DALI-2 SI PRO
DALI-2 SI-1L PRO

Datasheet

Combi Sensor Module

DALI-2 sensor module for
the integration of sensors
with relay output
in DALI systems

Art.Nr. 89453477-P
Art.Nr. 89453477-1L-P

DALI-2 SI / SI-1L PRO Multifunctional Sensor Module

Overview

- Module with switching input for sensor input
- Easy integration of occupancy and movement sensors, contact switches, photoelectric barrier sensors etc.
- Application controller like DALI-2 CS (same functionality, and compatible for synchronisation)
- 4 operating modes:
    - Movement triggered
    - Movement triggered with constant light control*
    - Constant light control*
    - Light control (4 thresholds)*

  *****_for all light control a light sensor (DALI-2 CS,…) needs to be configured via synchronisation_
- Operating modes can be changed via scenes and external DALI commands
- Corridor function – second light level before off in case of absence
- Easy configuration via DALI-Cockpit Software Tool and Lunatone DALI USB interface.
- Multiple modules can be installed within a DALI system.
- Version with potential free input (DALI-2 SI PRO) and with input for mains (DALI-2 SI-1L PRO) are available
- Supply via the DALI bus, no additional power supply needed
- the compact device is suitable for back box installation

Specification, Characteristics

Type	**DALI-2 SI PRO**	**DALI-2 SI-1L PRO**
article number	89453477-P	89453477-1L-P
GTIN	GTIN 9010342013492	GTIN 9010342013492

DALI interface DA, DA		
output type	DALI, DALI-2, Multimaster	
terminal markings	DA, DA	
voltage range	9,5V … 22,5Vdc according to IEC62386	
typical current consumption DALI (16.5V)	5.1 mA	4.3 mA
max current consumption DALI (22.5V)	5.7 mA	4.8 mA
DALI addresses	none	
DALI-2 addresses	1	

input		
input type	potential free switching input	switching input for mains voltage
number of inputs	1	1
marking input terminals	T1, COM	LT1, N
input voltage range	--	230Vac +10% / -15%
input frequency	--	50Hz … 60Hz
input resistance	--	175kΩ
minimum length of control pulse	40ms	40ms

max wire length	5m	10m (up to 50m in an interference-free environment i.e. no parallel power lines)

insulation data

impulse voltage category	II	
pollution degree	2	
rated insulation voltage	250V	
insulation	reinforced isolation DALI / housing	reinforced isolation DALI / switching input (mains)
insulation test voltage	3000Vac DALI / housing	3000Vac DALI / switching input (mains)

environmental conditions

storing and transportation temperature	-20°C … +75°C
operational ambient temperature	-20°C … +60°C
rel. humidity, not condensing	15% … 90%

general data

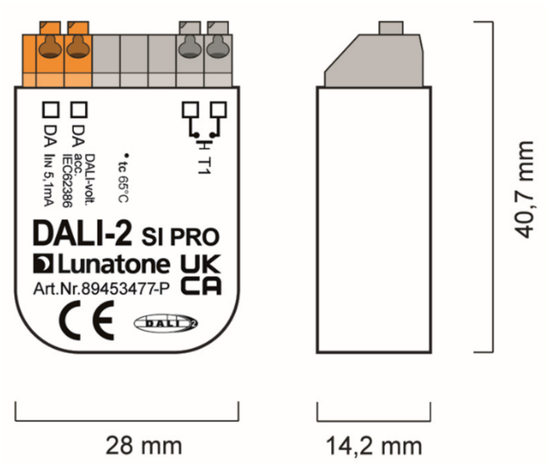
dimensions (l x w x h)	40mm x 28mm x 15mm	59mm x 33mm x 15mm
mounting	back box installation, installation in protection class II devices	
rated maximum temperature tc	65°C	75°C
expected life time	100.000h	
protection class	SKII (when used/installed as intended)	
protection degree	IP20	

terminals

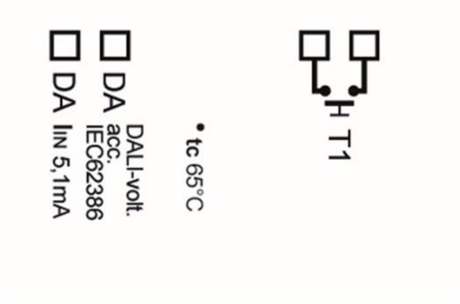
connection type	spring terminal connectors
wire size: solid core	0,5 … 1,5 mm^2 (AWG20 … AWG16)
wire size: fine wired	0,5 … 1,5 mm^2 (AWG20 …AWG16)
wire size: using wire end ferrule	0,25 … 1 mm^2
stripping length	8,5 … 9,5 mm / 0,33 … 0,37 inch
tightening/ release of wire	push mechanism

standards

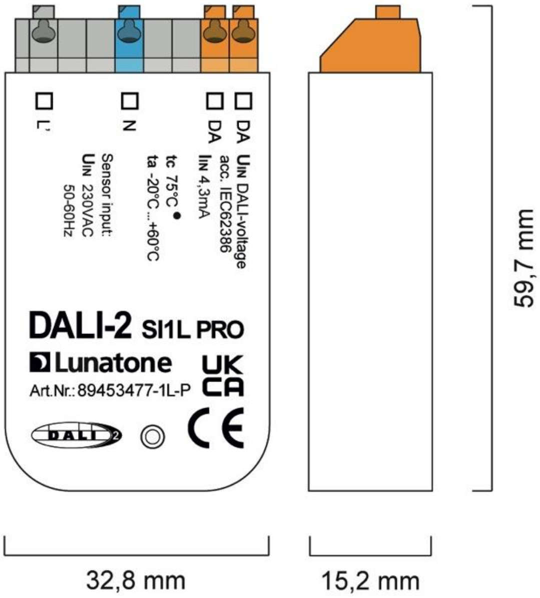
DALI	IEC62386-101:2014 IEC62386-103:2014 IEC62386-303
EMV	EN 61547 EN 50015 / IEC CISPR15
safety	EN 61347-2-11 EN 61347-1
Markings	DALI-2, CE, UKCA


DA
DA
DALI-volt.
acc.
IEC62386
IIN 5,1mA
tc 65°C
T1
DALI-2 SI PRO
Lunatone
UK CA
Art.Nr.89453477-P
CE
DALI 2
40,7 mm
28 mm
14,2 mm

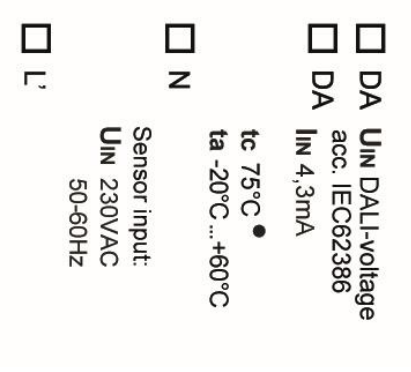
dimensions DALI-2 SI PRO


DA
DA
DALI-volt.
acc.
IEC62386
IIN 5,1mA
tc 65°C
T1

connection plan DALI-2 SI PRO

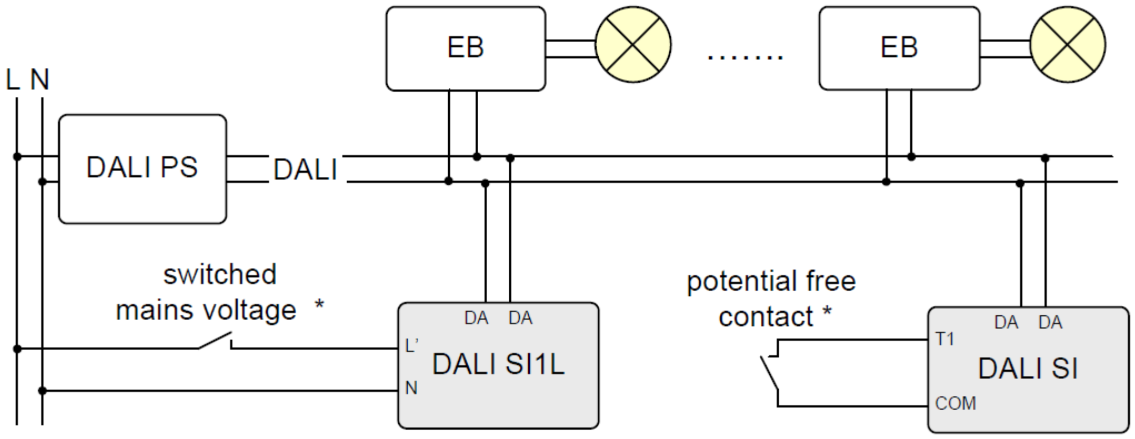

L'
N
DA
DA
UIN DALI-voltage
acc. IEC62386
IIN 4,3mA
tc 75°C
ta -20°C...+60°C
Sensor input:
UIN 230VAC
50-60Hz
DALI-2 SI1L PRO
Lunatone
UK CA
Art.Nr.:89453477-1L-P
DALI 2
CE
59,7 mm
32,8 mm
15,2 mm

