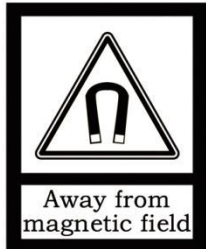# K-BUS® Presence Sensor with Constant Lighting_V1.1

CSBPC-02/00.1

KNX/EIB Home and Building Control System

Attentions

1. **Please keep devices away from strong magnetic field, high temperature, wet environment;**

Away from magnetic field	Away from high-temp	Prevent moisture

2. **Please do not fall the device to the ground or make them get hard impact;**

Handle with care

3. **Please do not use wet cloth or volatile reagent to wipe the device;**

Wipe with care

4. **Please do not disassemble the devices.**

Contents

Chapter 1 Functional description

The device is a presence/motion detector with integrated constant light level control. The device communicates via KNX with actuators or other KNX devices. It is designed for flush mounted installation in ceilings with wall box or clamps (see section 3.3). Owing to its tilting sensor head, the device can be aligned with the required capture area. The main application for the device is automatic control of the lighting on an office workplace.
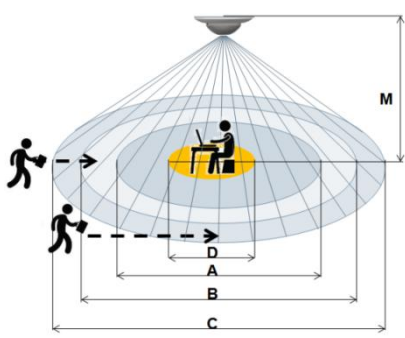
This manual provides detailed technical information about the Presence Sensor with Constant Lighting for users as well as assembly and programming details, and explains how to use the device by the application examples.

The device is connected directly to the bus via the EIB terminal and does not require an additional supply voltage. The physical address assignment and parameter settings can be used with the engineering tool software ETS (version ETS4 or above) with the .knxprod file. **Note: It is best to program the physical address before installing.**

The main functions of the device are summarized as follows:

- **Brightness measuring.**

- **Motion detector and Presence detector, which can be locked or released via object.**

- **The brightness measuring via internal light sensor or KNX, and the internal sensor measuring can be calibrated via object or a correction factor.**

- **Presence detector additional HVAC applications control output, such as heating, ventilating and climate control of the room.**

- **Motion or Presence detector can be integrated control with ambient brightness.**

- **Use as single device or as main detector, respectively secondary detector, to extend the presence detection zone.**

- **Sequence operation for the Motion or Presence detector.**

- **Integrated 2-level light controller (switching).**

- **Integrated constant light level controller (dimming) .**

Chapter 2 Technical Parameter

Power Supply	Bus voltage	21-30V DC, via the KNX bus
	Bus current	approx.10mA
	Bus consumption	approx. 300mW at 30V DC
Presence detection	Type	Passive infrared (PIR)
	Range	Horizontal 360°, vertical approx. 105°, 288 sectors

The detection range is divided in following areas:
A) sitting in working desk height (0.8m)
B) walking straight to the detector
C) walking across the detector
D) Area of the brightness measuring in working desk height (0.8m)
Follow Table shows the maximum reachable diameter in meter of the different areas for different installation heights (M).

M	A	B	C	D
5.0m	-	8.5	14	Ø3.0
4.0m	-	7.5	12	Ø2.3
3.5m	5.5	6.5	10	Ø2.0
3.0m	5	6	8	Ø1.6
2.5m	4.5	5	7	Ø1.2

Brightness measurement	Type	Contrast measurement
	Range	20~1000LUX, the upper limit after calibration is 20000 LUX
	Note :Recommended mounting height for constant light level control: 2.4 m~3.0 m	
Operation/display	Red LED and push button	Assigning the physical address
Connections	EIB/KNX	Bus connection terminal
Protection class	IP20, to EN 60529	
Temperature range	Operation	–5 °C ... 45 °C
	Storage	– 20 °C ... 55 °C
	Transport	– 20 °C ... 70 °C
Ambient condition	Humidity	5~93%,except dewing
CE norm	In accordance with the EMC guideline and the low voltage guideline	
Certification	EIB/KNX - certified	
Mounting	Mounted in wall box or in the ceiling, fixed by the left and right fixing clamps	
Dimensions	Ø 88 mm x 63 mm	
Weight	Approx. 0.07KG	
Housing, Colour	Plastic, Titanium white	

Motion and presence detection supplements:

Due to the physical principal only a movement can be detected. In case of presence detection smaller movements will be detected due to a higher resolution of the optical lens. The specific definition:

-- Movement "One step of a person of 1m"

-- Presence "Horizontal movement of a human hand with 25 cm"

A fingertip or a sitting person without any move cannot be detected with this method.

The detection range also depends on the direction of the movement: Straight to the sensor (radial) is more less than across the sensor.

Chapter 3 Dimension, Operating and Display, Mounting and Connecting

3.1. Dimension
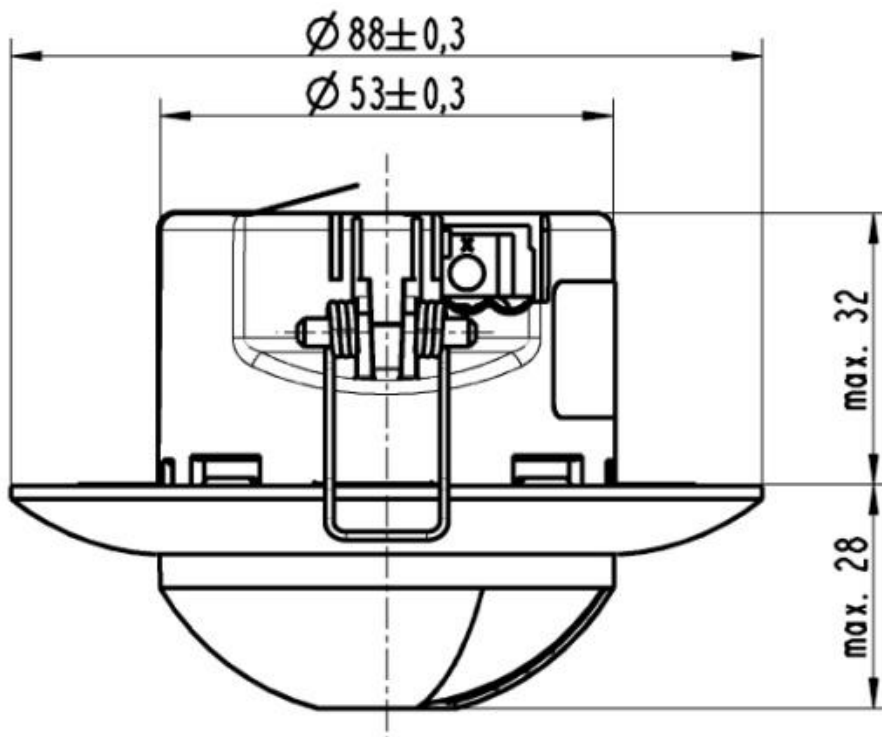
3.2.   Operating and Display
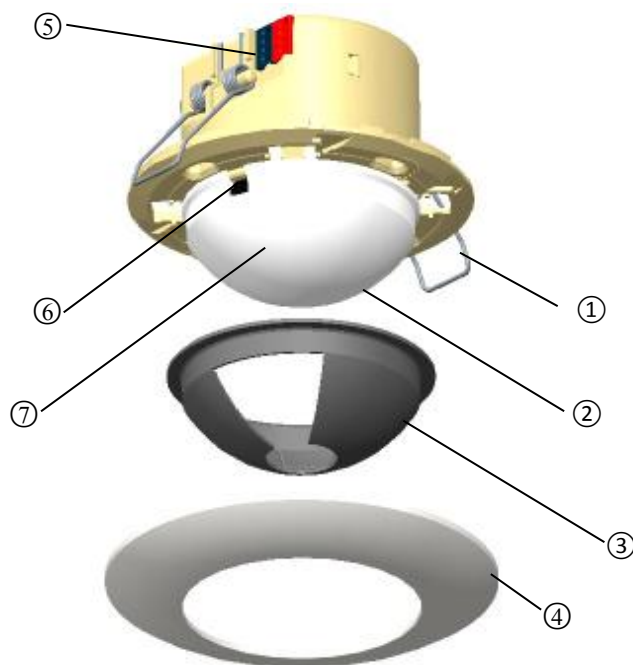
①Fixing clamps

②Detector lens

③Shade

④Design ring

⑤KNX/EIB bus connection terminal

⑥Programming button

⑦Programming LED position

Note: After the device is connected to the bus voltage, the sensor must first "Restart", i.e. the motion sensor will be initialized. (Programming LED flashes briefly with motion).

3.3.   Mounting and Connecting

Safety Note:

• **The device must be mounted and commissioned by an authorized electrician.**

• **When connecting the device, it should be ensured that the device can be isolated.**

• **The device must not be opened.**

• **For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.**

The device is intended for ceiling mounting. Recommended mounting height: 2.4m – 3.0m

There are the following options for this (see Fig.1):

❖ UP mounting (A) in an UP socket with screw fixing

❖ UP mounting (A) with fixing claws in suspended ceiling

❖ AP mounting (B) in the AP housing (see accessories)
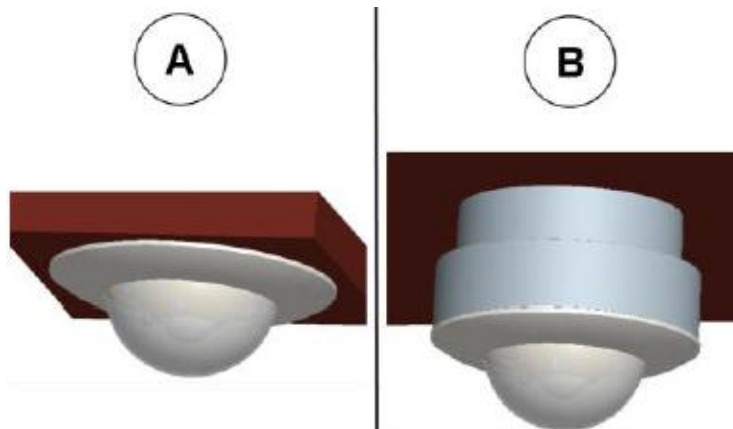
Fig. 1

Connecting the detector (see Fig. 2)

D1 Device

D2 Bus terminal

D2.1 (-) Terminal (grey)

D2.2 (+) Terminal (red)

D2.3 Test contact

D2.4 Bus line wire
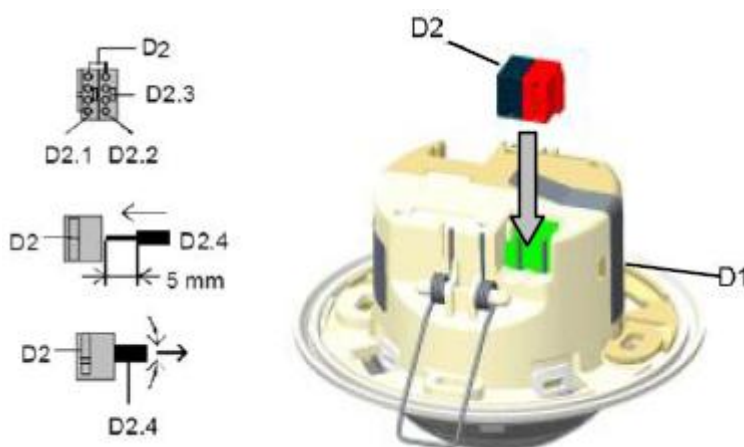
Fig. 2

Connecting:

Plug wires into the bus terminal. Ensure you have stripped the insulation back!

Push the bus terminal on the plug in the device (see Fig. 2)

Disconnecting:

Separate the bus terminal from the device (use a screwdriver if necessary) Separate the wires from the bus terminal by turning.

Installation in UP socket using screws (see Fig. 3)

E1 Device

E2 Socket fixing screws

E3 UP socket Depth: min. 40 mm, Æ 60 mm

The device is secured with fixing screws in the UP socket. The device can be installed offset by 90° with the additional fixing holes.

Note: Fixing clamps must not be mounted!

Fig. 3

Mounting the fixing clamps for mounting the device in suspended ceilings (see Fig. 4)

G1 Device

G2 Fixing clamp

Extend the fixing claws slightly and push over the lugs on the device.
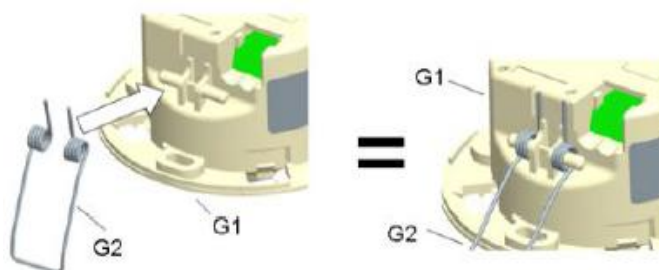
Fig. 4

Installation in suspended ceilings with fixing clamps (see Fig. 5)

F1 Suspended ceiling (max. thickness of the suspended ceiling: 30mm)

F2 Fixing clamps

F3 Device

Press the fixing clamps together (see Fig. 5) and push the device into the opening (Ø 60mm - 65 mm) with the fixing clamps in front.

The fixing clamps hold the device on the ceiling.
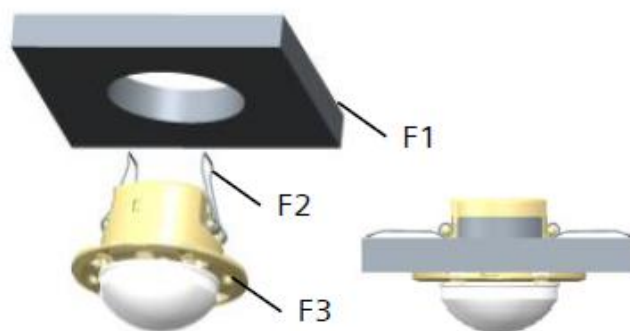
Fig. 5

Caution: When dismounting the device hold it where the two housing parts are joined together. Otherwise, the fixing clamps may hit your fingers.

Cutting the shade (see Fig. 6)

If the detection range of the motion sensor must be reduced, a shade can be used.

The shade is cut out in the wanted sectors with a knife.
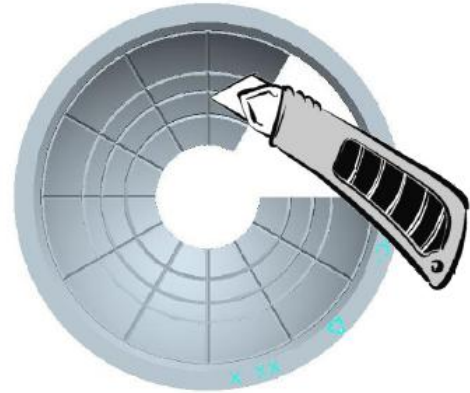
Fig. 6

Caution: Do not cut out the mounted shade! Only cut out the dismounted shade!

Mounting / Dismounting the shade (see Fig. 7)

Put the shade H2 over the lens of the device H1 and fix it with the design ring H3.

Note: The learning button be reached only partly when the shade is mounted.

Mounting the design rings

The design ring H3 is clipped on to the device H1 from below, until the snap lock hooks on the design cover engage on the outer edge of the device with an audible click.

