Functions

L-WEB, L-STUDIO

L-ROC

L-INX

L-IOB

Gateways

LPAD-7,
L-VIS, L-STAT

L-DALI

Routers, NIC

Interfaces

Accessories

BACnet      ✓ DALI
CEA-709      OPC

**L-DALI Multi-Sensor**

# LDALI-MS2-BT / LDALI-MS3-BT / LDALI-MS4-BT

Datasheet #89094001

The LOYTEC LDALI-MS2/MS3/MS4-BT multi-sensor performs occupancy detection and measures the illuminance level. It integrates perfectly into the L-DALI product line of lighting controllers and LROC-40x room automation controllers. The occupancy sensor uses a passive infrared presence detector and a digital microphone. The sensor is optimized for use in typical office environments where even the small movements of somebody working at a desk and hitting the keyboard have to be detected across the complete detection area.

The LDALI-MS2/MS3-BT provides a presence detection zone diameter of 10.8 m at 3 m mounting height and is ideal to cover a typical office room or an area in an open office space. As well it is suitable for highbay-applications for mounting heights up to 12 m. The detection area for mounting heights from 5 m to 12 m is 256 m².

The LDALI-MS4-BT provides a flat lense and the presence detection zone diameter is 7 m at 3 m mounting height.

With the built-in infrared receiver, the room's lights, sunblinds and HVAC system can be controlled via the optionally available IR remote control L-RC1. In addition to occupancy and illuminance sensors, the LDALI-MS2/MS3/MS4-BT comes with integrated temperature and humidity sensors. In room automation applications, those values can be used to calculate the current dew point. On the back of the sensor, there is a connector for three digital inputs, allowing to connect conventional switches and push-buttons, window contacts, dew point sensor, etc. This feature not only saves on additional hardware, but also significantly reduces wiring costs, as the inputs can be wired inside the room and wires no longer have to be pulled to the I/O modules in the switching cabinet.

Furthermore, the LDALI-MS2/MS3/MS4-BT can transmit all supported beacon-types (iBeacon, Eddystone UID beacon or manufacturer specific LOYTEC beacon) for indoor localization.

The LDALI-MS2-BT comes with three mounting options: It can be mounted in-wall in standard flush-mounted boxes, spring snap in false ceilings and on-wall with the included surface mounting box. The LDALI-MS3/MS4-BT is designed to be used with spring snaps in false ceilings.

Communication and power supply is handled via the DALI bus. The LDALI-MS2/MS3/MS4-BT is a DALI-2 certified multi-sensor as defined in the IEC 62386 (2014) standard and can be integrated into DALI-2 systems of other vendors.

## Features

- Easy integration into LOYTEC L-DALI lighting systems and LROC-40x room automation controllers with a special focus on lighting control and reducing energy costs
- DALI-2 certified input device, according to IEC62386-101, IEC62386-103, IEC62386-301, IEC62386-303 and IEC62386-304
- High sensitivity occupancy detection – dual technology (PIR and acoustic, separate sensitivity parameter for each technology, sensitivity adujstable), optimized for office applications
- Illuminance measurement
- Built-in infrared receiver for optional infrared remote control L-RC1
- Temperature sensor
- Humidity sensor
- 3 digital inputs (dry contact)

- Configurable Bluetooth beacons and services: indoor navigation, asset tracking and access to LWEB-900 room control solution
- The LDALI-MS3/MS4-BT can be mounted directly in false ceilings (spring mount included).
- The LDALI-MS2-BT can be mounted in a flush-mounted box, directly in false ceilings (spring mount included) or on-wall (mounting kit LOYMS2-OW must be ordered separately).
- Multi-master compatible, up to 16 LDALI-MS2/MS3/MS4-BT sensors per DALI channel given a sufficiently dimensioned bus supply
- Supplied via the DALI bus, no external power supply required
- Sensor head of the LDALI-MS2/MS3-BT can be tilted up to ±15° vertically
- Flat lense in LDALI-MS4-BT type
- Firmware update via DALI

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# LDALI-MS2-BT / LDALI-MS3-BT / LDALI-MS4-BT