dimensions DALI-2 SI 1L PRO


L'
N
DA
DA
UIN DALI-voltage
acc. IEC62386
IIN 4,3mA
tc 75°C
ta -20°C...+60°C
Sensor input:
UIN 230VAC
50-60Hz

connection plan DALI-2 SI 1L PRO

Typical Application


L N
DALI PS
DALI
EB
EB
....
switched
mains voltage *
DA DA
L'
N
DALI SI1L
potential free
contact *
DA DA
T1
COM
DALI SI

* typical devices with switching contact: light barrier, motion sensor, relay, switch

Factory Setting

For simple applications the factory settings are sufficient:

DALI-2 Settings	Application Controller – Master Mode
Operating Mode	Motion detection without constant light control**,** an external *ON command* deactivates motion detection until the next external *OFF command*
Effective range	Broadcast
ON command (1)	Recall Max
Hold Time (2)	10min
Absence value (3)	none
Hold Time Absence (4)	0s
OFF command (5)	Off
OnCMD threshold	none
Bright Out threshold	none
Power Up behaviour	no action
Constant light control (CLC)	inactive

Installation

- the DALI-2 SI / DALI-2 SI-1L PRO module gets connected and supplied by the DALI bus. A DALI bus power supply is required.
- The connection to the DALI terminals can be made regardless of polarity.
- The wiring should be carried out as a permanent installation in a dry and clean environment.
- Installation may only be carried out in a voltage-free state of the system and by qualified specialists.
- National regulations for setting up electrical systems must be followed.
- The DALI wiring can be realized with standard low-voltage installation material. No special cables are required.
- Only 1 wire may be connected to each terminal. When using double wire end ferrules, the connection capacity of the terminal must be considered.
- **DALI-2 SI PRO:** the maximum cable length of the button connections is 5m.
- **DALI-2 SI-1L PRO:** Switching input LT1 is intended for use with line voltage, it is galvanically separated from the DALI-line.

☞ **Attention:** The DALI-signal is not classified as SELV circuit (Safety Extra Low Voltage). Therefore, the installation regulations for low voltage apply.

☞ **Note:** The cross section: the voltage drop on the DALI line must not exceed 2V at maximum length (300m) and maximum bus load (250mA).

Cycle of Motion Detection

The motion detection is always processed according to the following sequence (Figure 2):

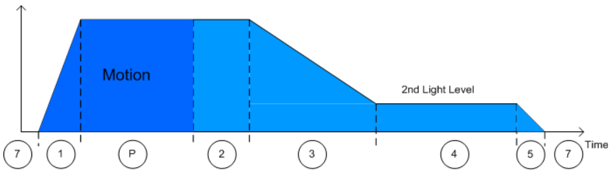


Figure. 1 motion/presence detection sequence

States:
1: Fade In Time – dim to 1st light level
2: Hold Time (On-State)
3: Fade Time – dim to 2nd light level
4: 2nd Hold Time (2nd Light Level)
5: Fade Out Time – dim to off
P: Presence detected - retrigger
7: Off

If motion is detected the sensor switches to the configured light level. While presence is detected (P) or the hold time is running (2) the light level stays on – either on a fix light level or controlled by a constant light control algorithm.
After the hold time, if not further motion was detected, the sensor changes the light level to the 2nd light level for a defined time (4). This 2nd light level is a user defined value (no constant light control). If motion is detected in this state, the sensor switches to the previous states (1, P). In case no further motion is detected the Off command (7) is sent

HINT: set the “absence level” to a low value, otherwise it could be higher than the light level set by the constant light control.

Steps Nr 1, 3 and 5 control the change between the states: 7/P/2/4/7. Depending on the DALI-commands for each state, the fade time can be used to allow smooth changes.

Functionality

The DALI-2 SI / SI1L PRO is an application controller (equivalent to a DALI-2 CS in *Master Mode*). It gives direct DALI control commands that are immediately executed by the DALI drivers. Other sensors can be used in to feed in information to the DALI-2 SI/SI-1L PRO via DALI-2 event messages (these sensors should be set to instance mode). These can be set up via “Synchronisation”.

Operating Modes

The SI/SI-1L PRO offers 4 different operating modes: motion control, motion control with constant light control, sole constant light control or light control via light thresholds.

Note: the DALI-2 SI PRO and DALI-2 SI-1L PRO do not include a light sensor. For operating modes with light control, a DALI light sensor is required that reports the light values to the DALI-2 SI / SI-1L PRO via DALI events (see section “Synchronization”).

External commands can also be used to influence the operating behaviour of the sensor (e.g. when operated via another control device). The reaction to such interventions is explained in detail for each operating mode.

Operating Mode 1 – motion control

- Movement activates a fixed light level

If movement is detected the time sequence is activated with a user defined fixed light level in State 2 (see Figure. 1 "Motion detection: sequence" on page 6). The light level stays active until no more movement is detected and the hold time has elapsed. Then the light level will be switched to the 2nd user defined light level.

Additional threshold values can be defined, such that the motion control is only active above or below this defined threshold.

The operating behaviour can be influenced by external on / off / dimming and scene commands. The options for each command are described on page 13

Operating Mode 2 – motion control with constant light control*

- Movement activates constant light control
- 2nd light level is user defined and constant

If movement is detected the time sequence is activated with constant light control in State 2 (see figure "Motion detection: sequence" on page 6). The constant light control stays active until no more movement is detected and the “Hold On Time” has expired. Then the light level will be switched to the 2nd light value, which is a fixed user defined value.

Additional threshold values can be defined: such that the motion and light control is only active above or below this defined threshold.

The operating behaviour can be influenced by external on / off / dimming and scene commands. The options for each command are described on page 13

***** *A DALI light sensor, linked in section “synchronisation” is required*

Operating Mode 3 – constant light control*

- Constant light Control
- No motion detection

In this operating mode, only the light sensor is used; motion detection is inactive. The constant light control can be switched on and off with DALI commands (e.g. from a control device such as a DALI light switch).

The operating behaviour can be influenced by external on / off / dimming and scene commands. The options for each command are described on page 16.

***** *A DALI light sensor, linked in section “synchronisation” is required*

Operating Mode 4 – light threshold control*

- Light control via light thresholds
- No motion detection

Only the light sensor is used in this operating mode. Both motion detection and constant light control are inactive. 4 light thresholds can be defined which trigger a DALI command on either falling below or exceeding the threshold. 2 of the 4 thresholds can be used to send commands repeatedly. The commands are sent at a user-defined interval until the threshold condition is no longer met.

The operating behaviour can be influenced by external scene commands. The options are described on page 17.

***** *A DALI light sensor, linked in section “synchronisation” is required*

Additional Functionality

Response to external DALI commands

The behaviour of the control in the event of external commands (e.g. by a switch) can be configured with the DALI cockpit. Depending on the operating mode, different behaviours are possible. The options are described later in the document.

