CHORUS

GEWISS

GWA9531A - KNX PRESENCE SENSOR ALT. 2-6 METRES

GWA9531A

Technical Manual

Contents

1 Introduction

The presence detector GWA9531A ALT. 2-6 METRES is ideal for flush-mounting assembly in ceilings or suspended ceilings and for the integrated application in the automated system of KNX buildings, as they are provided with an integrated KNX BUS coupler.

Three pyroelectric detectors and a high-resolution lens are able to detect even the smallest movements. The three PYR sensors, with a 360° detection area, can be activated individually or as a group.

An integrated light sensor with a linear output measures the brightness. Its optical filter has a spectral response that is similar to that of the human eye.

The detection range varies between a diameter of 10 and 16 metres (360°) depending on the height of the ceiling where the sensor is installed and on the approach angle of the person in the area of coverage (for more information refer to the device assembly instruction sheet).

The device can be configured as a “master” or “slave”.

The presence detector has a 2-channel constant brightness controller with an offset parameterizable between -50% and +50%. The constant brightness control can be activated or deactivated via bus or based on the presence detector on the “Lighting“ or “HVAC” channel. The presence detector and the light sensor (lux) each work independently on the two “light” and “HVAC” channels. The additional HVAC channel can be used for the temperature adjustment controls**,** alarm systems or presence detection

The device has an additional output channel to manage the light switching, adjustment (dimming) or scenario selection functions.

2 Application

The device performs the following functions:

- 1 light channel for sending ON/OFF switching commands, predefined brightness adjustment commands, or the selection of a scene linked to movement detection
- 1 brightness channel for sending an ON/OFF switching command when the brightness threshold is exceeded (with hysteresis setting)
- Standby function: if the light channel is set on absolute brightness adjustment, an emergency standby light can be programmed using a standby value [%] and duration [min/h]
- 1 HVAC channel for controlling heating, ventilation and air conditioning linked to movement detection
- 1 brightness (lux) output (2 bytes)
- 2 channels for the light function, that can impose a constant light intensity adjustment. Channel 2 can work in synch or with an offset between -50% and +50% compared with channel 1
- 3 passive infrared sensors with a 360° detection area, which can be activated individually or as a pair.

2.1 Association limits

Maximum number of group addresses: 254
Maximum number of associations: 254

This means that up to 254 group addresses can be defined, and up to 254 associations can be made (between communication objects and group addresses).

3 Menu*"General"*

The **General** menu contains only the parameters that make it possible to enable and configure the detector as a Master or Slave, via the parameter "**Type of detector**" and the parameter "**Delay time for forced control mode**". If it is configured as "**Master**", the submenus appear to the left as shown in figure 3.1.

The basic structure of the menu is as follows:

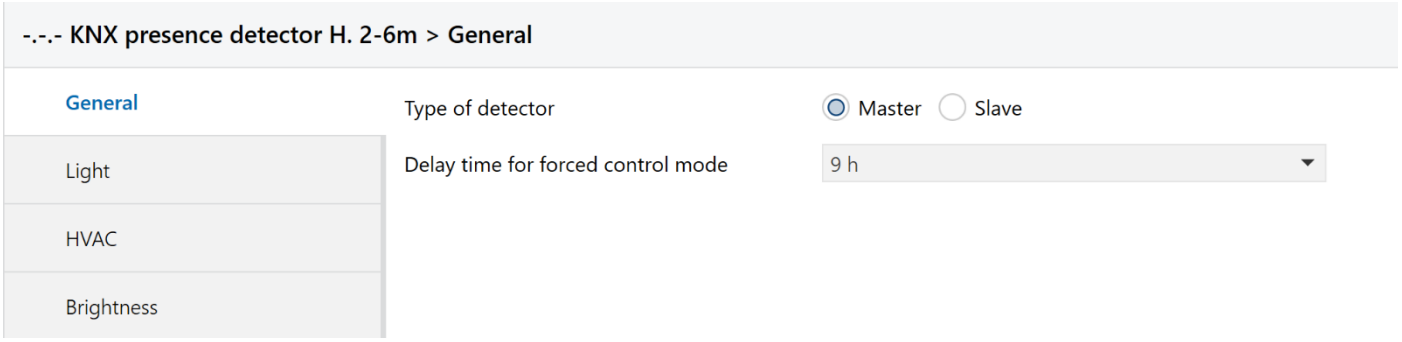

Fig. 3.1: Menu with Type of detector - Master

3.1 Parameters

3.1.1 General – Type of detector "Master"

The parameter "**Type of detector**" is used to select the sensor as **Master** or **Slave**:

- **Master** **(default value)**
- Slave

If the sensor is selected as **Master**, menus appear for the functions **Light**, **HVAC**, **Brightness**, **Brightness value calibration**, **Evaluation of PIR** and **Constant light control**, whose configuration parameters are explained below in the manual, and the parameter "**Delay time for forced control mode"**.

If the device is configured as a **Master**, it can manage other detectors as a **Slave** via the 1-bit input object ***External motion - light*** (Data Point Type 1.001 DPT_Switch). The signals received from the external presence detectors "slave" are processed in the same way as the indoor detector and work in parallel.

The input object ***External motion - light*** (Data Point Type 1.001 DPT_Switch) is used to configure Master-Slave operation as follows:

- For the **Slave** detectors: connect, via the group address, all the outputs of the **Slave** devices ***Output - light*** object to the input object ***External motion - light*** of the detector configured as **Master**.

The parameter "**Delay time for forced control mode"** is used to set the detector resetting delay in AUTO mode after executing an OFF or ON switching command. The values that can be set are:

- OFF
- 5 min
- 10 min
- 15 min
- 20 min
- 30 min
- 40 min
- 50 min
- 1 h
- 1.30 h

- 2 h
- 2.30 h
- ….
- **9 h** **(default value)**

3.2 General – Type of detector “Slave”

If the parameter “**Type of detector**” is used to select **Slave**, as in Fig. 3.2, the **Slave mode parameters** menu is displayed, which permits configuring some parameters to have the detector operate as a **Slave**.

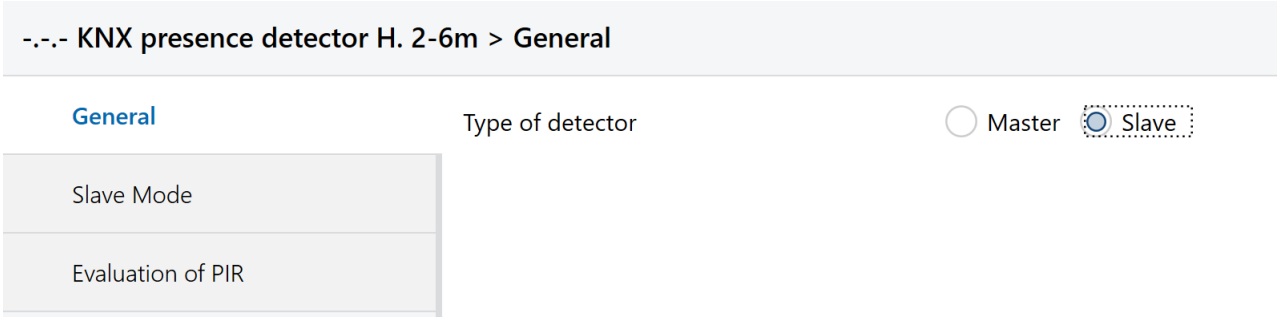

Fig. 3.2: Menu with Type of detector - Slave

Only two communication objects are visible in **Slave** mode: ***Output - light (switch)*** - (Data Point Type 1.001 DPT_Switch) and ***Input - light (Disable)*** - (Data Point Type 1.001 DPT_Switch).

The ***Output - light (switch)*** object should be address, in a Master/Slave configuration, to the ***External motion - light*** (Data Point Type 1.001 DPT_Switch) input object of the **Master** device, as indicated in the previous paragraph.

The ***Input - light (Disable)*** (Data Point Type 1.001 DPT_Switch) object has the function of locking the detector, if received with the value **1 (lock).** In this case, the detector remains locked also if movement is detected and no telegram is output.
If received with the value **0 (unlock),** the detector returns to normal automatic mode.

The switch off delay in **slave** mode is fixed to 30 seconds.

