ESYLUX



OPERATING INSTRUCTIONS
COMPACT MD/PD BMS

DALI-2

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Table of contents

1. Information about the document 5
1.1 Introduction 5
1.2 Highlighted information within the text 5
1.3 Manufacturer's address 6
1.4 Product identification 6
1.5 Warnings 8

2. Basic safety information 9
2.1 Safety instructions 9
2.2 Intended use 9
2.3 Liability and damages 10

3. Product description 10
3.1 Introduction 10
3.2 Included in delivery 11

4. Installation 11

5. Connection 12

6. Initial operation 13

7. DALI instances 13

8. Settings 14
8.1 Memory bank 2 14
8.1.1 Sensor LED mode 14
8.1.2 Sensor LED brightness 15
8.1.3 ALS correction factor 15
8.1.4 Determining the ALS correction factor 16
8.1.5 Memory bank 2 17
8.1.6 PIR sensitivity 18

9. Maintenance 18
9.1 Cleaning 19

10. Disposal 19

11. EU Declaration of Conformity 19

12. ESYLUX manufacturer's warranty 19

1. Information about the document

1.1 Introduction

These operating instructions contain detailed information on the installation, commissioning and setting options of the product described.
The current version of this document is available on the respective product page at www.esylux.com and can be printed out in A4 format. Read the operating instructions carefully and observe all safety instructions and warnings.

Navigating on screen

Reading the digital document is supported by the following functions:

- **Linked table of contents:** Clicking on the chapter title opens the corresponding chapter.
- **Linked references:** Clicking on → **Reference** opens the specified location.
- **List of bookmarks:** An overview of all chapters can be found in the list of bookmarks in the PDF document.

1.2 Highlighted information within the text

Formatting

To make these operating instructions easier to read, certain information is highlighted using different formatting.
The meaning of this formatting is explained below:

➢ Calls to action

✓ Results and outcomes of actions

< > Menu items in the app

→ Text references

Important and useful additional information

Warns of dangerous electrical voltage

1.3 Manufacturer's address

ESYLUX GmbH
An der Strusbek 40
22926 Ahrensburg I Germany
info@esylux.com
www.esylux.com

1.4 Product identification

These instructions apply to the following products:

Produktname
PD-C 360/8 BMS DALI-2
PD-C 360/8 BMS DALI-2 BK
PD-C 360/8 BMS DALI-2 WINSTA CodeI
PD-C 360/8 BMS FM DALI-2
PD-C 360/24 BMS DALI-2
PD-C 360/24 BMS DALI-2 BK
PD-C 360/24 BMS DALI-2 WINSTA CodeI
PD-C 360/24 BMS FM DALI-2
PD-C 360/32 BMS DALI-2
MD-C 360/40 BMS WAREHOUSE DALI-2
MD-C 360/40 BMS WAREHOUSE DALI-2 BK
MD-C 360/40 BMS WAREHOUSE SM DALI-2
MD-C 360/40 BMS WAREHOUSE SM DALI-2 BK

The product name is located on the product nameplate.

The product name contains essential information about the product:

Differentiator	Element	Description
Device category	PD	Presence detector
	MD	Motion detector
Series	C	COMPACT
Detection angle	360	Specifiedin degrees (°)
Detection range diagonally	8 / 24 / 32 / 40	Specified in metres (m) Ø
Function	BMS	Can be integrated into building management systems
	WAREHOUSE	Suitable for high bay warehouses
	DALI-2	Control system (Digital Addressable Lighting Interface)
	FM	Installation type (FM = Einbau)
	WINSTA CodeI	Pre-assembled Wago Winsta® line MIDI Cod. I
	BK	Colour (BK = black)

1.5 Warnings

Warnings are listed at the start of the relevant chapter if there is a risk of a hazardous situation occurring.

The preceding signal words have the following meanings:

⚠ DANGER!

This signal word denotes a hazard involving a high level of risk. Failure to observe the warning will result in death or serious injury.

⚠ WARNING!

This signal word denotes a hazard involving a moderate level of risk. Failure to observe the warning may result in death or serious injury.

⚠ CAUTION!

This signal word denotes a hazard involving a low level of risk. Failure to observe the warning may result in minor or moderate injury.

CAUTION!

This signal word warns against situations in which failure to observe the notice may result in damage to property.

2. Basic safety information

2.1 Safety instructions

Specialist personnel

Electrical devices connected to a 230 V mains supply may only be assembled and commissioned by electrical installation technicians or trained electricians, taking country-specific regulations into account.

DANGER!

Risk of fatal injury from electric shock!

