

## DALI CS

### Datasheet

#### Combi Sensor Modul



DALI sensor module for presence detection and lighting control



Art. Nr. 86458621

Art. Nr. 86458621-W16

Art. Nr. 86458621-W16-AP

Art. Nr. 86458621-W16-ZD

Art.Nr. 86458621-15-W16

Art.Nr. 86458621-15-W16-AP

Art.Nr. 86458621-15-W16-ZD

Art.Nr. 86458621-O-W16 (Office)

Art.Nr. 86458621-O-W16-AP

Art.Nr. 86458621-O-W16-ZD

Art.Nr. 89453862 (CS PS 20mA)

Art.Nr. 89453862-15

Art.Nr. 89453862-O

# DALI CS Combi Sensor Module

## Overview

- Sensor Module for DALI lighting systems
- movement detection (PIR) and light intensity measurement
- 5 operating modes (up from FW 5.0):
  - movement triggered constant light control
  - movement triggered light control
  - movement triggered and manually activated constant light control
  - Constant light control
  - Off Only
- Corridor function – second light level before off in case of absence
- The module can be used as light controller or just as sensor unit for integration in BMS-systems
- Simple configuration with the help of the “DALI-Cockpit” software tool
- Multimaster capable – multiple sensors can be used on the same DALI-line
- Supply via DALI-line (or mains in case of DALI CS PS)
- Optimized types for different applications and detection areas (hall, office) available
- types with integrated temperature sensor available



## Specification, Characteristics

type	DALI CS		
article number	86458621	86458621-15	86458621-O
application	standard	hall	office

### electrical data:

supply	via DALI signal line (DALI-voltage according IEC62386)
marking terminals	DA, DA
typical current consumption DALI	3.5 mA
power consumption	<100mW
control	DALI

### insulation data:

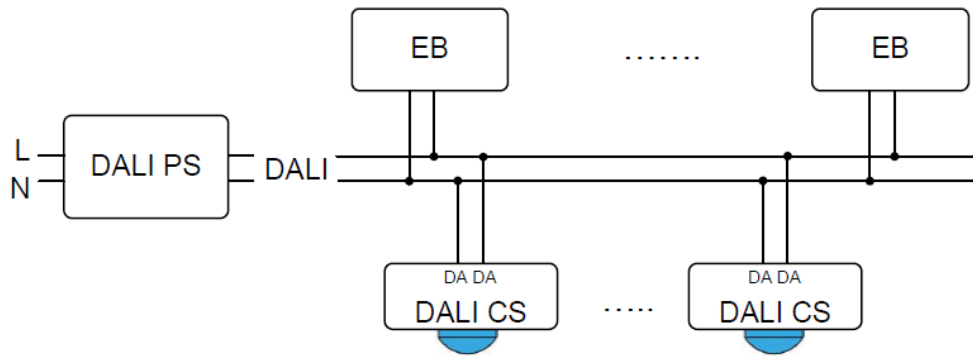
impulse voltage category	II
pollution degree	2
rated insulation voltage	250V
rated impuls withstanding voltage	4kV
insulation DALI/housing	reinforced isolation
insulation test voltage	3000Vac

**environmental conditions:**

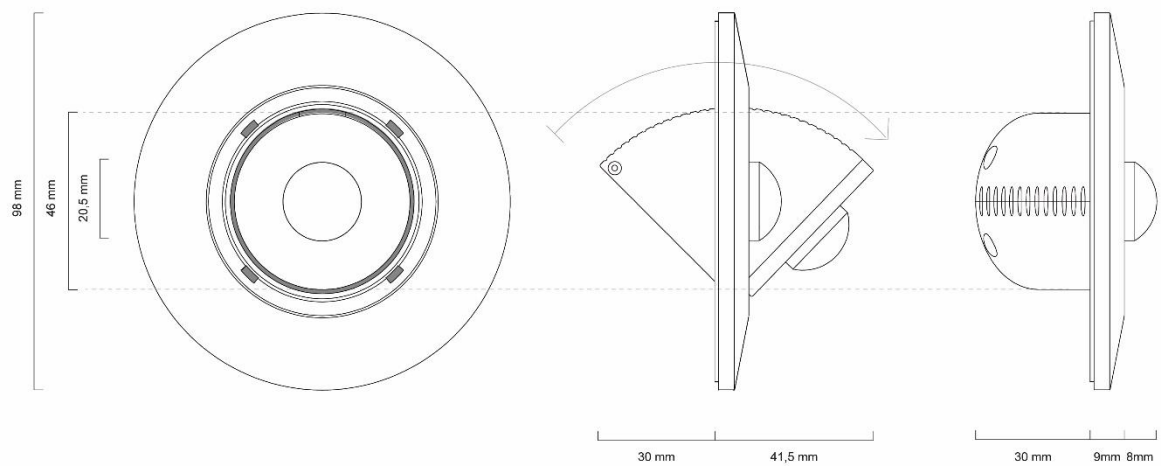
storing and transportation temperature	-20°C ... +75°C
operational ambient temperature	-20°C ... +70°C
rel. humidity, none condensing	15% ... 90%

**technical data:**

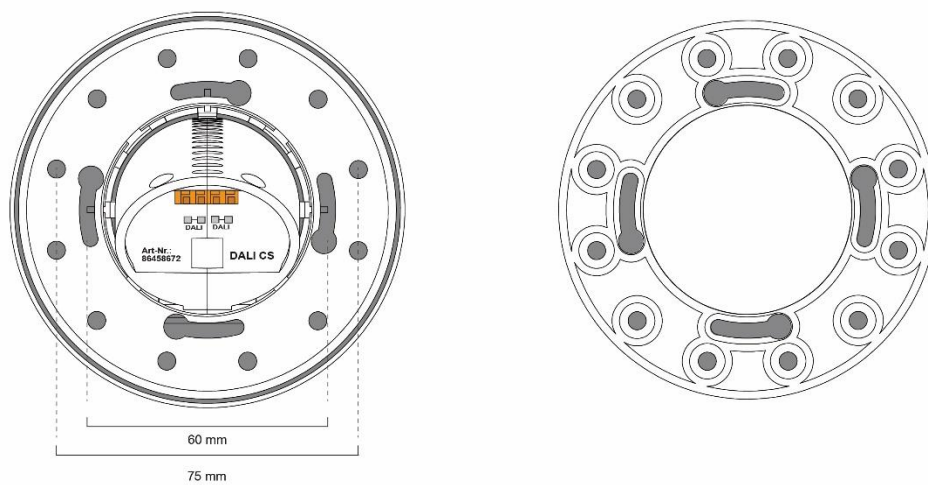
Presence Detection: principle:	PIR	PIR	PIR
detection range:	12m	15m	2.3m / 3m
max. mounting height:	8m	12m	3m
zones:	92	128	36 / 48
horizontal:	±51°	±34,5°	±44°/±90°
vertical:	±46°	±34,5°	±44°/±90°
min. temp.difference:	>4°C	>4°C	>4°C
light sensor	range: 0-2500lux resolution: 1lux		
temperature sensor	range: -20°C to +70°C resolution: 1°C		
group selector	yes		
function	configureable		
<b>general data:</b>			
protection class	II in intended use		
protection degree	IP20		
mounting	back box surface mounted (article number extension „-AP“), RAL9016 only suspended ceiling (article number extension „-ZD“), RAL 9016 only		
available colours	RAL9010 RAL9016 (article number extension „-W16“)		
<b>terminals:</b>			
connection type	spring terminal connector		
wire size solid core	0,5 ... 1,5 mm <sup>2</sup> (AWG20 ... AWG16)		
wire size fine wired	0,5 ... 1,5 mm <sup>2</sup> (AWG20 ... AWG16)		
wire size using wire end ferrule	0,25 ... 1,5 mm <sup>2</sup>		
stripping length	8,5 ... 9,5 mm / 0,33 ... 0,37 inch		
<b>standards:</b>			
EMC	EN 61547 EN 55015		
safety	EN 61347-2-11 EN 61347-1		
markings	ENEC-11, CE		



