

## **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.
- Mode for readjusting the reference light level (from firmware 4.14 on)
- Several DALI LS modules can be used within one DALI-line, provided that they control different destination addresses
- The compact module can easily be installed in a back box or directly on cavity walls.
- The DALI LS is directly supplied by the DALI-line, no additional power supply is needed (DALI Bus Power supply is required)
- Simple installation due to DALI double clamp connector

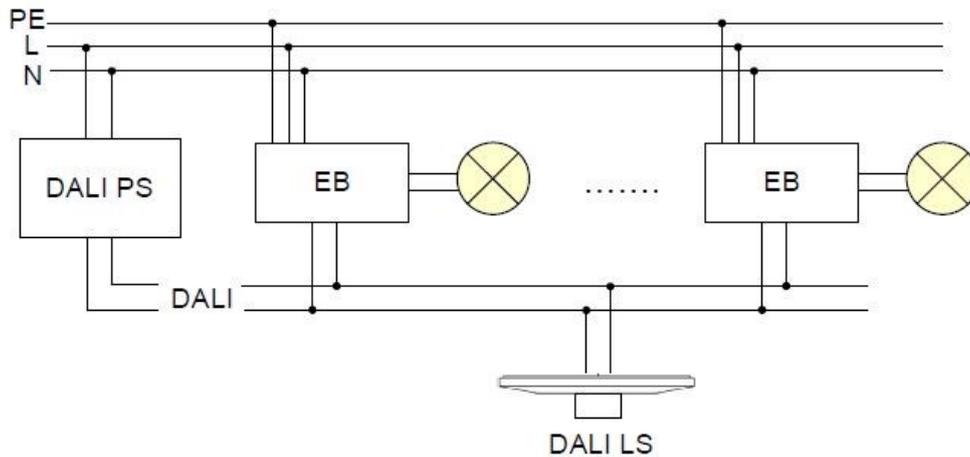
## Specification, Characteristics

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

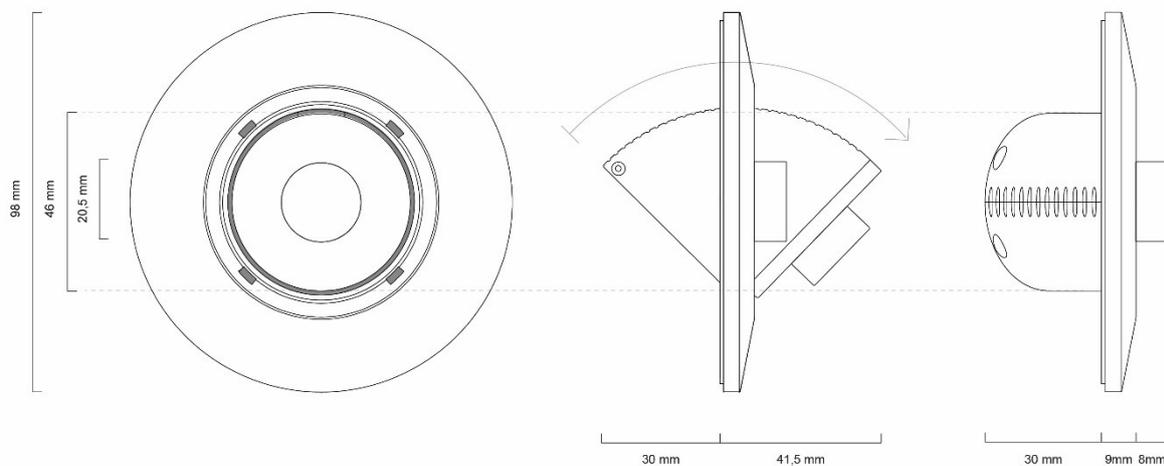
type	DALI LS			
article number	86458674	86458674-W16	86458674-W16-AP	86458674-W16-ZD

**technical data:**

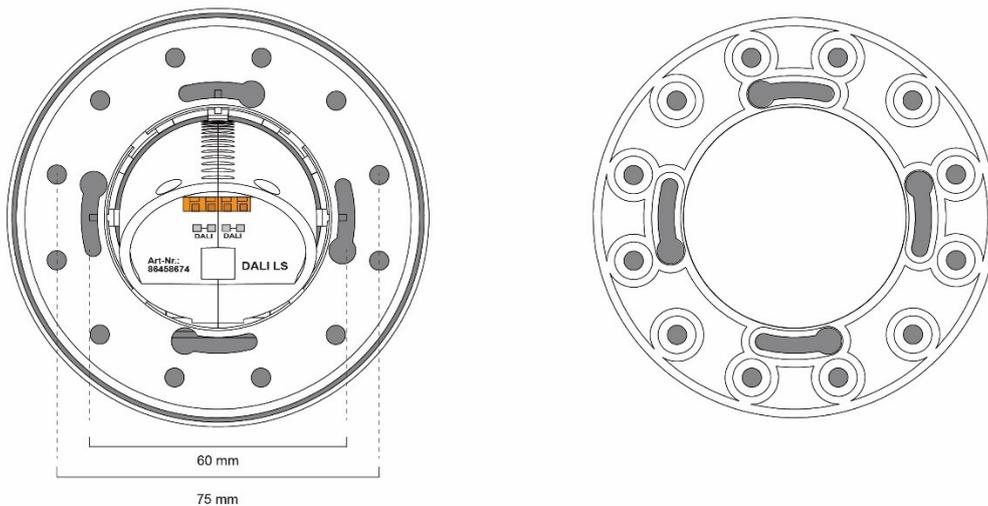
light sensor	range: 0-2500lux resolution: 1lux			
function	programmable, ref. lightlevel selection via rotary switch			
storing/transportation temperature	-20°C ... +75°C			
operational ambient temperature	-20°C ... +70°C			
protection class	IP20			
connecting wire cross section	0.5-1.5 mm <sup>2</sup>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



