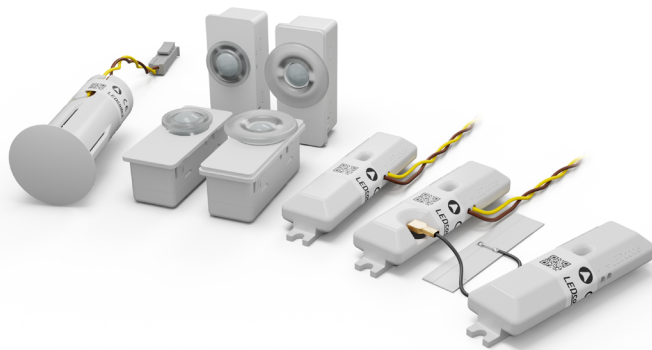


## Bluetooth Casambi BT Family Wireless Control Modules Developed for Europe



The LEDcode-Casambi BLE wireless control modules by eldoLED are 2-way digital devices, designed for integration into your luminaire. They can be connected to any eldoLED DALI-2 LED driver with LEDcode2 interface to provide a seamless integration into a Casambi BLE network. Commissioning can be done via the Casambi App. These products merge Quality of Light with wireless control.

The wireless control modules receive power and data via the LEDcode2 connection to the driver. Combined with an eldoLED LED driver, these miniaturized low-voltage devices enable simple wireless control of individual luminaires, groups of luminaires using LEDcode Cross and room control.

The product family includes wireless control modules in 3 different form factors (linear shape with or without external antenna, and flush-mount shape). The modules can be equipped with different profiles for controlling single channel drivers (ECODrive\* and SOLOdrive\*) or two channel drivers (DUALdrive\* and LINEARdrive 200D models\*).

The product family also includes BLE modules combined with integrated sensors for energy saving and room control. These products can either fit in a rectangular 17x44mm Zhaga cut-out or can be mounted with the lens receptacle in a round 16mm cut-out. They are available for IP20 rated luminaires as well as IP66 rated luminaires. The range includes PIR lenses for 3m as well as 6m mounting heights.

The family received a best-in-class rating by Casambi and has been designed to meet the standards in Europe (CE) as well as North America (UL).

### Applications

- Indoor and architectural lighting with wireless control
- Office, education and commercial room, stairways and corridor control
- Waterproof luminaires for passages, garages and low-bay industrial applications with wireless corridor control

### Key Features and Benefits

- Wireless control with Bluetooth (Casambi Ready)
- Quality of Light with BLE wireless control. Low-voltage BLE module that works with eldoLED DALI-2 drivers with a LEDcode2 interface of the following series:
  - ECODrive (dim down to 1%)
  - SOLOdrive (dim down to 0.1%)
  - DUALdrive (Tunable White)
  - LINEARdrive 200D (CV applications)
 See the reference table for more details.
- No additional mains voltage required.
- Miniaturized and minimalistic design enabling multiple ways to integrate the module in the luminaire. Available form factors include:
  - Linear shape with integrated antenna
  - Flush-mount shape with integrated antenna
  - Linear shape with external antenna
  - Zhaga book 20 shape (17x44mm) with sensors and option to mount in 16mm cut-out using lens receptacle
  - The sensor product range includes models for IP20 and for IP66 rated luminaires
  - Sensor product range includes models with presence detection optimized for 3m and 6m mounting height
- Multiple profiles are available to control:
  - 1 channel drivers (ECODrive\* and SOLOdrive\*, LINEARdrive 200D\*)
  - 2 channel drivers (DUALdrive\*, LINEARdrive 200D\*)
- Positive release tested by Casambi, enables use in an ecosystem with over 300 industry partners (e.g. wall switches)
- Cost-effective and commissioning-free group control can be enabled by the driver with LEDcode Cross. One driver (the driver with a wireless control module) broadcasts DALI commands to the other DALI drivers over the DALI line. The primary driver receives its control input via the LEDcode bus from the wireless control module.

