

# HBIR31/W

Bluetooth DALI PIR Lowbay | Integrated 80mA PSU | Ceiling mounting

**HYTRONIK**<sup>®</sup>  
SENSORS & LIGHTING CONTROL



## Benefits

Adaptable: Metal surface mount box options

Integrated: Built-in 80 mA DALI PSU for stable control

Simple: Wireless setup and commissioning via Koolmesh App

## Applications

Ceiling or surface mounting (with accessory)

Offices & Classrooms

Corridors & Staircases

Check Out the Complete System Solution on the Website:  
<https://www.hytronik.com/product/HBIR31-W>



CB

CE

RED

UK  
CA

## Product Description

HBIR31/W is a Bluetooth PIR standalone motion sensor designed for low-bay applications with a typical mounting height of 2.5 m, featuring a wide detection range for larger area coverage. It integrates an 80 mA DALI power supply, capable of powering and controlling multiple LED drivers on the same DALI bus. When used with standard DALI tunable white drivers, it enables motion sensing, daylight harvesting, brightness dimming, and colour temperature tuning. All parameters and commissioning can be configured via the app, enabling flexible lighting control and efficient system deployment.

## Functions and Features

See additional details at the end of datasheet



Built-in DALI PSU



DALI Broadcast  
Output



DT6/DT8 Lighting  
Control



Koolmesh - See  
bluetooth control  
below



Live Energy &  
Diagnostic Data  
Part 252 / 253



Luminaire Asset  
Data Part 251



Push-Button  
Input

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## Specifications

### Main Capabilities

|                            |             |
|----------------------------|-------------|
| Dimming (Output) Interface | DALI/DALI-2 |
| Push Button Input          | 2           |

### Sensor Data

|                                 |                          |
|---------------------------------|--------------------------|
| Detection angle                 | 360°                     |
| Max. Detection range (Diameter) | 18.0 m                   |
| Maximum Mounting Height         | 6.0 m                    |
| Detection area                  | 254 m <sup>2</sup>       |
| Sensitivity                     | 10%/ 30% /50% /75%/ 100% |
| Detection Methods               | Passive Infrared (PIR)   |

### Electrical Data

|                                         |                      |
|-----------------------------------------|----------------------|
| Bluetooth Platform                      | Nordic nRF52832      |
| Bluetooth frequency                     | 2.4 GHz - 2.483 GHz  |
| Bluetooth range (Phone to Device)       | 10-30m               |
| Bluetooth transmit power                | 4 dBm                |
| Bluetooth system                        | Koolmesh             |
| Operating voltage range                 | 220-240 VAC 50/60 Hz |
| Stand-by power (Psb)                    | <1W                  |
| Warming-up                              | 20 s                 |
| DALI bus nominal current (I guaranteed) | 80 mA                |

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## Specifications

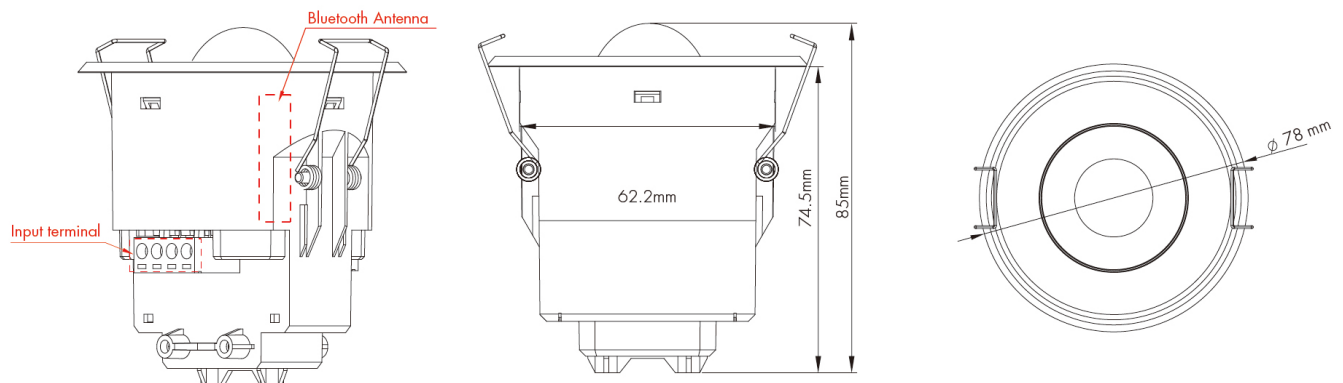
| Technical           |              |
|---------------------|--------------|
| Product weight      | 86.0 g       |
| Product height      | 85.0 mm      |
| Product length      | 78.0 mm      |
| Product width       | 78.0 mm      |
| Mounting hole       | 66.0 mm      |
| Ambient temperature | -20 ~ +50 °C |
| Storage temperature | -35 ~ +55 °C |
| Humidity max        | 10 ~ 90%     |
| IP Rate             | IP20         |

| Standard |                                               |
|----------|-----------------------------------------------|
| EMC      | EN 55015, EN 61000, EN 61547                  |
| LVD      | AS/NZS 60669-1/-2-1, EN 60669-1, EN 60669-2-1 |
| RED      | EN 300328, EN 301489-1/-17                    |

