



KNX Universal Presence Detector 360 Constant Light Control incl. Bus Coupler

Ref.No.: N000530

Extraordinary price-performance ratio with impressive quality and software features (ETS)

The KNX/EIB Universal Presence Detector 360 KLR with integrated KNX/EIB connection is the latest in the world. With its 4 pyro-detectors (can be switched on and off separately via ETS!) and a high-resolution lens it captures the smallest movement and evaluates each signal with a first-class electronic system controlled by a micro-controller. For concealed ceiling installation a usual case (flat is sufficient) is required or an optional surface installation cap can be used.

The differences and most important advantages of a presence detector compared with a motion detector (simple light measurement, malfunction caused by artificial light) are the universal application thanks to the special and permanent light measurement (daylight and/or mixed light measurement). The light value measurement is executed by a special sensor which disposes of a spectral sensitivity similar to the human eye.

Another advantage is the complete 360° room monitoring without any obstacles (for ceiling installation) with one single detector. The detector can capture an area of approx. 16x16 meters with the movement detection, a pure presence detection covers approx. 6x6 meters. When installed on the ceiling vandalism and theft by simply removing the detector is almost impossible. This is particularly important for public buildings. Larger rooms can be equipped with additional detectors based on the Master/Slave Function. Switching the 4 Pyro detectors on or off via ETS permits to influence the detection which can again be adjusted individually by sensitivity parameters.

Applications:

Constant light control, semi or fully-automatic corridor lighting or basic lighting control with restricted and manual operation as well as scene control for each room, particularly in apartment rooms, offices and spare rooms, bathroom/WC, corridors and staircases etc., control of workplace lighting, switching and dimming functions, HCV (Heating, Climate, Ventilation) presence control, simple alarm functions, hotel room control, server room monitoring (activating cameras, light or alarm functions, access control etc.). When installed on the ceiling ideal for rooms with limited installation options (glass or metal walls).

Features/Assembly:

Using the presence detector application software for the ETS the following operating modes can be parameterized:

Light control channel:

After detecting a movement the detector sends a 1-frame or an adjustable dimming value (0...100%). If there is no movement the presence detector sends - after an adjustable follow-up time - a 0-frame or a second adjustable dimming value (0...100%).

Control channel HCV (Heating, Climate, Ventilation):

This output is only activated after the verification of 2 to 20 consecutive monitoring windows of equal length in which at least one movement was detected. Thanks to the possibility to parameterize sensitivity the detector can also be used for simple alarm functions e.g. for one-family or apartment houses in Home-Automation (no VDS alarm system permit, there is no sabotage protection and multiple pulse counter).

Master- or Slave Mode:

Can be configured by parameterizing by means of ETS. After an adjustable release time the detector returns to its standard condition.

Constant light control:

Presence detectors with constant light control dispose of additional functions. They do not only send a dimming value of 0 to 100% but can also be switched by presence or a control command. Even standby time and brightness can be parameterized individually. For lamps that can be dimmed activation is achieved by permanent constant light control by means of a value object "Absolute Dimming".

Your advantages:

- Passive infrared (PIR) presence detector for ceiling installation with integrated KNX/EIB connection.
- 4 Pyro-detectors and one high-resolution lens capture the smallest movements
- Full or semi automat: As a full automat the light is switched on or off automatically depending on presence and brightness. With a semi-automat you must always switch on by hand using a KNX/EIB push button or a conventional push button with KNX/EIB push button interface or binary input. Switch-off is automatic. A brightness sensor with linear output provides the light measurement. An integrated optical filter has a profile that is similar to the human eye. The light sensor can trigger a 0-frame or a 1-frame in all operating modes as soon as the adjusted Lux value is exceeded or fallen below. In addition to that, the measured light value in Lux can be read out via bus.

Technical data

- Nominal voltage: 24V DC (21V DC – 30V DC KNX EIB)
- Power input: 0,5 W
- Captured area: 360°
- Range: 16 m, presence: 6 m
- PIR-sensors: 4 Pyro-detectors for large capture area
- Sensitivity: adjustable via ETS: low- normal – high
- Installation height: 2 m–4 m
- Adjustments: All adjustments can be set remote by ETS
- Light measurement: brightness sensor with optical filter and linear output
- Light value: light value in Lux can be read out via BUS
- Switching criteria: movement and brightness
- KNX EIB-connection: bus terminal 2-pole, 4 plug terminals each for wires with Ø 0.6 to 0.8 mm²
- release time adjustable
- Protection: IP 20 inside assembly/ class II
- Operating temperature range: 0 to +40 °C
- Detector dimensions: 86 mm x 86 mm x 35 mm
- Constant light control

Installation height	Persons sitting down Ø Diameter	Persons walking about Ø Diameter
2.0m	3m	12m
2.5m	4m	14m
3.0m	5m	16m
3.5m	6m	18m
4.0m	---	20m

There must be a minimum distance of 1.5 m between the motion detector and the connected lighting. Otherwise, due to the heat change, lights within the sensor range might trigger a new pulse for switching on due to the heat change after switching off. Light sources must not point directly to the motion detector.

The *KNX/EIB Universal Presence Detector 360* is based on a modern microcontroller to which 4 PIR sensors are connected, a brightness sensor and an IR- receiver. As far as the output goes the motion detector disposes of a KNX bus connection which ensures all switching and control functions.

The **KNX Universal Presence Detector 360 KLR** disposes of the following excellent features:

- **Stylish and functional design and extraordinary price-performance ratio**

- **Pyro detectors**

The 4 PIR-sensors of the presence detector capture smallest movements and can be activated as a single unit, and in groups of two or three.

- **Compact design**

Presence detector and bus coupler are integrated on a single board. This ensures high reliability and fault-free function.

- **Linear light sensor**

Disposes of an optical filter to adapt the sensitivity profile to the human eye. Sends the measured LUX values directly as 2 byte information via bus. This saves external light sensors when light controls are applied.

