LON manual

Application description

LON presence detector PlanoSpot 360 PSLON

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1. Functional characteristics

1.1 Presence detector PlanoSpot 360 PSLON

The presence detector switches or controls a maximum of two lighting groups dependent on the presence of persons and the current brightness. For this purpose, two constant light controller objects are available, each with its own brightness setpoint value, in which a selection can be made from three targeted light measurements.

- With brightness-dependent switching, the lighting is switched on for an adjustable length of time if movement is detected in the detection area and there is insufficient brightness.
- With constant light control, the lighting is controlled to a constant brightness of artificial light and daylight if movement has been detected in the detection area.

The occupancy controller objects transmit the presence information in the room either to the constant light controller or other devices such as heating, ventilation or blind controls. The channel has a switch-on delay and a time delay.

The presence detector also has an integrated scene component as well as the possibility of processing scenes for both lighting groups. In combination with the remote control, the presence detector is not only capable of switching and dimming its own lighting groups, but also other external consumers such as lights, blinds etc.

The SendoPro management remote control permits the adjustment and optimisation of defined parameters. For example, the brightness setpoint value can be set quickly and reliably via both daylight-dependent switching and constant light control.

The parameters can be read to provide a clear overview. In order to achieve the optimum adjustment to the lighting conditions in a room, the current brightness can be read out in lux and optimised using the room correction factor.

1.2 Features

- Passive infrared presence detector for ceiling installation
- Flat design with interchangeable bezel frame in different colours
- Square detection area 360° (up to 64 m^2) for reliable and easy planning
- Automatic presence- and brightness-dependent control for lighting and HVAC
- Two differently sized detection zones for greater flexibility. Adjustable via parameters or remote control.
- Manual alignment of the detection area (swivel mechanism)
- Mixed light measurement in 3 ways suitable for fluorescent lamps (FL/PL/ESL), halogen/incandescent lamps and LEDs
- 3 x light sensor #1010
- Detection and sending of current brightness
- Setting the room correction factor for brightness measurement calibration
- 2 x constant light controller #3050 for controlling two lighting groups
- Switching or constant light control with standby function (orientation light)
- Switching mode with dimmable lighting
- Fully or semi-automatic
- Brightness switching value or setpoint value can be set in lux via plug-in, network variable or remote control
- Teach-in of the brightness switching value or the setpoint value
- Self-learning time delay can be set via plug-in, network variable or remote control
- Reduction of time delay when present briefly (short-term presence)
- Manual override by network variable, or remote control
- 3 x occupancy controller #3071
- Occupancy sensor #1060
- Switch-on delay and configurable
- Separate disable objects for light and presence outputs
- Configurable sensitivity of motion detection
- Test mode for checking function and detection area
- Scene panel #3250 can be used with the user remote control
- Integrated scene module (Scene controller #3251)
- Parallel switching of multiple presence detectors (master/slave or master/master)
- Installation in false ceilings with springs
- Surface mounting on ceilings possible with back box (optional)
- User remote control «theSenda S» (optional)
- Management remote control «SendoPro» (optional)
- Installation remote control «theSenda P» (optional)
- Standardised LONMARK objects
- Plug-in for convenient adjustment of parameters and functionality

1.3 Technical data

Presence detector	PlanoSpot 360 PSLON
Number of light measurements (mixed light)	3
Recommended installation height	2.0 - 3.0 m (minimum height > 1.7 m)
Max. detection area	8 x 8 m (Mh. 3.5 m) / 64 m² walking 4.5 x 4.5 m (Mh. 3.0 m) / 20 m² seated
Detection angle horizontal vertical	360° 120°
Operating voltage	24 V AC/DC | AC +10%/-20% | DC ±20%
Power consumption	approx. 30 mA / 38 mA with LED on
Type of installation	Installation in false ceilings
Brightness switching value / setpoint value setting range	approx. 10 – 3000 lux
Time delay	10 s – 100 min
Presence switch-on delay	10 s – 30 min / not active
Standby dimming value	1 – 25% of the lamp output
Standby time	30 s – 60 min / not active / permanently on
Remote control communication Receiving data	IR
Topology	LON FTT
Ambient temperature	0 °C ... +50°C
Storage temperature	-25 °C ... +60 °C
Protection rating	IP 20

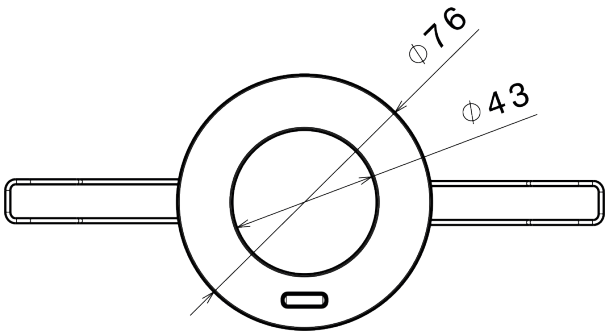
1.3.1 Product overview

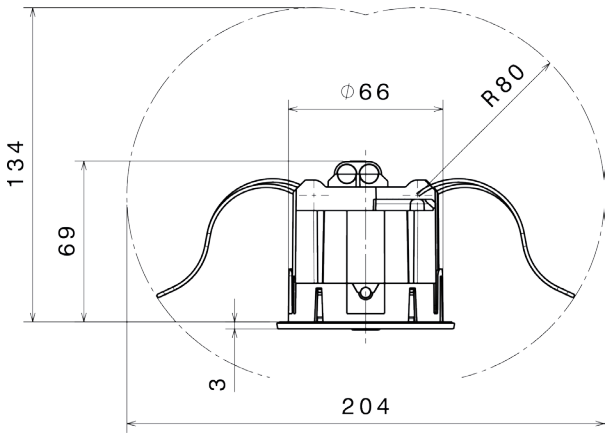
Type of installation	Channel	Colour	Type	Item number
Ceiling installation	3 Light | 2 HVAC	White	PlanoSpot 360 PSLON DE WH	2039200
Ceiling installation	3 Light | 2 HVAC	Black	PlanoSpot 360 PSLON DE BK	2039201
Ceiling installation	3 Light | 2 HVAC	Silver	PlanoSpot 360 PSLON DE SR	2039202
Ceiling installation	3 Light | 2 HVAC	Special colour in accordance with customer information	PlanoSpot 360 PSLON DE SF	2039203

Accessories	Item number
Back box 75A WH	9070949
Back box 75A BK	9070950
Back box 75A SR	9070951
Management remote control SendoPro 868-A	9070675
Installation remote control theSenda P	9070910
User remote control theSenda S	9070911

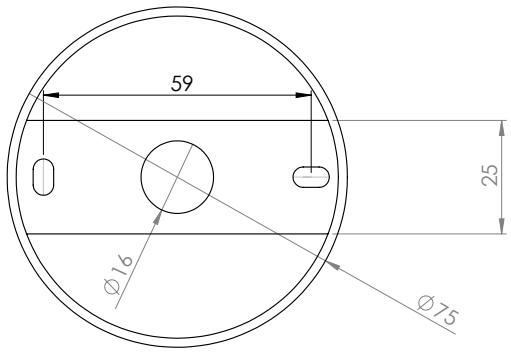
1.3.2 Dimensions

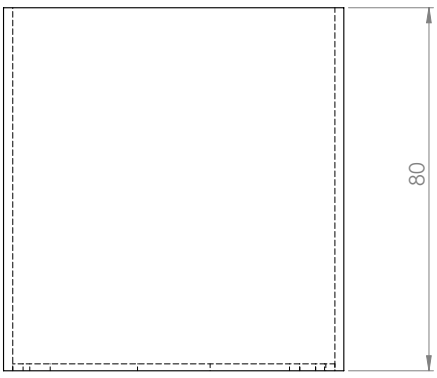
PlanoSpot 360 PSLON





Back box 75 A



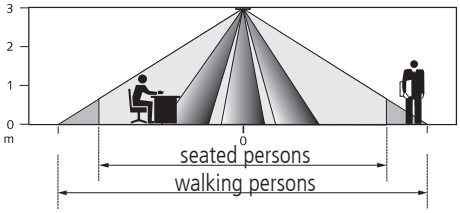


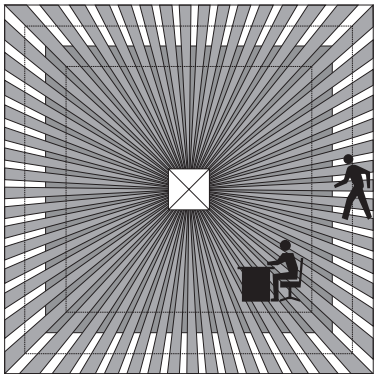
1.3.3 Detection area PlanoSpot 360 PSLON

The square detection area of the presence detector guarantees accurate and simple planning. Two detection zones are available; the user can switch between them by means of a parameter or the management remote control.
Note that seated and moving persons are detected in differently-sized areas.
The recommended installation height is 2 m – 3 m. As installation height increases, the sensitivity of the presence detector decreases. At an installation height of 3 m or higher, walking motions are necessary and the detection areas of several detectors should overlap around the perimeter. The detection range is reduced as the temperature increases.
This sensitivity can be adjusted in 5 levels via remote control or plug-in.

Seated persons:
The presence detector reacts very sensitively to the slightest movements. The information refers to movements at table height (approx. 0.80 m).

Walking persons:
From an installation height of > 3 m, the size and distance between the active and passive zones increase.
More pronounced movements are required for clear detection





Standard detection zone

Installation height	seated persons		walking persons	
2.0 m	9 m²	3.0 m x 3.0 m	20 m²	4.5 m x 4.5 m ± 0.5 m
2.5 m	16 m²	4.0 m x 4.0 m	36 m²	6.0m x 6.0m ± 0.5m
3.0 m	20 m²	4.5 m x 4.5 m	49 m²	7.0 m x7.0 m ± 1.0 m
3.5 m		-	64 m²	8.0 m x8.0 m ± 1.0 m

Reduced detection zone

Installation height	seated persons		walking persons	
2.0 m	4.0 m²	2.0 m x 2.0 m	4.4 m²	2.1 m x 2.1 m ± 0.5 m
2.5 m	6.3 m²	2.5 m x 2.5 m	9.0 m²	3.0 m x 3.0 m ± 0.5 m
3.0 m	9.0 m²	3.0 m x 3.0 m	14.4 m²	3.8 m x 3.8 m ± 1.0 m
3.5 m		-	22.1 m²	4.7 m x 4.7 m ± 1.0 m

By aligning the optics manually, the detection area can be shifted towards the window or the interior by 0.5 to 1 m, depending on the installation height.

2. Description of objects PlanoSpot 360 PSLON

The LON interface files can be found on the Theben HTS website: http://www.theben-hts.ch or http://www.theben.de

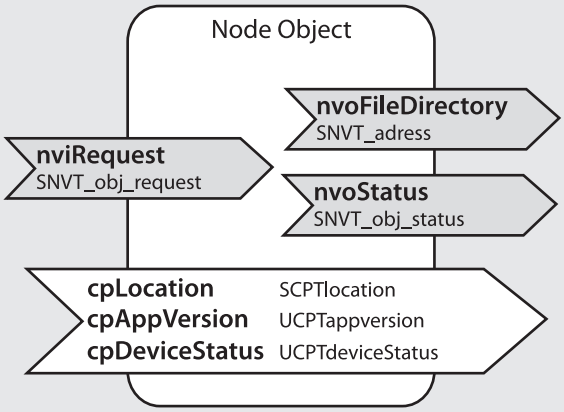
2.1 Objects

The PlanoSpot 360 PSLON presence detector uses standardised LONMARK function profiles exclusively.

Name	Profile	Description
Node object	0	The device-relevant, higher-order information, inputs and outputs are shown here. – Neuron ID – Location – Detector status – Device-relevant faults if applicable – Error-handling
Light sensor (3x)	1010	The light sensor makes available the current brightness value in lux. 1 per light measurement available.
Occupancy sensor	1060	The presence sensor makes available information about whether the detection area is occupied.
Occupancy controller (3x)	3071	The presence controller supports the presence-dependent control of lighting channels or additional controllers.
Constant light controller (2x)	3050	The constant light controller controls the light according to the desired brightness and presence. Control can be switched off. The constant light controller is then in switching mode dependent on presence and brightness (traditional presence detector).
Remote control	3200	This object passes on the IR commands received from the remote control to the configured output variables for the control of blinds, light, etc.
Scene panel	3250	The scene panel sends out the configured scenes for each of the two scene buttons on the user remote control.
Scene controller	3251	The scene controller processes the scenes received via IR commands or input variables, and generates control commands for the light or blinds control.

2.2 Node object

The node object only supports the commands prescribed by LONMARK.



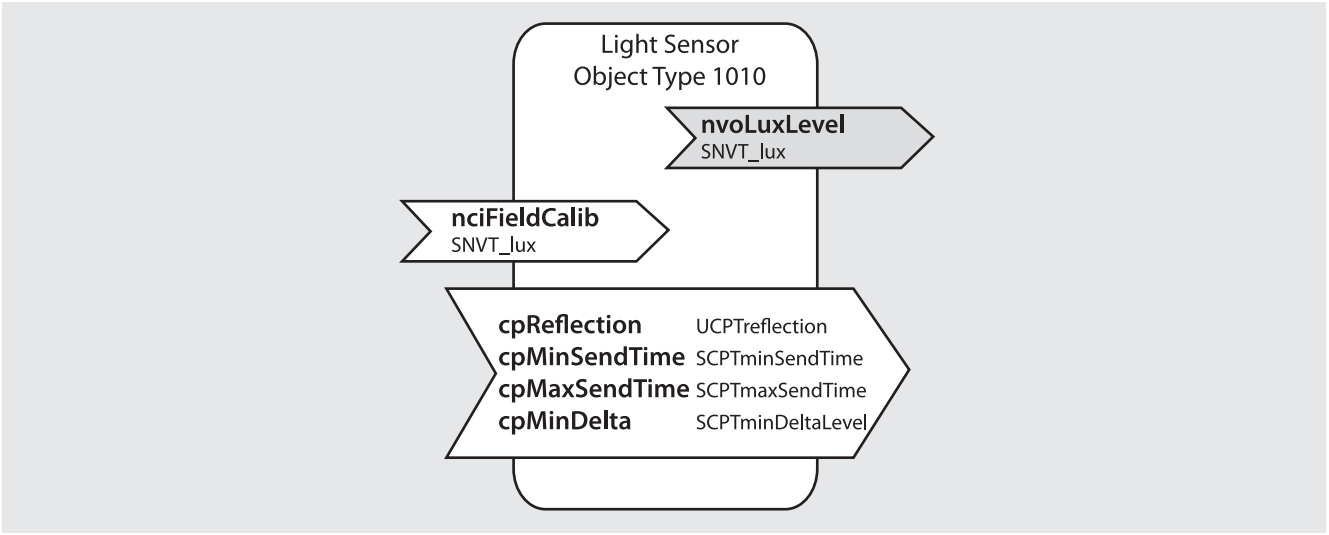
- Processing and output of the detector's status information.
- Processing and output of possible faults relevant to the device.

2.2.1 Configuration parameters

	Variable	Data type	Value range	Default	Description
Input variables (nvi)	nviRequest	SNVT_obj_request			Variable to control and check the device state or the function profile. Feedback takes place via nvoStatus. The following functions are supported: • RQ_NORMAL enable object and remove override • RQ_UPDATE_STATUS just report object status • RQ_REPORT_MASK report status bit mask
Output variables (nvo)	nvoStatus	SNVT_obj_status			Feedback on queries via nviRequest. The following status bits are supported: • invalid_id • invalid_request • report_mask
	nvoFileDirectory	SNVT_address			Start address of the configuration parameter files
Configuration variables (nci)	--				
Configuration parameters (cp)	cpLocation	SCPTlocation			Name of the site, can be assigned by the integrator during programming.
	cpAppVersion	UCPTappVersion			HI-Byte = Hardware Version; LOW-Byte = Build Version; e.g. 1.02
	cpDeviceStatus	UCPTdeviceStatus			3 error bits can be shown: Bit 0: invalid configuration variables (nci) in the EEPROM Bit 1: invalid configuration parameters (cp) Bit 2: Hardware malfunction Error bits 0 and 1 can be cleared by parameter download (resync with LNS database)

2.3 Light sensor objects

There are 3 function profiles for the light sensor available, corresponding to the three light measurements of the detector. They correspond to LONMARK Profile 1010. The light sensor sends the current brightness value in lux at the installation location of the detector to the Lonworks network, either cyclically or when there are sufficiently large changes. The measured brightness value can be adapted to the current situation in the room with a correction value (room correction factor).



2.3.1 Description

The currently measured brightness is output via the network variable nvoLuxLevel. The measurement must be calibrated, so that nvoLuxLevel corresponds to the value measured with a lux meter below the detector.

The configuration variable nciFieldCalib is used to calibrate the light measurement with a lux meter. The presence detector uses this to calculate the reflection factor nciReflection valid for this room. This factor can also be input directly.

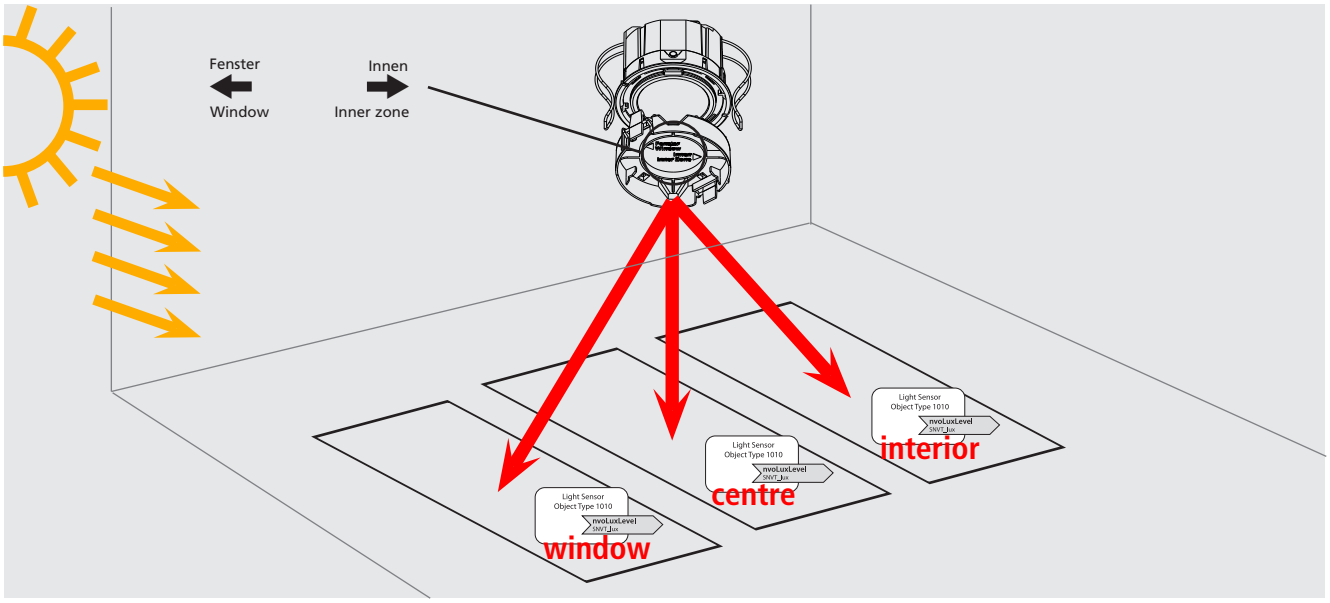
The configuration variable nciMinDelta defines how large the daylight change must be for the network variable nvoLuxLevel to be updated prior to the expiry of cpMaxSendTime. Updating will not take place in shorter intervals than specified in cpMinSendTime.

2.3.2 Positioning of the detector and light measurement

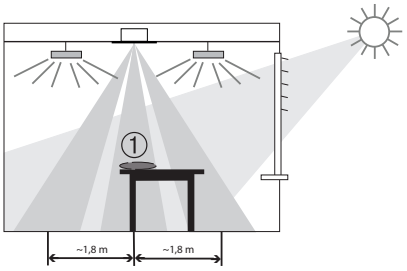
The PlanoSpot 360 PSLON has 3 directed light measurements. The central light measurement detects the brightness directly below the detector, while the two other light measurements detect the brightness close to the window or in the interior. The precondition for this is that the PlanoSpot 360 PSLON is correctly positioned during installation. For this purpose, a sticky label is affixed to the presence detector and accordingly labelled on the installation protection. This allows the correct installation of the presence detector. The use of the following light measurements is recommended:

- Switching or constant light control 1-channel: Use of the centre light measurement
- Switching or constant light regulation 2-channel: Use of both light measurements window or interior

For special room configurations, light measurements can be selected to optimise the result.



2.3.3 Information about calibration



The presence detector measures the brightness on the ceiling. The brightness measured by the presence detector is dependent on the reflection characteristics of the room, in particular the materials and furniture, but also the time of day and weather conditions. The aim of the room correction factor or reflection factor is to adapt the measurement of the presence detector to the conditions of the relevant area, e.g. the work surface.

$$\text{Room correction factor (reflection factor)} = \frac{\text{Brightness value at the ceiling}}{\text{Brightness value on the work surface}}$$

In every case it is recommended to perform the calibration with a mix of approximately 50% each of artificial light and daylight. When the detector is powering up, calibration may only be performed after the start-up phase has ended. During the start-up phase the LED of the detector flashes in one second intervals.

2.3.3.1 Calibration with the plug-in or parameter browser

- The lux meter ① is placed on the work surface below the sensor and the measured lux value is entered in the plug-in. Then press the "Calibrate" button. Alternatively the measured lux value is entered in the configuration variable nciFieldCalib and confirmed with the Enter button.
- The room correction factor cpReflection is automatically calculated from this. Values between 0.05 and 2.0 are permitted. Calculated or entered values outside the permitted range will automatically be set to the appropriate limit value.
- The calculated reflection factor cpReflection will be applied directly. With correct calibration the output variable nvoLuxLevel corresponds to the value measured on the work surface. The reaction of the constant light controller is delayed, caused by the control parameter, both with daylight-dependent switching and constant light control.

2.3.3.2 Calibration via the configuration variable nciFieldCalib or via the management remote control

- The lux meter ① is placed on the work surface below the sensor, and the measured lux value is sent as data type SNVT_lux to the configuration variable nciFieldCalib or via SendoPro management remote control to the detector. In this way the calibration can be performed through a visualisation or a control system.
- The room correction factor cpReflection is automatically calculated from this. Values between 0.05 and 2.0 are permitted. Calculated or entered values outside the permitted range will automatically be set to the appropriate limit value.
- The calculated reflection factor cpReflection will be applied directly. With correct calibration the output variable nvoLuxLevel corresponds to the value measured on the work surface. The reaction of the constant light controller is delayed, caused by the control parameter, both with daylight-dependent switching and constant light control.

2.3.3.3 Direct input of the room correction factor (reflection factor)

The room correction factor can also be input directly. For this purpose the corresponding value between 0.05 and 2.0 will be written to the variable cpReflection. When the presence detector is delivered, the room correction factor is preset to the value of 0.3.

2.3.4 Configuration parameters

	Variable	Data type	Value range	Default	Description
Input variables (nvi)	-				
Output variables (nvo)	nvoLuxLevel	SNVT_lux	0 … 65,535 lux		Measured brightness in lux will be sent when there are changes larger than SCPTminSendDelta or cyclically after SCPTmaxSendTime
Configuration variables (nci)	nciFieldCalib	SNVT_lux	0 … 65,535 lux		Surrounding brightness in lux for self-calibration
Configuration parameters (cp)	cpReflection	UCPTreflection	0.05 ... 2.0	0.3	Room correction factor. The reflection factor will be calculated automatically from cpFieldCalib when it has an entry, but can also be entered manually.
	cpMinSendTime	SCPTminSendTime	0 … 6553.5 s	1 s	Minimum transmission pause for nvoLuxLevel. 0 = no transmission pause
	cpMaxSendTime	SCPTmaxSendTime	0 … 6553.5 s	60 s	Heartbeat for nvoLuxLevel. 0 = no heartbeat
	cpMinSendDelta	SCPTminDeltaLevel	0.0 .. 100%	5 %	Minimum value change that leads to resending

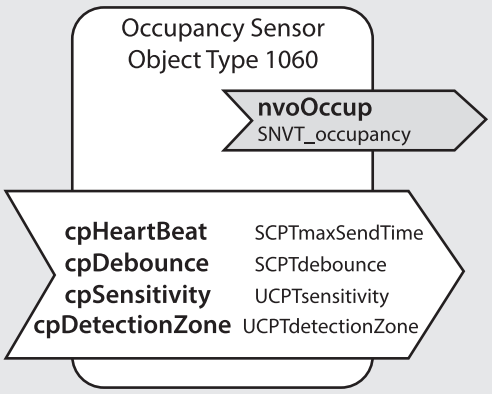
Note: Calculated or entered values of the room correction factor cpReflection outside the permitted range will automatically be set to the permitted limits if a binding exists between light sensor and constant light controller. If there is no binding between both objects, the room correction factor is configurable within the variable limits (0.05 ... 2.0), also the brightness setpoint value (10 - 3000 lux).