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## Technical Drawing



The Bluetooth antenna is located at the marked end of the device.

- Keep the antenna area clear of metal or conductive materials.
- Maintain at least 10 mm clearance around the antenna whenever possible for optimal wireless performance.
- Avoid installing the antenna section inside a metal enclosure or behind large metal structures.

## Application Example

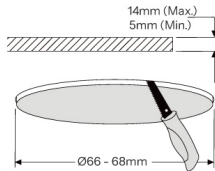


# HBIR31/W

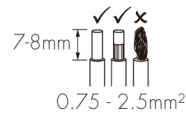
Bluetooth DALI PIR Lowbay | Integrated 80mA PSU | Ceiling mounting

## Installation Process

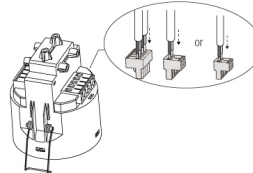
1



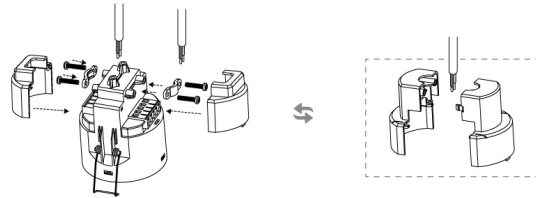
2



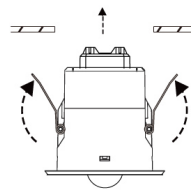
3



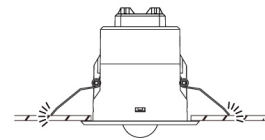
4



5



6



## Detailed Installation Instructions

1. Ceiling cut-out (hole Ø 66~68mm).
2. Prepare the cables correctly.
3. Connect the cables to the pluggable terminal blocks according to the wiring diagram.
4. Secure the cables with screws and cable clips for better stability. Install the standard back caps (or replace with the high back cap HA08 for larger wire diameter if necessary).
5. Bend the spring clips upwards and fit the sensor into the ceiling cut-out.
6. Spring clips will release and secure the sensor in the ceiling.

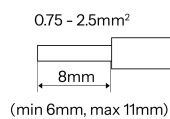
# HBIR31/W

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## ⚠ Wiring Guidelines

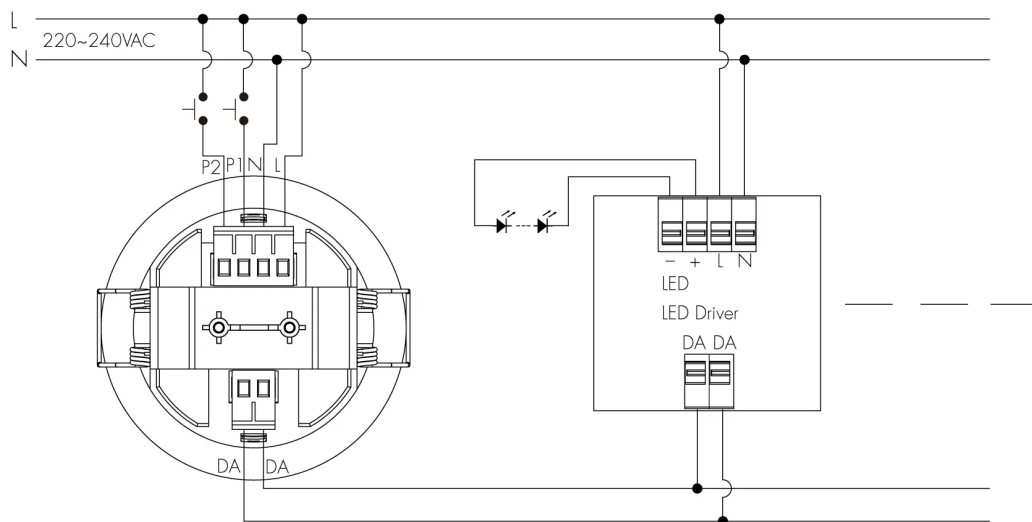
1. Installation by a qualified electrician only and in accordance with local electrical regulations.
2. Disconnect mains power before installation, wiring, maintenance or replacement.
3. Failure to follow the wiring diagram may result in product damage and malfunction.
4. Refer to the Wire Preparation section for recommended wire diameter and strip length.
5. Push inputs are mains-voltage inputs and must only be connected to mains-rated switches.
6. Do not connect mains voltage (L/N) to the DALI terminals.
7. For polarity-marked DALI terminals (DA+/DA-), observe correct DALI polarity.
8. For non-polarity-marked DALI terminals (DA/DAL), DALI wiring is polarity-free.