\* DALI-2 models with LEDcode2 interface

### Specifications and Certifications

CASAMBI **LEDcode2**



# BT Family Wireless Control – Datasheet

## Products

| Product**  | Nominal Input over LEDcode2 | Housing Form Factor | IP Rating | Mounting Height for Sensor | Compatible DALI-2 Drivers with LEDcode interface                  |
|------------|-----------------------------|---------------------|-----------|----------------------------|-------------------------------------------------------------------|
| BT-L2E1    | 5V 7mA                      | Linear*             | IP20      | -                          | ECOdrive, SOLOdrive, DUALdrive (DT6), LINEARdrive (DT6)           |
| BT-S1E1    | 5V 7mA                      | Flush-mount         | IP20      | -                          |                                                                   |
| BT-L1E-1w1 | 5V 7mA                      | Linear              | IP20      | -                          |                                                                   |
| BT-L1E-1x1 | 5V 7mA                      | Linear              | IP20      | -                          |                                                                   |
| BT-Z2E-3x1 | 5V 7mA                      | Zhaga               | IP20      | 3m                         | ECOdrive, SOLOdrive, DUALdrive (DT6, DT8), LINEARdrive (DT6, DT8) |
| BT-Z2E-6x1 | 5V 7mA                      | Zhaga               | IP20      | 6m                         |                                                                   |
| BT-Z6E-3x1 | 5V 7mA                      | Zhaga               | IP66      | 3m                         |                                                                   |
| BT-Z6E-6x1 | 5V 7mA                      | Zhaga               | IP66      | 6m                         |                                                                   |

\* External antenna is linear PCB.

\*\* All products have Evolution (E) Casambi stack as standard. The product is capable of OTA (over-the-air) updates. BT-L2E1, BT-S1E1 contain FCC ID: 2ADCB-BRM1, the other ones contain FCC ID: 2ALA3-CBM003B, contains IC (ISED): 22496-CBM003B

## Ordering Guide

| BT        | Lx                                                                                                                                                                                | E                      | 1                                                                         | w1                                                  | 5400                                                      |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|
| Family    | Housing type                                                                                                                                                                      | Wireless Network Stack | Version                                                                   | Connection                                          | Profile                                                   |
| BLE radio | L1 = Linear with internal antenna<br>L2 = Linear with external antenna<br>S1 = Flush-mount with internal antenna<br>Z2= Zhaga for IP20 luminaire<br>Z6 = Zhaga for IP66 luminaire | E = Casambi Evolution  | 1 = Version 1<br>3 = 3m ceiling sensor lens<br>6 = 6m ceiling sensor lens | w1 = Pre-wired<br>x1 = Push-in connector on product | Profile number, see the table 'Profile Information' below |

## Profile Information

| Number | Product                  | Driver                                                                 | Control                                      |
|--------|--------------------------|------------------------------------------------------------------------|----------------------------------------------|
| 5400   | BT-L2E1, BT-S1E1         | ECOdrive, SOLOdrive, LINEARdrive DT6                                   | 1 channel dim of intensity                   |
| 5402   | BT-L2E1, BT-S1E1         | DUALdrive 2x DT6, LINEARdrive 2x DT6                                   | 2 channel dim of intensity                   |
| 14106  | BT-L2E1, BT-S1E1         | DUALdrive 2x DT6, LINEARdrive 2x DT6                                   | 2 channel dim and CCT (2700-6500K)           |
| 5403   | BT-L2E1, BT-S1E1         |                                                                        | 2 channel dim and CCT (3000-6500K)           |
| 5405   | BT-L2E1, BT-S1E1         |                                                                        | 2 channel dim and CCT (3000-6500K)           |
| 38986  | BT-L1E-1w1<br>BT-L1E-1x1 | ECOdrive, SOLOdrive, LINEARdrive DT6                                   | 1 channel dim of intensity                   |
| 39367  |                          | DUALdrive 2x DT6, LINEARdrive 2x DT6                                   | 2 channel dim of intensity                   |
| 39369  |                          | DUALdrive 2x DT6, DUALdrive DT8<br>LINEARdrive 2x DT6, LINEARdrive DT8 | 2 channel dim and CCT (2700-6500K)           |
| 37313  | BT-Z2E-3x1               | ECOdrive, SOLOdrive, LINEARdrive DT6                                   | 1 channel sensor-driven dimming of intensity |
| 44096  | BT-Z2E-6x1               | DUALdrive 2x DT6, LINEARdrive 2x DT6                                   | 2 channel dim of intensity                   |
| 44097  | BT-Z6E-3x1<br>BT-Z6E-6x1 | DUALdrive 2x DT6, DUALdrive DT8<br>LINEARdrive 2x DT6, LINEARdrive DT8 | 2 channel dim and CCT (2700-6500K)           |

