).

11.9.2 Px: external push-button

Number	Name	Object function	Data type
13 | 31 | 49 | 65	Px: external push-button	Input	1.001 switch

The detector switches on if a 1 (default) is received via this object. The detector switches off if a 0 (default) is received via this object.

- *Manual mode inactive*: Movement detector is back on automatic.
- *Manual mode active*: The movement detector remains switched off until the detector is switched on manually or manual mode is deactivated.

Note

The movement detector is inactive in manual mode and to switch it on or off is only possible only via the external push-button. In automatic mode the switch-on via the external push-button simulates a movement.

11.9.3 Px: Activate test mode

Number	Name	Object function	Data type
14 | 32 | 50 | 66	Px: Activate test mode	Input	1.001 switch

The test mode is activated via this object (1 = activated, 0 = deactivated). It is automatically deactivated after 10 minutes.

11.9.4 Px: Brightness reduced according to switch-off delay

Number	Name	Object function	Data type
16 | 34 | 52 | 68	Px: Brightness reduced according to switch-off delay	Input	7.005 time (s)

If no movement is detected after the switch-off delay has expired, the function enters the programmed switch-off delay and then switches off. The switch-off delay can be reprogrammed at all times via this object from a different control element without the aid of ETS. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.10 Communication objects — Presence detector — Slave

11.10.1 Px: Enable movement

Number	Name	Object function	Data type
1	19	37	53	Px: Enable movement		1.001 switch

The detector can be blocked or enabled via the object. Enabling has priority over all other objects.

11.10.2 Px: Actuator status

Number	Name	Object function	Data type
4	22	40	56	Px: Actuator status		1.001 switch

Actuators controlled by the detector can send their status to this input (1 bit). Upon the receipt of an Off telegram on the object the detection of movement is suppressed for the specified pause time and the switch-off delay is reset.

11.10.3 Px: Detection independent of brightness

Number	Name	Object function	Data type
5	23	41	57	Px: Detection independent of brightness		1.001 switch

If a 1 is received on this object, the detector switches at every movement independent of brightness. However, if a 0 is received, the detector switches on only when the brightness drops below the programmed brightness-value threshold and during movement.

11.10.4 Px: External brightness

Number	Name	Object function	Data type
6	24	42	58	Px: External brightness		9.* 2-byte float value

The brightness value of an external brightness sensor is sent to this object.

11.10.5 Px: External brightness-value threshold

Number	Name	Object function	Data type
7	25	43	59	Px: External brightness-value threshold		9.* 2-byte float value

The external brightness-value threshold can be adjusted via this object. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.10.6 Internal brightness-value threshold

Number	Name	Object function	Data type
8 | 26 | 44 | 60	Internal brightness-value threshold		9.* 2-byte float value

The internal brightness-value threshold can be adjusted via this object. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.10.7 Px: Movement (slave)

Number	Name	Object function	Data type
11 | 29 | 47 | 63	Px: Movement (slave)		1.001 switch

To retrigger the master, this object sends (Default: independent of brightness) a 1 telegram.

11.11 Communication objects — Presence detector — Monitoring

11.11.1 Px: Enable movement

Number	Name	Object function	Data type
1	19	37	53	Px: Enable movement	Input	1.001 switch

The detector can be blocked or enabled via the object. Enabling has priority over all other objects.

11.11.2 Px: Monitoring

Number	Name	Object function	Data type
15	33	51	67	Px: Monitoring	Output	1.001 switch

The programmed value is sent to the actuator via the output during movement and after expiry of the switch-off delay (2 seconds).

11.12 Communication objects — Presence detector — Constant light switch

11.12.1 P1: Output 1

Number	Name	Object function	Data type
	P1: Output 1		1.001 switch
			5.001 percentage (0..100%)
			5.010 counter pulses (0..255)
			18.001 scene control
			20.102 HAVC mode
			9.* 2-byte float value

The parameterized value during movement is sent to the actuator via the output when the parameterized brightness threshold including the hysteresis is exceeded or falls short. When output 2 is active, output 1 is to activated the light row with the largest distance to the window and output 2 with the smallest distance to the window.

