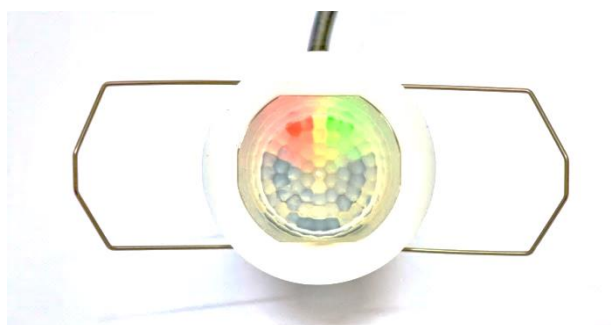




SWISS GARDE 360 HOKUSPOKUS KNX/KLR

APPLICATION DESCRIPTION

MODEL	TYPE NO.
SG HOKUSPOKUS KNX/KLR	25010



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1. Functional description

The **SWISS GARDE Hokuspokus KNX/KLR** (25010) is an ultra-flat mini KNX motion detector with constant light regulation and a total of 3 light channels

The detector is for flush ceiling mounting and has protection class IP54, class II.

The Hokuspokus KNX has a KNX interface and is ideal for use in building automation systems.

The device is based on a modern 16-bit microcontroller with internal flash memory and an integrated KNX/EIB bus coupler.

Two pyro detectors and a high resolution lens can detect the smallest motions.

The 2 PIR sensors can be activated individually or in groups.

A light sensor with linear output measures brightness. Its built-in optical filter has a spectral response similar to that of the human eye.

The motion detector has a 2-channel constant light controller with a parametrable offset between -50% to +50%. There is an additional light channel output for switching, dimming or scene selection.

The HVAC channel can be used for HVAC controls, alarm systems or motion detection.

With the standard KNX bus, all switching and control functions can be easily programmed and executed.

The application description is valid for devices with the **program version 2.4**. Functional enhancements and changes of **program version 2.7** are described in chapter 5.

2 COMMUNICATION OBJECTS *

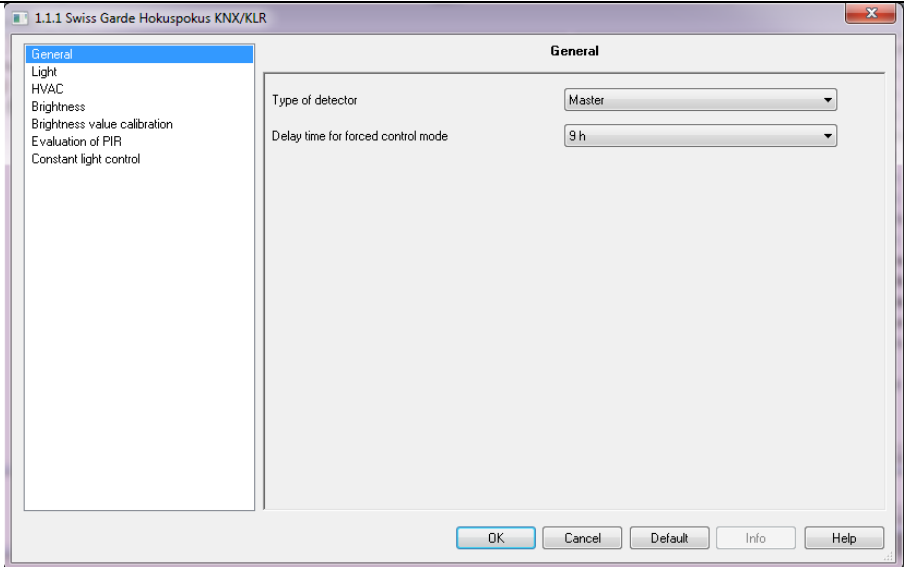
→ input object ← output object

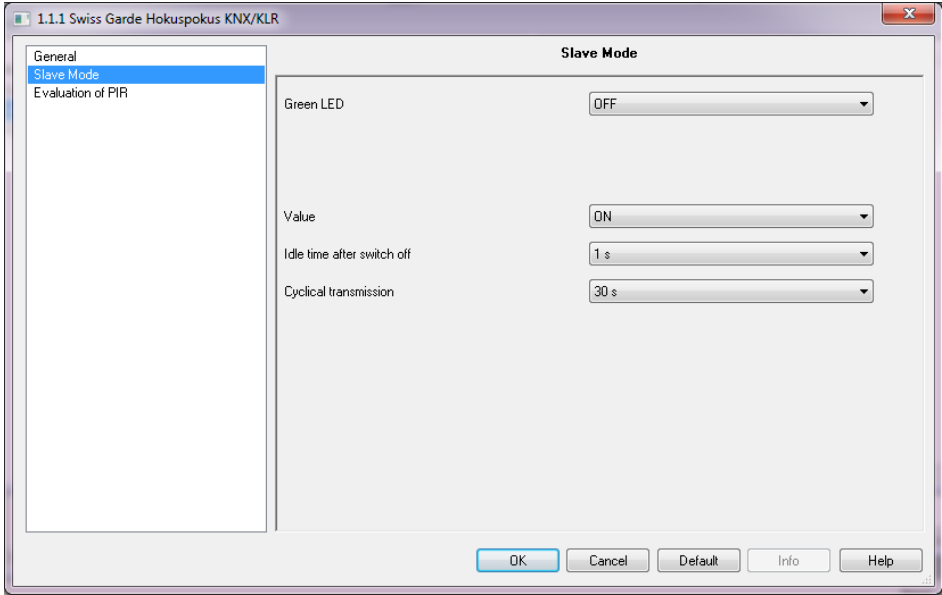
Object		Function	link application with:	Bit/Byte
0	←	Output - light (preset dimming)	light group actuator	1 byte
0	←	Output - light (switching)	light group actuator	1 bit
0	←	Output - light (scene)	light group actuator	1 bit
1	→	Input external switch / status - light (switching)	KNX switch, touch display, logic	1 bit
2	→	Input external motion - light (switching)	Output - light for secondary unit (object 0)	1 bit
3	→	Input - light (forced control)	• External logic module	2 bit
3	→	Input - light (lock)	KNX switch, touch display, logic module	1 bit
4	←	Output - HVAC (switching)	<ul style="list-style-type: none"> Actuators for HVAC devices such as heating, ventilation and air conditioning Control of alarm logic modules Presence or motion function 	1 bit
5	→	External switch / status - HVAC (switching)	KNX switch, touch display, logic	1 bit
6	→	External motion - HVAC (switching)	Output HVAC for secondary unit (output object 4)	2 byte
7	→	Input - HVAC (forced control)	External logic module	2 bit
7	→	Input - HVAC (lock)	KNX switch, touch display, logic	1 bit
8	←	Threshold switch brightness (switching)	Logic, actuator	1 bit
9	←	Brightness (lux value)	Logic, touch display	2 byte
10	←	AD calibration value	Read out and then set manually for calibration procedure	2 byte
16	→	Constant light control, switch on/off	KNX switch , logic	1 bit
17	→	Constant light control, dimming relative	4 bit dimming object from KNX switch for ON/OFF, dimming up and down, touch display	4 bit
18	→	Constant light control, preset dimming	Logic module	1 byte
20	→	Constant light control, forced control	KNX button, logic	1 bit
21	→	Constant light control, scene selection	Logic module	1 byte
22	←	Constant light control, channel 1 - output	Dimming actuator for light group 1	1 byte
23	←	Constant light control, channel 2 - output	Dimming actuator for light group 2	1 byte
24	→	Light - standby	Switching of standby value sets	1 bit

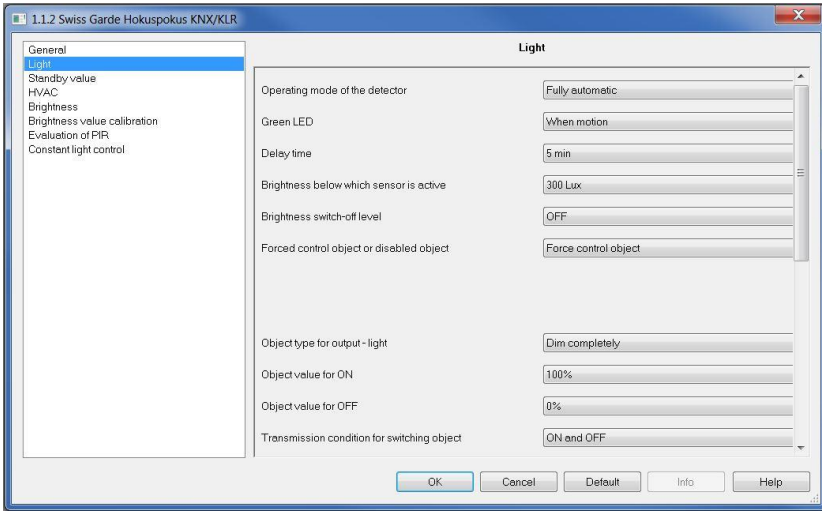
* Communication objects program version v2.4