For other profiles, please contact your eldoLED sales representative.

# BT Family Wireless Control – Datasheet

## Electrical Specifications

|            | Input    | Input Voltage Range | Maximum Input Power | Peak Current    | Polarity                                   | Radio Protocol | Line of Sight (open air) |
|------------|----------|---------------------|---------------------|-----------------|--------------------------------------------|----------------|--------------------------|
| BT-L2E1*   | LEDcode2 | 4.0-6.5V            | 50mW                | <15mA @3.6V     | Protected against incorrect LEDcode wiring | BLE 4.0        | 45m                      |
| BT-S1E1    |          |                     |                     |                 |                                            |                | 45m                      |
| BT-L1E-1w1 |          | 3.0- 5.5V           | 100mW               | <20mA @startup  |                                            | BLE 5.3        | 100m**                   |
| BT-L1E-1x1 |          |                     |                     |                 |                                            |                | 100m**                   |
| BT-Z2E-3x1 |          |                     | 500mW               | <100mA @startup |                                            |                | 70m-120m***              |
| BT-Z2E-6x1 |          |                     |                     |                 |                                            |                | 70m-120m***              |
| BT-Z6E-3x1 |          |                     |                     |                 |                                            |                | 70m-120m***              |
| BT-Z6E-6x1 |          |                     |                     |                 |                                            |                | 70m-120m***              |

\* Remote antenna Pulse W3525B

\*\* Line of Sight doubles in long range mode

\*\*\* Line of Sight 70m in a metal box, doubles in long range mode; 120m in plastic enclosure, doubles in long range mode.

## Minimum and Maximum Ratings

|                                     |              |
|-------------------------------------|--------------|
| Operating Ambient Temperature Range | -20°C - 50°C |
| Lifetime                            | 50.000 hours |

