

HBIR28/2CH

Dual-Channel PIR Lowbay | Bluetooth and ON/OFF | Ceiling mounting

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

- Reliable: Fail-safe lighting support through NC relay configuration
- Flexible: Dual relay outputs for load control and system integration
- Wireless: App-based setup for fast commissioning

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/HBIR28-2CH>



RED

UK
CA

Product Description

HBIR28/2CH is a flush-mount PIR low-bay Bluetooth motion sensor with dual-channel on/off control, designed for a typical mounting height of 2.5 m. It features two independent relay outputs, including one voltage-free contact with both NO and NC terminals and one normally open relay. All parameters are configured wirelessly via app, allowing fast commissioning and one-key deployment across multiple devices.

Functions and Features

See additional details at the end of datasheet



Dual Relay Output



Koolmesh - See bluetooth control below



NO Contact



NO/NC Standard Mode



ON/OFF Control



Push-Button Input



Zero-Cross Relay Operation

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Specifications

Main Capabilities

Dimming (Output) Interface	Volt-free Contact (VFC), Relay On/Off
Push Button Input	2

Sensor Data

Detection angle	360°
Max. Detection range (Diameter)	9.0 m
Maximum Mounting Height	6.0 m
Detection area	64 m ²
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)	<0.5W
Warming-up	20 s
Max withstandable in-rush current	80A@160µs
VFC Output(Vote-free Contact / Dry Contact)	2A@24VDC , 2A@250VAC
Load capacitive	400.0 VA

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Specifications

Technical	
Product weight	85.0 g
Product height	79.2 mm
Product length	78.0 mm
Product width	78.0 mm
Mounting hole	66.0 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-40 ~ +70 °C
Humidity max	10 ~ 90%
IP Rate	IP20
IP Rate (facial part)	IP54

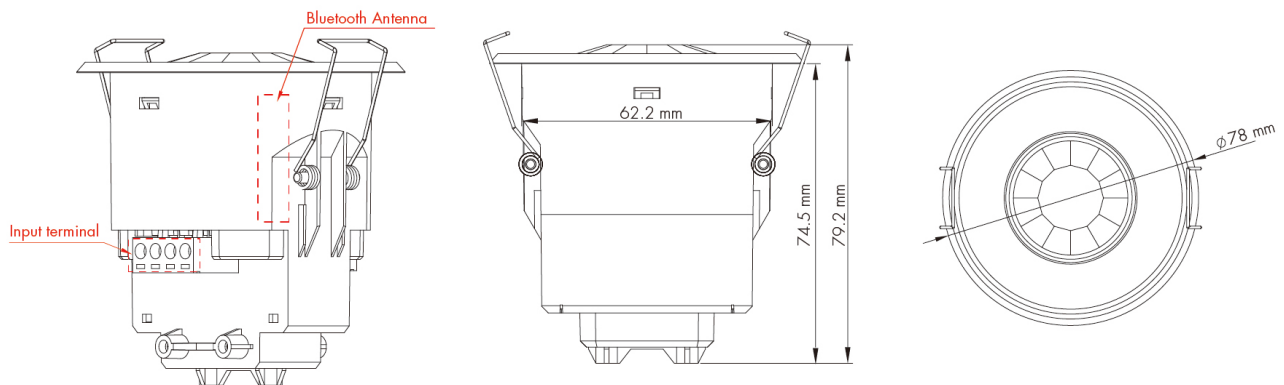
Standard	
EMC	EN 55015, EN61000-3-2/-3-3, EN 61547
LVD	AS/NZS 60669-1/-2-1, EN 60669-1, EN 60669-2-1
RED	EN 300328, EN 301489-1/-17

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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

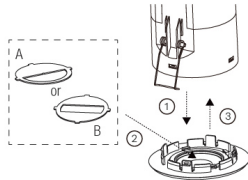


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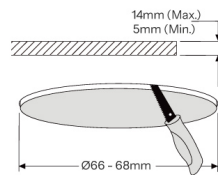
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Installation Process

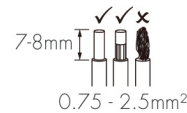
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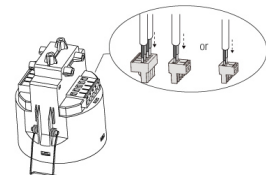
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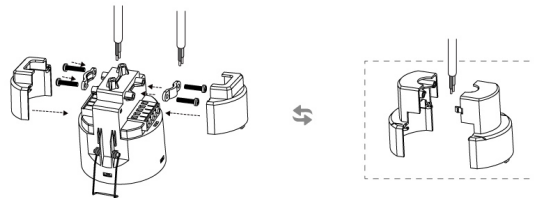
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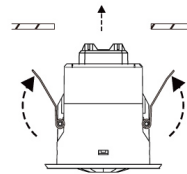
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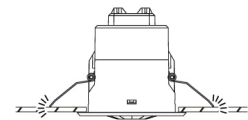
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6



7



Detailed Installation Instructions

1. Optional: If a detection blind is required, detach the lens cover, select the suitable detection blind and place it above the lens, then refit the lens cover onto the sensor body.
2. Ceiling cut-out (hole Ø 66~68mm).
3. Prepare the cables correctly.
4. Connect the cables to the pluggable terminal blocks according to the wiring diagram.
5. 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).
6. Bend the spring clips upwards and fit the sensor into the ceiling cut-out.
7. Spring clips will release and secure the sensor in the ceiling.