11.12.2 Px: Output 2

Number	Name	Object function	Data type
	Px: Output 2		1.001 switch
			5.001 percentage (0..100%)
			5.010 counter pulses (0..255)
			18.001 scene control
			20.102 HAVC mode
			9.* 2-byte float value

The parameterized value during movement is sent to the actuator via the output when the parameterized brightness threshold including the hysteresis is exceeded or falls short. When output 2 is active, output 1 is to activated the light row with the largest distance to the window and output 2 with the smallest distance to the window.

11.12.3 Px: Automatic / manual off

Number	Name	Object function	Data type
	Px: Automatic / manual off		1.001 switch

The control can be activated (automatic) or deactivated (manual) via the object. If the object is connected to a control element, the device is switched off with a 0 and the control is deactivated.

11.12.4 Px: slave

Number	Name	Object function	Data type
	Px: slave		1.001 switch

The constant light switch can be switched on with a 1 from a different movement or presence detector via the object.

11.12.5 Px: External brightness

Number	Name	Object function	Data type
	Px: External brightness		9.* 2-byte float value

Via this object it is possible to link an external value from a different brightness sensor with the constant light switch.

11.12.6 Px: Enable presence

Number	Name	Object function	Data type
	Px: Enable presence		1.001 switch

The constant light switch can be blocked or enabled via the object. Enabling has priority over all other objects.

11.12.7 Px: Switch-off delay

Number	Name	Object function	Data type
	Px: Switch-off delay		7.005 time (s)

If no movement is detected, the function enters the programmed switch-off and then switches off. The switch-off delay can be reprogrammed at all times via this object from a different control element without the aid of ETS. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.12.8 Px: Brightness-value threshold

Number	Name	Object function	Data type
	Px: Brightness-value threshold		9.* 2-byte float value

This communication object can be used to specify values from outside. This value is used as the new switching threshold. The current switching threshold can be read via this communication object. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.12.9 Px: Saving brightness-value threshold

Number	Name	Object function	Data type
	Px: Saving brightness-value threshold		1.001 switch

If value = 1 is sent on this communication object, the current measured brightness value is saved as the new switching threshold of the control.

11.12.10 Px: Actual brightness

Number	Name	Object function	Data type
	Px: Actual brightness		9.* 2-byte float value

The current (filtered) brightness value is made available via the "Actual brightness" communication object under consideration of the daylight and artificial light correction.

11.12.11 Px: Status of control

Number	Name	Object function	Data type
	Px: Status of control		1.001 switch

The object indicates the status of the control, as to whether the control is active (value = 1) or inactive (value = 0).

11.13 Communication objects — Presence detector — Constant light controller

11.13.1 Px: Output 1

Number	Name	Object function	Data type
1 | 19	Px: Output 1	Output	5.001 percentage (0..100%)
			5.010 counter pulses (0..255)

The respective control value is sent to the actuator via the output. When output 2 is active, output 1 is to activated the light row with the largest distance to the window and output 2 with the smallest distance to the window.

11.13.2 Px: Output 2

Number	Name	Object function	Data type
2 | 20	Px: Output 2	Output	5.001 percentage (0..100%)
			5.010 counter pulses (0..255)

The respective control value is sent to the actuator via the output. When output 2 is active, output 1 is to activate the light row with the largest distance to the window and output 2 with the smallest distance to the window.

11.13.3 Px: Automatic / manual off

Number	Name	Object function	Data type
3 | 21	Px: Automatic / manual off	Input	1.001 switch

The control can be activated (automatic) or deactivated (manual) via the object. If the object is connected to a control element, the control is deactivated with a 0 and activated with a 1. (0 = manual off, 1 = automatic).

11.13.4 Px: Relative dimming (dimmer)

Number	Name	Object function	Data type
4 | 22	Px: Relative dimming (dimmer)	Input	3.007 dimming control

The object can be connected to a control element. This makes it possible to dim the lights brighter / darker in the room. The constant light controller is deactivated.

11.13.5 Px: Value (dimmer)

Number	Name	Object function	Data type
5 | 23	Px: Value (dimmer)	Input	5.001 percentage (0..100%)

The object can be connected to a value sender. This makes it possible to regulate the lighting in the room manually. The constant light controller is deactivated.