3 PARAMETERS

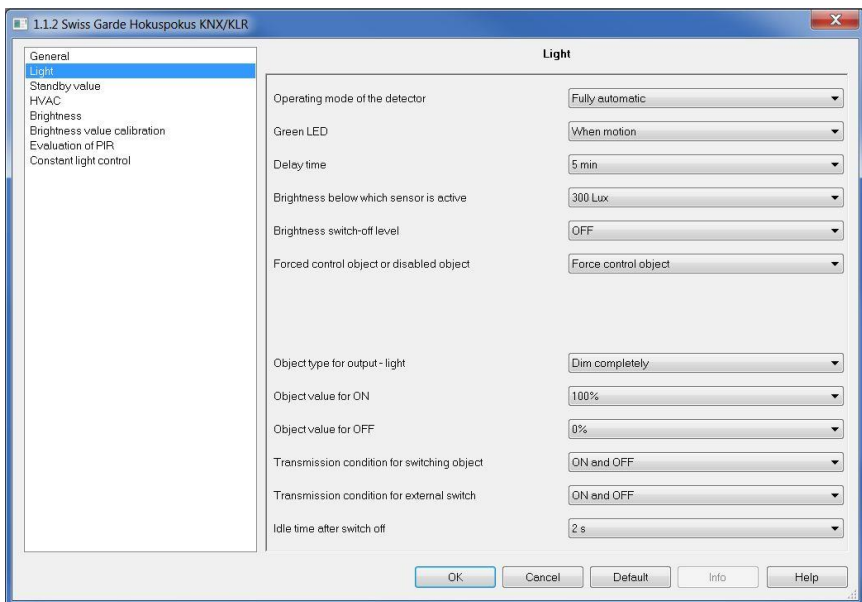
To set the parameters, the Swiss Garde Hokuspokus KNX/KLR motion detector should be highlighted in the configuration or operating mode and the command *Parameter* be selected from the *Edit* menu item or via the context menu (right mouse click). The *Edit parameter...* window will open with multiple tabs.

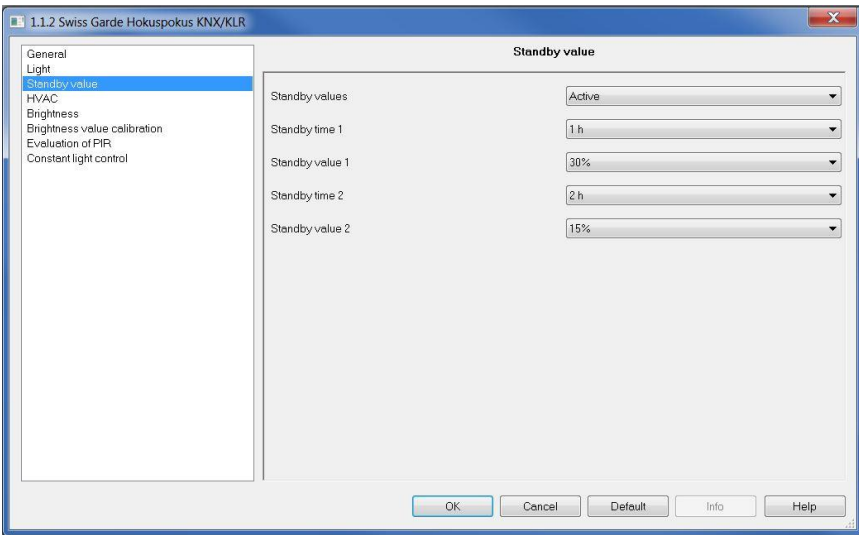
3.1.1 General	
<i>Type of detector</i>	The function of the detector is set as a master or secondary detector (slave) device
<i>Delay time for forced control mode</i>	The value "OFF" or a time of 5 min to 9 hrs can be selected in the <i>reset time forced control</i> menu. This parameter defines the time delay for the detector to reset to AUTO mode, after an OFF or ON command has been executed.

3.1.2 Secondary detector Mode	
Secondary detector Mode (Slave Mode)	<p>The secondary detector mode can be reached in the menu General: click the type of detector as <i>slave</i> and the menu <i>slave mode</i> appears. The delay time of the secondary unit is fixed to 30 sec.</p>
<i>LED green</i>	<p>For testing purposes, the indication LED for motions can be activated</p>
<i>Value of object</i>	<p>Selectable <i>ON</i> or <i>OFF</i></p>
<i>Idle time after switch off</i>	<p>Can be set from 1 sec to 60 sec Default value is 5 sec</p>
<i>Cyclical transmission</i>	<p>We recommend retriggering the Master unit cyclically when operating in the Master/Secondary detector mode. The interval time for cyclical transmission can be set from 1 second to 4 hours. Default value is 30 sec</p>
PIR evaluation	
<i>Active sensors</i>	<p>The 2 PIR sensors can be enabled individually or together. The numbers 1, 2 correspond to positions 1, 2 as shown in the illustration (page 14).</p>
<i>Sensitivity setting</i>	<p>The sensitivity can be adjusted from 1 to 10.(1 = min, 10 = max) The default value is 5.</p>

3.2.1 Light - switching	
<i>Operating mode of the detector</i>	Sets the operating mode to fully or semi-automatic.
<i>Green LED</i>	This LED may flash once after each motion detection or remain off
<i>Delay time</i>	The delay time for the light channel can be set from 1 sec to 4 hrs
<i>Brightness below which sensor is active</i>	Set lighting value from 10 Lux to 2000 Lux and always. Important: If the light channel always remain active (even with values > 2000 lux, the parameter must be to always .
<i>Brightness above which lighting is turned off</i>	Brightness threshold (lux) for immediate switch-off, even if delay time has not yet elapsed. Default value is OFF .
<i>Forced control object or disabled object</i>	This will set object 3. See description of object 3: <i>force control mode – lock mode</i>
<i>If locked object = 0</i>	Selects an action to be executed after reception of a 0 command
<i>If locked object = 1</i>	Selects an action to be executed after reception of a 1 command
<i>Object type for output - light</i>	This will define object 0. The following options are available: <i>switching, dim completely, scene selection</i>
<i>Object value for ON when object type is:</i> <i>light = switching</i> <i>light = dimming</i> <i>light = scene</i>	Select ON or OFF (ON is default value) Select preset dim value from 0% to 100% Select scenes from 1...32
<i>Object value for OFF when object type:</i> <i>light = switching</i> <i>light = dimming</i> <i>light = scene</i>	Select ON or OFF (OFF is default value) Select preset dim value from 0% to 100% Select scenes from 1...32

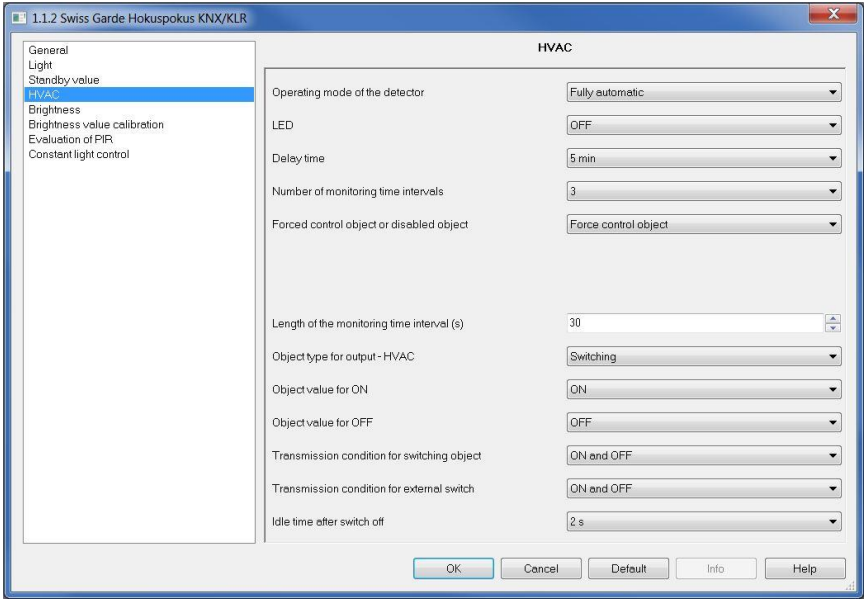
<i>Transmission conditions for switching object</i>	Transmission filter for output object 0: <i>Output - Light - Switching</i> Selection: ON and OFF; neither ON nor OFF; only ON; only OFF
<i>Transmission conditions for external switch</i>	Selection: ON and OFF; neither ON nor OFF; ON only; OFF only
<i>Idle time after switch off</i>	Can be set from 1 sec to 60 secs <u>Applications:</u> Prevention off bus traffic excess Prevention of erroneous lighting restart if: <ul style="list-style-type: none"> light bulbs are cooling down room is deserted after switching off with a KNX switch.
<i>Cyclical transmission</i>	If the light channel is in switching mode, it is possible to cyclically transmit the "ON" mode. The interval time for cyclical transmission can be set from 1 second to 4 hours.