## Wire Preparation



Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor 1. 200 metres (total) max. for 1mm<sup>2</sup> CSA (Ta = 50°C) 2. 300 metres (total) max. for 1.5mm<sup>2</sup> CSA (Ta = 50°C)

## Wiring Diagram

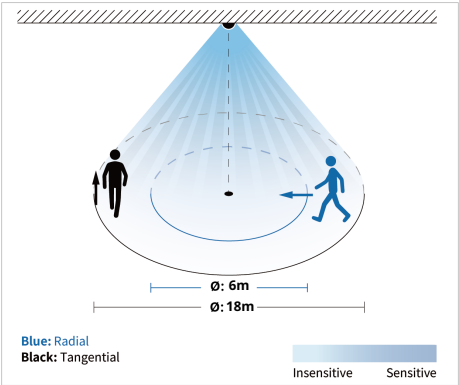


Detection Range

Single Person Walk (Ceiling mount)

- The data is tested under following conditions:
- Single person walking
  - Sensor not connected to any driver that may have soft-on period
  - Testing temperature Ta = 20°C
  - The testing is conducted in an open and spacious indoor field, without noticeable obstacles or influences that may affect PIR performances.

Detection example 2.5m mounting height:



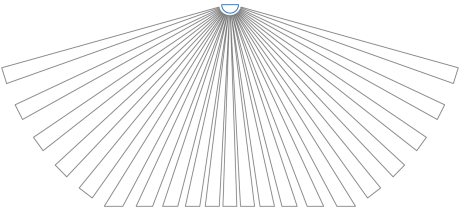
Tangential movement

|      |     |    |    |    |    |
|------|-----|----|----|----|----|
| H[m] | 2.5 | 3  | 4  | 5  | 6  |
| Ø[m] | 18  | 18 | 14 | 12 | 10 |

Radial movement

|      |     |   |   |   |   |
|------|-----|---|---|---|---|
| H[m] | 2.5 | 3 | 4 | 5 | 6 |
| Ø[m] | 6   | 6 | 6 | 6 | 4 |

Detection schematic diagram



## Commissioning Instructions and Precautions

### A. Factory settings Notes

1. Sensor setting: Control object: Zone, Sensor status: Sensor ON, Detection range: 100%, Hold time: 20min, Hold time scene: ALL ON, Stand-by time: 5s, Stand-by time scene1: 10%, Sensor mode: Auto, Mode in priority: Manual prior to sensor.
2. Push switch setting: Push switch function: Normal PUSH (Retractive switch), Control object: Zone, Single press: ON/OFF, Double press: disable, Press and hold: Brightness dimming.

### B. DALI Bus Current Notes

Typical DALI bus current consumption per driver is approximately 2 mA. Before installation, calculate the total bus current consumption of all devices connected to the same DALI bus. Ensure that the total current consumption does not exceed the guaranteed supply current of the DALI bus power supply, and allow sufficient system margin.

**Warning:** For additional important documents, including installation precautions, product guidelines, and guarantee conditions, please refer to the official downloads.

<https://hytronik.com/service/downloads>



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## Switch Input Function Configuration

The provided Switch-Dim interface allows for a simple dimming method using commercially available non-latching (momentary) wall switches. Detailed Push switch configurations can be set on Koolmesh app.