Dismounting the design ring

The design ring is dismounted by pulling downwards. Use a screwdriver to help with this operation.
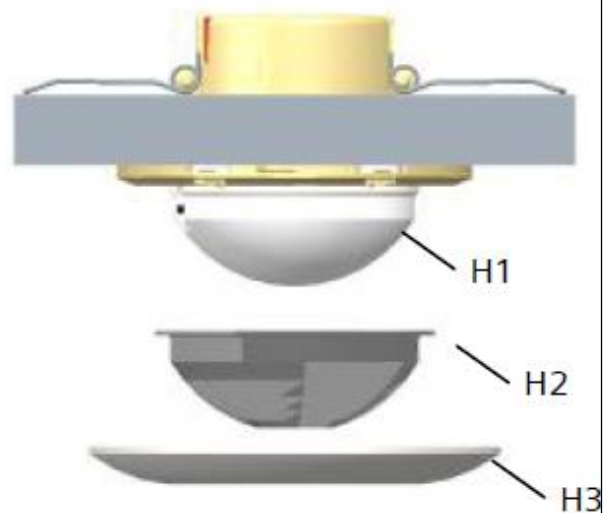
Fig. 7

Caution: Be careful when handling the screwdriver. There is a risk of scratching the ceiling or the design cover. Accordingly, be gentle while working

Mounting site

Brightness measurement in particular

The daylight measurement determines an average brightness value in the room, which can differ from the brightness on the worktop. You should therefore avoid mounting sites with extreme light ratios.

If the detector is fitted near lights with a high proportion of indirect light, the artificial light level at the detector mounting point must not exceed the wanted nominal lighting level in the room. This can be compensated by increasing the separation between the light cone and the detector. For constant lighting control, direct artificial light on the detector should be avoided.

It is recommended to orientate the learning button of the device to the window, if possible. With increasing mounting height the sensitivity of the brightness measuring is reduced. Especially at mounting height > 3.0m a test application on site is recommended.

Presence-motion detection in particular:

Normally, the switching pattern is determined by people in the detector's catchment area.

In exceptional cases, however, it can be switched on inadvertently through "outside factors". Accordingly, potential "sources of interference" should be corrected during planning or before mounting.

Basics:

❖ The PIR - sensor reacts to temperature differences.

❖ The lower the temperatures difference between the ambient temperature and the moving object, the less sensitive the analysis. In other words, moving objects will not then be detected as efficiently and the catchment area is restricted.

Note:

• **There must be an unobstructed line of sight to the person in the catchment area. People behind walls, etc. (including glass) cannot be detected!**

• **Obstacles such as party walls, plants or shelves can limit the catchment area.**

• **Hanging lights cause shadows in the catchment area if they are mounted in the immediate vicinity of the presence detector.**

Interference factors to be avoided:

❖ Rapid temperature changes in the vicinity of the detector, caused by fan heaters being switched on or off, fans, etc., simulate motion.

❖ Lights being switched on or off in the immediate catchment area (mainly incandescent and halogen lamps) simulate motion.

❖ Moving objects such as machines, robots, hanging posters, falling flower petals, hot paper from laser printers, animals, etc.

❖ The mounting site must not be exposed to vibrations or motion.

Chapter 4 Project Design & Application

Application program	Max. number of communication objects	Max. number of group addresses	Max. number of Association addresses
Presence Sensor with Constant Lighting	72	160	200

4.1. Presence / Motion detector

The detector senses the presence of a person or that there is no longer anyone in its detection area. The detector signal can be analyzed via two separate communication channels, termed motion detector and presence detector. The detection range is identical for all channels. Each channel can be locked individually via objects.

4.2. Presence detector (HVAC)

The detector has an additional control output for HVAC applications.

For example, this function can switch systems that are used for heating, ventilating and climate control (HVAC) of the room from "Energy saving mode" in an unused room to "Comfort mode" in an occupied room and back to "Energy saving mode", when the room is again unoccupied.
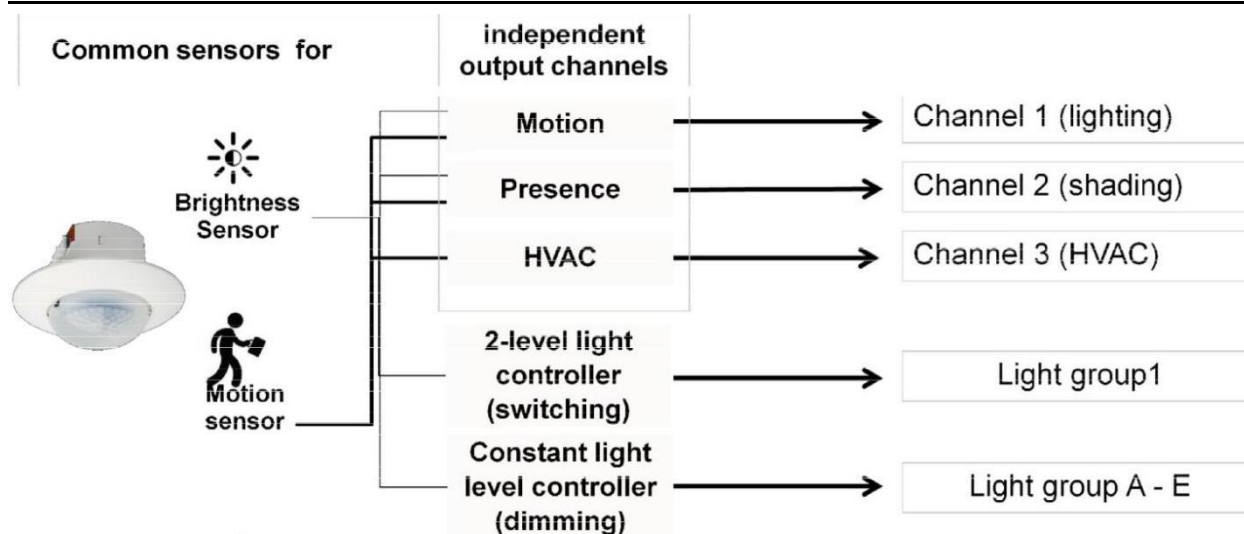
Fig. 1 Three independent configuration detector channels for different applications

4.3. Functionality of the Presence detector / Motion detector / HVAC-detector

For each detector channel 4 communication objects are available, in sum 12 different communication objects. It is possible to send one or two KNX telegrams at the beginning and at the end of a detected presence, according to configuration.

The values of the communication objects are configured for each functional block (motion detector, presence detector, HVAC-detector) via corresponding parameters.
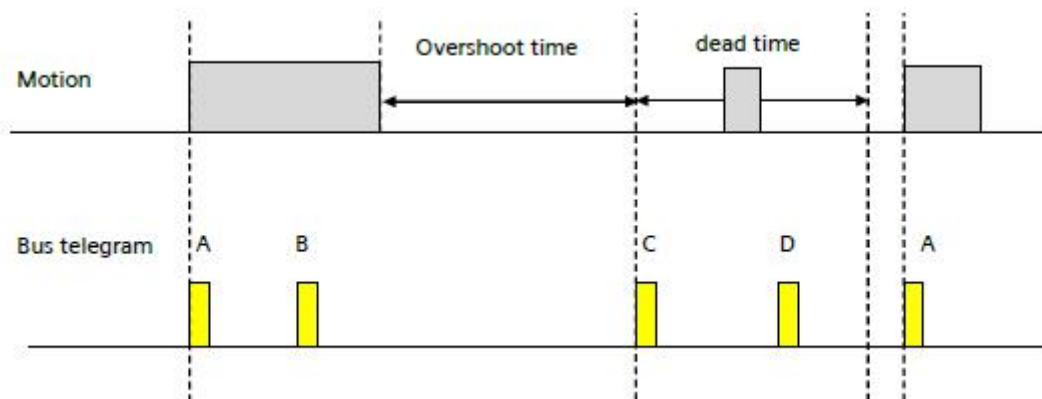
Fig. 2 Flowchart

Each time a presence is detected, the overshoot time is started. Its duration is configurable for each functional block separately. The end of presence is determined by the end of the overshoot time.

The duration of the dead time is also configurable per functional block. It is used to protect the actuators that are connected to the detector. If a presence is detected during the dead time, neither telegrams are sent nor the overshoot time is started.

In the following the telegrams, which are send at the beginning of a presence, are called A and B, the telegrams, which are sent at the end of a presence, are called C and D.

Operating Sequence

After the device has detected a presence, telegram A is sent immediately. If it has been configured to send also a telegram B, then telegram B is sent after the configured time (optionally also cyclically). If there are no motions any more, at the end of the overshoot time telegram C and (if configured) telegram D are sent. Telegram D can also be sent cyclically.

If there are motions during the overshoot time is running, the overshoot time is restarted.

4.4. Use as single device or as main detector, respectively secondary detector

The detector can be operated as an independent device, as the main or secondary detector.

According to the requirement, additional presence detectors can be connected with the "main detector" via KNX as "secondary detectors" to extend the presence detection zone. "Secondary detectors" supply motion information only to the main detector.

4.5. Brightness measuring – adjustable via KNX

The device contains an independent light sensor. The signal measured there is available both at the KNX and internally.

Because the light sensor measures directly, it must be possible to calibrate it for indirect measurement, so that it can be adapted to the different installation sites. Rapid brightness fluctuations are filtered out. The measurement range of the internal light sensor is between 20 and 1000 lux.
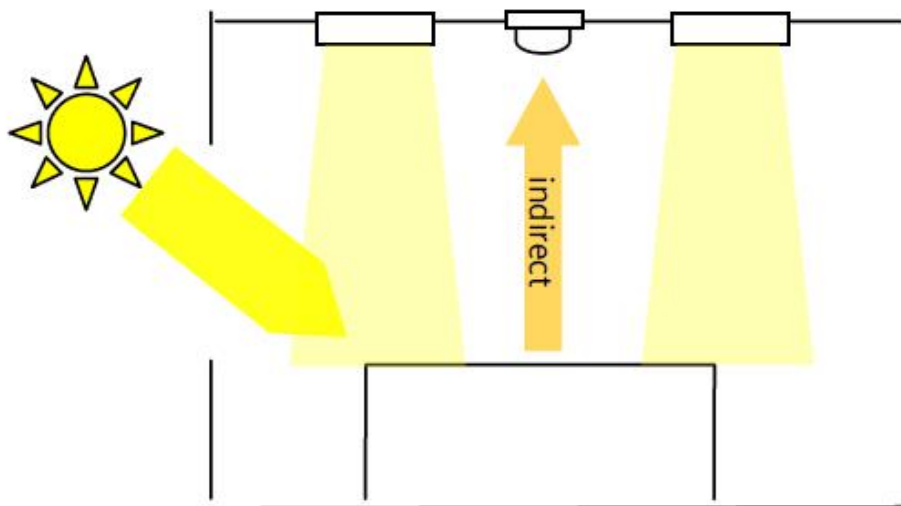
Fig. 3 indirect brightness measuring

The settings determine whether the brightness value computed by the device or a brightness value received from outside is used for the detector's remaining functional blocks.

For indirect brightness measuring a maximal distance of 2.8m is recommended. In case of larger distances the measuring can be realized via a reference area with 2.8m distance.

4.6. Integrated 2-level light control (switching)

If the brightness controller is enabled (automatic mode) the lighting is switched on as soon as the brightness falls below a set lower threshold. The lighting is switched off if the set upper brightness threshold is exceeded. The brightness thresholds are variable either via parameters or via communication objects.

The controller can also be operated semi-automatically by separating into two individual switching objects for exceeding or falling below the threshold. In this way, it can be switched to "Only on" or "Only off."

If the controller receives a switching or dimming command via the associated communication object over KNX, then this is deemed an external override and the controller switches automatic mode off. This change of status is sent simultaneously on the bus via the "Automatic Status" object.

4.7. Integrated constant light level control (dimming)

The luminance of the day light falling through a window into a room decreases in the room with the distance from the window.
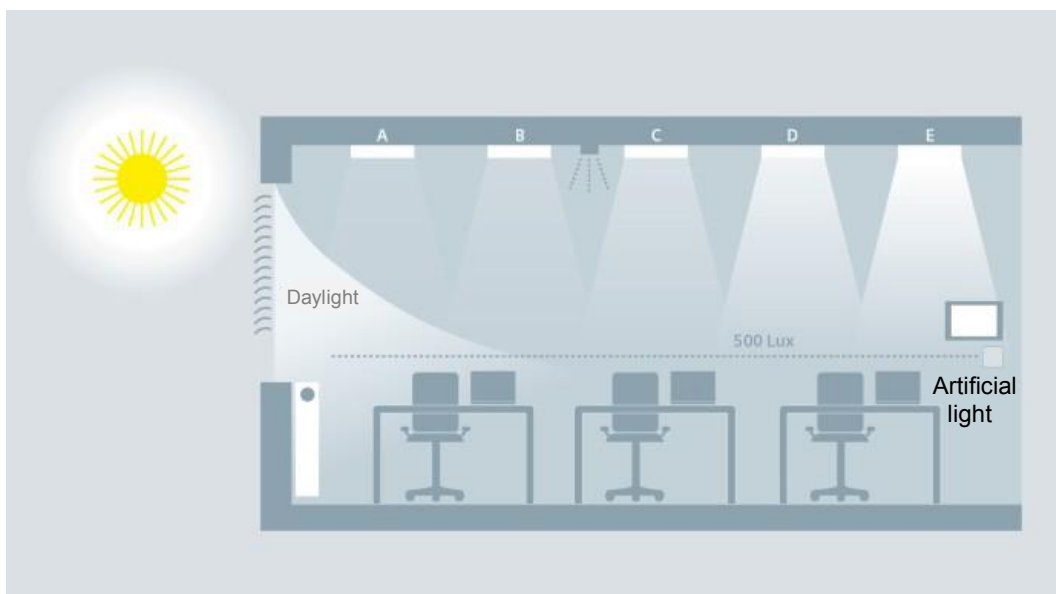
Fig. 4 Principal of constant light level control with five luminaries

Depending on lamp type, the lighting is controlled to the preset brightness value via dimming actuators or switching/dimming actuators. The brightness setpoint may be configured via a parameter or set via a communication object.

For optimum use of the day light penetrating the room the presence detector with constant light level control offers the option to control a main lighting group directly and up to four additional lighting control groups each via their own characteristic curve and their own controller (master/slave operation).

All lighting groups are dimmed to the same set point value. This allows controlling the light level in a room with only one presence detector with constant light level control. Depending on the relative distance of the additional lighting groups to the window compared to the main lighting group, each of these additional lighting groups has to be dimmed brighter or darker than the main lighting group.