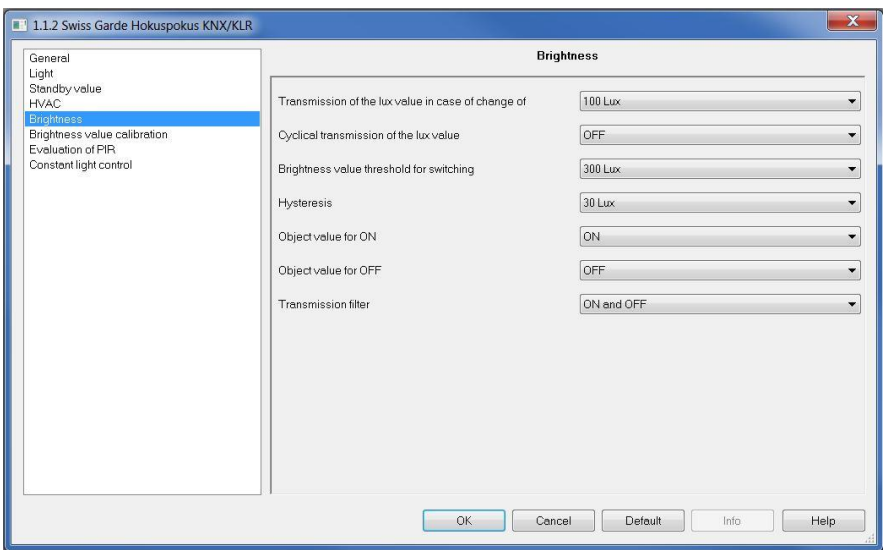
3.2.2 Light – Preset Dimming	 <p>The screenshot shows the 'Light' configuration window. On the left is a sidebar with a tree view containing: General, Light (selected), Standby value, HVAC, Brightness, Brightness value calibration, Evaluation of PIR, and Constant light control. The main area contains the following settings:</p> <ul style="list-style-type: none"> Operating mode of the detector: Fully automatic Green LED: When motion Delay time: 5 min Brightness below which sensor is active: 300 Lux Brightness switch-off level: OFF Forced control object or disabled object: Force control object Object type for output - light: Dim completely Object value for ON: 100% Object value for OFF: 0% Transmission condition for switching object: ON and OFF Transmission condition for external switch: ON and OFF Idle time after switch off: 2 s <p>At the bottom are buttons for OK, Cancel, Default, Info, and Help.</p>
Object type for output-light	<i>Preset dimming</i> This setting enables the standby light function. The <i>Standby value</i> option appears in the <i>Light</i> menu (page 10).

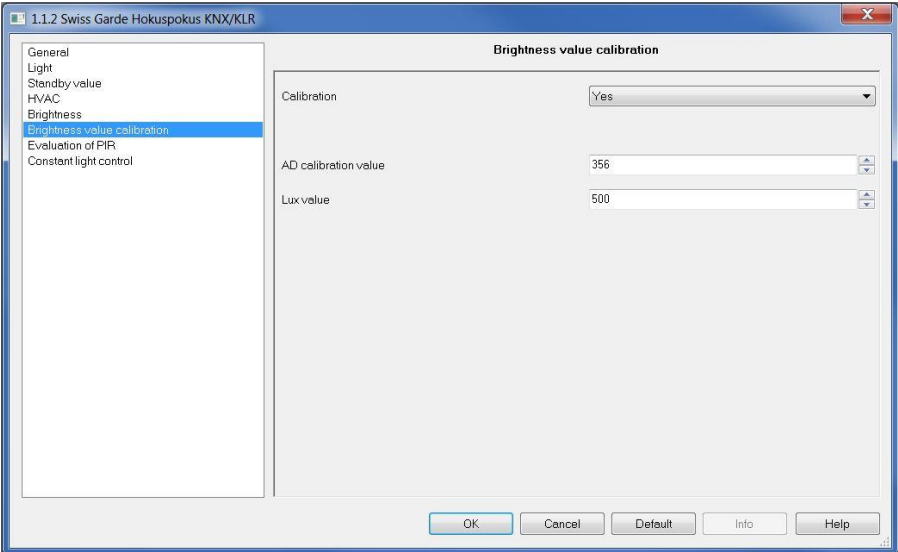
3.2.3 Light - Standby parameters	
<i>Standby values</i>	Toggles the orientation light function between active and inactive
<i>Standby time 1</i>	Set orientation light 1 duration time (seconds, minutes, hours).
<i>Standby value 1</i>	Set light intensity in % (0...100%)
<i>Standby time 2</i>	Set orientation light 2 duration time (seconds, minutes, hours).
<i>Standby value 2</i>	Set light intensity in % (0...100%)

Standby light

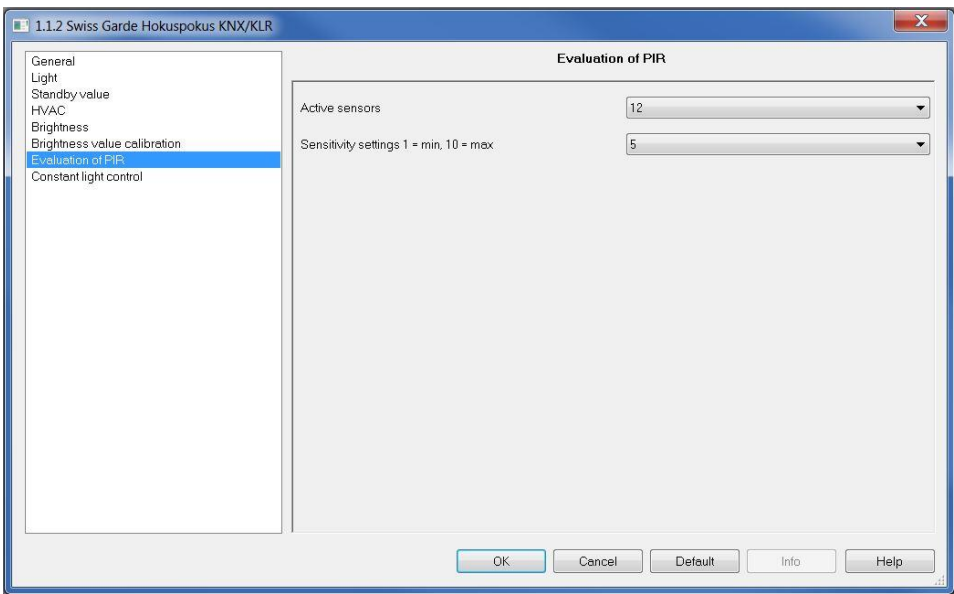
If the light channel is set to *preset dimming*, a new menu will appear to enable the standby functionality. There are 2 parameters for both the duration time and the light intensity (%) of the standby operation. After the regular duration time has elapsed the standby light will turn on. With object 24 → the user will then be able to select one of two presetable parameter pairs. If the object value is 0 or there was no command received yet, value pair 1 is enabled. A 1 command value will trigger pair 2. After standby has elapsed, an OFF command will be sent on the light channel. The motion detector will return to regular mode and standby mode will be reset. Lock commands and forced control commands will always reset standby mode immediately.