The following commands sent to the same destination address (1st address) are interpreted as an **ON command**:

RECALL MAX
RECALL MIN
ON AND STEP UP
Light level (DAP)>0%
GO TO LAST ACTIVE LEVEL
GOTO SCENE X (if the command was configured to be interpreted as an ON command for the SI / SI-1L PRO)

The following commands sent to the same destination address are interpreted as an **OFF command**:

OFF
Light level (DAP) =0
GOTO SCENE X (if configured to be interpreted as an OFF command for the SI / SI-1L PRO)

Dimming commands: In addition, it can be specified how the motion control or light control should behave when manual dimming commands (UP/DOWN) to the target address (1. Destination address) occurs.

On and Bright Out threshold

The motion sensor function can be adapted to the ambient light behaviour with the help of the On- and Off-Threshold.

ON Command threshold: The motion detection sequence can be started independent from the actual light level (default) or if the light level is above or below the OnCmd-threshold.
For a running motion sequence the presence detection – retriggering the sequence on motion - can either be set independent from the actual light level or only if the light level is below the **Bright out threshold**.
Bright out- Application example: Car Park lighting, that is set ON during the night (if measured light level < 70lux) but should not be kept ON during the day even though there might be constant detection of motion.

Power-On behaviour

It is possible to configure a start-up command to achieve a defined operating state after power on (return of the bus voltage). The start-up command can either be a DALI-command or a fast run of the motion detection sequence.

Multiple sensors in same group

The option “Synchornisation” is used for adding light control to the DALI-2 SI / SI-1L PRO or if several sensors need to cover the same detection area (e.g. a corridor with multiple sensors).

In the DALI Cockpit software (tab: "Synchronisation") the sensor addresses used for motion detection and sensor addresses used for light detection can be specified.

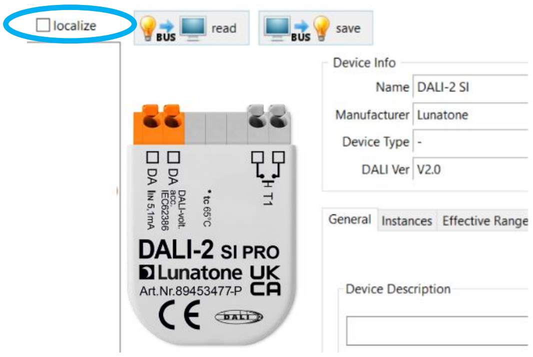
The DALI-2 SI / SI-1L PRO take over the control (Master-Mode) all other sensors should be set to Instance mode (Slave Mode) and only send out event messages. The instance settings are automatically configured by the DALI-2 SI/SI-1L PRO in the specified addresses.

Backward compatibility for older generation CS is made possible by the option “Backward compatibility with eDALI CS”. Definition of the same effective range (target address 1) automatically synchronizes older generation sensors. The parameters of the sensors should be coordinated, especially the hold on times.

Configuration in DALI-Cockpit

The addressing and configuration of the DALI SI / SI-1L PRO can be done easily with the help of the DALI Cockpit software tool and a suitable interface module (DALI USB, DALI 4Net, DALI SCI RS232). After an address has been assigned the parameters can be configured to fit the application.

For localisation a buzzer is integrated in each DALI-2 MC device. Alternatively, the allocation can also be done via the serial number of the device.

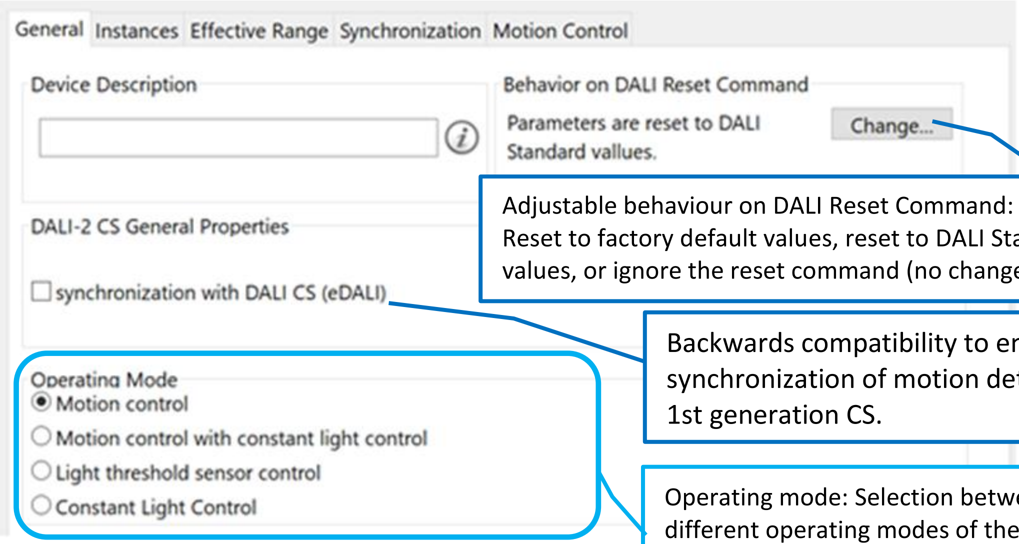

☐ localize
BUS read
BUS save
DALI-2 SI PRO
Lunatone
Art.Nr.89453477-P
General
Instances
Effective Range
Device Description

Device Info
Name: DALI-2 SI
Manufacturer: Lunatone
Device Type: -
DALI Ver: V2.0

Configuration of the module is possible with the settings on the different tabs, explained in detailed on the following pages.

Tab: “General“ – Sensor mode, Operating Mode:

Selection of the operating mode is made on the “General” tab, see Figure. 2. Depending on the selection the remaining tabs will be adapted accordingly. Additionally on tab general the behaviour of the module on a DALI Reset command can be set: ignore the reset command, change settings to DALI standard settings (only instance values are effected), change settings to Lunatone delivery default.


General
Instances
Effective Range
Synchronization
Motion Control
Device Description
Behavior on DALI Reset Command
Change...
DALI-2 CS General Properties

Parameters are reset to DALI Standard vallues.

☐ synchronization with DALI CS (eDALI)

Operating Mode
● Motion control
○ Motion control with constant light control
○ Light threshold sensor control
○ Constant Light Control

Adjustable behaviour on DALI Reset Command:
Reset to factory default values, reset to DALI Standard values, or ignore the reset command (no changes to settings)