Firstly, this requires determining the installation position of the presence detector. The presence detector can be installed on the ceiling at any of the positions A –E. The position of the presence detector determining the main lighting group is in principle freely selectable. Yet, it should be close to the window allowing the best measurement of the daylight contribution.
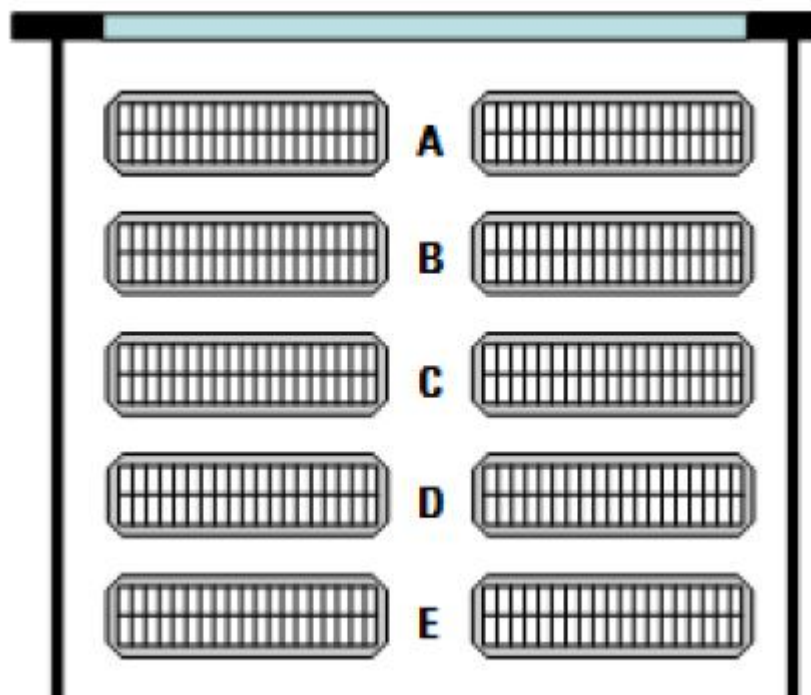
Fig. 5 Position of lighting groups A-E

For master/slave operation the day light curve under lighting groups A-E has to be captured. For this purpose the artificial lighting has to be completely turned off, such that just the natural day light is illuminating the room. Ideally, the day light is evenly falling into the room (no sharp shade / sunlight edges), bright, and diffused, e.g. at noon on a bright day with overcast sky. Under each lighting group the luminance (Lux) has to be measured manually and these values have to be entered into ETS.

Fig. 6 Parameters for measured brightness values

The control characteristic curve for the additional lighting groups has to be determined without day light. For that purpose the room has to be completely darkened or the characteristic curve has to be determined at night. Sending a start signal to communication object 71 starts the determination of the characteristic curves. The presence detector automatically generates 15 discrete control values in the range 0%...100% for each constant light level controller of the main and additional lighting groups. The controllers send dimming values to the corresponding lighting groups and the presence detector measures the resulting luminance level. The period for the measurement can be configured between 10 and 60 seconds to allow for optimal pre-heating of the lamps.

Fig. 7 Parameters for control characteristics

After successful completion or interruption of the calibration run the controller is in the state "inactive". In case of successful completion the lighting groups are set to 50%, in case of a failure to minimum value ~ 6%.

During operation the constant light level controller can take up to four different states:

Active: In this state the constant lighting control is active. In a configurable period the controller compares set point and actual values and sends a control value.

Inactive: In the state the controller is passive. The controller does not compare set point value and actual value and does

not send control values.

Stand-by: In this state the controller is passive. Different from the state "inactive" it still compares the set point value with the actual value. On a corresponding difference between set point value and actual value the controller automatically switches to the active state.

Off: The controller function is stopped and actuators for main and additional lighting groups are first dimmed to a minimum and then completely turned off a second later.

Behavior on bus voltage failure / recovery

On bus voltage failure the current setpoint value is saved.

On bus voltage recovery the setpoint value is restored. The controller is in the state OFF.

Chapter 5 Parameter setting description in the ETS

5.1. Parameter window "General"

Parameter window "General" can be shown in fig. 5.1. Here can set general parameter and functional blocks.

Fig. 5.1 "General" parameter window

Parameter "Operating mode"

Use these parameters to determine the mode. Options:

normal (40s start up time)

test mode (5s ramp up without LED)

test mode (5s ramp up with LED)

If "normal (40s start up time)" is selected, after programming the device starts up with a warm-up phase of about 40 seconds.

During the test phase the test mode with or without LED can be selected.

If "test mode (5s ramp up without LED)" is selected, the LED of the detector does not flash. So it is possible to test the brightness threshold and the delay time.

In "test mode (5s ramp up with LED)", the integrated programming LED shows the status of the motion detector. So it is possible to test the detection range of the PIR sensor independent of the brightness value:

· LED stays on: Programming mode

· LED flashes (clocking sequence): Device running up

· LED comes on for a short time: Motion has been detected

After the test phase has been finished, the operating mode "normal" should be selected. Afterwards the software has to be downloaded again to the device.

Parameter "Evaluate status object [sec.](0=no evaluation)"

When switching lights on and off in a detector's detection area, the change of temperature of the lighting may lead to motion being detected incorrectly. To prevent this, the sensor is disabled for a certain time.

Options: **0 - 255 seconds, 0=no evaluation**

Functional blocks

Parameter "Motion detector"

This parameter determines whether an analysis has to be carried out according to the motion detector criteria. Options:

deactivated

active

If it is set to "deactivated" all relevant additional parameters and objects are invisible.

Parameter "Presence detector"

This parameter determines whether an analysis has to be carried out according to the presence detector criteria. Options:

deactivated

active

If it is set to "deactivated" all relevant additional parameters and objects are invisible.

Parameter "Presence detector (HVAC) (Heating, Ventilating, Air Conditioning) "

This parameter determines whether an analysis has to be carried out according to the criteria for HVAC control. Options:

deactivated

active

If it is set to "deactivated" all relevant additional parameters and objects are invisible.

This parameter determines whether an analysis has to be carried out according to the criteria for light control. Options:

deactivated

active

If it is set to "deactivated" all relevant additional parameters and objects are invisible.

Parameter "Constant light level control continuous"

This parameter determines whether an analysis has to be carried out according to the criteria for constant light level control. Options:

deactivated

active

If it is set to "deactivated" all relevant additional parameters and objects are invisible.

5.2. Parameter window "Brightness measuring"

Parameter window "Brightness measuring" can be shown in fig. 5.2. Here can set brightness measuring parameters.

Fig. 5.2 "Brightness measuring" parameter window

Parameter "Measuring method of internal light sensor"

The internal light sensor can only measure directly. The light level on the desk can be determined indirectly by recomputing, if the parameter is set accordingly. For this, the detector's brightness measurement function must be calibrated.

Parameter "Calibration"

Calibration is carried out either via an object (no. 27) or via adjustment factor. Options:

via object

with adjustment factor

Parameter "Adjustment factor (x 0.1)"

This parameter is visible only if the parameter "Calibration" is set to "with adjustment factor." Options:

1..200

In this case, the light measured by the light sensor is multiplied by 0.1 of the set adjustment factor.

Parameter "Number of values for calculation of average"

The internal light sensor measures every second. For brightness measurement, the mean value can be formed from several values measured consecutively. The number of values to be used to form the mean value is determined via the parameter. Options:

1

2

4

8

Parameter "Send brightness value cyclically"

This parameter determines whether and at what intervals the brightness value determined is sent via the bus. Options:

no

1 second

5 seconds

10 seconds

30 seconds

1 minute

Parameter "Send brightness value on change"

This parameter determines whether the brightness value is sent automatically and immediately when it changes. Options:

no

at small change

at medium change

at large change

5.3. Parameter window "Motion detector/Presence detector"

Parameter window "Motion detector/Presence detector" can be shown in Fig. 5.3 and Fig.5.4. Here can set Motion detector/Presence detector parameters. The configuration for the Motion detector and the Presence detector functional block is performed similar. Take the Motion detector an example in the follow.

General	Lock motion sensor via comm-object ○ no ● yes
Brightness measuring	Value of locking object after bus voltage recovery [Off (0) ▾]
Motion detector	Locking is active ● if locking object = 0 / ○ if locking object = 1
Presence detector	Locking object acts on ○ sensor ● objects (A, B, C, D)
HVAC-Presence detector	Behaviour if lock is enabled [detector sends no telegram ▾]
Light control (on-off)	Behaviour if lock is disabled ● detector sends current status (A-B or C-D) / ○ detector sends no telegram
Constant light level control co...	

Motion detection [up to brightness level 10 LUX ▾]
Source for brightness value ● internal value ○ external value
Device works as ● single or master device ○ slave

-------- Begin of Motion ---------
If motion is detected, send (A) [On ▾]
Send second telegram (B) ○ no ● yes
Delay for second telegram (0...255 seconds) [0]
Second telegram (B) [On ▾]
Send second telegram (B) cyclically [no ▾]

----------- Overshoot time ------------
Timer [one overshoot time ▾]
Hours (0...23) [0]
Minutes (0...59) [0]
Seconds (0...59) [10]

-------- End of Motion ---------
If motion is no longer detected, send (C) [Off ▾]
Send second telegram (D) ○ no ● yes
Delay for second telegram (0...255 seconds) [5]
Second telegram (D) [Off ▾]
Send second telegram (D) cyclically [5 seconds ▾]
Send telegram (C) and (D) after bus voltage recovery ● no ○ yes

Dead time after end of detection (0...59 sec) [5]
Dead time is also applied for extension input ● no ○ yes

Fig. 5.3 "Motion detector" parameter window

General
Brightness measuring
Motion detector
Presence detector
HVAC-Presence detector
Light control (on-off)
Constant light level control co...

Lock Presence sensor via comm-object ○ no ● yes

Value of locking object after bus voltage recovery
Off (0) ▾

Locking is active
● if locking object = 0
○ if locking object = 1

Locking object acts on ○ sensor ● objects (A, B, C, D)

Behaviour if lock is enabled
detector sends no telegram ▾

Behaviour if lock is disabled
● detector sends current status (A-B or C-D)
○ detector sends no telegram

Detection of Presence
brightness independent ▾

Source for brightness value ● internal value ○ external value

Device works as ● single or master device ○ slave

-------- Begin of Presence ---------

If Presence is detected, send (A)
On ▾

Send second telegram (B) ○ no ● yes

Delay for second telegram (0...255 seconds)
0

Second telegram (B)
On ▾

Send second telegram (B) cyclically
no ▾

----------- Overshoot time -------------

Timer
one overshoot time ▾

Hours (0...23)
0

Minutes (0...59)
0

Seconds (0...59)
10

-------- End of Presence ---------

If Presence is no longer detected, send (C)
Off ▾

Send second telegram (D) ○ no ● yes

Delay for second telegram (0...255 seconds)
0

Second telegram (D)
Off ▾

Send second telegram (D) cyclically
5 seconds ▾

Send telegram (C) and (D) after bus voltage recovery ● no ○ yes

Dead time after end of detection (0...59 sec)
5

Dead time is also applied for extension input ● no ○ yes

Fig. 5.4 "Presence detector" parameter window

This parameter determines if the motion detector can be locked and unlocked via a communication object. Options:

no

yes

The follow several parameters are visible only if the parameter "Lock motion sensor via comm- object" is not set to "No."

This parameter determines what the value of the locking communication object will be after bus voltage recovery. Options:

Off (0)

On (1)

as before bus voltage failure

query via bus

This parameter determines how the value of the locking communication object is analyzed. Options:

if locking object = 0

if locking object = 1

This parameter defines the behavior of the lock. Options:

sensor

objects (A,B,C,D)

Sensor: When 'locked', the sensor itself is disabled. If the overshoot timer has already started (detector switched on), the overshoot timer will be continued and after the overshoot time the detector switches off (sends C-D). Re-triggering through the detector is not possible as long the lock is set. Re-triggering via the extension object is still possible.

Objects: When 'locked' the output communication objects A-B and C-D of the detector will be controlled. Triggering via the extension object is still possible.

This parameter is visible only when parameter "Lock acts on" is set to "objects (A-B-C-D)". Options:

detector switches ON, sends A-B

detector switches OFF, sends C-D

detector sends no telegram

Detector switches ON, sends A-B: When the detector is 'locked' telegrams A(B) are sent. However no telegrams will be sent if the overshoot timer was active prior to 'locking'. This mode is useful for "continuous ON" applications.

Detector switches OFF, sends C-D: when the detector is locked telegrams C(D) are sent only if the overshoot timer was already active, otherwise no telegrams are sent. This mode is useful for "continuous OFF" applications.

Detector sends no telegram: Throughout the entire time that the detector has been 'locked', it is still passively monitoring to detect motion, but just not sending any of the associated telegrams.

─ Parameter "Behaviour if lock is disabled"

If the above parameter option selects "**detector switches ON, sends A-B**", the parameter has the following options set. Options:

detector switches delay off, sends C-D

detector switches at once off, sends C-D

Detector switches delay off, sends C-D: The overshoot timer will be restarted after 'unlock'. If no motion is detected after 'unlocking' the detector sends C(D) after the overshoot time. If motion is detected after 'unlock' the overshoot time is retriggered.

Detector switches at once off, sends C-D: Telegrams C(D) are sent at once. After unlocking between A and B, B will not be sent, but C-D immediately.

If the above parameter option selects "**detector switches OFF, sends C-D**", the parameter has the following options set. Options:

detector sends no telegram

Detector sends no telegrams: : If the lock is disabled no telegram will be sent at all.

If the above parameter option selects "**detector sends no telegram**", the parameter has the following options set. Options:

detector sends current status A-B or C-D)

detector sends no telegram

detector sends current status (A-B or C-D): If the lock is disabled the detector sends the current status including the overshoot time left. This behaviour is used for applications "silent mode", during locking phase no telegrams will be sent.

Detector sends no telegrams: If the lock is disabled no telegram will be sent at all. The device enters normal mode again only in case of a new presence detection.

This parameter controls the reporting of a motion dependent on the ambient brightness. If a movement has already been detected (overshoot time running), then there is no further analysis of the ambient brightness. In other words, if further motions are detected during a detected motion, then the overshoot time is restarted. Options:

up to brightness level 2Lux

up to brightness level 5Lux

up to brightness level 10Lux

up to brightness level 15Lux

up to brightness level 20Lux

up to brightness level 50Lux

up to brightness level 100Lux

up to brightness level 200Lux

up to brightness level 500Lux

up to brightness level 1000Lux

brightness independent

Parameter "Source for brightness value"

This parameter determines which brightness value is used for analyzing the brightness threshold. Options:

internal value

external value

If this parameter is set to "Internal value" the value of the brightness sensor inside the device is used.

If "External value," the value from the communication object is used. This value is reproduced at bus voltage recovery and used until it is overwritten by the bus.

Parameter "Device works as"

This parameter determines whether the detector is used as a standalone device or as a master or as a slave in conjunction with other motion sensors. Options:

single or master device

slave

5.3.1 Begin of Motion

The following parameters are visible only if the device is working as a standalone device or as a master (parameter "Device works as" is set to "Single or master device").

Parameter "If motion is detected, send (A)"

This parameter determines whether a telegram is sent after a motion is detected and what format the telegram has. Options:

no telegram

On

Off

8-bit value

8-bit value (selectable)

scene recall

16-bit value (decimal)

16-bit value (temperature)

16-bit value (brightness)

——Parameter "Value [0 … 255]"

This parameter is visible only if the preceding parameter "If motion is detected, send (A)" is set to "8-bit value." This sets the 8-bit value to be sent in the range **0...255**.

——Parameter "Value (if Obj. 28 = 0) (0…255)"
——Parameter "Value (if Obj. 28 = 1) (0…255)"

This parameter is only visible, if the previous parameter "If motion is detected, send (A) " is set to "8-bit value (selectable)".

These define the vales which will be used depending on object 28 "8-bit value selection, motion, A/C". Options: **0...255**

——Parameter "Scene number"

This parameter is visible only if the preceding parameter "If motion is detected, send (A)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

scene 1

scene 2

…

scene 64

Parameter "Value [0 ... 65 535]"

This parameter is visible only if the preceding parameter "If motion is detected, send (A)" is set to "16-bit value (decimal)".

This sets the 16-bit value to be sent in the range **0 ... 65535.**

Parameter "Value"

This parameter is visible only if the preceding parameter "If motion is detected, send (A)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

Parameter "Value"

This parameter is visible only if the preceding parameter "If motion is detected, send (A)" is set to "16-bit value (brightness)".