<h3>3.3 HVAC</h3>	 <p>The screenshot shows the HVAC configuration window for the 1.1.2 Swiss Garde Hokuspokus KNX/KLR system. The window is titled '1.1.2 Swiss Garde Hokuspokus KNX/KLR' and has a sidebar on the left with the following menu items: General, Light, Standby value, HVAC (selected), Brightness, Brightness value calibration, Evaluation of PIR, and Constant light control. The main area is titled 'HVAC' and contains the following settings:</p> <ul style="list-style-type: none"> Operating mode of the detector: Fully automatic LED: OFF Delay time: 5 min Number of monitoring time intervals: 3 Forced control object or disabled object: Force control object Length of the monitoring time interval (s): 30 Object type for output - HVAC: Switching Object value for ON: ON Object value for OFF: OFF Transmission condition for switching object: ON and OFF Transmission condition for external switch: ON and OFF Idle time after switch off: 2 s <p>At the bottom of the window are buttons for OK, Cancel, Default, Info, and Help.</p>
	<p>All parameters are identical to those of the light channel with the exception of:</p>
<p><i>Number of monitoring time windows</i></p>	<p>The number of monitoring time intervals can be set from 1 to 32.</p>
<p><i>Duration of monitoring time window</i></p>	<p>Adjustable from 1 s to 30,000 s (8.33h)</p>
<p>Note!</p>	<p>The correct setting for fastest response of the HVAC channel is: <i>Number of monitoring time windows: 1</i> <i>Duration of monitoring time window: 1 second</i></p>
<p>Presence or motion function with HVAC channel</p>	<p>The above parameters should be used for the presence or motion function (the signal is independent from the ambient lighting brightness!).</p>

3.4 Brightness/ threshold switch	
	The parameters for object 8 ← (<i>Brightness threshold switch</i> , 1 bit) and object 9 ← (<i>Brightness value</i> , 2 bytes) can be set in the Brightness / Threshold menu.
<i>Transmission of the lux value in case of change of</i>	This parameter allows the lux value + change to be sent via object 9 (<i>brightness value</i>) if the set threshold is exceeded. Values from 10 lux up to 1800 lux and "OFF" can be set. The set value of change refers to the set threshold.
<i>Cyclical transmission of the light value</i>	Values from 5 seconds to 30 minutes and „OFF“ can be set.
<i>Lux value of the threshold for switching</i>	Can be set from 10 lux to 2000 lux
<i>Hysteresis</i>	Can be set from 5 lux to 200 lux
<i>Object value for ON</i>	Selection: "ON" or "OFF"
<i>Object value for OFF</i>	Selection: "OFF" or "ON"
<i>Transmission filter</i>	Selections: "ON and OFF"; "neither ON nor OFF"; "ON only"; "OFF only"

<h3>3.5 Brightness value calibration</h3>	
<p><i>Calibration</i></p>	<p>"NO": Factory calibration is enabled (default value)</p> <p>Reset to factory calibration: This is possible at any time with the setting "NO" and thereafter the reprogramming of the detector.</p> <p>"YES": This option opens the following two additional windows:</p>
<p><i>AD calibration value</i></p>	<p>Read <i>AD calibration value</i> (at ←object 10) in the ETS and enter it in the window.</p> <p>Attention: use type 7.001 unsigned 2 byte counter in the <i>read/send value</i> menu! The AD value read-out then appears in the <i>Value received</i> menu (e.g. 739 pulses).</p>
<p><i>Lux value</i></p>	<p>Measure reference brightness with lux meter and enter corresponding value.</p>
	<p>See also description of "AD calibration value" on page 24 for further details.</p>

3.6 PIR evaluation



Active sensors	The 2 PIR sensors can be enabled individually or together. The numbers 1, 2 correspond to positions 1, 2 as shown in the illustration below.
Sensitivity setting 1 = min, 10 = max	The sensitivity can be adjusted from 1 to 10. The default value is 5.

Numbering of the PIR sensors



The PIR sensors 1 and 2 can be enabled individually or together.
The 2 positions of the pyro detectors are visible in the above illustration.

Constant light control

1.1.1 Swiss Garde Hokuspokus KNX/KLR

Constant light control

Constant light controller	Switch-on
Channel 2 for constant light control	Active
Transmit difference	3%
Preset setpoint	300 lx
Switch constant light control with	Motion detector light
Time interval for cyclic transmission	No cyclical transmission
Switch on brightness value	80%
Time after switch-on until constant light control starts	1 s
Offset channel 2	0% synchronous
Forced control during switch-on	No reaction
Forced control during switch-off	No reaction
Time for relative dimming	2 s
Take over setpoint after	1 s
Changed setpoint to flash memory	disabled
Keep changed setpoint	No
Scene	Switch-on

OK Cancel Default Info Help

Constant light scenes

1.1.1 Swiss Garde 360 RA

Constant light control

General	Forced control during switch-on	No reaction
Light	Forced control during switch-off	Last value
HVAC	Time for relative dimming	8 s
Brightness	Take over setpoint after	5 s
Brightness value calibration	Changed setpoint to flash memory	disabled
Evaluation of PIR	Keep changed setpoint	No
Constant light control	Scene	Switch-on
	Scene 1	500 lx
	Scene 2	500 lx
	Scene 3	500 lx
	Scene 4	500 lx
	Scene 5	500 lx
	Scene 6	500 lx
	Scene 7	500 lx
	Scene 8	500 lx
	Dead zone	2

OK Cancel Default Info Help

3.8 Constant light parameters	
<i>Constant light controller</i>	This parameter enables or disables the constant light controller.
<i>Channel 2 for constant light control</i>	Channel 2 can be enabled for constant light control <i>Active/inactive Via the output object 23 a configurable value with a fixed offset can be transmitted</i>
<i>Preset setpoint</i>	The preset setpoint in lux for constant light control can be preset in the ETS. It can also be changed via objects 17 and 18 (constant light - dimming relative and constant light - dim completely).
<i>Transmit difference</i>	This parameter (from 1% to 100%) defines the tolerance window to be exceeded in order to send a new brightness control value.
<i>Switching constant light control with</i>	<i>Switching constant light control ON/OFF</i> can be done using three different sources: By → object 16, presence detection on the light channel or presence detection on the HVAC channel.
<i>Time interval for cyclical transmission</i>	Defines the cycle time interval with which the last brightness value is repeated, even if it has not exceeded the tolerance window. Cyclical transmission can also be disabled.
<i>Switch on brightness value</i>	The switch on value for the lighting can be set from 1% to 100 %.
<i>Switch on timeout</i>	This parameter defines the initial time delay before constant light control is started.
<i>Offset for channel 2 *</i>	The offset range for channel 2 can be set from -50%, 0% to +50%.

* In addition to the previous constant light control channel 1 (Object 22 ←) there is a second constant light control channel 2 (Object 23 ←). The control signal of *channel 1 ± offset* value is sent to the dimming actuator for light channel 2. Internally, the control range has been extended to ± 150% in order to maintain a reasonable control range at the limits.

That means: Offset at -50%, darkness: FF (=100%) is sent to both objects. Internally, object 1 is at 150% and object 2 at 100%. If the ambient brightness now increases, object 1 remains at 100% (150% - x) and object 2 is regulated downwards (150% - 50% - x). If the regulation now drops below 100%, object 1 will also be visibly smaller on the bus, e.g. 73%, object 2 23%. Object 1 is then regulated down to 0 and object 2 is set to the minimum value of 50%. The values for transmission difference and cyclical transmission are taken from the once off available parameters.

3.8 Constant light parameters	(Continued)
<i>Force control during switch-on</i>	This parameter allows the constant light controller function to be set to: <i>no reaction, minimum brightness, maximum brightness</i>
<i>Force control during switch-off</i>	This parameter allows the constant light controller function to be set to: <i>no reaction, minimum brightness, maximum brightness</i>
<i>Time for relative dimming</i>	This parameter allows the relative dimming time to be set. This will influence the dimming soft control.
<i>Take over setpoint after</i>	This parameter allows setting the time delay after which a new setpoint will be recognized and stored in the RAM memory.
<i>Changed setpoint to flash memory</i>	This parameter allows a new set point to be written to the flash memory.
<i>Scene</i>	Various lux values can be set as light scenes (light moods). These can be enabled through object 21 as well.
<i>Dead zone</i>	<p>The dead zone is an area within which the actual light value can change without generating new control commands. The default value for the dead zone is 2.</p> <p>The lux value tolerance of the dead zone can be extracted from the table below.</p> <p><u>Example:</u></p> <p>Dead zone value = 2</p> <p>Brightness = 500 lux</p> <p>The resulting tolerance is: +/- 24 lux</p> <p>This means that the actual value can change from 476 lux to 524 lux without sending new control inputs to the actuator.</p>

Dead zone/Brightness correlation

Brightness in lux

+/- lux tolerance (dead band)

		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

4 FUNCTIONAL BLOCKS

The functionality of the motion detector can be split up into the following blocks:

- Motion detection
- Brightness measuring
- Light control channel *Switching*
- Light control channel *preset dimming* with optional standby light function
- HVAC control channel (with presence or motion function)
- Lighting dependent threshold switch
- 2 channel constant light control

The motion detector and the brightness sensor (lux) each work independently on the light channel and the HVAC channel.