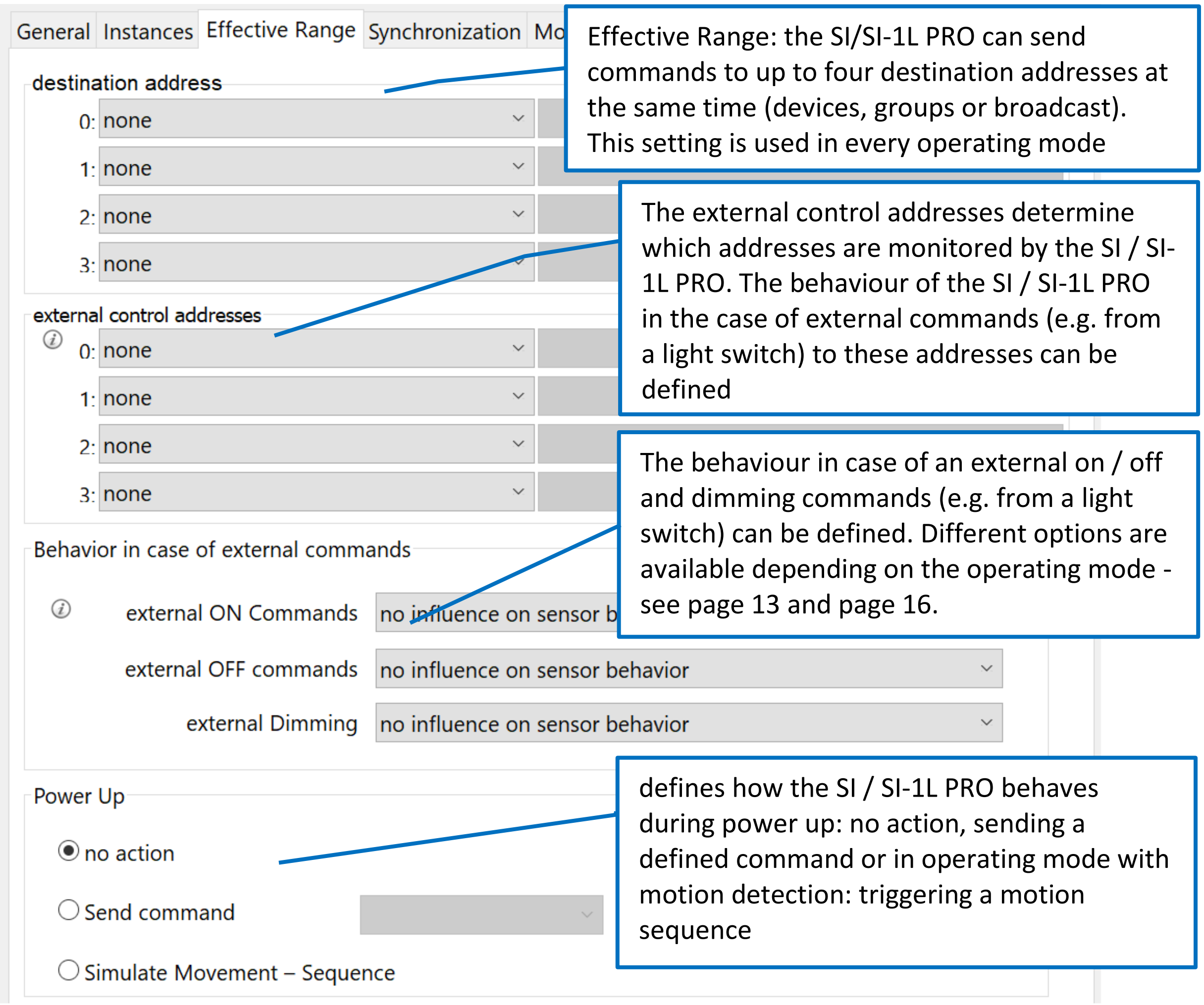
Backwards compatibility to enable synchronization of motion detection with 1st generation CS.

Operating mode: Selection between the four different operating modes of the application controller. - Description of the operating modes see section "Operating modes" on page 6

Figure. 2 Tab: “General“ – sensor mode, operating mode

Tab: "Effective range" - effective range, external control and power-up behaviour

See Figure. 3. On this tab the effective range of is defined: which DALI-gears are controlled. In addition, external control addresses can be defined, which the DALI-2 SI/SI-1L PRO monitors. The behaviour of the DALI-2 SI / SI-1L PRO in case of other control units sending commands to these addresses can be defined. This way, manual control of lights via a switch can be realised, without interference of the motion detection or constant light control.



destination address

0: none
1: none
2: none
3: none

external control addresses

0: none
1: none
2: none
3: none

Behavior in case of external commands

external ON Commands: no influence on sensor b
external OFF commands: no influence on sensor behavior
external Dimming: no influence on sensor behavior

Power Up

● no action
○ Send command
○ Simulate Movement – Sequence

Effective Range: the SI/SI-1L PRO can send commands to up to four destination addresses at the same time (devices, groups or broadcast). This setting is used in every operating mode

The external control addresses determine which addresses are monitored by the SI / SI-1L PRO. The behaviour of the SI / SI-1L PRO in the case of external commands (e.g. from a light switch) to these addresses can be defined

The behaviour in case of an external on / off and dimming commands (e.g. from a light switch) can be defined. Different options are available depending on the operating mode - see page 13 and page 16.

defines how the SI / SI-1L PRO behaves during power up: no action, sending a defined command or in operating mode with motion detection: triggering a motion sequence

Figure. 3 Tab: “Effective Range“ – destination address and external control address

Tab: “Synchronization” – sensor input and Slaves

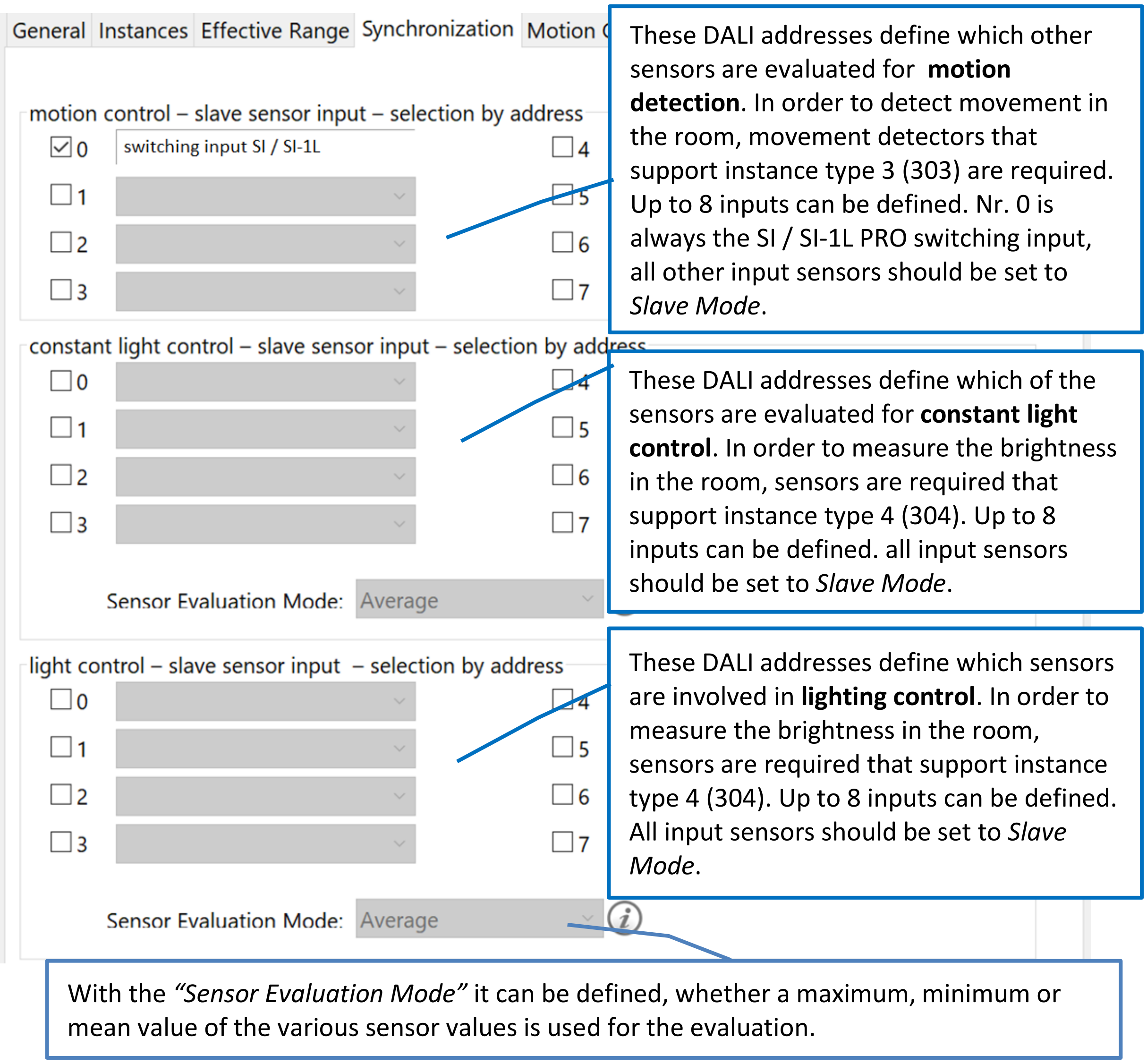
See Figure. 4. To include other sensor measurements into the evaluation, additional DALI-2 CS or other DALI-2 sensors can be selected as sensor inputs.
The instance settings of the selected DALI-2 sensors are automatically configured correctly by the DALI-2 SI / SI-1L PRO. DALI-2 CS that are used as sensor inputs should additionally be set to “slave mode” (disable application controller). Depending on the operating mode, different sensors input for each sensor-functionality can be defined

for “*Motion detection*”:
- input for movement,
- input for light thresholds

for “*Motion detection with constant light control*”:
- input for movement,
- input for light thresholds,
- input for constant light control

for “*Constant light control”:*
- input for constant light control

for “*Light control*”:
- input for light thresholds.



motion control – slave sensor input – selection by address
☑ 0 switching input SI / SI-1L
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7

constant light control – slave sensor input – selection by address
☐ 0
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
Sensor Evaluation Mode: Average

light control – slave sensor input – selection by address
☐ 0
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
Sensor Evaluation Mode: Average

These DALI addresses define which other sensors are evaluated for **motion detection**. In order to detect movement in the room, movement detectors that support instance type 3 (303) are required. Up to 8 inputs can be defined. Nr. 0 is always the SI / SI-1L PRO switching input, all other input sensors should be set to *Slave Mode*.