If light sensor and constant light controller are subsequently connected with one another, a connection check will be performed within 30 seconds. In the process, the brightness setpoint value nciLuxSetPoint will be moved to the physically possible limits, which depend on the set room correction factor cpReflection.

If the light sensor and constant light controller are already connected during input, the testing and any shifting are performed as soon as input takes place.

2.4 Occupancy Sensor Object

The occupancy sensor object corresponds to the LONMARK profile 1060. If the presence detector detects a movement, the output of the occupancy sensor will be set to the state OCCUPIED. This presence signal is used, for example, by an occupancy controller for presence-dependent control. The behaviour is defined with the configuration parameters.



2.4.1 Description

The network variable nvoOccup will be set to the status OCCUPIED as soon as the detector has registered a movement. After the movement has ended, the status changes back to UNOCCUPIED after the delay time nciDebounce.

The configuration variable nciDebounce defines the time delay for the reset of the output variable after movement has been recognised. It is restarted with every new motion. The internal delay time of 5 seconds is added to the set delay time.

The configuration variable nciHeartbeat defines the repeat frequency of the network variable nvoOccup. It is sent without changes. The setting of 0 seconds deactivates the heartbeat.

5 levels of detection sensitivity can be set using the configuration variable cpSensitivity. The default is average sensitivity (level 3). In practice this is optimal for all application cases and should only be adjusted in urgent cases.

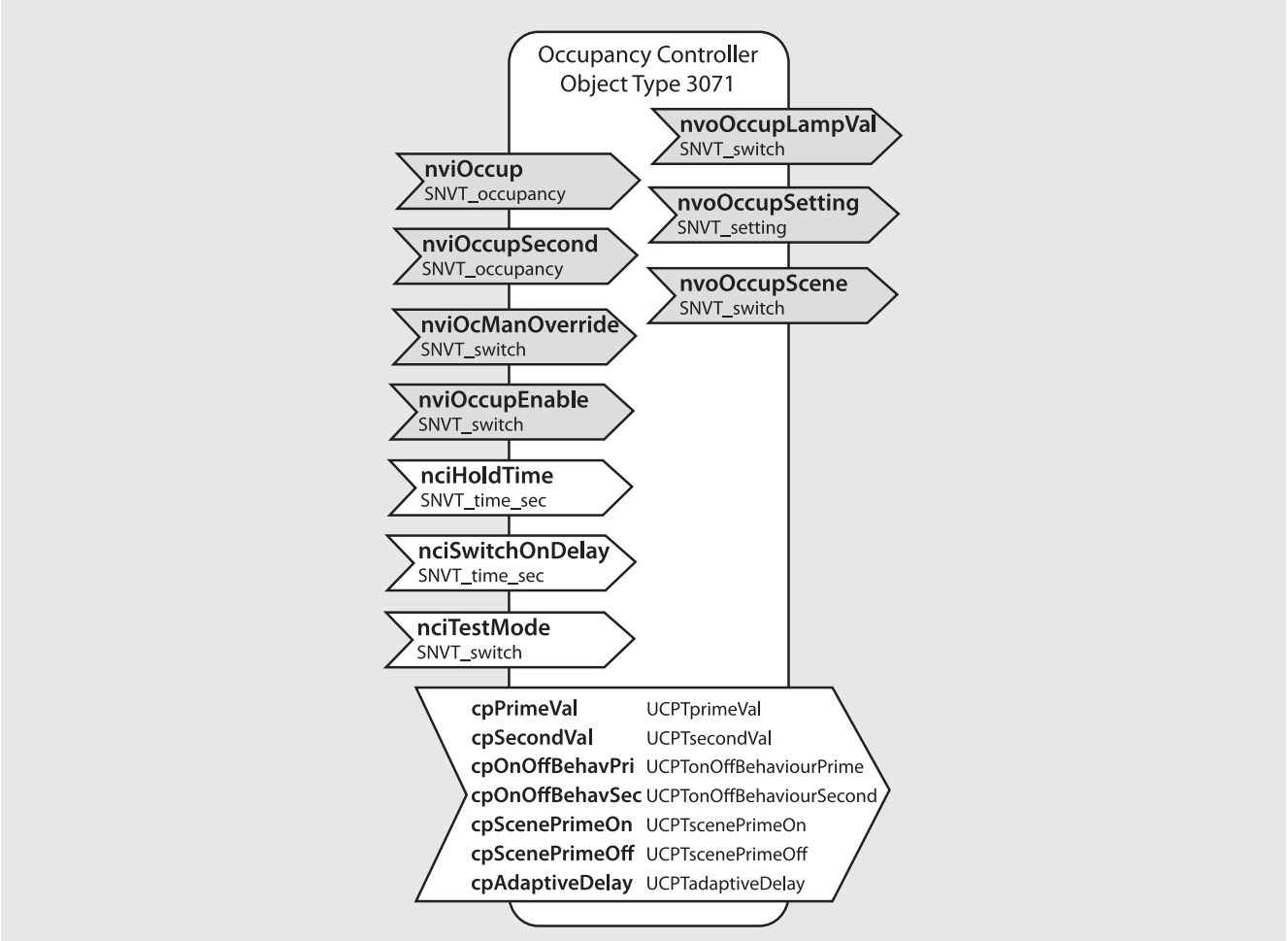
The presence detector has two differently sized detection zones. These can be selected with the configuration variable cpDetectionZone. Alternatively, detection zones and detection sensitivity can be selected conveniently with the SendoPro management remote control.

2.4.2 Configuration parameters

	Variable	Data type	Value range	Default	Description
Input variables (nvi)	--				
Output variables (nvo)	nvoOccup	SNVT_occupancy			0: OC_OCCUPIED: Room occupied 1: OC_UNOCCUPIED: Room unoccupied
Configuration variables (nci)	--				
Configuration parameters (cp)	cpHeartbeat	SCPTmaxSendTime	0.0 to 6553.4 s	120 s	Heartbeat for the output nvoOccup Setting 0 seconds deactivates the heartbeat.
	cpDebounce	SCPTdebounce	0.0 to 6553.4 s	0 s	Time delay for the reset of nvoOccup after the motion ends, plus an internal delay of 5 s.
	cpSensitivity	UCPTsensitivity	1 ... 5	3	Detection sensitivity for the presence detection: 1: Low sensitivity 2: Reduced sensitivity 3: Average sensitivity, factory setting 4: Increased sensitivity 5: High sensitivity
	cpDetectionZone	UCPTdetectionZone	Standard, reduced	Standard	Selection of detection area (at installation height 3.5 m) Standard: 8 x 8 m reduced: 4.7 x 4.7 m

2.5 Occupancy controller objects

There are 3 function profiles of the occupancy controller type available. These correspond to LONMARK Profile 3071. The three outputs can be used universally. For example, one can be used to control both light outputs, a second controls the wall panel lighting group depending on the brightness level, while a third is used for presence-dependent HVAC control. The presence test mode is also part of the occupancy controller.



2.5.1 Description

The network variable nvoSetting is used for presence-dependent control e.g. of the constant light controller. During presence (input nviOccup to OC_OCCUPIED) it switches to the status SET_ON. The time delay nciHoldTime is restarted with every motion. After the time delay nciHoldTime has expired, the nvoSetting changes to SET_OFF.

The network variable nvoOccupLampValue is used for presence-dependent switching of a lighting group (without influence of brightness). During presence (input nviOccup to OC_OCCUPIED) it switches to the value defined with cpPrimeVal. The time delay nciHoldTime is restarted with every motion. After the time delay nciHoldTime has expired, nvoOccupLampValue changes to 0%/0.

Manual override is possible, for example using a button, via the network variable nviOcManOverride. When an x%/1 is received on nviOcManOverride, the controller will be activated and the time delay restarted. nvoOccupSetting will be set to SET_ON, the value x%/1 received on nciOcManOverride will be written to nvoOccupLampValue. When a 0%/0 is received on nviOcManOverride, the controller will be switched off for the duration of the presence. nvoOccupLampValue will be set to 0%/0.

Every occupancy controller can also be permanently overridden or blocked. When an x%/0 is received on nviOccupEnable, nvoOccupLampValue, nvoOccupSetting and nvoOccupScene will be deactivated. The internal logic continues to operate during the block, but no telegrams about the network variables mentioned will be sent. After unblocking with x%/1, the current state will be sent. After every reset, nviOccupEnable is set to 100%/1.

Taking adjacent presence into account enables the formation of light islands. When an OC_OCCUPIED is received on nviOccupSecond when there is no own presence (OC_UNOCCUPIED at nviOccup), nvoOccupLampValue will be set to x%/1 in accordance with cpSecondVal. In addition, the value from cpSecondVal will be transferred to nvoOccupSetting using SET_STATE. When own presences exists (nviOccup at OC_OCCUPIED), nvoOccupLampValue will be set to x%/1 in accordance with cpPrimeVal. cpSecondVal will thus be overridden. When an x%/1 is received on nviOcManOverride, the received value is set to the output nvoOccupLampValue.

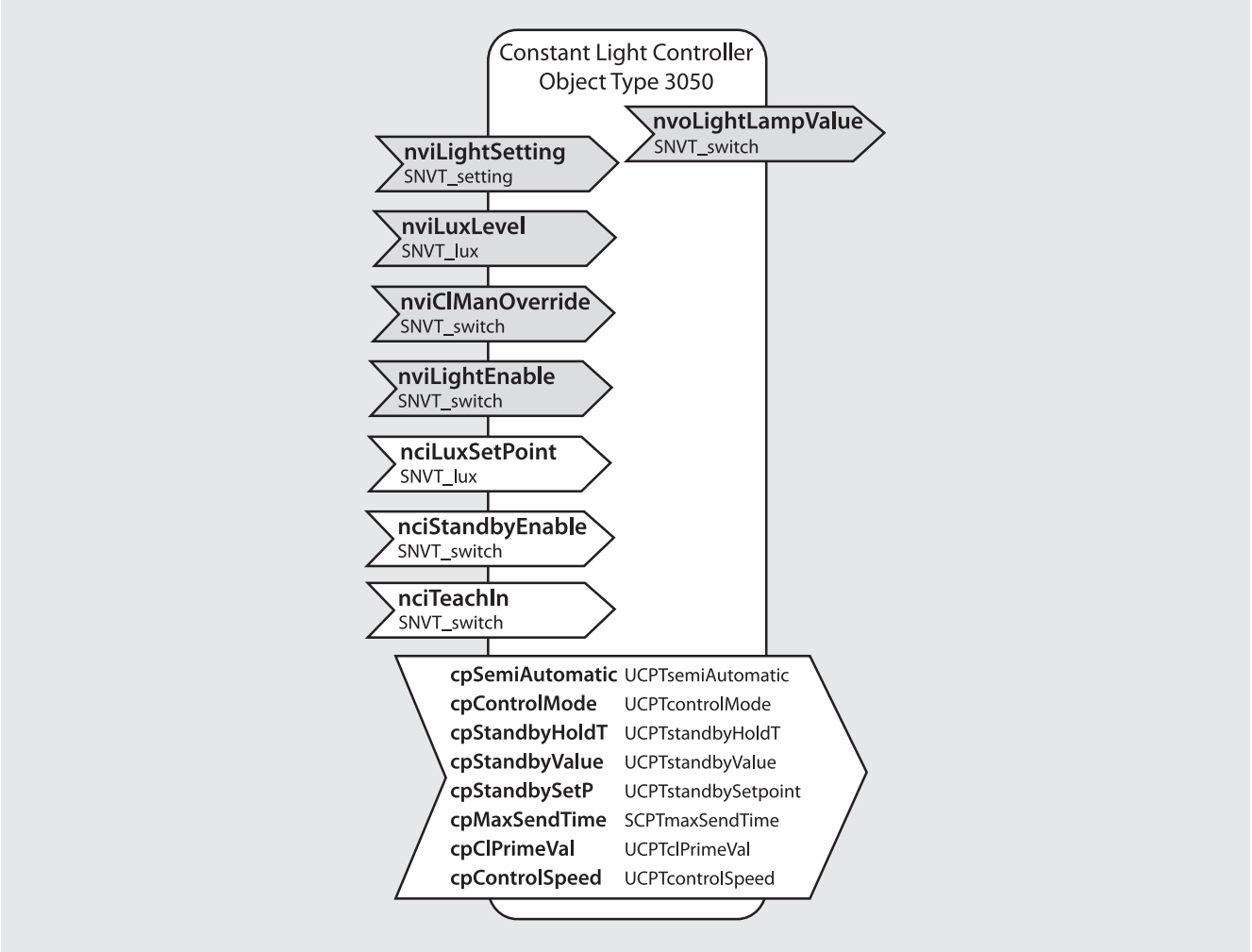
Depending on the status, during presence or absence, in each case a defined scene number can be set via the output nvoOccupScene. The scene to be set is selected with the configuration parameters cpScenePrimeOn or cpScenePrimeOff.

2.5.2 Configuration parameters

	Variable	Data type	Value range	Default	Description
Input variables (nvi)	nviOccup	SNVT_occupancy			Input variable from occupancy sensor
	nviOccupSecond	SNVT_occupancy			Occupancy signal from detectors from the vicinity, for the formation of "light islands". Overridden when own presence exists
	nviOcManOverride	SNVT_Switch			Input variable for manual override. When 0%/0 is received, the occupancy controller switches off the lighting for the duration of the presence. When an x%/1 is received, the time delay nciHoldTime will be started and the value received written to nvoOccupLampVal. (overrides cpPrimeVal) When an UNOCCUPIED is received on nviOccup, the controller switches off the light after the time delay nciHoldTime expires and goes back into fully automatic mode. Switched on immediately when switch-on delay configured.
	nviOccupEnable	SNVT_Switch			Input variable to block the occupancy controller. When x%/0 is received, nvoOccLampValue, nvoOccupSetting and nvoOccupScene will be deactivated. After every reset, nviOccupEnable is set to 100%/1.
Output variables (nvo)	nvoOccupLampVal	SNVT_Switch			Output variable for control of light or HLK without brightness influence. Status x%/1 according to cpPrimeVal when present. Status 0%/0 when absent after expiry of nciHoldTime or switch-off with 0%/0 to nviManOverride.
	nvoOccupSetting	SNVT_setting			Operation mode for an additional controller (e.g. constant light controller). SET_ON when present. SET_OFF when absent after the expiry of nciHoldTime. SET_STATE transfers a status
	nvoOccupScene	SNVT_scene			Output of the defined scene numbers 0 ... 255 (RECALL) in accordance with: cpScenePrimeOn when present cpScenePrimeOff when absent after the expiry of nciHoldTime
Configuration variables (nci)	nciHoldTime	SNVT_time_sec	0.0 ... 6553 s	600 s	The time delay for the outputs nvoOccupLampVal and nvoOccupSetting. nciHoldTime is restarted when motion occurs (OCCUPIED to nviOccup). If the adjacent zones are still occupied, there will be no switch off, but a switch to nciSecondVal.
	nciSwitchOnDelay	SNVT_time_sec	0.0 ... 6553 s	0 s	Switch-on delay for the output nvoOccupLampVal.
	nciTestMode	SNVT_Switch			Activation / Deactivation of test mode for motion detection: OCCUPIED: nvoOccLampVal = 100%/1 UNOCCUPIED: nvoOccLampVal = 0%/0
Configuration parameters (cp)	cpPrimeVal	UCPTprimeVal	0 ... 100 %	100 %	Output value of the lamp when present via nviOccup
	cpSecondVal	UCPTsecondVal	0 ... 100 %	0 %	Output value of the lamp during presence of adjacent zones ("light island") via nviOccupSecond.
	cpOnOffBehavPri	UCPTonOffBehaviourPrime		On/Off	Describes what telegram is sent (via nviOccup) when presence begins and ends. ON_OFF_CMD: On when present, Off when absent ONLY_OFF_CMD: Only off when absent ONLY_ON_CMD: Only ON when present
	cpOnOffBehavSec	UCPTonOffBehaviourSecond		On/Off	Describes what telegram is sent (via nviOccupSecond) when presence begins and ends. For selection see cpOnOffBehavPri
	cpScenePrimeOn	UCPTscene-PrimeOn		0	Scene when room occupied Scene number 0 … 255
	cpScenePrimeOff	UCPTscene-PrimeOff		0	Scene when room unoccupied Scene number 0 … 255
	cpAdaptiveDelay	LON_State_t	ACTIVE, INACTIVE	ACTIVE	Activates or deactivates the adaptive time delay and short-term presence: ACTIVE: recommended when the Occupancy Controller is connected to a Constant Light Controller. The time delay nciHoldTime adjusts automatically to the user's behaviour and can increase independently to 30 minutes or reduce back to the set minimum time. With settings ≤ 2 min or ≥ 30 min it remains unchanged at the set value. INACTIVE: recommended, when the Occupancy Controller controls HVAC applications. The set time delay remains fixed.

2.6 Constant Light Controller Objects

There are 2 function profiles of the constant light controller type available. These correspond to LONMARK Profile 3071. They optionally permit constant light control or daylight-dependent switching. By selecting between three directional light measurements (light sensor objects), two lighting groups can be switched or regulated independently of one another.



2.6.1 Functionality

Each of the two constant light controllers optionally supports the daylight-dependent switching function or constant light control. Both controllers can be used independently of one another. The network variables nvoLightLampValue are used to control a lighting group, optionally in constant light control mode (cpControlMode = CONSTANT LIGHT CONTROL) or presence and daylight-dependent switching (cpControlMode = SWITCHING).

2.6.1.1 Presence and daylight-dependent switching

Fully automatic device function

As a fully automatic device (cpSemiAutomatic = FULLY AUTOMATIC), the network variable nvoLightLampValue switches when someone is present (nviLightSetting to SET_ON) **and** in case of insufficient brightness (nviLuxLevel < nciLuxSetPoint, wait delay) to the status x%/1 defined with cpClPrimeVal. When no one is present (nviLightSetting at SET_OFF) **or** sufficient brightness (nviLuxLevel > nciLuxSetPoint+hysteresis, wait delay) nvoLightLampValue switches to 0%/0, if no standby operation is activated.

Semi-automatic device function

As a semi-automatic device (cpSemiAutomatic = SEMI AUTOMATIC), the detector never switches independently, i.e. no telegram is triggered when no one is present and there is insufficient brightness. The lighting must always be switched manually via nviClManOverride with x%/-1 (see following sections). When no one is present (nviLightSetting at SET_OFF) **or** sufficient brightness (nviLuxLevel > nciLuxSetPoint+hysteresis, wait delay) nvoLightLampValue switches to 0%/0, if no standby operation is activated.

Setting of the brightness threshold

The brightness threshold nciLuxSetPoint can be set by means of the commissioning tool, the plug-in, with the SendoPro management remote control, or via the network variable nciLuxSetPoint. If a value is set that is invalid in conjunction with the room correction factor (reflection factor), the next closest valid value will be set.

Note: If a binding exists, or after the creation of the binding between light sensor and constant light controller, the brightness threshold nciLuxSetPoint will be moved to the physically possible limits, which depend on the set room correction factor cpReflection. See Section 2.3 Information about calibration.

Teach-in of the brightness threshold

The brightness threshold can be taught via teach-in. This is done via the plug-in, via the SendoPro management remote control, or via the network variable nciTeachIn. In the process, the detector takes the currently measured brightness and saves it as a new brightness threshold. In doing so nciLuxSetPoint is overwritten.

Standby operation as orientation light

If nciStandbyEnable is set to x%/1, the lighting will not be switched off when no one is present (nviSetting at SET_OFF) and there is insufficient brightness, but the lighting remains at the standby value cpStandbyValue during the set standby time cpStandbyHoldTime, and thus serves as an orientation light.

With the "ON" setting, the lighting remains permanently at the standby value cpStandbyValue when no one is present. The lighting switches off if the brightness level in the room exceeds the standby setpoint value cpStandBySetPoint. The lighting returns to the standby value independently when no one is present if the room brightness falls below the set brightness level (also as a semi-automatic device).

Manual override

Manual override is possible, for example using a button, via the network variables nviSetting or nviClManOverride. Depending on which of the two network variables was used, different behaviour appears after the manual override:

- When an x%/1 is received on nviClManOverride, the received value is copied to nvoLightLampValue.
  When a 0%/0 is received on nviClManOverride, the controller will be switched off and nvoLightLampValue set to 0%/0.
  Dimming occurs through cyclically transmitted x±Δx%/1. The lighting will be dimmed to be brighter or darker.
  The lighting will remain at the set value for the duration of the presence (behaviour after manual override: "school")
- Upon receiving a SET_UP or SET_DOWN on nviSetting, the lighting will be dimmed brighter or darker.
  During the presence, the brightness threshold will be temporarily set to the current actual value. After the time delay expires, the originally configured brightness threshold applies again. (Behaviour after manual override: "office")
  No SET_ON, SET_OFF, or SET_STATE may be sent from the button. These commands are reserved for internal detector use.

If the lighting is switched off (nvoLightLampValue at 0%/0), the lighting will be switched on again with an x%/-1 to nviClManOverride and remains active for at least 30 mins, as long as there are people present. It then switches off when the brightness is adequate. If the light is already switched on, the manual override will be cancelled with an x%/-1 to nviClManOverride; the detector is in normal operation.

Blocking and unblocking

Every constant light controller can also be permanently overridden or blocked. Upon reception of an x%/0 on nviLightEnable, nvoLightLampValue will be deactivated. The internal logic continues to operate during the block, but no telegrams about the network variables mentioned will be sent. After unblocking with x%/1, the current state will be sent. After every reset, nviLightEnable is set to 100%/1.

2.6.1.2 Constant light control

Fully automatic device function

As a fully automatic device (cpSemiAutomatic = FULLY AUTOMATIC), the constant light control will be started in case of presence (nviLightSetting auf SET_ON) **and** insufficient brightness (nviLuxLevel < nciLuxSetPoint, wait for delay). The network variable nvoLightLampValue switches to the status x%/1 defined with cpClPrimeVal. Based on this switch-on value it will be controlled to the setpoint value. In case of absence (nviLightSetting at SET_OFF) **or** sufficient brightness (nviLuxLevel > nciLuxSetPoint, wait delay after dimming down from nvoLightLampValue to < 10%), nvoLightLampValue switches to 0%/0, if no standby operation is activated.

Semi-automatic device function

As a semi-automatic device (cpSemiAutomatic = SEMI AUTOMATIC), no telegram is triggered when no one is present and there is insufficient brightness. The lighting must always be switched on manually with an x%/-1 via nviClManOverride. Constant light control is started. In case of absence (nviLightSetting at SET_OFF) **or** sufficient brightness (nviLuxLevel > nciLuxSetPoint, wait delay after dimming down from nvoLightLampValue to < 10%), nvoLightLampValue switches to 0%/0, if no standby operation is activated.

Setting of the brightness setpoint value

The brightness setpoint value nciLuxSetPoint can be set by means of the commissioning tool, the plug-in, with the SendoPro management remote control, or via the network variable nciLuxSetPoint. If a value is set that is invalid in conjunction with the room correction factor (reflection factor), the next closest valid value will be set.

Note: If a binding exists, or after the creation of the binding between light sensor and constant light controller, the brightness setpoint value nciLuxSetPoint will be moved to the physically possible limits, which depend on the set room correction factor cpReflection. See Section 2.3 Information about calibration.

Teach-in of the brightness setpoint value

The brightness setpoint value can be taught via teach-in. This is done via the plug-in, via the SendoPro management remote control, or via the network variable nciTeachIn. In the process the detector takes the currently measured brightness and saves it as a new brightness setpoint value. In doing so nciLuxSetPoint is overwritten

Standby operation as orientation light

If nciStandbyEnable is set to x%/1, the lighting will not be switched off when no one is present (nviLightSetting at SET_OFF), but the lighting remains controlled during the set standby time cpStandbyHoldTime at the standby setpoint value cpStandBySetPoint, and thus serves as an orientation light. The standby value cpStandbyValue serves as the upper limit of the output value.

With the setting "ON", the lighting will be permanently controlled to the Standby set point value cpStandBySetPoint (limited by the standby value cpStandbyValue) when no one is present. If the room brightness increases above the standby setpoint value, the lighting switches off (wait delay after dimming down from nvoLightLampValue to <10%). The lighting returns to the standby value independently when no one is present if the room brightness falls below the set brightness level (also as a semi-automatic device).

Manual override

Manual override is possible, for example using a button, via the network variables nviLightSetting or nviCIManOverride. Depending on which of the two network variables was used, different behaviour appears after the manual override:

- When an x%/1 is received on nviCIManOverride, the received value is copied to nvoLightLampValue.
  When a 0%/0 is received on nviCIManOverride, the controller will be switched off and nvoLightLampValue set to 0%/0.
  Dimming occurs through cyclically transmitted x±Δx%/1. The lighting will be dimmed to be brighter or darker.
  Constant light control will be stopped for the duration of the presence (behaviour after manual override: "school")
- Upon receiving a SET_UP or SET_DOWN on nviLightSetting, the lighting will be dimmed brighter or darker.
  While the presence continues, the constant light control remains active at the new temporary setpoint value. After the time delay expires, the originally configured brightness setpoint value applies again. (Behaviour after manual override: "office")
  No SET_ON, SET_OFF, or SET_STATE may be sent from the button. These commands are reserved for internal detector use.