The structure of the **Slave Mode** menu is as follows:

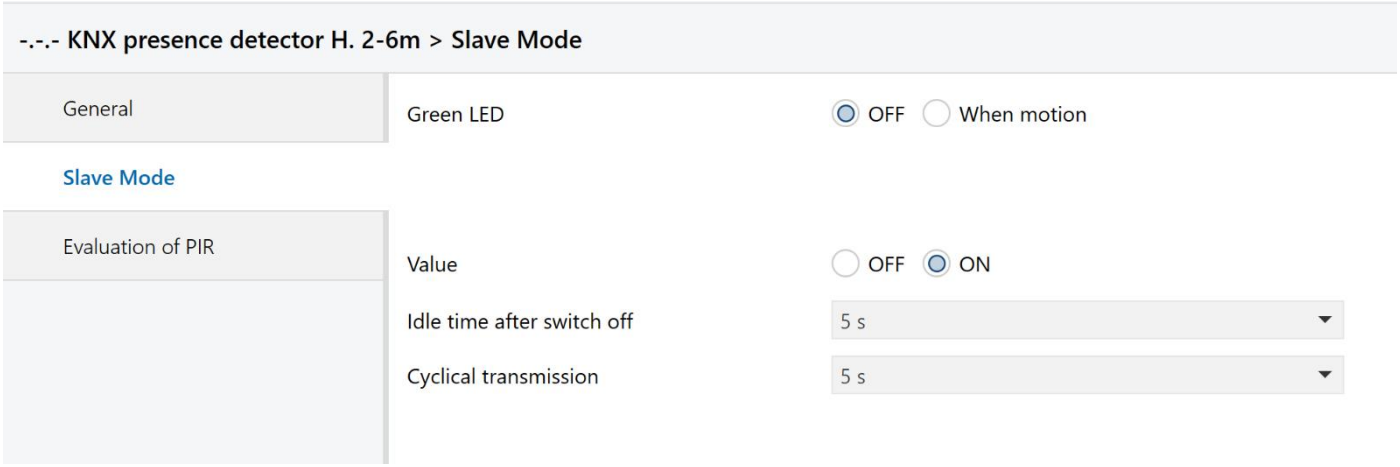

Fig. 3.3: “Slave mode**”** parameters menu

3.2.1 Green LED

The possible values are:

- OFF
- When motion

If "**When motion**" is selected, the led is activated when a presence is detected.

3.2.2 Value

With this parameter, it is possible to set the values that the ***Output - light (switch)*** (Data Point Type 1.001 DPT_Switch) output object can have when transmitting to a **Master** device in the case of movement.

The possible values are:

- OFF
- ON **(default value)**

3.2.3 Idle time after switch off

This parameter makes it possible to limit untimely switching of the controlled circuits.

The dead time after switch off can be parametrised between 1 and 60 seconds, **default value 5 s**

3.2.4 Cyclical transmission

In the case of a detection system with a **Master** sensor and one or more **Slave** sensors, the **Slave** sensors should keep the communication with the **Master** active by cyclically transmitting the object ***Output - light (switch)*** (Data Point Type 1.001 DPT_Switch).

If the detector is configured as a **Slave** , it is recommended to always keep cyclical transmission active by suitably configuring this parameter.

The possible values are: OFF, 1 s, 2 s, 3 s, 4 s, **5 s**, …….., 4 h **(default value)**

4 *"Light"* menu

The **Light** menu includes parameters that make it possible to configure sensor operation to control the brightness using switching actuators or KNX dimmers connected to the system.
the parameters listed after "**Object type for output – light**" change based on the value selected with this parameter (**Switching**, **Dim completely**, **Scene**).

Fig. 4.1 shows the parameters that appear when selecting "**Object type for output – light"** = **Switching** (default value). The structure of the menu is as follows:

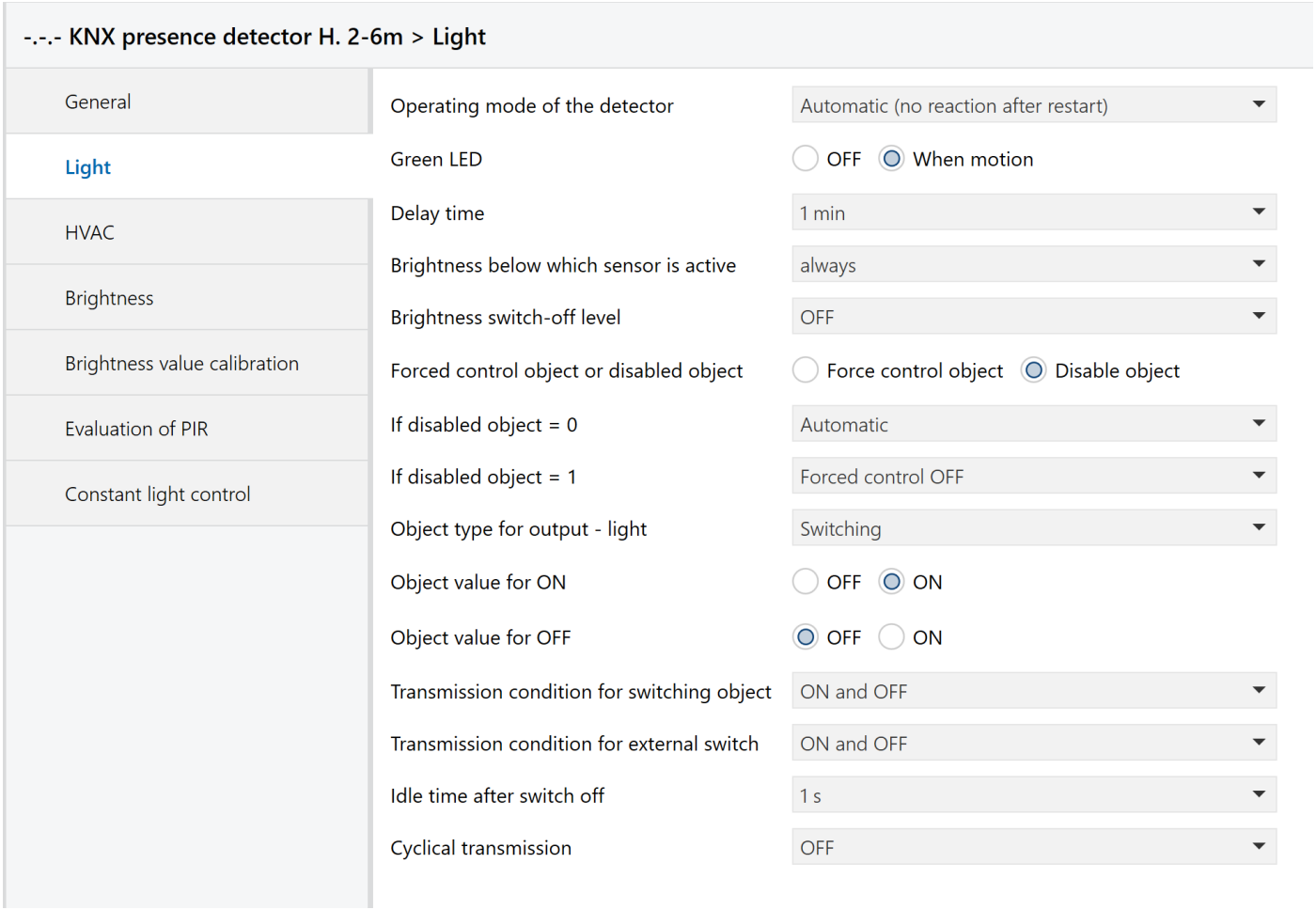

Fig. 4.1: "Light" menu with "Object type for output – light" **=** Switching

4.1 Parameters

The parameters included in the **Light** menu are listed below.

4.1.1 Operating mode of the detector

After resetting the bus supply voltage or an interruption in the bus voltage, the presence detector is inactive the first 60 seconds. During this period of device stabilisation, the detector does not transmit any telegrams. Depending on the application, the light control can be reactivated after the restart period by selecting the "**Semi automatic**" or "**Automatic (75s light on after restart)**" mode.

The **"Operating mode of the detector"** parameter may have the following values:

- **Automatic (no reaction after restart)** **(default value)**
- Semi automatic
- Automatic (75s light on after restart)".

The differences between the completely automatic and semiautomatic modes are:

- the completely automatic mode has three operating conditions: ready, active and passive
- the semiautomatic mode has two operating conditions: ready and active
- The semiautomatic mode does not turn on the light after the movement was detected. The light can only be turned on manually using a button or an external KNX command.

If **Automatic (no reaction after restart)** is selected, the device acts in a completely automatic manner and does not perform any control or activate any function after the restart, therefore it waits to detect a movement before transmitting an ON signal.

If **Semi automatic** is selected, the light is never turned on when detecting movement (in this mode, the system waits for the ON signal to be transmitted via another bus command, for example a push-button) but is turned off after a movement is detected.

If **Automatic (75s light on after restart)"** is selected, after restart, the device sends an ON switching command and after 75 seconds it sends OFF.

4.1.2 Green Led

This parameter is used to set the behaviour of the green signalling LED on the device when a movement is detected by the sensor.

It can assume the following values:

- **OFF** **(default value)**
- When motion

By selecting **OFF**, the LED remains off when a movement is detected.
By selecting **When motion**, the LED flashes each time a movement is detected.

4.1.3 Delay time

This parameter makes it possible to set a delay when sending a switch off command OFF on the object ***Output - light*** (Data Point Type 1.001 DPT_Switch) after movement was detected.