The constant light controller receives the actual brightness value from the Lux sensor. The controller can be switched on/off by a command via → object 16 or triggered by motion detection on the light or HVAC channel.

After switching or recovery of the KNX bus voltage, the motion detector usually generates a switch-on procedure.

4.1 LIGHT CONTROL CHANNEL

The light control channel has two operating modes that can be selected via the *detector operating mode* parameters.

The possible settings are:

- fully-automatic
- semi-automatic

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

- fully-automatic mode has three operating conditions: ready, active and passive
- semi-automatic mode has two operating conditions: ready and active
- semi-automatic mode does not switch the light on after motion has been detected. Lighting can only be switched on manually by an external KNX switch.

4.1.1 OBJECT 0 OUTPUT – LIGHT – SWITCH

← Output 1 bit

After each detected motion this output sends an "ON" command and starts the delay timer

The delay time can be set from 1 second to 4 hours.

At the end of the programmed time interval an "OFF" command is sent to the output (object 0).

4.1.2 OBJECT 0 OUTPUT – LIGHT – COMPLETE DIMMING

← Output 1 byte

This mode sends preselected dim values (0% to 100%) to the output for *objective value for ON* and for *objective value for OFF* respectively.

4.1.3 OBJECT 0 OUTPUT – LIGHT – SCENE

← Output 1 byte

For the *Objective value for ON* or *Objective value for OFF* one of 32 scenes can be selected respectively.

4.1.4 OBJECT 1 EXTERNAL SWITCHING / STATUS - LIGHT - SWITCH

→ Input 1 Bit

Input object 1 *external switch / status* can be used in two different ways:

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

In both cases, a received telegram „ON“ sets the detector to the ON state and an „OFF“ telegram to the ready state.

Whether commands for ON or OFF will be sent during the transitions depends on the parameter *sending conditions for external push button*.

After having received an **ON** command, the follow up timer starts as if a motion had been detected.

Lighting is subsequently switched off again.

After having received an **OFF** command the detector remains in its passive status during which it will not detect any motion. After having passed the *idle time after switch off*, the detector is ready again.

The idle time after switch off can be programmed in the **light** menu.

4.1.5 OBJECT 2 EXTERNAL MOVEMENT - LIGHT - SWITCH

➔ Input 1 Bit

Additional detectors (slaves) can be connected through Object 2 “external movement - light – switching”. The received signal from external presence detectors is processed the same as if from its own detector and works in parallel.

Object 2 is used to set up a **Master-Secondary detector configuration** as follows:

Secondary devices: Connect **all outputs** of the **secondary devices** (←object 0) to the **input external movement-light-switching** (➔object 2) of the **master device**.

4.1.6 OBJECT 3 INPUT - LIGHT - FORCED CONTROL / LOCK

➔ Input 2 Bit

The meaning of this object is defined by the *Light* ⇔ *forced control object or disabling object* parameter.

Forced control object:

Object 3 when used as **forced control object** has 3 values which can be received by a **2 bit command**:

- (1) **Forced control object ON** (control = 1, value = 1)
An **ON command** is sent unconditionally to the *output – light* (object 0).
The follow up timer is disabled and the timer *release time* starts.
If after having terminated the release time and no further command is sent to the forced control object, normal operation is resumed.
- (2) **Forced control object OFF** (control = 1, value = 0)
An **OFF command** is sent unconditionally to the *output – light* (object 0).
The delay timer is disabled and the timer *release time* starts.
If after having terminated the release time and no further command is sent to the forced control object, normal operation is resumed.
- (3) **Forced control object auto** (control = 0, value = 0)
Normal operation is resumed immediately.

Locked object:

Object 3 when used as **locked object** has 2 values which can be received by a **1 bit command 0 and 1**:

The response to a switch command on this object is controlled by two more parameters:

Light ⇔ *if locked object = 0*, and *Light* ⇔ *if locked object = 1*,

Both parameters can specify one of the following commands:

- forced control ON
- forced control OFF
- automatic
- lock (actual state)
- do nothing

Note: Incorrect settings of parameters such as: *locked object*, *lock at 0* and *no action at 1* and *release time restraint OFF* can completely inactivate the correct function of the motion detector.

4.2 HVAC CHANNEL

← Output 1 bit

The HVAC channel has the same objects and the same operating modes as the light channel. It works the same way as the light channel as well.

The motion detection function, however, has been expanded and substituted by a “longer presence detection”. This is done by setting several equally long monitoring time windows. At least one motion detection must occur during each time slot.

The parameters are:

number of monitoring time windows
length of monitoring time window (s)

Motion and presence function

The HVAC output can be used as a motion or presence function. To activate this, the *number of observation time windows* must be set to 1 and the *length of the observation time window* set to 1 second. The signal is independent of the ambient light level.

4.2.1 OBJECT 4 OUTPUT – HVAC – SWITCH

← Output 1 bit

Object 4 "Output - HVAC - Switch" is similar to object 0 "Output - light - switch" but has additional functions (see HVAC parameters, page 10).

4.2.2 OBJECT 5 EXTERNAL SWITCHING / STATUS - HVAC

→ Input 1 Bit

Object 5 "External switching / status - HVAC" is identical to object 1 "External switching / status - light".

4.2.3 OBJECT 6 EXTERNAL MOVEMENT - HVAC

→ Input 1 Bit

Object 6 "External movement - HVAC - switch" is identical to object 2 "External movement - light - switch".

4.2.4 OBJECT 7 INPUT - HVAC - FORCED CONTROL

→ Input 2 Bit

Object 7 "Input - HVAC - forced control" is identical to object 3 "Input - light - forced control".