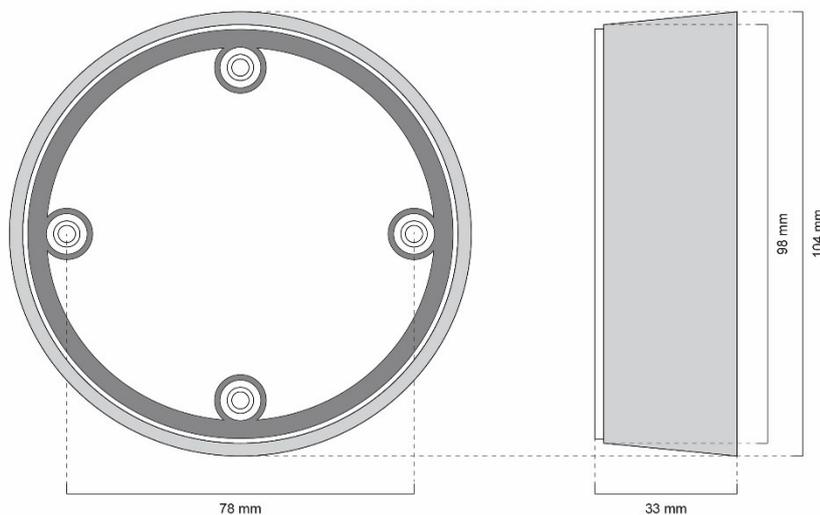
typical installation



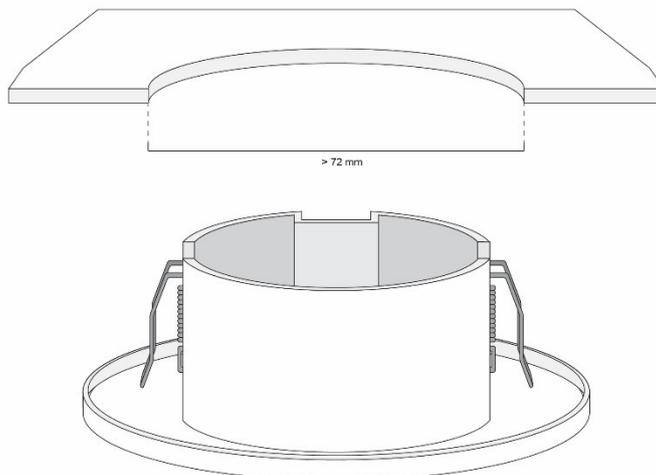
dimensions



mounting: dimensions mounting ring



mounting: dimensions surface mounting accessory (-AP)



mounting : dimensions suspending ceiling accessory (-ZD)

## Installation

- the DALI LS is supplied directly by the DALI-line (typical current consumption 3.5mA) no additional power supply is needed. A DALI bus power supply is required.
- 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.

## Application

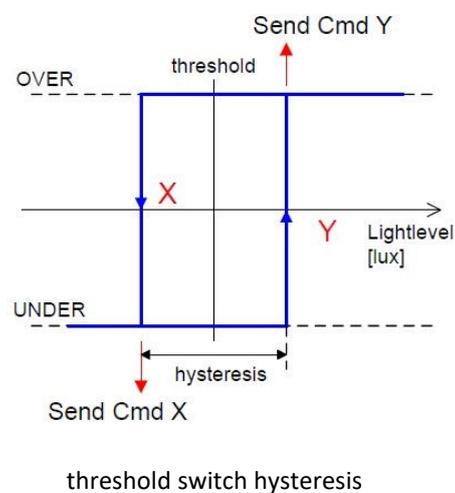
With the DALI LS the light intensity can be measured. The measured variable can either be used as an input variable for a threshold switch or for light control. Alternatively, the measured value can also be read out by a higher-level controller.

With the DALI-Cockpit software tool and a suitable interface to the DALI-Bus (DALI-USB, DALI-SCI, DALI4Net etc.) the DALI LS can be configured easily and conveniently from the PC. DALI-Cockpit and DALI-USB interface are only necessary for the configuration of the DALI installation and can be removed afterwards, they are not needed in normal operation.

In the DALI cockpit, all settings for the operating mode and functionality can be made and the effective range of the DALI LS can be defined.

### **Threshold Switch**

In the DALI cockpit, switching thresholds for the light intensity can be defined (threshold and hysteresis), and DALI commands can be sent as a reaction if these are undershot or exceeded.