With an x%/-1 on nviCIManOverride, the manual override will be cancelled; the detector is in normal operation.

Blocking and unblocking

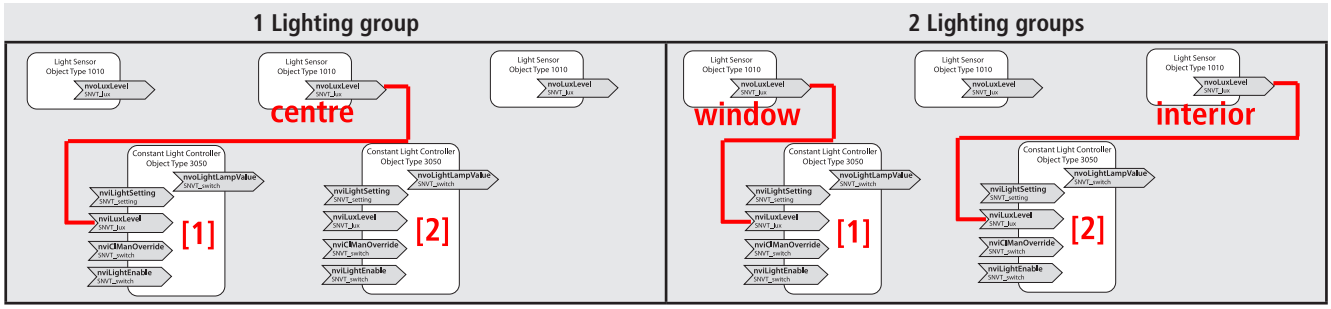
Every constant light controller can also be permanently overridden or blocked. Upon reception of an x%/0 on nviLightEnable, nvoLightLampValue will be deactivated. The internal logic continues to operate during the block, but no telegrams about the network variables mentioned will be sent. After unblocking with x%/1, the current state will be sent. After every reset, nviLightEnable is set to 100%/1.

2.6.1.3 Number of lighting groups

The use of the following light measurements is recommended:

- Switching or constant light control 1-channel: Use of the centre light measurement
- Switching or constant light regulation 2-channel: Use of both light measurements window or interior

For special room configurations, light measurements can be selected to optimise the result

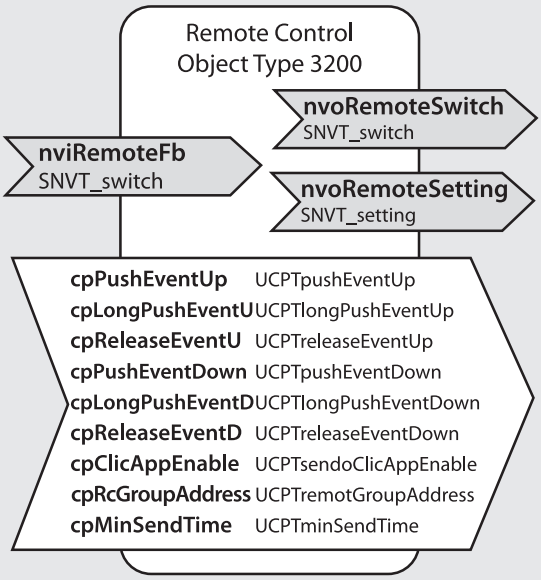


2.6.2 Configuration parameters

	Variable	Data type	Value range	Default	Description
Output variables (nvo)	nviLightSetting	SNVT_setting			Defines the controller operating mode. SET_ON starts the controller to Present (start of the control) SET_OFF switches the controller to Absent SET_STATE sets the output to the received value SET_UP, SET_DOWN, changes the setpoint value of the controller relatively SET_STOP deactivates nvoLightLampValue. The internal logic continues to operate during the block, but no telegrams about the network variables mentioned will be sent.
	nviLuxLevel	SNVT_lux			Current brightness value from the light sensor
	nviClManOverride	SNVT_Switch			Manual override for the lighting channel. The sent value will be transferred directly to the output and the controller will be stopped. A received value x%/-1 shows the following behaviour: - Switching (in the switched-off state): Lighting will be switched on for 30 mins, regardless of brightness. If the room has been left in the meantime, the lighting switches off. - Control, semi-automatic device: start of the control - Switching or control (in switched-on state): eliminating a manual override, return to automatic operation
	nviLightEnable	SVNT_switch			Blocking: In the state x%/0 of the network variable nviLightEnable, nvoLightLamp-Value is deactivated (internal logic continues to operate, but no telegrams are sent via the output objects). After every reset, nviLightEnable is set to 100%/1.
Output variables (nvo)	nvoLightLampValue	SNVT_Switch			Output of the controller, to be connected with actuator. ON/OFF and 0%-100%
Configuration variables (nci)	nciLuxSetPoint	SNVT_lux	10 - 3000 lux		Brightness setpoint value [lux] or brightness threshold [lux] If the light measurement is deactivated in the switching operating mode (cpCon-trolMode = Switching), (nciLuxSetPoint = 65,535, measurement off (only depen-dent on presence)) and there is a switch to the constant light control operating mode (cpControlMode = 0), nciLuxSetPoint will be set to 500 lux. The setting limits of nciLuxSetPoint are dependent on the room correction factor cpReflection. During input, there will be a check to see whether the value lies within valid limits.
	nciStandbyEnable	SNVT_Switch			Standby operation x%/0: Disable x%/1: Enable
	nciTeachIn	SNVT_Switch			An x%/1 to nciTeachIn overwrites nciLuxSetPoint with the currently measured brightness value.
Configuration parameters (cp)	cpSemiAutomatic	UCPTsemiAutomatic		FULLY AUTOMATC	Fully or semi-automatic device FULLY AUTOMATIC: Fully automatic device SEMI AUTOMATIC: Semi-automatic device
	cpControlMode	UCPTcontrolMode		SWITCHING	Operating mode CONSTANT LIGHT CONTROL: Constant light control SWITCHING: Switching mode
	cpStandbyHoldTime	UCPTstandbyHoldTime	0.0 – 6553 s	30 min	Standby time
	cpStandbyValue	UCPTstandbyValue	0 % to 25 %	10 %	Maximum dimming value in standby operation or switch-on dimming value
	cpStandbySetPoint	UCPTstandbySetPoint	10 - 200 lux	50 lux	Standby setpoint value (constant light control) or standby threshold (switching)
	cpMaxSendTime	SCPTmaxSendTime	0 s – 6553 s	1 min	Heartbeat (max. time between two updates for the light output)
	cpClPrimeVal	UCPTclPrimeVal	0 – 100 %	100 %	Output value of nvoLightLampValue (switching) or switch-on value of the control system (constant light control)
	cpControlSpeed	UCPTcontrolSpeed		Standard	Control speed: standard, average, fast

2.7 Remote control

2 function profiles for remote control are available, one for each bank of buttons on the user remote control. These correspond to LONMARK Profile 3200 (switch). Every function profile passes on the IR commands received from the corresponding bank of buttons from the user remote control to the configured output variables for the control of blinds, lights, etc. This allows either the lighting groups controlled by the presence detector itself to be manually switched and dimmed or external lighting groups or blinds to be operated.



2.7.1 Functionality

The user remote control allows to call up switching/dimming and blinds commands. With each press of a button, the configured event is sent via the network variables nvoRemoteSetting and nvoRemoteSwitch. To be able to define the start value for dimming, the network variable nviRemoteFb must also be connected with the feedback output object of the actuator.

Both banks of buttons on the user remote control are each encoded with an IR group address. The IR group address is to be set using the configuration variables cpRcGroupAddress.

The presence detector channels and the user remote control channels are linked via an IR group address. On SendoClic 3 and theSenda S, 2 IR group addresses are available for linking.

Operation of a lighting group requires that the IR group address of the presence detector channel matches that of the user remote control channel.

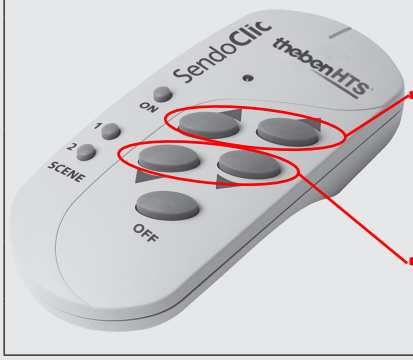
The selection of the IR group addresses enables the separation of neighbouring detectors controlled by the user remote control.

The following commands are available

Action	Telegram to nvoRemoteSetting	Telegram to nvoRemoteSwitch
Switch light on and off	SET_ON, SET_OFF (no internal use possible!)	100%/1, 0%/0
Dim light	SET_UP 2%, SET_DOWN 2%	(x+2)%/1, (x-2)%/1
Automatic operation constant light controller		x%/-1
Moving hanging up and down	SET_STATE UP, DOWN	
Jiggle slat	SET_UP x%, y°, SET_DOWN x%, y°	
No action	SET_NO_MESSAGE	NO_MSG

The following relation exists between the buttons of the user remote control and the configuration variables:

SendoClic



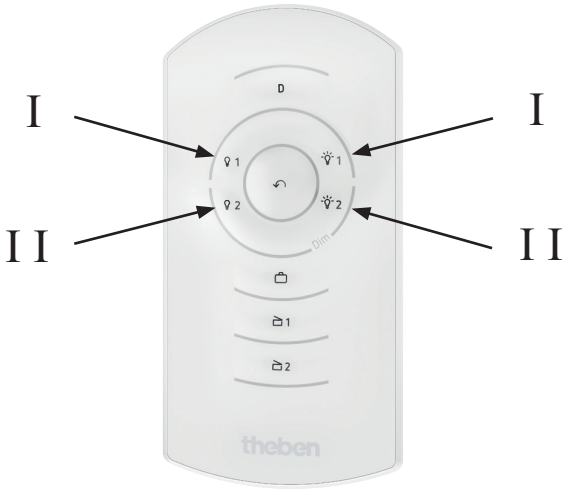
Designation	Network variable
Button ▲, Short button press event	cpPushEventUp
Button ▲, Long button press event	cpLongPushEventU
Button ▲, Event when released	cpReleaseEventU
Button ▼, Short button press event	cpPushEventDown
Button ▼, Long button press event	cpLongPushEventD
Button ▼, Event when released	cpReleaseEventD

On the SendoClic, the IR group addresses can be freely assigned to the channels. Further information can be found in the SendoClic operating instructions.

theSenda S

Designation	Network variable
Button 💡, Short button press event	cpPushEventUp
Button 💡, Long button press event	cpLongPushEventU
Button 💡, Event when released	cpReleaseEventU
Button, Short button press event	cpPushEventDown
Button, Long button press event	cpLongPushEventD
Button, Event when released	cpReleaseEventD

IR group addresses I and II are allocated permanently to 4 buttons on theSenda S user remote control, and cannot be changed. Further information can be found in the operating instructions of theSenda S.

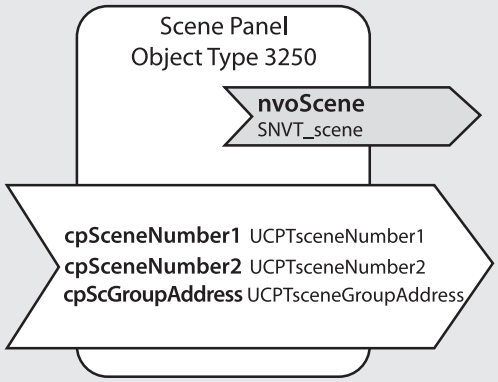


2.7.2 Configuration parameters

	Variable	Data type	Value range	Default	Description
Input variables (nvi)	nviRemoteFb	SNVT_Switch			Feedback input of switching/dimming actuators during dimming
Output variables (nvo)	nvoRemoteSwitch	SNVT_Switch			Output of the switching values for light control (switching/ dimming)
	nvoRemoteSetting	SNVT_setting			Output of the dimming values for light control Output of the operating commands for the blinds
Configuration parameters (cp)	cpPushEventUp	UCPTpushEventUp		Switch: ON/100% Setting: SET_NO_MSG, invalid, invalid	Event when up button is pressed briefly. **nvoRemoteSwitch:** ON : switch on OFF : switch off UP : dim up DOWN : dim down NO_MSG : no event INVALID: -1 **nvoRemoteSetting:** SET_ON : switch on SET_OFF: switch off SET_UP : move upwards SET_DOWN : move downwards SET_STOP : stop command SET_STATE: absolute command SET_NO_MSG : no event
	cpLongPushEventU	UCPTlongPushEventUp		UP, 2%	Event when up button is pressed for an extended period. For events see cpPushEventUp
	cpReleaseEventU	UCPTreleaseEventUp		NO_MSG	Event when up button is released (after extended button press). For events see cpPushEventUp
	cpPushEventDown	UCPTpushEventDown		OFF	Event when down button is pressed briefly. For events see cpPushEventUp
	cpLongPushEventD	UCPTlongPushEventDown		DOWN, 2%	Event when down button is pressed for an extended period. For events see cpPushEventUp
	cpReleaseEventD	UCPTreleaseEventDown		NO_MSG	Event when down button is released (after extended button press). For events see cpPushEventUp
	cpRcGroupAddress	UCPTremoteGroupAddress	I, II, III	I	IR group address of the corresponding bank of buttons of the user remote control. When using theSenda S, IR group address III cannot be used.
	cpMinSendTime	SCPTminSendTime	0 ... 6553 s	0.2 s	Time between dimming telegrams
	cpClicAppEnable	UCPTsendoClicAppEnable		Active	Release of the user remote control app

2.8 Scene panel (3250)

A Scene Panel function profile is available. This corresponds to LONMARK profile 3250. The scene panel broadcasts the scene numbers which are triggered via the two scene buttons on the user remote control.



2.8.1 Functionality

The Scene Panel can only be used in conjunction with the user remote control:

- When there is a short button press on scene button 1 of the user remote control, the scenes defined with cpSceneNumber1 will be sent to nvoScene.
- When there is a short button press on scene button 2 of the user remote control, the scenes defined with cpSceneNumber2 will be sent to nvoScene.

Both scene buttons on the user remote control are encoded with an IR group address. The IR group address is to be set using the configuration variables cpScGroupAddress.

The scene panel is linked with a scene controller, either the internal scene controller of the presence detector, or another scene controller, for example one that is available in an actuator.

2.8.2 Configuration parameters

	Variable	Data type	Value range	Default	Description
Output variables (nvo)	nvoScene	SNVT_scene			Scene output object RECALL when there is a short button press on the scene button of the user remote control LEARN when there is an extended (10 s) press on the scene button on the user remote control with appropriate scene number. Scene 0 is not used.
Configuration parameters (cp)	cpScene-Number1cpScene-Number1	Unsigned short	0 ... 255	1	Scene that should be sent when button 1 of the user remote control is pressed
	cpSceneNumber2	Unsigned short	0 ... 255	2	Scene that should be sent when button 2 of the user remote control is pressed
	cpScGroupAdress	UCPTsceneGroupAddress	I, II, III	I	Information of the IR group address of the user remote control

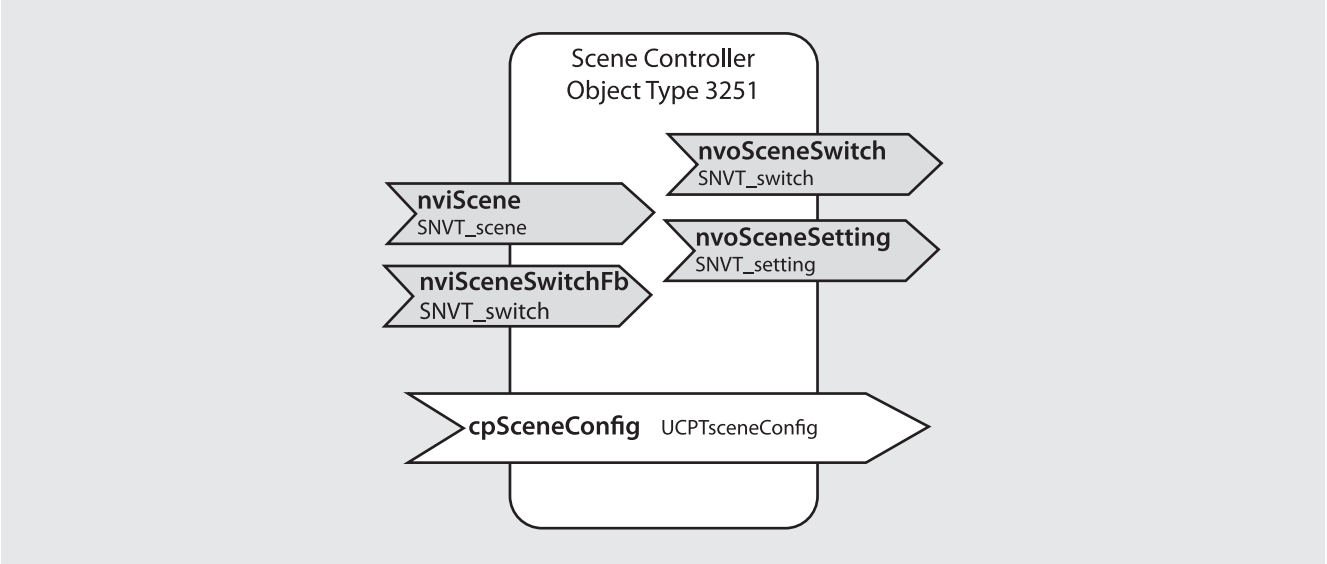
Note:

On the SendoClic, the IR group addresses can be freely assigned to the scene buttons. See also 8 «Integrating the user remote control» page 50.

On theSenda S, the scene buttons are permanently allocated to IR group addresses I and II.

2.9 Scene controller

A function profile for the scene controller is available. It corresponds to LONMARK profile 3251. It is either controlled from external scene buttons, or via the scene buttons of the user remote control.

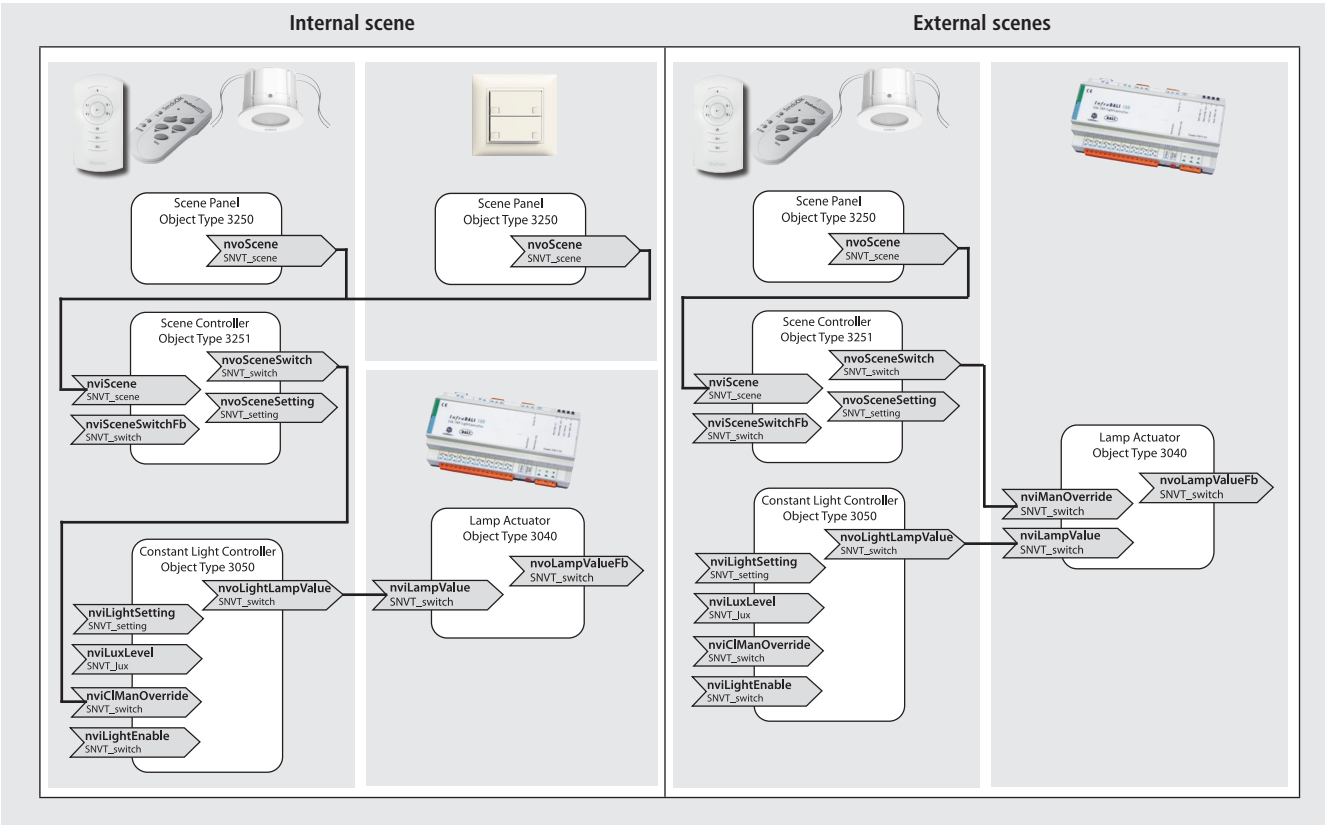


2.9.1 Functionality

Two different application cases can be covered:

- **Internal scenes**: These can be initiated via the remote control, or via external scene buttons. The network variable nvoSceneSwitch outputs is taken to the constant light controller.
- **External scenes**: Actuators without their own scene controllers can use the scene controller of the presence detector. The network variable nvoSceneSwitch outputs is taken to the actuator.

In both cases, the value configured with cpSceneConfig will be output to nvoSceneSwitch with an SC_RECALL to nviScene.



2.9.2 Configuration parameters

	Variable	Data type	Value range	Default	Description
Input variables (nvi)	nviScene	SNVT_scene			Scene input object from the scene panel for saving and reading the saved scenes, with the commands RECALL and LEARN and the associated scene number 1 to 255. Scene 0 is not used. • Call up with nviScene.function = SC_RECALL and nviScene.scene_number = x • Teach in with nviScene.function = SC_LEARN and nviScene.scene_number = x
	nviSceneSwitchFb	SNVT_Switch			Input object for the actuator value. When there is a LEARN command on nviScene, the current value will be learned as a new scene value.
Output variables (nvo)	nvoSceneSwitch	SNVT_Switch			Output object type switch of the scene controller. The configuration takes place via cpSceneConfig.
	nvoSceneSetting	SNVT_setting			Output object type setting of the scene controller. The configuration takes place via cpSceneConfig.
Configuration parameters (cp)	cpSceneConfig	UCPTsceneConfig			8 save points for the configuration of individual scenes. **nvoSceneSwitch:** ON / 0 % - 100 % OFF / 0% NO_MSG **nvoSceneSetting:** SET_ON SET_OFF SET_UP SET_DOWN SET_STATE SET_STOP SET_NO_MSG

3. Basic configurations

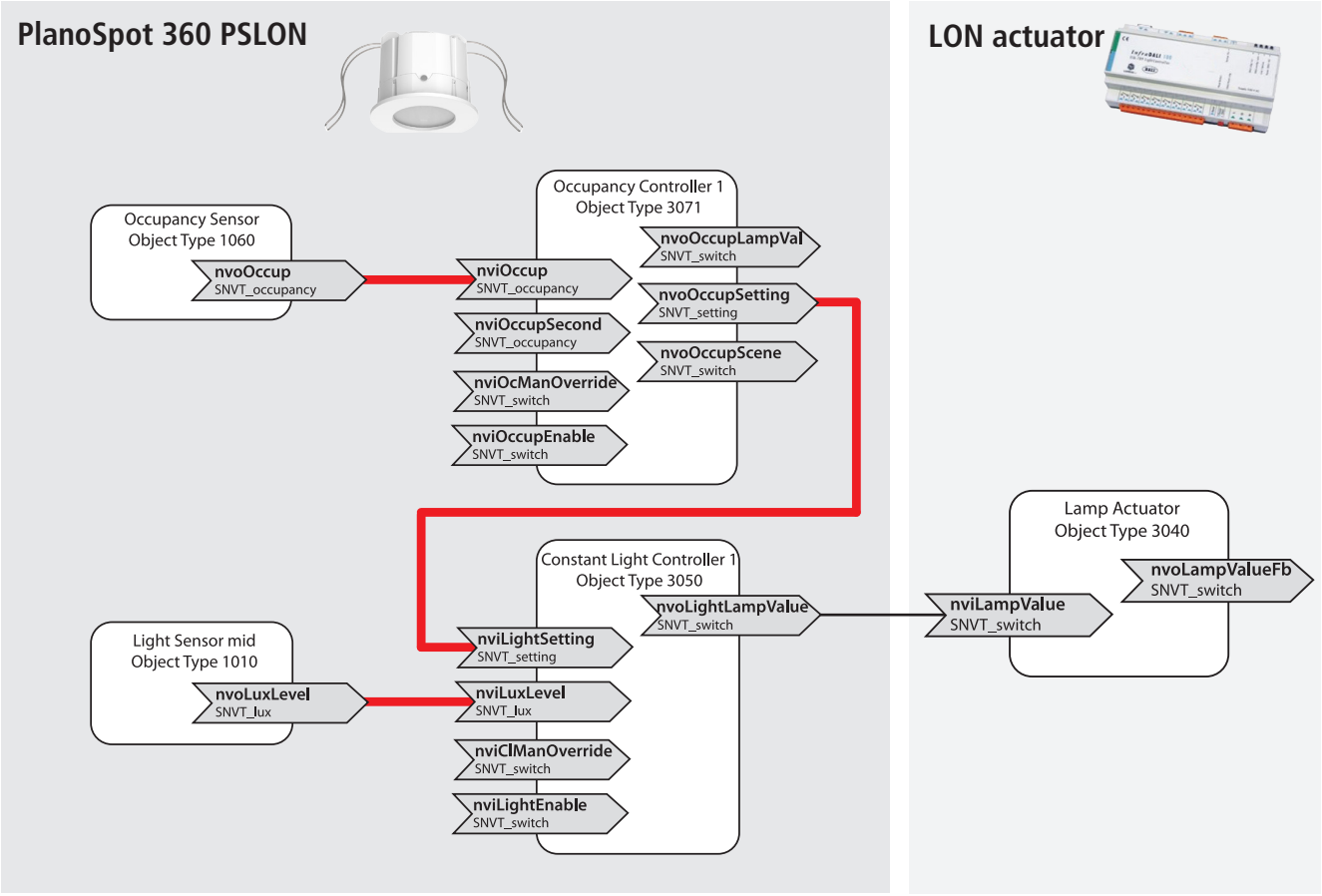
The functionality of the presence detector is dependent on the bindings between the function blocks.