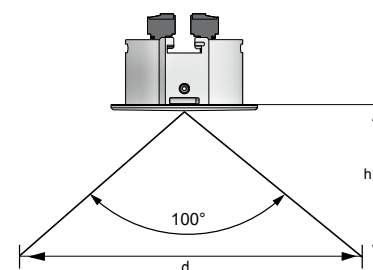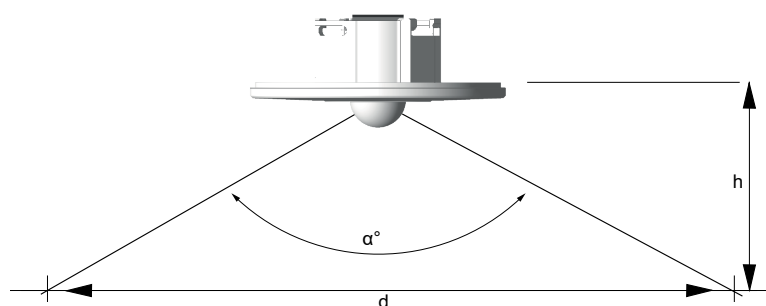| Specifications | | | |
|---|---|---|---|
| Type | LDALI-MS2-BT | LDALI-MS3-BT | LDALI-MS4-BT |
| Dimensions (mm) | Total Ø: 104, DIM042<br>flush-mounted Ø: 60<br>mounting depth: 30 | Total Ø: 68, DIM089<br>mounting hole Ø: 60<br>mounting depth: 42 | Total Ø: 68, DIM061<br>mounting hole Ø: 60<br>mounting depth: 42 |
| Installation | Ceiling mount:<br>• Direct installation in false ceilings (spring mount included)<br>• Flush-mounted installation<br>• On-wall (mounting kit LOYMS2-OW must be ordered separately) | Ceiling mount:<br>• Direct installation in false ceilings (spring mount included) | |
| Power supply | DALI bus, 6 mA / 10 mA at 16 V DC (Bluetooth disabled/enabled), max. 10mA (inrush current) | | |
| Operating conditions | 0 °C to 50 °C, 10 – 90 % RH, noncondensing, degree of protection: IP20 | | |
| Interfaces | 1 x DALI<br>1 x infrared remote control receiver<br>3 x digital input (dry contact, not protected against overvoltage)<br>1 x Bluetooth interface | | |
| DALI protocol conformance (IEC 62386 parts) | 101 ed2, 103 ed1 (input device), 301 ed1 (digital inputs, IR remote), 303 ed1 (PIR), 304 ed1 (lux sensor) | | |
| Bluetooth & RF characteristics | Maximum output power: + 4 dBm<br>Frequency range: 2402 - 2480 Mhz | | |
| Occupancy detection | PIR and acoustic, sensitivity adjustable | | |
| Passive infrared motion detector | Detection diameter: 10.8 m @ 3 m mounting height (92 m²), 136 zones, opening angle: 122° (up to 5 m mounting height)<br><br>Highbay-application: 5 m – 12 m mounting height, detection area: 256 m² (opening angle: 73.6° @ max.12 m, 122° @ 5 m) | | Detection diameter: 7.2 m @ 3 m mounting height (44 m²),156 zones,<br>opening angle: 100° (up to 5 m mounting height) |
| Mounting height | max. 12 m | | max. 5 m |
| Illuminance measurement | 0 – 4000 lux, resolution: 0.125 lux | | |
| Temperature measurement | -5 °C to 60 °C, resolution: 0.1 °C, accuracy: ±0.2 °C (0 °C to 70 °C) | | |
| Rel. Humidity measurement | 0 % – 100 %, resolution 0.5 %,<br>accuracy:<br>typ. ±2.2 % R.H. @ 25 °C, 20 % – 80 % R.H.<br>typ. ±4 % R.H. @ 25 °C, 0 % – 20 % R.H. and 80 % – 100 % R.H. | | |
| Connection wires profile | 0.2 – 1.5 mm² [AWG 28 – 14] | | |
| Wire stripping length | 6 mm [0.24 in] | | |
| Wire length for digital inputs | < 10 m | | |
| Color | RAL 9010, pure white | | |
| For use with | LDALI-3E10x-U, LDALI-ME20x-U, LDALI-PLCx, LROC-40x, LIOB-591 | | |
| **Resource limits** | | | |
| Type | LDALI-MS2-BT | LDALI-MS3-BT | LDALI-MS4-BT |
| Number of LDALI-MSx-BT | 16 per DALI channel, with sufficient dimensioned DALI bus power supply | | |