### **Automatic Light Level Control (constant light control)**

The DALI LS can also function as an automatic light level controller. In this mode, the measured brightness value is compared with a reference value and the effective range is incrementally dimmed up or down. The constant light control is insensitive to short-term interference.

The DALI LS reacts to specific commands to the same effective range by activating / deactivating the control to avoid undesired interferences after one of the specified DALI commands has been sent (manually or automatically by another control unit).

The DALI LS activated the brightness control after:

- Power Up
- Direct Arc Power (>0%) Befehl
- Recall Max
- Recall Min

The DALI LS deactivates the brightness control after:

- Direct Arc Power (0%) Befehl
- Off
- Goto Scene X

This enables activation and deactivation of the brightness control. Also, Scenes can be set, without being subsequently changed by the control.

From firmware 4.14 onwards, the brightness reference value can be adjusted using the dimming commands UP and DOWN. After receiving a dimming command, the DALI LS determines the brightness and uses this as a new reference value. This allows manual dimming to the desired brightness value, after which the DALI LS tries to keep the set brightness constant.

### **Monitoring**

The light sensor can also only be used for measuring or monitoring purposes and the measured value can be forwarded to a higher-level control (central control unit).

### **Factory Default Settings**

For simple applications the factory settings are sufficient. Factory settings: ambient light control, effective range: broadcast, the reference value can be set with the rotary switch on the backside:

- n=0 .. control inactive
- n=1...14 reference value =  $n \cdot 100\text{lux}$
- 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.

### **Configuration**

With the software tool DALI Cockpit and a suitable interface to the DALI bus (DALI-USB, DALI-SCI, DALI4Net etc.) the factory setting can be changed, and the device functionality can be adapted for individual use. The DALI Cockpit enables addressing of the DALI installation and localizing of devices. For the spatial allocation of the devices, each DALI LS module can be triggered to light up the internal red LED via the DALI Cockpit. This makes it easy to locate the unit spatially and assign a desired address.

With the DALI Cockpit the configuration of the DALI LS can be made. The effective range and the parameters specific to the chosen functionality can be set.

Up to 4 addresses can be selected for the effective range; these can be individual addresses, group addresses or broadcast.

When used as a threshold switch, two commands can be defined that are sent to the effective range. One command that is sent when the measurements has exceeded the defined threshold (on command, CmdX). And one command when the measured light level has fallen below the threshold (off command, CmdY).

The DALI commands available for this are divided into commands for switching on (CmdX) and switching off (CmdY):

CmdX (ON-command):

Command Number	Command Name	Description
-	DIRECT ARC POWER>0	light level in %
5	RECALL MAX	go to maximum light level
6	RECALL MIN	go to minimum light level
8	ON AND STEP UP	switches on to the minimum if it was off, otherwise increases the light value by one dimming step
16-31	GO TO SCENE	calls respective scene (0-15)

CmdY (OFF-Befehle):

Command Number	Command Name	Description
-	DIRECT ARC POWER = 0	light level in %
0	OFF	turns the light off
16-31	GO TO SCENE	calls respective scene (0-15)

When using the light level command (Direct Arc Power), a desired fade time can be set (optional).

If the constant light control is used, the reference value can be set via the cockpit and the automatic adjustment of the reference value via dimming, can be activated or deactivated.

If several addresses are used for the effective range, the following behaviour should be noted:

With the brightness control, the output of the control commands to each of the 4 addresses of the effective range is handled separately, i.e. a sub-range can also be switched off with one of the above commands (OFF, GOTO SCENE X) or set to a fixed value, while the others sub-areas continue to be controlled in a regulated manner.

With the automatic adjustments of the brightness reference value via dimming, however, only dimming commands that are sent to the 1st address of the effective range are valid.

If no effective range is defined, no DALI commands are sent. In this mode, the DALI LS can only be used for measurement purposes. The measured quantities can be queried with specified commands – see section DALI commands below.

### Operation mode

The DALI LS supports 3 operating modes (from firmware V4.14) that can be set with the DALI cockpit: master mode, slave mode and event message mode.

**Master mode (default):** In this operating mode the DALI LS works as a DALI control device and sends event-related DALI commands to the DALI loads according to the configuration.

In combination with a central control, this direct control method can be undesirable. Therefore, 2 additional operating modes have been introduced:

**Event Message Mode and Slave Mode:** In these operating modes, the DALI LS does not become active on the bus by itself, it only responds to queries. For these queries, commands are available as part of a

proprietary protocol extension. There is also the option of assigning a DALI address to the DALI LS and querying the values via the standard DALI command "Query Scene Value". This method is of course also available in master mode. For information on the protocol, please contact our support.

## DALI Standard

In normal operation, the DALI LS works as a control device on the DALI bus and sends standard DALI commands to the effective range according to its configuration. It is based on the standard for DALI Control Gear (IEC 62386-102).

## 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 and Equipment

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

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

Lunatone DALI products

<http://www.lunatone.at/en/>

Lunatone datasheets and manuals

<http://lunatone.at/en/downloads/>

## Contact

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## 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.