These DALI addresses define which of the sensors are evaluated for **constant light control**. In order to measure the brightness in the room, sensors are required that support instance type 4 (304). Up to 8 inputs can be defined. all input sensors should be set to *Slave Mode*.

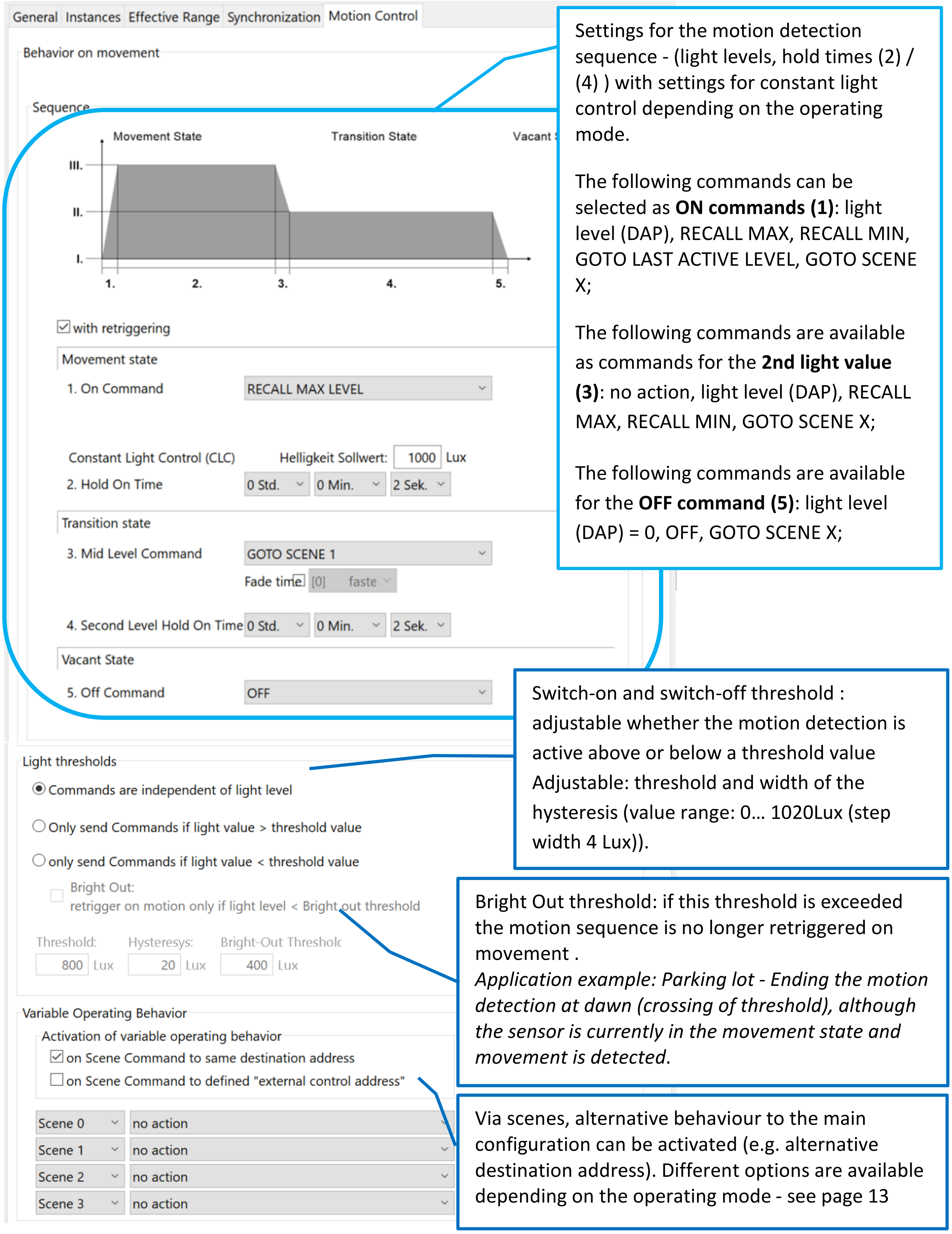
These DALI addresses define which sensors are involved in **lighting control**. In order to measure the brightness in the room, sensors are required that support instance type 4 (304). Up to 8 inputs can be defined. All input sensors should be set to *Slave Mode*.

With the *“Sensor Evaluation Mode”* it can be defined, whether a maximum, minimum or mean value of the various sensor values is used for the evaluation.

Figure. 4 Tab: “Synchronisation“ – sensor inputs for measurement evaluation

Tab: “Motion Control“

See Figure. 5, in this tab, the times and light levels of the motion detection sequence, that is triggered by movement, can be defined. As well as the light thresholds to activate the motion detection depending on the lighting conditions. (operating mode description see page 6 and page 7)



☑ with retriggering

Movement state

1. On Command: RECALL MAX LEVEL

Constant Light Control (CLC) Helligkeit Sollwert: 1000 Lux

2. Hold On Time: 0 Std. 0 Min. 2 Sek.

Transition state

3. Mid Level Command: GOTO SCENE 1

Fade time ☐ [0] faste

4. Second Level Hold On Time: 0 Std. 0 Min. 2 Sek.

Vacant State

5. Off Command: OFF

Light thresholds

● Commands are independent of light level

○ Only send Commands if light value > threshold value

○ only send Commands if light value < threshold value

☐ Bright Out:
retrigger on motion only if light level < Bright out threshold

Threshold: 800 Lux
Hysteresys: 20 Lux
Bright-Out Threshol 400 Lux

Variable Operating Behavior

Activation of variable operating behavior

☑ on Scene Command to same destination address

☐ on Scene Command to defined "external control address"

Scene 0	no action
Scene 1	no action
Scene 2	no action
Scene 3	no action

Settings for the motion detection sequence - (light levels, hold times (2) / (4)) with settings for constant light control depending on the operating mode.

The following commands can be selected as **ON commands (1)**: light level (DAP), RECALL MAX, RECALL MIN, GOTO LAST ACTIVE LEVEL, GOTO SCENE X;

The following commands are available as commands for the **2nd light value (3)**: no action, light level (DAP), RECALL MAX, RECALL MIN, GOTO SCENE X;

The following commands are available for the **OFF command (5)**: light level (DAP) = 0, OFF, GOTO SCENE X;

Switch-on and switch-off threshold : adjustable whether the motion detection is active above or below a threshold value Adjustable: threshold and width of the hysteresis (value range: 0… 1020Lux (step width 4 Lux)).

Bright Out threshold: if this threshold is exceeded the motion sequence is no longer retriggered on movement .
Application example: Parking lot - Ending the motion detection at dawn (crossing of threshold), although the sensor is currently in the movement state and movement is detected.

Via scenes, alternative behaviour to the main configuration can be activated (e.g. alternative destination address). Different options are available depending on the operating mode - see page 13

Figure. 5 Tab: „motion detection control“

Motion Control - Behaviour with external commands

The operating behaviour can be influenced by external commands (e.g. from a DALI-switch).

In the Cockpit tab "Effective range", the behaviour of the sensor on ON- / OFF- and dimming commands, sent to the 4 configurable "external control addresses", can be defined.

Additionally, the operating behaviour of the sensor can be changed with scene commands, via the tab "Motion detection" -section: Variable Operating Behaviour.