LOYMS2-OW, On-wall Mounting Box



LDALI-MS2-BT



LDALI-MS3-BT



LDALI-MS4-BT

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# LDALI-MS2-BT / LDALI-MS3-BT / LDALI-MS4-BT



## Mounting Height / Coverage LDALI-MS2/MS3-BT

| h [m] | d [m] | A [m²] | α[°] |
|---|---|---|---|
| 1.5 | 5.4 | 23 | 122 |
| 2.0 | 7.2 | 41 | 122 |
| 2.5 | 9.0 | 64 | 122 |
| 2.7 | 9.7 | 75 | 122 |
| 3.0 | 10.8 | 92 | 122 |
| 3.5 | 12.6 | 125 | 122 |
| 4.0 | 14.4 | 164 | 122 |
| 4.5 | 16.2 | 207 | 122 |
| 5.0 | 18.0 | 256 | 122 |
| 6.0 | 18.0 | 256 | 112 |
| 8.0 | 18.0 | 256 | 96.7 |
| 10.0 | 18.0 | 256 | 84 |
| 12.0 | 18.0 | 256 | 73.6 |

## Mounting Height / Coverage LDALI-MS4-BT

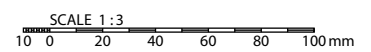| h [m] | d [m] | A [m²] | α[°] |
|---|---|---|---|
| 1.5 | 3.6 | 10.0 | 100 |
| 2.0 | 4.8 | 17.8 | 100 |
| 2.5 | 6.0 | 27.9 | 100 |
| 2.7 | 6.4 | 32.5 | 100 |
| 3.0 | 7.2 | 40.2 | 100 |
| 3.5 | 8.3 | 54.7 | 100 |
| 4.0 | 9.5 | 71.4 | 100 |
| 4.5 | 10.7 | 90.3 | 100 |
| 5.0 | 11.9 | 111.5 | 100 |

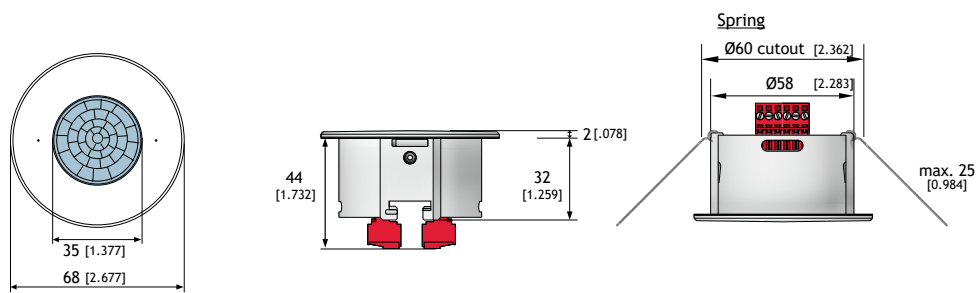| Order number | Product description |
|---|---|
| LDALI-MS2-BT | DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth), up to 12 m mounting height |
| LDALI-MS3-BT | DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth), up to 12 m mounting height |
| LDALI-MS4-BT | DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth, flat lense), up to 5 m mounting height |
| LOYMS2-OW | On-wall Mounting Kit for LDALI-MS2-BT / LOYBT-MS2 (8 pcs per package) |
| L-RC1 | Infrared remote control for room automation applications |