This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (B)"

This parameter determines whether a second telegram is sent after a delay to the first. Options:

> **no**
>
> **yes**

Parameter "Delay for second telegram [0 ... 255 Seconds]"

This parameter is visible only if the preceding parameter "Send second telegram (B)" is set to "Yes."

This determines the time interval between sending the first telegram (A) and the second telegram (B).

Options: **0..255**

Parameter "Second telegram (B)"

This parameter is visible only if the preceding parameter "Send second telegram (B)" is set to "Yes." This determines the format of the second telegram (B). Options:

> **On**
>
> **Off**
>
> **8-bit value**
>
> **scene recall**
>
> **16-bit value (decimal)**
>
> **16-bit value (temperature)**
>
> **16-bit value (brightness)**

Parameter "Value [0 … 255]"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "8-bit value." This sets the 8-bit value to be sent in the range **0...255**.

——Parameter "Scene number"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

> **scene 1**
>
> **scene 2**
>
> **…**
>
> **scene 64**

——Parameter "Value [0 … 65 535]"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "16-bit value (decimal)". This sets the 16-bit value to be sent in the range **0 ... 65535.**

——Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

——Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "16-bit value (brightness)". This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (B) cyclically"

If you want the second telegram (B) to be sent cyclically after a motion is detected, then this parameter must be set to the corresponding value.Options:

> **no**
>
> **1 second**
>
> **5 seconds**
>
> **10 seconds**
>
> **30 seconds**
>
> **1 minute**

The following parameter is visible only if the device is working as a slave (parameter "Device works as" is set to "Slave").

A device in slave mode can only send an "On telegram" to the master if motion has been detected to trigger this via the secondary input. The internal overshoot time of 10 seconds is fixed, i.e. a telegram can be sent every 10 seconds to the master at most.

If the slave detector is triggered permanently, then a telegram is sent to the master only on the first triggering. However, if the user in this case wants to send further telegrams, then this can be achieved, but the parameter must be set accordingly. Options:

> **no**
>
> **1 second**
>
> **5 seconds**
>
> **10 seconds**
>
> **30 seconds**
>
> **1 minute**

5.3.2 Overshoot time

The following parameters are visible only if the device is working as a standalone device or as a master (parameter "Device works as" is set to "Single or master device").

This parameter determines whether the overshoot time is always the same ("One overshoot time") or can be changed via a bus telegram (object no. 5). Options:

> **one overshoot time**
>
> **two overshoot times**
>
> **variable overshoot time**

If "Two overshoot times" are set, then overshoot time 0 or overshoot time 1 can be selected via the telegram.

If the "Timer" parameter is set to "variable overshoot times," then the telegram stipulates a value.

These parameters determine the minimum time for a detected motion. At the end of the overshoot time, one or two telegrams are sent on the bus (configurable). If a movement has already been detected (overshoot time running) and further motion occurs, then the overshoot time is restarted.

If the "Timer" parameter described above is set to "Two overshoot times," then these parameters are available twice (overshoot time and overshoot time 2).

If the "Timer" parameter described above is set to "variable overshoot time," then these parameters allow configuring default settings, which may be changed via the bus. The parameter for hours can only be set to a value in the range **[0…15].**

5.3.3 End of Motion

The following parameters are visible only if the device is working as a standalone device or as a master (parameter "Device works as" is set to "Single or master device").

Parameter "If motion is no longer detected, send (C)"

This parameter determines whether a telegram or which telegram is sent, if no further movement has been detected by the end of the overshoot time. Options:

> **no telegram**
>
> **On**
>
> **Off**
>
> **8-bit value**
>
> **8-bit value (selectable)**
>
> **scene recall**
>
> **16-bit value (decimal)**
>
> **16-bit value (temperature)**
>
> **16-bit value (brightness)**

——Parameter "Value [0… 255]"

This parameter is visible only if the preceding parameter "If motion is no longer detected, send (C)" is set to "8-bit value."

This sets the 8-bit value to be sent in the range **0...255**.

——Parameter "Value (if Obj. 28 = 0) (0…255)"

——Parameter "Value (if Obj. 28 = 1) (0…255)"

This parameter is only visible, if the previous parameter "If motion is no longer detected, send (C)" is set to "8-bit value (selectable)".

These define the vales which will be used depending on object 28 "8-bit value selection, motion, A/C".

Options: **0...255**

Parameter "Scene number"

This parameter is visible only if the preceding parameter "If motion is no longer detected, send (C)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

scene 1

scene 2

…

scene 64

Parameter "Value [0 … 65 535]"

This parameter is visible only if the preceding parameter "If motion is no longer detected, send (C)" is set to "16-bit value (decimal)".

This sets the 16-bit value to be sent in the range **0 ... 65535.**

Parameter "Value"

This parameter is visible only if the preceding parameter "If motion is no longer detected, send (C)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

Parameter "Value"

This parameter is visible only if the preceding parameter "If motion is no longer detected, send (C)" is set to "16-bit value (brightness)".

This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (D)"

This parameter determines whether a second telegram is sent after a delay to the first. Options:

no

yes

Parameter "Delay for second telegram [0 … 255 Seconds]"

This parameter is visible only if the preceding parameter "Send second telegram (D)" is set to "Yes."

This determines the time interval between sending the first telegram (C) and the second telegram (C). Options: **0..255**

Parameter "Second telegram (D)"

This parameter is visible only if the preceding parameter "Send second telegram (D)" is set to "Yes."

This determines the format of the second telegram (D). Options:

On

Off

8-bit value

scene recall

16-bit value (decimal)

16-bit value (temperature)

16-bit value (brightness)

——Parameter "Value [0 ... 255]"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "8-bit value."

This sets the 8-bit value to be sent in the range **0...255**.

——Parameter "Scene number"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

scene 1

scene 2

…

scene 64

——Parameter "Value [0 ... 65 535]"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "16-bit value (decimal)".

This sets the 16-bit value to be sent in the range **0 ... 65535.**

——Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

——Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "16-bit value (brightness)".

This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (D) cyclically"

If you want the second telegram (D) to be sent cyclically after a motion is ended, then this parameter must be set to the corresponding value. Options:

no

1 second

5 seconds

10 seconds

30 seconds

1 minute

Parameter "Send telegram (C) and (D) after bus voltage recovery"

This parameter determines whether telegram C and (if configured) telegram D are also sent automatically after bus voltage recovery. Options:

no

yes

Parameter "Dead time after end of detection (0..59 sec.)"

The dead time is used to protect the actuator that is connected to the motion detector. If a motion occurs in the dead time, the motion detector does not switch on. Options: **0..59**

Note:

1. The dead time should be set to a longer time than the delay time between telegrams C and D, because otherwise telegram D may fail.

2. Because the sensor is enabled internally for approximately 3 seconds after detecting a motion, it can be that a motion detected during the dead time also triggers a telegram. This is the case if the motion is detected during the last 3 seconds of the dead time. To guarantee that the dead time is effective, it should be chosen to be as large as possible.

Parameter "Dead time is also applied for extension input"

Options:

no

yes

If the dead time is configured such that it also acts on the secondary device, then a trigger received from the secondary device is "interim stored" by the detector. The corresponding telegrams A to D will be sent after the dead time has elapsed.

If the parameter is set to "No", then the triggers received from the secondary device, take effect immediately.

5.4. Parameter window "HVAC - Presence detector"

Parameter window "HVAC - Presence detector" can be shown in Fig. 5.5. Here can set HVAC - Presence detector parameters.

Fig. 5.5 "HVAC - Presence detector" parameter window

Parameter "Lock HVAC sensor via comm-object"

This parameter determines how the value of the locking communication object is analyzed. Options:

no

if locking object = 0

if locking object = 1

The follow parameter is visible only if the parameter "Lock HVAC sensor via comm- object" is not set to "No."

—— Parameter "Value of locking object after bus voltage recovery"

This parameter determines what the value of the locking communication object will be after bus voltage recovery. Options:

Off (0)

On (1)

as before bus voltage failure

query via bus

Parameter "Interval time for HVAC - Presence detection (minutes)"

This parameter determines the time interval in which the motion pulses are counted. Options: **0..15**

Parameter "Minimum number of detected motions during interval time"

This parameter determines the number of motions that have to be detected during the monitoring time to meet the criterion for starting the HVAC presence. This ensures that a HVAC presence starts only if persons remain in the capture area of the detector for a longer period. Options: **1..50**

Parameter "Device works as"

This parameter determines whether the detector is used as a standalone device or as a master or as a slave in conjunction with other motion sensors. Options:

single or master device

slave

5.4.1 Begin of HVAC Presence

The following parameters are visible only if the device is working as a standalone device or as a master (parameter "Device works as" is set to "Single or master device").

Parameter "If HVAC - Presence is detected, send (A)"

This parameter determines whether a telegram is sent after a presence is detected and what format the telegram has. Options:

no telegram

On

Off

8-bit value

scene recall

16-bit value (decimal)

16-bit value (temperature)

16-bit value (brightness)

——Parameter "Value [0 … 255]"

This parameter is visible only if the preceding parameter "If HVAC - Presence is detected, send (A)" is set to "8-bit value." This sets the 8-bit value to be sent in the range **0...255**.

——Parameter "Scene number"

This parameter is visible only if the preceding parameter "If HVAC - Presence is detected, send (A)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

scene 1

scene 2

…

scene 64

——Parameter "Value [0 … 65 535]"

This parameter is visible only if the preceding parameter "If HVAC - Presence is detected, send (A)" is set to "16-bit value (decimal)". This sets the 16-bit value to be sent in the range **0 ... 65535.**

——Parameter "Value"

This parameter is visible only if the preceding parameter "If HVAC - Presence is detected, send (A)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

Parameter "Value"

This parameter is visible only if the preceding parameter "If HVAC - Presence is detected, send (A)" is set to "16-bit value (brightness)".

This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (B)"

This parameter determines whether a second telegram is sent after a delay to the first. Options:

no

yes

Parameter "Delay for second telegram [0 ... 255 Seconds]"

This parameter is visible only if the preceding parameter "Send second telegram (B)" is set to "Yes."

This determines the time interval between sending the first telegram (A) and the second telegram (B).

Options: **0..255**

Parameter "Second telegram (B)"

This parameter is visible only if the preceding parameter "Send second telegram (B)" is set to "Yes."

This determines the format of the second telegram (B). Options:

On

Off

8-bit value

scene recall

16-bit value (decimal)

16-bit value (temperature)

16-bit value (brightness)

Parameter "Value [0 ... 255]"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "8-bit value."

This sets the 8-bit value to be sent in the range **0...255**.

Parameter "Scene number"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

scene 1

scene 2

…

scene 64

Parameter "Value [0 ... 65 535]"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "16-bit value (decimal)".

This sets the 16-bit value to be sent in the range **0 ... 65535.**

Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (B)" is set to "16-bit value (brightness)".

This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (B) cyclically"

If you want the second telegram (B) to be sent cyclically after a motion is detected, then this parameter must be set to the corresponding value.Options:

> **no**
>
> **1 second**
>
> **5 seconds**
>
> **10 seconds**
>
> **30 seconds**
>
> **1 minute**

The following parameter is visible only if the device is working as a slave (parameter "Device works as" is set to "Slave").

Parameter "Send trigger telegrams cyclically"

A device in slave mode can only send an "On telegram" to the master if motion has been detected to trigger this via the secondary input. The internal overshoot time of 10 seconds is fixed, i.e. a telegram can be sent every 10 seconds to the master at most.

If the slave detector is triggered permanently, then a telegram is sent to the master only on the first triggering. However, if the user in this case wants to send further telegrams, then this can be achieved, but the parameter must be set accordingly. Options:

> **no**
>
> **1 second**

5 seconds

10 seconds

30 seconds

1 minute

5.4.2 Overshoot time

The following parameters are visible only if the device is working as a standalone device or as a master (parameter "Device works as" is set to "Single or master device").

——Parameter "Timer"

This parameter determines whether the overshoot time is always the same ("One overshoot time") or can be changed via a bus telegram (object no. 21). Options:

one overshoot time

two overshoot times

variable overshoot time

If "Two overshoot times" are set, then overshoot time 0 or overshoot time 1 can be selected via the telegram.

If the "Timer" parameter is set to "variable overshoot times," then the telegram can stipulate a value.

——Parameter "Hours [0 … 23]"

——**Parameter "Minutes [0 … 59]"**

——**Parameter "Seconds [0 … 59]"**

These parameters determine the minimum time for a detected HVAC - presence. At the end of the overshoot time, one or two telegrams are sent on the bus (configurable). If a HVAC presence has already been detected (overshoot time running) and further motion occurs, then the overshoot time is restarted.

If the "Timer" parameter described above is set to "Two overshoot times," then these parameters are available twice (overshoot time and overshoot time 2).

If the "Timer" parameter described above is set to "variable overshoot time," then these parameters allow configuring default settings, which may be changed via the bus. The parameter for hours can only be set to a value in the range **[0…15].**

5.4.3 End of HVAC - Presence

The following parameters are visible only if the device is working as a standalone device or as a master (parameter "Device works as" is set to "Single or master device").

Parameter "If HVAC - Presence is no longer detected, send (C)"

This parameter determines whether a telegram or which telegram is sent, if no further HVAC presence has been detected by the end of the overshoot time. Options:

> **no telegram**
>
> **On**
>
> **Off**
>
> **8-bit value**
>
> **scene recall**
>
> **16-bit value (decimal)**
>
> **16-bit value (temperature)**
>
> **16-bit value (brightness)**

Parameter "Value [0 ... 255]"

This parameter is visible only if the preceding parameter "If HVAC - Presence is no longer detected, send (C)" is set to "8-bit value."

This sets the 8-bit value to be sent in the range **0...255**.

Parameter "Scene number"

This parameter is visible only if the preceding parameter "If HVAC - Presence is no longer detected, send (C)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

> **scene 1**
>
> **scene 2**
>
> **…**
>
> **scene 64**

Parameter "Value [0 ... 65 535]"

This parameter is visible only if the preceding parameter "If HVAC - Presence is no longer detected, send (C)" is set to "16-bit value (decimal)".

This sets the 16-bit value to be sent in the range **0 ... 65535.**

Parameter "Value"

This parameter is visible only if the preceding parameter "If HVAC - Presence is no longer detected, send (C)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

——Parameter "Value"

This parameter is visible only if the preceding parameter "If HVAC - Presence is no longer detected, send (C)" is set to "16-bit value (brightness)".

This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (D)"

This parameter determines whether a second telegram is sent after a delay to the first. Options:

no

yes

Parameter "Delay for second telegram [0 ... 255 Seconds]"

This parameter is visible only if the preceding parameter "Send second telegram (D)" is set to "Yes."

This determines the time interval between sending the first telegram (C) and the second telegram (D).

Options: **0..255**

Parameter "Second telegram (D)"

This parameter is visible only if the preceding parameter "Send second telegram (D)" is set to "Yes."

This determines the format of the second telegram (D). Options:

On

Off

8-bit value

scene recall

16-bit value (decimal)

16-bit value (temperature)

16-bit value (brightness)

——Parameter "Value [0 ... 255]"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "8-bit value."

This sets the 8-bit value to be sent in the range **0...255**.

Parameter "Scene number"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "scene recall".

This parameter determines the number of the 8-bit scene to be called up. Options:

scene 1

scene 2

…

scene 64

Parameter "Value [0 ... 65 535]"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "16-bit value (decimal)". This sets the 16-bit value to be sent in the range **0 ... 65535.**

Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "16-bit value (temperature)".