The settable values are between 1 second and 4 hours (**1 min default value**).

If **"Operating mode of the detector"** was set to **semi-automatic**, if the brightness increases during the switch off delay time and exceeds the threshold set with the "**Brightness switch-off level**" parameter, the channel that manages brightness sends an OFF switching signal via the objects ***Output - light (switch)*** (Data Point Type 1.001 DPT_Switch) , or ***Constant light control channel X*** (DPT Scaling 5.001 (0..100%)) but the delay time continues.

If the brightness is reduced below the value set in the "**Brightness below which sensor is active**" parameter, the channel that manages the brightness sends an ON switching signal via the objects ***Output - light (switch)*** (Data Point Type 1.001 DPT_Switch) , or ***Constant light control channel X*** (Data Pont Type 5.001 DPT_Percentage (0..100%)) until the delay time has elapsed.

The value of this parameter can also be modified via bus with the object ***Delay time - Time [s]*** (Data Pont Type 7.005 DPT_Time), for example by a supervisor, to change the behaviour of the detector without having to adjust the parameter and as a result have to reprogram the device with ETS, depending on the needs of the user, the delay time can be changed dynamically during certain time bands.
The values sent via the communication object remain stored temporarily in the device. If there is an interruption in the power supply and after it is restored, or after a reset by ETS or a reprogramming, the value initially attributed to the parameter is reset.

Note: The switch off delay, if the device is in **Slave** mode, is fixed to 30 seconds.

4.1.4 Brightness below which sensor is active

With this parameter, it is possible to set a brightness threshold below which the sensor activates (e.g. “light sensitive function”). When the brightness value detected is higher, for example during the day, the sensor remains inactive.

The values that can be set are: 10 Lux, 20 Lux…. **500 Lux**, ….1800 Lux, 2000 Lux, always (**default value**)

If **always** is set, the sensor always remains active (also with brightness above 2000 Lux).
The value of this parameter can also be modified via bus with the object ***Brightness lower limit*** (Data Pont Type 9.004 Lux), for example by a supervisor, to change the behaviour of the detector without having to adjust the parameter and as a result have to reprogram the device with ETS

4.1.5 Brightness switch-off level

With this parameter it is possible to set a brightness threshold above which the sensor sends a command to switch the light OFF, via the object ***Output - light (switch)*** (Data Point Type 1.001 DPT_Switch), also if the switch off delay set with the “**Delay time**” parameter has not yet elapsed.

The values that can be set are: **OFF**, 10 Lux, 20 Lux….1800 Lux, 2000 Lux, Automatic (**default value**).

With the **Automatic** setting, the detector automatically calculates the switch off threshold with the following rule:

- If the effective brightness 1 minute after the switching of the light output channel is greater than the value set with the "**Brightness below which sensor is active**” parameter, the brightness threshold for switching off the light is increased to 10% above this value plus 200 Lux.

- If the effective brightness 1 minute after the switching of the light output channel is lower than the value set with the "**Brightness below which sensor is active**” parameter, the brightness threshold for switching off the light is increased to 10% above the effective brightness value sent via the object ***Brightness value (lux)*** (Data Point Type 9.004 DPT_2 byte float value (Lux)) plus 200 Lux.

The switch-off threshold is recalculated after each delay time has elapsed and with a new movement detected or an "ON" switching command.

If the parameter “**Brightness switch-off level”** is selected with a fixed value, this value must be greater than or equal to the “**Brightness below which sensor is active”** parameter.

4.1.6 Forced control object or disabled object

This parameter makes it possible to enable the lock function, which displays the 1 bit object ***Input - light - Disable*** (Data Point Type 1.001 DPT_Switch) with the lock function, or the 2 bit object ***Input – light – Forced control*** (Data Point Type 2.001 DPT_Switch control) with the priority, forcing function.

If “**Force control object** is selected via the 2 bit object ***Input – light – Forced control*** the device can receive forcing commands from other devices (e.g. push-buttons or a supervisor) via the bus with the following values:

- *Input – light – Forced control* “ON” (control =1, value=1)
An ON switching command is sent on the object ***Output - light*** (Data Point Type 1.001 DPT_Switch) only if the status changes. Any timing in progress is disabled and the forced control “**Delay time**” is restarted. If after the end of the switch-off delay no other command is sent to the forced control object, normal operation is restored.

- *Input – light – Forced control* “OFF” (control=1, value=0)
An OFF switching command is sent on the output object ***Output - light*** (Data Point Type 1.001 DPT_Switch) but only if the status was modified. Any timing in progress is disabled and the forced control “**Delay time**” is restarted. If after the end of the switch-off delay no other command is sent to the forced control object, normal operation is restored.

- *Input – light – Forced control* “auto” (disable forced control) (control=0, value =0).
Normal operation is restarted immediately.

If **Disable object** is selected via the 1 bit object ***Input – light - Disable*** the device can receive locking commands from other devices (e.g. buttons or a supervisor) via bus. In that case, they are made visible with the following parameters "**If disabled object = 0**" and "**If disabled object = 1**" that can have the following values:

- Forced control ON
- **Forced control OFF** **(default value "If disabled object = 1")**
- **Automatic** **(default value "If disabled object = 0")**
- Lock (current switching state)
- No action

Pay **attention** to incorrect parameter settings.
For example: selecting **Lock (current switching state)** for the parameter "**If disabled object = 0**" and **No action** for the parameter "**If disabled object = 1**" with "**Delay time for forced control mode"** = "**OFF**", means that the detector would remain locked and unusable.

4.1.7 Object type for output – light

With this parameter, it is possible to select the type of output command object for the light.
The possible values are:

- **Switching** **(default value)**
- Dim completely
- Scene

If the **Switching** function is selected, the type of object ***Output - light - Switch*** is Data Point Type 1.001 DPT_Switch (1 bit, ON/OFF). After every movement that is detected, an "ON" command is sent on the switching object and the switching delay set with the parameter "**Delay time"** is started (from 1 sec to 4 hours). At the end of the programmed time interval, an "OFF" command is set via the same object.

If the **Dim completely** function is selected, the type of object ***Output - light – Dim completely*** is Data Point Type 5.001 DPT_Percentage (0..100%). This mode makes it possible to send preselected brightness values (from 0% to 100%) to the output object in relation to the ON and OFF value respectively.
This function displays the **Standby value** menu in which the standby light function is set.

If the **Scene** function is selected, the type of object ***Output - light – Scene*** is Data Point Type 17.001 DPT_Scene number (1 byte). For the ON and OFF value, it is possible to select respectively one of the 32 scenes available using the following parameter.

4.1.8 Object value for ON , Object value for OFF

Based on the function selected with the previous parameter for the light control output object, these two parameters make it possible to associate a different value based on the ON and OFF command.

The values associated with the **Object value for ON** parameter can be:

- If "**Object type for output** = **Light" = Switching:** OFF or **ON (default value)**
- If "**Object type for output** = **Light"** = **Dim completely**: a value between 0% and **100% (default value)**
- If "**Object type for output** = **Light"** = **Scene**: Scene 1, **Scene 2**,..Scene 32. **(default value)**

The values associated with the **Object value for OFF** parameter can be:

- If "**Object type for output** = **Light" = Switching**: **OFF** or ON **(default value)**
- If "**Object type for output** = **Light"** = **Dim completely**: a value from **0%** to 100% **(default value)**
- If "**Object type for output** = **Light"** = **Scene**: Scene 1, **Scene 2**,..Scene 32. **(default value)**

4.1.9 Transmission condition for switching object

Transmission filter for the object ***Output – light - Switch*** (Data Point Type 1.001 DPT_Switch) with which it is possible to select only the values that the object adopts when transmitted on the bus.

The possible values are:

- Neither ON nor OFF
- Only OFF
- Only ON
- **ON and OFF (default value)**

4.1.10 Transmission condition for external switch

The object ***External switch / status - light*** (Data Point Type 1.001 DPT_Switch) can be used in two different ways:

- As an input for an external push-button that turns on the light directly
- As an input for monitoring the status or the command input of an actuator

In both cases, a telegram received with this object set to **ON** sets the detector status to ON (light on) and an **OFF** telegram sets the status to "ready".

Based on the values configured with the parameter "**Transmission condition for external switch**" the detector sends a light switch on or switch off command. The possible values are:

- Neither ON nor OFF
- Only OFF
- Only ON
- **ON and OFF (default value)**

After receiving an ON telegram, the switch off delay time starts as if a movement was detected; automatic switch off takes place automatically at the end.
After receiving an OFF telegram, the sensor switches to a passive status in which it does not detect any movement; at the end, the sensor is ready again to detect movement.
The time interval of passivity is controlled after switch off by the "**Death zone"** parameter present in the **Constant light control** menu.