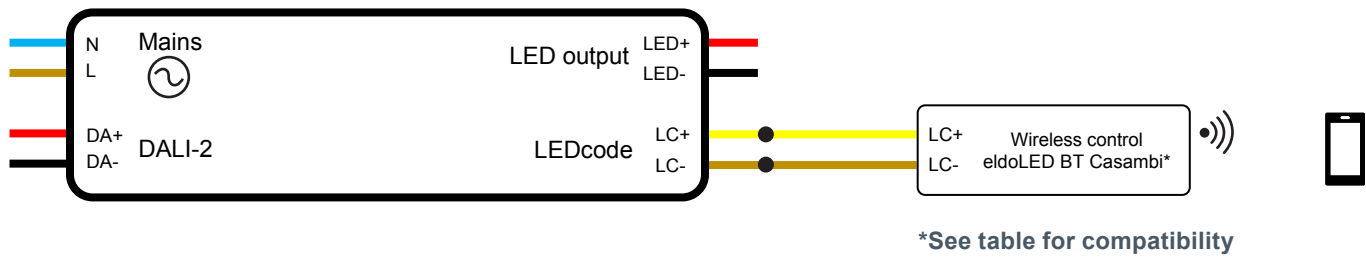
## Wiring and Connector Lay Out

|                              |                       |                          |                                                                                                  |
|------------------------------|-----------------------|--------------------------|--------------------------------------------------------------------------------------------------|
|                              | BT-L2E1<br>BT-L1E-1w1 | BT-S1E1                  | BT-L1E-1x1<br>BT-Z2E-3x1, BT-Z2E-6x1<br>BT-Z6E-3x1, BT-Z6E-6x1                                   |
| Connector Type               | n/a, pre-wired        | Molex 43460-0201 female* | BT-L1E-1x1: WAGO 205-302, or alike<br>BT-Z2E and BT-Z6E versions: Phoenix PTSM 1771091, or alike |
| Wire Type                    | Solid                 | Solid                    | Solid                                                                                            |
| Wire Dimensions              | 0.5mm <sup>2</sup>    | 0.33mm <sup>2</sup>      | 0.5mm <sup>2</sup>                                                                               |
| Wire Length                  | 600mm                 | 100mm                    | n/a                                                                                              |
| Wire Strip Length            | 6mm                   | n/a                      | 6mm                                                                                              |
| Maximum Length to LED driver | 3m                    | 3m                       | 3m                                                                                               |

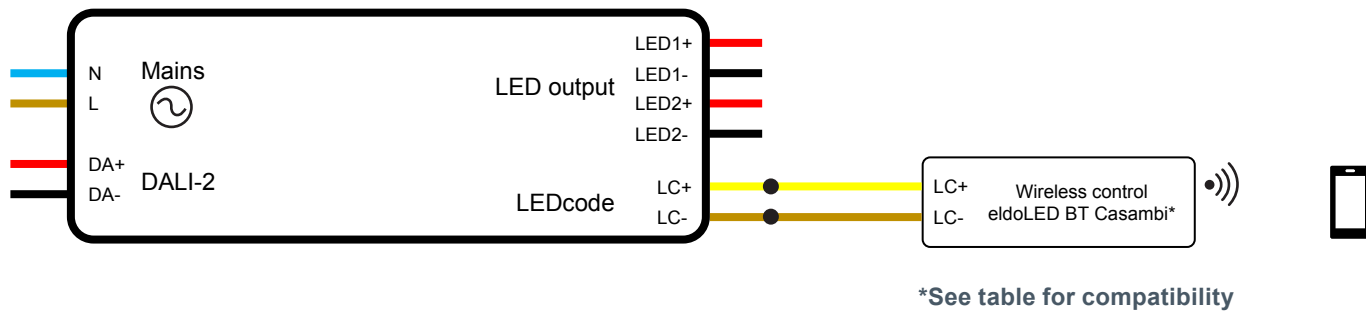
\* Male part Molex 43465

Wiring Diagram

ECODrive, SOLOdrive, LINEARdrive 1 channel (DALI) (top view)



DUALdrive, SOLOdrive, LINEARdrive 2 channel (DALI) (top view)



Compatibility Table

| ECODrive DALI | SOLOdrive DALI (1 or 2 channel)<br>LINEARdrive DALI 1x DT6 | DUALdrive DALI 2x DT6<br>LINEARdrive DALI 2x DT6 | DUALdrive DALI DT8<br>LINEARdrive DALI DT8 |
|---------------|------------------------------------------------------------|--------------------------------------------------|--------------------------------------------|
| BT-L1E-1w1    | BT-L1E-1w1                                                 | BT-L1E-1w1                                       | BT-L1E-1w1                                 |
| BT-L1E-1x1    | BT-L1E-1x1                                                 | BT-L1E-1x1                                       | BT-L1E-1x1                                 |
| BT-L2E1       | BT-L2E1                                                    | BT-L2E1                                          |                                            |
| BT-S1E1       | BT-S1E1                                                    | BT-S1E1                                          |                                            |
| BT-ZxE-xx1    | BT-ZxE-xx1                                                 | BT-ZxE-xx1                                       | BT-ZxE-xx1                                 |