- **Scene function**

The KNX/EIB Universal Presence Detector 360 can activate scenes. Actuators or push buttons which support the scene function can be linked with the scene output object of the presence detector. Thus, when light is required, not only light groups but complete scenes can be activated.

- **Constant light control**

The constant light control receives the actual value from the common brightness measurement. Switch on (start of constant light control) as well as switch off (stop) can be carried out using object 16, the light channel or the HVC channel. Basically, after switch on/return of the bus voltage, the switch on process is started due to the transient response of the internal circuit.

Important advice

The KNX Universal Presence Detector 360 KLR is suitable for interior application, only.

Function

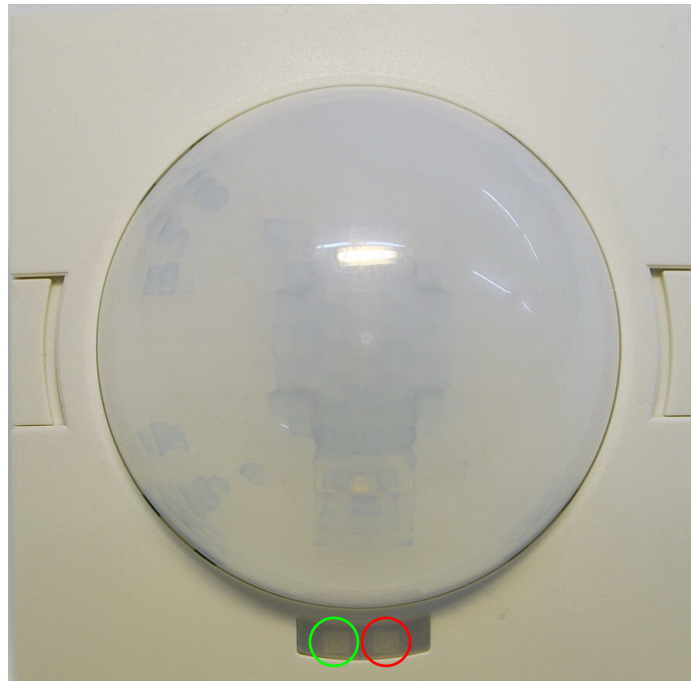
The KNX/EIB Universal Presence Detector 360 KLR responds to the heat radiation of bodies moving. If a person approaches the monitored area, the connected light/lamp is switched on automatically. If the person leaves the area, the light is switched off after a time that can be set in the ETS.

Installation

The ideal ceiling installation height is about 2m to 4m. Connect the presence detector as follows:

Insert red wire (+) of the bus line into the **red bus clamp**.

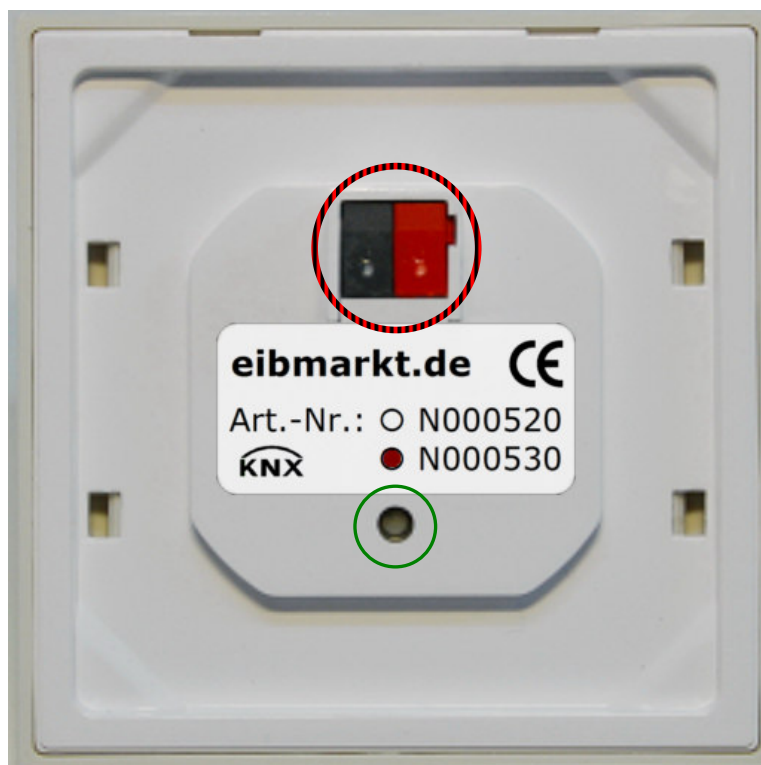
Insert black wire (-) of the bus line into the **black bus clamp**.



LED Movement: flashes 1x for each capture
LED Programming: shines when programming button is pressed

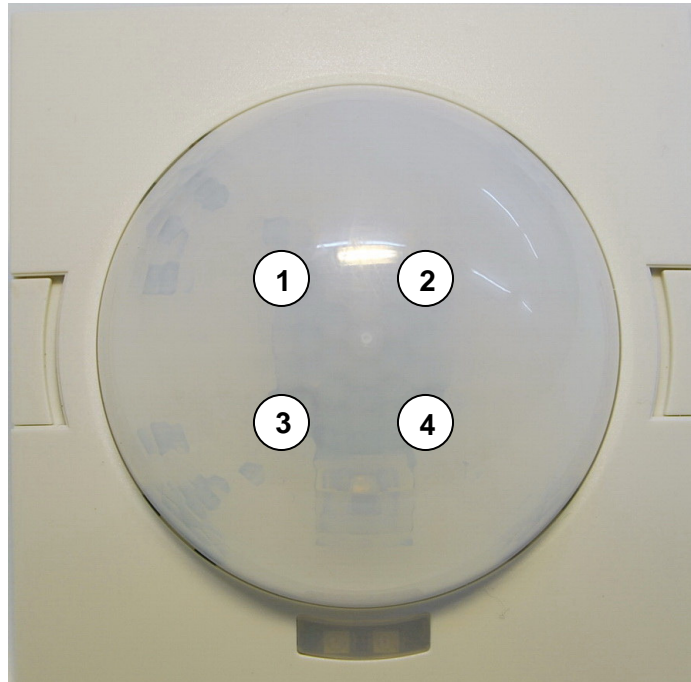
Bus clamp - (black)