The bindings for the most common applications can be generated automatically by the plug-in. The plug-in checks whether bindings already exist. If no bindings exist, they will be generated automatically. If bindings already exist, these must first be deleted before they can be automatically generated.

- Presence detector with 1-channel switching or constant light control
- Presence detector with 1-channel switching or constant light control and additional presence-dependent output for HVAC
- Presence detector with 1-channel switching or constant light control and manual override via LON button
- Presence detector with 1-channel switching or constant light control and manual override via user remote control
- Presence detector with 2-channel switching or constant light control
- Presence detector with 2-channel switching or constant light control and additional presence-dependent output for HVAC
- Presence detector with 2-channel switching or constant light control and user remote control
- Presence detector with 2-channel switching or constant light control and additional wall panel lighting (classroom application)

3.1 Presence detector with 1-channel switching or constant light control

It is the basic functionality of a presence detector. The average light measurement will be used for daylight-dependent switching or constant light control of the presence detector. The presence detector bindings marked in red can be generated directly by the plug-in.

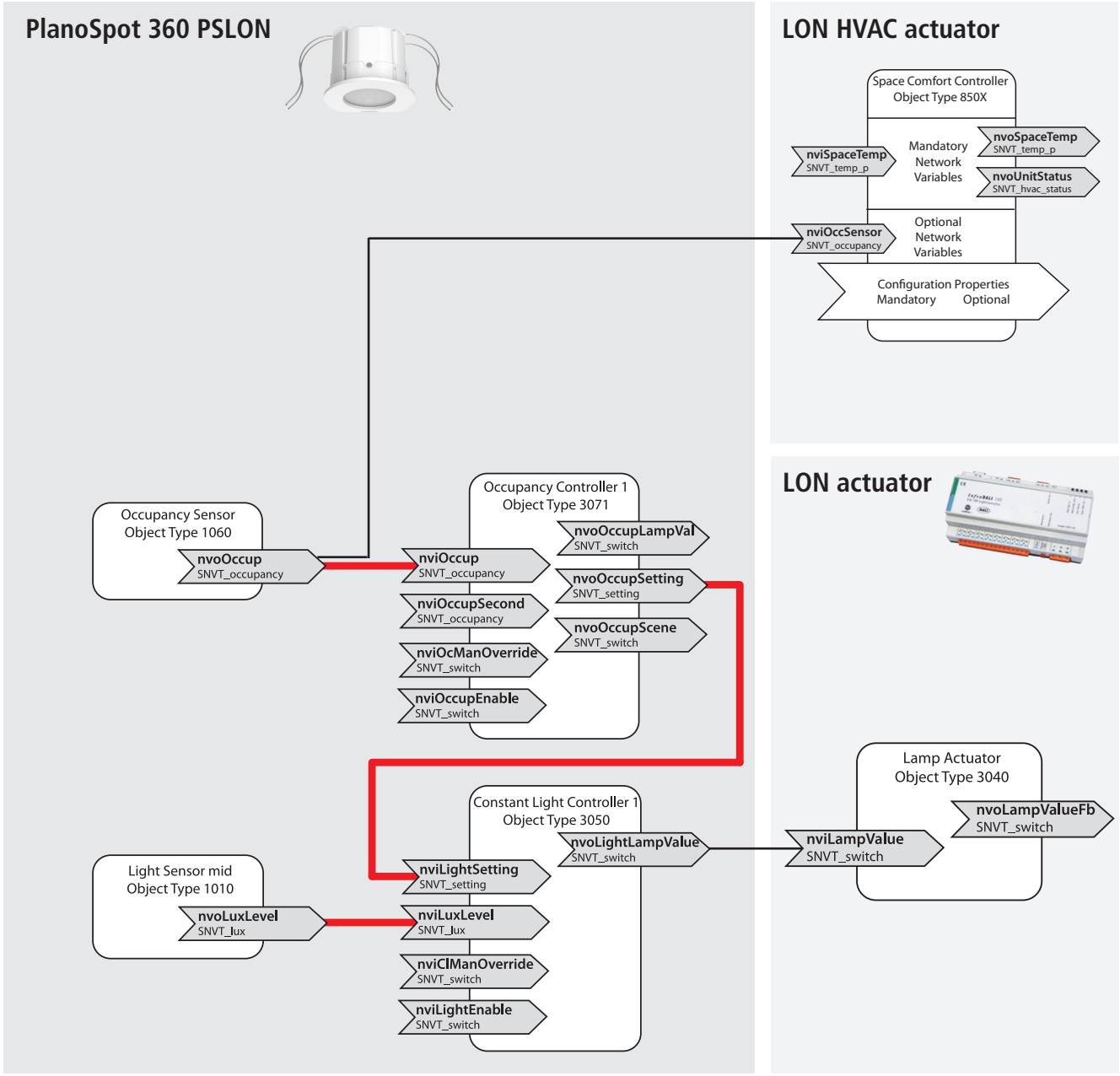


Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

3.1.1 Presence detector with 1-channel switching or constant light control and additional presence-dependent output for HVAC

It is the basic functionality of a presence detector. The average light measurement will be used for daylight-dependent switching or constant light control of the presence detector. In addition, a second occupancy sensor is used for the presence-dependent control of HVAC. The presence detector bindings marked in red can be generated directly by the plug-in.



Parameters

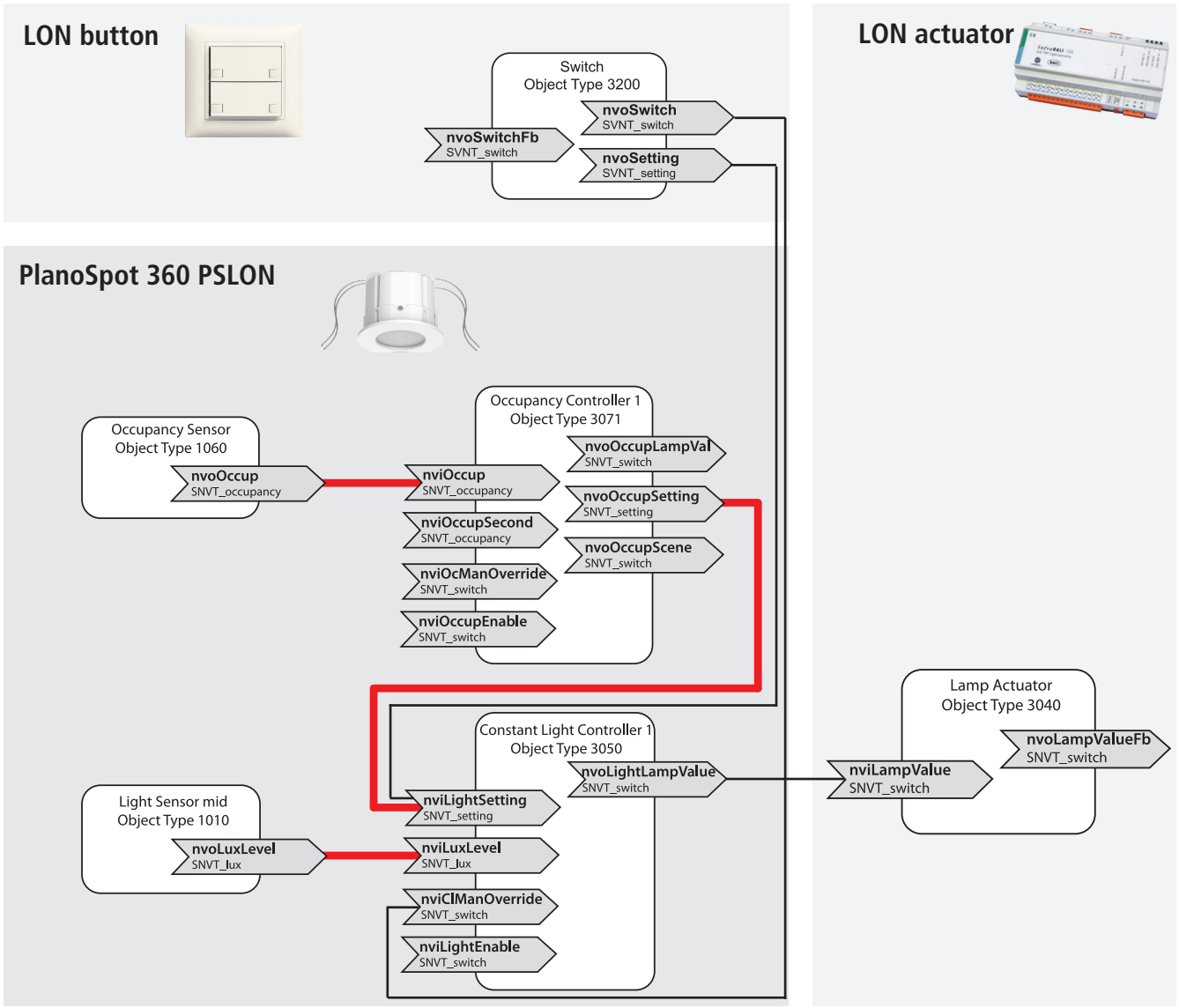
Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

3.1.2 Presence detector with 1-channel switching or constant light control and manual override

3.1.2.1 Use of the setting network variables

Presence detector with manual override. The average light measurement will be used for daylight-dependent switching or constant light control of the presence detector. In addition, the lighting can be manually switched and dimmed via a button. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviLightsetting for manual override, the constant light control remains active at the new setpoint value after a manual dimming process



Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

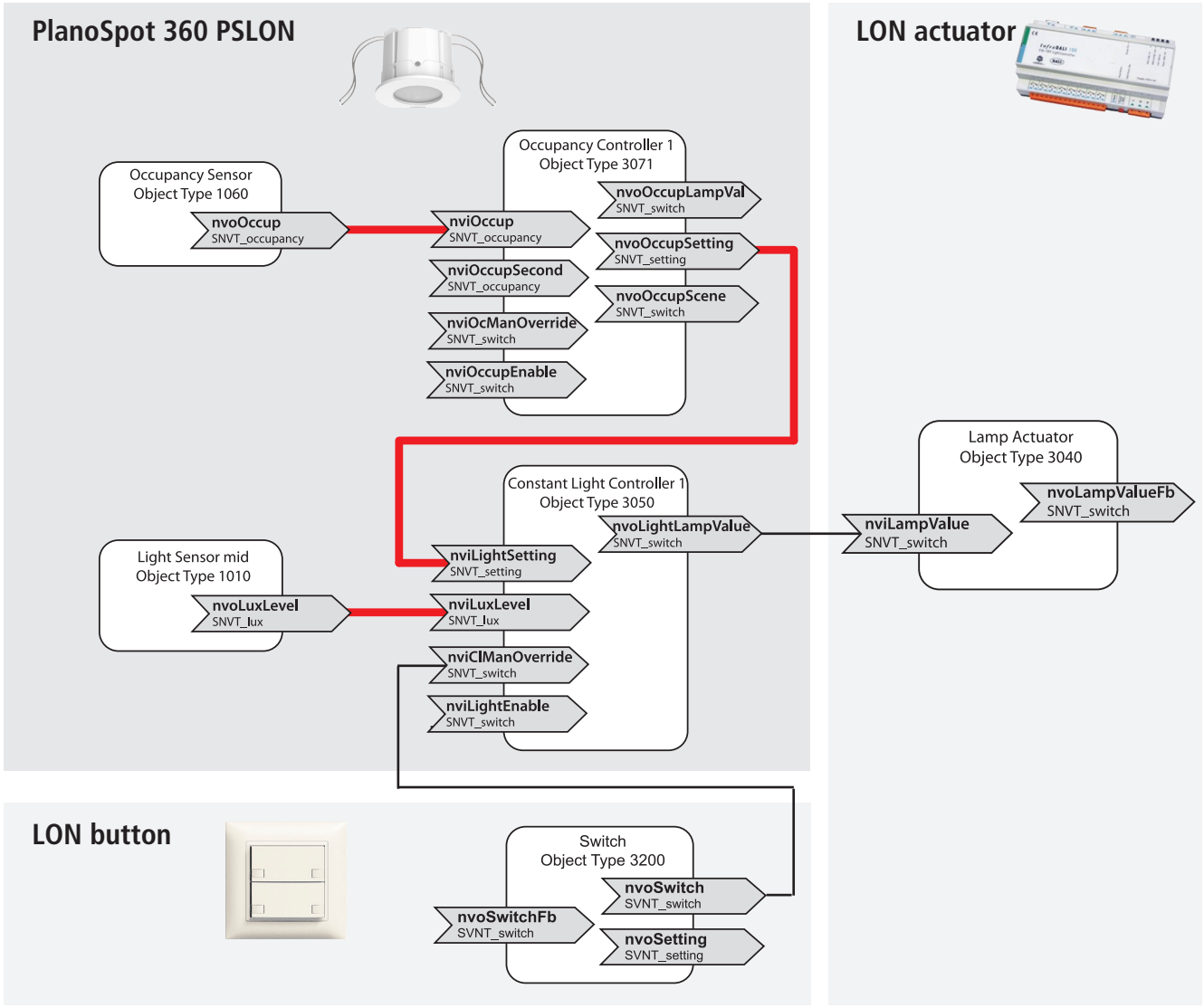
3.1.2.2 Use of the manOverride network variables

Presence detector with manual override. The average light measurement will be used for daylight-dependent switching or constant light control of the presence detector. In addition, the lighting can be manually switched and dimmed via a button. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviCIManOverride for manual override, the following behaviour is exhibited:

Switching: The lighting remains on for at least 30 min., then it goes off when there is enough brightness. The light will go off after a preset time delay if the room is (early) vacated (or goes into standby operation).

Constant light control: Control will be stopped after a manual dimming process. While the presence continues, the lighting remains dimmed to the set value, regardless of the daylight.



Parameters

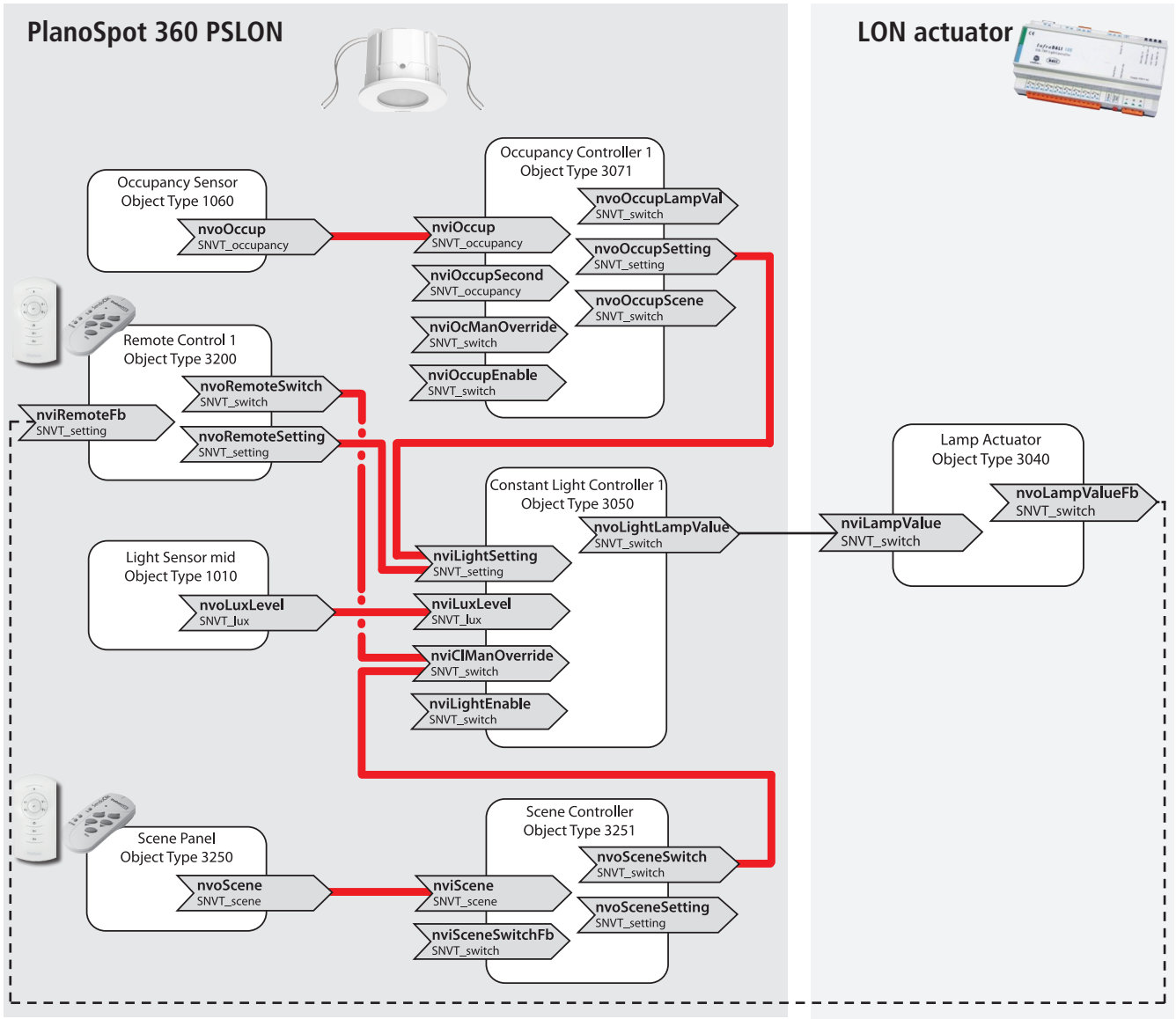
Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

3.1.3 Presence detector with 1-channel switching or constant light control and user remote control

3.1.3.1 Use of the setting network variables

Presence detector with manual override via remote control. The average light measurement will be used for daylight-dependent switching or constant light control of the presence detector. In addition, lighting can be switched and dimmed via the user remote control; scenes can also be used. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviLightsetting for manual override, the constant light control remains active at the new setpoint value after a manual dimming process



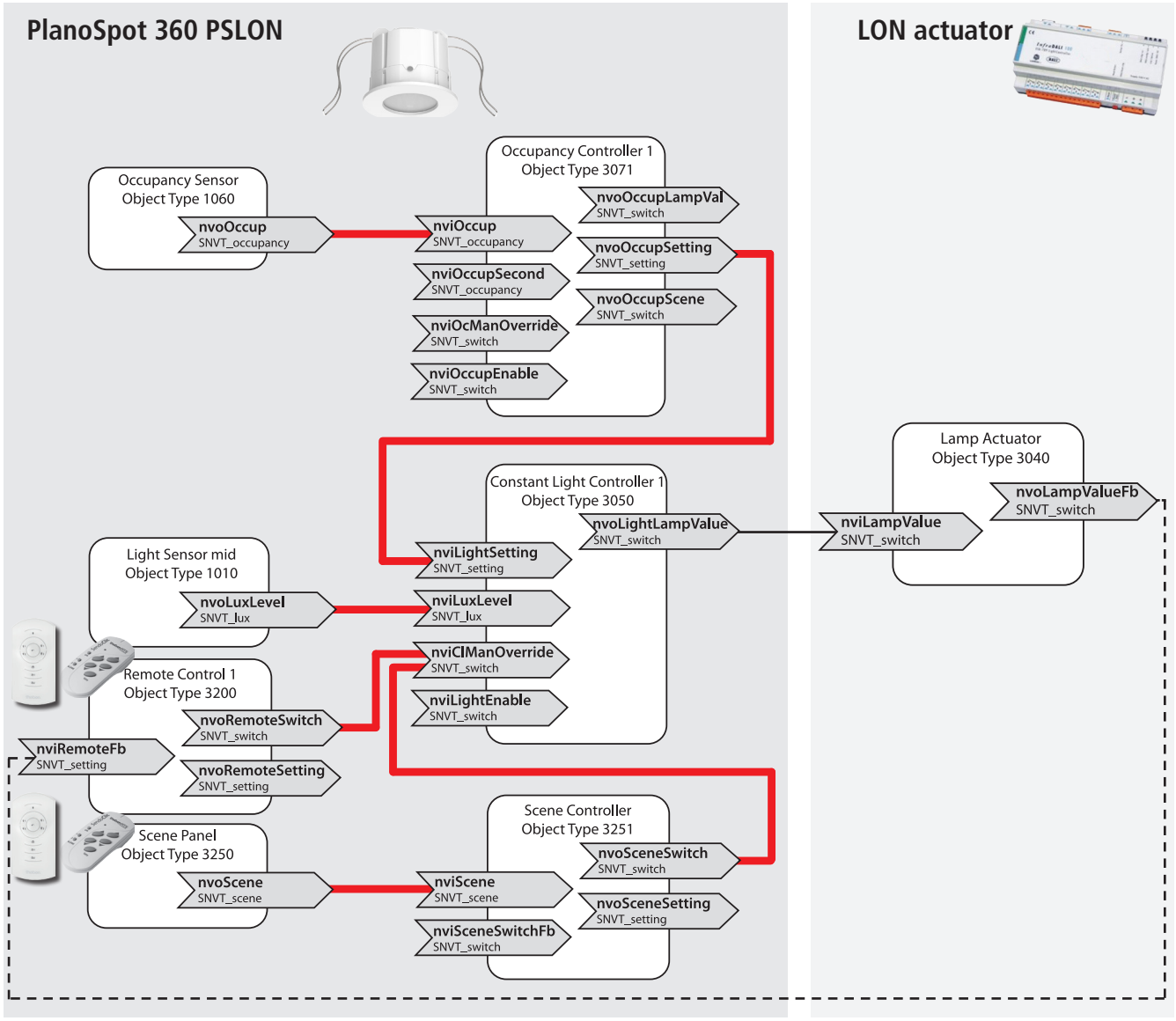
Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
	cpSceneConfig = 1, 70%, 1, SET_NO_MESSAGE, invalid, invalid; 2, 30%, 1, SET_NO_MESSAGE, invalid, invalid;
	cpPushEventUp = 100%; SS_ON; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventU = invalid; invalid; SET_UP; 2%; invalid
	cpReleaseEventU = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
	cpPushEventDown = 0%; SS_OFF; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventD = invalid; invalid; SET_DOWN; 2%; invalid
	cpReleaseEventD = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
All other parameters are set to their default values.	

3.1.3.2 Use of the manOverride network variables

Presence detector with manual override via remote control. The average light measurement will be used for daylight-dependent switching or constant light control of the presence detector. In addition the lighting can be switched and dimmed manually via remote control. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviCIManOverride for manual override, the constant light control will be stopped after a manual dimming process. While the presence continues, the lighting remains dimmed to the set value, regardless of the daylight.