# Dimensions of the devices in mm and [inch]
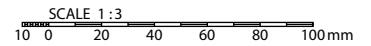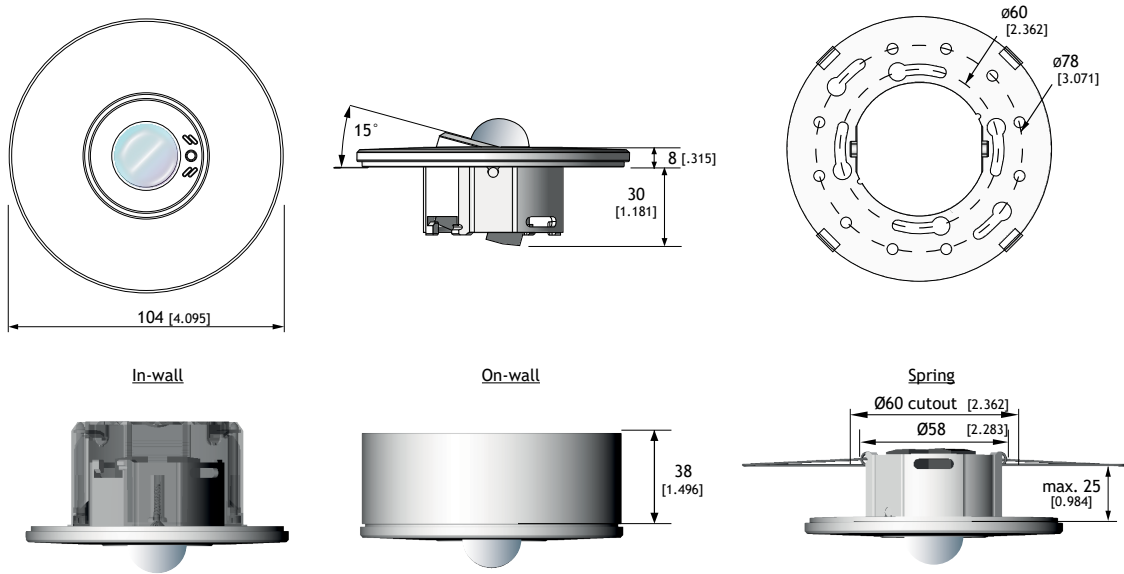
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## DIM042 LDALI-MS2-BT

ø60 [2.362]
ø78 [3.071]

15°
8 [.315]
30 [1.181]

104 [4.095]

In-wall

On-wall

Spring

38 [1.496]

Ø60 cutout [2.362]
Ø58 [2.283]
max. 25 [0.984]

SCALE 1 :3
10 0 20 40 60 80 100 mm

## DIM061 LDALI-MS4-BT

Spring
Ø60 cutout [2.362]
Ø58 [2.283]
max. 25 [0.984]

2 [.078]

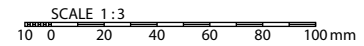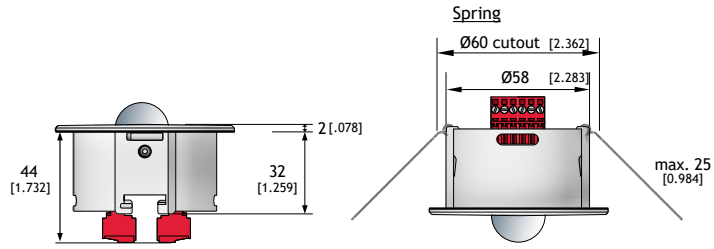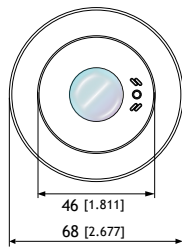44 [1.732]
32 [1.259]

35 [1.377]
68 [2.677]

SCALE 1 :3
10 0 20 40 60 80 100 mm

The products of LOYTEC electronics GmbH are subject to constant development. Therefore, LOYTEC reserves the right to modify technical specifications at any time without prior notice. The most recent datasheet can be downloaded from www.loytec.com.

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# Dimensions of the devices in mm and [inch]

## DIM089     LDALI-MS3-BT

Spring

Ø60 cutout [2.362]

Ø58 [2.283]

2 [.078]

44
[1.732]

32
[1.259]

max. 25
[0.984]

46 [1.811]

68 [2.677]

SCALE 1:3

10  0     20     40     60     80    100 mm

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**buildings under control**