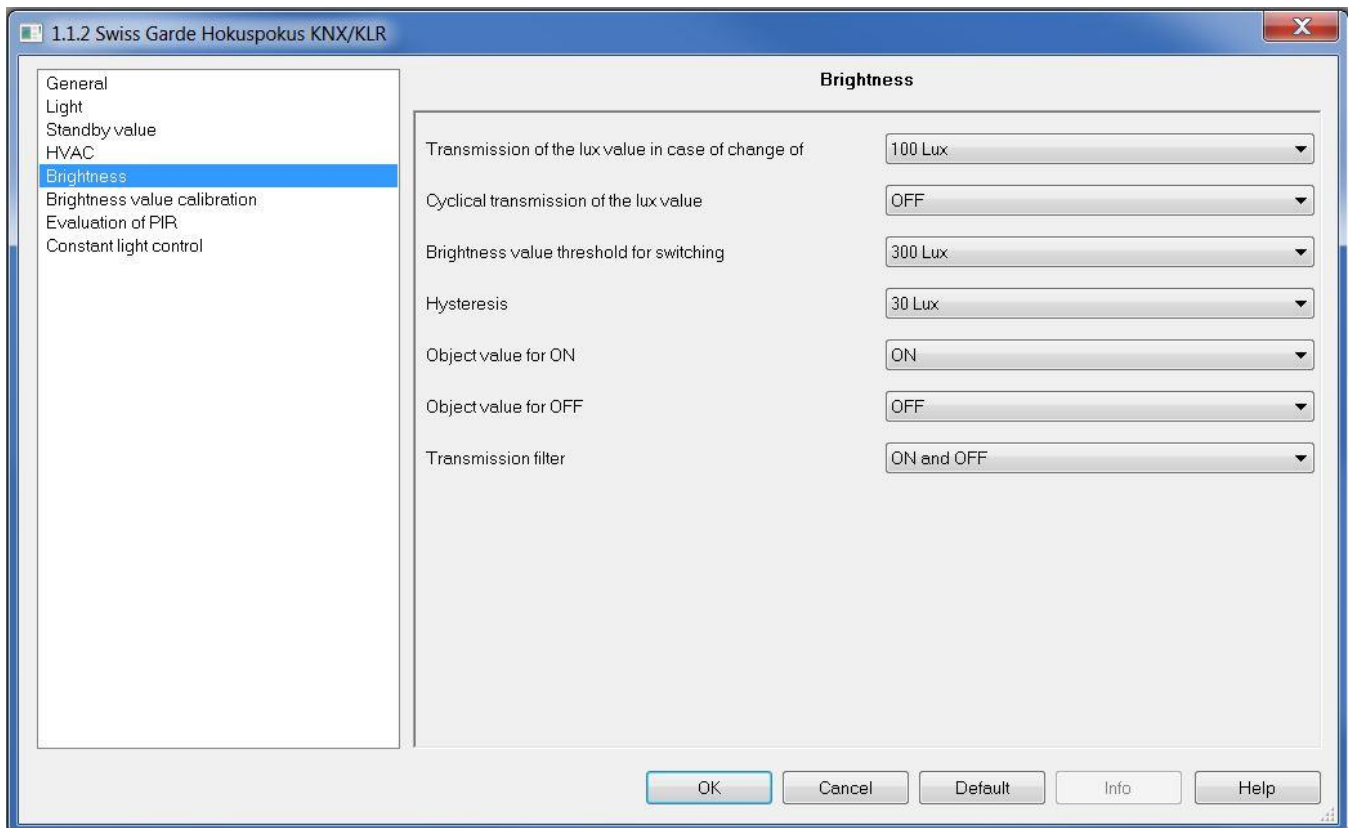
4.2.5 OBJECT 7 INPUT - HVAC - DISABLE

→ Input 1 Bit

Object 7 "Input - HVAC - disable" is identical to object 3 "Input - light - disable".

4.3 BRIGHTNESS THRESHOLD SWITCH

This block has two output objects: Threshold switch and brightness value



4.3.1 OBJECT 8 THRESHOLD SWITCH BRIGHTNESS - SWITCHING

← Output 1 bit

Output object 8 sends an "ON" if the measured brightness is greater than the *Value for switching the threshold value switch* parameter. If the measured brightness drops below the *Switch-on threshold value* – (minus) the *Hysteresis* parameter, an "OFF" is transmitted.

4.3.2 OBJECT 9 BRIGHTNESS VALUE

← Output 2 bytes

Output object 9 sends the current measured brightness value in lux. The transmission is triggered by changes that are greater than the parameter *Transmission of the light value in case of a change of* or cyclically with the time stipulated for *Cyclical transmission of the light value*.

If the cycle time is set to "OFF" there will be no cyclical transmission.

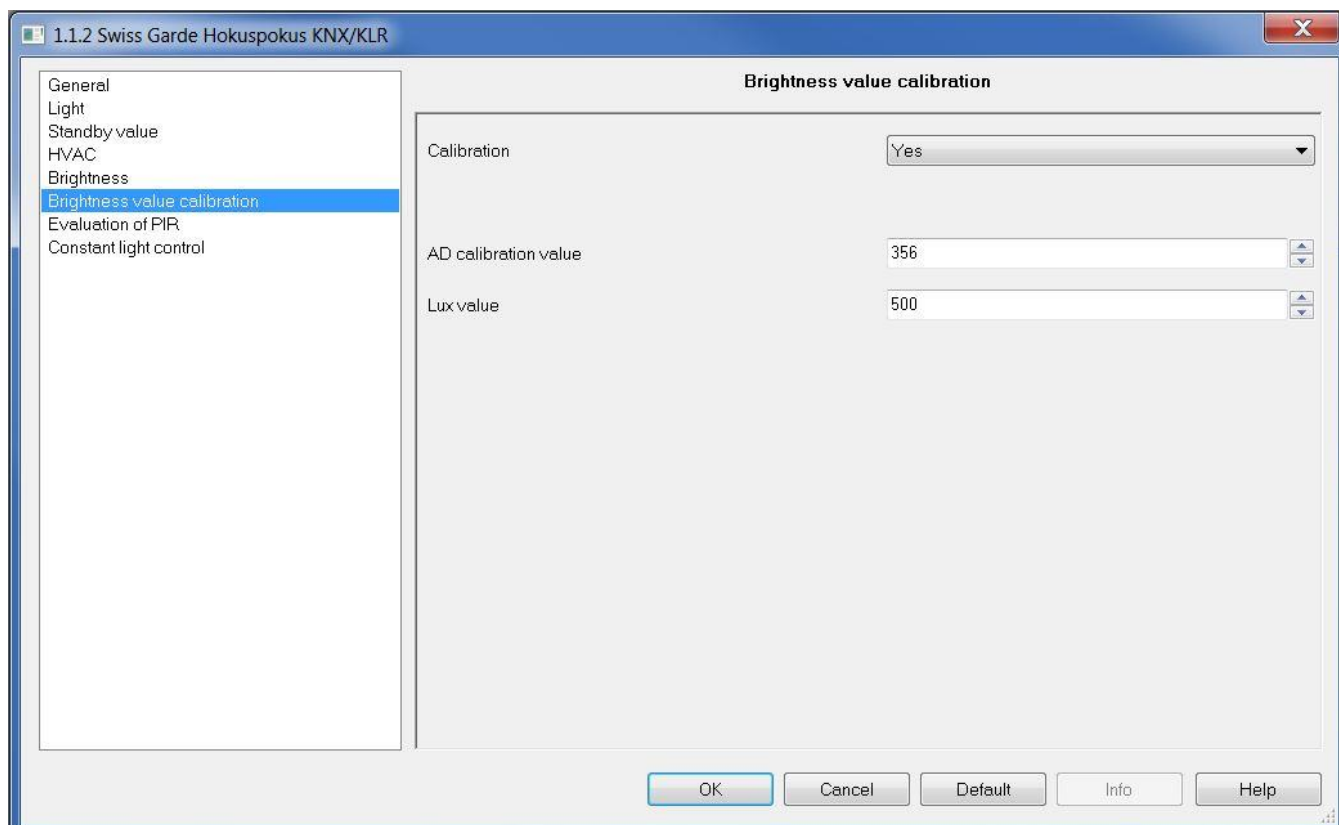
4.4 AD CALIBRATION VALUE

← Output 2 bytes

Object 10 is not transmitted autonomously. It can only be read. Its unsigned 16 bit value represents the momentary value of the AD converter for the brightness measurement.

The brightness measurement can be calibrated as follows:

1. Measure the incident light - on a desktop for example - with an external lux meter. This represents the reference lux value.
2. Read out the AD calibration value (communication object 10) in the ETS.
Note: In the menu *Read/send value*, use type **7.001 unsigned 2 byte counter!**
 The AD value read then appears in the *Value received* menu as **739 pulses**, for example.
3. With full access, enter the two values *Lux value* and *AD calibration value* as parameters.



4.5 OBJECTS FOR CONSTANT LIGHT CONTROL

4.5.1 OBJECT 16 CONSTANT LIGHT - SWITCH ON/OFF

→ Input 1 Bit

This input allows the constant light controller to be switched ON and OFF (*Object*).

Alternatively the constant light controller can be activated by motion detection on the light or the HVAC channel.

4.5.2 OBJECT 17 CONSTANT LIGHT - RELATIVE DIMMING

→ Input 4 Bit

Using this object, the current value is changed with relative dimming steps of 1%.

Using a KNX push button, light can be dimmed and set to a new brightness level.

The new light value can then be displayed in Lux on a KNX touch panel through object 9: *brightness value*.

Important: In the menu *constant light* ⇒ *take over set point after* you can define the period during which the controller will remain switched off. After this interval, the new value is written to the RAM (not to the flash memory)!

Note: This new target value remains stored in RAM as long as there are people present in the scanned area. After switching the light channel off and back on again, the set point stored in ETS is adopted once again. If the newly changed set point are definitely taken over, set the parameter *Keep changed set point* to **YES** (see also section 3.8 Constant light parameter page 18)

4.5.3 OBJECT 18 CONSTANT LIGHT – PRESET DIMMING

→ Input 1 Byte

With this object the user can define a new dim setpoint in % over the bus.