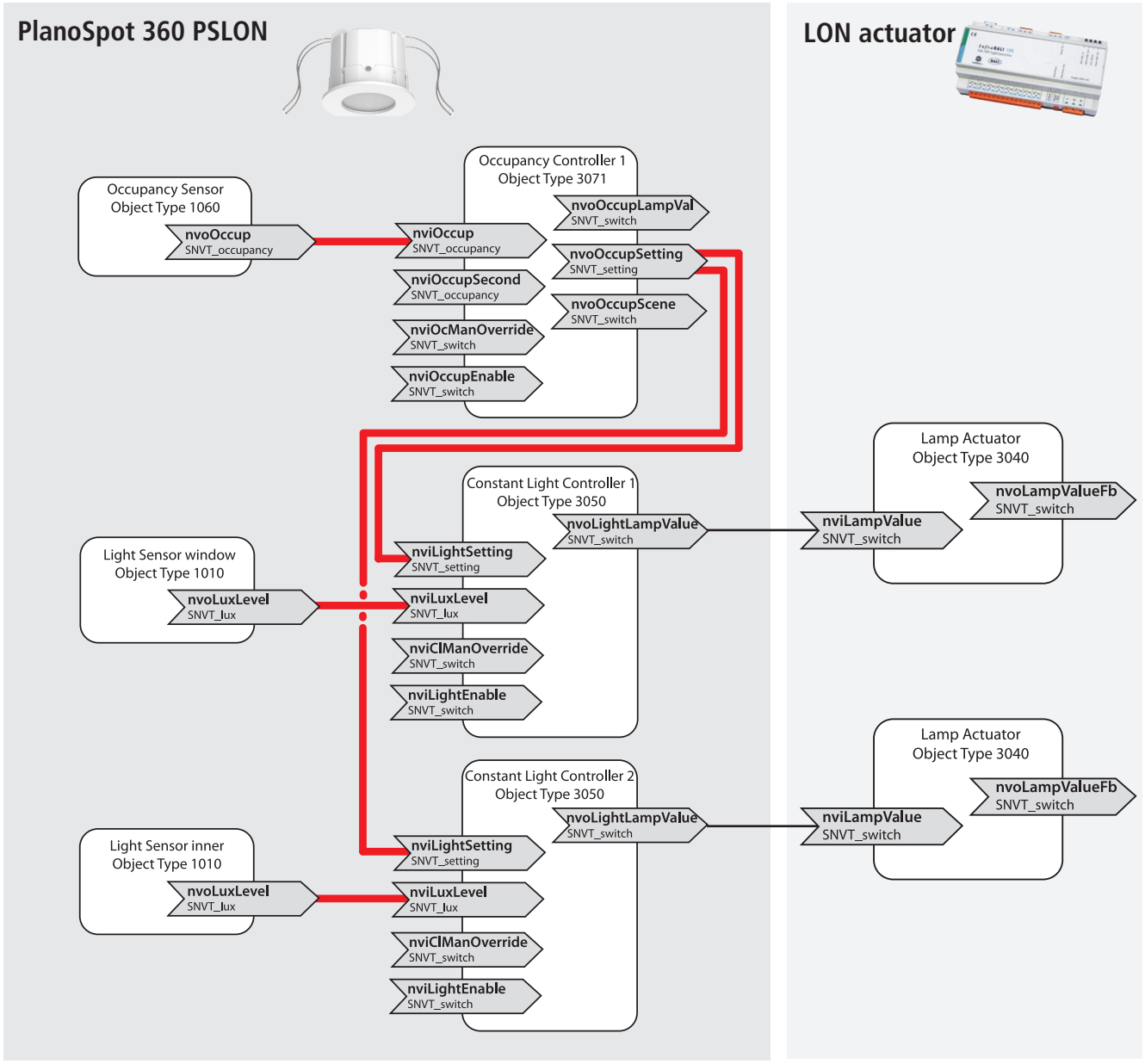
Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
	cpSceneConfig = 1, 70%, 1, SET_NO_MESSAGE, invalid, invalid; 2, 30%, 1, SET_NO_MESSAGE, invalid, invalid;
	cpPushEventUp = 100%; SS_ON; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventU = 2%; SS_UP; SET_NO_MESSAGE_; invalid; invalid
	cpReleaseEventU = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
	cpPushEventDown = 0%; SS_OFF; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventD = 2%; SS_DOWN; SET_NO_MESSAGE_; invalid; invalid
	cpReleaseEventD = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
All other parameters are set to their default values.	

3.2 Switching or constant light control of 2 lighting groups

3.2.1 Presence detector with 2-channel switching or constant light control

Switching or constant light control of two lighting groups. Subdivision into a lighting group close to the window and a lighting group close to the room interior. The presence detector bindings marked in red can be generated directly by the plug-in.

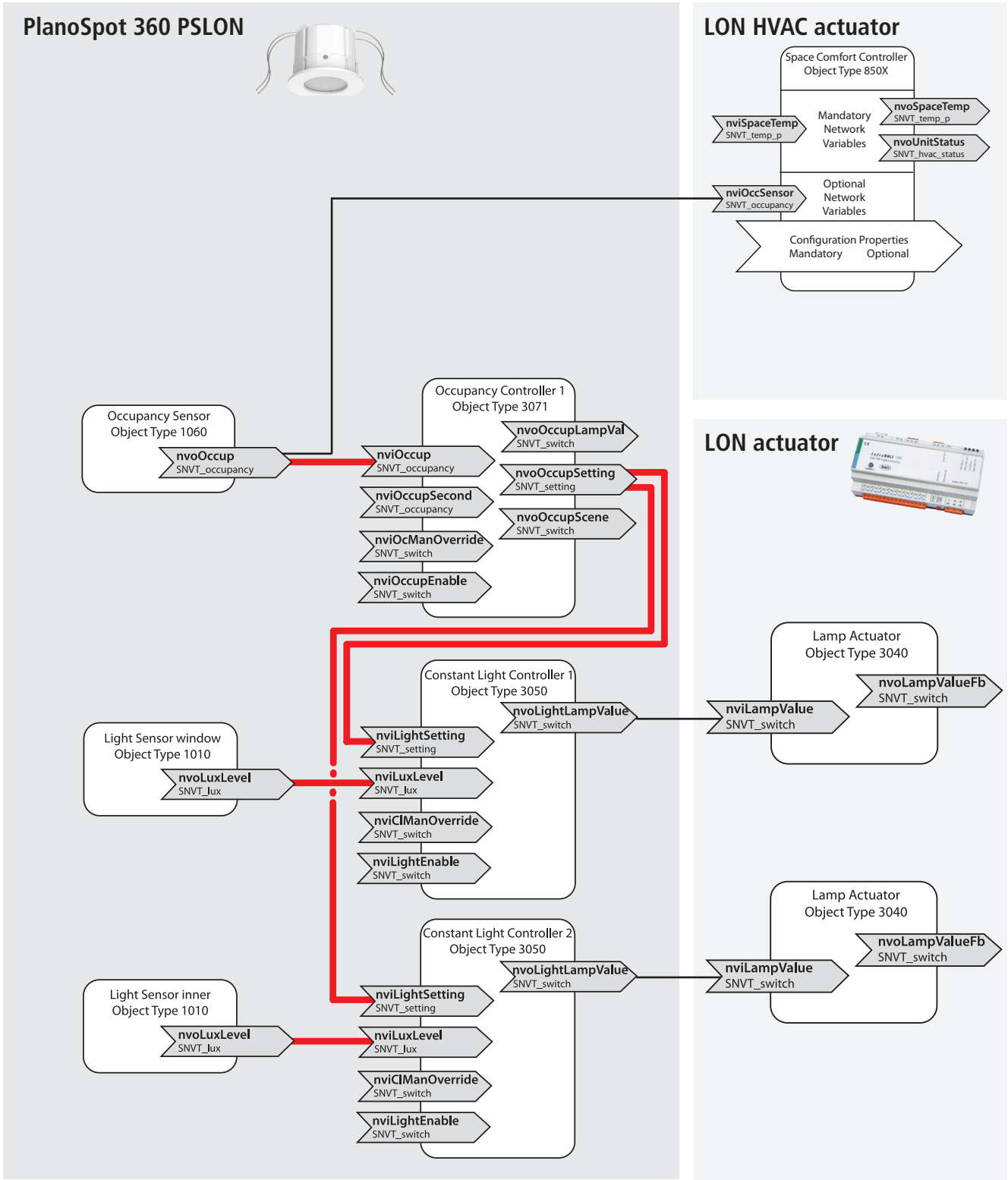


Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

3.2.2 Presence detector with 2-channel switching or constant light control and additional presence-dependent output for HVAC

Switching or constant light control of two lighting groups. Subdivision into a lighting group close to the window and a lighting group close to the room interior. In addition, a second occupancy sensor is used for the presence-dependent control of HVAC. The presence detector bindings marked in red can be generated directly by the plug-in.



Parameters

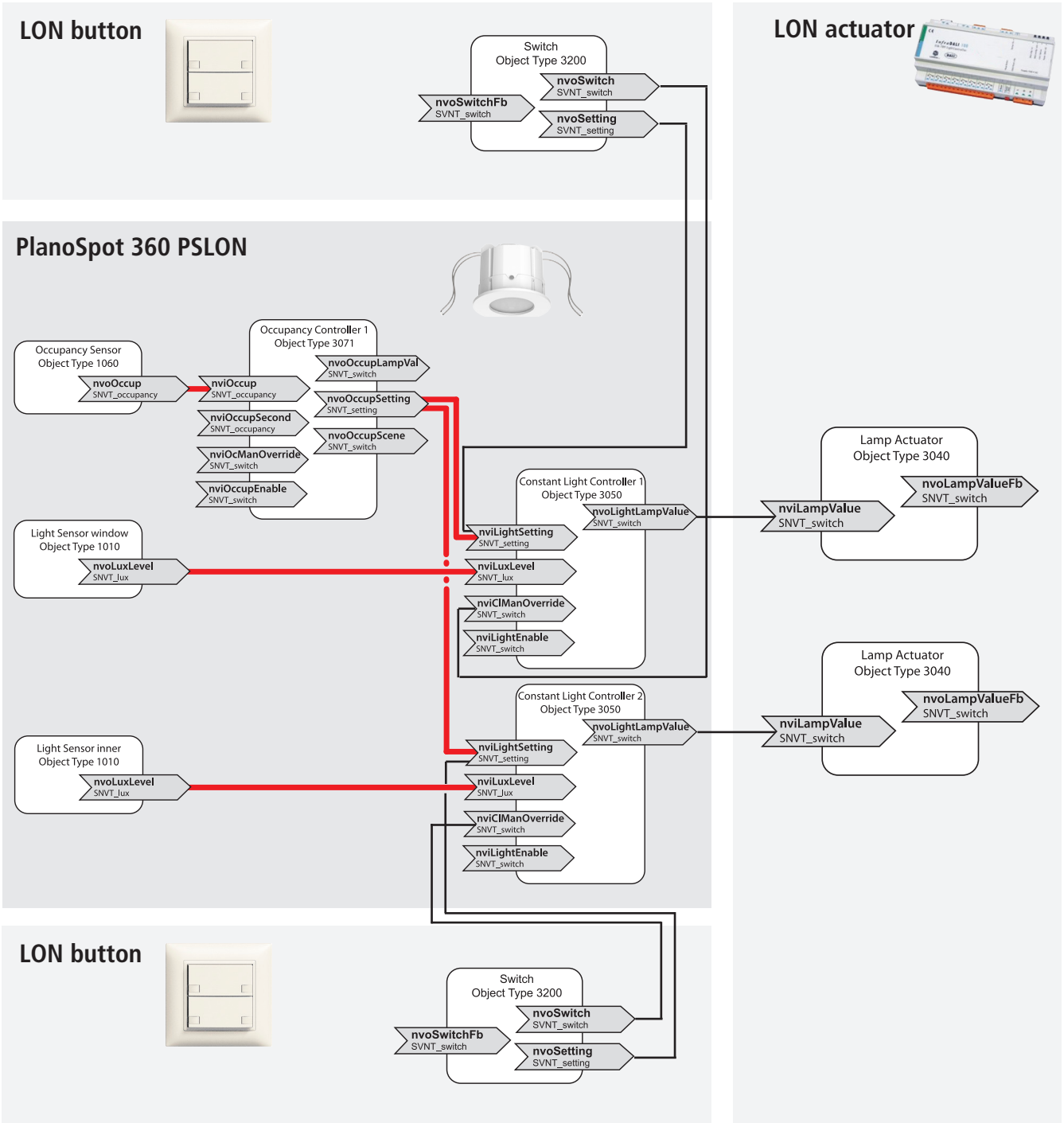
Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

3.2.3 Presence detector with 2-channel switching or constant light control and manual override

3.2.3.1 Use of the setting network variables

Switching or constant light control of two lighting groups, with manual override. Subdivision into a lighting group close to the window and a lighting group close to the room interior. In addition, the lighting can be manually switched and dimmed via a button. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviLightsetting for manual override, the constant light control remains active at the new setpoint value after a manual dimming process



Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

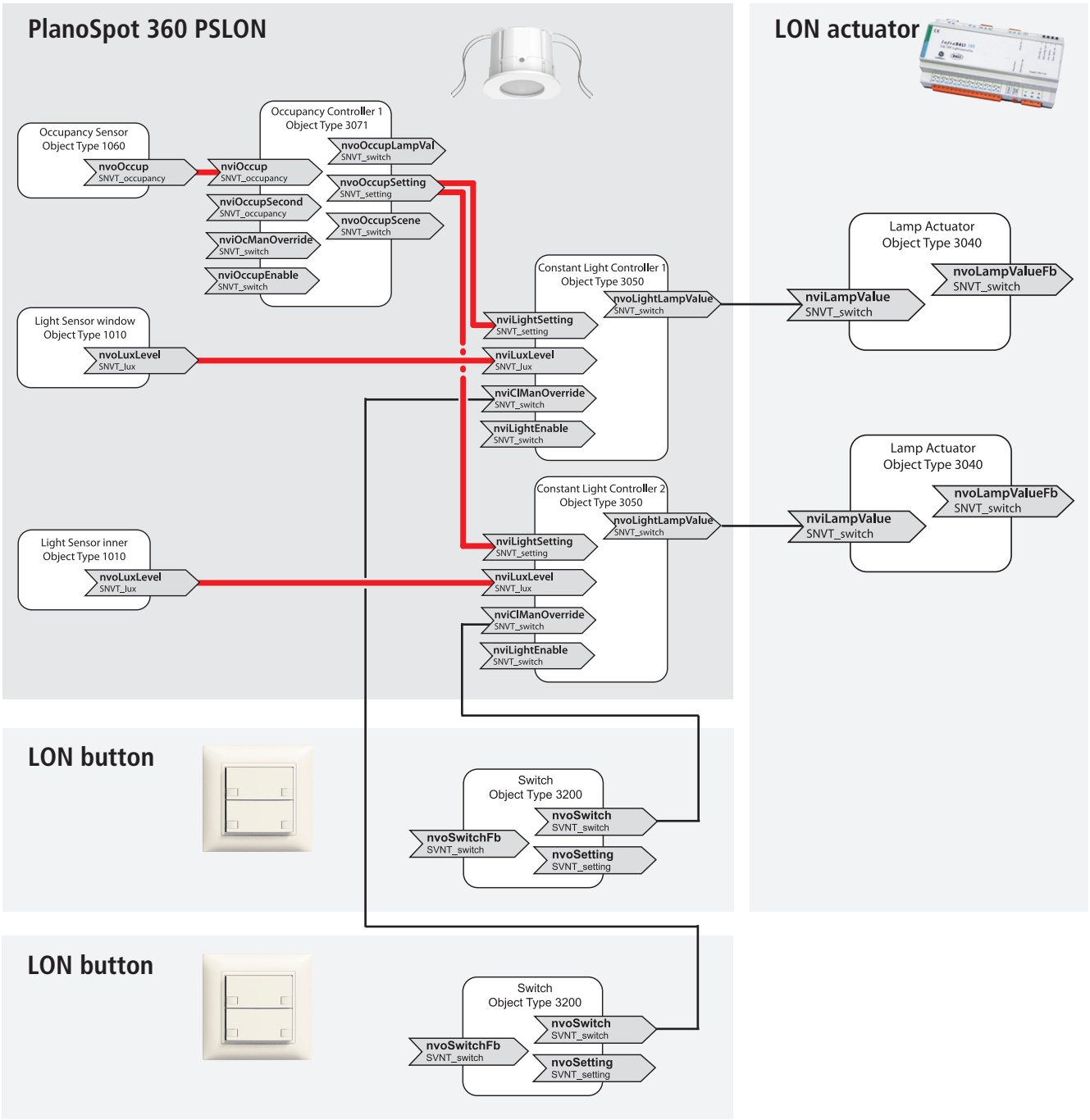
3.2.3.2 Use of the manOverride network variables

Switching or constant light control of two lighting groups, with manual override. Subdivision into a lighting group close to the window and a lighting group close to the room interior. In addition, the lighting can be manually switched and dimmed via a button. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviCIManOverride for manual override, the following behaviour is exhibited:

Switching: The lighting remains on for at least 30 min., then it goes off when there is enough brightness. The light will go off after a preset time delay if the room is (early) vacated (or goes into standby operation).

Constant light control: Control will be stopped after a manual dimming process. While the presence continues, the lighting remains dimmed to the set value, regardless of the daylight.



Parameters

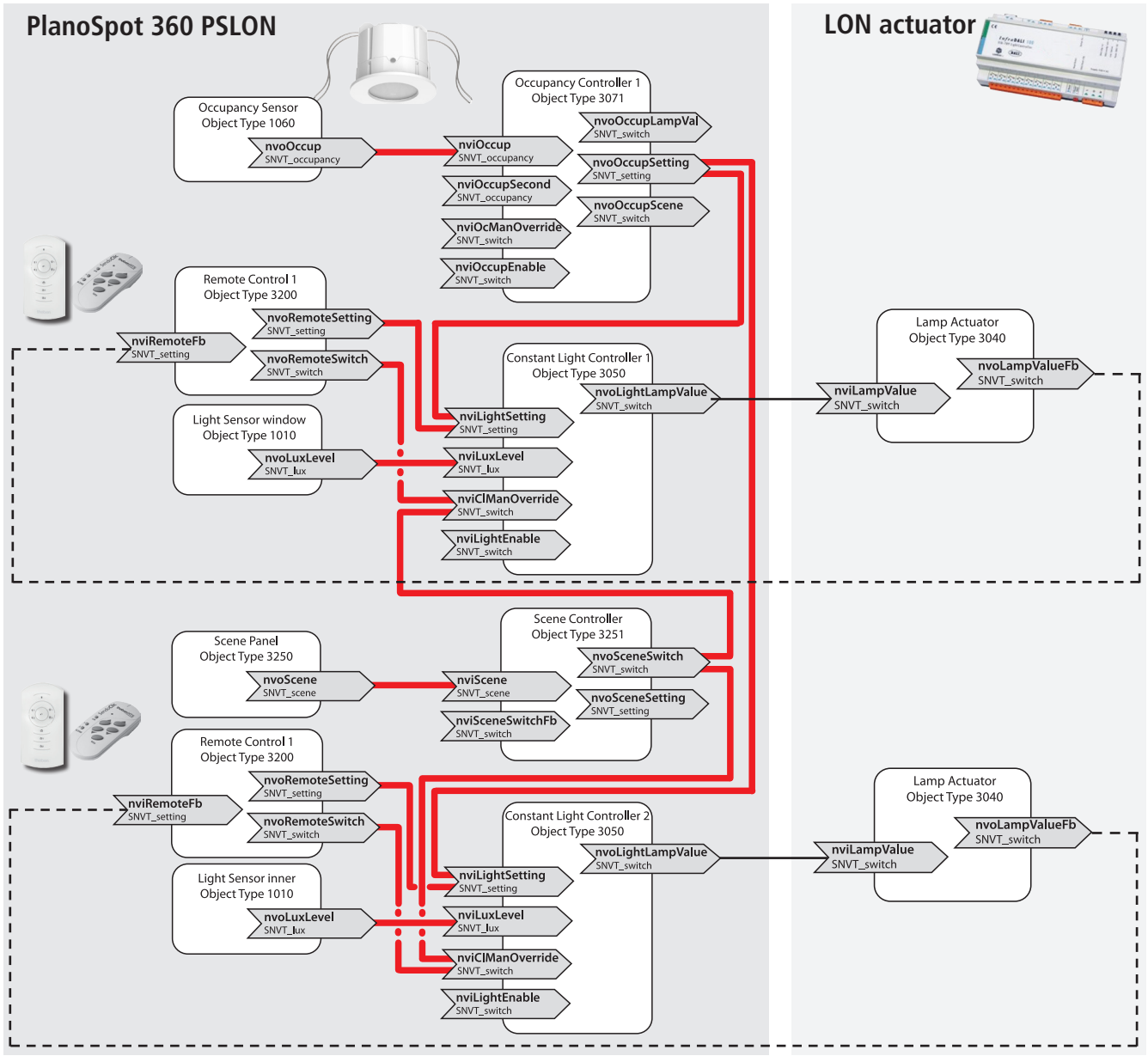
Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
All other parameters are set to their default values.	

3.2.4 Presence detector with 2-channel switching or constant light control and user remote control

3.2.4.1 Use of the setting network variables

Switching or constant light control of two lighting groups, with manual override via remote control. Subdivision into a lighting group close to the window and a lighting group close to the room interior. In addition, lighting can be switched and dimmed via the user remote control; scenes can also be used. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: When using the input nviLightsetting for manual override, the constant light control remains active at the new setpoint value after a manual dimming process



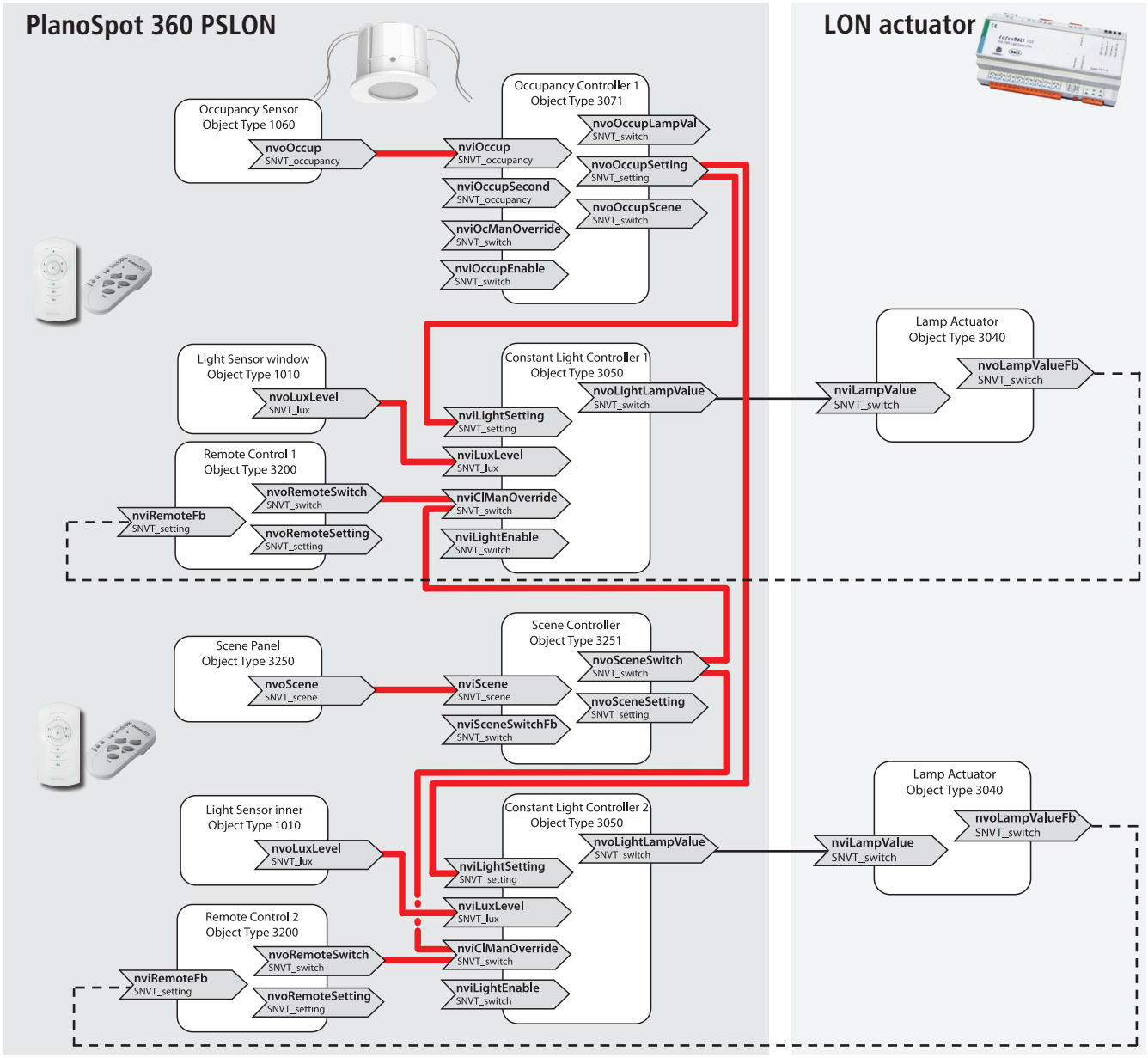
Parameters

Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
	cpSceneConfig = 1, 70%, 1, SET_NO_MESSAGE, invalid, invalid; 2, 30%, 1, SET_NO_MESSAGE, invalid, invalid;
	cpPushEventUp = 100%; SS_ON; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventU = invalid; invalid; SET_UP; 2%; invalid
	cpReleaseEventU = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
	cpPushEventDown = 0%; SS_OFF; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventD = invalid; invalid; SET_DOWN; 2%; invalid
	cpReleaseEventD = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
All other parameters are set to their default values.	