11.13.6 Px: slave

Number	Name	Object function	Data type
6 | 24	Px: slave	Input	1.001 switch

The constant light controller can be switched on with a 1 from a different movement or presence detector via the object.

11.13.7 Px: External brightness

Number	Name	Object function	Data type
7 | 25	Px: External brightness	Input	9.* 2-byte float value

Via this object it is possible to link an external value from a different external brightness sensor with the constant light controller. The internal brightness sensor is inactive for the constant light controller.

11.13.8 Px: Enable presence

Number	Name	Object function	Data type
8 | 26	Px: Enable presence	Input	1.001 switch

The constant light controller can be blocked or enabled via the object. Enabling has priority over all other objects.

11.13.9 Px: Switch-off delay

Number	Name	Object function	Data type
10 | 28	Px: Switch-off delay	Input	7.005 time (s)

If no movement is detected, the function enters the programmed switch-off and then switches off. The switch-off delay can be reprogrammed at all times via this object from a different control element without the aid of ETS. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.13.10 Px: Setpoint brightness

Number	Name	Object function	Data type
11 | 29	Px: Setpoint brightness	Input / output	9.* 2-byte float value

This communication object can be used to specify values from outside. This value is used as the new setpoint. The current setpoint can be read via this communication object. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.13.11 Px: Saving setpoint brightness

Number	Name	Object function	Data type
12 | 30	Px: Saving setpoint brightness	Input	1.001 switch

The desired brightness value is set with a control element via communication objects automatic / manual off, relative dimming (dimmer) and / or value (dimmer). If, for example, the luxmeter shows the value 500 lx, this brightness value with the sending of a 1 will be stored on this communication object as new setpoint of the control. Note: When setting the desired brightness, e.g. 500 lx, the lamp's light-up time is to be taken into account.

11.13.12 Px: Actual brightness

Number	Name	Object function	Data type
13 | 31	Px: Actual brightness	Output	9.* 2-byte float value

The current (filtered and corrected with daylight and artificial light correction) brightness value is made available via the "Actual brightness" communication object.

11.13.13 Px: Move/adjust blind

Number	Name	Object function	Data type
14 | 32	Px: Move/adjust blind	Input	1.008 up/down

The object is connected with the move command of the control element. When a value 1 (moving up) or 0 (moving down) is received, the parameters set under "Control parameters for blind movement" become active. The switch mode is deactivated after a programmed time and the normal control algorithm is reactivated.

11.13.14 Px: Move blind into position

Number	Name	Object function	Data type
15 | 33	Px: Move blind into position	Input	5.001 percentage (0..100%)

The object is connected with a 1-byte position command of the control element / actuator. When a value is received, the parameters set under "Control parameters for blind movement" become active. The switch mode is deactivated after a programmed time and the normal control algorithm is reactivated.

11.13.15 Px: Brightness reduced according to switch-off delay

Number	Name	Object function	Data type
16 | 34	Px: Brightness reduced according to switch-off delay	Input	7.005 time (s)

If no movement is detected after the switch-off delay has expired, the function enters the programmed switch-off delay and then switches off. The switch-off delay can be reprogrammed at all times via this object from a different control element without the aid of ETS. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.13.16 Px: Status of control

Number	Name	Object function	Data type
17 | 35	Px: Status of control	Output	1.001 switch

The object indicates the status of the control, as to whether the control is active (value = 1) or inactive (value = 0).

11.13.17 Px: Brightness calibration

Number	Name	Object function	Data type
18 | 36	Px: Brightness calibration	Input / output	1.001 switch

The calibration of the lamps can be started with value = 1 of this communication object. The lamps are then switched on with 100% and then dimmed darker in steps of 10%. The detector then knows what the dimming curves of the lamps look like. This object sends value = 1 when the calibration has been completed. If an error occurs during calibration, this object sends value = 0.

11.14 Communication objects — Presence detector — HVAC

11.14.1 P3: HVAC

Number	Name	Object function	Data type
37	P3: HVAC	Output	1.001 switch
			5.001 percentage (0..100%)
			5.010 counter pulses (0..255)
			18.001 scene control
			20.102 HAVC mode
			9.* 2-byte float value

The value for switching on is sent to the actuator via the output during movement and after expiry of the switch-on delay.