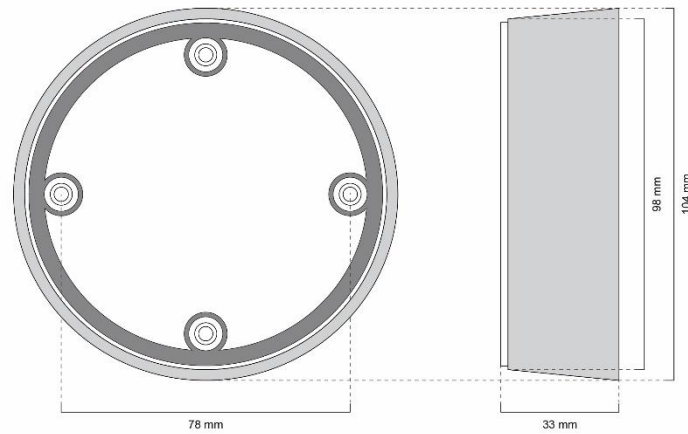
typical application: several sensors on one DALI-line



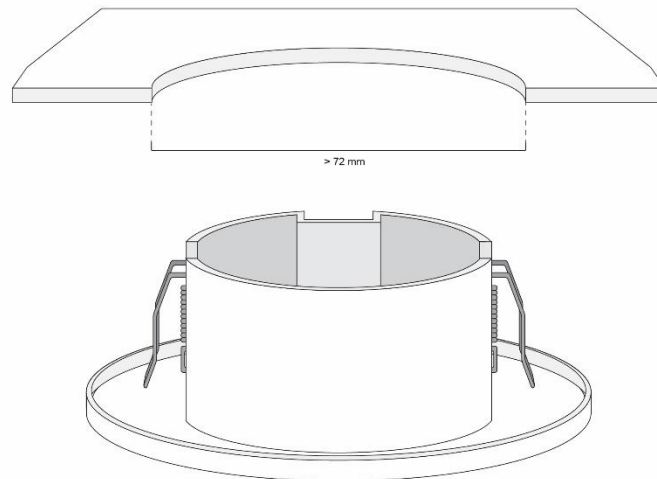
dimensions and space requirements



dimensions mounting ring



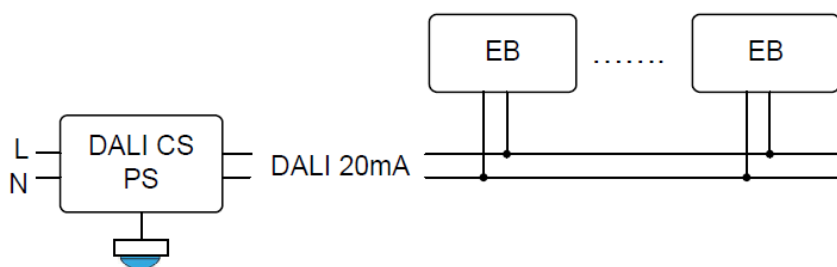
surface mounting: dimensions assessor



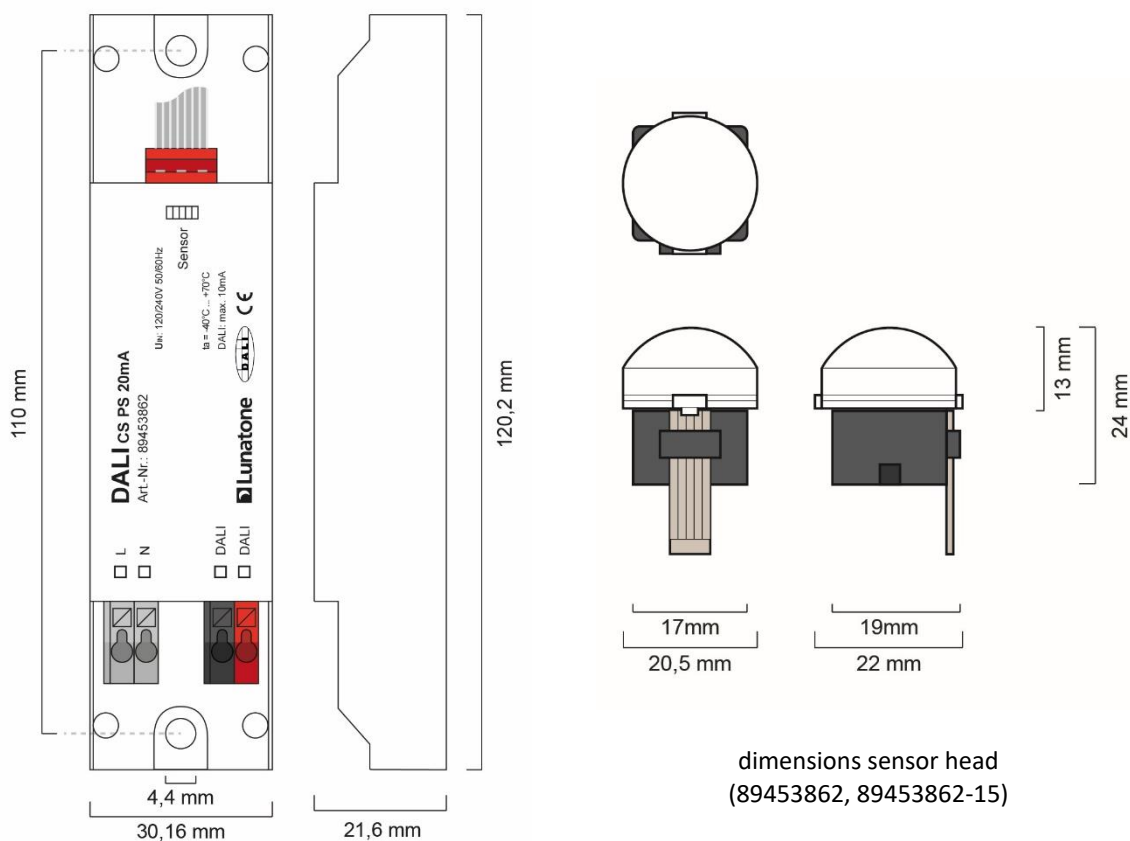
suspended ceiling: dimensions mounting hole diameter