Bus clamp + (red)



Programming key

Numbering PIR sensors

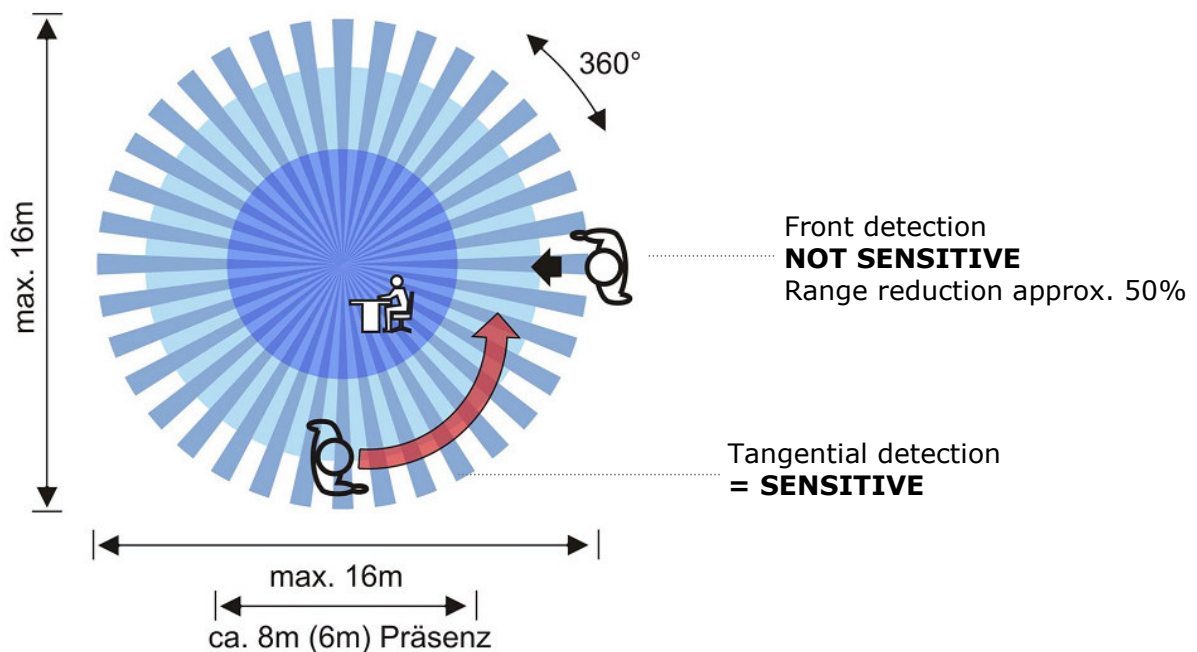


The PIR-sensors 1 2 3 4 can be activated over the ETS as a single unit or in groups. Doing so, the respective numbers must be respected.

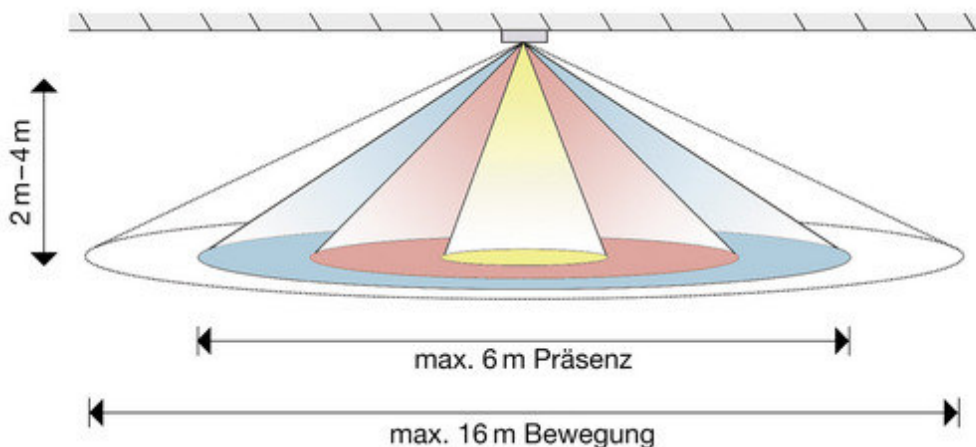
Detection area

The 360° round capture area as well as the dense capture network guarantee an optimum function. The range depends on the installation height and the walking direction (high sensitivity when cutting or changing a switch segment). Since the presence detector responds to the temperature difference between heat source and ambient temperature, the range can vary depending on the installation location (floor heating etc.).