The value for switch-off is sent to the actuator after expiry of the switch-off delay.

11.14.2 P 3: Slave

Number	Name	Object function	Data type
38	P 3: Slave	Input	1.001 switch

The constant light controller can be switched on with a 1 from a different movement or presence detector via the object.

11.14.3 P3: Enable HVAC

Number	Name	Object function	Data type
39	P3: Enable HVAC	Input	1.001 switch

The detector can be blocked or enabled via the object. Enabling has priority over all other objects.

11.14.4 P3: Switch-off delay

Number	Name	Object function	Data type
40	P3: Switch-off delay	Input	7.005 time (s)

If no movement is detected, the function enters the programmed switch-off and then switches off. The switch-off delay can be reprogrammed at all times via this object from a different control element without the aid of ETS. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.14.5 P3: Switch-on delay

Number	Name	Object function	Data type
41	P3: Switch-on delay	Input	7.005 time (s)

The switch-on delay can be reprogrammed at all times via this object from a different control element without the aid of ETS. If this value is not to be overwritten during each download, the parameter "Overwrite setting during download" is to be programmed accordingly.

11.14.6 P3: Force-position

Number	Name	Object function	Data type
42	P3: Force-position	Input	1.001 switch

By means of function force-position the control function is deactivated (value = 1) and the device switches to a parameterized value until the force-position is deactivated again (value = 0). The force-position has a lower priority than enable.

11.15 Communication objects — Presence detector — Brightness detection

11.15.1 BR: Brightness

Number	Name	Object function	Data type
69	BR: Brightness	Output	9.* 2-byte float value

This object sends the brightness value calibrated via the daylight correction.

11.15.2 BR: Alarm

Number	Name	Object function	Data type
70	BR: Alarm	Output	1.005 alarm

If a brightness value is not received within the programmed time, the object sends value = 1.

11.15.3 BR: External brightness 1

Number	Name	Object function	Data type
71	BR: External brightness 1	Input	9.* 2-byte float value

Via this object it is possible to combine an external value from a different brightness sensor with the internal brightness.

11.15.4 BR: External brightness 2

Number	Name	Object function	Data type
72	BR: External brightness 2	Input	9.* 2-byte float value

Via this object it is possible to combine an external value from a different brightness sensor with the internal brightness.

11.15.5 BR: Brightness adjustment (daylight)

Number	Name	Object function	Data type
73	BR: Brightness adjustment (daylight)	Input	9.* 2-byte float value

The measured value for daylight is sent to this object during the brightness adjustment.

11.15.6 BR: Brightness adjustment (output 1)

Number	Name	Object function	Data type
74	BR: Brightness adjustment (output 1)	Input	9.* 2-byte float value

The measured value for output 1 (light row 1) is sent to this object during the brightness adjustment.

11.15.7 BR: Brightness adjustment (output 2)

Number	Name	Object function	Data type
75	BR: Brightness adjustment (output 2)	Input	9.* 2-byte float value

The measured value for output 2 (light row 2) is sent to this object during the brightness adjustment.

11.15.8 BR: LED

Number	Name	Object function	Data type
76	BR: LED	Input	1.001 switch

The LED located in the device can be switched on and off via this object (1= switch-on, 0 = switch-off).

11.16 Communication objects - Object RTC

11.16.1 Heating control value

Number	Name	Object function	Data type
1	Heating control value (control value heating/cooling)	Output	1. Switching 2. Percent (0 to 100%)

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.

2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

11.16.2 Additional Heating Stage

Number	Name	Object function	Data type
2	Additional heating stage (additional stage heating/cooling)	Output	1. Switching 2. Percent (0 to 100%)

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.

2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

Note

The additional stage can also be used as a parallel second heating stage. To do this, set the parameter for the temperature difference to the basic stage to 0°C.

11.16.3 Cooling control value

Number	Name	Object function	Data type
3	Cooling control value	Output	1. Switching 2. Percent (0 to 100%)

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.

2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

11.16.4 Additional cooling stage

Number	Name	Object function	Data type
4	Additional cooling stage	Output	1. Switching 2. Percent (0 to 100%)

Description:

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.