type	DALI CS PS 20mA		
article number	89453862	89453862-15	89453862-O
application	standard	hall	office
electrical data:			
supply	via DALI-line (DALI-voltage according IEC62386) or mains (230Vac)		
marking terminals	DA, DA or L,N (mains)		
typical current consumption DALI	3.5 mA When powered by mains: DALI-line supply max. 20mA		
control	DALI		
insulation data:			
impulse voltage category	II		
pollution degree	2		
rated insulation voltage	250V		
rated impuls withstanding voltage	4kV		
insulation DALI/housing	reinforced isolation		
insulation test voltage	3000Vac		
environmental conditions:			
storing and transportation temperture	-20°C ... +75°C		
operational ambient temperature	-20°C ... +70°C		
rel. humidity, none condensing	15% ... 90%		
technical data:			
Presence Detection:			
principle:	PIR	PIR	PIR
detection range:	12m	15m	2.3m / 3m
max. mounting height:	8m	12m	3m
zones:	92	128	36 / 48
horicontal:	±51°	±34,5°	±44°/±90°
vertical:	±46°	±34,5°	±44°/±90°
min. temp.difference:	>4°C	>4°C	>4°C
light sensor	range: 0-2500lux resolution: 1lux		
temperature sensor	-		
group selector	no		
function	configurable		
general data:			
protection class	II in intended use		
protection degree	IP20		
mounting	luminaire integration		
available colours	RAL9010		
terminals:			
connection type	spring terminal connector		
wire size solid core	0,5 ... 1,5 mm² (AWG20 ... AWG16)		
wire size fine wired	0,5 ... 1,5 mm² (AWG20 ... AWG16)		
wire size using wire end ferrule	0,25 ... 1,5 mm²		
stripping length	8,5 ... 9,5 mm / 0,33 ... 0,37 inch		

sable length sensor head	ca. 400 mm
<b>standards:</b>	
EMC	EN 61547 EN 55015
safety	EN 61347-2-11 EN 61347-1
markings	CE



typical application DALI CS PS: self-sustaining system e.g.: floor lamp integration



dimensions DALI CS PS 20mA

dimensions sensor head  
(89453862, 89453862-15)

## Installation

- the DALI CS is supplied directly by the DALI-line (typical current consumption 3.5mA)
- the DALI CS PS can alternatively be supplied by mains. In this case the module provides a bus power supply for a small DALI circuit (max. 20mA)
- the connection to the DALI-line is polarity free
- suitable connecting wire cross sections are in the range from 0.5mm<sup>2</sup> to 1.5mm<sup>2</sup>
- back box mounting: the mounting ring is mounted directly on the back box. The housing can be attached to the mounting ring and will have sufficient space for fully flat installation.
- For mounting the sensor on cavity walls or suspended ceilings a special type is available (article number extension "-ZD"). This type includes additional fixtures with spring-clips.
- For surface mounting a special type is available as well (article number extension "-AP").
- Sensor adjustment to optimize detection area by variation of the declination (up to 40°) and rotation (360°)

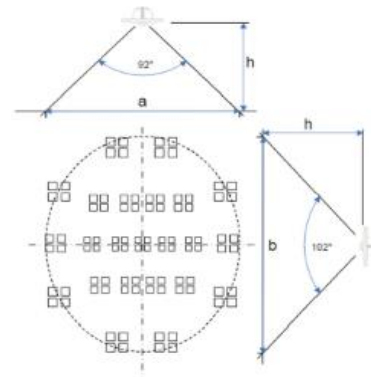
## Presence Detection

A temperature difference between the moving object and environment of at least 4°C is required. Heat sources such as copiers or heaters may have a negative influence on motion detection.

### **Presence Detection (Standard)**

The PIR method allows detection of relatively large areas by using only one sensor head. With opening angles of 46.3° and 51.3° and a sensor mounted at a height of 5 meters the 92 zones cover an area of more than 100m<sup>2</sup>. The

distance between sensor and the object of interest should be less than 12 meters, which limits the mounting height to about 8m.



h [m]	a [m]	b [m]	A [m <sup>2</sup> ]
2,50	5,2	6,2	25,1
2,7	5,6	6,7	29,3
3,0	6,2	7,4	36,2
3,5	7,2	8,6	49,2
4,0	8,3	9,9	64,3
5,0	10,4	12,3	100,4
6,0	12,4	14,8	144,6
8,0	16,6	19,8	257,1

relation of mounting height and detection area

### **Presence Detection CS-15**

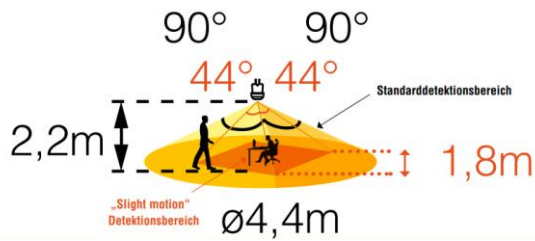
The sensor type „-15“ is suitable for high rooms (e.g. halls) with mounting height up to 12m. The detection range is about 15m.

h [m]	a [m]	b [m]	A [m <sup>2</sup> ]
5,0	6,9	6,9	37,1
7,5	10,3	10,3	83,5
10,0	13,7	13,7	148,4
12,0	16,5	16,5	213,7

### **Presence Detection CS-O**

For office application detection of slight motion is required (e.g. detection of arm movement of a sitting person). The DALI CS-O is tailored to this application and has an sensitive “inner area” and a standard detection “outer area”. The maximum mounting height is about 3m.



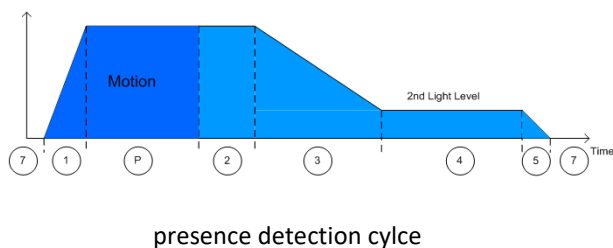


h [m]	Standard Detektionsbereich		Slight Motion Detektionsbereich		
	a [m]	b [m]	A1 [m2]	l [m]	A2 [m2]
2,0	4	4	12,5	1,6	2,56
2,2	4,4	4,4	15,2	1,8	3,24
2,5	5	5	19,6	2	4
3,0	6	6	28,2	2,4	5,76

relation of mounting height and detection area

### Cycle of Movement Detection

The sequence is shown below:



States:

- 1: Fade In Time
- 2: Hold On Time (On-State)
- 3: Fade Time
- 4: Hold On Time (2nd Light Level)
- 5: Fade Out Time
- P: Presence detected
- 7: Off

If motion is detected the sensor switches the “target area” to the defined light level. While presence is detected (P) or the “Hold On Time” is running (2) the light level stays on (either fix or controlled by a constant light control algorithm if activated).

After the “Hold On Time” the sensor changes the light to absence light level (2nd light level) for a defined time (4). The absence light level is a fixed value (no constant light control

possible). If motion is detected in this state, the sensor again switches to the previous states (1,P). Finally the cycle ends with switching off.

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

The number 1, 3 and 5 describe only the change between the states. Depending on the DALI-commands used, fade time can be used to allow smooth changes.

Firmware-versions before V5.0 have a simplified sequence than shown above without absence value.