- Observe the five safety rules:

  1. Disconnect the power supply
  2. Secure the power supply from being switched on again
  3. Check that the relevant components have been de-energised
  4. Set up the earthing and short-circuiting mechanisms as required
  5. Cover or isolate neighbouring live parts

- Protect the device with a 10 A circuit breaker.
- Protect the circuit with a residual current device (RCD).
- Observe the contact opening width (µ = < 1.2 mm).

2.2 Intended use

Place of use

COMPACT series DALI-2 BMS presence detectors are designed for integration into a DALI-2 bus system in indoor applications. The presence detector uses passive infrared technology (PIR). It requires a clear view of people and reacts to even the smallest movements, such as the movements of a person sitting at a desk. The presence detector is particularly suitable for rooms with daylight that are used for extended periods of time, such as classrooms, offices, meeting and conference rooms, sports halls, fitness rooms, warehouses and exhibition halls. Any other use beyond this is considered improper and can lead to personal injury and damage to property. Only use this product in accordance with the information provided in these instructions.

2.3 Liability and damages

Warranty

The device must not be changed, modified or painted – doing so will render any warranty claims void.
The manufacturer accepts no liability for damage caused due to **improper** use.
Check the device for damage after unpacking. If the device is damaged, return it to the place of sale.

3. Product description

3.1 Introduction

The COMPACT series DALI-2 BMS presence detector has been developed for intelligently controlling lighting groups in accordance with the DALI-2 standard. It has been designed for integration into a DALI-2 bus system in indoor applications.
The DALI-2 BMS presence detector detects movement, light values or push button actuations and converts them into DALI-2 information. The control unit (e.g. an APC presence detector) manages all the information and automatically controls the DALI-2 groups based on the information from the DALI-2 BMS presence detector.

Properties

Main product features:

- Certified in accordance with the DALI-2 standard
- Only suitable for lighting control using a DALI-2-enabled application controller
- Integrated motion and light sensor based on the IEC 62386-303/-304 standard
- Two non-floating inputs for connecting push buttons based on the IEC 62386-301 + IEC 62386-302 standard

CAUTION!

Do not use external voltage.

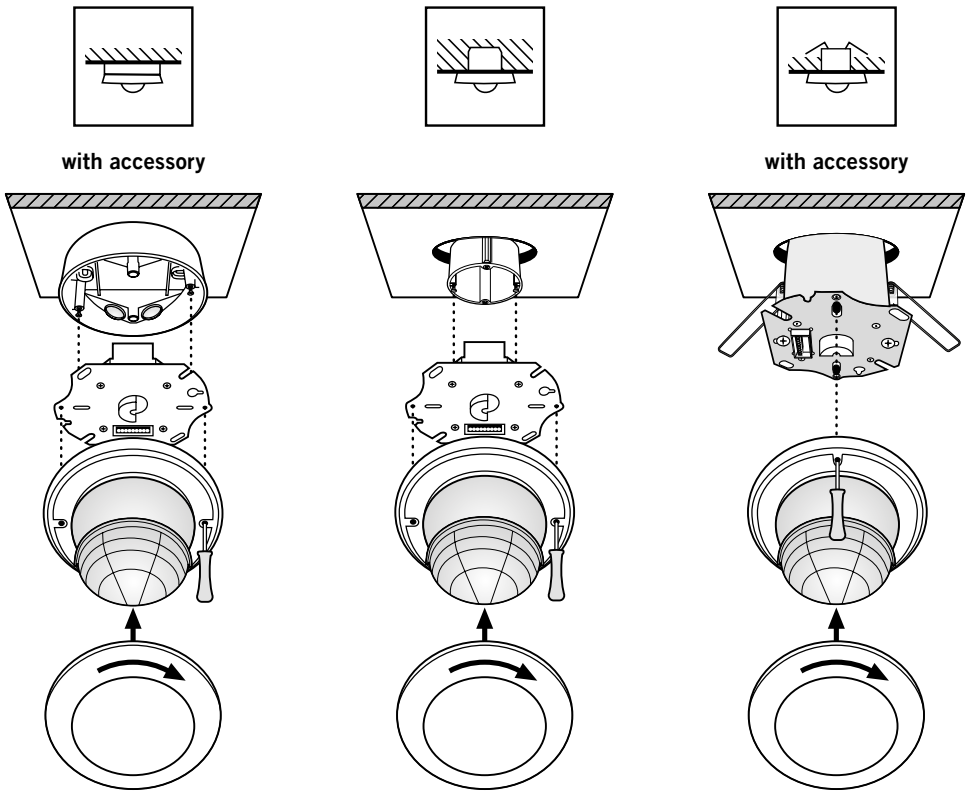
- Supply voltage on the DALI-2 bus system

3.2 Included in delivery

1 x presence detector
1 x lens mask
1 x quick-reference guide

4. Installation

The following types of installation are possible:



Installation using the surface-mounted box*

Installation in suspended ceilings and flush-mounted boxes

Installation using the ceiling installation set*

*Required accessories are not included in the scope of delivery.