2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

Note

The additional stage can also be used as a parallel second cooling stage. To do this, set the parameter for the temperature difference to the basic stage to 0°C.

11.16.5 Control On/Off

Number	Name	Object function	Data type
5	1. Control On/Off	Output	Switching
	2. Control On/Off (master)	Output	Switching
	3. Control On/Off (slave)	Output	Switching

If a 0 telegram is received, the controller switches to OFF mode and regulates the temperature to the setpoint value for frost/heat protection. When the controller is switched on again, the remaining operating mode objects are queried in order to determine the new operating mode.

Note

About item 2:

During active ON/OFF controller function in master/slave mode the ON/OFF (master) control object is to be linked with this object.

About item 3:

During active ON/OFF controller function in master/slave mode the ON/OFF (slave) control object is to be linked with this object.

11.16.6 Actual temperature

Number	Name	Object function	Data type
6	1. Actual temperature	Output	2-byte floating point value
	2. Actual temperature weighted	Output	2-byte floating point value

1. The object outputs the measured (room) temperature, adjusted by the calibration value.

2. The object outputs the temperature value which is calculated from the recording and weighting of internal and up to two external temperatures.

Note

An external temperature measurement for room control may be practical for larger rooms and/or floor heating.

11.16.7 External actual temperature

Number	Name	Object function	Data type
7	External actual temperature	Input	2-byte floating point value

2-byte communication object for reading an external temperature value provided via the KNX bus.

11.16.8 External actual temperature 2

Number	Name	Object function	Data type
8	External actual temperature 2	Input	2-byte floating point value

2-byte communication object for reading an additional external temperature value provided via the KNX bus.

11.16.9 Fault, actual temperature

Number	Name	Object function	Data type
9	1. Fault, actual temperature	Output	Switching
	2. Fault, actual temperature (master)	Output	Switching
	3. Fault, actual temperature (slave)	Output	Switching

If one of the parameterized input temperatures is unavailable to the controller for a period longer than the monitoring time, the controller enters the error mode. The error mode is sent to the bus as the value 1.

Note

About item 2:

This object must be connected to the "Fault, actual temperature (slave)" object in order to indicate the error mode.

About item 3:

This object must be connected to the "Fault, actual temperature (slave) object in order to indicate the error mode.

11.16.10 Local actual temperature

Number	Name	Object function	Data type
10	Local actual temperature	Output	Switching

Not visible!

11.16.11 Current setpoint

Number	Name	Object function	Data type
11	Current setpoint	Output	2-byte floating point value

The object outputs the current setpoint temperature resulting from the following: the parameterized setpoint temperature of the current operation type and operating mode, the manual setpoint temperature adjustment, a change in the base setpoint temperature via the base setpoint value object. This is purely a transmitting object.

11.16.12 Operating mode

Number	Name	Object function	Data type
12	1. Operating mode	Input / output	HVAC mode
	2. Operating mode (master)	Input / output	HVAC mode
	3. Operating mode (slave)	Input / output	HVAC mode

The "Operating mode" object receives, as a 1-byte value, the operating mode that is to be set. Here value 1 means "Comfort", value 2 "Standby", value 3 "Economy" and value 4 "Frost/heat protection".

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note

Item 2:

If the master/slave mode is the active operating mode, the Operating mode (slave) object must be connected to this object.

Item 3:

Bei aktiven Betriebsmodus im Master-/Slavebetrieb ist das Objekt Betriebsmodus (Master) mit diesem Objekt zu verbinden.

11.16.13 Superimposed operating mode

Number	Name	Object function	Data type
13	1. Superimposed operating mode	Input	HVAC mode
	2. Superimposed operating mode (master/slave)	Input	HVAC mode

The "Superimposed operating mode" object receives the operating mode that is to be set as 1-byte value. Here value 0 means "Superimposition inactive", value 1 "Comfort", value 2 "Standby", value 3 "Economy" and value 4 "Frost/heat protection".

In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note

Item 2:

If the master/slave mode is active, the "Superimposed operating mode" object of the master and the slave must be connected to the group address of the transmitter.