This sets the 16-bit value to be sent in the range **0.0°C / 32F ... 40.0°C / 104F**.

Parameter "Value"

This parameter is visible only if the preceding parameter "Second telegram (D)" is set to "16-bit value (brightness)". This sets the 16-bit value to be sent in the range **0 LUX ... 2000 LUX** .

Parameter "Send second telegram (D) cyclically"

If you want the second telegram (D) to be sent cyclically after a HVAC - Presence is ended, then this parameter must be set to the corresponding value. Options:

no

1 second

5 seconds

10 seconds

30 seconds

1 minute

Parameter "Send telegram (C) and (D) after bus voltage recovery"

This parameter determines whether telegram C and (if configured) telegram D are also sent automatically after bus voltage recovery. Options:

no

yes

The dead time is used to protect the actuator that is connected to the presence detector. If a motion occurs in the dead time, the presence detector does not switch on. Options: 0..59

Note:

1. The dead time should be set to a longer time than the delay time between telegrams C and D, because otherwise telegram D may fail.

2. Because the sensor is enabled internally for approximately 3 seconds after detecting a motion, it can be that a motion detected during the dead time also triggers a telegram. This is the case if the motion is detected during the last 3 seconds of the dead time. To guarantee that the dead time is effective, it should be chosen to be as large as possible.

Options:

   no

   yes

If the dead time is configured such that it also acts on the secondary device, then a trigger received from the secondary device is "interim stored" by the detector. The corresponding telegrams A to D will be sent after the dead time has elapsed.

If the parameter is set to "No", then the triggers received from the secondary device, take effect immediately.

5.5. Parameter window "Light control (on-off)"

Parameter window "Light control (on-off)" can be shown in Fig. 5.6. Here can set Light control (on-off) parameters.

Fig. 5.6 "Light control (on-off)" parameter window

Parameter "Source for brightness value (actual value)"

This parameter selects the source for the brightness value. Options:

internal value

external value

Parameter "Setpoint value via"

This parameter determines whether the setpoint for light control are set to a fixed value, which in each case can be changed only using the ETS, or whether the corresponding factory-provided values can be changed via the bus, via a communication object. Options:

parameter

Parameter, changeable via object

The value received via the communication object overwrites the factory-provided parameter value and is stored permanently.

5.5.1 Switch On

Parameter "Switch on, if brightness is lower than xx LUX"

This parameter determines the starting brightness value from which the "Switching on" telegram (object no. 51) will be sent. Options: **100..1600**

If the brightness value for switching on is greater than the brightness value for switching off, then the value for switching on will be set by the controller to the value for switching off, i.e. both values are then identical. This means that the controller only has to send a telegram to switch on. Switching off in this case is a manual process.

Note :

1. The internal light sensor has a measurement range from 20 to 1000 LUX. It is therefore sensible to set a threshold above 1000 LUX only if an external sensor, having a corresponding measurement range, is used for brightness measurement, or indirect measurement has been configured.

2. Depending on the internal recalculation of the value, this can cause impreciseness when resolving of approximately 5%.

Parameter "Switch on, not before xx seconds"

This parameter determines the interval at which the corresponding telegram for switching on is sent after falling below the nominal brightness value. Options: **0..59**

5.5.2 Switch Off

Parameter "Switch off, if brightness is higher than xx LUX"

This parameter determines the starting brightness value from which the "Switching off" telegram (object no. 52) will be sent. Options: **250..1600**

Note:

1. The internal light sensor has a measurement range from 20 to 1000 LUX. It is therefore sensible to set a threshold above 1000 LUX only if an external sensor, having a corresponding measurement range, is used for brightness measurement, or indirect measurement has been configured.

2. Depending on the internal recalculation of the value, this can cause impreciseness when resolving of approximately 5%.

Parameter "Switch off, not before xx seconds."

This parameter determines the interval at which the corresponding telegram for switching off is sent after exceeding the nominal brightness value. Options: **0..59**

5.6. Parameter window "Constant light level control continuous"

Parameter window "Constant light level control continuous" can be shown in Fig. 5.7. Here can set Constant light level control continuous parameters.

| General |
| Brightness measuring |
| Motion detector |
| Presence detector |
| HVAC-Presence detector |
| Light control (on-off) |
| **Constant light level control continuous** |

----------- Actual value -----------

| Source for brightness value | only internal value ▼ |

----------- Setpoint -----------

Setpoint value via	○ parameter
	○ parameter, changeable via object
Setpoint value in LUX (250...1600)	600 ⌄

----------- Controller ----------------

Maximal deviation from setpoint value (hysteresis)	+/- 10% ▼
Send dimming value every (controller speed)	1 second ▼
Timeout for automatic off [min] (0 = no automatic off)	3 ⌄
Additional hysteresis for restart when controller was in standby [LUX]	100 ⌄
Start and finish constant light level control with	only dimming-value telegram ▼

---------- Controller output -----------

Max. step for dimming	5 (2,0%) ▼
First dim-value, when control starts	query from actuator's status ▼
First dim-value, when reading from object fails (1...255)	128 ⌄
Max. dimming value Master (1...255)	255 ⌄
Min. dimming value Master (1...255)	1 ⌄
Master / slave operation	○ no ● yes

------------- Slaves -------------

Mode of calculation	● calculating via characteristic
	○ calculating via offsets
Number of slaves	4 ▼

Max. dimming value slave 1 (1...255)	255 ⌄
Min. dimming value slave 1 (1...255)	1 ⌄
Max. dimming value slave 2 (1...255)	255 ⌄
Min. dimming value slave 2 (1...255)	1 ⌄
Max. dimming value slave 3 (1...255)	255 ⌄
Min. dimming value slave 3 (1...255)	1 ⌄
Max. dimming value slave 4 (1...255)	255 ⌄
Min. dimming value slave 4 (1...255)	1 ⌄

------- Slave calibration data ---------

Position of Master (A...E)	at measuring position A ▼
Measured LUX value at position A (0...2000)	0
Measured LUX value at position B (0...2000)	0
Measured LUX value at position C (0...2000)	0
Measured LUX value at position D (0...2000)	0
Measured LUX value at position E (0...2000)	0

------- Control characteristic --------

! For best control first create control curve

Start with ON at Obj. 71

| Delay until next step | 12 |

Fig. 5.7 "Constant light level control continuous" parameter window

Motion detector	----------- Setpoint -----------
Presence detector	Setpoint value via ○ parameter ◉ parameter, changeable via object
HVAC-Presence detector	Min. setpoint in LUX (250 - 1600) 400
Light control (on-off)	Max. setpoint in LUX (250...1600) (is used as start value) 1000
Constant light level control continuous	Change of setpoint per dimming step 1/8 (13%) ▼
	Light can be switched off when setpoint is zero ○ no ◉ yes
	Control can be started when setpoint is greater than zero ○ no ◉ yes

Append: the parameter "Setpoint value via parameter, changeable via object" setting

--------- Slave offset data ------------

Offset for slave 1 to the master dimming value in percent (-100...100)	0
Offset for slave 2 to the master dimming value in percent (-100...100)	0
Offset for slave 3 to the master dimming value in percent (-100...100)	0
Offset for slave 4 to the master dimming value in percent (-100...100)	0

Append: the parameter "Mode of calculation via slave offset data" setting

5.6.1 Actual value

Parameter "Source for brightness value"

This parameter selects the source for the brightness value. Additionally, the weight of internal and external sources can be selected. Options:

> **only internal value**
>
> **only external value**
>
> **25% intern / 75% extern**
>
> **50% intern / 50% extern**
>
> **75% intern / 25% extern**
>
> **lower value of intern and extern**
>
> **upper value of intern and extern**

5.6.2 Setpoint

Parameter "Setpoint value via"

The setpoint can be either configured as a fixed value (ETS parameter) or as a dynamic value (via object). Either the setpoint can be sent to the device as a brightness value in LUX via object no. 55 (DPT 9.004) or the setpoint can be changed via a dimming command (object no. 56). When the setpoint was changed the current valid value is sent via object no. 55. Options:

> **parameter**
>
> **Parameter, changeable via object**

Parameter "Setpoint value in LUX [250 .. 1600]"

This parameter is only visible if the previous parameter "Setpoint value via" has been set to "parameter".

This parameter determines the brightness setpoint for constant light level control in the range of **250 .. 1600 LUX.**

Parameter "Min. setpoint in LUX [250 .. 1600]"

This parameter is only visible if the previous parameter "Setpoint value via" has been set to "parameter, changeable via object". Options: **250..1600**

This parameter determines the minimum brightness setpoint for constant light level control changed via relative and absolute dimming commands (see objects 55 and 56).

Parameter "Max. setpoint in LUX [250 .. 1600] (is used as start value)"

This parameter is only visible if the previous parameter "Setpoint value via" has been set to "parameter, changeable via object". Options: **250..1600**

This parameter determines the maximum brightness setpoint for constant light level control changed via relative and absolute dimming commands (see object 55 and 56).

If the maximum brightness level was accidentally configured lower than the minimum level then the maximum setpoint is set to [minimum setpoint + 10].

Parameter "Change of setpoint per dimming step"

This parameter is only visible if the previous parameter "Setpoint value via" has been set to "parameter, changeable via object".Options:

1/64 (2%)

1/32 (3%)

1/16 (6%)

1/8 (13%)

1/4 (25%)

1/2 (50%)

This parameter determines the value of the constant light level control setpoint changing per dimming step if dimming with stop telegram is used.

Parameter "Light can be switched off when setpoint is zero"

This parameter is only visible if the previous parameter "Setpoint value via" has been set to "parameter, changeable via object". Options:

no

yes

This parameter determines whether the controller on receipt of the value "0" via object 55 shall switch to the state "Off". In that case, the controller function stops and at the same time the actuators are turned off with a dimming value of "0" via object 61 and, if applicable, via objects 64, 66, 68, and 70. Additionally, switching off telegrams are sent via object 60 and, if applicable, via objects 63, 65, 67, and 69, if parameter "Start and finish constant light level control with" is set accordingly.

Parameter "Control can be started when setpoint is greater than zero"

This parameter is only visible if the previous parameter "Setpoint value via" has been set to "parameter, changeable via object". Options:

no

yes

This parameter determines whether the controller switches from the state "inactive" to the state "active" if a setpoint value greater than "0" is received via object 55.

At the same time the received LUX value is the new set point.

5.6.3 Controller

Parameter "Maximal deviation from setpoint value (hysteresis)"

This parameter determines the difference between current value and setpoint value that activates the controller. Options:

+/- 5%

+/- 10%

+/- 15%

+/- 20%

This parameter only affects the control of the main lighting group.

Parameter "Send dimming value every (controller speed)"

This parameter determines the interval for sending the calculated control values. Options:

1 second

2 seconds

3 seconds

5 seconds

10 seconds

20 seconds

Note: When an external measurement is used then setting the parameter to 1 second makes sense, assuming that the external value is received within half of the time selected here. When the internal measurement is used this parameter should be set to a value that is at least double the value of the parameter setting of "Number of values for calculation of average".

Parameter "Timeout for automatic off [min](0 = no automatic off)"

If the actuating variable of the controller in the "active" state has reached the configured minimum level and at the same time the current value of the measured brightness is higher than the brightness setpoint, then the controller changes into the state "standby" and sends a switching telegram with the value "Off".

The period from reaching the condition described above to switching into the state "standby" is determined by the previous parameter in the range 1-230 minutes. If that parameter is set to "0" then the controller remains in the state "active" with the minimum control values.

Parameter "Additional hysteresis for restart when controller was in standby[LUX]"

When the controller is in the state "standby" and the current light level value drops below the setpoint value minus hysteresis minus additional hysteresis then the controller automatically changes into the state "active". Options: **0..230**

Note: If setpoint value minus hysteresis minus additional hysteresis is lower than 50 LUX, then 50 LUX is used as the limit for changing back to the state "active".

Parameter "Start and finish constant light level control with"

This parameter determines the type of telegrams sent by the constant light level controller on start and ending of the control activity (switching into state "active" respectively leaving the "active" state). Options:

only dimming-value telegram

additional switching telegram at begin of control

additional switching telegram at stop of control

additional switching telegram at begin and stop

5.6.4 Controller output

Parameter "Max. step for dimming"

This parameter determines the maximum step of the control value to be used for dimming. Options:

1 (0,5%)

3 (1,1%)

4 (1,5%)

5 (2,0%)

6 (2,5%)

7 (2,7%)

10 (3,9%)

Note: The maximum step for dimming should be chosen such that a change of the dimming value does not change the illumination more than the configured hysteresis of the set point.

Parameter "First dim-value, when control starts"

This parameter determines how the first dimming value (starting value) for the control is established. Options:

copy from parameter

query from actuator's status

calculate start value

query from actuator's status (default setting):

The current control value of the dimming actuator is interrogated via a status read request and the control loop is started with this value. This action takes into account that the dimming value could have been changed by a relative dimming command while the control loop was inactive. The status read request does not work with all DALI Gateways.

calculate start value:

Before the control starts the current actual value is measured. This value represents the mixed light (daylight and artificial light). Using the calibration curve the measured value of the room brightness is then computed into the control value, which is used as a starting value for the control.

copy from parameter:

This parameter setting is used if the other two options do not apply.

Parameter "First dim value [1 … 255]"

This parameter is only visible if the parameter "First dim-value when control starts" is set to "copy from parameter". Options: **1..255**

This parameter determines the starting value used by the controller for the control value.

Parameter "First dim-value when reading from object fails [1 … 255]"

This parameter is only visible if the parameter "First dim value when control starts" is set to "query from actuator's status". Options: **1..255**

This parameter determines the starting value used by the controller for the control value if the status query of the dimming actuator does not return a value within one second.

Parameter "Max. dimming value Master [1 … 255]"

This parameter determines the maximum dimming value of the master. Options: **1..255**

Parameter "Min. dimming value Master [1 … 255]"

This parameter determines the minimum dimming value of the master.Options: **1..255**

Parameter "Master / slave operation"

This parameter determines whether the controller runs in master/slave operation or not. Options:

       no

       yes

5.6.5 Slaves

The following parameters are only visible if the parameter "Master/slave operation" has been set to "Yes".

Parameter "Mode of calculation"

This parameter determines how the control value for the additional lighting groups is calculated. Options:

calculating via characteristic

calculating via offsets

calculating via characteristic: The control values for the additional lighting groups are derived from the main control value by calibration curves transforming the measured (main) luminance level into a calculated luminance level for the position of each additional lighting groups. If this setting is selected parameter settings in section 5.6.5.1.

calculating via offsets: The control values for the additional lighting groups are derived from the main control value by an offset that is entered for each additional lighting group. If this setting is selected parameter settings in section 5.6.5.2.

Parameter "Number of slaves"

This parameter determines the number of additional lighting control groups. Options: 1/2/3/4

Parameter "Max. dimming value slave 1 [2, 3, 4] (1..255)"

This parameter determines the maximum dimming value of the respective additional lighting control group [1…4]. Options: 1..255

Parameter "Min. dimming value slave 1 [2, 3, 4] (1..255)"

This parameter determines the minimum dimming value of the respective additional lighting control group [1…4]. Options: 1..255

5.6.5.1 Slave calibration data

The following parameters are only visible if the parameter "Master/slave operation" has been set to "Yes" and the parameter "Mode of calculation" has been set to "calculation via characteristic".