4.1.11 Idle time after switch off

The purpose of this parameter is to prevent excess telegram traffic on the bus and erroneous switching on caused by light sources that are cooling down or leaving the room after a shut-signal is sent by pressing a KNX push-button.

The values that can be set range from 1 to 60 seconds, **default value 1s.**

4.1.12 Cyclical transmission

This parameter, which is only visible if the "**Object type for output** = **Light"** parameter was set to **Switching**, is used to set the cyclical transmission interval of the ON status if requested.

The values that can be set range from **OFF**, 1s, 2s, 3s, 4s….. 4 h **(default value)**

5 *"Standby value"* menu

If the parameter "**Object type for output** = **Light**" is set to **Dim completely**, the "**Standby value**" menu appears, in which the function of the standby light can be configured.
Two pairs of values can be defined for the duration and light intensity of the standby light function. Once the switch off delay has elapsed completely, the detector checks which pair of values must be activated via the object ***Light – standby*** (Data Point Type 1.001 DPT_Switch):

• if the object value = **0** (or was not received) the value pair "**Standby time 1**" and "**Standby value**" is activated **1**;
• if the object value = **1** the value pair "**Standby time 2**" and "**Standby value**" is activated **2**;

If the brightness during standby exceeds the level set in the "**Brightness swich-off level**" parameter, the light output channel is switched to OFF by the object ***Output - light*** (Data Point Type 1.001 DPT_Switch).

If brightness is reduced to below the value set with the parameter "**Brightness below which sensor is active**", the light output channel is switched to ON by the object ***Output - light*** (Data Point Type 1.001 DPT_Switch) with the set standby values until the **Delay time** elapses.

At the end of the standby light operation, a OFF switching signal is sent on the object ***Output - light*** (Data Point Type 1.001 DPT_Switch). If movement (in completely automatic operating mode) or switching is detected, the sensor is activated again and standby is ended.

NB: Lock and forced operation cancel the standby operation.

The structure of the menu is as follows:

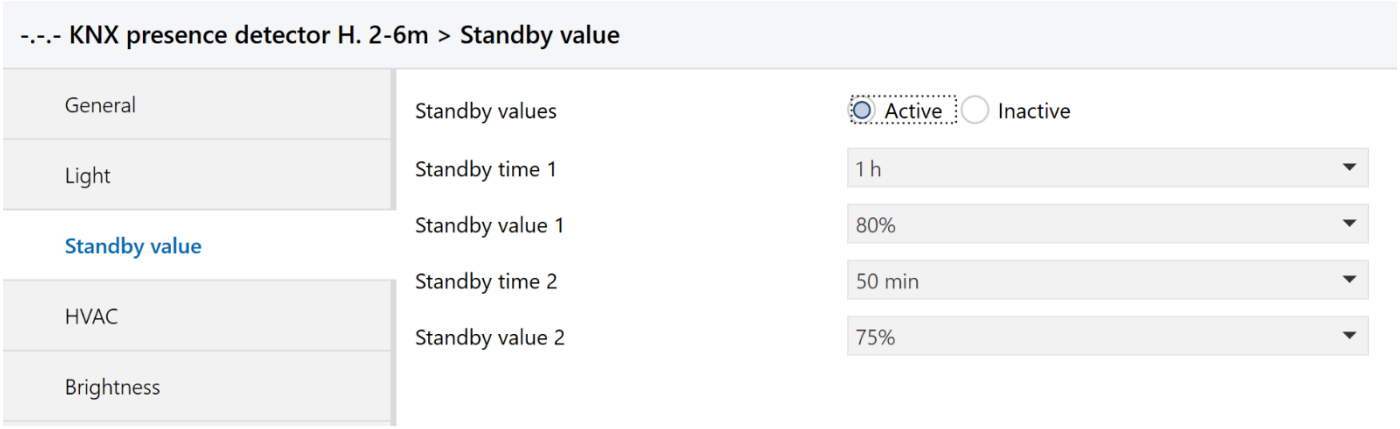

Fig. 5.1: "Standby value" menu with "Object type for output **=** Light" = Dim completely

5.1 Parameters

The parameters included in the **Standby value** menu are listed below.

5.1.1 Standby values

With this parameter, the standby function can be activated or not activated. The possible values are:

- Active
- **Inactive (default value)**

By selecting **Active** the following configuration parameters are displayed.

5.1.2 Standby time 1

Sets the duration 1 of the standby light.

The possible values are: OFF or a value between 1 min and unlimited. **(1 h default value)**

The value **unlimited** can be useful for emergency lamps that maintain a permanent minimum brightness value.

5.1.3 Standby value 1

Sets the intensity 1 of the standby light.

The possible values are: between 0% and 100%. **(80% default value)**

5.1.4 Standby time 2

Sets the duration 2 of the standby light.

The possible values are: OFF or a value between 1 min and unlimited. **(50 min default value)**

The value **unlimited** can be useful for emergency lamps that maintain a permanent minimum brightness value.

5.1.5 Standby value 2

Sets the intensity 2 of the standby light.

The possible values are: between 0% and 100%. **(75% default value)**

6 *“HVAC”* menu

The HVAC channel has the same objects and operating modes as the light channel; movement/presence detection is however amplified, as it is based on the principle of «long duration». Detection takes place during multiple time frames of equal length, during each of which at least one movement must be detected.

The structure of the menu is as follows:

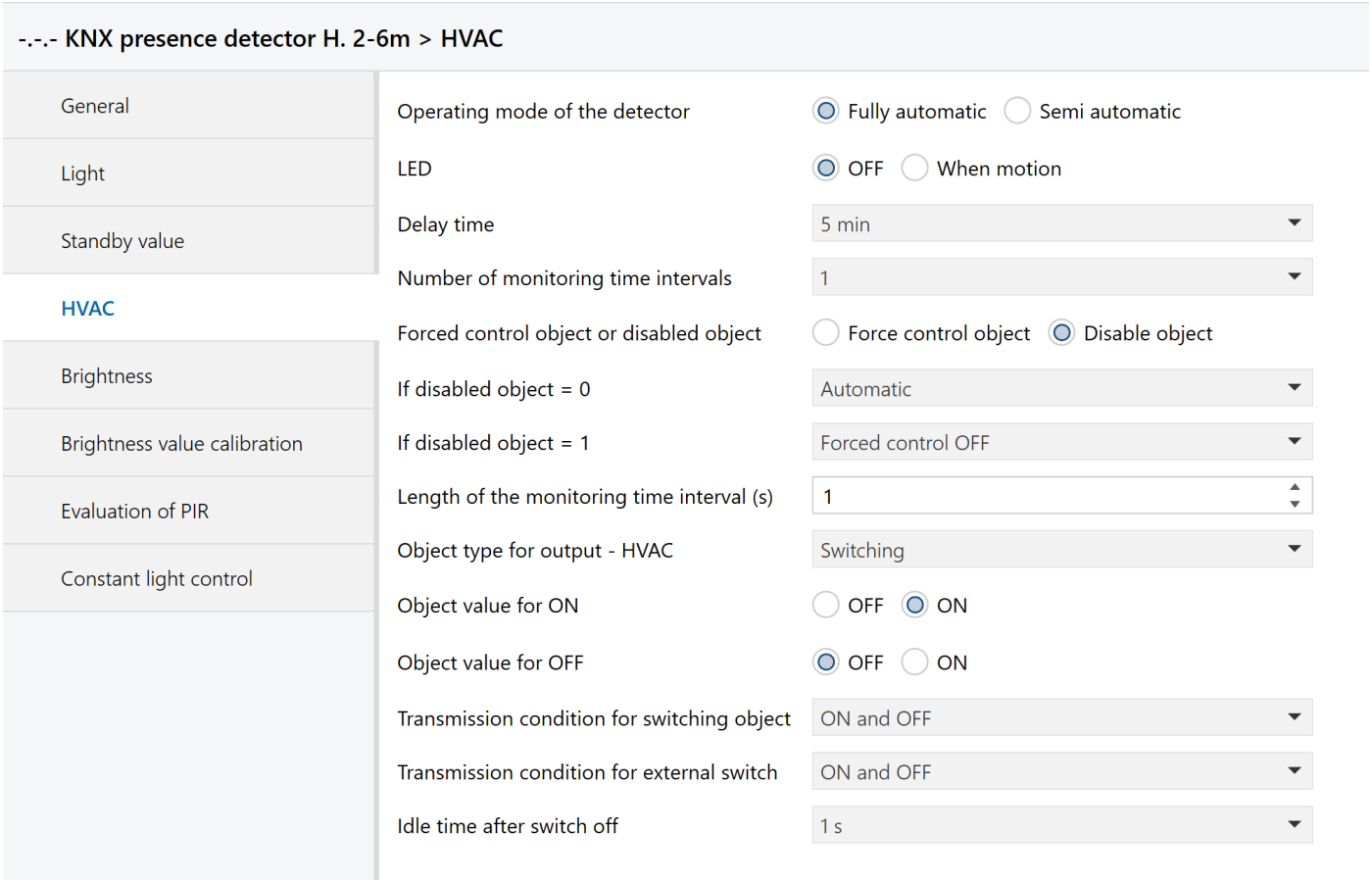

Fig. 6.1: “HVAC” menu

6.1 Parameters

All the parameters, with the exception of the following, are identical to those in the **Light** menu explained in chapter 4.