11.16.14 Window contact

Number	Name	Object function	Data type
14	1. Window contact	Input	Switching
	2. Window contact (master/slave)	Input	Switching

The object uses the value 1 to signal an open window to the controller. If no other object with a higher priority is present, then the "Window contact" message causes the controller to be set to the setpoint value for frost/heat protection. In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note

Item 2:

If the master/slave mode is active, the "Window contact (master/slave)" object of the master and the slave must be connected to the group address of the transmitter.

11.16.15 Presence watchdog

Number	Name	Object function	Data type
15	1. Presence detector	Input	Switching
	2. Presence detector (master/slave)	Input	Switching

This object transmits the value 1 to the controller to signal that there are people in the room. If not other object with a higher priority is present, then the "Presence detector" causes the controller to be set to the comfort setpoint value. In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note

Item 2:

If the master/slave mode is active, the "Presence detector (master/slave)" object of the master and the slave must be connected to the group address of the transmitter.

11.16.16 Status heating

Number	Name	Object function	Data type
16	Status heating	Output	Switching

The room temperature controller sends an ON telegram via the "Status heating" object as soon as it is active in the heating mode. If the controller is in the inactive zone between heating and cooling or is in cooling mode, the room temperature controller transmits an OFF telegram on the "Status heating" object.

11.16.17 Status cooling

Number	Name	Object function	Data type
17	Status cooling	Output	Switching

The room temperature controller sends an ON telegram via the "Status cooling" object as soon as it is active in the cooling mode. If the controller is in the inactive zone between heating and cooling or is in heating mode, the room temperature controller transmits an OFF telegram on the "Status cooling" object.

11.16.18 Basic load

Number	Name	Object function	Data type
16	Basic load	Input / output	Switching

This object uses the value 1 to activate a parameterized base load, i.e. a minimum control value greater than zero. The value 0 deactivates the base load. When the base load is deactivated, the control value can be lowered all the way to zero if necessary when the setpoint temperature is reached, despite the minimum value set in the parameter.

Note

Deactivating the basic load for a floor heating system is always useful in the summer, since it saves heating energy.

11.16.19 Switchover heating/cooling

Number	Name	Object function	Data type
17	Switchover heating/cooling	Input / output	Switching

1. Automatic: If the switchover between heating and cooling is performed automatically by the room temperature controller, then this object is used to provide information on the current heating (0) or cooling (1) status to the KNX bus. It is a transmitting object.

2. Only via object: The switchover between heating and cooling on the room temperature controller occurs solely via this 1-bit communication object. The value (0) activates the heating mode, and the value (1) activates the cooling mode. This is a receiving object.

3. Manual or via object: The switchover between heating and cooling on the room temperature controller occurs by user interaction or via the 1-bit communication object. The information on the respective heating (0) or cooling (1) status is available to the KNX bus. This is a receiving and sending object.

11.16.20 Fan coil manual

Number	Name	Object function	Data type
18	1. Fan coil manual	Output	Switching
	2. Fan coil manual (master)	Output	Switching
	3. Fan coil manual (slave)	Output	Switching

Using this 1-bit communication object, a fan coil actuator can be placed in manual fan mode or returned to automatic fan mode. In the automatic fan mode of the fan coil actuator, the fan's rotational speed is defined in the fan coil actuator using the control value. In manual fan operation, the user of the room temperature controller can set the fan's rotational speed as needed. This setting will remain active until it is reset. The fan speed level 0 is an exception: to avoid damage to the building, automatic mode is activated again 18 hours after fan speed level 0 is selected.

Note

Item 2:

If fan coil manual is active in the master/slave mode, the fan coil manual (slave) object must be connected to this object.

Item 3:

If fan coil manual is active in the master/slave mode, the fan coil manual (master) object must be connected to this object.

11.16.21 Fan coil step

Number	Name	Object function	Data type
19	1. Fan coil step	Output	2-byte floating point value
	2. Fan coil step (master)	Output	2-byte floating point value
	3. Fan coil step (slave)	Output	2-byte floating point value

The fan speed level in the fan coil actuator is selected via the 1-byte communication object. Whether the fan speed level information is transmitted in manual or also in automatic fan speed level mode can be set. The formats that can be selected for the 1-byte communication object are the fan speed level (0..5) or a percentage value (0..100%) which is calculated back to a fan speed level in the fan coil actuator.