Parameter "Position of Master"

This parameter determines the position (A…E) of the main lighting control group. The number of positions depends on the number of additional lighting control groups (slaves) selected via the parameter "number of slaves". If e.g. the "number of slaves" was set to "2" then the positions A…C are available. Options:

> **at measuring position A**
>
> **at measuring position B**
>
> **at measuring position C**
>
> **at measuring position D**
>
> **at measuring position E**

Parameter "Measured LUX value at position A [0…2000]"

Enter the illumination value measured at lighting position A with an luminance (LUX) meter in the range of 0…2000 LUX.

Parameter "Measured LUX value at position B [0…2000]"

Enter the illumination value measured at lighting position B with an luminance (LUX) meter in the range of 0…2000 LUX.

Parameter "Measured LUX value at position C [0…2000]"

This parameter is only visible if the parameter "number of slaves" has been set to "2", "3" or "4".

Enter the illumination value measured at lighting position C with an luminance (LUX) meter in the range of 0…2000 LUX.

Parameter "Measured LUX value at position D [0…2000]"

This parameter is only visible if the parameter "number of slaves" has been set to "3" or "4".

Enter the illumination value measured at lighting position D with an luminance (LUX) meter in the range of 0…2000 LUX.

Parameter "Measured LUX value at position E [0…2000]"

This parameter is only visible if the parameter "number of slaves" has been set to "4".

Enter the illumination value measured at lighting position E with an luminance (LUX) meter in the range of 0…2000 LUX.

5.6.5.2 Slave offset data

The following parameters are only visible if the parameter "Master/slave operation" has been set to "Yes" and the parameter "Mode of calculation" has been set to "calculation via offsets".

Parameter "Offset for slave 1 to the master dimming value in percent (-100...100)"

This parameter determines the offset used to calculate the dimming value for slave 1 from the dimming value of the master. Options: -100..100

Note: The limits for the minimum and maximum control values apply.

Parameter "Offset for slave 2 to the master dimming value in percent (-100...100)"

This parameter determines the offset used to calculate the dimming value for slave 2 from the dimming value of the master.

Note: The limits for the minimum and maximum control values apply.

Parameter "Offset for slave 3 to the master dimming value in percent (-100...100)"

This parameter determines the offset used to calculate the dimming value for slave 3 from the dimming value of the master.

Note: The limits for the minimum and maximum control values apply.

Parameter "Offset for slave 4 to the master dimming value in percent (-100...100)"

This parameter determines the offset used to calculate the dimming value for slave 4 from the dimming value of the master.

Note: The limits for the minimum and maximum control values apply.

5.6.6 Control characteristic

Parameter "Delay until next step"

This parameter determines the period (range: **10 to 60 seconds**) between each of the brightness measurements of the controller during calibration (compare object 71).

Note: Select a higher value for lamps with a longer warm up phase until providing full light output.

Chapter 6 Communication object description

The communication objects listed in the following paragraphs are available. Which of them are visible and can be linked with group addresses will be determined by setting the parameters

The number and type of visible objects can vary dependent on the parameter settings.

Note: in the property column in the table below "C" Communications represents a communication object functionality is enabled, the "W" On behalf of a distribution object to rewriting across the bus, "R"On behalf of a distribution object's value can be read via the bus, "T" Represents a communication object with transfer function, "U" On behalf of a distribution object's value can be updated.

6.1. "General" communication object

Number	Name	Object Function	Description	Group Addres	Length	C	R	W	T	U	Data Type	Priority
0	Status of switching actuator	On / Off			1 bit	C	R	W	T	-	boolean	Low

Fig.6.1 "General" communication object

Obj. No.	Function	Object name	Type	Flags	DPT
0	On/Off	Status of switching actuator	1bit	C,R,W,T	1.002 boolean
This object notifies the detector whether the actuator controlled by the device has switched. If a change of status (1->0 or 0->1) has occurred, then the sensor is not analyzed for a configurable time. This prevents the detector sensing the fall in temperature of an incandescent lamp that has just been switched off as motion.					

Table 6.1 "General" communication object table

6.2. "Brightness measuring" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
25	Brightness value (internal)	value in LUX			2 bytes	C	R	W	T	-	lux (Lux)	Low
26	Brightness value (external)	value in LUX			2 bytes	C	R	W	-	-	lux (Lux)	Low
27	Brightness value (calibration)	value in LUX			2 bytes	C	R	W	-	-	lux (Lux)	Low

Fig.6.2 "Brightness measuring" communication object

Obj. No.	Function	Object name	Type	Flags	DPT
25	value in LUX	Brightness value (internal)	2byte	C,R,W,T	9.004 lux (Lux)
This object sends its brightness value to the brightness measuring device. If cyclical sending is switched off, then the value can be determined via the bus with a read query. The measurement range for the internal light sensor is between 20 and 1000 LUX. This value can be changed by calibration. The upper limit for the internal brightness value after calibration is 20000 LUX.					

26	value in LUX	Brightness value (external)	2byte	C,R,W	9.004 lux (Lux)

This object feeds a value from an external brightness measuring device.

27	value in LUX	Brightness value (calibration)	2byte	C,R,W	9.004 lux (Lux)

Because the light sensor measures only the light reflected from the desk, it can be calibrated.

During calibration, the brightness value in the room in which the device has been mounted should be that used later as the setpoint for constant lighting control.

The ETS (diagnostic mode -> send telegram) is used to send the previously measured value to the device via the above object.

The measured value is entered as a decimal number in the entry field of the ETS. The ETS codes this value as DPT 9.004 (EIS5) and sends it to the device. As soon as the value has been received, the adjustment factor is computed from it (brightness value = adjustment factor * measured value).

If the parameter "Measuring method of the internal light sensor" has been set to "indirect," the recomputed value is output as the internal brightness value.

Note:

When calibrating object 27, plausibility checks are carried out. If the value communicated via the object is more than 20 times the value measured by the internal light sensor, the adjustment factor is set to 1. It is the same if a value above the internal brightness value (20,000 LUX) is transferred.

In case of a received telegram with 0 LUX the factor will be reset to "1" (= factory settings).

Owing to rounding errors, the measured and recomputed brightness value ("Internal brightness value") can differ slightly from the value recorded with the external measuring device.

The controller works only properly if the calibration procedure was successful and is stored within the flash memory.

Table 6.2 "Brightness measuring" communication object table

6.3. "Motion detector" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	Switching, Start of Motion, A	On			1 bit	C	R	W	T	-	switch	Low
2	Switching, Start of Motion, B	On			1 bit	C	R	W	T	-	switch	Low
3	Switching, End of Motion, C	Off			1 bit	C	R	W	T	-	switch	Low
4	Switching, End of Motion, D	Off			1 bit	C	R	W	T	-	switch	Low
5	Motion, Overshoot time	time 1 = 0 / time 2 = 1			1 bit	C	R	W	T	-	switch	Low
6	Motion detector lock	On / Off			1 bit	C	R	W	T	U	switch	Low
7	Extension input, Motion	On			1 bit	C	R	W	T	-	switch	Low
8	Extension input, Motion	Off			1 bit	C	R	W	T	-	switch	Low
5	Motion, Overshoot time	value			2 bytes	C	R	W	T	-	pulses	Low
28	8-bit value selection, Motion, A/C	value 1 / value 2			1 bit	C	R	W	-	-	switch	Low

Fig.6.3 "Motion detector" communication object

Obj.No.	Function	Object name	Type	Flags	DPT
1	On/Off	Switching, Start of Motion, A	1bit	C,R,W,T	1.001 switch
1	value	8-bit value, Start of Motion, A	1byte	C,R,W,T	5.001 percentage (0..100%)
1	value	16-bit value, Start of Motion, A	2byte	C,R,W,T	7.001 pulses
1	value	Brightness, Start of Motion, A	2byte	C,R,W,T	9.004 lux (Lux)
1	recall	Scene, Start of Motion, A	1byte	C,R,W,T	17.001 scene number
1	value	Temperature, Start of Motion, A	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the beginning of a detected motion or on external triggering:

- ❖   Switch On/Off - DPT 1.001
- ❖   8-bit value (decimal) (0 - 255) - DPT 5.001
- ❖   16-bit value (decimal) (0 - 65 535) - DPT 7.001
- ❖   16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004
- ❖   8-bit scene recall - DPT 17.001
- ❖   16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Note: After bus voltage recovery, there is a break of approximately 30 seconds before the detector can send via this object.

2	On/Off	Switching, Start of Motion, B	1bit	C,R,W,T	1.001 switch
2	value	8-bit value, Start of Motion, B	1byte	C,R,W,T	5.001 percentage (0..100%)
2	value	16-bit value, Start of Motion, B	2byte	C,R,W,T	7.001 pulses
2	value	Brightness, Start of Motion, B	2byte	C,R,W,T	9.004 lux (Lux)
2	recall	Scene, Start of Motion, B	1byte	C,R,W,T	17.001 scene number
2	value	Temperature, Start of Motion, B	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the beginning of a detected motion or on external triggering:

- ❖   Switch On/Off - DPT 1.001
- ❖   8-bit value (decimal) (0 - 255) - DPT 5.001
- ❖   16-bit value (decimal) (0 - 65 535) - DPT 7.001
- ❖   16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004
- ❖   8-bit scene recall - DPT 17.001
- ❖   16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Telegram B is sent after telegram A, if this has been configured. The delay time between A and B is also configurable.

3	On/Off	Switching, End of Motion, C	1bit	C,R,W,T	1.001 switch
3	value	8-bit value, End of Motion, C	1byte	C,R,W,T	5.001 percentage (0..100%)
3	value	16-bit value, End of Motion, C	2byte	C,R,W,T	7.001 pulses
3	value	Brightness, End of Motion, C	2byte	C,R,W,T	9.004 lux (Lux)
3	recall	Scene, End of Motion, C	1byte	C,R,W,T	17.001 scene number
3	value	Temperature, End of Motion, C	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the end of a detected motion or on external triggering:

- ❖ Switch On/Off - DPT 1.001
- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001
- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001
- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004
- ❖ 8-bit scene recall - DPT 17.001
- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

4	On/Off	Switching, End of Motion, D	1bit	C,R,W,T	1.001 switch
4	value	8-bit value, End of Motion, D	1byte	C,R,W,T	5.001 percentage (0..100%)
4	value	16-bit value, End of Motion, D	2byte	C,R,W,T	7.001 pulses
4	value	Brightness, End of Motion, D	2byte	C,R,W,T	9.004 lux (Lux)
4	recall	Scene, End of Motion, D	1byte	C,R,W,T	17.001 scene number
4	value	Temperature, End of Motion, D	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the end of a detected motion or upon external triggering:

- ❖ Switch On/Off - DPT 1.001
- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001
- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001
- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004
- ❖ 8-bit scene recall -DPT 17.001
- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Telegram D is sent after telegram C, if this has been configured. The delay time between C and D is also configurable.

5	time 1=0/time2=1	Motion, Overshoot time	1bit	C,R,W,T	1.001 switch
5	value	Motion, Overshoot time	2byte	C,R,W,T	7.001 pulses

This object controls the detector overshoot time. Depending on configuration either a current value (DPT 7.001, resolution 1 second) or one of the preconfigured overshoot times (overshoot time 0 or overshoot time 1) is selected.

This object is saved at bus voltage failure and restored at bus voltage recovery.

6	On/Off	Motion detector lock	1bit	C,R,W,T,U	1.001 switch

This object locks and releases the detector again.

The parameter "Lock motion sensor via comm- object" is used to set whether the detector is locked when a "0" is received or when a "1" is received. It can also be determined that the detector is never locked, regardless of the object.

Note:

Any motion detections annunciated via objects 7 and 8, Extension input motion, are still obeyed.

A locked detector evaluates detected motions depending on its parameter setting.

The start value after bus voltage recovery is configurable.

7	On	Extension input, Motion	1bit	C,R,W,T	1.001 switch

The detector is triggered from external via this object. This means, as soon as the detector receives the value "1" via this object, telegram A and B (object 1 and 2) are sent, according to the configuration. The extension objects are enabled during lock mode.

8	Off	Extension input, Motion	1bit	C,R,W,T	1.001 switch

The detector is switched off from external via this object. This means, as soon as the detector receives the value "0" via this object, telegram C and D (object 3 and 4) are sent, according to the configuration. The extension objects are enabled during lock mode.

28	value 1 / value 2	8-bit value selection, Motion, A/C	1bit	C,R,W	1.001 switch

The detector sends value 1 (0...255) in case of receiving "0" and value 2 (0...255) when "1".

In case of bus voltage recovery value 1 is used as default.

Table 6.3 "Motion detector" communication object table

6.4. "Presence detector" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
9	Switching, Start of Presence, A	On			1 bit	C	R	W	T	-	switch	Low
10	Switching, Start of Presence, B	On			1 bit	C	R	W	T	-	switch	Low
11	Switching, End of Presence, C	Off			1 bit	C	R	W	T	-	switch	Low
12	Switching, End of Presence, D	Off			1 bit	C	R	W	T	-	switch	Low
13	Presence, Overshoot time	time 1 = 0 / time 2 = 1			1 bit	C	R	W	T	-	switch	Low
14	Presence lock	On / Off			1 bit	C	R	W	T	U	switch	Low
15	Extension input, Presence	On			1 bit	C	R	W	T	-	switch	Low
16	Extension input, Presence	Off			1 bit	C	R	W	T	-	switch	Low
13	Presence, Overshoot time	value			2 bytes	C	R	W	T	-	pulses	Low
29	8-bit value selection, Presence, A/C	value 1 / value 2			1 bit	C	R	W	-	-	switch	Low

Fig.6.4 "Presence detector" communication object

Obj.No.	Function	Object name	Type	Flags	DPT
9	On/Off	Switching, Start of Presence, A	1bit	C,R,W,T	1.001 switch
9	value	8-bit value, Start of Presence, A	1byte	C,R,W,T	5.001 percentage (0..100%)
9	value	16-bit value, Start of Presence, A	2byte	C,R,W,T	7.001 pulses
9	value	Brightness, Start of Presence, A	2byte	C,R,W,T	9.004 lux (Lux)
9	recall	Scene, Start of Presence, A	1byte	C,R,W,T	17.001 scene number
9	value	Temperature, Start of Presence, A	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the beginning of a detected presence or on external triggering:

- ❖ Switch On/Off - DPT 1.001

- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001

- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001

- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004

- ❖ 8-bit scene recall - DPT 17.001

- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Note: After bus voltage recovery, there is a break of approximately 30 seconds before the detector can send via this object.

Obj.No.	Function	Object name	Type	Flags	DPT
10	On/Off	Switching, Start of Presence, B	1bit	C,R,W,T	1.001 switch
10	value	8-bit value, Start of Presence, B	1byte	C,R,W,T	5.001 percentage (0..100%)
10	value	16-bit value, Start of Presence, B	2byte	C,R,W,T	7.001 pulses
10	value	Brightness, Start of Presence, B	2byte	C,R,W,T	9.004 lux (Lux)
10	recall	Scene, Start of Presence, B	1byte	C,R,W,T	17.001 scene number
10	value	Temperature, Start of Presence, B	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the beginning of a detected presence or on external triggering:

- ❖ Switch On/Off - DPT 1.001

- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001

- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001

- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004

- ❖ 8-bit scene recall - DPT 17.001

- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Telegram B is sent after telegram A, if this has been configured. The delay time between A and B is also configurable.