### Light Sensor

#### Light measurement

All DALI CS types have also a light sensor included. The light sensor measures illuminance in a range from 0 to 2500 lux. The resolution is 1 lux (note: in fact, the sensor measures the reflected light).

The incident light is rated by the spectral sensitivity of the human eye and thus comparable to the subjective visual perception of brightness.

The incident light is accumulated over the complete area covered by the lense and hence can be interpreted as average value in the detection area. A relationship to the value measured on the reflecting surface below the mounted sensor can be defined with the help of a reference measurement.

### Temperature Sensor

Das DALI CS (Standard) provides a temperature sensor as well.

#### Temperature Measurement

The temperature sensor covers a range from -20°C to +70°C. The resolution is 1°C.

## Operating Modes

Starting from firmware version 5.0 the DALI CS module offers 5 different operating modes with different behaviour in interaction of presence detection, constant light control and manual operation (e.g. operating via another input device). The reaction on those interactions are explained for each operating mode separately.

### Operating Mode 1 – Presence triggered Constant Light Control:

If motion is detected the “cycle of movement detection” is started. After switch on to a predefined value the constant light control is active until no motion detected and hold time is finished. Then the 2<sup>nd</sup> light level becomes active.

Furthermore the motion sensor activity can be coupled to ambient light behaviour - motion sensor can be set to be only active above or under a light threshold.

- Constant light control is activated on movement
- 2nd light level is a constant light level (no constant light control)
- An external *Off-Command* stops the running movement sequence

For external On-Commands 3 options are available:

A: External *On-Command* deactivates the sensor (presence detection and constant light control)

B: External *On-Command* simulates movement, the hold time starts over

C: External *On-Command* simulates movement, the constant light control is temporary deactivated

### Operating Mode 2 – Presence triggered Light:

If motion is detected the light is switched to a predefined value and the motion sensor sequence is started (see pic „presence detection cycle“).

Furthermore the motion sensor can be set to be only active above or under a light threshold.

- On motion a predefined light level is recalled
- Constant light control disabled
- Manual *Off-Command* activates the motion sensor

For external On-Commands 3 options are available:

A: External *On-Command* deactivates the sensor (presence detection)

B: External *On-Command* simulates movement, the hold time starts over

C: External *On-Command* is ignored by the sensor (MASK)

### Operating Mode 3 – Presence triggered and manually activated Constant Light Control:

If motion is detected the motion sensor sequence is started (see pic „presence detection cycle“). After switch on to a predefined value the constant light control is active until no motion detected and hold time is finished. The the 2<sup>nd</sup> light level becomes active.

The constant light control can be activated and deactivated by external On- and Off

commands as well. In this case the motion sensor becomes inactive.

Furthermore the motion sensor can be set to be only active above or under a light threshold.

- On motion constant light control is activated
- External On-Command activates constant light control and deactivates presence detection
- External Off-Command deactivates constant light control and activates presence detection
- Corridor – 2nd light level is a constant light level (no constant light control)

## Operating Mode 4 – Constant Light Control:

In this operating mode only the light sensor is used, presence detection is inactive. The constant light control can be activated and deactivated manually.

- no presence detection
- External On-Command activates constant light control
- External Off-Command deactivates constant light control

## Operating Mode 5 - Off Only:

In this operating mode the light has to be switched on by another control device (e.g. manual input device). The motion sensor sequence (see pic „presence detection cycle) is only be started by an external On-Command. The light can be switched Off manually or is switched Off automatically when the motion sensor sequence is finished.

- The light is switched on by an external On-Command

- An external On-Command starts or retriggers the motion sensor sequence
- An external Off-Command stops the motion sensor sequence and the constant light control
- Motion retriggers the motion sensor sequence
- Corridor – 2nd light level is a constant light level (no constant light control)

## Behaviour on External DALI-Commands:

### On-Command:

The DALI commands below are interpreted as *On-Command* if sent to target address range:

RECALL MAX

RECALL MIN

ON AND STEP UP

DAP>0%

GOTO SCENE X (it the motion sensor uses this command as On-Command)

### Off-Command:

The DALI commands below are interpreted as *Off-Command* if sent to target address range:

OFF

DAP=0

GOTO SCENE X (it the motion sensor uses this command as Off-Command or to recall the 2nd light level)

Sensor behaviour on dimming with DALI-commands UP/DOWN:

If the effective range is dimmed by UP- or DOWN-commands (e.g. by another control device like the DALI MC), either the constant light control is deactivated or the new light level is used as temporary set value for the constant light control. The behaviour is configurable in the DALI-Cockpit by the option “temporary behaviour on manual dimming”). After light is switched Off and On the old set

value is used for the constant light control again.

## On- and Off-Threshold:

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

OnCmd Threshold: The motion sensor sequence can be started independent from the actual light level (default) or only if the light level is above or below the OnCmd-threshold.

Off-Cmd Threshold (Bright Out): a running motion sequence can be retriggered on motion either independent from the actual light level or only if light level is below the Off-Cmd threshold (bright out).

## Power-On behaviour:

In order to achieve a defined operating state after power on either a start-up command or a forced fast run of the motion sensor sequence can be used.

## Multiple sensors in same group:

Several sensors can be used to control the same group (e.g. to cover a big detection area). As soon as the same target address range has been defined (destination address 1), they are synchronized automatically. The sensor parameters have to be similar, especially the same hold on times should be used.

## Variable Operating Behaviour:

Firmware version 5.1 and higher offer the feature to change the operating behaviour during operation. Therefore either scene commands or proprietary commands can be used.

For each of the 16 scenes another behaviour can be configured. The following options are available:

- **1 – No Action (MASK):** recalling this scene has no effect (=default)
- **2 – Constant light control and presence detection inactive:** typical behaviour if a static scene is recalled ( e.g. entrance area during an event). The sensor can be activated again by an Off-Command of properly configured scene command.
- **3 – Constant light control incative, activated again after hold time:** typical behaviour for a temporary scene recall (e.g. presentation), if presence is no longer detected the sensor switches off the light.
- **4 – Waiting for movement:** the sensor is forced to State 7 (Off-state) and waiting for movement (e.g. for activating sensor again it has been deactivated before)
- **5 – Back to basic settings:** Switch back to standard settings (e.g.: to activate automatic mode again after sensor has been disabled or to switch back to the standard reference light level if an alternative value has been used)
- **6 – Alternative On-Command DAP:** Use of an alternative value to switch on (e.g. different day/night settings in warehouses)
- **7 – Alternative On-Command Scene:** Use of an alternative scene command to switch on (e.g. different day/night scene at entrance area)
- **8 – Alternative reference light level:** Use of an alternative reference light level for the constant light control (e.g.: work with more light)
- **9 – Alternative effective range:** Use another effective range - 4 groups or short addresses (e.g.: room divider)

## Factory Setting and Manual Configuration

For simple applications the factory settings are sufficient:

Setting	Value
Operating mode	2A, presence triggered light, an external <i>On-Command</i> deactivated presence detection and constant light control
Effective range	Broadcast
On-command	Recall Max
Hold Time	10min
Absence Value	none
Hold Time Absence	0s
Off-command	Off
OnCmd Threshold	none
OffCmd Threshold	none
PowerUp behaviour	no action
Constant Light Control (CLC)	inactive
Temperature sensor	no action

The target address range can be set with the rotary switch on the back of the device (if available). The last set of the effective range will be used, regardless of whether this was changed via rotary switch or via DALI Cockpit.

rotary switch	target address range
0	Broadcast
1	G0
2	G1
3	G2
4	G3
5	G4
6	G5
7	G6
8	G7
9	G8
10	G9
11	G10
12	G11
13	G12
14	G13
15	G14

## Configuration in DALI-Cockpit

The addressing and configuration of the DALI CS can be done easily with the help of the DALI Cockpit software tool. After an address

has been assigned the parameters of each device can be set up.