5. Connection

DANGER!

Risk of fatal injury from electric shock!

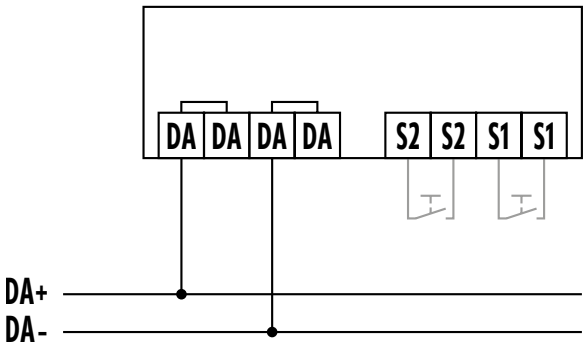
- Before connecting, disconnect the bus voltage supply (e.g. APC) at the mains.
- Check that the relevant components have been de-energised.

Connect the DALI-2 BMS presence detector:

- Observe the following wiring diagram and terminal assignment:

Terminal assignment

DA DALI-2 bus
S2 Push button 2
S1 Push button 1



Standard operation with optional control via a closing button. The maximum cable length from the push button to the presence detector is 30 m.

The length of the installation cable with a wire cross-section of 1.5 mm² must not exceed 300 m.

6. Initial operation

Initial operation is carried out in accordance with the applicable DALI-2 standard.

➢ Connect the DALI bus voltage.
  ✓ A warm-up phase of approx. 25 seconds is initiated.
  ✓ When the green sensor LED briefly flashes three times, the warm-up phase is complete.

The signals from the sensor LEDs indicate the following:

- Blue and red sensor LEDs flash alternately
  ✓ No DALI-2 short address assigned.
  (Factory setting in delivery state)

- Purple sensor LED flashes
  ✓ DALI-2 localisation and identification of the detector.

- Blue LED flashes
  ✓ DALI-2 short address assigned.

7. DALI instances

Each sensor input value is assigned to its own DALI-2 instance. They are equipped with corresponding instances depending on the sensor type.

The instances are identified by type and number.
BMS presence detectors in the COMPACT series with light measurement:

Instance number	Instance type	Description
0	1	Push button input
1	1	Push button input
2	3	Motion detection
3	4	Light measurement
4	2	Switch input
5	2	Switch input

8. Settings

The presence detector is parameterised and controlled only via the application controller (APC).

8.1 Memory bank 2

The DALI-2 BMS presence detector offers configuration/setting elements that have not yet been defined by the IEC-62386 standards.

The following settings can be defined in memory bank 2:

- Sensor LED on/off and sensor LED brightness
- Ambient light sensor (ALS) correction factor
- Sensitivity of the motion sensor (PIR)

The memory bank (memory bank 2) is written or read via standard DALI-2 commands.

8.1.1 Sensor LED mode

Value (decimal)	Value bits*	Description
0	0000 0000	Sensor LEDs are deactivated. Deactivating the sensor LEDs will hide all sensor LED signals for normal operation. The following events are not hidden: - DALI identification procedure started by the IDENTIFY DEVICE command - The LED sequence displayed during the warm-up phase immediately after switching on - PIR test modes
1	0000 0001	Sensor LEDs are activated. All events are signalled by the sensor LEDs.
2	0000 0010	(Like value = 1)

Value (decimal)	Value bits*	Description
3	0000 0011	Sensor LEDs are activated. All events are signalled by the sensor LEDs. Deactivating the 303 instance deactivates the signalling of events in the "Motion detection suppressed" category. This is applied if the sensor does not need to indicate any detected movement.

*The sensor LED mode settings provide the setting options listed below, which can be set independently to 1 or 0:

Bit [0] set: LEDs activated.

Bit [1] set: Deactivating the 303 instance also deactivates the signalling of events in the "Motion detection suppressed" category.

8.1.2 Sensor LED brightness

The sensor LED brightness can be configured from 5 – 100 % with values from 5 … 100. If sensor LEDs are to be deactivated, set the sensor LED mode value to 0.

8.1.3 ALS correction factor

The ALS correction factor of the ambient light sensor indicates the ratio between the measured value from the ceiling and the value sent to the APC by the DALI-2 BMS presence detector.
Different reflection behaviour indoors leads to differences in the brightness values from the ceiling and floor. The ALS correction factor is designed to compensate for these differences and can be set between 0.1 … 5.0.