3.2.4.2 Use of the manOverride network variables

Switching or constant light control of two lighting groups, with manual override via remote control. Subdivision into a lighting group close to the window and a lighting group close to the room interior. In addition, lighting can be switched and dimmed via the user remote control; scenes can also be used. The presence detector bindings marked in red can be generated directly by the plug-in.

Please note: for behaviour during switching or constant light control see Section 3.2.3.2



Parameters

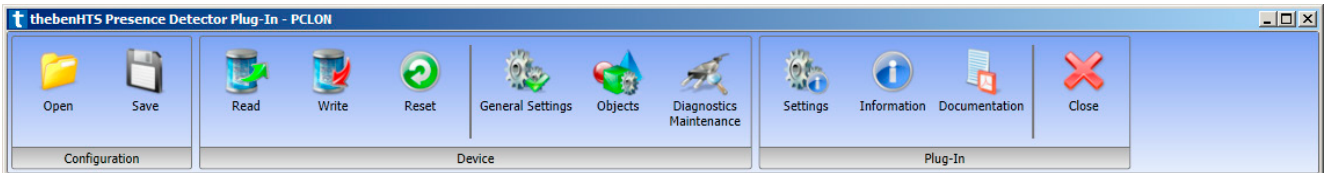
Switching	cpControlMode = SWITCHING
Constant light control	cpControlMode = CONSTANT_LIGHT_CONTROL
	cpSceneConfig = 1, 70%, 1, SET_NO_MESSAGE, invalid, invalid; 2, 30%, 1, SET_NO_MESSAGE, invalid, invalid;
	cpPushEventUp = 100%; SS_ON; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventU = 2%; SS_UP; SET_NO_MESSAGE_; invalid; invalid
	cpReleaseEventU = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
	cpPushEventDown = 0%; SS_OFF; SET_NO_MESSAGE_; invalid; invalid
	cpLongPushEventD = 2%; SS_DOWN; SET_NO_MESSAGE_; invalid; invalid
	cpReleaseEventD = invalid; SS_NO_MESSAGE; SET_NO_MESSAGE_; invalid; invalid
All other parameters are set to their default values.	

4. Plug-in

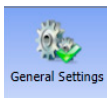
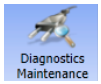
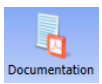
A plug-in is available for convenient configuration of the presence detector. In particular it allows the configuration of parameters, shows information on the detector's operating status and is able to generate bindings for typical application cases at the press of a button.

4.1 Operation of the plug-in

The plug-in is operated via intuitive icons:

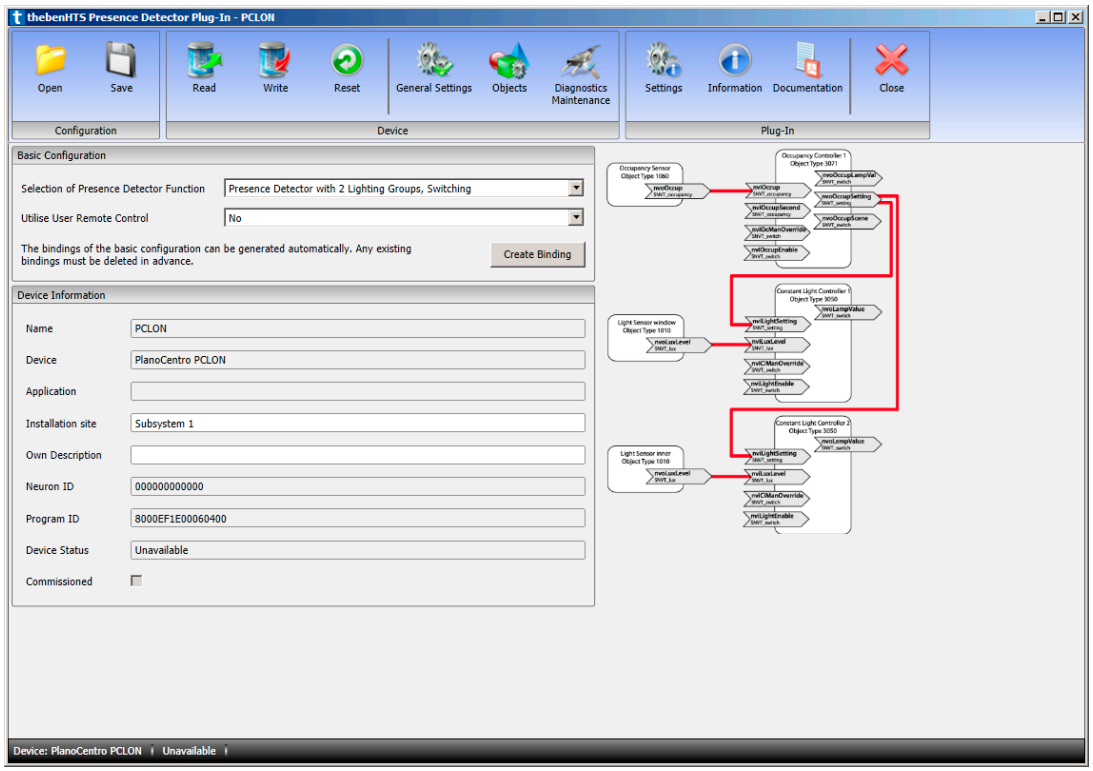


Description of the icons:

Icon	Function	Description
	Open	A saved parameter configuration can be loaded into the plug-in.
	Save	The entire device configuration performed with the plug-in is written to a configuration file.
	Read	Loads configuration from the presence detector
	Write	Saves the settings made in the LNS database
	Reset	The presence detector will be reset to the default settings it had when delivered.
	General settings	For information about the device and the creation of basic bindings, see Section 4.2
	Objects	Configuration of the objects, see Section 4.3
	Diagnostics, Maintenance	Information on the bindings and the status of the presence detector, see Section 4.4
	Settings	Plug-in settings, especially language selection
	Information	Information about the plug-in, especially the software version
	Documentation	LON manual will be opened as a PDF.
	Close	Terminates the plug-in

4.2 General settings

Device name, loaded application, Neuron ID, program version, device, article number are shown in the general settings. Whether the device is commissioned or not is shown. In addition, two fields are available for text input, one for the installation location, the other for a general description.



4.2.1 Basic function setting

As a special feature, the basic function of the presence detector can be selected. At the press of a button, the bindings required for the selected presence detector function will be generated. The plug-in checks whether bindings already exist. If no bindings exist, they will be generated automatically. If bindings already exist, these must first be deleted before they can be automatically generated.

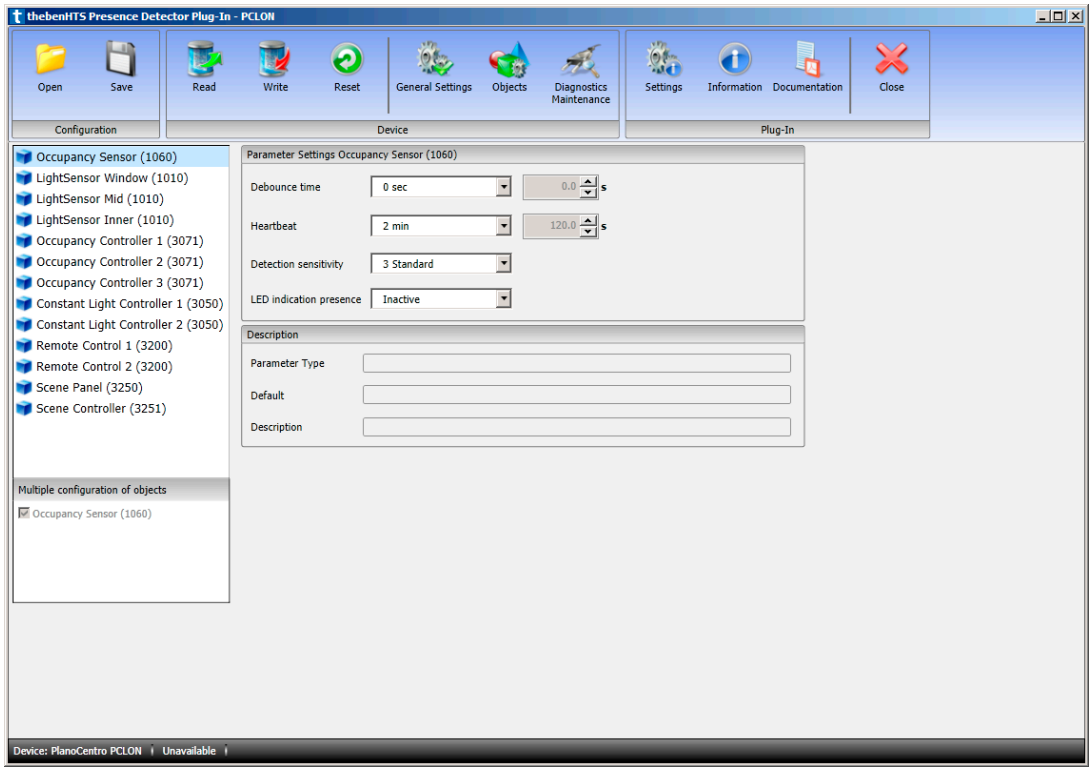
The following basic functions are available:

Function	Use user remote control
Presence detector with 1 lighting group, switching	no
Presence detector with 1 lighting group, switching	yes
Presence detector with 2 lighting groups, switching	no
Presence detector with 2 lighting groups, switching	yes
Presence detector with 1 lighting group, constant light control	no
Presence detector with 1 lighting group, constant light control	Yes, with control not active after manual override (school)
Presence detector with 1 lighting group, constant light control	Yes, with control active after manual override (office)
Presence detector with 2 lighting groups, constant light control	no
Presence detector with 2 lighting groups, constant light control	Yes, with control not active after manual override (school)
Presence detector with 2 lighting groups, constant light control	Yes, with control active after manual override (office)

4.3 Objects

4.3.1 Occupancy sensor

The following object configuration page is available for the occupancy sensor

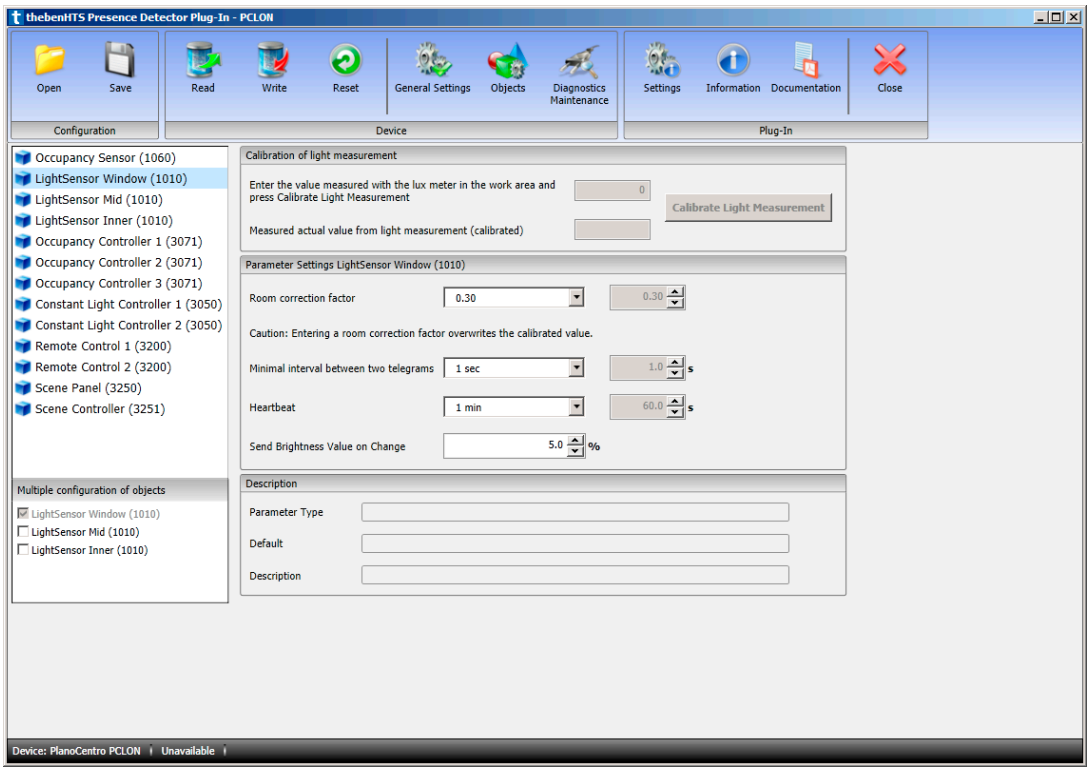


The following parameter settings can be made (**bold**: presetting):

Name	LON name	Values	Description
Debounce time	cpDebounce	**0 s** | 1 s | 5 s | 10 s | 20 s | 30 s | 1 min | 2 min | 3 min | 4 min | 5 min | 10 min | 15 min | 20 min | 25 min | 30 min | user-defined	Time delay for the reset of nvoOccup after the motion ends, plus an internal delay of 5 s.
Cyclical transmission	cpMaxSendTime	not active | 10 s | 20 s | 30 s | 40 s | 50 s | 1 min | **2 min** | 5 min | 10 min | 15 min | 20 min | 25 min | 30 min | user-defined	The output status for the output nvoOccup can be transmitted cyclically.
Detection sensitivity	cpSensitivity	1 very insensitive | 2 insensitive | **3 standard** | 4 sensitive | 5 very sensitive	Detection sensitivity for the presence detection: 1: Low sensitivity 2: Reduced sensitivity 3: Average sensitivity, factory setting 4: Increased sensitivity 5: High sensitivity
Selection of detection zone	cpDetectionZone	Standard, reduced	Selection of detection area (at installation height 3.5 m) Standard: 8 x 8 m reduced: 4.7 x 4.7 m

4.3.2 Light sensor

The following object configuration page is available for every light sensor



The following parameter settings can be made (**bold**: presetting):

Name	LON name	Values	Description
Room correction factor	cpReflection	0.05 | 0.1 | 0.15 | 0.2 | 0.25 | **0.3** | 0.35 |0.4 | 0.45 | 0.5 | 0.55 | 0.6 | 0.65 | 0.7 | 0.75 | 0.8 | 0.85 | 0.9 | 0.95 | 1.0 | 1.05 | 1.1 | 1.15 | 1.2 | 1.25 | 1.3 | 1.35 | 1.4 | 1.45 | 1.5 | 1.55 | 1.6 | 1.65 | 1.7 | 1.75 | 1.8 | 1.85 | 1.9 | 1.95 | 2.0 | calibrated	The room correction factor will be calculated automatically from cpFieldCalib when it has an entry, but can also be entered manually. "Calibrated" means that a calibration of the detector was carried out, see Section 4.3.2.1
Minimum transmission pause	cpMinSendTime	not active | 0.2 s | **1 s** | 5 s | 10 s | 20 s | 30 s | 1 min | 2 min | 3 min | 4 min | 5 min | 6 min | 7 min | 8 min | 9 min | 10 min | user-defined	Minimum transmission pause for nvoLuxLevel.
Maximum time between two telegrams	cpMaxSendTime	not active | 10 s | 20 s | 30 s | 40 s | 50 s | **1 min** | 2 min | 5 min | 10 min | 15 min | 20 min | 25 min | 30 min | user-defined	Heartbeat for nvoLuxLevel.
Minimum value change	cpMinDelta	1 ... 100%, increment 0.5%, **5%**	Minimum value change that leads to the nvoLuxLevel being sent again

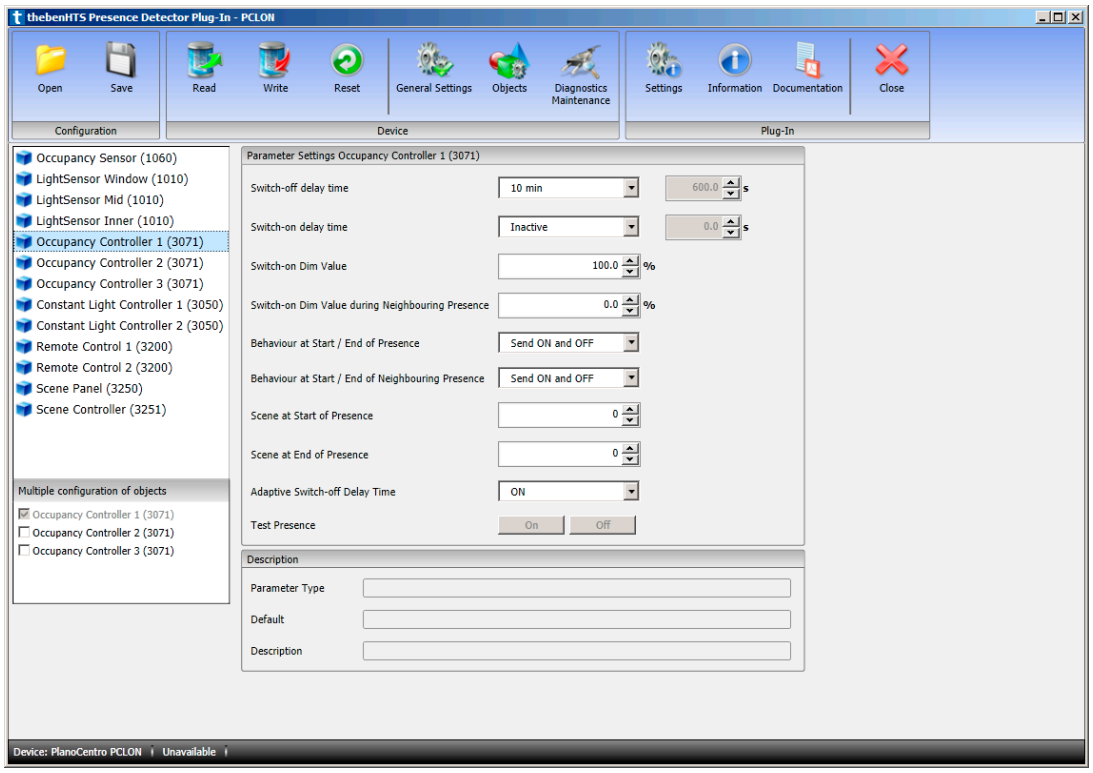
4.3.2.1 Calibration of light measurement

Proceed as follows to calibrate the light measurement. Please note the explanation of calibration in Section 2.3.3:

1. The lux meter is placed on the work surface below the sensor and the measured lux value is entered.
2. Press the button **Calibrate light measurement**.
3. The reflection factor will be calculated automatically. The calibrated actual value of the light measurement will be shown.
4. In the *Room correction factor* field *calibrated* is shown and/or the calculated room correction factor is visible.

4.3.3 Occupancy controller

The following object configuration page is available for every occupancy controller

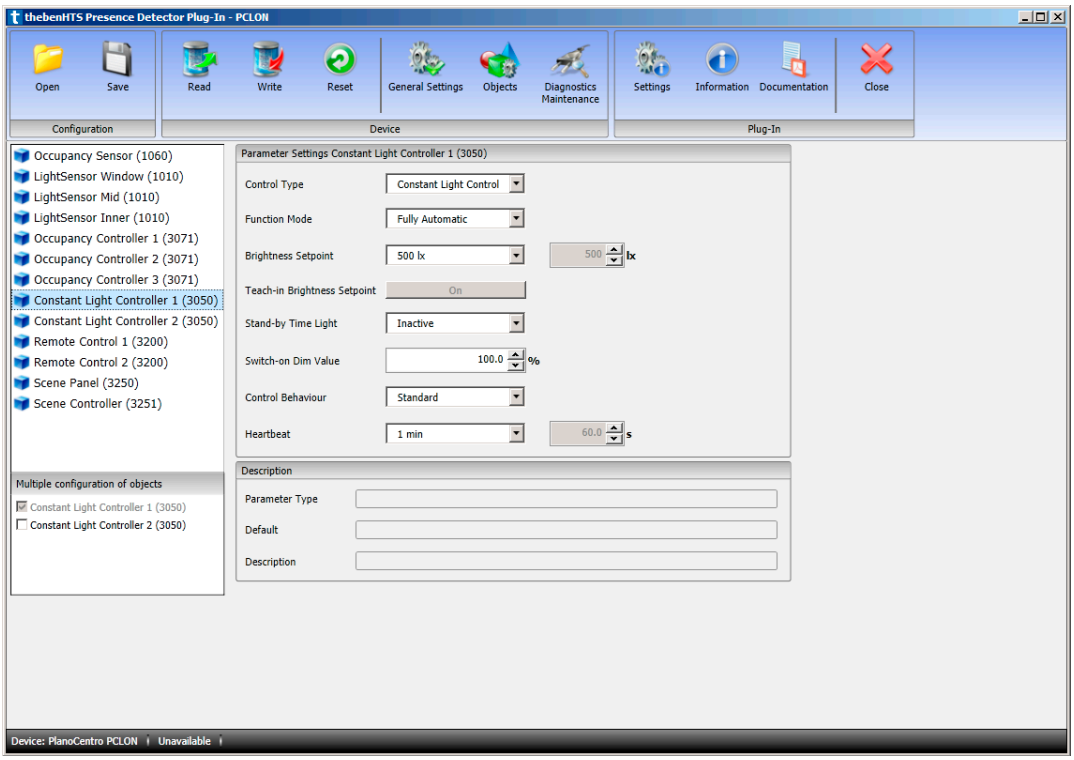


The following parameter settings can be made (**bold**: presetting):

Name	LON name	Values	Description
Time delay	nciHoldTime	10 s | 30 s | 60 s | 90 s | 2 min | 3 min | 4 min | 5 min | 6 min | 7 min | 8 min | 9 min | **10 min** | 12 min | 15 min | 20 min | 25 min | 30 min | 40 min | 50 min | 60 min | 70 min | 80 min | 90 min | 100 min | user-defined	The time delay for the outputs nvoOccupLampVal and nvoOccupSetting. nciHoldTime is restarted when motion occurs (OCCUPIED to nviOccup).
Switch-on delay	nciSwitchOnDelay	**not active** | 10 s | 20 s | 30 s | 45 s | 1 min | 2 min | 3 min | 4 min | 5 min | 6 min | 7 min | 8 min | 9 min | 10 min | 12 min | 15 min | 20 min | 25 min | 30 min | user-defined	Switch-on delay for the output nvoOccupLampVal.
Switch-on dimming value	cpPrimeVal	1 ... 100%, increment 0.5%, **100%**	Output value of nvoOccupLampVal when presence via nviOccup
Switch-on dimming value when presence in the adjacent area	cpSecondVal	1 ... 100%, increment 0.5%, **0%**	Output value of nvoOccupLampVal during presence of adjacent zones ("light island") via nviOccupSecond.
Response at start/end of presence	cpOnOffBehavPri	**Send ON and OFF** | Only send ON | Only send OFF	Describes what telegram is sent when presence begins and ends.
Behaviour at start/end of presence in the vicinity	cpOnOffBehavSec	**Send ON and OFF** | Only send ON | Only send OFF	Describes what telegram is sent via nviOccupSecond when presence begins and ends.
Scene when presence begins	cpScenePrimeOn	0 ... 255, **0**	Scene when room occupied
Scene when presence ends	cpScenePrimeOff	0 ... 255, **0**	Scene when room unoccupied
Adaptive time delay	cpAdaptiveDelay	**On** | Off	Recommended setting: For control of a constant light controller: **On** For control of HVAC: **Off**
Presence test	nciTestMode	On | **Off**	For information about presence test see chapter 7 / page 48.