# BT Family Wireless Control – Datasheet

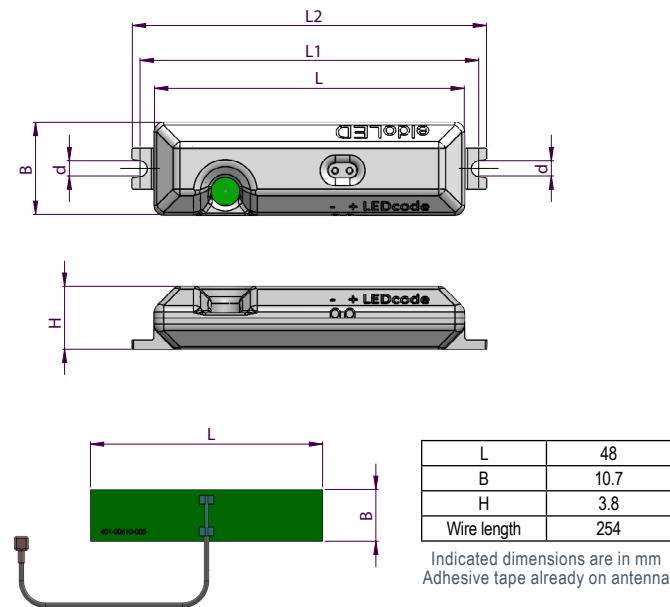
## Mechanical Details

|                                             | BT-L2E1<br>(L2 x B x H) | BT-L1E-1x1 / 1w1<br>(L2 x B x H)             | BT-S1E1<br>(L2 x Ø D3) | BT-Z2E-3x1 / 6x1<br>BT-Z6E-3x1 / 6x1<br>(L1 x B1 x H)     |
|---------------------------------------------|-------------------------|----------------------------------------------|------------------------|-----------------------------------------------------------|
| Dimensions                                  | 73 x 19 x 13mm          | 73 x 19 x 13mm                               | 61 x 30mm              | 47 x 20 x 18mm (BT-Z2E)<br>47 x 20 x 21.4mm (BT-Z6E)      |
| Screw Hole (d)                              | 3.2mm                   | 3.2mm                                        | -                      | -                                                         |
| Mounting Screws                             | M3                      | M3                                           | -                      | -                                                         |
| Torque                                      | <100Nm                  | <100Nm                                       | -                      | -                                                         |
| Antenna Connector                           | I-PEX-U.FL              | -                                            | -                      | -                                                         |
| Antenna Weight                              | 3.3gr                   | -                                            | -                      | -                                                         |
| Motion Sensor Detection Angle               | -                       | -                                            | -                      | PIR -45 .. +45 degrees, see PIR angular sensitivity graph |
| Light Sensor* Detection Range               | -                       | -                                            | -                      | Photocell 10-2000 lux                                     |
| Zhaga Cut-out Mount (LEX-S Zhaga book 20)   | -                       | -                                            | -                      | 17 x 44mm                                                 |
| Receptacle Mount (D)                        | -                       | -                                            | -                      | Ø 16mm (BT-Z2E versions)<br>Ø 18mm (BT-Z6E versions)      |
| Max Material Thickness for Receptacle Mount | -                       | -                                            | -                      | 1.6mm (BT-Z2E versions)<br>2.5mm (BT-Z6E versions)        |
| Foam** when using Lens Receptacle           | -                       | -                                            | -                      | Eriks CR Fest (neoprene based)                            |
| Foam Thickness                              | -                       | -                                            | -                      | 2mm (BT-Z2E versions)<br>4mm (BT-Z6E versions)            |
| Weight of Individual Product                | 10.2gr                  | 10.2gr (1x1 version)<br>18.4gr (1w1 version) | 12.2gr                 | 12.3gr (BT-Z2E versions)<br>13.5gr (BT-Z6E versions)      |
| Packaging                                   | 2 or 10 pcs per box     |                                              |                        |                                                           |
| Box Weight (volume pack, 50 pcs)            | 1.39kg                  | 1.39kg (1x1 version)<br>1.8kg (1w1 version)  | 1.49kg                 | 1.85kg (BT-Z2E versions)<br>1.91kg (BT-Z6E versions)      |