4.5.4 OBJECT 20 CONSTANT LIGHT - FORCE CONTROL

→ Input 1 Bit

In accordance to the parameters *force output at ON* and *force output at OFF*, various options can be selected: *no reaction*, *minimum brightness*, *maximum brightness*

4.5.5 OBJECT 21 CONSTANT LIGHT - SCENE

→ Input 1 byte

Scene selection input. 8 adjustable scenes can be selected via ETS.

This object has no switch function but only changes the brightness setpoint values.

4.5.6 OBJECT 22 CONSTANT LIGHT - OUTPUT CHANNEL 1

← Output 1 bytes

This is the constant light control signal (% brightness) for the dimming actuator of lighting 1

4.5.7 OBJECT 23 CONSTANT LIGHT - OUTPUT CHANNEL 2

← OUTPUT 1 Byte

This is the constant light control signal for the dimming actuator of lighting 2.

The lux value is equal to channel 1 +/- offset.

5 PROGRAMMVERSION 2.7

With the program version 2.7, the function possibilities of the motion detector - series Swiss Guard Hokuspokus KNX / KLR expanded and existing features of program version 2.4, have been supplemented respectively adapted.

The standard values (default values of the parameters compared to the settings in version 2.4 are partially modified.

These settings allow a simple and safe functionally check (initial start-up) of the motion detector .

Older devices of software version 2.4 can also be programmed with the program version 2.7 (backward compatibility .

However, supplemented functions and the additional communication objects are not all supported.

5.1 Overview of the changes:

- *Forced control Secondary detector-Mode* → see 5.2.0
 - *Parameter changes via communication objects* → see 5.2.1
 - *dimming function with constant light control (clc)* → see 5.2.2
 - *Power on characteristics* → see 5.3.1
 - *Automatic lighting OFF threshold* → see 5.3.2
 - *Delay time in semi-automatic mode* → see 5.3.3
 - *Standby-function* → see 5.3.4
 - *Light sensor adaption* → see 5.3.5
-
- *Monitor-LED (green);*
As long as the detector detects a movement, the monitor LED flashes at 0.5 Hz

5.2 COMMUNICATION OBJECTS

→ INPUT OBJECT

← OUTPUT OBJECT

Object		Function	link application with:	Bit/Byte
0	←	Output - light (preset dimming)	light group actuator	1 byte
0	←	Output - light (switching)	light group actuator	1 bit
0	←	Output - light (scene)	light group actuator	1 bit
1	→	Input external switch / status - light (switching)	KNX switch, touch display, logic	1 bit
2	→	Input external motion - light (switching)	Output - light for secondary unit (object 0)	1 bit
3	→	Input - light (forced control)	• External logic module	2 bit
3	→	Input - light (lock)	KNX switch, touch display, logic module	1 bit
4	←	Output - HVAC (switching)	<ul style="list-style-type: none"> Actuators for HVAC devices such as heating, ventilation and air conditioning Control of alarm logic modules Motion or presence function 	1 bit
5	→	External switch / status - HVAC (switching)	KNX switch, touch display, logic	1 bit
6	→	External motion - HVAC (switching)	Output HVAC for secondary unit (output object 4)	2 byte
7	→	Input - HVAC (forced control)	External logic module	2 bit
7	→	Input - HVAC (lock)	KNX switch, touch display, logic	1 bit
8	←	Threshold switch brightness (switching)	Logic, actuator	1 bit
9	←	Brightness (lux value)	Logic, touch display	2 byte
10	←	AD calibration value	Read out and then set manually for calibration procedure	2 byte
11	→ ←	Delay time (sec)	Read or write, touch display, external logic	2 byte
12	→ ←	Brightness below which sensor is active	Read or write, touch display, external logic	2 byte
14	→	Constant light control, forced dimming	4 bit dimming object from KNX switch for ON/OFF, dimming up and down, touch display	4 bit
16	→	Constant light control, switch on/off	KNX switch, logic	1 bit
17	→	Constant light control, dimming relative	4 bit dimming object from KNX switch for ON/OFF, dimming up and down, touch display	4 bit
18	→	Constant light control, pre-set dimming	Logic module	1 byte
20	→	Constant light control, forced control	KNX button, logic	1 bit
21	→	Constant light control, scene selection	Logic module	1 byte
22	←	Constant light control, channel 1 - output	Dimming actuator for light group 1	1 byte
23	←	Constant light control, channel 2 - output	Dimming actuator for light group 2	1 byte
24	→	Light - standby	Switching of standby value sets	1 bit

5.2.0 COMMUNICATION OBJECTS with Secondary detector- Mode

Object		Function	link application with:	bit/byte
0	←	Output (switching)	Master presence -detector	1 bit
3	→	Input (forced control)	KNX switch, touch display, logic module	1 bit

Object forced control:

The object 3 as a forced control object knows 2 values (1 bit command) which can be received :

If object forced control = 1: output (Obj.0) remains locked when motion is detected , no telegrams are sent

If object forced control = 0: output (Obj.0) → AUTO (normal operation)

5.2.1 OBJECTS for dynamic parameter changes

→ Input 2 byte

← Output 2 byte

Via object 11 (delay time) and via object 12 (brightness below which sensor is active) may be changed or read the related parameter- values directly without to re-programming the presence- detector.

This mode allows via external devices (BMS , touch screen , logic) to influence the functioning of the presence- detector directly .

For example, dependent on user needs, the light-ON switching characteristic / delay time can be dynamically adapted during certain day times to optimize the application .

Changed values via object remain stored temporarily. After bus voltage interruption / return , after a reset or after a re- programming , the originally parameterized values are active again.

5.2.2 Object 14 Constant- light- control , forced-dimming

→ Input 4 bit

If the constant light control of the motion detector is activated by a motion detection or by an external "ON"- command (obj1, dimming values (brighter or darker transmitted to object 14 interrupt the function Constant-light-control immediately and remains inactive during motion detection and or the delay- time.

At that moment, the constant-light-control output-value (Obj 22 can with relative dimming (brighter / darker by a KNX push button - to be changed .

After the delay- time or after an external " OFF " switching command , the constant-light- control is active again and operates (when motion-detection with the stored parameter- values .

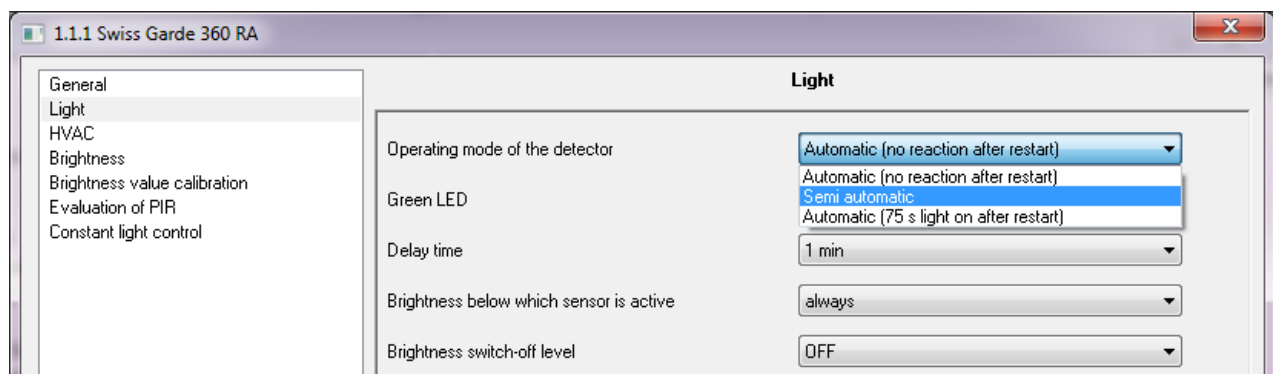
5.3 Parameters

5.3.1 Operating mode during power- on

After power -on/ bus voltage return or bus voltage interruption, the presence-detector is for the first 60sec inactive. During this stabilization-period of the electronic device, the detector doesn't sends any telegrams too.

Dependent on the application, in the operating mode "Automatic" ,the light output (obj1/obj22) can be activated during the start-up phase.

In this mode, two options with "75s light on after restart" or "no reaction after restart" can be selected.