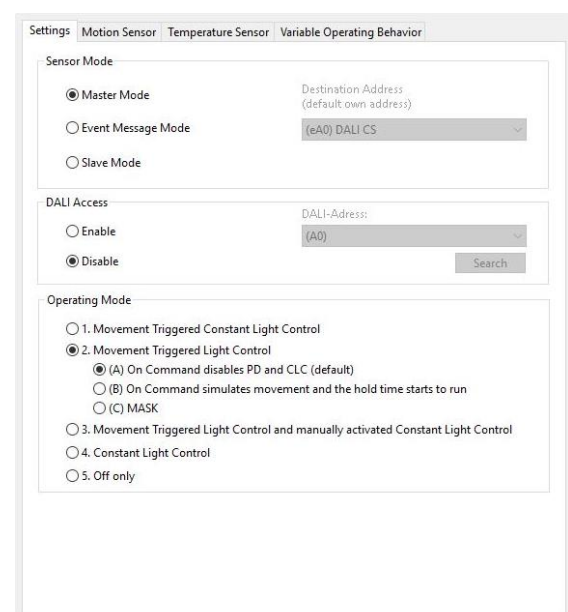
The spatial allocation of sensor and DALI address can be done by visual feedback when selected. For this purpose the red LED integrated in the sensor must be forced to flash – this feature can be activated in the DALI-Cockpit in the “Localize”-checkbox.



There are several tabs for setting up the sensor.

## „Settings“ – Operating Mode, Sensor Mode and DALI Access

The basic function of the device can be setup in the „Settings“-tab.



The basic use case of the sensor can be configured with the help of the “Sensor Mode”. The module can act either as controller or as sensor unit (e.g. in combination with a central control unit).

## Master Mode (Default)

In this operating mode the DALI CS acts as control device and sends event-based DALI-commands to DALI control gear as defined in the settings.

## Event Message Mode

In this mode control gear are not controlled directly by the sensor. Instead the proprietary sync-commands of the motion sensor can be redirected to any given address (e.g. to the sensor itself so that the source of the message can be allocated). These event messages can be evaluated by a central control unit. Light and temperature values can be queried.

## Slave Mode

The DALI CS does not send out any commands. It only answers to queries.

For controls who do not support the proprietary commands a standard DALI address can be assigned to the DALI CS and the sensor values can be read out using QUERY SCENE LEVEL commands (see also: “Query Sensor Values”).

The box “DALI-Access” can be used to assign a DALI-address to the device. Via this device the sensor values can be queried.

Furthermore the operating mode can be selected in the so-named box.

## **„Motion Sensor“ – Configuration of the motion sequence**

In this tab the effective range and the motion sequence can be configured (see pic „presence detection cycle”).

The effective range for motion and light sensor are always the same!

In addition the OnCmd-Threshold and the OffCmd-Threshold for the light level can be defined. The adjustable range of the threshold values is from 0...1020 Lux (step size: 4 lux).

The following commands can be used as “On-Command” (1): DAP, RECALL MAX, RECALL MIN, GOTO LAST ACTIVE LEVEL, GOTO SCENE X;

For recalling the second light value the following commands can be used (3): no action, DAP, RECALL MAX, RECALL MIN, GOTO SCENE X;

The screenshot displays the 'Motion Sensor' configuration tab. It includes sections for 'Destination Address' (with four rows for 1-4), 'Power up' (with 'Send Command' and 'Light Level (DAP)' options), 'Hold on time (2)' (set to 10min), 'Second level Hold on time (4)' (set to 0min), 'On Command (1)' (set to RECALL MAX LEVEL), 'Mid Level Command (3)' (set to None), and 'Off Command (5)' (set to OFF). There are also sections for 'On-Cmd Threshold (Light sensor)' and 'Off-Cmd Threshold (Light sensor) - Bright Out', both with radio button options and numerical thresholds (500 Lux and 1000 Lux respectively). A 'Switch on red LED when movement is detected' checkbox is at the bottom.

Finally for the “OFF-command” (5) these commands are available: DAP, OFF, GOTO SCENE X;

## **„Light sensor“ – constant light control (CLC)**

In this tab the parameters of the constant light control (CLC) can be set. The reference value can be defined (0...2040Lux, step size 8 Lux).

Furthermore the temporary behaviour of the sensor (constant light control) when dimming commands (UP/DOWN) are sent to the respective “destination address” of the sensor



(first address only) can be configured. The CLC can either be disabled („Disable CLC“) or the new light value is temporary used as reference value for the CLC („Auto Adjust Ref Light Level“).

As alternative to the constant light control the light sensor can be used as threshold switch with hysteresis (Threshold (0...1020 lux, Stepsize 4lux), Hysteresis (0..255 lux)).

## „Temperature Sensor“

A threshold switch with hysteresis is also available for the temperature sensor.

The settings of the temperature sensor are independent from motion and light, another destination address can be used.

The threshold can be varied form -20°C to 70°C (hysteresis from 0.1° to 25.5°).

## „Variable Operating Behaviour“

In this tab different operating behaviours can be defined:

## Parameter adaption using the DALI Daylight module

After the device configuration is finished the DALI CS acts with the configured parameters. For individual adaption of the customer the DALI Daylight module can be used. With the help of the DALI Daylight app several parameters can be adapted.

## Proprietary Commands

The sensor can be set up without DALI Cockpit by using proprietary commands.

### Operating Modes:

Switching between operating modes can be done by:

*Cmd225 Set DTR As Operating Mode*

*Cmd226 Query Operating Mode*

Binary values:

0000 0000 ... slave mode

0000 0010 ... event message mode

0000 0001h ... master– operating mode 1

0001 0001h ... master– operating mode 2

0010 0001h ... master– operating mode 3

0100 0001h ... master– operating mode 4

1000 0001h ... master– operating mode 5

### Constant light control (CLC):

Activate/deactivate CLC:

*Cmd 218 Store DTR As CLC Mode*

*Cmd 219 Query CLC Mode*

Constant Light Control Mode Configuration:

0 ... constant light control disabled

1 ... constant light control enabled + temporary disable CLC at manual dimming

2 ... constant light control enabled + temporary adjust reference value at manual dimming

Set CLC Reference Value:

*Cmd 220 Store DTR as CLC Reference Value*

*Cmd 221 Query CLC Reference Value*

CLC Reference value = value \* 8lux

### Variable Operating Behaviour

*Cmd240 Activate Custom Scene Behaviour*

DTR-Values:

0...15 Number of Custom Scene Behaviour

### Query Sensor Values:

The measurement values of the sensor can be read out either by proprietary commands or by QUERY SCENE VALUE commands after assigning a standard DALI address to the DALI CS. Find all relevant commands below.