6.1.1 Number of monitoring time intervals

The number of monitoring time intervals can be set between 1 and 32, with **1 default value**

6.1.2 Length of the monitoring time interval (s)

The duration of the monitoring intervals can be set from 0 s to 30,000 s (corresponding to 8 h and 20 min). The default value is equal to **1 s**.

NB: The HVAC output can be used for presence detection. To activate it, the “**Number of monitoring time intervals**” must be set to **1** and the “**Length of the monitoring time interval (s)**” set to **1 second** (the presence signal is independent of ambient light).

The objects relative to the channel HVAC: ***Output – HVAC*** (Data Point Type 1.001 DPT_Switch), ***External switch /status - HVAC*** (Data Point Type 1.001 DPT_Switch), ***External motion – HVAC*** (Data Point Type 1.001 DPT_Switch), ***Input-HVAC - disable*** (Data Point Type 1.001 DPT_Switch) or ***Input – HVAC – Forced control*** (Data Point Type 2.001 DPT_Switch Control) are managed in the same way as the analogue light channel, but always based on the parameters related to them.

7 *"Brightness"* menu

In the **Brightness** menu, parameters can be set for managing the two output and command objects ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) and ***Brightness value (lux)*** (Data Point Type 9.004 DPT_2 byte float value (Lux)).

The structure of the menu is as follows:

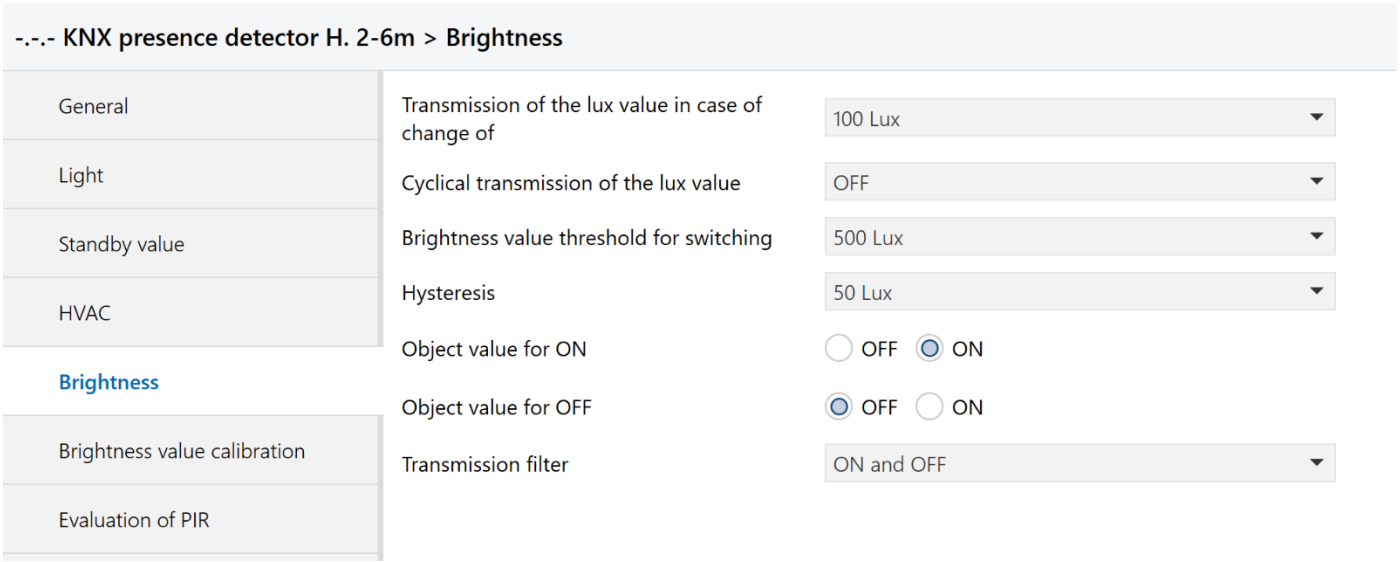

Fig. 7.1: "Brightness" menu

7.1 Parameters

The following parameters are used to configure brightness measurement and transmission on the bus.

7.1.1 Transmission of the lux value in case of change of

This parameter causes the measured brightness value to be transmitted via the object ***Brightness value (lux)*** (Data Point Type 9.004 DPT_2 byte float value), if the brightness value exceeds the threshold set with the "**Brightness value threshold for switching**" parameter, plus the variation value set here.

The possible values are: OFF, 10 Lux, 20 Lux,…,**100 Lux**,.. 1600 Lux, 1800 Lux **(default value)**

7.1.2 Cyclical transmission of the lux value

This is used to set the cyclical transmission of the current brightness with the object ***Brightness value (lux)*** (Data Point Type 9.004 DPT_2 byte float value).

The possible values are: **OFF**, 5 s, 10 s, 20 s, ….., 30 min **(default value)**

If the cyclical transmission time is set to "OFF", there will not be any cyclical transmission.

7.1.3 Brightness value threshold for switching

If the brightness value measured by the sensor exceeds the value set with this parameter, the object ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) is set to ON.

If the brightness value measured by the sensor drops down below the value of this parameter, less the value indicated in the following parameter **"Hysteresis"**, the object ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) is set to OFF.

The possible values are: 10 Lux, 20 Lux,…,**500 Lux**,.. 1600 Lux, 2000 Lux **(default value)**

7.1.4 Hysteresis

It is possible to configure a hysteresis that is triggered when sending an OFF command with the object ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) when the brightness is lowered below the value set in the parameter "**Brightness value threshold for switching"** (see the previous paragraph).

The possible values are: 5 Lux, 10 Lux,…,**50 Lux**,.. 180 Lux, 200 Lux **(default value)**

7.1.5 Object value for ON

It is possible to configure the value to sent via the object ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) when adopting an ON value.

The possible values are: OFF e **ON** **(default value)**

7.1.6 Object value for OFF

It is possible to configure the value to sent via the object ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) when adopting an OFF value.

The possible values are: **OFF** and ON **(default value)**

7.1.7 Transmission filter

Transmission filter for the object ***Brightness threshold switch value*** (Data Point Type 1.001 DPT_Switch) which is used to select only the values to be adopted by the object when transmitted on the bus.

The possible values are:

- Neither ON nor OFF
- Only OFF
- Only ON
- **ON and OFF** **(default value)**

8 *“Brightness value calibration”* menu

With this menu, it is possible to set the calibration of the brightness sensor.
The calibration value can be read (read-only object) via the object ***AD Calibration value*** (8.001 DPT_2 byte signed value – pulses difference) that transmits the current value of the brightness measurement of the indoor AD converter.
The structure of the menu is as follows:

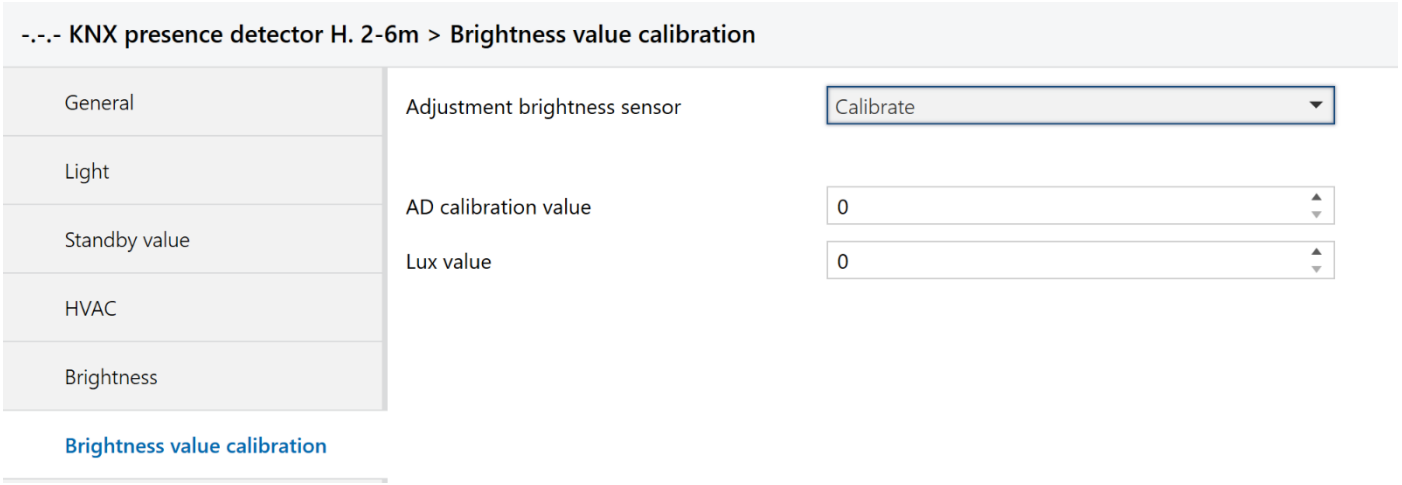

Fig. 8.1: “Brightness value calibration” menu – Personalised calibration

8.1 Parameters

The parameters for the brightness sensor calibration are listed below

8.1.1 Adjustment brightness sensor

With this sensor it is possible to leave the factory setting of the indoor brightness sensor or set a personalised calibration.
The values that can be set are:

- Factory calibration **(default value)**
- Calibrate
- Keep internal value

If the parameter is set to **Factory calibration**, each time the device is reprogrammed, the sensor is calibrated with the factory values.