The following settings are available:

Operating mode 1 – motion detection

An external **ON command**
No influence: the ON command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
External control: motion control is deactivated (The SI / SI-1L PRO does not send any DALI commands), until manually reactivated by an external OFF command.
Simulate movement: start the Motion Detection Sequence (Figure. 1, page 6)

An external **OFF command**
No influence: the OFF command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
Waiting for motion: change to State 5 and then to OFF state (state 7,Figure. 1), motion detection active - waiting for motion
Disable sensor control: change to state 5 and then to OFF state (state 7,Figure. 1), the motion detection is deactivated until reactivated by an ON command.

an external **DIMMING command:**
No influence: the DIMMING command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
External control: motion control is deactivated (The SI / SI-1L PRO does not send any DALI commands), until manually reactivated by an external OFF command.
Change light level until end of sequence: the On command light level (State 2, Figure. 1) is changed by dimming. The new light level is retained for the current movement detection sequence

Variable Operating Behaviour - An external **SCENE command**
No action: the SCENE command is ignored by the SI / SI-1L PRO.
Reset to Default: The SI / SI-1L PRO is set to the basic configuration, all previously forced changes to the operating behaviour are terminated.
Alternative destinations: An alternative destination address (user defined) is used instead of the configured standard destination.
Alternative ON Command Light Level DAP: Instead of the currently configured light level DAP command, the alternatively defined DAP is used in state 2 (Motion Detection Sequence Figure. 1).
Alternative ON Command SCENE Instead of the currently configured scene command, the alternatively defined scene is used in state 2 (Motion Detection Sequence Figure. 1, page 6).
Waiting for motion: go to State 5 and then to OFF state (state 7,Figure. 1),. motion detection active - waiting for motion

Operating Mode 2 – motion detection with constant light control

An external **ON command**
No Influence: the ON command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
External control: Constant light control and motion control are deactivated (The SI / SI-1L PRO does not send any DALI commands). until

they are reactivated by an external OFF command.

Simulate movement: start the Motion Detection Sequence (Figure. 1, page 6)

Simulate movement without constant light control: Starts the motion detection sequence (State 1, Figure. 1) and deactivates the constant light control. The sent ON command is executed instead of constant light control. The constant light control is temporarily deactivated until the OFF-state (state 7,Figure. 1) is reached.

Constant Light Control: The motion detection is deactivated and constant light control is permanently active until it is cancelled by an OFF command. (Standard behaviour is thereby reactivated)

An **external OFF command**

No Influence: the OFF command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured

Waiting for motion: Got to OFF state - go to State 5 and then to OFF state (state 7,Figure. 1), motion detection active - waiting for motion

Disable sensor control: change to state 5 and then to OFF state (state 7,Figure. 1) , the motion detection is deactivated until reactivated by an ON command. Enables: *„Off Only “: if the SI / SI-1L PRO should only send an off command after a manual on (simulate movement) after the hold time has expired*

an **external DIMMING command:**

no influence: the DIMMING command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured

External control: Constant light control and motion control are deactivated (the SI / SI-1L PRO does not send any DALI commands) until they are reactivated by an OFF command.

Disable constant light control until end of sequence: constant light control is deactivated temporarily during Motion Detection Sequence (State 2). Automatic reactivation of constant light control after end of sequence

Change constant light control reference light level until end of sequence: the reference light level for constant light control is changed by dimming. If no dimming process is detected for 2 seconds, the current light value is adopted as the new setpoint for the constant light control. The new setpoint is only retained for the current movement detection sequence (as long as movement is detected).

Change constant light control reference light level: the reference light level for constant light control is changed by dimming. If no dimming process is detected for 2 seconds, the current light value is adopted as the new setpoint for the constant light control.

Variable Operating Behaviour -

An **external SCENE command**

No action: the SCENE command is ignored by the SI / SI-1L PRO

Reset to defaults: The SI / SI-1L PRO is set to the basic configuration, all previously forced changes to the operating behaviour are terminated.

Alternative destinations: An alternative destination address (user defined) is used instead of the configured standard destination.

Alternative ON Command Light Level DAP: Instead of the currently configured light level DAP command, the alternatively defined DAP is used in state 2 (Motion Detection Sequence Figure. 1).

Alternative ON Command SCENE Instead of the currently configured scene command, the alternatively defined scene is used in state 2 (Motion Detection Sequence Figure. 1, page 6).

Alternative constant light control reference light level: Instead of the current reference value an alternative user defined light level is used

Disable Constant Light Control until end of sequence: constant light control is deactivated temporarily during Motion Detection Sequence (State 2). Automatic reactivation of constant light control once no more movement is detected.

external control: Constant light control and motion control are deactivated. The SI / SI-1L PRO does not send any DALI commands.
Waiting for motion: Got to OFF state - go to State 5 and then to OFF state (State 7,Figure. 1) motion detection active - waiting for motion

Tab: „Light Control“

Depending on the selected operating mode:

Operating mode: Constant light control
For constant light control, a configured DALI-2 sensor is required under “Synchronization”

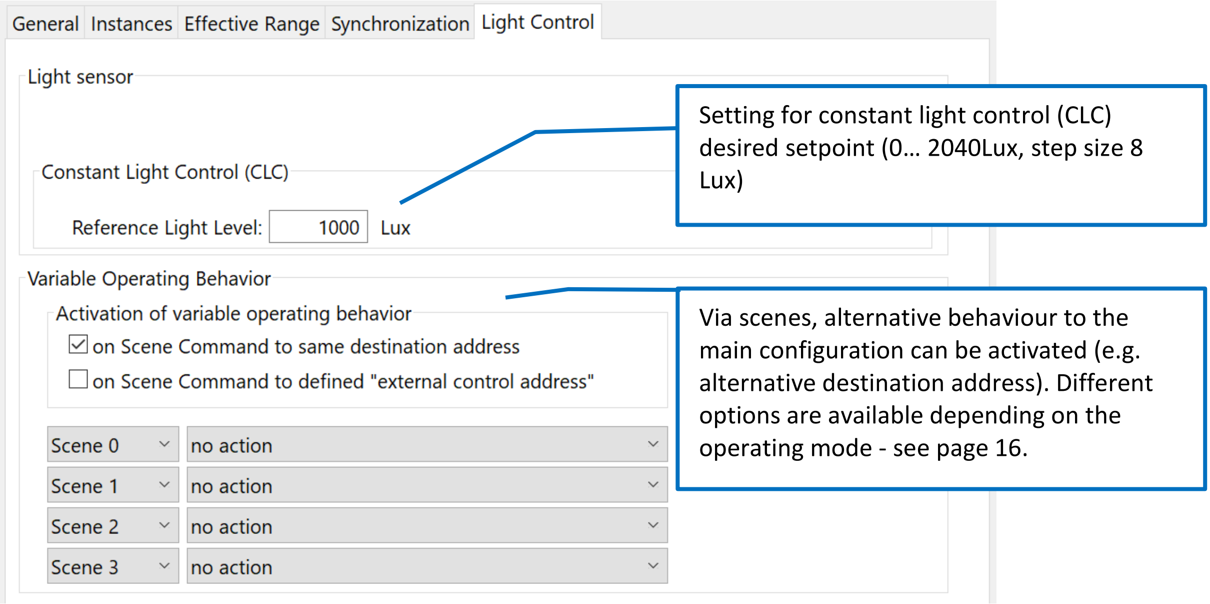
See Figure. 6. The tab “light control” contains the settings for constant light control (CLC) if the Operating mode: "constant light control" was selected.

Operating mode: Light threshold control
For the light threshold control, a configured DALI-2 sensor is required under “Synchronization”

See *Figure. 7*. If the Operating Mode: "Light-controlled” was selected the light sensor control functions as a threshold switch.

A maximum of 4 thresholds can be defined. The defined DALI commands will be executed if the values are exceeded or fallen below of.

2 of the 4 available thresholds can also be used to send commands periodically. The commands are sent at a user-defined interval until the threshold condition is no longer met.