### Proprietary Commands:

Supported Sensors:

*Cmd215 Query Supported Sensors*

bit 0: Motion Sensor supported

bit 1: Light Sensor supported

bit 2: IR sensor supported

bit 3: Temp Sensor supported

Motion Sensor:

*Cmd200 Query Motion Status*

0 ... no motion detected

1 ... motion detected

2 ... motion has been detected, delay running

*Cmd101 Motion Sensor OFF-State*



Sync-Command, sent by sensor to effective range at the end of the motion sequence (when going to OFF state)

## Cmd102 Motion Sensor ON-State

Sync- Command, sent by sensor to effective range when motion is detected (switch to On-State or retrigger by motion)

## Cmd105 Motion Sensor MIN-State

Sync-Command, sent by sensor to effective range after hold time is finished (goto MIN-state; 2nd light level)

Light sensor:

## Cmd205 Query Light Level Low

has to be read out first

## Cmd206 Query Light Level High

Light Level = Light Level High \* 256 + Light Level Low

temperature sensor:

## Cmd210 Query Temperature

Temp = (answer-80)/2 [-40°C ... 87,5°C]

## Query via Scene Values:

Assigning a DALI address (DALI-Access):

## Cmd212 Set DTR As DALI Short Address

## Cmd213 Query DALI Short Address

## Cmd212 Set DTR As DALI Access Mode

DALI Access Mode:

0 ... access via DALI Address disabled  
1 ... access via DALI Address enabled

temperature:

## DALI176 Query Scene 0 Value

Temp High in °C [-128°C bis +127°C]

## DALI177 Query Scene 1 Value

Temp Low in 1/256°C

Temp= Temp High + Temp Low / 256

light level:

## DALI 178 Query Scene 2 Value

Light Level High in Lux, dieser Wert muss als erster ausgelesen werden

## DALI 179 Query Scene 3 Value

Light Level Low in Lux

Light Level = Light Level High \* 256 + Light Level Low

motion:

## DALI 180 Query Scene 4 Value

Motion Status:

0 ... no motion

1 ... motion detected

2 ... motion has been detected, delay running

Bewegung:

## Purchase Order Information

**Art.Nr. 86458621:** DALI CS, sensor module (motion/ light/ temperature), pure white (RAL9010), back box

**Art.Nr. 86458621-W16:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), back box

**Art.Nr. 86458621-W16-AP:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), surface mouting

**Art.Nr. 86458621-W16-ZD:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), suspended ceiling

**Art.Nr. 86458621-15-W16:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), presence detection range 15m, back box

**Art.Nr. 86458621-15-W16-AP:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), presence detection range 15m, surface mounting

**Art.Nr. 86458621-15-W16-ZD:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), presence detection range 15m, suspended ceiling

**Art.Nr. 86458621-O-W16:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), for office applications, back box

**Art.Nr. 86458621-O-W16-AP:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), for office applications, surface mounting

**Art.Nr. 86458621-O-W16-ZD:** DALI CS, sensor module (motion/ light/ temperature), traffic white (RAL9016), for office applications, suspended ceiling

**Art.Nr. 89453862:** DALI CS PS, sensor module (motion/ light), integrated bus power supply 20mA, pure white (RAL9010), luminaire integration

**Art.Nr. 89453862-15:** DALI CS PS, sensor module (motion/ light), integrated bus power supply 20mA, pure white (RAL9010), presence detection range 15m, luminaire integration

**Art.Nr. 89453862-O:** DALI CS PS, sensor module (motion/ light), integrated bus power supply 20mA, pure white (RAL9010), for office applications, luminaire integration

## Additional Information

Datasheets and manuals

<https://jumitech/produkter>

DALI-Cockpit – free configuration tool from Lunatone for DALI systems

<http://lunatone.at/en/downloads/Lunatone-DALI-Cockpit.zip>

## Contact

Technical Support: [support@jumitech.dk](mailto:support@jumitech.dk)

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[www.jumitech.dk](http://www.jumitech.dk)

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## **DALI LS**

### **Datasheet**

#### **Light Sensor**

Sensor unit for the measurement of  
light intensity with integrated  
brightness control algorithm for  
DALI-systems

Art. Nr. 86458674

Art. Nr. 86458674-W16

Art. Nr. 86458674-W16-AP

Art. Nr. 86458674-W16-ZD

# DALI LS Light Sensor Module

## Overview

- Sensor unit for measuring lighting intensity levels in DALI-systems
- The module can either act as lighting control unit or be used for monitoring purposes only.
- For lighting control two modes are available: a digital threshold-based control or an ambient light dependent control
- When used as threshold based control the DALI LS can transmit various DALI commands (like OFF, RECALL MIN/MAX, GO TO SCENE X, ...) to destination addresses.
- When used as ambient light dependent control the reference light level and the destination address can be defined.
- Sensor properties are set easily by the DALI-Cockpit software tool via a DALI USB interface.
- For the destination address single addresses, group addresses and broadcast can be used.
- For simple applications the default configuration may be sufficient. With the help of the rotary switch on the backside the reference value of lighting intensity can be defined. Default destination address is broadcast.
- Several DALI LS modules can be used within one DALI-line.
- The compact module can easily be installed in recessed conduit boxes or directly on cavity walls.
- The DALI LS must not be connected to the mains. It is directly supplied by the DALI-line.
- Simple installation due to DALI double clamp connector

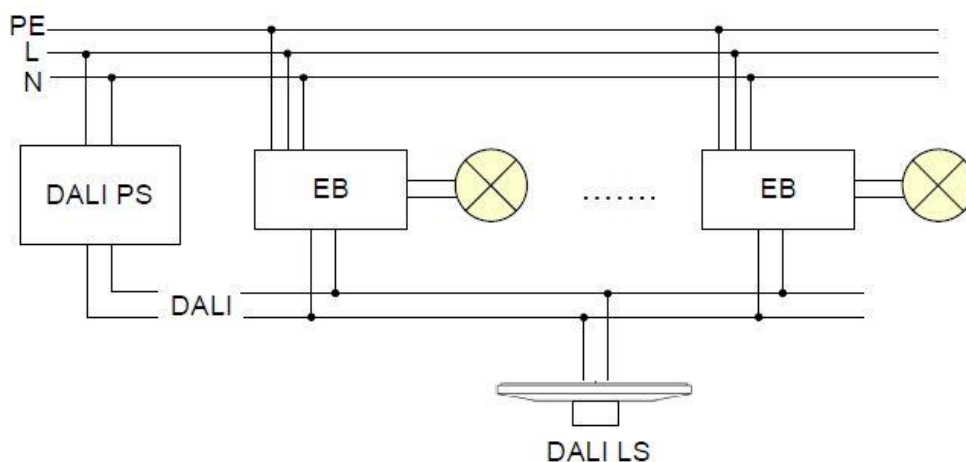
## Specification, Characteristics

Type	DALI LS			
article number	86458674	86458674-W16	86458674-W16-AP	86458674-W16-ZD
<b>elctrical data:</b>				
supply	via DALI-line			
typical current consumption	3.5 mA			
control	DALI			