If **Keep internal value** is set, if personalised calibration is performed this configuration is stored internally.

If **Calibrate** is set, two additional parameters appear:

- The **“AD calibration value”** parameter can have values from **0** to 65535 **(default value)**
- The **“Lux value”** parameter can have values from **0** to 65535 **(default value)**

The calibration of the brightness measurement can be customised as follows:

1. Measures the incident light – on a desktop for example – with an external luxmeter. This represents a reference value in lux.
2. Read the calibration value AD of the object ***AD Calibration value*** (8.001 DPT_2 byte signed value – pulses difference) by means of ETS.
3. Insert the two values in the parameters “**Lux value**” and “**AD calibration value**” respectively.

9 *“Evaluation of PIR”* menu

With this menu, it is possible to parametrise the three PYR sensors inside the detector.

The structure of the menu is as follows:

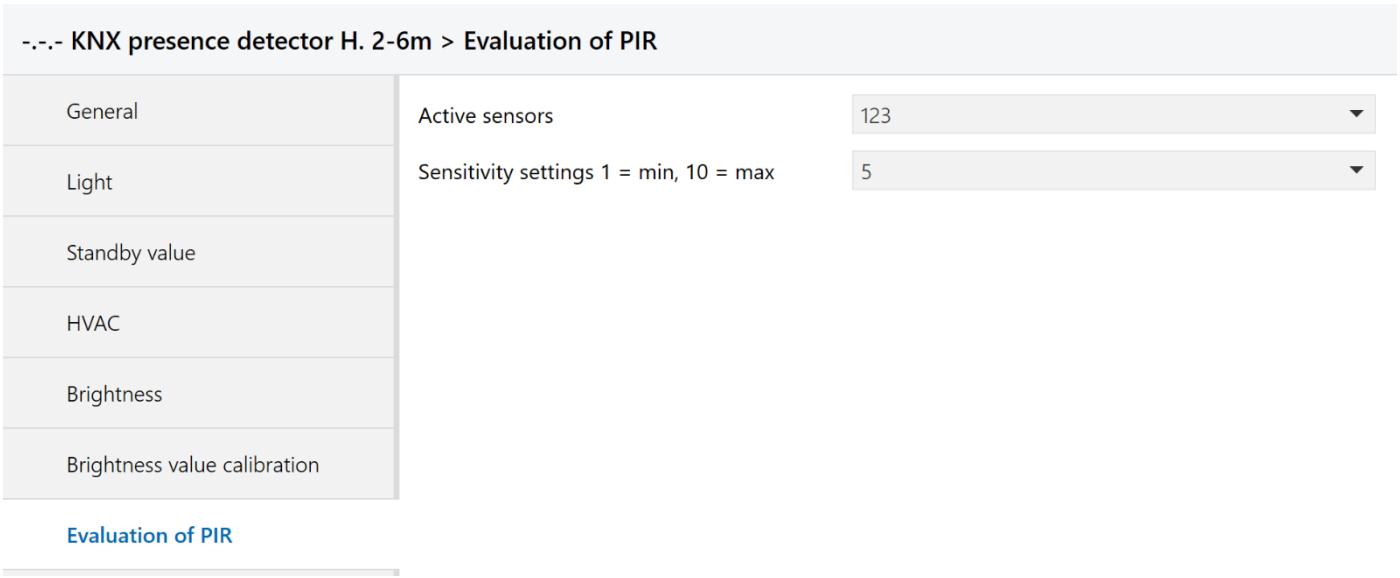

Fig. 9.1: “Evaluation of PIR” menu

9.1 Parameters

The parameters for calibrating the PYR sensors are indicated below.

9.1.1 Active sensors

The 3 PYR sensors are activated individually or as groups. Numbers 1, 2 and 3 correspond to positions 1, 2, 3 represented below in figure 9.2. The possible values are:

--- (no sensor active)
1-- (sensor 1 active)
-2-- (sensor 2 active)
12- (sensors 1 and 2 active)
--3 (sensor 3 active)
1-3 (sensors 1 and 3 active)
-23 (sensors 2 and 3 active)
123 (all three sensors active) **(default value)**

9.1.2 Sensitivity settings 1 = min, 10 = max

Sensitivity can be set between 1 and 10 (1 = minimum, 10 = maximum), the default value is **5**.

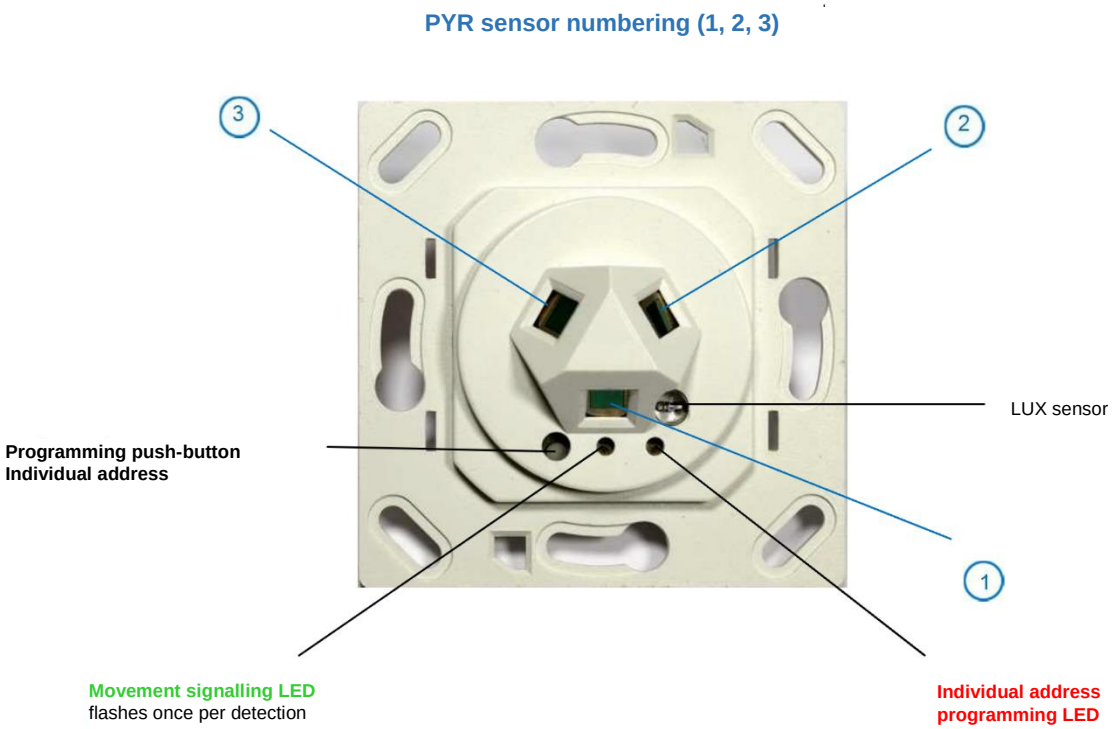

Fig. 9.2: location of the three PYR sensors in the device

10 *“Constant light control”* menu

This menu permits configuring the constant light control as the outdoor light changes and is conditioned by presence detection.