4.3.4 Constant Light Controller

The following object configuration page is available for every constant light controller

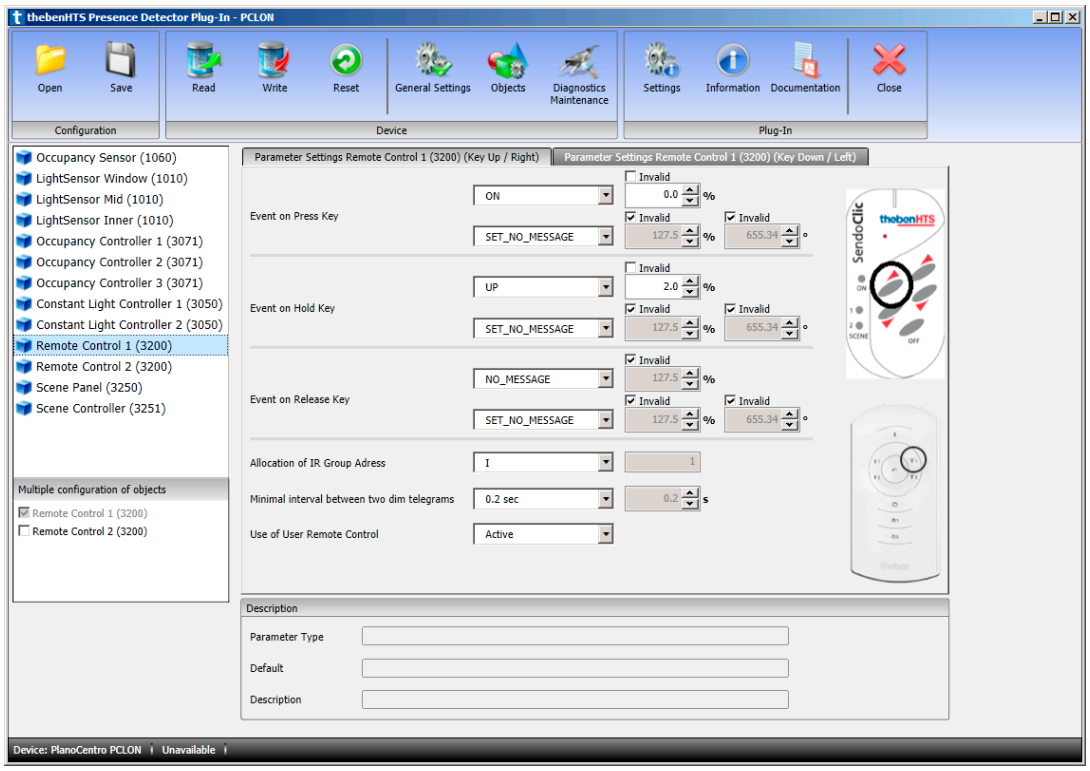


The following parameter settings can be made (**bold**: presetting):

Name	LON name	Values	Description
Control type	cpControlMode	**Switching** | Constant light control	
Configuration type	cpSemiAutomatic	**Fully automatic device** | Semi-automatic device	
Brightness setpoint value	nciLuxSetPoint	10 lx | 12 lx | 14 lx | 16 lx | 20 lx | 22 lx | 24 lx | 26 lx | 28 lx | 30 lx | 35 lx | 40 lx | 45 lx | 50 lx | 55 lx | 60 lx | 65 lx | 70 lx | 80 lx | 90 lx | 100 lx | 110 lx | 120 lx | 130 lx | 140 lx | 150 lx | 160 lx | 170 lx | 180 lx | 190 lx | 200 lx | 220 lx | 240 lx | 260 lx | 280 lx | 300 lx | 320 lx | 340 lx | 360 lx | 380 lx | 400 lx | 420 lx | 440 lx | 460 lx | 480 lx | **500 lx** | 550 lx | 600 lx | 650 lx | 700 lx | 750 lx | 800 lx | 850 lx | 900 lx | 950 lx | 1000 lx | 1100 lx | 1200 lx | 1300 lx | 1400 lx | 1500 lx | 1600 lx | 1700 lx | 1800 lx | 1900 lx | 2000 lx | 2200 lx | 2400 lx | 2600 lx | 2800 lx | 3000 lx | Measurement off (only depending on presence) | user-defined	
Teach-in brightness setpoint value	nciTeachin	Button: Teach-In	Teach-in overwrites the brightness setpoint value with the currently measured brightness.
Lighting standby time	nciStandbyEnable	**not active** | active	When the presence ends, the lighting is not switched off, but serves as an orientation light.
Duration of lighting standby time	cpStandbyHoldT	30 s | 1 min | 2 min | 3 min | 4 min | 5 min | 6 min | 7 min | 8 min | 9 min | 10 min | 12 min | 15 min | 20 min | 25 min | **30 min** | 40 min | 50 min | 60 min | on | user-defined	Faded out when "Standby time light = not active"
Standby brightness	cpStandbySetPoint	10 lx | 12 lx | 14 lx | 16 lx | 20 lx | 22 lx | 24 lx | 26 lx | 28 lx | 30 lx | 35 lx | 40 lx | 45 lx | **50 lx** | 55 lx | 60 lx | 65 lx | 70 lx | 80 lx | 90 lx | 100 lx | 110 lx | 120 lx | 130 lx | 140 lx | 150 lx | 160 lx | 170 lx | 180 lx | 190 lx | 200 lx | user-defined	Faded out when "Standby time light = not active"
Standby value	cpStandbyValue	1 ... 25%, increment 0.5%, **10%**	Max. dimming value in standby operation
Cyclical transmission	cpMaxSendTime	not active | 10 s | 20 s | 30 s | 40 s | 50 s | **1 min** | 2 min | 5 min | 10 min | 15 min | 20 min | 25 min | 30 min | user-defined	Max. time between two updates for the light output
Switch-on dimming value	cpClPrimeVal	1 ... 100%, increment 0.5%, **100%**	Dimming value when switching on (switching) or switch-on value of the control system (constant light control)
Control behaviour	cpControlSpeed	**Standard** | Medium | Fast	Faded out when "control type = switching"

4.3.5 Remote control

The following object configuration page is available for every remote controller



The following parameter settings can be made (**bold**: presetting):

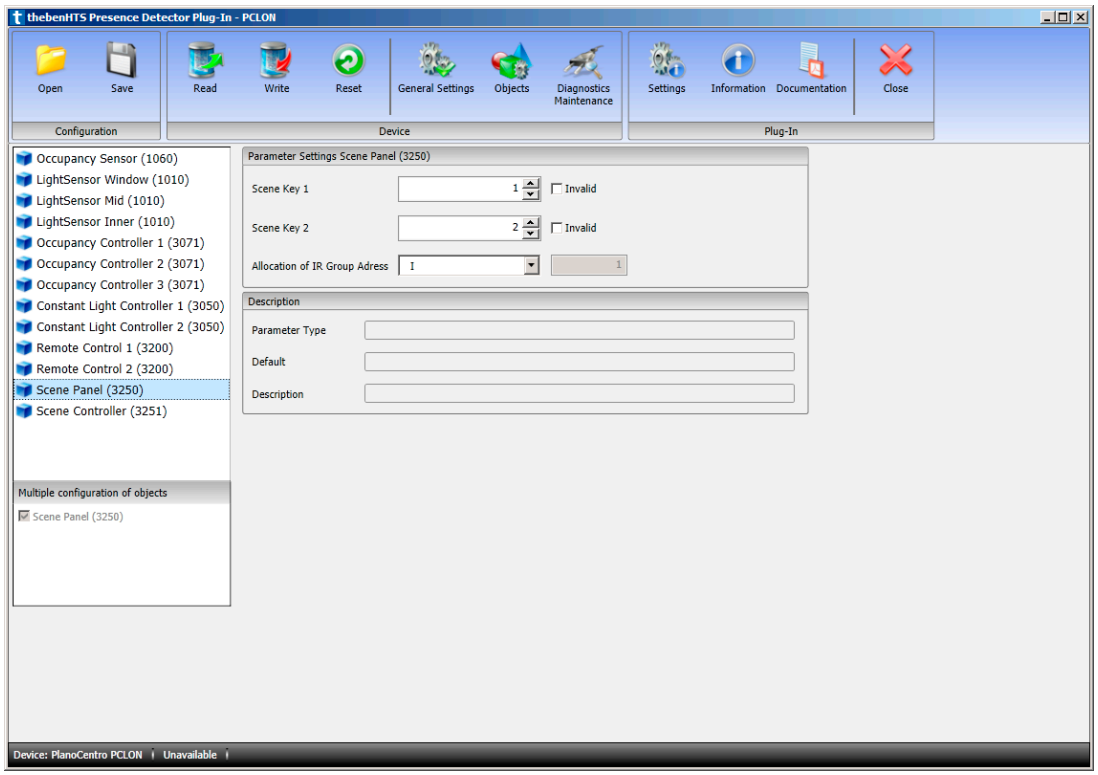
Name	LON name	Object	Function	Values	
Short button press event ▲	cpPushEvenUp	nvoRemoteSwitch	**ON** | OFF | INVALID | NO_MESSAGE | UP | DOWN	0 ... 100 %, **100 %**	
		nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **0 %**	- 359.98 ° ... 360 °, **invalid**
Long button press event ▲	cpLongPushEventU	nvoRemoteSwitch	ON | OFF | INVALID | NO_MESSAGE | **UP** | DOWN	0 ... 100 %, **2 %**	
		nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **0 %**	- 359.98 ° ... 360 °, **invalid**
Event when released ▲	cpReleaseEventU	nvoRemoteSwitch	ON | OFF | INVALID | **NO_MESSAGE** | UP | DOWN	0 ... 100 %, **0 %**	
		nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **0 %**	- 359.98 ° ... 360 °, **invalid**
Short button press event ▼	cpPushEventDown	nvoRemoteSwitch	ON | **OFF** | INVALID | NO_MESSAGE | UP | DOWN	0 ... 100 %, **0 %**	
		nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **0 %**	- 359.98 ° ... 360 °, **invalid**
Long button press event ▼	cpLongPushEventD	nvoRemoteSwitch	ON | OFF | INVALID | NO_MESSAGE | UP | **DOWN**	0 ... 100 %, **2 %**	
		nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **0 %**	- 359.98 ° ... 360 °, **invalid**
Release event ▼	cpReleaseEventD	nvoRemoteSwitch	ON | OFF | INVALID | **NO_MESSAGE** | UP | DOWN	0 ... 100 %, **0 %**	
		nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **0 %**	- 359.98 ° ... 360 °, **invalid**
Allocation of IR group address	cpRcGroupAdress		**I** | II | III *		
Shortest time between two telegrams	cpMinSendTime		not active | **0.2 s** | 0.4 s | 0.6 s | 0.8 s | 1 s | 2 s | 5 s | user-defined		
Use of the user app	cpClicAppEnable		**Active** | not active		

* When using theSenda S user remote control, IR group address III cannot be used.

Note: The commands UP, DOWN are not defined with nvoRemoteSwitch. If the object nviRemoteFb is linked, the feedback value will be sent plus or minus the defined %value with UP/DOWN. If the object nviRemoteFb is not linked, the last output value will be sent plus or minus the defined % value with UP/DOWN.

4.3.6 Scene panel

The following object configuration page is available for the scene panel



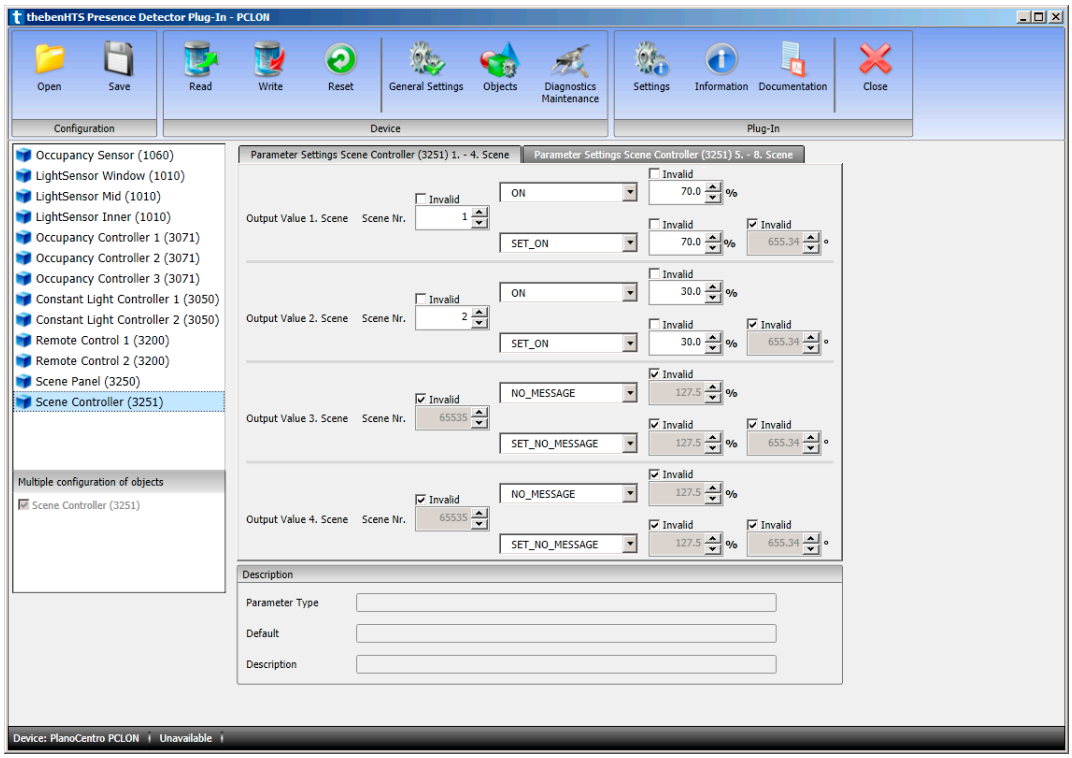
The following parameter settings can be made (**bold**: presetting):

Name	LON name	Values	Description
Scene button 1	cpScene-Number1cpSce-neNumber1	0 ... 255, **1**	
Scene button 2	cpSceneNumber2	0 ... 255, **2**	
Allocation of IR group address	cpScGrou-pAddress	**I** | II | III *	

* When using theSenda S user remote control, IR group address III cannot be used.

4.3.7 Scene controller

The following object configuration page is available for the Scene Controller



The following parameter settings can be made (**bold**: presetting):

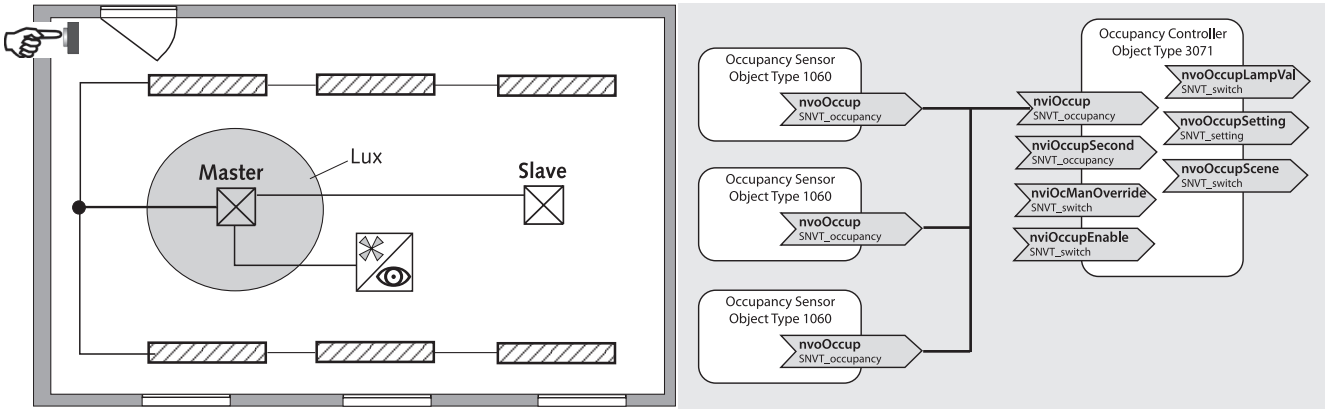
Name	LON name	Scene no.	Object	Function	Values	
Output value 1st scene	cpSceneConfig	1 ... 255, **1**	nvoRemoteSwitch	**ON** | OFF | INVALID | NO_MESSAGE	0 ... 100 %, **70 %**	
			nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **invalid**	- 359.98 ° ... 360 °, **invalid**
Output value 2st scene	cpSceneConfig	1 ... 255, **2**	nvoRemoteSwitch	ON | **OFF** | INVALID | NO_MESSAGE	0 ... 100 %, **30 %**	
			nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **invalid**	- 359.98 ° ... 360 °, **invalid**
Output value 3rd - 8th scene	cpSceneConfig	1 ... 255, **free**	nvoRemoteSwitch	ON | OFF | INVALID | **NO_MESSAGE**	0 ... 100 %, **invalid**	
			nvoRemoteSetting	**SET_NO_MESSAGE** | SET_ON | SET_OFF | SET_UP | SET_DOWN | SET_STATE | SET_STOP	0 ... 100 %, **invalid**	- 359.98 ° ... 360 °, **invalid**

5. Parallel switching

In larger rooms, several detectors can be connected in parallel. This extends the overall presence detection area.

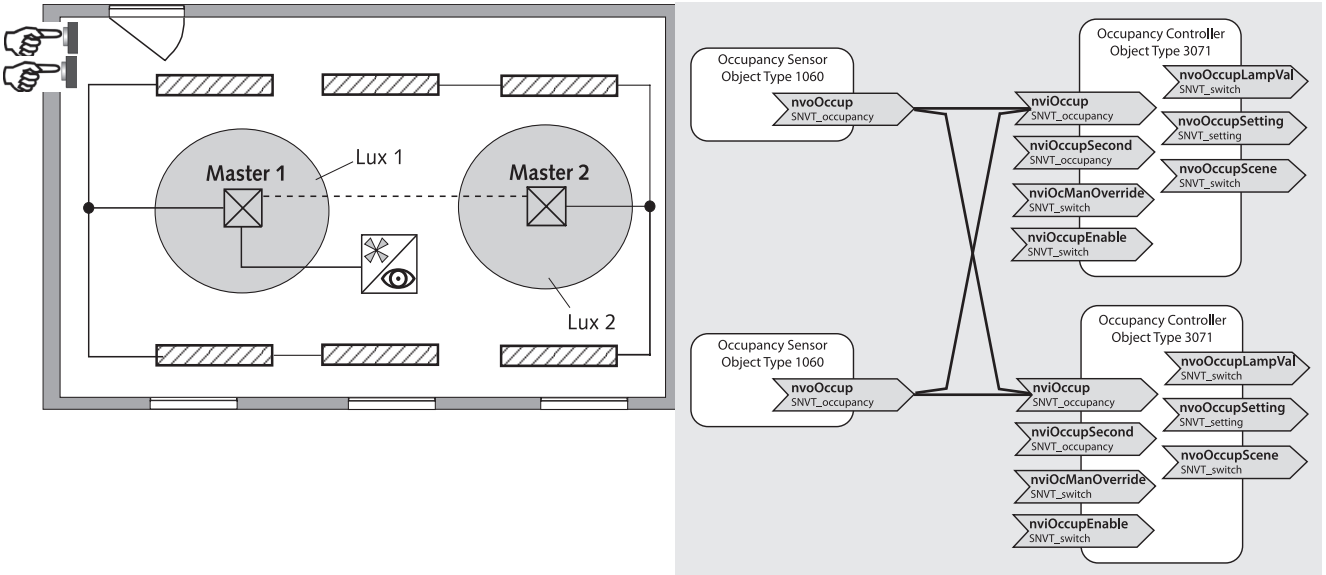
5.1 Master/Slave parallel switching

A "Master" can be connected to several "Slaves". For this purpose the network variable nviOccup of the occupancy controller of the "Master" is linked with the network variables nvoOccup of all "Slaves". The Slaves only supply presence information from their detection area. The Master performs brightness measurement and administration of all parameter settings.



5.2 Master/Master parallel switching

Several presence detectors can be linked to one another as "Masters in parallel switching". For this purpose the network variable nviOccup of the occupancy controller of the first "Master" is linked with the network variables nvoOccup of all presence detectors. Also, the network variable nviOccup of the occupancy controller of the additional "Master" is linked with the nvoOccup of all other presence detectors. Presence detection is done jointly during light measurement, parameter settings and lighting control are individually processed by each Master.



6. Start-up

6.1 Identification

The presence detector will be identified during start-up with the service button on the back of the presence detector or without dismantling the presence detector via the SendoPro 868-A management remote control. A network management message with the Neuron ID of the presence detector will be sent.

6.2 Setting the device to the factory setting

The presence detector can be reset to its factory setting by pressing the service button for 10 seconds.

- This puts the device in the "unconfigured" state.
- All parameters are reset to their default values.

6.3 Switching behaviour

After power is switched on or a restart occurs, the detector runs through the start-up phase. This is indicated by the LED flashing.

1. Start up phase (30 seconds)

- The LED flashes at one second intervals.
- The outputs nvoLightLampValue of the constant light controller #3050 will be set to 100%/1 after 5 seconds regardless of brightness. After 15 seconds the outputs nvoLightLampValue will be reset to 100 % / 1. Any constant light control that has been set is not active.
- Occupancy controllers #3071 are not controlled.
- During the start-up phase only the following IR commands are permitted:
  - Test On / Off
  - Reset
  - Manual override On / Off / dimming
    The override is performed and the detector finishes the start-up phase.
- At the end of the start-up phase, the detector goes into normal operation.

2. Operation mode normal

- The detector is ready for operation (LED off or LED indicates motion).

3. Event of malfunction

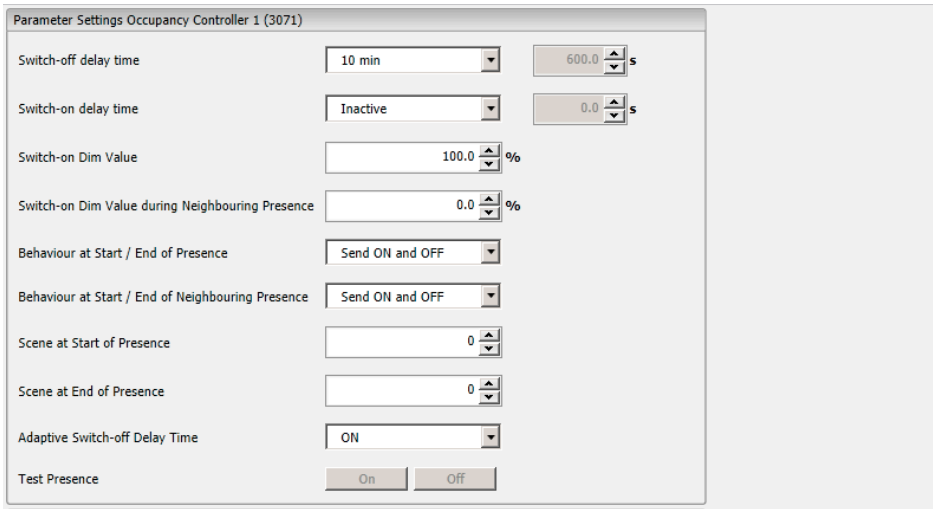
- LED flashes rapidly
- For troubleshooting, see chapter 9 / page 58.

7. Presence test mode

The presence test serves to test presence detection and parallel switching.

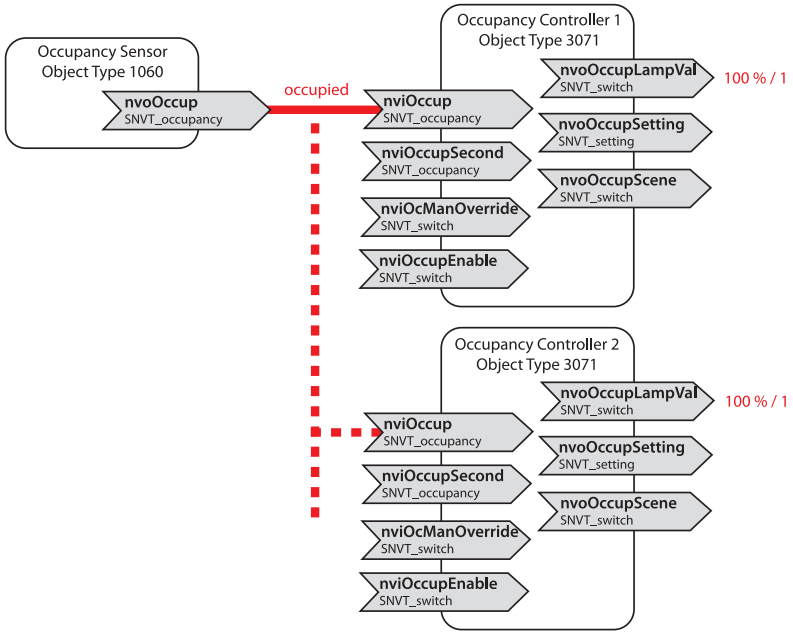
Activation	- Test presence "On" with the SendoPro management remote control 868-A - via plug-in or configuration variable nciTestMode
End	With subsequent restart: - Test presence <Off> command with the SendoPro 868-A management remote control - Mains failure and thus power up - via plug-in or configuration variable nciTestMode - the test-mode presence will be terminated automatically after 10 min

View of presence test mode in the plug-in:



Bindings

The presence test mode only works correctly if the internal bindings are present. This concerns the bindings between occupancy sensor and occupancy controllers.



Test response

The presence detector exhibits the following behaviour in test mode:

- The LED shows movements detected by the internal PIR sensor. Movement information sent by slave detectors will not be shown.
- Every occupancy controller must be set to the presence test mode separately.
- The configuration parameters will be set specifically for the duration of the test mode, regardless of the bindings.
- The constant light controllers are not affected by the test mode. They continue to work normally.
- The presence detector performs a reset after the end of the test mode.

Display LED	Status nviOccup	Status nvoOccupLampVal	Description
On	Occupied	100% / 1	When there is movement (LED on) every occupancy controller without time delay switches directly because of nviOccup to 100% / 1
Off	UnOccupied	0% / 0	When absent (LED off) every occupancy controller without time delay switches directly because of nviOccup to 0% / 0

Commands and adjustable parameters

The following commands are possible with the management remote control in presence test mode

- End presence test
- Reset / Restart of the detector
- Changing detection sensitivity

The selected detection sensitivity is unchanged on activation of the presence test. Sensitivity can be adjusted during the test. The presence detector performs a reset after the end of the test mode.