11	On/Off	Switching, End of Presence, C	1bit	C,R,W,T	1.001 switch
11	value	8-bit value, End of Presence, C	1byte	C,R,W,T	5.001 percentage (0..100%)
11	value	16-bit value, End of Presence, C	2byte	C,R,W,T	7.001 pulses
11	value	Brightness, End of Presence, C	2byte	C,R,W,T	9.004 lux (Lux)
11	recall	Scene, End of Presence, C	1byte	C,R,W,T	17.001 scene number
11	value	Temperature, End of Presence, C	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the end of a detected presence or on external triggering:

- ❖ Switch On/Off - DPT 1.001
- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001
- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001
- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004
- ❖ 8-bit scene recall - DPT 17.001
- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

12	On/Off	Switching, End of Presence, D	1bit	C,R,W,T	1.001 switch
12	value	8-bit value, End of Presence, D	1byte	C,R,W,T	5.001 percentage (0..100%)
12	value	16-bit value, End of Presence, D	2byte	C,R,W,T	7.001 pulses
12	value	Brightness, End of Presence, D	2byte	C,R,W,T	9.004 lux (Lux)
12	recall	Scene, End of Presence, D	1byte	C,R,W,T	17.001 scene number
12	value	Temperature, End of Presence, D	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the end of a detected presence or on external triggering:

- ❖ Switch On/Off - DPT 1.001
- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001
- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001
- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004
- ❖ 8-bit scene recall -DPT 17.001
- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Telegram D is sent after telegram C, if this has been configured. The delay time between C and D is also configurable.

13	time 1=0/time2=1	Motion, Overshoot time	1bit	C,R,W,T	1.001 switch
13	value	Motion, Overshoot time	2byte	C,R,W,T	7.001 pulses

This object controls the detector overshoot time. Depending on configuration either a current value (DPT 7.001, resolution 1 second) or one of the preconfigured overshoot times (overshoot time 0 or overshoot time 1) is selected.

This object is saved at bus voltage failure and restored at bus voltage recovery.

14	On/Off	Presence lock	1bit	C,R,W,T,U	1.001 switch

This object locks and releases the detector again.

The parameter "Lock Presence sensor via comm- object" is used to set whether the detector is locked when a "0" is received or when a "1" is received. It can also be determined that the detector is never locked, regardless of the object.

Note:

Any presence detections annunciated via objects 15 and 16, Extension input motion, are still obeyed.

A locked detector evaluates detected presence depending on parameter settings.

The start value after bus voltage recovery is configurable.

15	On	Extension input, Presence	1bit	C,R,W,T	1.001 switch

The detector is triggered from external via this object. This means, as soon as the detector receives the value "1" via this object, telegram A and B (object 9 and 10) are sent, according to the configuration. The extension objects are enabled during lock mode.

16	Off	Extension input, Presence	1bit	C,R,W,T	1.001 switch

The detector is switched off from external via this object. This means, as soon as the detector receives the value "0" via this object, telegram C and D (object 11 and 12) are sent, according to the configuration. The extension objects are enabled during lock mode.

29	value 1 / value 2	8-bit value selection, Presence, A/C	1bit	C,R,W	1.001 switch

The detector sends value 1 (0...255) in case of receiving "0" and value 2 (0...255) when "1".The value will be sent immediately in case of value C or D was sent as last value.

In case of bus voltage recovery value 1 is used as default.

Table 6.4 "Presence detector" communication object table

6.5. "HVAC - Presence detector" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
17	Switching, Start of HVAC-Presence, A	On			1 bit	C	R	W	T	-	switch	Low
18	Switching, Start of HVAC-Presence, B	On			1 bit	C	R	W	T	-	switch	Low
19	Switching, End of HVAC-Presence, C	Off			1 bit	C	R	W	T	-	switch	Low
20	Switching, End of HVAC-Presence, D	Off			1 bit	C	R	W	T	-	switch	Low
21	HVAC-Presence, overshoot time	Off = 1 / On = 2			1 bit	C	R	W	T	-	switch	Low
22	HVAC-Presence lock	On / Off			1 bit	C	R	W	T	U	switch	Low
23	Extension input, HVAC-Presence	On			1 bit	C	R	W	T	-	switch	Low
24	Extension input, HVAC-Presence	Off			1 bit	C	R	W	T	-	switch	Low
21	HVAC-Presence, overshoot time	value			2 bytes	C	R	W	T	-	pulses	Low

Fig.6.5 "HVAC - Presence detector" communication object

Obj. No.	Function	Object name	Type	Flags	DPT
17	On/Off	Switching, Start of HVAC - Presence, A	1bit	C,R,W,T	1.001 switch
17	value	8-bit value, Start of HVAC - Presence, A	1byte	C,R,W,T	5.001 percentage (0..100%)
17	value	16-bit value, Start of HVAC - Presence, A	2byte	C,R,W,T	7.001 pulses
17	value	Brightness, Start of HVAC - Presence, A	2byte	C,R,W,T	9.004 lux (Lux)
17	recall	Scene, Start of HVAC - Presence, A	1byte	C,R,W,T	17.001 scene number
17	value	Temperature, Start of HVAC - Presence, A	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the beginning of a detected presence or on external triggering:

- ❖ Switch On/Off - DPT 1.001

- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001

- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001

- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004

- ❖ 8-bit scene recall - DPT 17.001

- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Note: After bus voltage recovery, there is a break of approximately 30 seconds before the detector can send via this object.

18	On/Off	Switching, Start of HVAC - Presence, B	1bit	C,R,W,T	1.001 switch
18	value	8-bit value, Start of HVAC - Presence, B	1byte	C,R,W,T	5.001 percentage (0..100%)
18	value	16-bit value, Start of HVAC - Presence, B	2byte	C,R,W,T	7.001 pulses
18	value	Brightness, Start of HVAC - Presence, B	2byte	C,R,W,T	9.004 lux (Lux)
18	recall	Scene, Start of HVAC - Presence, B	1byte	C,R,W,T	17.001 scene number
18	value	Temperature, Start of HVAC - Presence, B	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the beginning of a detected presence or on external triggering:

- ❖ Switch On/Off - DPT 1.001

- ❖ 8-bit value (decimal) (0 - 255) - DPT 5.001

- ❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001

- ❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004

- ❖ 8-bit scene recall - DPT 17.001

- ❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Telegram B is sent after telegram A, if this has been configured. The delay time between A and B is also configurable.

19	On/Off	Switching, End of HVAC - Presence, C	1bit	C,R,W,T	1.001 switch
19	value	8-bit value, End of HVAC - Presence, C	1byte	C,R,W,T	5.001 percentage (0..100%)
19	value	16-bit value, End of HVAC - Presence, C	2byte	C,R,W,T	7.001 pulses
19	value	Brightness, End of HVAC - Presence, C	2byte	C,R,W,T	9.004 lux (Lux)
19	recall	Scene, End of HVAC - Presence, C	1byte	C,R,W,T	17.001 scene number
19	value	Temperature, End of HVAC -Presence, C	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the end of a detected presence or on external triggering:

❖ Switch On/Off - DPT 1.001

❖ 8-bit value (decimal) (0 - 255) - DPT 5.001

❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001

❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004

❖ 8-bit scene recall - DPT 17.001

❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

20	On/Off	Switching, End of HVAC - Presence, D	1bit	C,R,W,T	1.001 switch
20	value	8-bit value, End of HVAC - Presence, D	1byte	C,R,W,T	5.001 percentage (0..100%)
20	value	16-bit value, End of HVAC - Presence, D	2byte	C,R,W,T	7.001 pulses
20	value	Brightness, End of HVAC - Presence, D	2byte	C,R,W,T	9.004 lux (Lux)
20	recall	Scene, End of HVAC - Presence, D	1byte	C,R,W,T	17.001 scene number
20	value	Temperature, End of HVAC -Presence, D	2byte	C,R,W,T	9.001 temperature (℃)

Depending on the setting, this object sends one of the following values to the bus at the end of a detected presence or on external triggering:

❖ Switch On/Off - DPT 1.001

❖ 8-bit value (decimal) (0 - 255) - DPT 5.001

❖ 16-bit value (decimal) (0 - 65 535) - DPT 7.001

❖ 16-bit value (brightness) (0LUX - 2000LUX) - DPT 9.004

❖ 8-bit scene recall -DPT 17.001

❖ 16-bit value (temperature) (0.0°C / 32F - 40.0°C / 104F) - DPT 9.001

Telegram D is sent after telegram C, if this has been configured. The delay time between C and D is also configurable.

21	time 1=0/time2=1	HVAC - Presence, Overshoot time	1bit	C,R,W,T	1.001 switch
21	value	HVAC - Presence, Overshoot time	2byte	C,R,W,T	7.001 pulses

This object controls the detector overshoot time. Depending on configuration either a current value (DPT 7.001, resolution 1 second) or one of the preconfigured overshoot times (overshoot time 0 or overshoot time 1) is selected.

This object is saved at bus voltage failure and restored at bus voltage recovery.

22	On/Off	HVAC - Presence lock	1bit	C,R,W,T,U	1.001 switch

This object locks and releases the detector again.

The parameter "Lock Presence sensor via comm- object" is used to set whether the detector is locked when a "0" is received or when a "1" is received. It can also be determined that the detector is never locked, regardless of the object.

Note:

Any HVAC - Presence detections annunciated via objects 23 and 24, Extension input motion, are still obeyed. A locked detector does not evaluate detected motions.

The start value after bus voltage recovery is configurable.

23	On	Extension input, HVAC - Presence	1bit	C,R,W,T	1.001 switch

The detector is triggered from external via this object. This means, as soon as the detector receives the value "1" via this object, telegram A and B (object 17 and 18) are sent, according to the configuration. The extension objects are enabled during lock mode.

24	Off	Extension input, HVAC - Presence	1bit	C,R,W,T	1.001 switch

The detector is switched off from external via this object. This means, as soon as the detector receives the value "0" via this object, telegram C and D (object 19 and 20) are sent, according to the configuration. The extension objects are enabled during lock mode.

Table 6.5 "HVAC - Presence detector" communication object table

6.6. "Light control (on-off)" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
44	Control unit On/Off (on-off)	On / Off			1 bit	C	-	W	T	-	switch	Low
45	Status, automatic mode (on-off)	On / Off			1 bit	C	-	W	T	-	boolean	Low
46	Setpoint for switching on	value in LUX			2 bytes	C	R	W	-	-	lux (Lux)	Low
47	Setpoint for switching off	value in LUX			2 bytes	C	R	W	-	-	lux (Lux)	Low
48	Input switching value (on-off)	On / Off			1 bit	C	-	W	T	-	switch	Low
49	Input dimming value (on-off)	brighter / darker			4 bit	C	-	W	T	-	dimming control	Low
50	Input dimming value (on-off)	value			1 byte	C	-	W	T	-	percentage (0..100%)	Low
51	Switching (on-off)	On			1 bit	C	-	W	T	-	switch	Low
52	Switching (on-off)	Off			1 bit	C	-	W	T	-	switch	Low

Fig.6.6 "Light control (on-off)" communication object

Obj. No.	Function	Object name	Type	Flags	DPT
44	On/Off	Control unit On/Off (on-off)	1bit	C,W,T	1.001 switch

This object switches the controller on or off per group address. This information can come from a bus button or from the output object of a presence detector, for example.

45	On/Off	Status, automatic mode (on-off)	1bit	C,W,T	1.002 boolean

The controller notifies its internal status to the outside world via this object. The status can either have the value "On," i.e. the controller works in automatic mode, or the value "Off." Moreover, this does not differentiate between whether the controller was switched off manually or by override.

Describing this object has no effect.

46	value in LUX	Setpoint for switching on	2byte	C,R,W	9.004 lux (Lux)

This object notifies the brightness controller of the setpoint for switching on in automatic mode. Until the first occurrence of a value, the value from the parameter "Switch on if brightness value less than xx LUX" is used as the setpoint.

This object is saved at bus voltage failure and restored at bus voltage recovery.

47	value in LUX	Setpoint for switching off	2byte	C,R,W	9.004 lux (Lux)

This object notifies the brightness controller of the setpoint for switching off in automatic mode. Until the first occurrence of a value, the value from the parameter "Switch off if brightness value greater than xx LUX" is used as the setpoint.

This object is saved at bus voltage failure and restored at bus voltage recovery.

48	On/Off	Input switching value (on-off)	1bit	C,W,T	1.001 switch

If a value (logical 0 or 1) is received via this object, the controller switches off (automatic mode off), because it has been overwritten from outside.

Only by receiving "logical 1" via object no. 44 will the controller be switched on again (automatic mode on).

49	brighter / darker	Input dimming value (on-off)	4bit	C,W,T	3.007 dimming control

If a value is received via this object, the controller switches off, because it has been overwritten from outside.

Only by receiving "logical 1" via object no. 44 will the controller be switched on again (automatic mode on).

50	value	Input dimming value (on-off)	1byte	C,W,T	5.001 percentage (0..100%)

If a value (0-255) is received via this object, the controller switches off, because it has been overwritten from outside.

Only by receiving "logical 1" via object no. 44 will the controller be switched on again (automatic mode on).

51	On	Switching (on-off)	1bit	C,W,T	1.001 switch

This object is one of the outputs of the two-point controller. It sends the value "On" if the brightness is below the defined brightness value in a given period of time.

52	Off	Switching (on-off)	1bit	C,W,T	1.001 switch

This object is one of the outputs of the two-point controller. It sends the value "Off" if the brightness is below the defined brightness value in a given period of time.

Table 6.6 "Light control (on-off)" communication object table

6.7. "Constant light level control continuous" communication object

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
43	Control actual value (continuous)	value in LUX			2 bytes	C	R	W	-	-	lux (Lux)	Low
53	Control unit On/Off (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
54	Status, Automatic mode (continuous)	On / Off			1 bit	C	R	-	T	-	boolean	Low
55	Setpoint abs. (DPT 9004) (continuous)	value in LUX			2 bytes	C	R	W	T	-	lux (Lux)	Low
56	Setpoint rel. (DPT 3007) (continuous)	brighter / darker			4 bit	C	R	W	-	-	dimming control	Low
57	Control stop, switching value (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
58	Control stop, dimming (continuous)	brighter / darker			4 bit	C	-	W	T	U	dimming control	Low
59	Control stop, dimming value (continuous)	dimming value			1 byte	C	-	W	T	U	percentage (0..100%)	Low
60	Output switching Master (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
61	Output dimming value (Master)	dimming value			1 byte	C	-	W	T	U	percentage (0..100%)	Low
62	Master status dimming (continuous)	dimming value			1 byte	C	-	W	T	U	percentage (0..100%)	Low
63	Output switching Slave 1 (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
64	Output dimming value Slave 1 (continuous)	dimming value			1 byte	C	-	W	T	-	percentage (0..100%)	Low
65	Output switching Slave 2 (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
66	Output dimming value Slave 2 (continuous)	dimming value			1 byte	C	-	W	T	-	percentage (0..100%)	Low
67	Output switching Slave 3 (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
68	Output dimming value Slave 3 (continuous)	dimming value			1 byte	C	-	W	T	-	percentage (0..100%)	Low
69	Output switching Slave 4 (continuous)	On / Off			1 bit	C	-	W	T	-	switch	Low
70	Output dimming value Slave 4 (continuous)	dimming value			1 byte	C	-	W	T	-	percentage (0..100%)	Low
71	Calibration of master (continuous)	1=Start / 0=Stop			1 bit	C	-	W	T	-	start/stop	Low

Fig.6.7 "Constant light level control continuous" communication object

Obj. No.	Function	Object name	Type	Flags	DPT
43	value in LUX	Control actual value (continuous)	2byte	C,R,W	9.004 lux (Lux)

Via the group address assigned to this object the current control actual value in LUX is transmitted on a read request.