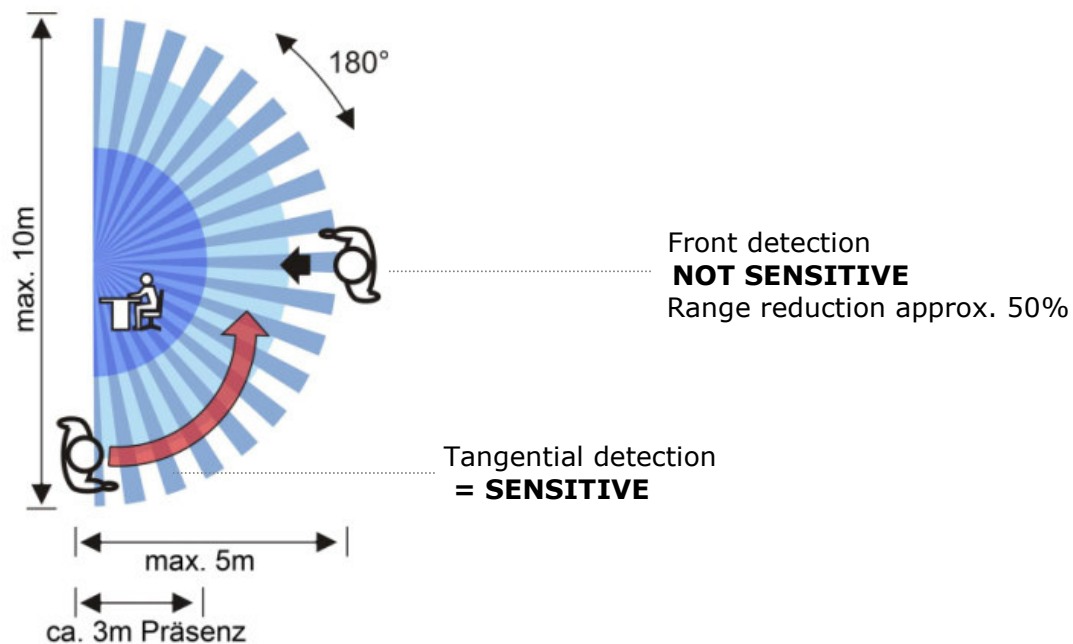
Ceiling installation version View from top



Ceiling installation version Side view



Wall-Version - View from top



Trouble shooting

Fault

Cause/Correction

Device does not switch:

- dimming value set too high
- check light bulb
- check position of hand switch
- check voltage/ fuse

Switches on and off without any reason or does not switch off at all:

- check detection area for faults: (draught, animals, heating etc.) can cause malfunctions!
- check distance to lamp (heat reflection or direct light)
- the presence detector is too sensitive, reduce the range with the sensitivity adjustment on ETS and / or cover the lens in the malfunction area with adhesive tape.

Switches on by day:

- LUX value for brightness threshold set too high. Change using menu light on ETS.

After connection to the KNX EIB Bus the electronic needs about 1 min. until it is ready for operation!

Application Description



Communication objects

Nr.	Name	Function	in/out	Type
0	Output - light	Switching	out	DPT1 / DPT 5
1	External switch / status - light	Switching	in	DPT 1
2	External movement - light	Switching	in	DPT 1
3	Input - light	Restraint	in	DPT 2
	Input - light	Lock	in	DPT 1
4	Output - HCV	Switching	out	DPT 1
5	Movement HCV	External switch	in	DPT 1
6	Movement HCV	External movement	in	DPT 1
7	Input-Climate HCV	Restraint	in	DPT 2
	Input-Climate HCV	Lock	in	DPT 1
8	Brightness switch	Threshold switch	out	DPT 1
9	Brightness value Lux	Brightness value Lux	out	DPT 9
10	Brightness AD calibration value	AD calibration value	out	non DPT
16	ConstantLight	Switch On/Off	in	DPT 1
17	ConstantLight	Set Relative Dimming	in	DPT 3
18	ConstantLight	Set Absolute Dimming	in	DPT 5
20	ConstantLight	Forced Control	in	DPT 1
21	ConstantLight	Scene	out	DPT 17
22	ConstantLight	Absolute Dimming Output	out	DPT 5

PARAMETERS

The following parameters are visible:

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general

Light
HCV (heating, conditioning, ventilation)
brightness
IR remote control
calibration brightness value
evaluation PIR
constant light

release time restraint: 9h

OK Cancel Default Info Help

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general

Light

operating mode of detector: fully automatic
LED green: in case of movement
follow-up time: 5 min
brightness threshold below active sensor: 300 Lux
brightness threshold above switch off: OFF
force or lock object: force object

object type for output - light: switching
object value for ON: ON
object value for OFF: OFF
sending conditions for switching object: ON and OFF
sending conditions for external push button: ON and OFF
idle time after switch off: 2 s

OK Cancel Default Info Help

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general

HCV (heating, conditioning, ventilation)

operating mode of detector: fully automatic
LED: OFF
follow-up time: 5 min
number of monitoring time windows: 3
force or lock object: force object

length of monitoring time window (s): 30
object type for output - climate (HCV): switching
object value for ON: ON
object value for OFF: OFF
sending conditions for switching object: ON and OFF
sending conditions for external push button: ON and OFF
idle time after switch off: 2 s

OK Cancel Default Info Help

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general

brightness

send light value in case of change by: 100 Lux
cyclical sending of light value: OFF
value for switching the threshold switch: 300 Lux
hysteresis: 30 Lux
object value for ON: ON
object value for OFF: OFF
send filter: ON and OFF

OK Cancel Default Info Help

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general

IR remote control

IR-channel: CH1

OK Cancel Default Info Help

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general

calibration brightness value

calibration brightness value: YES
AD calibration value: 0
lux value: 0

OK Cancel Default Info Help

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general

evaluation PIR

active Sensors: 4321
sensitivity 1 = min, 10 = max: 5

OK Cancel Default Info Help

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general

constant light

constant light controller: enabled
preset setpoint: 300 lx
Send difference: 5%
switching ON/OFF by: object
Cycle Transmission time: no cyclic transmission