General
Instances
Effective Range
Synchronization
Light Control
Light sensor
Constant Light Control (CLC)
Variable Operating Behavior
Activation of variable operating behavior

Reference Light Level: 1000 Lux

☑ on Scene Command to same destination address

☐ on Scene Command to defined "external control address"

Scene 0 no action

Scene 1 no action

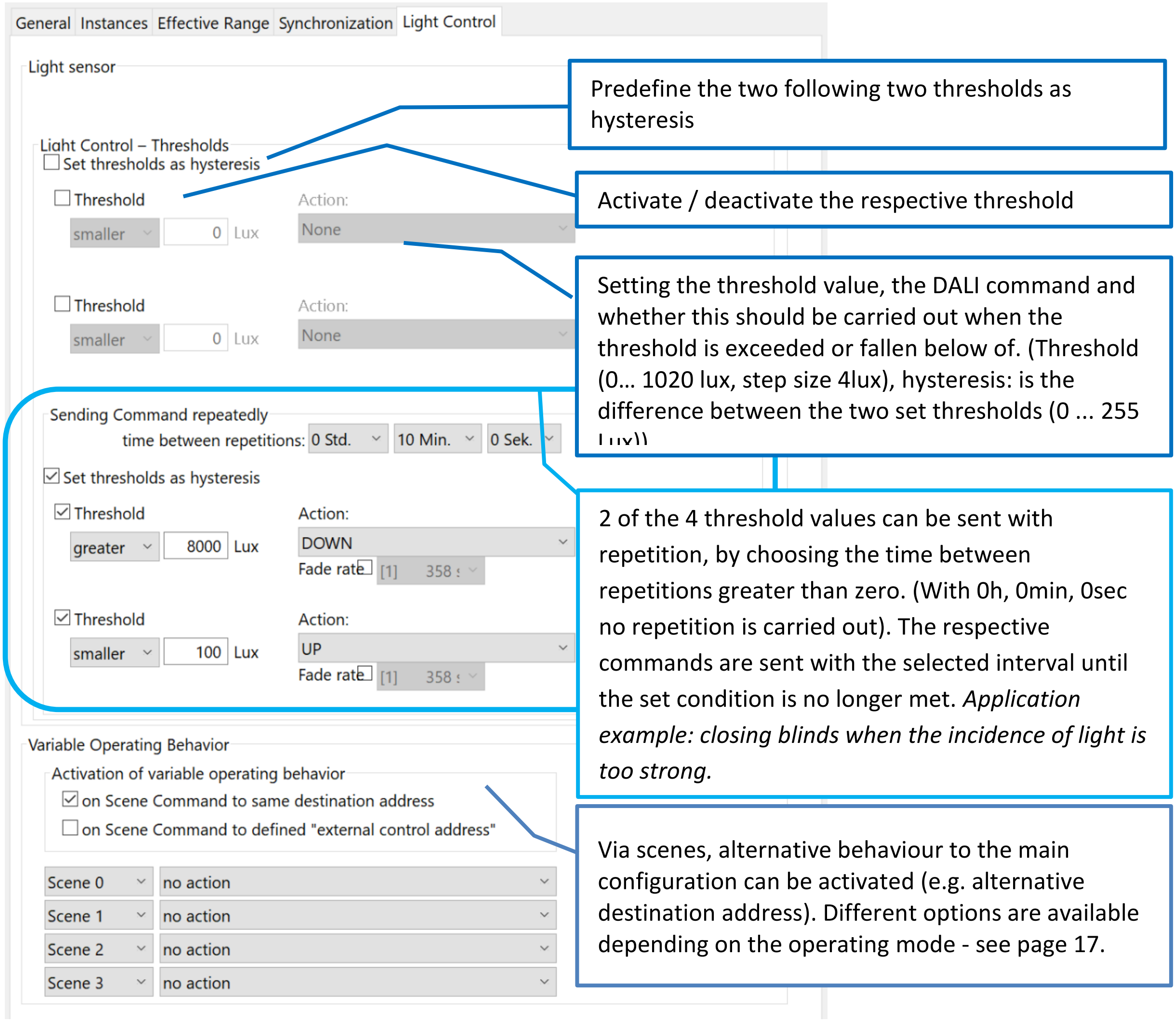
Scene 2 no action

Scene 3 no action

Setting for constant light control (CLC) desired setpoint (0… 2040Lux, step size 8 Lux)

Via scenes, alternative behaviour to the main configuration can be activated (e.g. alternative destination address). Different options are available depending on the operating mode - see page 16.

Figure. 6 Tab: „Light Control“ – Operating Mode : with constant light control



Light sensor

Light Control – Thresholds

☐ Set thresholds as hysteresis

☐ Threshold — Action:
smaller 0 Lux — None

☐ Threshold — Action:
smaller 0 Lux — None

Sending Command repeatedly
time between repetitions: 0 Std. 10 Min. 0 Sek.

☑ Set thresholds as hysteresis

☑ Threshold — Action:
greater 8000 Lux — DOWN
Fade rate ☐ [1] 358 s

☑ Threshold — Action:
smaller 100 Lux — UP
Fade rate ☐ [1] 358 s

Variable Operating Behavior

Activation of variable operating behavior
☑ on Scene Command to same destination address
☐ on Scene Command to defined "external control address"

Scene 0 — no action
Scene 1 — no action
Scene 2 — no action
Scene 3 — no action

Predefine the two following two thresholds as hysteresis

Activate / deactivate the respective threshold

Setting the threshold value, the DALI command and whether this should be carried out when the threshold is exceeded or fallen below of. (Threshold (0… 1020 lux, step size 4lux), hysteresis: is the difference between the two set thresholds (0 ... 255

2 of the 4 threshold values can be sent with repetition, by choosing the time between repetitions greater than zero. (With 0h, 0min, 0sec no repetition is carried out). The respective commands are sent with the selected interval until the set condition is no longer met. *Application example: closing blinds when the incidence of light is too strong.*

Via scenes, alternative behaviour to the main configuration can be activated (e.g. alternative destination address). Different options are available depending on the operating mode - see page 17.

Figure. 7 Tab: „Light Control“ -Operating Mode: without constant light control

Light Control - Behaviour with external commands

The operating behaviour can be influenced by external commands (e.g. from a DALI-switch).

In the Cockpit tab "Effective range", the behaviour of the sensor on ON- / OFF- and dimming commands, sent to the 4 configurable "external control addresses", can be defined.

Additionally, the operating behaviour of the sensor can be changed with scene commands, via the tab "Motion detection" -section: Variable Operating Behaviour.

The following settings are available:

Operating Mode 3 – constant light control

An **external ON command**
No influence: the ON command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
External control: the constant light control is deactivated. (the SI / SI-1L PRO does not send any DALI commands), until reactivated by an external OFF command.
Enable constant light control: The constant light control is activated.

An **external OFF command**
No influence: the OFF command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
Disable constant light control: The constant light control is deactivated.

an **external DIMMING command:**
No influence: the DIMMING command is ignored by the SI / SI-1L PRO. The SI / SI-1L PRO continues to carry out the control as configured
Disable constant light control temporarily: constant light control is deactivated until the next OFF command.
Change constant light control reference light - temporary: the reference light level for constant light control is changed by dimming. If no further dimming process is detected for 2 seconds, the current light value is adopted as the new setpoint for the constant light control. The new setpoint is only retained until the next OFF command.
Change constant light control reference light level -general: the reference light level for constant light control is changed by dimming. If no dimming process is detected for 2 seconds, the current light value is adopted as the new setpoint for the constant light control.

Variable Operating Behaviour - An **external SCENE command**
No action: the SCENE command is ignored by the SI / SI-1L PRO
Reset to Default: The SI / SI-1L PRO is set to the basic configuration, all previously forced changes to the operating behaviour are terminated.
Alternative destinations: An alternative destination address (user defined) is used instead of the configured standard destination.
Alternative constant light control reference light level: Instead of the current reference value an alternative user defined light level is used
Enable constant light control: The constant light control is activated.
External Control: The constant light control is deactivated (the SI / SI-1L PRO does not send any DALI commands).