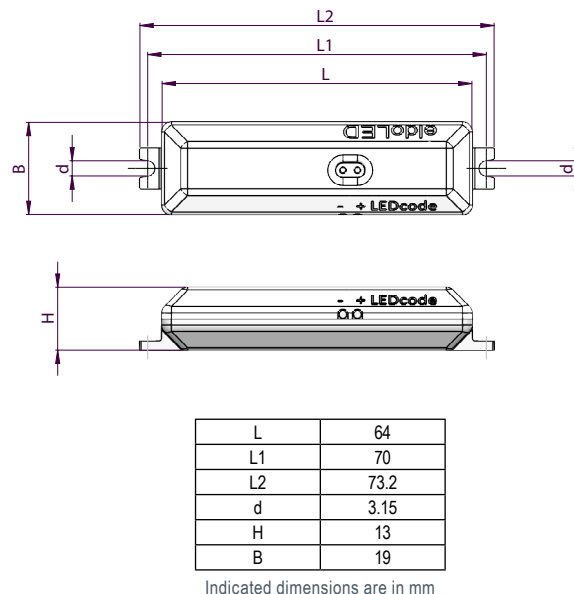
\*Avoid overlapping detection zones for the motion sensor. Heaters, fans, printers and copiers located in the detection zone may cause incorrect occupancy detections. Avoid direct light into the photocell detector.

\*\* IP20: foam is intended to press-fit the receptacle and avoid rattle and rotation of the unit. It is the responsibility of the luminaire manufacturer to check the foam thickness for optimum performance.  
IP66: foam is intended to press-fit the receptacle and provide an IP66 tight connection. It is the responsibility of the luminaire manufacturer to check the foam thickness for optimum performance.

BT-L2E1

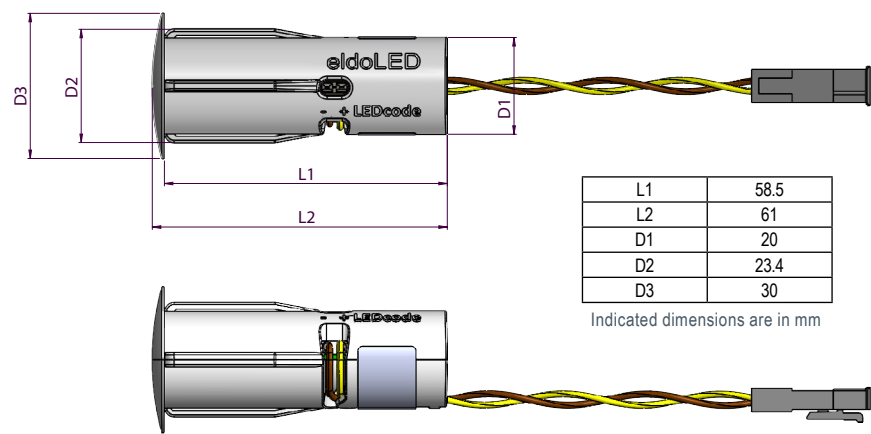


BT-L1E-1x1 / 1w1

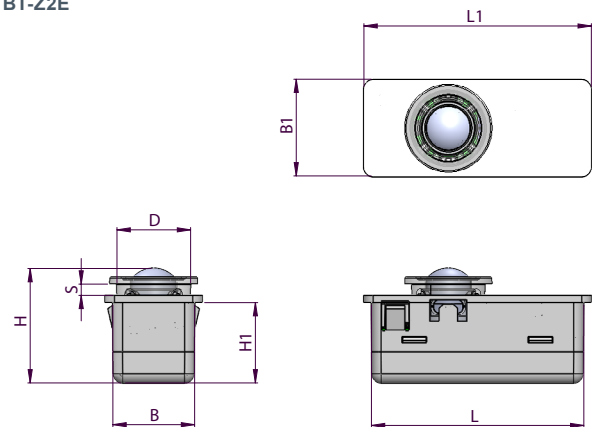


Mechanical Details (continued)