Note: Single press, double press, and press-and-hold actions can each be independently assigned to one function via the app. Once configured, each action triggers only its assigned function. Multiple functions cannot be activated by a single press action.

| Switch function                 | Action                                                                             | Descriptions                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fire Alarm Function             | Refer to <a href="https://support.koolmesh.com/">https://support.koolmesh.com/</a> | <ul style="list-style-type: none"><li>• Able to connect the Fire Alarm system.</li><li>• Once the fire alarm system is triggered, all the luminaries controlled by the Push Switch will enter the preset scene (normally it's full on), after the fire alarm system gives the ending signal, all the luminaries controlled by this Push Switch will revert back to normal status.</li></ul> |
| ON OFF Switch (Latching Switch) | /                                                                                  | <ul style="list-style-type: none"><li>• Upgrade a standard on/off control to Bluetooth control, enabling one latching switch to control multiple luminaires or zones, reducing wiring and switch count.</li></ul>                                                                                                                                                                           |
| Normal PUSH (Retractive Switch) | Single press (> 0.1s)<br>Double press<br>Press and hold (>= 1s)                    | <ul style="list-style-type: none"><li>• ON/OFF</li><li>• OFF only</li><li>• Recall this scene</li><li>• Sensor take over</li><li>• Not in use</li></ul>                                                                                                                                                                                                                                     |
| Sensor-Link                     | /                                                                                  | <ul style="list-style-type: none"><li>• Hold time/scene</li><li>• Stand-by time/scene</li><li>• Upgrade a normal on/off motion sensor to a Bluetooth-controlled motion sensor</li></ul>                                                                                                                                                                                                     |

Options

Included Accessories



Deep-reaching rear covers HA08 and HA08/S

Accessories



Plastic Mount Box | Surface Mounting | white color

HA03

[www.hytronik.com/product/HA03](http://www.hytronik.com/product/HA03)



Plastic Mount Box | Surface Mounting | IP54 Waterproof Gasket

HA03/IP54

[www.hytronik.com/product/HA03-IP54](http://www.hytronik.com/product/HA03-IP54)



Metal Mount Box | Surface Mounting | Grey Color

HA09/G

[www.hytronik.com/product/HA09-G](http://www.hytronik.com/product/HA09-G)



Metal Mount Box | Surface Mounting | Black Color

HA09/B

[www.hytronik.com/product/HA09-B](http://www.hytronik.com/product/HA09-B)



Metal Mount Box | Surface Mounting | White Color

HA09/W

[www.hytronik.com/product/HA09-W](http://www.hytronik.com/product/HA09-W)

## Koolmesh - Operating guide

Bluetooth



Smartphone(ios)



Smartphone (Android)



iPad



Web

For additional information, including project and network, device, and scenes, please refer to: <http://faq.koolmesh.com/>

## Shared Koolmesh App Features

- |                                                                                                                                                        |                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|  Alert for excess lux / temperature / humidity via multi-meter HBLM01 |  Koolmesh Pro iPad for on-site configuration                       |
|  Astro timer (sunrise and sunset)                                     |  Network sharing via QR code or keycode                            |
|  Bulk commissioning (copy and paste settings)                         |  Offline commissioning                                             |
|  Compatible with Shelly energy metering                             |  One-key device replacement                                      |
|  Continuous development in progress...                              |  Quick setup mode & advanced setup mode                          |
|  Device firmware update over-the-air (OTA)                          |  Remote control via Hytronik gateway & touch screen HPAD-TSJASE1 |
|  Device social relations check                                      |  Scenes                                                          |
|  Different permission levels via authority management               |  Schedule                                                        |
|  Floorplan feature to simplify project planning                     |  Staircase function for quick setup                              |
|  Grouping luminaires via mesh network                               |  Test mesh network connection quality                            |
|  Internet-of-Things (IoT) featured                                  |  Web platform for project deployment & data analysis             |

## Device-specific Koolmesh App features

- |                                                                                                                                                          |                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|  Adjustable motion & static sensitivity & adjustable sensing distance |  Dynamic daylight harvest auto-configuration |
|  Compatible with EnOcean kinetic switches                             |  Motion sensor range test                    |
|  Detailed motion sensor settings                                      |  Motion sensor trigger diagnosis             |
|  Dusk/Dawn photocell (twilight function)                              |  Push switch configuration                   |

## Bluetooth Mesh Network Installation & Device Access Range

### 1. Phone/Pad to Device Range (Bluetooth Connection)

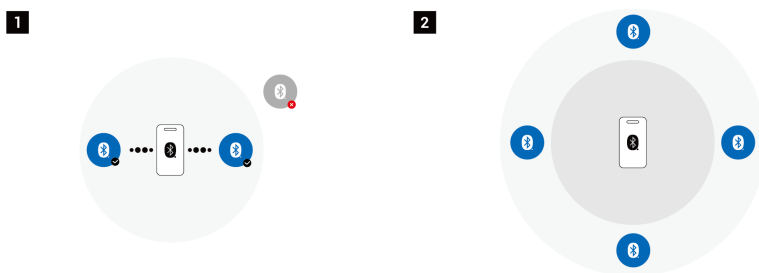
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

### 2. Device to Device Range (Mesh Network Communication)

Once commissioned, devices communicate through the wireless mesh network. Users can access and control all devices within the network when connected to any active mesh node.