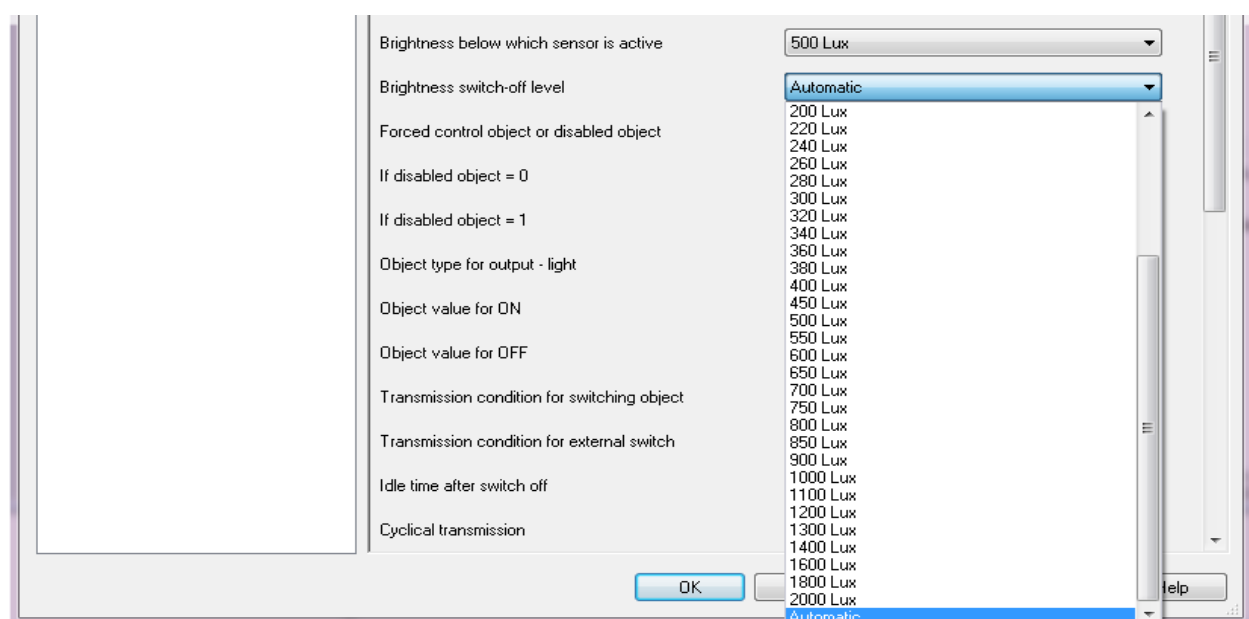


5.3.2 Automatic adaptation of the "light-off" threshold

With the setting „Automatic“ in the parameter *Brightness above which lighting is turned off*, the detector, calculates automatically the light-off threshold with the following rule:

If the effective brightness with switched light-channel (after 1min.) is greater than the parameterized value „*Brightness below which sensor is active*“, the light-off threshold is 10% increased above this value plus 200LUX.

If the effective brightness with switched light-channel (after 1min.) is below than the parameterized value „*Brightness below which sensor is active*“, the light-off threshold is 10% increased above the actual brightness-value (obj9) plus 200LUX.



The light-off threshold is recalculated after each expired delay-time and a renewed motion-detection or an "ON" switching-command.

If the parameter *Brightness switch-off level* is selected with a fixed value, this value needs to be higher or the same as the parameter *Brightness below sensor is active*.

5.3.3 Delay-time, mode semi- automatic

If the brightness is increasing during the delay-time and passes over the threshold "*Brightness switch off level*", the light-channel (obj0/obj22) is switching off but the delay-time is continuing either.

If the brightness reduces below the value "*Brightness below sensor is active*", the light channel is switching "ON" again, till the delay-time is expired.

5.3.4 Standby-functionality

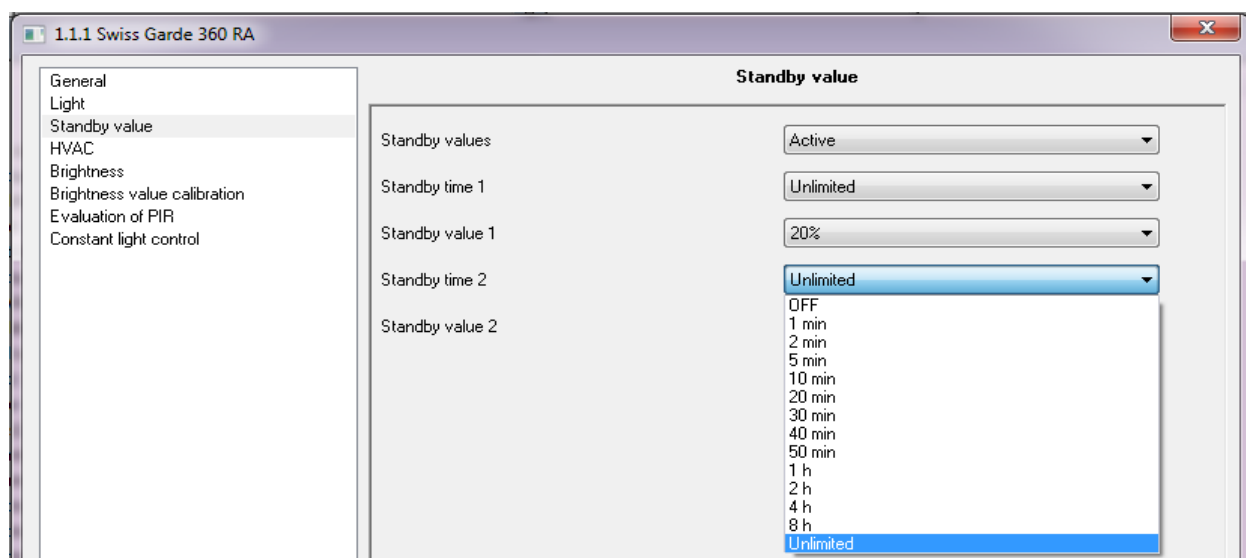
When the light-channel is used as "*dim completely*", a standby-light can be activated optionally.

Two pairs of values are available and can select with obj24.

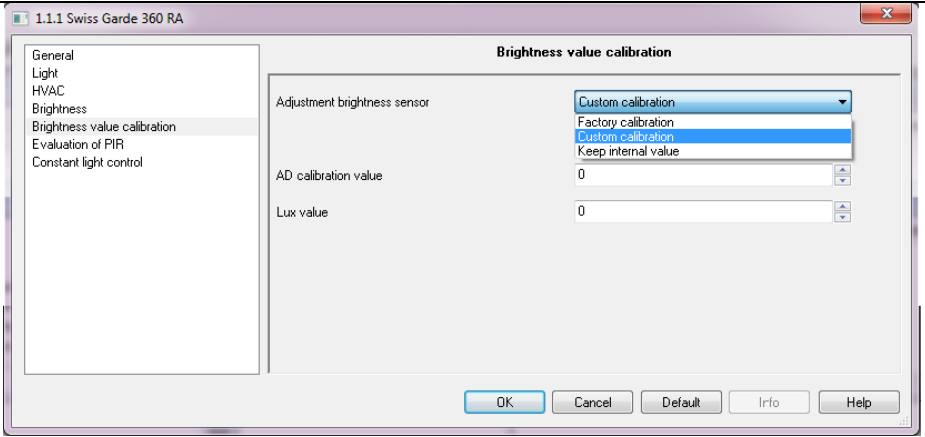
The delay-time for the Standby-functionality can also parameterized as "Unlimited " too. → Emergency-light with permanent minimum brightness.

If the brightness during standby increase over "*Brightness switch off level*", the light-channel (obj0) is switching off .

If the brightness reduces below the value "*Brightness below sensor is active*", the light channel is switching "ON" with the standby-settings again till the delay-time (standby) is expired.



5.3.5 Adjustment brightness sensor

<p>Brightness value calibration</p>	
<p><i>Factory calibration</i></p>	<p>This setting is possible at any time with reprogramming of the presence-detector.</p>
<p><i>Custom calibration</i></p>	<p>This option open two additional windows. <i>AD calibration value and Lux value</i></p>
<p><i>AD calibration value</i></p>	<p>Read out the AD calibration value (communication object 10) in the ETS and submit it in the window AD calibration value. Note: In the menu Read/send value, use type 7.001 unsigned 2 byte counter! The AD value read then appears in the Value received menu as 739 pulses, for example.</p>
<p><i>Lux value</i></p>	<p>Measure with Luxmeter the reference brightness and submit it in the Lux window.</p>
<p><i>Keep internal value</i></p>	<p>This setting is selected after a recalibration was made.</p>