Note

Item 2:

If fan coil step is active in the master/slave mode, the fan coil step (slave) object must be connected to this object.

Item 3:

If fan coil step is active in the master/slave mode, the fan coil step (slave) object must be connected to this object.

11.16.22 Fan coil step status

Number	Name	Object function	Data type
20	Fan coil step status	Input / output	2-byte floating point value

Using the "Fan coil step status" object, the room temperature controller receives the current fan speed level of the fan coil actuator.

11.16.23 Fan speed level 1

Number	Name	Object function	Data type
21	Fan speed level 1	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

11.16.24 Fan speed level 2

Number	Name	Object function	Data type
22	Fan speed level 2	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

11.16.25 Fan speed level 3

Number	Name	Object function	Data type
23	Fan speed level 3	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

11.16.26 Fan speed level 4

Number	Name	Object function	Data type
24	Fan speed level 4	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

11.16.27 Fan speed level 5

Number	Name	Object function	Data type
25	Fan speed level 5	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

11.16.28 Basic set value

Number	Name	Object function	Data type
26	Basic set value	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the parameterized basic setpoint value via the KNX bus. Parameters can be used to define whether the value received by this object is interpreted as "Setpoint heating comfort", "Setpoint cooling comfort" or an average between heating and cooling comfort.

11.16.29 Resetting manual set values

Number	Name	Object function	Data type
27	Resetting manual set values	Input	Switching

This 1-bit communication object is used to reset the manual setpoint adjustment that was set on the device.

11.16.30 Dew point alarm

Number	Name	Object function	Data type
28	Dew point alarm	Input	Switching

This 1-bit communication object is used to place the controller in the dew point alarm mode. This causes the current setpoint value to be set to the heat protection setpoint value in order to keep the structure from being damaged by dew.

Note

This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value (0). When an alarm is active, manual operation of the controller is blocked. This information is indicated by a corresponding icon on the control unit.

11.16.31 Condensate water alarm

Number	Name	Object function	Data type
29	1. Condensate water alarm	Input	Switching
	2. Condensate water alarm (master/slave)	Input	Switching

This 1-bit communication object is used to place the controller in the condensation alarm mode. This causes the current setpoint value to be set to the heat protection setpoint value in order to keep the structure from being damaged by an overflowing condensation container.

Note

Item 1:

This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value (0). When an alarm is active, manual operation of the controller is blocked. This information is indicated by a corresponding icon on the device.

Item 2:

This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value (0). When an alarm is active, manual operation of the controller is blocked. This information is indicated by a corresponding icon on the device.

- When the master/slave mode is active, the condensate water alarm (master/slave) objects must be connected to the alarm transmitter.

11.16.32 Outside temperature for summer compensation

Number	Name	Object function	Data type
30	Outside temperature for summer compensation	Input	2-byte floating point value

In order to save energy, and to ensure that the temperature difference occurring during entry and exit of a climate-controlled building stays within comfortable limits, the reduction of room temperature by cooling devices should be limited as a function of the outside temperature (summer compensation). This, for example, prevents the air-conditioning system from further reducing the room temperature to 24°C with an outside temperature of 35°C.

This function can only be used with an outside temperature sensor. This 2-byte communication object must then be used to provide the controller with the current outside temperature.

11.16.33 Summer compensation active

Number	Name	Object function	Data type
31	Summer compensation active	Output	Switching

This 1-bit communication object is used to indicate via the bus whether the summer compensation is active (1) or inactive (0). If it is active, the setpoint value configured for the cooling mode is increased by the summer compensation function. A decrease of the cooling mode setpoint temperature below the value calculated by the parameterized summer compensation function is not possible. An increase of the setpoint temperature for the cooling mode is always possible.

11.16.34 Set value reached

Number	Name	Object function	Data type
32	Set value reached	Output	Switching

When the setpoint set on the device in comfort mode has been reached it is sent by means of value (1) as information to the KNX bus via the 1-bit communication object. The function is started by activating the comfort or presence mode. If the reaching of the setpoint temperature is interfered with by the preselection of a different operating mode or by adjustment to a new setpoint, value (0) is sent.