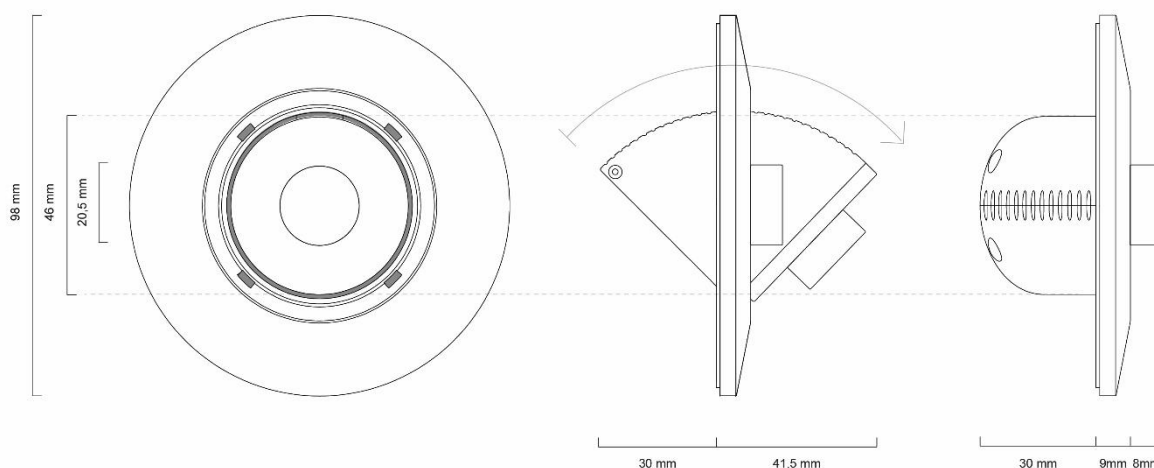
Type	DALI LS			
article number	86458674	86458674-W16	86458674-W16-AP	86458674-W16-ZD

**technical data:**

light sensor	range: 0-2500lux resolution: 1lux			
function	programmable, ref. lightlevel selection via rotary switch			
storing/transportation temperature	-20°C ... +75°C			
operational ambient temperature	-20°C ... +70°C			
protection class	IP20			
connecting wire cross section	0.5-1.5 mm <sup>2</sup>			
colour	RAL9010	RAL9016	RAL9016	RAL9016
mounting	back box	back box	surface mounting	suspended ceiling

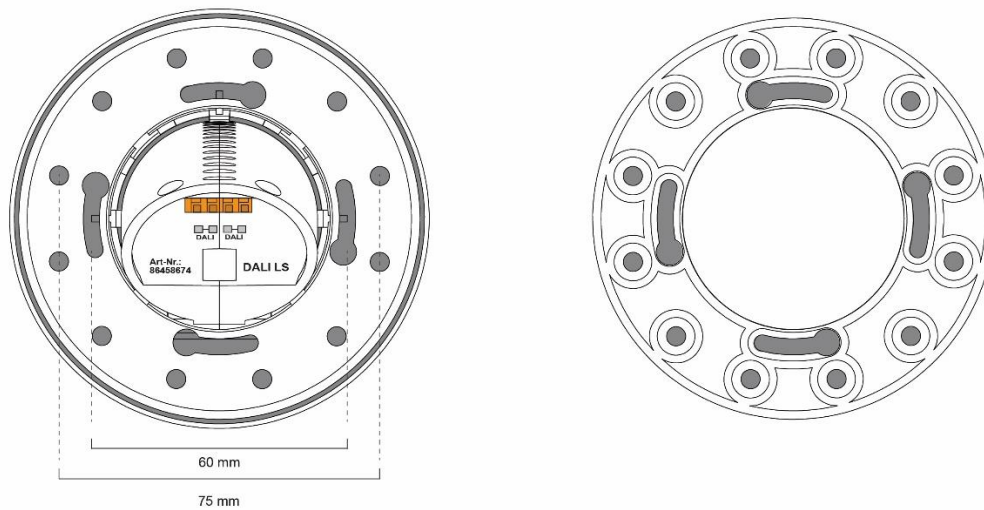


typical installation

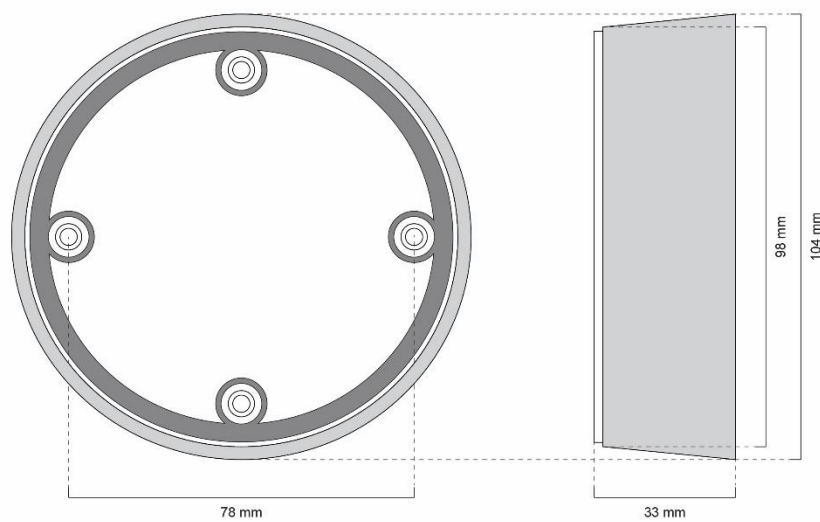


dimensions

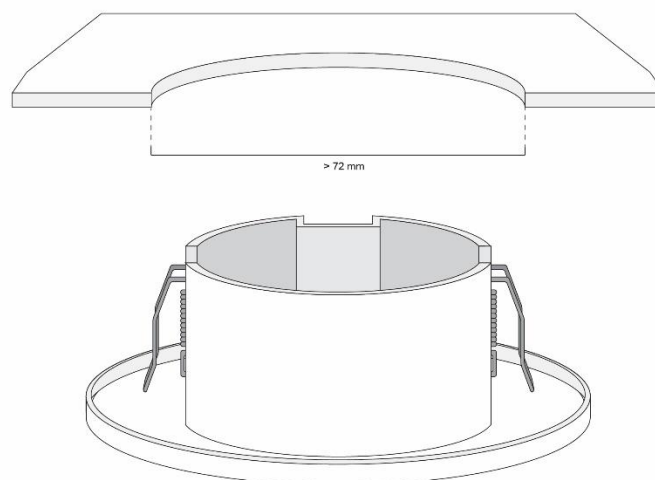
2018-03-15



mounting: dimensions mounting ring



mounting: dimensions surface mounting accessory (-AP)



Mounting : dimensions suspending ceiling accessory (-AP)

## Installation

- the DALI LS is supplied directly by the DALI-line (typical current consumption 3.5mA)
- the connection to the DALI-line is polarity free
- suitable connecting wire cross sections are in the range from 0.5mm<sup>2</sup> to 1.5mm<sup>2</sup>
- back box mounting: the mounting ring is mounted directly on the back box. The housing can be attached to the mounting ring and will have sufficient space for fully flat installation.
- For mounting the sensor on cavity walls or suspended ceilings a special type is available (article number extension "-ZD"). This type includes additional fixtures with spring-clips.
- For surface mounting a special type is available as well (article number extension "-AP").
- Sensor adjustment to optimize detection area by variation of the declination (up to 40°)

## Light Sensor

### *Light measurement*

All DALI CS types have also a light sensor included. The light sensor measures illuminance in a range from 0 to 2500 lux. The resolution is 1 lux (note: in fact, the sensor measures the reflected light).