#### Note:

- Bluetooth range varies by product. Refer to the Specification section for details.
- Actual communication range may vary depending on product type, obstacles, environmental conditions, and luminaire construction.



## Bluetooth Network Components



### HBGW02

Bluetooth Mesh Gateway | Ethernet or Wi-Fi 2.4GHz | wall/flat surface mounting  
[www.hytronik.com/product/HBGW02](http://www.hytronik.com/product/HBGW02)



### HBGW02/D

Bluetooth Mesh Gateway | Dual-band Wi-Fi | wall/flat surface mounting  
[www.hytronik.com/product/HBGW02-D](http://www.hytronik.com/product/HBGW02-D)



### HBGW03/R

BACnet Gateway | Dual-band Wi-Fi or Ethernet | DIN rail/wall/flat surface mounting  
[www.hytronik.com/product/HBGW03-R](http://www.hytronik.com/product/HBGW03-R)



### HBKS01/W

Bluetooth Kinetic Switch | One-gang | Wireless Control  
[www.hytronik.com/product/HBKS01-W](http://www.hytronik.com/product/HBKS01-W)



### HBKS01D/W

Bluetooth Kinetic Switch | Single Rocker | White Color  
[www.hytronik.com/product/HBKS01D-W](http://www.hytronik.com/product/HBKS01D-W)



### HBKS02/W

Bluetooth Kinetic Switch | Two-gang | White Color  
[www.hytronik.com/product/HBKS02-W](http://www.hytronik.com/product/HBKS02-W)



### HBKS02D/W

Bluetooth Kinetic Switch | Double Rocker | White Color  
[www.hytronik.com/product/HBKS02D-W](http://www.hytronik.com/product/HBKS02D-W)



### HBKS03/W

Bluetooth Kinetic Switch | Three-gang | White Color  
[www.hytronik.com/product/HBKS03-W](http://www.hytronik.com/product/HBKS03-W)



### HBLM01

Multi-meter | Bluetooth & NFC | Lux Measurements  
[www.hytronik.com/product/HBLM01](http://www.hytronik.com/product/HBLM01)



### HPAD-TSJASE1

Bluetooth Touch Tablet | Gateway Integrated | Switch Boxes  
[www.hytronik.com/product/HPAD-TSJASE1](http://www.hytronik.com/product/HPAD-TSJASE1)

## Functions and Features



### Built-in DALI PSU

Built-in DALI PSU means the DALI bus power supply is integrated into the product, eliminating the need for an external DALI power unit.

This reduces wiring complexity, saves installation space, and simplifies commissioning, making the system more compact and efficient.



### DALI Broadcast Output

This product supports DALI broadcast output, allowing control commands to be sent simultaneously to all devices on the DALI bus without individual addressing.

This enables simple group control, synchronized operation, and fast commissioning within a DALI lighting system.



### DT6 / DT8 Lighting Control

Supports DT6 (single-channel dimming) and/or DT8 (tunable white / colour) lighting control via DALI, enabling brightness and colour temperature adjustment based on control logic such as occupancy or daylight.



### Live Energy & Diagnostic Data Part 252 / 253

Koolmesh can wirelessly read live operating data from D4i drivers, or compatible DALI drivers with Part 252 / 253 implemented.

Readable data may include real-time power (W), energy consumption (kWh), voltage (V), current (mA), power factor, operating hours (burn hours), driver temperature, start counters and LED failure flags (open/short circuit).

For standard DALI-2 DT6/DT8 drivers, Koolmesh can read the data points made available by the driver, with the actual retrievable data depending on the driver's supported functions.



### Luminaire Asset Data Part 251

Koolmesh can read Part 251 luminaire asset data where available, such as GTIN, serial number, manufacturing date, luminous flux, colour temperature and manufacturer ID. The information must be pre-written into Memory Bank 1 by the luminaire OEM or driver manufacturer. If left unconfigured, related fields may be blank or unavailable.



### Push Button Input

This product integrates push-button (momentary switch) inputs, allowing external potential-free switches to trigger basic lighting control functions. Each input can be configured for actions such as on/off switching, dimming or scene recall, providing flexible manual control and user interaction within the lighting system. The push-button inputs operate independently of the sensor's automatic functions, enabling seamless coexistence of manual and sensor-based lighting control.

## Check out for further explanation of features

<https://hytronik.com/solutions/lighting-control-features>