11.16.35 Fahrenheit

Number	Name	Object function	Data type
33	1. Fahrenheit	Input / output	Switching
	2. Fahrenheit (master)	Input / output	Switching
	3. Fahrenheit (slave)	Input / output	Switching

The temperature indication on the display can be changed from Celsius (°C) to Fahrenheit (°F). The conversion from Celsius to Fahrenheit always takes place in the display unit, since only Celsius values are sent over the KNX bus. The value (0) results in a temperature indication in Celsius, while the value (1) results in Fahrenheit.

Note

Item 2:

If the Fahrenheit object is active in the master/slave mode, the Fahrenheit (slave) object must be connected to this object.

Item 3:

If the Fahrenheit object is active in the master/slave mode, the Fahrenheit (master) object must be connected to this object.

11.16.36 Display backlighting

Number	Name	Object function	Data type
34	Display backlighting	Input / output	Switching

The display backlighting is activated with value (1) and deactivated with value (0) via the 1-bit communication object.

Note

This function is mainly used in rooms where backlighting during the night is considered to be a disturbing factor, such as in hotel rooms and bedrooms.

11.16.37 On/off request

Number	Name	Object function	Data type
35	1. On/off request (master)	Input	Switching
	2. On/off request (slave)	Input	Switching

This 1-bit communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.38 Setpoint display

Number	Name	Object function	Data type
36	1. Setpoint display (master)	Input / output	2-byte floating point value
	2. Setpoint display (slave)	Input / output	2-byte floating point value

This 2-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.39 Request setpoint (slave)

Number	Name	Object function	Data type
37	1. Request setpoint (master)	Input	Percent (0..100%)
	2. Request setpoint (slave)	Input	Percent (0..100%)

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.40 Confirm setpoint (slave)

Number	Name	Object function	Data type
38	1. Confirm setpoint (master)	Input / output	Percent (0..100%)
	2. Confirm setpoint (slave)	Input / output	Percent (0..100%)

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.41 Heating/cooling request

Number	Name	Object function	Data type
39	1. Heating/cooling request (master)	Input	Switching
	2. Heating/cooling request (slave)	Input	Switching

This 1-bit communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.42 Request fan speed level manual

Number	Name	Object function	Data type
40	1. Request fan speed level manual (master)	Input	Switching
	2. Request fan speed level manual (slave)	Input	Switching

This 1-bit communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.43 Request fan speed level

Number	Name	Object function	Data type
41	1. Request fan speed level (master)	Input	Percent (0..100%)
	2. Request fan speed level (slave)	Input	Percent (0..100%)

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.44 Confirm fan speed level

Number	Name	Object function	Data type
42	1. Confirm fan speed level (master)	Input / output	Percent (0..100%)
	2. Confirm fan speed level (slave)	Input / output	Percent (0..100%)

This 1-byte communication object must be connected to the respective slave communication object in order to synchronise the devices in the master/slave configuration.

11.16.45 Controller status RHCC

Number	Name	Object function	Data type
43	Controller status RHCC	Output	2-byte floating point value

This communication object outputs the heating/cooling operation type, active/inactive operation, the frost and heat alarm, and the error (actual temperature reading failure) in accordance with the specification for the RHCC (Room Heating Cooling Controller) status.

11.16.46 Controller status HVAC

Number	Name	Object function	Data type
44	1. Controller status HVAC	Output	Percent (0..100%)
	2. Controller status HVAC (master)	Output	Percent (0..100%)
	3. Controller status HVAC (slave)	Output	Percent (0..100%)

This communication object outputs the current operating mode, the heating/cooling mode, active/inactive mode, the frost alarm and the dew point alarm in accordance with the specification for the HVAC (Heating Ventilation Air Conditioning) status.

Note

Item 2:

If the master/slave mode is active, the HVAC status (slave) object must be connected to this object.

Item 3:

If the master/slave mode is active, the HVAC status (master) object must be connected to this object.

11.16.47 Commissioned

Number	Name	Object function	Data type
45	Commissioned	Output	Switching

The controller uses this 1-bit communication object to send a cyclical "Sign of life". This signal can be used to monitor the device, e.g. by means of a visualisation.

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