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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. Please select the appropriate loads based on the device specifications and electrical safety requirements. Do not exceed the recommended load capacity.
7. VFC Notes (Channel 2)

To accommodate different customer and project requirements, this product supports both NC and NO wiring options.

• NC Connection

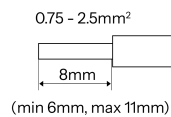
When NC connection is used, the required fail-safe lighting behaviour can be achieved by configuring the corresponding scene in the Koolmesh app. With the appropriate scene setting, the light can remain on if the sensor loses power or fails.

• NO Connection

NO connection can be used for standard operation and does not require additional scene configuration.

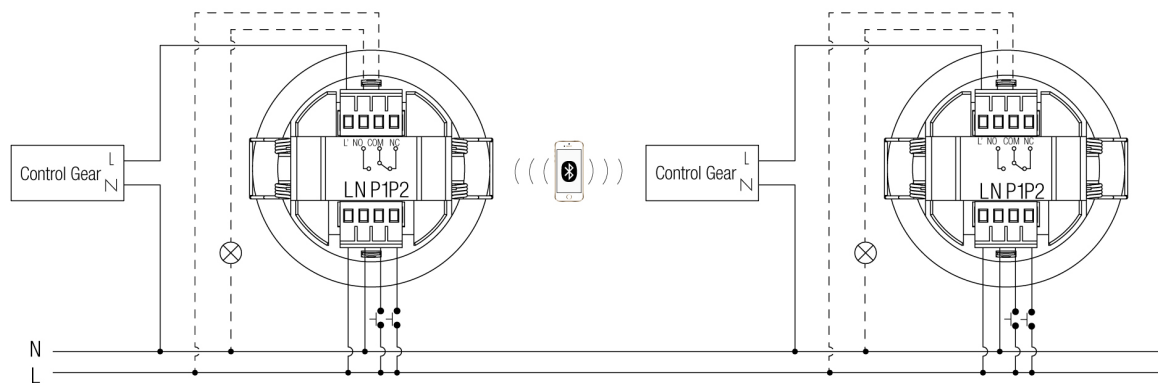
For project-specific configuration guidance, please contact Hytronik technical support.

Wire Preparation



Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.

Wiring Diagram

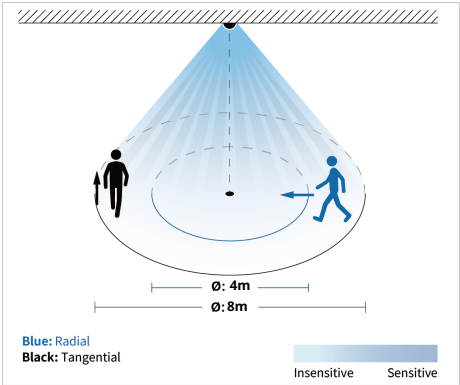


Detection Range

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:



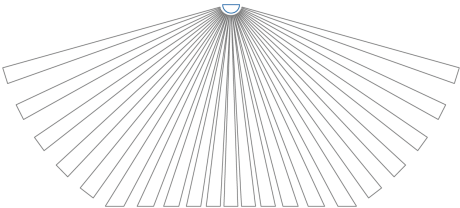
Tangential movement

H[m]	2.5	3	4	5	6
Ø[m]	8	9	7	7	7

Radial movement

H[m]	2.5	3	4	5	6
Ø[m]	4	4	4	4	4

Detection schematic diagram



Commissioning Instructions and Precautions

A. Push Notes

1. This product has two independent PUSH inputs: Push1 controls Channel 1, Push2 controls Channel 2.

B. L' Output (Channel 1) and Version Notes

1. This product is available in two hardware versions. Please check the product version before commissioning or replacement.

Version A: NC L' output, supports fail-safe light-on behaviour via L'. Max. in-rush current: 50A @ 160µs.

Version B: NO L' output, factory default version. Max. in-rush current: 80A @ 160µs. L' is for standard switching only and does not support fail-safe light-on behaviour.

If fail-safe light-on behaviour is required for Version B, please refer to Wiring Guidelines and use Channel 2 wiring with App scene configuration. Do not mix Version A and Version B in the same control application unless the wiring logic has been reviewed.