switch On value: 100%
switch On timeout: 10 s

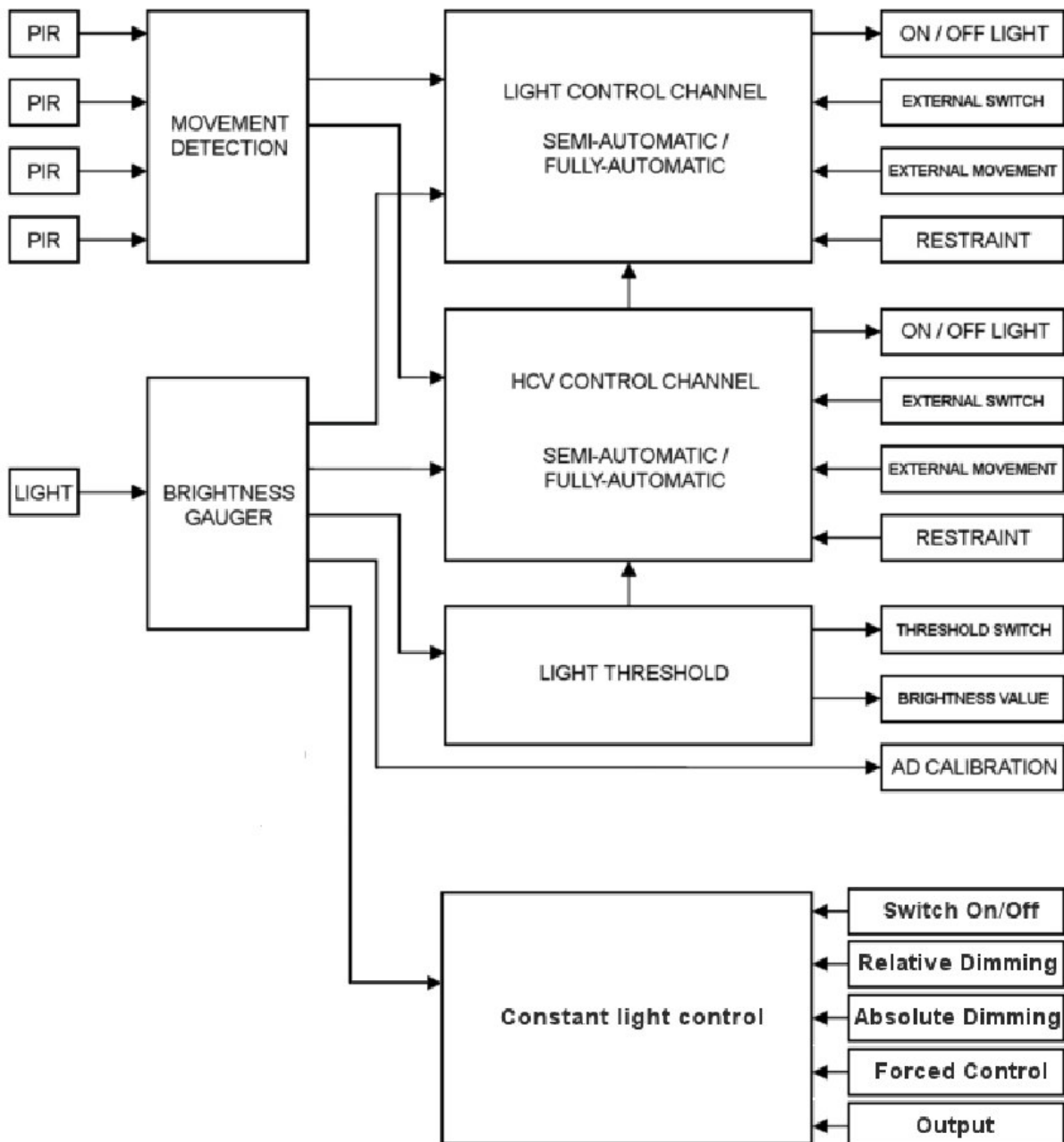
force output at ON: no reaction
force output at OFF: no reaction
relative dimming time: 8 s
take over setpoint after: 5 s
write changed setpoint to flash: disabled

OK Cancel Default Info Help

Functional Blocks

Function of the presence detector can be divided into the following blocks:

- Motion detection
- Brightness meter
- Light control channel
- HCV control channel
- Threshold switch depending on light
- Constant light control



The presence detector as well as the brightness meter have an independent influence on the light channel and the HCV channel.

LIGHT CONTROL CHANNEL

The light control channel has two operating modes which are set using the parameter operating mode of the presence detector. Possible adjustments are:

- fully-automatic
- semi-automatic

The differences between the operating modes fully-automatic and semi-automatic are as follows:

- Fully-automatic function has two operating conditions: ready, active and passive
- Semi-automatic function has two operating conditions: ready and active.
- The semi-automatic system does **not switch** on the light **automatically** when motion is detected. This can only be done by an external push button (KNX EIB).

OBJECT ON/OFF LIGHT

In this operating mode, each detectable movement causes the output object „ON/OFF LIGHT“ to send an „ON“ command and, thus, the follow-up time starts.

The follow-up time is set using the respective parameter. After completion of the follow-up time, an „OFF“ command is sent on the output object.