The structure of the menu is as follows:

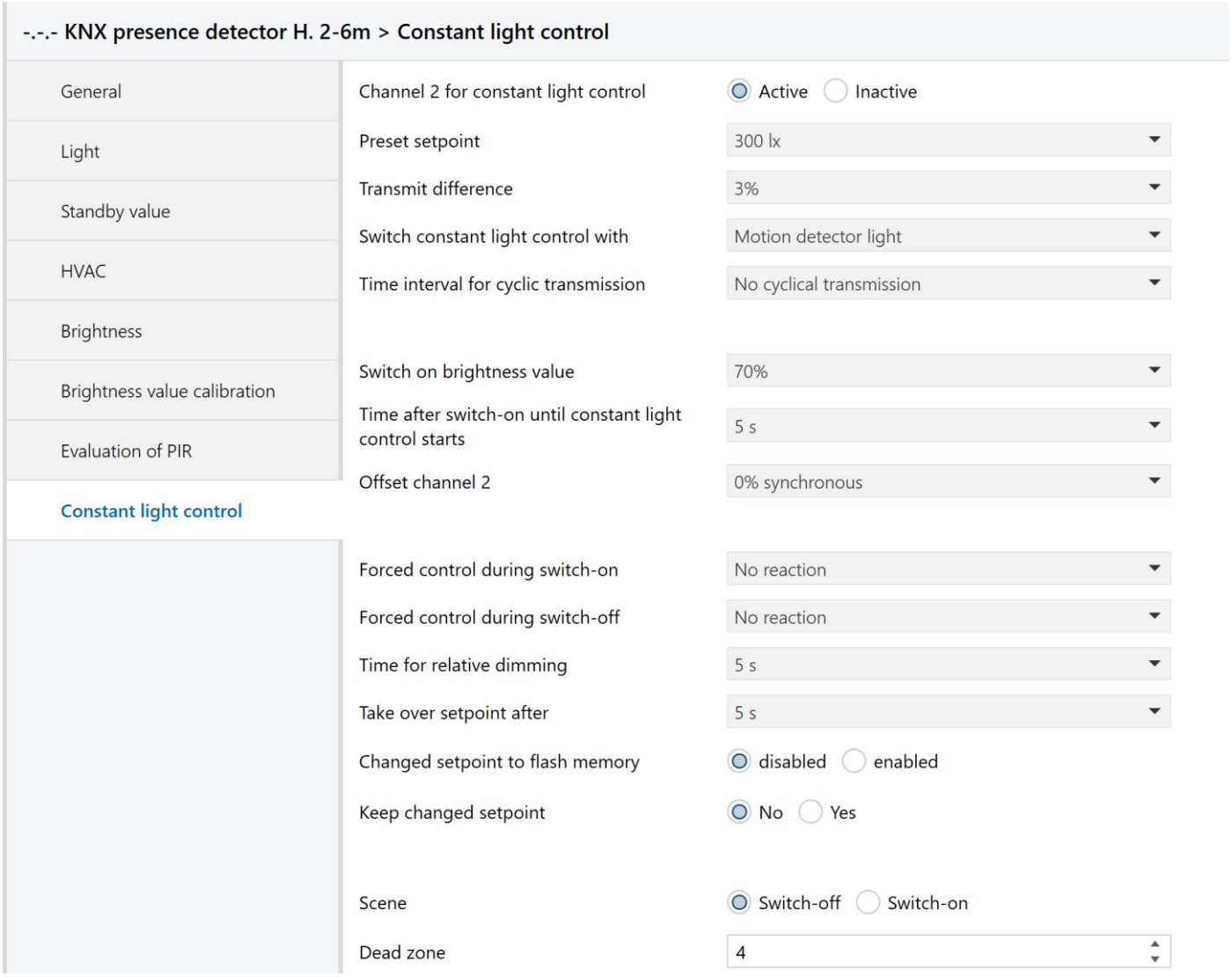

Fig. 10.1: “Constant light control” menu

10.1 Parameters

The parameters for configuring the constant light control are indicated below

10.1.1 Constant light controller

The possible values are:

- Switch OFF
- Switch ON (default value)

Selecting **Switch ON** displays all the parameters for configuring the constant light and the communication objects that control the constant light via bus.

The constant light control can be enabled or disabled via bus (e.g. by a push-button or a supervisor) or via the input object ***Constant light control - Switch On/Off*** (Data Point Type 1.001 DPT_Switch).

Alternatively, the constant light control can be activated by the detection of a presence and sent on the bus via the objects dedicated to the light or HVAC channel.

The input object ***Constant light control – Dim relative*** (Data Point Type 3.007 DPT_Dimming control) can be used to change the current brightness value (with adjustment steps of 1%) for example by a KNX push-button that the user can use to directly adjust the brightness in the room. The new brightness value that is reached is notified via bus via the object ***Brightness value (lux)*** (Data Point Type 9.004 DPT_2 byte float value) and displayed on a supervisor.

The user can use the input object ***Constant light control – Dim completely*** (Data Point Type 5.001 DPT_Percentage 0..100%) to send a new brightness % setpoint from a device (e.g. by a supervisor) via bus.

The device sends the percentage value calculated to maintain the light constant via the output object ***Constant light control channel 1*** (Data Point Type 5.001 DPT_Percentage 0..100%) to a KNX dimmer actuator, on channel 1.

If the constant light control of the presence detector is activated by the detection of a presence or by an external "ON" command received via the object ***External switch/status - light*** (Data Point Type 1.001 DPT_Switch), the dimming values (brighter or darker) transmitted to the object ***Constant Light – Dim forced*** (Data Point Type 3.007 DPT_Dimming control) by a push-button or a supervisor immediately interrupt the constant control function and remain inactive during the movement detection and/or the delay time. In that moment, any value sent to a dimmer actuator via the object ***Constant light control channel 1*** (Data Point Type 5.001 DPT_Percentage 0..100%) can change.

After the **Delay time** or after a switching command "OFF" received externally, the constant light control is active again and operates, when detecting movement, based on the values set in the following parameters.

The other communication objects dedicated to constant light control are provided in the following paragraphs based on the respective enabling and configuration parameters.

10.1.2 Channel 2 for constant light control – Offset channel 2

This parameter enables a second light control channel that can be used to adjust the light in an actuator or multiple KNX dimmer actuators that require an offset with respect to those controlled by channel 1 (for example, two rows of lamps, one near the windows the other far away).

The possible values are:

- Active
- Inactive (default value)

Selecting **Active** displays the output object ***Constant light control channel 2*** (Data Point Type 5.001 DPT_Percentage 0..100%) by means of which the device sends the percentage value calculated by the regulator that is identical to what is sent on the analogue object of Channel 1, but with the addition/reduction of an offset that is set via the parameter "**Offset channel 2".**

The parameter "**Offset channel 2"** can have any value within the following range:

- 50%, -40%, -30%, -20%. -10%, **0%-Synchronous,** +10%, +20%, +30%, +40% +50% **(default value)**

The value **0%-Synchronous** indicates that the adjustment of channel 2 will be synchronous with channel 1 (offset = 0%).
The control signal of channel 1 ± the offset is sent to the dimmer actuator for channel 2. Internally, the control range is extended to 150% in order to maintain a reasonable limit control interval.
This means that with an offer of -50%, a value is sent to both objects ***Constant light control channel 1*** and ***Constant light control channel 2*** with the value **OFF** (-100%, darkness). Internally, the value of the object ***Constant light control channel 2*** is 150% and that of the object ***Constant light control channel 2*** is 100%.

If the brightness in the room increases, the object ***Constant light control channel 1*** remains at 100% (150% - x) and the object ***Constant light control channel 2*** is reduced (150% - 50% - x). If the adjustment goes down below 100%,

also the value of the object ***Constant light control channel 1*** will be visibly lower on the bus, for example 73%, the object ***Constant light control channel 2*** at 23%. The object ***Constant light control channel 1*** is therefore set to 0 and the object ***Constant light control channel 2*** is set to the minimum value of 50%.

The values are transmitted on the bus based on the "**Transmit difference**" parameter or, in the case of a cyclical transmission, via the "**Time interval for cyclic transmission**" parameter, available at that moment.

10.1.3 Preset setpoint

This parameter is used to preset the reference setpoint for the constant light control in ETS.

The possible values range from 10 Lux to 2000 Lux, with **default value 300 Lux**

This value can also be modified if needed via bus with the input objects ***Constant light control – Dim relative*** (Data Point Type 3.007 DPT_Dimming control) and ***Constant light control – Dim completely*** (Data Point Type 5.001 DPT_Percentage 0..100%). When a new value is received via these two objects, by means of a relative adjustment or an absolute value in %, the setpoint is updated.

Important: it is possible to set the time interval during which the regulator remains deactivated in the **Constant light control** menu with the "**Take over setpoint after"** parameter. At the end of this time interval, the new setpoint is written in the RAM memory (but not in the flash memory!).

Attention: this new setpoint remains stored until a presence is detected in the environment and the delay time has elapsed. If a new presence is detected in the environment, the setpoint defined in ETS is reactivated. If the new dimming setpoint must be adopted permanently, then the "**Take over setpoint after"** parameter must be set to **yes** in the **Constant light control** menu.

10.1.4 Transmit difference

The "**Transmit difference**" parameter defines the tolerance range that must be exceeded to send a new brightness value, that is a new value is sent when the brightness varies with the percentage indicated in this parameter.