C. 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.

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 https://support.koolmesh.com/	• Able to connect the Fire Alarm system. • 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.
ON OFF Switch (Latching Switch)	/	• Upgrade a standard on/off control to Bluetooth control, enabling one latching switch to control multiple luminaires or zones, reducing wiring and switch count.
Normal PUSH (Retractive Switch)	Single press (> 0.1s) Double press Press and hold (>= 1s)	• ON/OFF • OFF only • Recall this scene • Sensor take over • Not in use
Sensor-Link	/	• Hold time/scene • Stand-by time/scene • Upgrade a normal on/off motion sensor to a Bluetooth-controlled motion sensor

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Options

Included Accessories



Deep-reaching rear covers HA08 and HA08/S



Blind Insert Option 1 and Option 2

Accessories



Plastic Mount Box | Surface Mounting | white color

HA03

www.hytronik.com/product/HA03



Plastic Mount Box | Surface Mounting | IP54 Waterproof Gasket

HA03/IP54

www.hytronik.com/product/HA03-IP54



Metal Mount Box | Surface Mounting | Grey Color

HA09/G

www.hytronik.com/product/HA09-G



Metal Mount Box | Surface Mounting | Black Color

HA09/B

www.hytronik.com/product/HA09-B



Metal Mount Box | Surface Mounting | White Color

HA09/W

www.hytronik.com/product/HA09-W

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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)

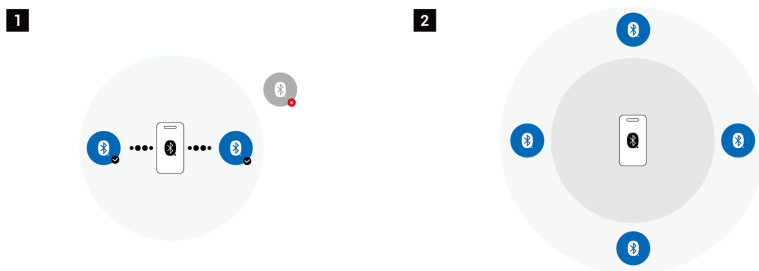
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

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



HBGW02/D

Bluetooth Mesh Gateway | Dual-band Wi-Fi | wall/flat surface mounting
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



HBKS01/W

Bluetooth Kinetic Switch | One-gang | Wireless Control
www.hytronik.com/product/HBKS01-W



HBKS01D/W

Bluetooth Kinetic Switch | Single Rocker | White Color
www.hytronik.com/product/HBKS01D-W



HBKS02/W

Bluetooth Kinetic Switch | Two-gang | White Color
www.hytronik.com/product/HBKS02-W



HBKS02D/W

Bluetooth Kinetic Switch | Double Rocker | White Color
www.hytronik.com/product/HBKS02D-W



HBKS03/W

Bluetooth Kinetic Switch | Three-gang | White Color
www.hytronik.com/product/HBKS03-W



HBLM01

Multi-meter | Bluetooth & NFC | Lux Measurements
www.hytronik.com/product/HBLM01



HPAD-TSJASE1

Bluetooth Touch Tablet | Gateway Integrated | Switch Boxes
www.hytronik.com/product/HPAD-TSJASE1

Functions and Features



Dual Relay Output

The product incorporates two independent relays that allow separate control of multiple lighting circuits or load types. Each relay can be configured individually, providing flexible switching options and enabling more versatile control strategies within the lighting system.



NO Contact

This product provides a single switched live output (L'), corresponding to NO (Normally Open) logic. When the product is not powered, the load remains off.

In standby condition, the output is off; when triggered, the output switches on to power the load, achieving "light on when occupied". This follows the standard definition: NO: open when idle, closed when triggered; NC: closed when idle, open when triggered.

This configuration is widely used for general switching and control applications requiring activation upon detection.



NO/NC Standard Mode

This product provides NO, NC and COM contacts, and is intended to be used via the NO (Normally Open) terminal.

In standby condition, the contact remains open; when triggered, the contact closes to switch on the load, achieving "light on when occupied".

This follows the standard definition: NO: open when idle, closed when triggered; NC: closed when idle, open when triggered.

This mode represents standard switching logic and is suitable for applications where the load is activated only upon occupancy detection.



ON/OFF Control

The product supports basic ON/OFF control of the connected luminaire, allowing the light to be switched fully on or off through the sensor's detection logic or an external control input. This provides straightforward lighting control for applications that do not require dimming functionality.



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.



Zero-Cross Relay Operation

The product operates its relay at the AC zero-cross point, reducing inrush current through the relay contacts when switching the load. By minimising electrical stress during each switching event, this method supports higher load capability and extends the operational lifetime of the relay in practical lighting applications.

Check out for further explanation of features

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

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Additional Notes

Detection Blind Insert Options and Detection Range Reference

Two fixed blind inserts are supplied to reduce or limit the detection area. The blind insert can be fitted directly into the lens cover. Select the suitable blind insert according to the required detection area and installation application.

Option 1 provides a rectangular detection area. Option 2 provides a half-circle detection area, suitable for applications where detection from one side needs to be limited.

For reference, the next page includes detection pattern and dimensional drawings to support actual installation and application. The detection diagram is based on the following test conditions:

Detection Range Test Conditions:

Single person walking or forklift driving at 5 km/h

Sensor not connected to a driver with soft-on period

Ambient temperature (Ta): 20 °C

Test conducted in a large open indoor area without obstacles affecting PIR performance

Note: Detection range may vary depending on installation angle, temperature, and humidity conditions.

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Additional Diagram