8. Integrating the user remote control

See also SendoClic, theSenda S operating manual

8.1 Performance characteristics of the SendoClic user remote control

The user remote control makes it easy to switch and dim lighting using the PlanoSpot 360 PSLON presence detector. The user remote control has two channels for controlling lighting groups, blinds or external channels with switching and dimming. A user remote control provides the option of saving two different lighting scenarios, which can be retrieved anytime at the touch of button.

8.2 Combining the presence detector and SendoClic

The presence detector channels and the SendoClic user remote control channels are linked via an IR group address. Three IR group addresses are available for linking.

The operation of a lighting group requires that the presence detector channel IR group address and the SendoClic channel correspond.

The selection of the IR group addresses enables the separation of neighbouring detectors controlled by the SendoClic user remote control.

Procedure:
Set the coding switch in the battery compartment of the SendoClic (see table below), so the IR group addresses are allocated to the SendoClic channels which were previously set in the plug-in for Remote Control 1 and Remote Control 2 in the Scene Panel.

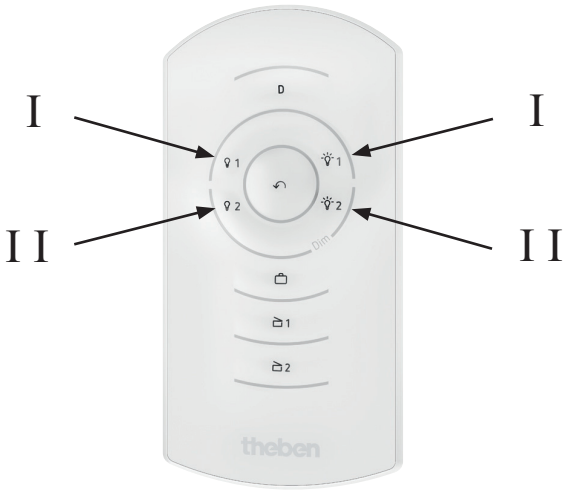
Coding switch location	IR group address		Buttons Scene 1 and 2
	Channel 1 ▼/▲ (SendoClic)	Channel 2 ▼/▲ (SendoClic)	
0	All	All	All
1	I	I	I
2	I	I I	I + I I
3	I	I I I	I + I I I
4	I I	I	I + I I
5	I I	I I	I I
6	I I	I I I	I I + I I I
7	I I I	I	I + I I I
8	I I I	I I	I I + I I I
9	I I I	I I I	I I I

8.3 Combining the presence detector and theSenda S

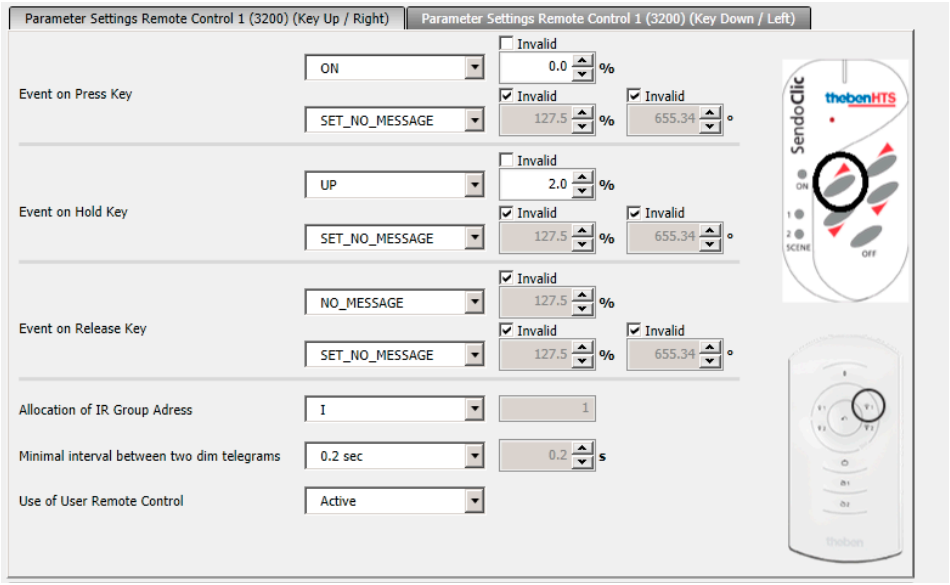
The presence detector channels and the theSenda S channels are linked via an IR group address. 2 IR group addresses are available for linking.

Operation of a lighting group requires that the presence detector channel IR group address and that of theSenda S channel match.

The selection of the IR group addresses enables the separation of neighbouring detectors controlled by the theSenda S user remote control. IR group addresses I and II are allocated permanently to 4 buttons on theSenda S user remote control, and cannot be changed. Further information can be found in the operating instructions of theSenda S.



Afterwards define the output state for every button in the plug-in for Remote Control 1 and Remote Control 2 and in the Scene Panel:

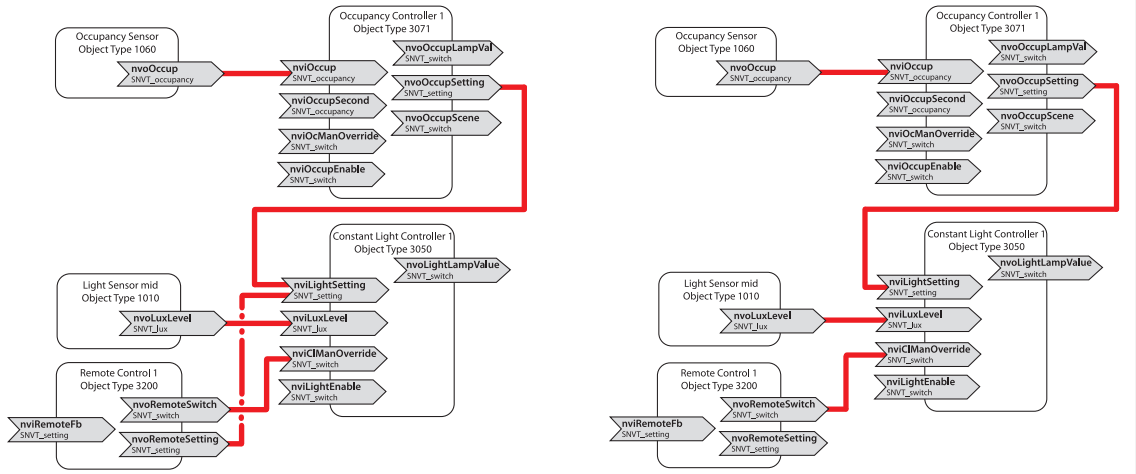


8.4 Examples of set IR group addresses

Subject	Chapter/page
One presence detector, one lighting channel	chapter 8.4.1 / page 52
One presence detector, two lighting channels	chapter 8.4.2 / page 53
A presence detector with one internal and external lighting channel each	chapter 8.4.3 / page 54
A presence detector with an internal lighting channel and external blinds	chapter 8.4.4 / page 55
Two presence detectors, each with a lighting channel with a shared SendoClic user remote control	chapter 8.4.5 / page 56
Two presence detectors, each with one lighting channel with separate SendoClic user remote control (restriction)	chapter 8.4.6 / page 57

8.4.1 One presence detector, one lighting channel

Description	One lighting channel of a presence detector is manually controlled with a user remote control. Constant light controller 1 of the presence detector is controlled with the user remote control.
Bindings	PlanoSpot 360 PSLON
	via nviSetting / Via nviSwitch

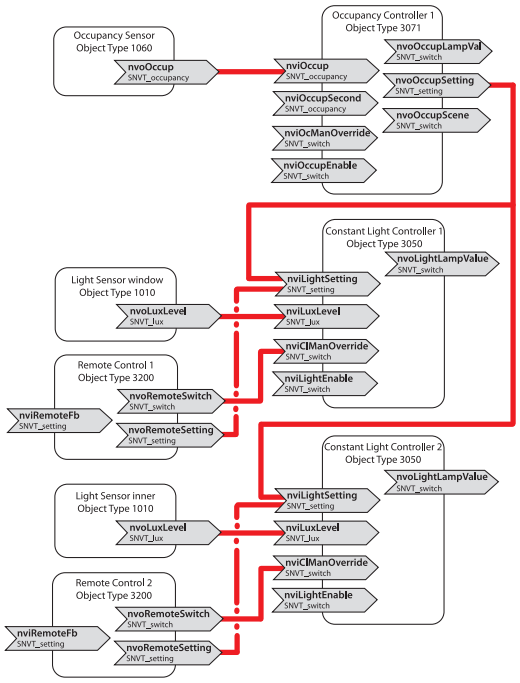


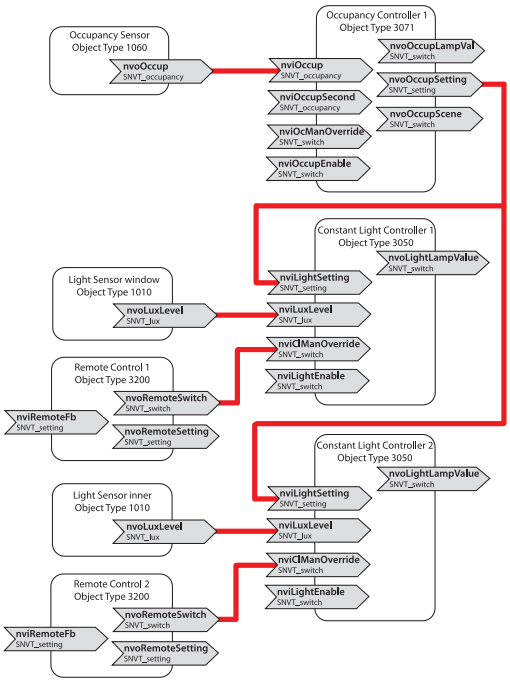
Parameters	PlanoSpot 360 PSLON						
	Remote Control 1						
	Parameter (via nviSetting)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_UP	2 %	invalid	SET_DOWN	2 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Parameter (via nviSwitch)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_UP	2 %		SS_DOWN	2 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	I					
	Shortest time between 2 telegrams	0.2 s					
	Use of the user app	Active					
	Remote Control 2						
	see settings for Remote Control 1						
	SendoClic						
	Operating control	Setting	Comment				
	Coding switch	1					

8.4.2 One presence detector, two lighting channels

Description	Two lighting channels of a presence detector are manually controlled with a user remote control. Constant light controller 1 of the presence detector is controlled with channel 1 of the user remote control. Constant light controller 2 of the presence detector is controlled with channel 2 of the user remote control.

Bindings	Via nviSetting	Via nviSwitch



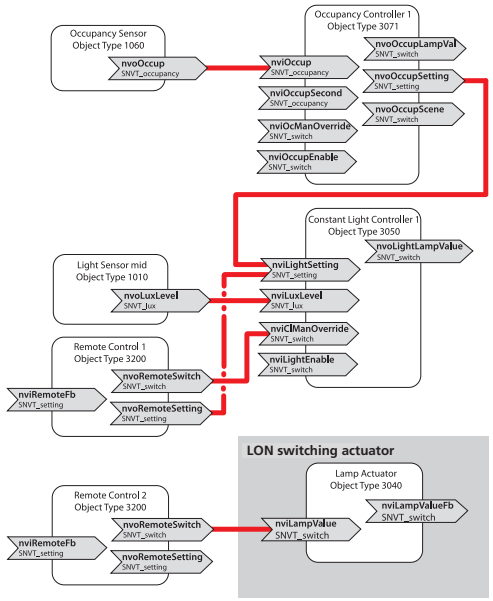


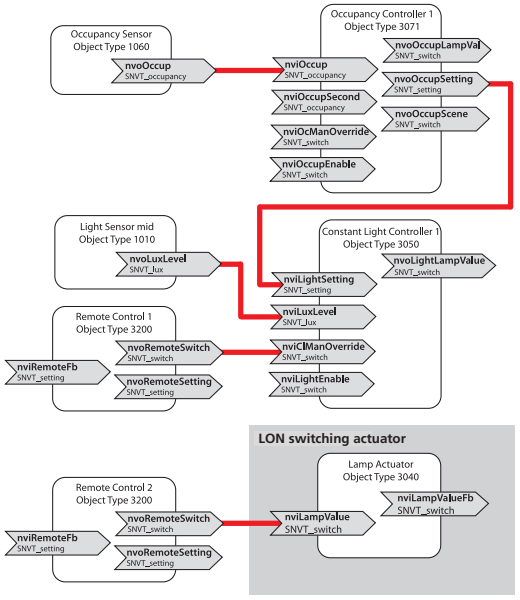
Parameters	PlanoSpot 360 PSLON						
	Remote Control 1						
	Parameter (via nviSetting)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_UP	2 %	invalid	SET_DOWN	2 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Parameter (via nviSwitch)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_UP	2 %		SS_DOWN	2 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	I					
	Shortest time between 2 telegrams	0.2 s					
	Use of the user app	Active					
	Remote Control 2						
	IR group address	II					
	All other parameters as with Remote Control 1						
	SendoClic						
	Operating control	Setting	Comment				
	Coding switch	2	The assignment of the SendoClic channels is changed via setting 4.				

8.4.3 A presence detector with one internal and external lighting channel each

Description	One lighting channel of a presence detector and an additional consumer, for example a channel of a switching or dimming actuator, are controlled with a user remote control. Constant light controller 1 of the presence detector is controlled with channel 1 of the user remote control. The channel of the switching or dimming actuator is controlled with channel 2 of the user remote control.

Bindings	Via nviSetting	Via nviSwitch



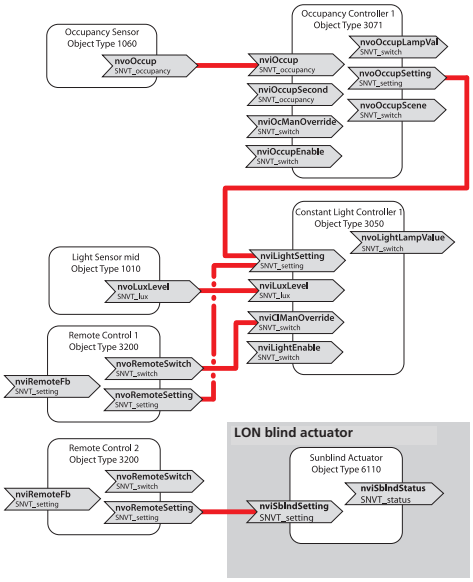


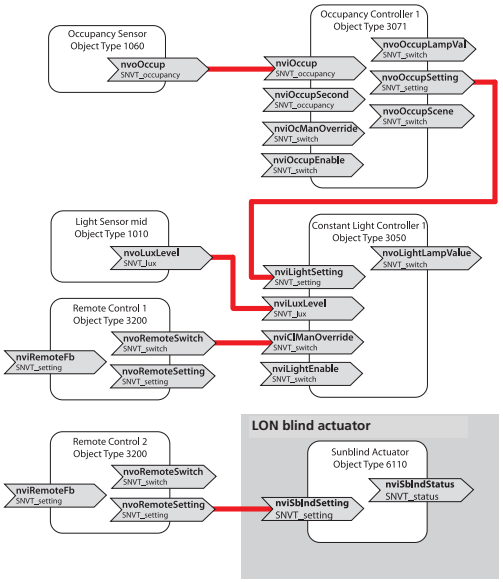
Parameters							
	PlanoSpot 360 PSLON						
	Remote Control 1						
	Parameter (via nviSetting)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_UP	2 %	invalid	SET_DOWN	2 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Parameter (via nviSwitch)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_UP	2 %		SS_DOWN	2 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	I					
	Shortest time between 2 telegrams	0.2 s					
	Use of the user app	Active					
	Remote Control 2						
	IR group address	II					
	All other parameters as with Remote Control 1 (parameter via nviSwitch)						
	SendoClic						
	Operating control	Setting	Comment				
	Coding switch	2	The assignment of the SendoClic channels is changed via setting 4.				

8.4.4 A presence detector with an internal lighting channel and external blinds

Description	One lighting channel of a presence detector and one set of blinds are manually controlled with a SendoClic user remote control. Constant light controller 1 of the presence detector is controlled with channel 1 of the user remote control. The channel of the blinds actuator is controlled with channel 2 of the user remote control.

Bindings	Via nviSetting	Via nviSwitch



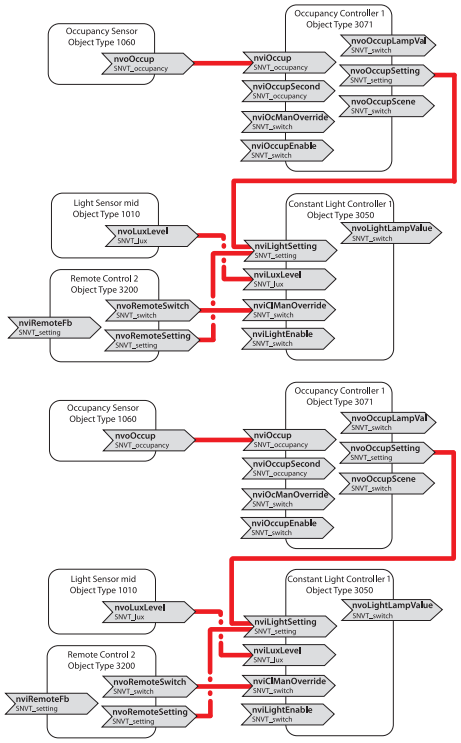


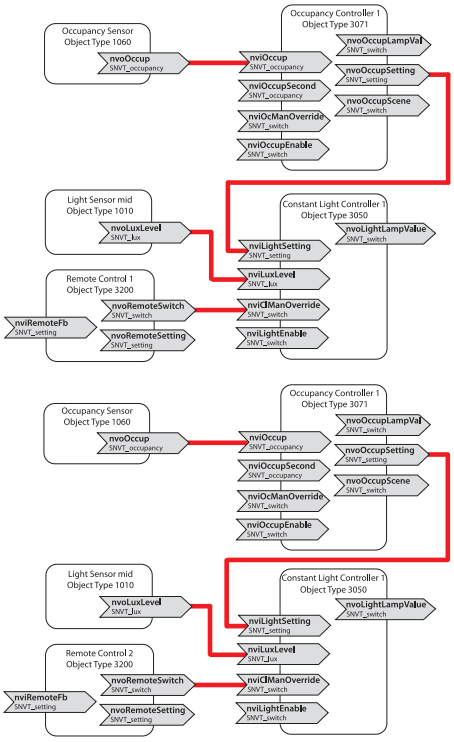
Parameters	PlanoSpot 360 PSLON					
	Parameter Remote Control 1 (via nviSetting)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_UP	2 %	invalid	SET_DOWN	2 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Parameter Remote Control 1 (via nviSwitch)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_UP	2 %		SS_DOWN	2 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	I					
	Shortest time between 2 telegrams	0.2 s					
	Use of the user app	Active					
	Parameter Remote Control 2	Button ▲			Button ▼		
	Event with short button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_DOWN	invalid	- 10 °	SET_UP	invalid	+ 10 °
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_OFF	0 %	invalid	SET_ON	100 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	II					
	All other parameters as with Remote Control 1						
	SendoClic						
	Operating control	Setting	Comment				
	Coding switch	2	The assignment of the SendoClic channels is changed via setting 4.				

8.4.5 Two presence detectors, each with a lighting channel with a shared SendoClic user remote control

Description	One lighting channel can be manually controlled by two presence detectors using a SendoClic user remote control. Constant light controller 1 of the first presence detector is controlled with channel 1 of the user remote control. Constant light controller 1 of the second presence detector is controlled with channel 2 of the user remote control.

Bindings	Via nviSetting	Via nviSwitch



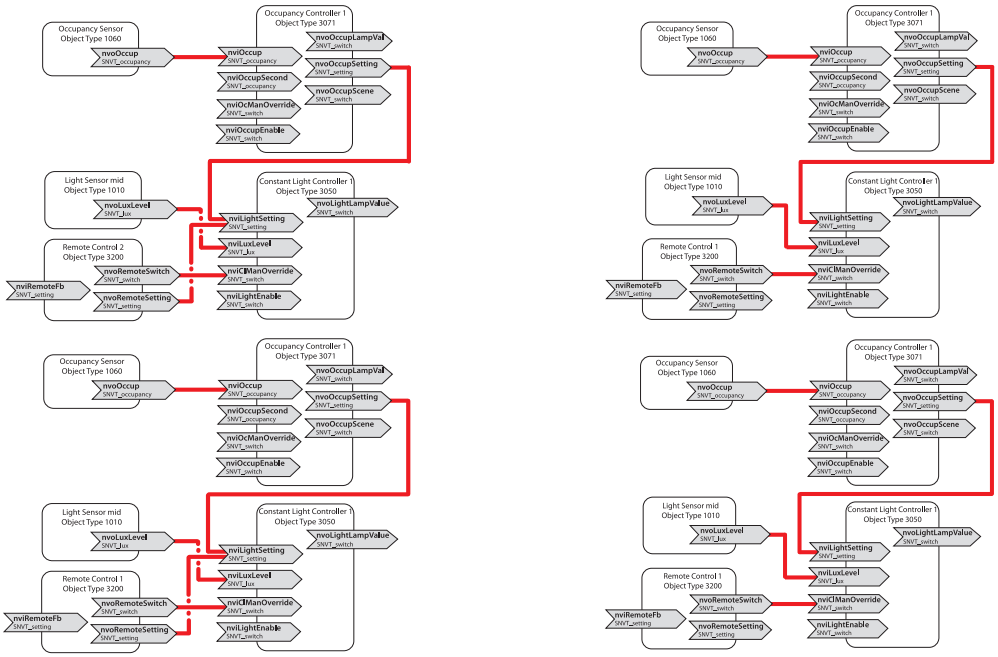


Parameters						
	PlanoSpot 360 PSLON detector 1					
	Parameter Remote Control 1 (via nviSetting)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_UP	2 %	invalid	SET_DOWN	2 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Parameter Remote Control 1 (via nviSwitch)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_UP	2 %		SS_DOWN	2 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	I					
	Shortest time between 2 telegrams	0.2 s					
	Use of the user app	Active					
	PlanoSpot 360 PSLON detector 2					
	Parameter Remote Control 1	Button ▲			Button ▼		
	IR group address	II					
	All other parameters as with detector 1						
	SendoClic					
	Operating control	Setting	Comment				
	Coding switch	2	The assignment of the SendoClic channels is changed via setting 4.				

8.4.6 Two presence detectors, each with one lighting channel with separate SendoClic user remote control (restriction)

Description	One lighting channel each is manually controlled by two presence detectors in the same room using two SendoClic user remote controls. The constant light controller 1 of the first presence detector is controlled with the bank of buttons on one SendoClic. The constant light controller 1 of the second presence detector is controlled with the bank of buttons of the other SendoClic.

Bindings	Via nviSetting	Via nviSwitch



Parameters						
	PlanoSpot 360 PSLON detector 1					
	Parameter Remote Control 1 (via nviSetting)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_UP	2 %	invalid	SET_DOWN	2 %	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Parameter Remote Control 1 (via nviSwitch)	Button ▲			Button ▼		
	Event with short button press	SS_ON	100 %		SS_OFF	0 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event with long button press	SS_UP	2 %		SS_DOWN	2 %	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	Event when released	SS_NO_MESSAGE	invalid		SS_NO_MESSAGE	invalid	
		SET_NO_MESSAGE	invalid	invalid	SET_NO_MESSAGE	invalid	invalid
	IR group address	I					
	Shortest time between 2 telegrams	0.2 s					
	Use of the user app	Active					
	PlanoSpot 360 PSLON detector 2					
	Parameter Remote Control 1	Button ▲			Button ▼		
	IR group address	II					
	All other parameters as with detector 1						
	SendoClic 1						
	Operating control	Setting	Comment				
	Coding switch	1					
	SendoClic 2						
	Operating control	Setting	Comment				
	Coding switch	2					

9. Troubleshooting

Fault/error	Cause
Light does not switch on or switches off during presence and darkness	Lux value is set too low; detector set on semi-automatic device; light was switched off manually via push button or remote control; person not within detection area; obstruction(s) interrupting detection; time delay set too short
Light stays on during presence despite sufficient brightness	Lux value is set too high; the light was just switched on manually via push button or remote control (wait 30 minutes); detector is in test mode
Light does not switch off or light switches on spontaneously during absence	Wait for time delay (self-learning); thermal sources of interference in the detection area: fan heaters, incandescent lamps / halogen spotlight, moving objects (e.g. curtains hanging in an open window)
Error flashing (4 x per second)	Malfunction during start-up phase or during operation; device is not fully functional!
Display of the error bits of the device status in the node object	3 error bits can be shown: Bit 0: invalid configuration variables (nci) in the EEPROM Bit 1: invalid configuration parameters (cp) Bit 2: Hardware malfunction Error bits 0 and 1 can be cleared by parameter download (resync with LNS database)