OBJECT EXTERNAL MOVEMENT

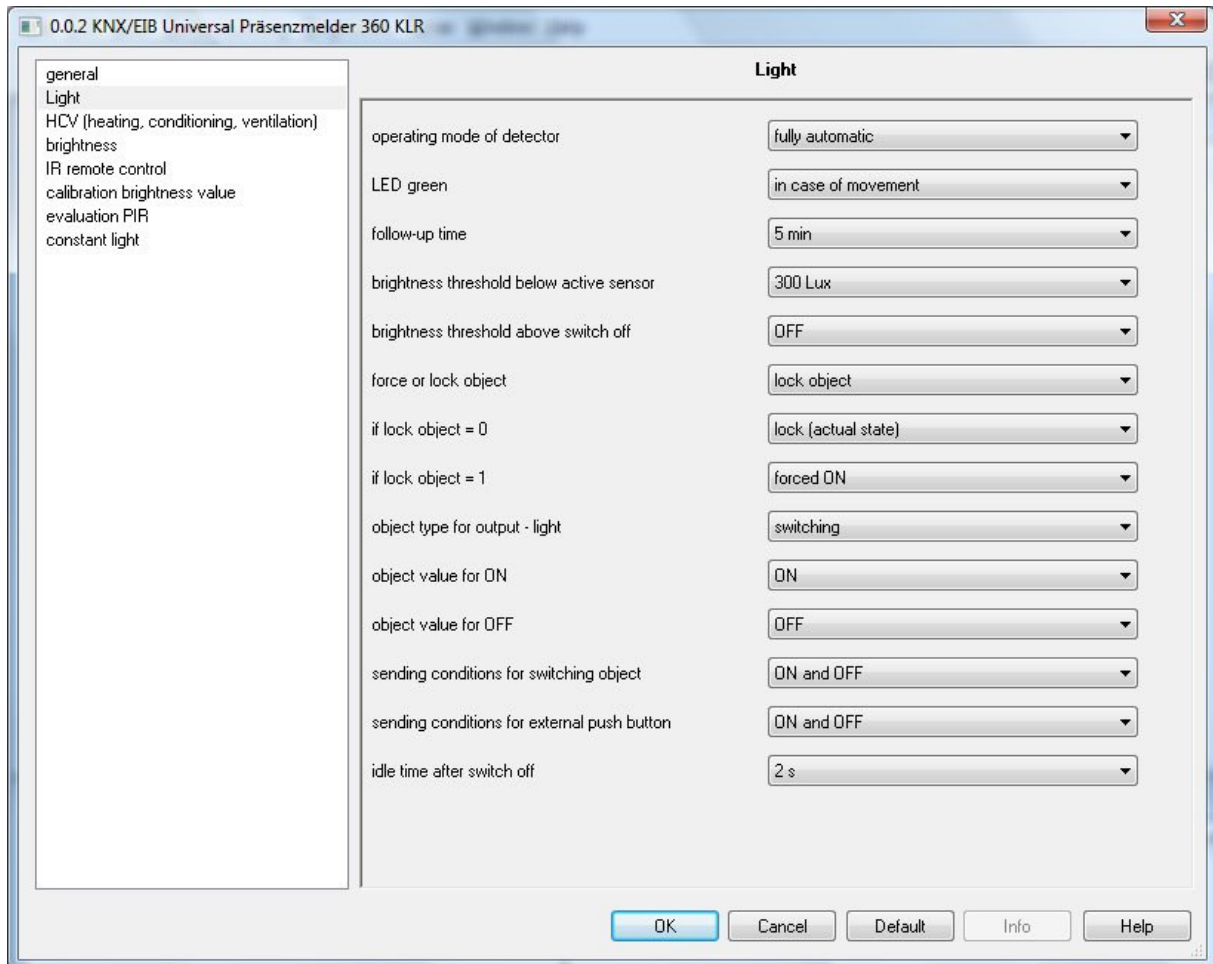
Using the object „external motion“ an additional detector can be connected.

The movement that is detected and received is dealt with in the same way as the own detected motion and is always parallel to it.

OBJECT RESTRAINT

The object „Restraint“, has three values that can be received:

- Restraint ON (Control = 1 value = 1). Here, an unconditional „ON“ command is sent on the output object. After that, evaluation is cancelled and the restraint release time starts. If, after completion of the release time, nothing is received on the restraint object, normal operation is taken up again.
- Restraint OFF (Control = 1 value = 0). Here, an unconditional „OFF“ command is sent on the output object. After that, evaluation is cancelled and the restraint release time starts. If, after completion of the release time, nothing is received on the restraint object, normal operation is taken up again.
- Restraint AUTO (Control = 0 value = 0). After that, normal operation of the detector is taken up again.



OBJECT EXTERNAL SWITCH / STATUS

The recipient object „External switch / Status“ can be used in two different ways:

- as input for an external switch which switches the light directly
- as input to receive the status or the switching input of an actuator

In both cases, an incoming frame with the value ON switches the detector into the mode „Light switched on“ and an OFF into the mode „ready“. Whether, during the status transitions, the commands to switch the light on or off are sent, depends on the parameter „Sending condition for external push button“. After receiving the ON frame the follow-up time starts as if motion was detected. After that it is switched off automatically. After an OFF frame the detector remains in its passive mode in which it does not detect any movement. Finally, the detector is ready to detect movement again. The passive time is determined by the parameter „Idle time after switch off“ which is visible in full access mode.

HCV Channel

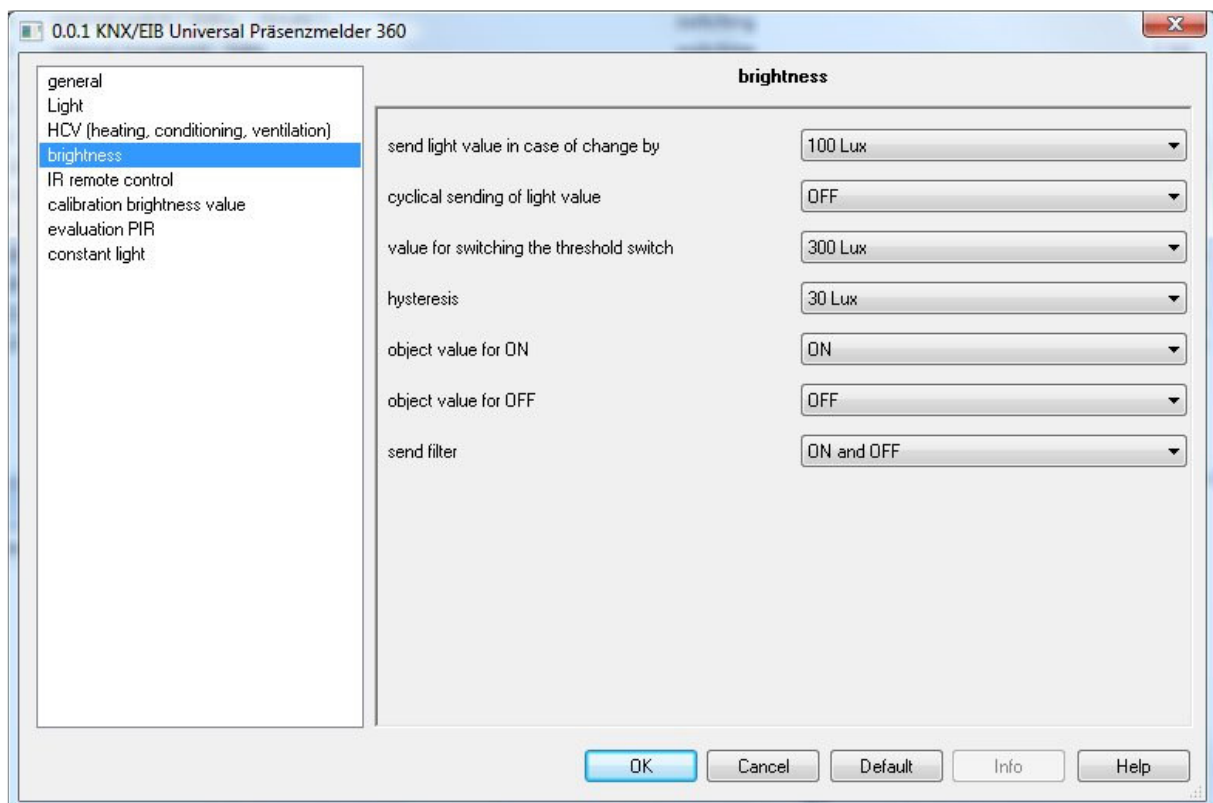
The HCV channel has the same objects and the same operating modes as the light channel. The HCV channel functions in the same way, too. It is only the motion detection that has an extended function. Motion detection has been replaced by a „Longer present detection“. This works by detecting at least one movement in each time window during several monitoring time windows of the same length. The required parameters are: „Number of monitoring time windows“ and „Length of monitoring time window“.