The incident light is rated by the spectral sensitivity of the human eye and thus comparable to the subjective visual perception of brightness.

### *Werkseinstellung und Konfiguration*

## Factory Setting and Manual Configuration

For simple applications the factory settings are sufficient, the reference value can be set with the rotary switch on the backside:

- n=0 .. control inactive
- n=1...14 reference value = n\*100lux
- n=15 adaptive reference value (can be set with dimming commands), default=500lux (FW4.14 and higher)

Detailed settings can be done with the DALI-Cockpit.

## Purchase Order Information

**Art.Nr. 86458674:** DALI LS, sensor module (light), pure white (RAL9010), back box

**Art.Nr. 86458674-W16:** DALI LS, sensor module (light), traffic white (RAL9016), back box

**Art.Nr. 86458674-W16-AP:** DALI LS, sensor module (light), traffic white (RAL9016), surface mounting

**Art.Nr. 86458674-W16-ZD:** DALI LS, sensor module (light), traffic white (RAL9016), suspended ceiling

## Additional Information

Datasheets and manuals

<https://jumitech/produkter>

DALI-Cockpit – free configuration tool from  
Lunatone for DALI systems

<http://lunatone.at/en/downloads/Lunatone-DALI-Cockpit.zip>

## Contact

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to the installation.



## DALI Temp



### Datasheet

### Temperature Sensor

DALI sensor unit for temperature  
measurements

Art. Nr. 86459544

# DALI Temp Temperature Sensor

## Overview

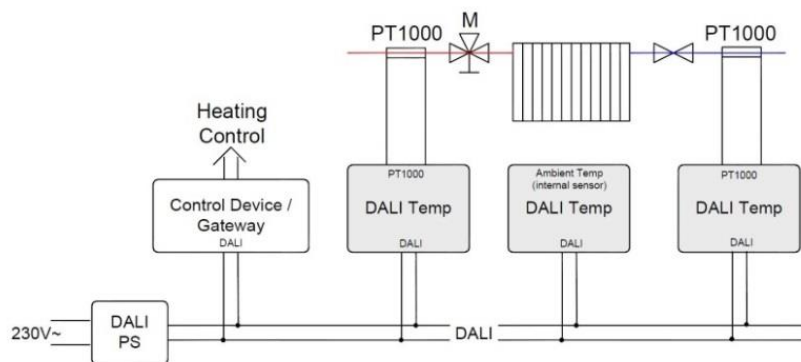
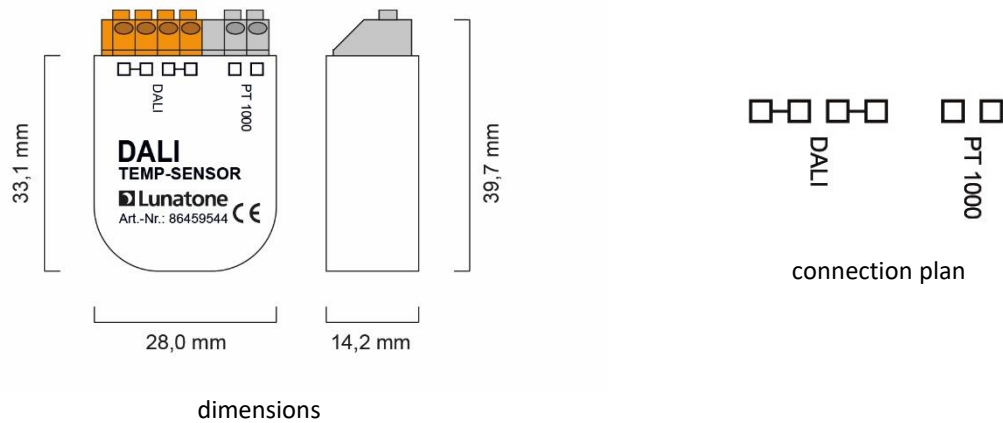
- DALI sensor unit for temperature measurements
- Internal sensor and terminals for connecting an external PT1000 (other external sensors on request)
- The measurement values of internal and external sensor can be queried via DALI
- Suitable for measuring and monitoring temperature e.g. for heating and ventilation technology
- The module does not require an additional power supply, it is supplied by the DALI-line directly
- Double DALI terminals – the DALI signal line is connected through

## Specification, Characteristics

type	DALI Temp
article number	86459544
<b>electrical data:</b>	
power supply	via DALI- Bus
typ. current consumption	2.6 mA
output	DALI
number of used DALI addresses	1
input (optional)	PT1000
<b>technical data:</b>	
temperature measurement range (internal sensor)	0°C to... +75°C
accuracy (internal sensor)	0.5°C
temperature measurement range (external PT1000)	-25°C ... +125°C
accuracy (external PT1000)	0.4°C
storing and transportation temperature	-25°C ... +75°C
operational ambient temperature	-25°C ... +75°C
protection class	IP20
connecting wire cross section	0.5-1.5 mm <sup>2</sup>
dimensions	39,7mm x 28mm x 14mm
mounting	back box

### Application in heating technology e.g. for:

measurement of flow temperatures  
 measurement of return temperatures  
 measurement of ambient temperatures



typical installation

## Querying and Evaluating Temperature Values

### Query Measurement Values

The measurement values of the internal and the external sensor can be queried via scene values. Each measurement value is a 16bit value (2bytes), for low resolution (1°C) reading out the high byte only is sufficient.

Internal sensor:

HiByte: Scene 0 (Command: QUERY SCENE 0)

LoByte: Scene 1 (Command: QUERY SCENE 1)

External sensor:

HiByte: Scene 2 (Command: QUERY SCENE 2)

LoByte: Scene 3 (Command: QUERY SCENE 3)

### Evaluating the temperature

Formula for combining the two bytes and generating a value in °C:

$$\text{Temp}[^{\circ}\text{C}] = \text{HiByte} + \text{LoByte}/256$$

range HiByte (signed): [-128 ... +127]

range LoByte (unsigned): [0...255]

For measurements with low resolution reading the HiByte only is sufficient. The value of the HiByte corresponds directly to the temperature value in °C. For higher resolutions the LoByte can be queried after having read out the HiByte.

Example:

-5,75°C: HiByte=-6, LoByte= 64;

+5,75°C: HiByte=5, LoByte=192;

## Purchase Information

**Art.Nr. 86459544:** DALI Temp, temperature sensor (internal: 0°C ... +75°C), external PT1000 (-25°C ... +125°C), back box

## Additional Information

Datasheets and manuals

<https://jumitech/produkter>

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