This value can be set between 1% and 20% **(3% default value)**

10.1.5 Switch constant light control with

The constant light control can be activated by 3 different sources that can be selected here with the following options:

- Object
- Motion detector light (default value)
- Motion detector HVAC

"**Object**" indicates that upon reception of the object ***Constant light control - Switch ON/OFF*** (Data Point Type 1.001 DPT_Switch) with value **ON** (activation)

10.1.6 Time interval for cyclic transmission

This defines the cyclical time interval with which the last brightness value is repeated, even if it did not exceed the tolerance range. Cyclical transmission can also be disabled.
The parameter can have the following values:

- **No cyclical transmission**, 5 s, 10 s, ….. 10 min **(default value)**

10.1.7 Switch on brightness value

This parameter is used to define the switch on brightness value.

The parameter can be set between 1% and 100% **(70% default value)**

10.1.8 Time after switch-on until constant light control starts

This parameter defines the initial delay before the start of the constant light control.

The parameter may have the following values:1 s, 10 s, ….., 4 min, 5 min **(5 s default value)**

10.1.9 Forced control during switch-on

This parameter defines how the constant light control reacts when receiving a "**1**" (**ON**) via the input object from the bus ***Constant light control – Forced control*** (Data Point Type 1.001 DPT_Switch).

The values that can be set are:

- No reaction (default value)
- Minimum brightness
- Maximum brightness

10.1.10 Forced control during switch-off

This parameter defines how the constant light control reacts when receiving a "**0**" (**OFF**) via the input object from the bus ***Constant light control – Forced control*** (Data Point Type 1.001 DPT_Switch).

The values that can be set are:

- No reaction (default value)
- Minimum brightness
- Maximum brightness

10.1.11 Time for relative dimming

This parameter is used to set the duration of the relative dimming, for example if the adjustment should be more or less gradual.

The parameter may have the following values: 2 s, 3 s, …, **5s**, ..., 14 s, 15 s **(5 s default value)**

10.1.12 Take over setpoint after

This parameter sets the delay after which a new setpoint will be recognised and stored in the RAM memory.

The parameter may have the following values: 1 s, **5 s**, 10 s, ….., 4 min, 5 min **(5 s default value)**

10.1.13 Changed setpoint to flash memory

This parameter defines whether to enable (release) or disable (locked) the storing of the setpoint when it is modified in the device's flash memory.

- disabled (default value)
- enabled

10.1.14 Keep changed setpoint

If set to **Yes** , the modified value is stored in the RAM memory.
Attention: in that case, the new setpoint corresponds to the last set brightness value.

The possible values are:

- No **(default value)**
- Yes

10.1.15 Scene

This parameter, if enabled, is used to preset the brightness value to be called up when receiving scenes (1 to 8) via the object ***Constant light control - Scene*** (Data Point Type 17.001 DPT_Scene number).

The "**Scene X**" parameters are displayed (with X=1..8) that can have the following values:

- OFF, 10 Lux, 20 Lux, 40 Lux,……**500 Lux**,……1800 Lux, 2000 Lux **(default value)**

10.1.16 Dead zone

The dead zone is an area within which the value of the effective light can change without generating new control commands. In this case, the effective value is used for comparison with the instantaneous value that was most recently adjusted.
The value in Lux of the dead zone depends on the current brightness (last effective value to which it was adjusted); as sensitivity to brightness is logarithmic, this function is not linear.
To simplify the setting, a conventional value is used as a parameter; this value is connected to the value in Lux of the tolerance range as shown in the following table.

The possible values are: from 1 to 50 **(default 4)**

Example:

A Dead Zone with value = 2 and brightness = 500 lux, as shown in the table in Fig. 10.2 on the following page, results in a tolerance equal to: **+/- 24 lux.**
This means that the effective value can change from 476 lux to 524 lux without sending new control commands to the actuator.

Dead Zone/brightness correlation: adjustment tolerance (± lux)

Brightness in lux

Dead zone values: from 1 to 10

		Dead zone									
		1	2	3	4	5	6	7	8	9	10
Brightness	100	2	5	7	10	12	15	17	20	23	26
	200	5	9	14	19	24	30	35	40	46	52
	300	7	14	21	29	37	44	52	61	69	78
	400	9	19	29	39	49	59	70	81	92	104
	500	12	24	36	48	61	74	87	101	115	129
	600	14	28	43	58	73	89	105	121	138	155
	700	16	33	50	68	85	104	122	142	161	181
	800	19	38	57	77	98	119	140	162	184	207
	900	21	42	64	87	110	133	157	182	207	233
	1000	23	47	72	96	122	148	175	202	230	259
	1100	26	52	79	106	134	163	192	222	253	285
	1200	28	57	86	116	146	178	210	243	276	311
	1300	30	61	93	125	159	193	227	263	299	337
	1400	33	66	100	135	171	207	245	283	322	362
	1500	35	71	107	145	183	222	262	303	345	388
	1600	37	75	114	154	195	237	280	324	368	414
	1700	40	80	122	164	207	252	297	344	391	440
	1800	42	85	129	174	220	267	315	364	414	466
	1900	44	90	136	183	232	281	332	384	438	492
	2000	47	94	143	193	244	296	350	405	461	518

Fig. 10.2: “Dead zone/brightness correlation table” menu

11 Communication objects

The communication objects are listed in the following table:

Outputs:

#	Object name	Function of object	Description	Datapoint type
0	Output - light	Dim completely	Sends the value in % to the dimmer actuators	5.001 DPT_Percentage (0..100%)
0	Output - light	Switching	Sends the ON/OFF value to the actuators	1.001 DPT_Switch
0	Output - light	Scene	Sends the scenarios	17.001 DPT_Scene number
4	Output - HVAC	Switching	Actuator switching for HVAC	1.001 DPT_Switch
8	Brightness threshold switch value	Switching	Sends a switching command when exceeding the set brightness threshold	1.001 DPT_Switch
9	Brightness value	Brightness value (Lux)	Sends the detected brightness value	9.004 DPT_2 byte float value (Lux)
10	AD calibration value	AD calibration value	Sends the calibration value of the indoor AD converter	8.001 DPT_2 byte signed value – pulses difference
11	Delay time	Time (s)	Sends the set delay time value	7.005 DPT_Time
12	Brightness lower limit	Brightness (lux)	Sends the brightness threshold set for sensor activation	9.004 DPT_2 byte Float Value (LUX)
22	Constant light control channel 1	Value %	Sends the constant adjustment value in % to the channel 1 actuators	5.001 DPT_Percentage (0..100%)
23	Constant light control channel 2	Value in %	Sends the constant adjustment value in % to the channel 2 actuators	5.001 DPT_Percentage (0..100%)

Inputs:

#	Object name	Function of object	Description	Datapoint type
1	External switch / status light	Switching	Receives the switching commands from a push-button or the status from an actuator	1.001 DPT_Switch
2	External motion - light	Switching	Receives the switching commands from a “master” sensor in “slave” mode	1.001 DPT_Switch
3	Input - light	Disable	Reception of the light lock command	1.001 DPT_Switch
3	Input – light	Forced control	Reception of the light forcing command	2.001 DPT_Switch control

5	External switch/status – HVAC	Switching HVAC	Receives the HVAC switching commands from a push-button or the status from an actuator	1.001 DPT_Switch
6	External motion - HVAC	Switching HVAC	Receives the HVAC switching commands from a “master” sensor in “slave” mode	1.001 DPT_Switch
7	Input HVAC	Disable	Reception of the HVAC lock command	1.001 DPT_Switch
7	Input HVAC	Forced control	Reception of the HVAC forcing command	2.001 DPT_Switch control
11	Delay time	Time (s)	Sends the set delay time value	7.005 DPT_Time
12	Brightness lower limit	Brightness (lux)	Sends the brightness threshold set for sensor activation	9.004 DPT_2 byte Float Value (LUX)
14	Constant light	Dimm forced	Reception of a dimmer adjustment value from an external sensor/push-button	3.007 DPT_Dimming control
16	Constant light control	Switch ON/OFF	Reception of a constant light control activation/deactivation command	1.001 DPT_Switch
17	Constant light control	Dimm relative	Reception of a relative control command	3.007 DPT_Dimming control
18	Constant light control	Dim completely	Reception of an absolute brightness % value	5.001 DPT_Percentage (0..100%)
20	Constant light control	Forced control	Receives an ON/OFF command for activating the set brightness levels	1.001 DPT_Switch
21	Constant light control	Scene	Reception of scenes for activating the preset brightness values (light scenes)	17.001 DPT_Scene number
24	Light	Standby	Standby light activation	1.001 DPT_Switch

code 70194279

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Punto di contatto indicato in adempimento ai fini delle direttive e regolamenti UE applicabili:
Contact details according to the relevant European Directives and Regulations:
GEWISS S.p.A. Via A.Volta, 1 IT-24069 Cenate Sotto (BG) Italy tel: +39 035 946 111 E-mail: qualitymarks@gewiss.com

SAT

+39 035 946 111
8.30 - 12.30 / 14.00 - 18.00
lunedì ÷ venerdì - monday ÷ friday

24h **+39 035 946 260**

sat@gewiss.com
www.gewiss.com