The total time, the product of the two parameters can vary by the time of one monitoring period.

OBJECT ON/OFF HCV
OBJECT EXTERNAL MOTION
OBJECT RESTRAINT
OBJECT EXTERNAL SWITCH / STATUS

TRESHOLD SWITCH

This block has two output objects:



TRESHOLD SWITCH

This output object sends an „ON“ as soon as the measured brightness is bigger than the parameter „Threshold for switching on“. When the value falls below the „Threshold for switching on “ – parameter „Hysteresis“, an „OFF“ is sent.

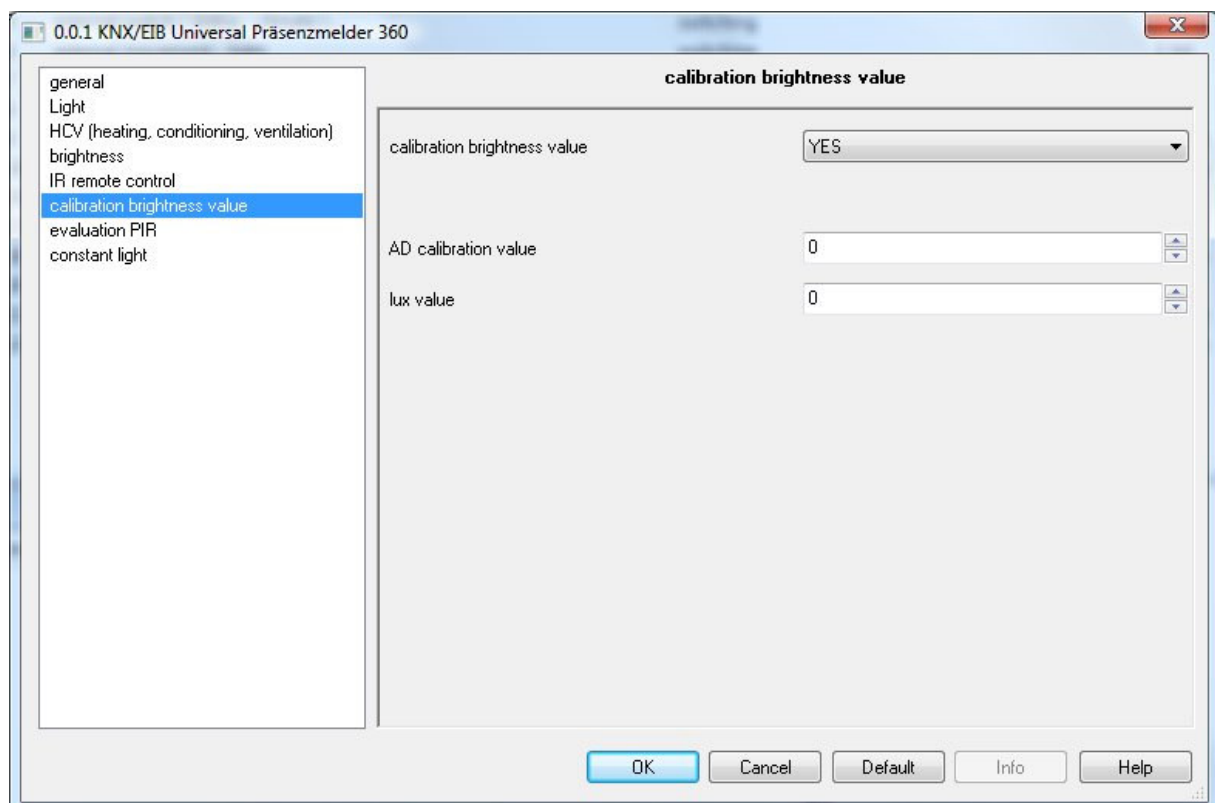
BRIGHTNESS VALUE

This output object sends the currently measured brightness value in Lux. It is sent as soon as there are changes bigger than the parameter „Send in case of changes“ or cyclically with the time set for „cyclical sending “. If cycle time is 0, there is no cyclical sending.