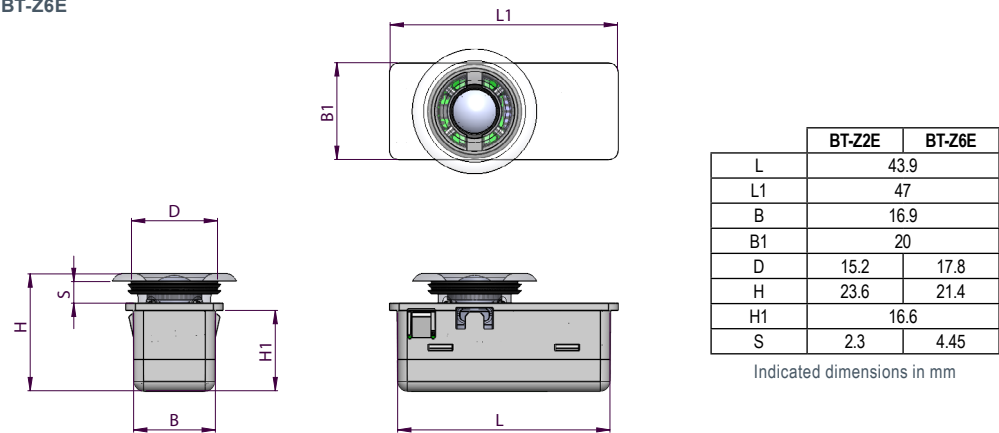
BT-S1E1



BT-Z2E



BT-Z6E

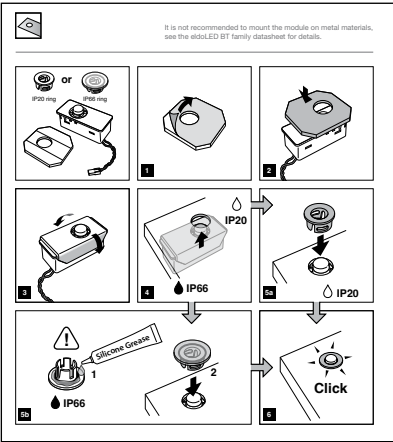


Mechanical Mounting Options

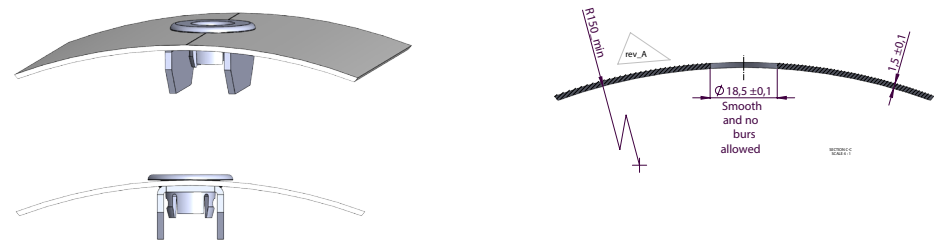
BT-Z2E-3x1, BT-Z2E-6x1  
BT-Z6E-3x1, BT-Z6E-6x1

Round cut-out

Mounting instructions: see separate document on the product page on the eldoLED website:

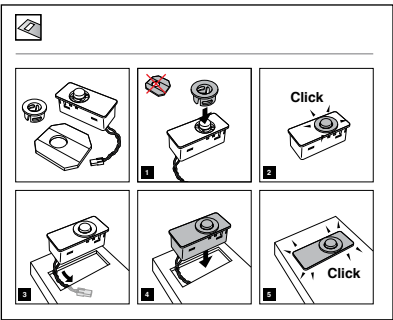


In case BT-Z6E modules are mounted onto a curved surface, please take the following into account:



Rectangular cut-out

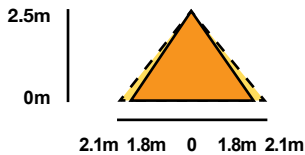
Mounting instructions: see separate document on the product page on the eldoLED website:



Sensor Characterization

3m ceiling height version

Sensitivity diagram for 360° presence detectors for BT-Z2E-3x1 and BT Z6E-3x1 versions

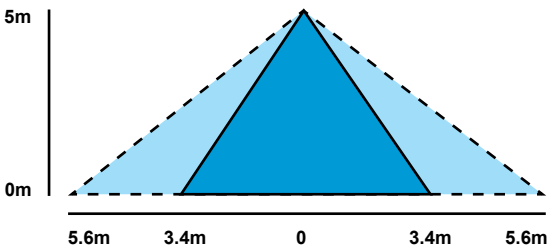


- Range for sideways passage (tangential motion) 
- Range for moving towards sensor (radial motion) 
- Range for sitting desk work (presence area) 

6m ceiling height version

Sensitivity diagram for 360° presence detectors for BT-Z2E-6x1 and BT Z6E-6x1 versions

When 6m PIR is mounted at 2.5m, the numbers scale.  
6m PIR has not been designed for desk work.



- Range for sideways passage (tangential motion) 
- Range for moving towards sensor (radial motion) 

# BT Family Wireless Control – Datasheet

## Self Test Sensor Module

After a power cycle the sensor module performs a self-test. A white LED flashes in a certain pattern during the self test. More information is available with your eldoLED sales representative.

## Standards and Compliances

|                                           |                                                                                             |
|-------------------------------------------|---------------------------------------------------------------------------------------------|
| Radio Equipment Directive (RED) - Europe  | 2014/53/EU<br>Note that RED covers EN 61347, EN 61547, EN 62311, EN 62493, EN 18031         |
| ENEC Safety                               | EN 62368-1:2014<br>EN 62479:2010                                                            |
| UL Management Equipment, Energy Component | UL 916                                                                                      |
| Radiated Emissions                        | EN 55015<br>47 CFR part 15.247<br>RSS-210 issue 9 August 2016<br>RSS-247 issue 1 May 2015   |
| EMC Compatibility (art 3.1)               | EN301 489-1 v2.2.3<br>EN301 489-17 v3.2.4<br>EN55032:2015+A11:2020<br>EN55035:2017+A11:2020 |
| Radio Spectrum (art 3.2)                  | EN300 328 v2.2.2                                                                            |
| Bluetooth                                 | Bluetooth Qualification & Declaration ID: D037520                                           |
| Surge Immunity                            | ANSI C63.4:2014                                                                             |
| Glow Wire Test                            | Passes 650°C glow wire test / 850°C glow wire test (France)                                 |
| Restriction of Hazardous Substance        | RoHS3 (Directives 2011/65/EU-2015/863/EU)                                                   |
| SVHC-list Substances                      | REACH Art 33                                                                                |

## Safety



Risk of electrical shock. May result in serious injury or death. Disconnect power before servicing or installing.



The LED driver may only be connected and installed by a qualified electrician. All applicable regulations, legislation, and building codes must be observed. Incorrect installation of the LED driver can cause irreparable damage to the LED driver and the connected LEDs.



eldoLED products are designed to meet the performance specifications as outlined at certain operating conditions in the data sheet. It is the responsibility of the fixture manufacturer to test and validate the design and operation of the system under expected and potential use cases, including faults.



Please observe voltage drop over long cable lengths. Longer cable lengths increase EMI susceptibility.



Product renderings and dimensional drawings are generic for the housing type. Product label, connector type and quantity may vary.

## Warranty

eldoLED Products are covered by a 5-year limited warranty. This is the only warranty provided and no other statements in this datasheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms can be found at: [www.eldoled.com/legal/terms-and-conditions](http://www.eldoled.com/legal/terms-and-conditions)

**Note:** Actual performance may differ as a result of end-user environment and application.  
The product images shown are for illustration purposes only and may not be an exact representation of the product.  
Specifications subject to change without notice.