Note: Set the Transmit (T) flag for sending on change of value.

Obj. No.	Function	Object name	Type	Flags	DPT
53	On / Off	Control unit On/Off (continuous)	1bit	C,W,T	1.001 switch

The constant light level controller can be switched on or off via a group address assigned to this object. This command may come from a wall switch or an output object of a presence detector.

When a logical "0" is received the controller is turned off, i.e. set point value and actual value are no longer compared. Thus the constant light level control is stopped. When the controller is turned off the control value 0 is sent.

When a logical "1" is received the controller is turned on.

On bus voltage recovery the controller is turned off, independent of the status the controller had before bus voltage failure.

Obj. No.	Function	Object name	Type	Flags	DPT
54	On / Off	Status, Automatic mode (continuous)	1bit	C,R,T	1.002 boolean

The controller communicates its internal state via this object. When the state „On" is communicated the controller is either in the state "active" or "standby". When the state "Off" is communicated then the controller is either in the state "inactive" or "off".

Writing to this object has no effect.

55	value in LUX	Setpoint abs. (DPT 9.004) (continuous)	2byte	C,R,W,T	9.004 lux (Lux)

Via this object the setpoint for the constant light level control is set. Until the first value is received the value of the parameter "Maximum setpoint in LUX" is used as default value.

Note:

1. The currently valid control setpoint is sent via this object onto the bus on change of value, thus allowing a visualization to display the current value.

2. When the setpoint value changes the control process may be active dependent on the determined calibration curve even if the actual value is within the range defined by the setpoint and the hysteresis.

3. On bus voltage recovery the value of this object is sent automatically.

4. The setpoint value is limited by the configuration settings for minimum / maximum set point value.

5. On reception of 0 the set point value is not changed.

56	brighter / darker	Setpoint rel. (DPT 3007) (continuous)	4 bit	C,R,W	3.007 dimming control

Via this object the setpoint can be changed relative to the current value. The controller increments or decrements the internal setpoint every second by a dimming value set via parameter, if "Change of setpoint per dimming step" is used.

Note:

1. The controller can process relative changes of the setpoint only every second. When e.g. two ¼-brighter dimming telegrams are received within 200ms then both are joined together. The result is one dimming brighter command with about 50% increase.

2. The setpoint value is limited by the configuration settings for minimum / maximum set point value.

57	On / Off	Control stop, switching value (continuous)	1 bit	C,W,T	1.001 switch

When a value is received via this object then the controller changes its state to "inactive". In this state the controller is passive, i.e. no control commands are sent onto the bus.

58	brighter / darker	Control stop, dimming (continuous)	4 bit	C,W,T,U	3.007 dimming control

When a value is received via this object then the controller changes its state to "inactive". In this state the controller is passive, i.e. no control commands are sent onto the bus.

59	dimming value	Control stop, dimming value (continuous)	1byte	C,W,T,U	5.001 percentage (0..100%)

When a value is received via this object then the controller changes its state to "inactive". In this state the controller is passive, i.e. no control commands are sent onto the bus.

60	On / Off	Output switching Master (continuous)	1bit	C,W,T	1.001 switch

Via this object the controller sends on and off control commands to the main lighting group. It sends the value "On" when the brightness is below the defined brightness setpoint for a defined time. It sends the value "Off" when the controller received a logical "0" via object 53 or when the controller changes from the state "active" to the state "standby" (see parameter "Timeout for automatic off [min]").

61	dimming value	Output dimming value (Master)	1byte	C,W,T,U	5.001 percentage (0..100%)
		Via this object the controller sends the dimming values for the main lighting group.			
62	dimming value	Master status dimming (continuous)	1byte	C,W,T,U	5.001 percentage (0..100%)
		Via this object the current dimming value of the dimming actuator for the main lighting group (master) can be read.			
63	On / Off	Output switching Slave 1 (continuous)	1bit	C,W,T	1.001 switch
		Via this object the controller sends on and off control commands to the first additional lighting group. It sends the value "On" when the brightness is below the defined brightness setpoint for a defined time. It sends the value "Off" when the controller received a logical "0" via object 53 or when the controller changes from the state "active" to the state "standby".			
64	dimming value	Output dimming value Slave 1 (continuous)	1byte	C,W,T	5.001 percentage (0..100%)
		Via this object the controller sends the dimming values for the first additional lighting group.			
65	On / Off	Output switching Slave 2 (continuous)	1bit	C,W,T	1.001 switch
		Via this object the controller sends on and off control commands to the second additional lighting group. It sends the value "On" when the brightness is below the defined brightness setpoint for a defined time. It sends the value "Off" when the controller received a logical "0" via object 53 or when the controller changes from the state "active" to the state "standby".			
66	dimming value	Output dimming value Slave 2 (continuous)	1byte	C,W,T	5.001 percentage (0..100%)
		Via this object the controller sends the dimming values for the second additional lighting group.			
67	On / Off	Output switching Slave 3 (continuous)	1bit	C,W,T	1.001 switch
		Via this object the controller sends on and off control commands to the third additional lighting group. It sends the value "On" when the brightness is below the defined brightness setpoint for a defined time. It sends the value "Off" when the controller received a logical "0" via object 53 or when the controller changes from the state "active" to the state "standby".			
68	dimming value	Output dimming value Slave 3 (continuous)	1byte	C,W,T	5.001 percentage (0..100%)
		Via this object the controller sends the dimming values for the third additional lighting group.			
69	On / Off	Output switching Slave 4 (continuous)	1bit	C,W,T	1.001 switch
		Via this object the controller sends on and off control commands to the fourth additional lighting group. It sends the value "On" when the brightness is below the defined brightness setpoint for a defined time. It sends the value "Off" when the controller received a logical "0" via object 53 or when the controller changes from the state "active" to the state "standby".			

70	dimming value	Output dimming value Slave 4 (continuous)	1byte	C,W,T	5.001 percentage (0..100%)
	Via this object the controller sends the dimming values for the fourth additional lighting group.				
71	1=Start / 0=Stop	Calibration of master (continuous)	1bit	C,W,T	1.010 start/stop
	Via this object the calibration process of the controller is started with a logical "1". Required is that controller has status "inactive". After completion of the calibration process the controller is in the state "inactive". Via this object the calibration process of the controller is stopped with a logical "0". **Note: After a successful calibration the actuators are dimmed to 50%. After a failed calibration the actuators are dimmed to the minimum dimming level (~ 6%).**				

Table 6.7 "Constant light level control continuous" communication object table

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Chapter 7 Appendix

7.1. Determination of the correction factor of the brightness sensor

To be able to use the integrated brightness sensor, this must be calibrated, since the share of the reflected light, which the sensor measures, is dependent on the reflective area very strongly under the brightness sensor.

The brightness sensor includes only the reflected brightness by the indirect real-time measurement method which there exists under the sensor in the recording area. The integrated regulator needs the brightness for the evaluation, however, in the recording area. This can be calculated by a correction factor multiplied. The so certain correction factor is under parameter brightness measuring - to type correction factor in.

Example:

LUX if a LUX metre on the job surface 500 LUX, suited to below however at the ceiling includes only 200 LUX, the factor simply can be found out arithmetically with 2.5. It is reflected only 40% of the surface. As a parameter "correction factor" 2.5 has to be typed in.
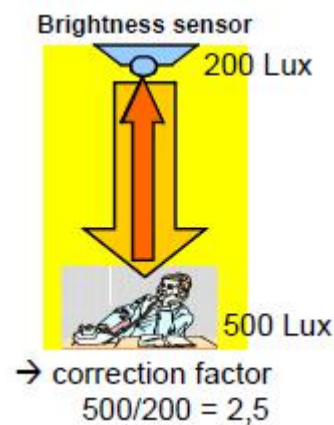

Fig. 8 indirect measuring

Alternative automatic method of computation

The measured density value can be sent to the device by communication object (27), the calculation of the correction factor therefore can be made by the device itself.

Example:

With a LUX metre of measured density value on the job surface at 500 LUX is sent to released communication object 27 by ETS.

Note: This kind of calibration requires a similar share of natural light and artificial light. The correction factor is limited on at most 20.

7.2. Determination of the control characteristic

The natural daylight drops off with increasing room depth. The controller can find the necessary lighting intensity out from the reference measurement under the sensor (master) from measured density values under the up to five lights. The determination of the five (5) density values must be carried out at daylight.
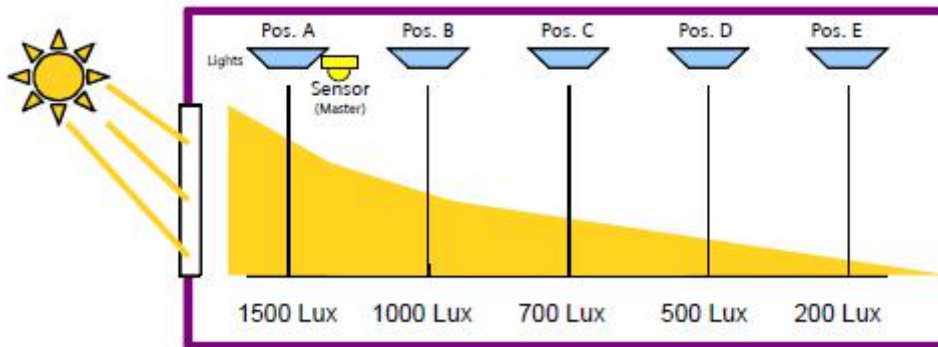

Fig. 9 Natural daylight drops off with increasing room depth

Example:

Being brightness distribution of the daylight found out with a LUX metre of the density values among the five lights like into Fig. 9 after room depth of Fig.9 represented for the configuration of the control characteristic. The measurements are typed in ETS as a parameter "measured LUX value at position A, ..., E". At the same time, the position of the brightness sensor has to be indicated here "to position A".
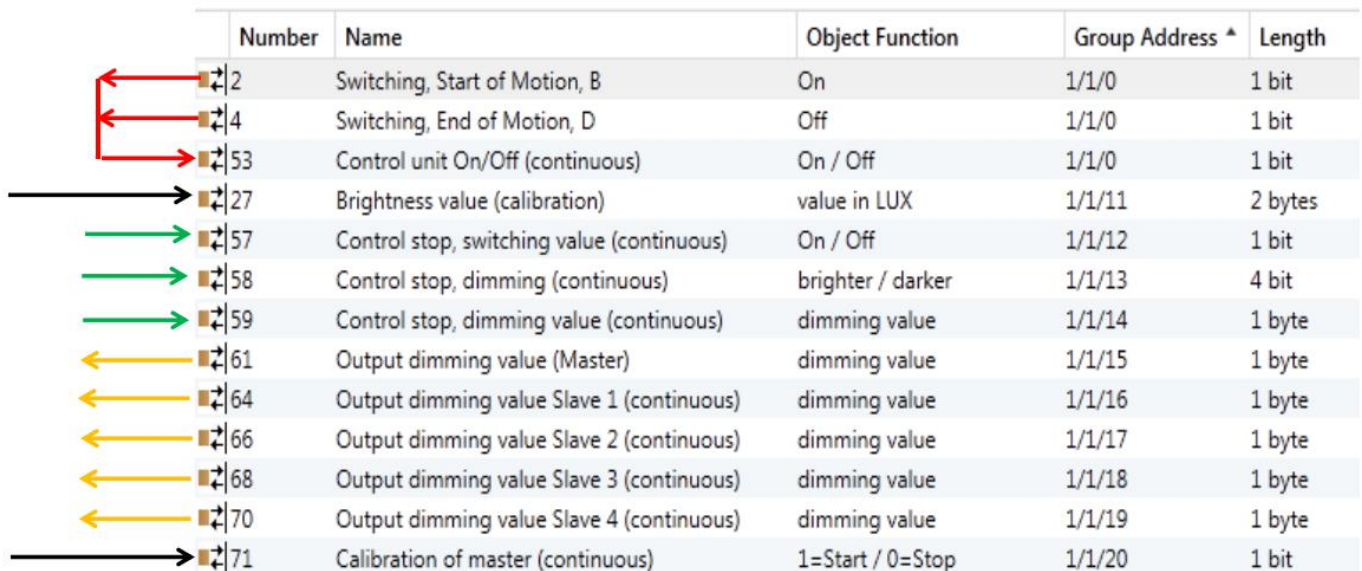
Note: This kind of calibration requires sufficiently natural daylight and no artificial light. The determination of the control characteristic is presupposed at the use of parameter "start value". The calculation works all the better the bigger the measurements are. The regulation needs only the relationship of the density values since these are standardized.

7.3. Determination of characteristic of used lights in the room

The light distribution is in the room of importance besides the light distribution in the room depth for an efficient constant light regulation by the radiation characteristic of the lights used. This can be found out at darkness without natural daylight. The inquiry can be started by an initial instruction "1" on the communication object 71. An automatic regulation is therefore possible during the darkness or not use of the room by time switching command during the after-hours. During the procedure the lights are steered for with up to 15 predefined density values. The accompanying brightness is measured in terms of the brightness sensor. A successful regulation is confirmed by the shining of all lights with 50% brightness at the end. In the case of a fault these shine with minimal brightness (approx. 6%). The 15 measurement results can be recorded and evaluated if necessary with the ETS group monitor.

7.4. Example of configuration

This example shows how a controller - consisting of 1 master and 4 expansions – with the functional block "motion detector" can be controlled fully automatically and be over steered manually:

	Number	Name	Object Function	Group Address ▲	Length
	2	Switching, Start of Motion, B	On	1/1/0	1 bit
	4	Switching, End of Motion, D	Off	1/1/0	1 bit
	53	Control unit On/Off (continuous)	On / Off	1/1/0	1 bit
	27	Brightness value (calibration)	value in LUX	1/1/11	2 bytes
	57	Control stop, switching value (continuous)	On / Off	1/1/12	1 bit
	58	Control stop, dimming (continuous)	brighter / darker	1/1/13	4 bit
	59	Control stop, dimming value (continuous)	dimming value	1/1/14	1 byte
	61	Output dimming value (Master)	dimming value	1/1/15	1 byte
	64	Output dimming value Slave 1 (continuous)	dimming value	1/1/16	1 byte
	66	Output dimming value Slave 2 (continuous)	dimming value	1/1/17	1 byte
	68	Output dimming value Slave 3 (continuous)	dimming value	1/1/18	1 byte
	70	Output dimming value Slave 4 (continuous)	dimming value	1/1/19	1 byte
	71	Calibration of master (continuous)	1=Start / 0=Stop	1/1/20	1 bit

Fig.10 Communication objects for a presence depending control with five light groups

The communication objects represented in Fig. 10 are needed to operate a controller as a presence dependent fully automatic controller. The controller will be enabled and disabled via object 53. This object is connected to the objects 1 and 3 with the same group address. Object 27 is only visible when the parameter "Calibration" setting is: "via object". The determination of the correction factor (calibration) must be carried out only once, being repeated, however if e.g. the underground or the reflective area changes.

Objects 57 - 59 are needed for a manual over driving. A push button of switching, dimming or setting value can interrupt the automatic control, as long as the presence status is "on". As soon as the object 53 goes to "0" and back to "1" by a telegram, the controller is again in the automatic mode. The objects 61, 64, 66, 68 and 70 are the value objects to the lights (actuators). Object 71 starts the determination of the characteristics of the used lights in the room.