- 0.1 corresponds to value 1 in memory bank 2
- 5.0 corresponds to value 50 in memory bank 2

Factory setting: ALS correction factor = 1

The DALI-2 BMS presence detector does **not** perform an ALS correction. The light value reported via the DALI-2 bus corresponds to the measured light value from the ceiling.
The light value reported by the DALI-2 BMS presence detector is limited to 819.0 lux. The reason for this is the 13 bit resolution reported by the DALI 304 instance.

8.1.4 Determining the ALS correction factor

The ALS correction factor of a single ambient light sensor is measured and determined using a lux meter at two points on the ground floor (100 lux and 500 lux).

- ➢ Dim the lighting until the lux meter indicates a value of 100 lux.
- ➢ Read the lux value measured by the DALI-2 BMS sensors
- ➢ Determine the correction factor for each DALI-2 BMS presence detector and apply to "ALS 0 correction factor 100 lux" and "ALS 1 correction factor 100 lux".
- ➢ Repeat these steps for 500 lux.
  - ✓ The ALS correction factor is determined

Example:

Brightness value measured using a lux meter on the floor: 100 lx
Brightness value measured by DALI-2 BMS presence detector from the ceiling: 54 lx

Correction factor = (100 / 54) = 1.851 → value = 1.9 → memory bank = 19

8.1.5 Memory bank 2

To configure settings in memory bank 2, use standard DALI commands for reading/writing to memory banks.

Location	Description	Memory type (reference 1)	Value range	Default value[1]	RESET value (reference 2)
0x04	LED mode, e.g. LEDs activated, "Motion detection suppressed" signalling deactivated 0 = LEDs deactivated 1 = LEDs activated 3 = LEDs activated, but the "Motion detection suppressed" event is not displayed if the 303 instance is deactivated	NVM	0 … 3	3	No change
0x05	LED brightness in the range 5 %…100 %	NVM	5 … 100	50	No change
0x08, 0x09	ALS 0 - correction factor 100 lux in 1/10 of the measured value	NVM	1 … 50	10	No change
0x0A, 0x0B	ALS 0 - correction factor 500 lux in 1/10 of the measured value	NVM	1 … 50	10	No change
0x0C, 0x0D	ALS 1 - correction factor 100 lux in 1/10 of the measured value	NVM	1 … 50	10	No change
0x0E, 0x0F	LS 1 - correction factor 500 lux in 1/10 of the measured value	NVM	1 … 50	10	No change
0x10	PIR sensitivity as in the range 1 % … 100 % (reference 3)	NVM	1 … 100, 254, 255	95	Firmware < V2.1.0: No change Firmware >= V2.1.0: Set to default value due to the implementation of the DALI-2 command

Reference 1:
ROM = Read-only memory, cannot be changed by the user.
NVM = Non-volatile memory, can be changed by the user.

Reference 2:
Value is reset to this default value by the "0xFE 0x10 RESET" DALI command.

Reference 3:
Although some DALI-2 BMS presence detector models use more than one PIR sensor, the sensitivity of all sensors for the device can only be set to the same value once.

8.1.6 PIR sensitivity

Memory location 0x10 allows the PIR sensitivity to be read and set from 1 %…100 % – the higher the value, the higher the sensitivity of the sensor.

Special memory location values:

- **254:** This value resets the PIR sensitivity to the factory setting. Subsequent reading operations then report the factory setting until this value is overwritten.
- **255:** This measured value indicates that adjustment of the PIR sensitivity is not supported.

The DiiA has proposed new DALI commands for adjusting the sensitivity of the sensors. As soon as they become available, memory bank 2 will reflect the adjustments made using the new commands.

Any value between 101 and 254 will reset the PIR sensitivity to the factory setting.

9. Maintenance

The device is maintenance-free. In the event of damage, the entire device must be replaced.

9.1 Cleaning

CAUTION!

Using the wrong cleaning products will damage the device. Do not use corrosive cleaning agents or solvents to clean or maintain the device.

➢ Use a lint-free cloth that is either dry or dampened with water.

10. Disposal



This product must not be disposed of with unsorted residual waste. Owners and operators of the product are legally obliged to dispose of all parts of the product properly and according to type. Contact your local town council for more information.

11. EU Declaration of Conformity

CE declaration

The product complies with the following directives:

EMC 2014 / 30 / EU
LVD 2014 / 35 / EU
RoHS 2011 / 65 / EU
Ecodesign 2009 / 125 / EG

12. ESYLUX manufacturer's warranty

ESYLUX manufacturer's warranty at www.esylux.com.
Technical and design features may be subject to change.