Operating Mode 4 – light threshold control

Variable Operating Behaviour - An **external SCENE command**
No action: the SCENE command is ignored by the SI / SI-1L PRO
Reset to Defaults: The SI / SI-1L PRO is set to the basic configuration, all previously forced changes to the operating behaviour are terminated.
Alternative Destinations: An alternative destination address (user defined) is used instead of the configured standard destination.
External control: the light threshold control is deactivated (the SI / SI-1L PRO does not send any DALI commands).

Instances

The DALI-2 SI PRO and DALI-2 SI1L PRO Integration support an instance standardized according to DALI: motion detector instance (303) for motion detection.

Instance Nr. 0: Type motion detector

Instances – General

enable/disable

If instances are not required, their event messages can be deactivated. In this case, event messages are not sent, and the measured values are not updated. They can, however, still be queried via a “Query” command, and the DALI-2 configuration commands and queries are still supported.

Instance group

Up to three instance groups can be assigned for each instance. Only the "Primary Group" is used for the event.

Instance type

The instance type defines which DALI-2 standard is valid for this instance. (The different instance types are specified in the DALI-2 standard.)

Instance number

Each instance in a device has a unique instance number.

Device group

The device can be assigned to up to 32 device groups (0...31). The lowest device group is used for the event.

Device address

A device address (or short address) (0..63) can be assigned to each device. With this the device can be clearly addressed. (Identical short addresses should be avoided.)

Event Scheme

The event scheme determines which information is transferred with the event. This information is required, to enable recognition and / filtering of events on the bus. The following 5 options are available:

- Instance addressing:
  instance type and instance number
- Device Addressing:
  device address and instance type
- Device/Instance Addressing:
  device address and instance number
- Device Group Addressing:
  Device group and instance type
- Instance Group Addressing:
  Instance group and instance type

Event priority

The event priority determines the order in which events are sent when they occur simultaneously on the bus. Priority 2 = highest and 5 = lowest.

Dead Time

The dead time can be set for each instance. It determines the time that must pass before an event can be sent again. This also applies if the event information (measured value) changes. If no dead time is required, it can be deactivated.

Instance 0 – Motion

Is an instance standardized by DALI-2 (62386-303), for sensors that detect motion. All settings are implemented according to the standard. The instance is DALI-2 certified.

The sensor switches between the following states:

- People in the room and movement (0xFF)
- People in the room and no movement (0xAA)
- Empty room (0x00)

If the sensor detects movement, it immediately changes to the state: "people in the room and movement”. This state is exited after 1 second at the earliest if no further movement is detected. In this case it changes to the state “People in the room and no movement”. After the hold time has expired it changes to the state “Empty room”- Vacant.

Report Time**:** can only be set if the event filter "Repeat" is activated and the events: "Still Vacant" and "Still Occupied" are enabled. The time between sending a "Still-Event" again is determined by the Report Time.

***Hold Time*:** Is the time that must pass before the state “people in the room and no movement” is changed to the state “empty room”. If movement is detected during this time the state is changed back to: “People in the room and movement”. (min. 1 second)

***Query*:** The current sensor state can be queried using the DALI command “Query input value”. The following values are possible: 0x00, 0xAA, 0xFF
(see paragraph above for the possible states)

***Event*:** the sensor status is transmitted by events. The following event information is available:

Bit0 = 0: No Movement
Bit0 = 1: Movement
Bit2/Bit1 = 00: Vacant
Bit2/Bit1 = 10: Still Vacant
Bit2/Bit1 = 01: Occupied
Bit2/Bit1 = 11: Still Occupied
Bit3 = 1: Movement Sensor
Bit5..Bit9 = 0: unused

More details can be found in the standard 62386-303.

Event filter: The event filter defines for which status change an event is generated.
Filter arrangement:

Bit0: Occupied Event active
Bit1: Vacant Event active
Bit2: Still Vacant/Occupied Event active
Bit3: Movement Event active
Bit4: No Movement Event active
Bit5..Bit7: unused

Example events during the movement sequence:

1: Movement detected:
Event filter "Movement", event filter "Occupied":
→ Event data: 0x0B

2: Continued movement: with set report time, event filter "Still Occupied/Vacant": → Event data: 0x0F

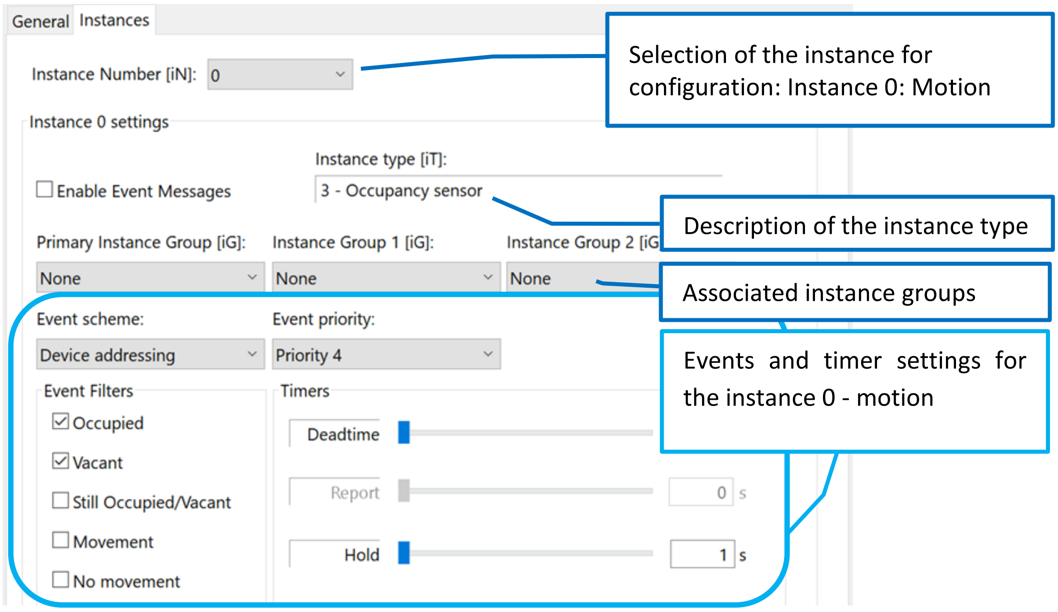
3: Movement stops: event filter "No Movement":
→Event data: 0x0A

4. Expiry of set hold time:
Event filter "Vacant":→ Event data: 0x08

5. Still no movement: with set report time: event filter "Still Occupied/Vacant"
→ Event data 0x0C

Cockpit - Instances

The settings for the instances can be made in the Cockpit – tab “Instances”.
Example for settings of instance 0 – motion see Figure. 8.



Instance Number [iN]: 0

Instance 0 settings

Instance type [iT]: 3 - Occupancy sensor

☐ Enable Event Messages

Primary Instance Group [iG]: None
Instance Group 1 [iG]: None
Instance Group 2 [iG: None

Event scheme: Device addressing
Event priority: Priority 4

Event Filters
☑ Occupied
☑ Vacant
☐ Still Occupied/Vacant
☐ Movement
☐ No movement

Timers
Deadtime
Report 0 s
Hold 1 s

Selection of the instance for configuration: Instance 0: Motion

Description of the instance type

Associated instance groups

Events and timer settings for the instance 0 - motion

Figure. 8 tab: „Instances“ – motion detector instance

Purchase Order Information

Art.Nr. 89453477-P: DALI-2 SI PRO, sensor interface with potential free switching input, back box

Art.Nr. 89453477-1L-P: DALI-2 SI 1L PRO, sensor interface with switching input for mains voltage, galvanic isolation, back box

Additional Information and Equipment

DALI-Cockpit – DALI system configuration tool, free when using a Lunatone interface device
https://www.lunatone.com/en/product/dali-cockpit/

Lunatone DALI products
http://www.lunatone.at/en/

Lunatone datasheets and manuals
http://lunatone.at/en/downloads/

Contact

Technical Support: support@lunatone.com

Requests: sales@lunatone.com

www.lunatone.com

Disclaimer

Subject to change. Information provided without guarantee.
The datasheet refers to the current delivery.

The function in installations with other devices must be tested for compatibility in advance.