AD CALIBRATION VALUE

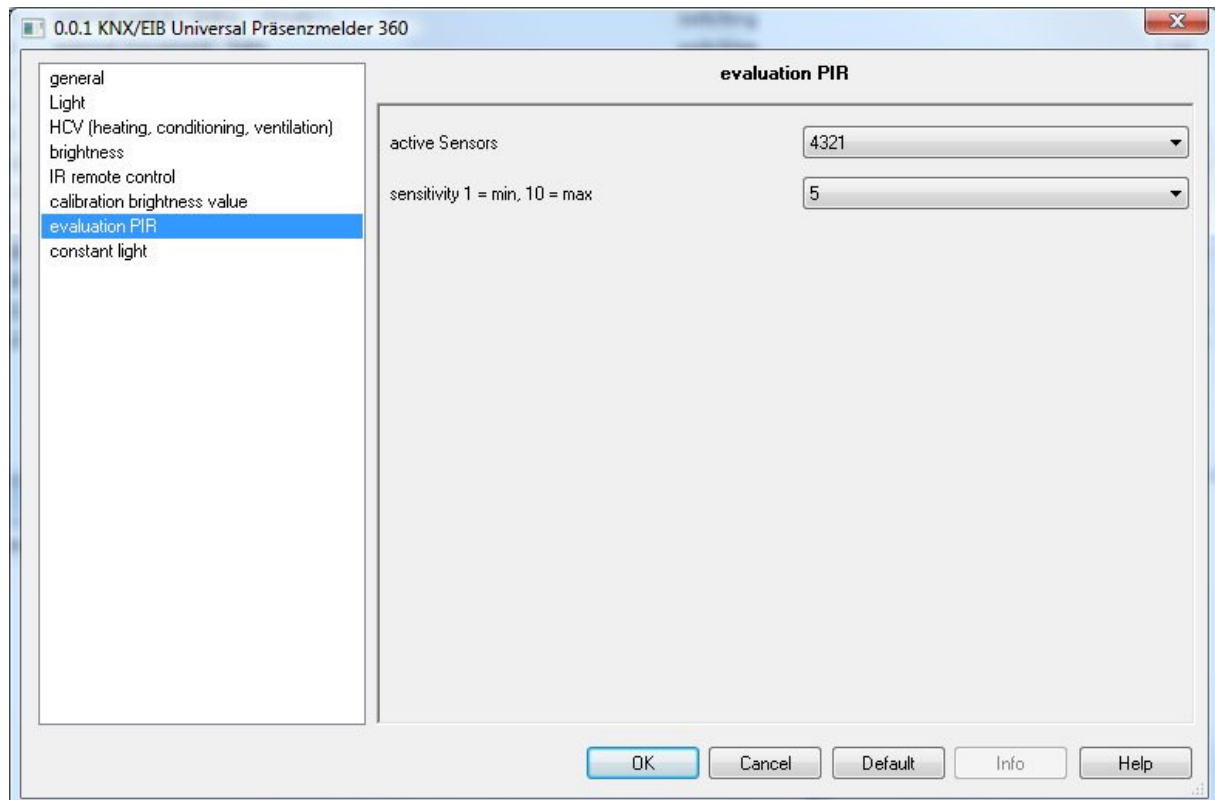
This output object does not send automatically. It can only be read. Its 16 Bit value without algebraic sign represents the current value of the AD converter for brightness measurement. The brightness meter can be calibrated as follows:

- 1) Using an external luxmeter. Measure brightness next to detector.
- 2) Read AD calibration values. This can be done, for example, with the ETS
- 3) Enter these 2 values, Lux value and AD value as parameters into AD calibration value and Lux value in full access mode.



EVALUATION OF THE PIR SENSORS

The PIR sensors are analogous elements which, relative to a standstill level, generate a signal with a voltage that can deviate into the negative or the positive in case of motion. The level of the standstill signal, which is the basis for all implemented evaluations, must be determined by the software.



Constant light control

The constant light control receives the actual value from the common brightness measurement. Switch on (start of constant light control) as well as switch off (stop) can be carried out using object 16, the light channel or the HVC channel.

Basically, after switch on/return of the bus voltage, the switch on process is started due to the transient response of the internal circuit.

In addition to the standard parameters such as nominal value, transmission difference, selection of control channel, cyclical sending, switch-on value, switch-on delay, forced control, dimming step intervals and range the constant light control disposes of a scene control as well as a parameter set to adapt the control parameters of the PID controller.

- OBJECT constant light- ON/OFF**
- OBJECT constant light - set relative dimming**
- OBJECT constant light - set absolute dimming**
- OBJECT constant light- forced control**
- OBJECT constant light- scene**
- OBJECT constant light- output absolute dimming**

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IR remote control
calibration brightness value
evaluation PIR
constant light

constant light

constant light controller	enabled
preset setpoint	300 lx
Send difference	5%
switching ON/OFF by	object
Cycle Transmission time	no cyclic transmission
switch On value	100%
switch On timeout	10 s
force output at ON	no reaction
force output at OFF	no reaction
relative dimming time	8 s
take over setpoint after	5 s
write changed setpoint to flash	disabled
light moods	enabled
light mood 1	500 lx
light mood 2	500 lx
light mood 3	500 lx
light mood 4	500 lx
light mood 5	500 lx
light mood 6	500 lx
light mood 7	500 lx
light mood 8	500 lx
PID parameter	user defined
dead band	2
cycle time	500
dimming up	
Kp - multiplier	40
Kp - divider	10
Ki - multiplier	1
Ki - divider	500
Kd - multiplier	0
dimming down	
Kp - multiplier	40
Kp - divider	10
Ki - multiplier	1
Ki - divider	2500
Kd - multiplier	0

OK Cancel Default Info Help

Optional Accessories

Surface installation frame

Surface installation frame for KNX/EIB Universal Presence Detector 360 KLR
Reference no. N000503



Protective grid

Dimensions: 150x150x80 mm
Color: white
Reference no. N000504



For a current product database and further information visit: www.eibmarkt.de or send your enquiry to: info@eibmarkt.de

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