

HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

Compact: Super small size Zhaga Book 20 sensor

Intelligent: Enabling Tri-level & Daylight harvesting & HCL

Flexible: Allowing wireless setup via app

Applications

For linear luminaires up to 8/12m height

Warehouse/ Logistic

Production

Check Out the Complete System Solution on the Website:
<https://www.hytronik.com/product/HIR60-R>



LVD RED



Product Description

HIR60/R is a Bluetooth DALI PIR motion sensor designed for mid-bay applications, complying with Zhaga Book 20 standards for seamless and standardized integration with compatible LED luminaires. With an enlarged sensor cover and optimized optics, it enables reliable motion detection and wider coverage at higher mounting heights. The sensor supports tri-level dimming, daylight harvesting, and Human Centric Lighting (HCL), providing enhanced visual comfort and energy efficiency. Through the Koolmesh system, it enables smart Bluetooth commissioning and networked control for DALI luminaires. The device also supports reading luminaire, energy, and diagnostics data provided by connected D4i drivers. All settings can be configured wirelessly via the Koolmesh app, ensuring fast, flexible, and efficient commissioning and maintenance.

Functions and Features

See additional details at the end of datasheet



D4i Driver
Compatibility



Daylight Harvest



Human Centric
Lighting (HCL)



Koolmesh - See
bluetooth control
below



Live Energy &
Diagnostic Data
Part 252 / 253



Luminaire Asset
Data Part 251



Magnetic Reset
switch



Manual Override



Semi-Automatic
Mode (Absence
Detection)



Tri-level Dimming



Zhaga Book 20
Standard

HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

Specifications

Main Capabilities

Dimming (Output) Interface	DALI
Connector Type	Zhaga book 20
Push Button Input	1

Sensor Data

Detection angle	360°
Lux range	<1000 lux
Max. Detection range (Diameter)	20.0 m
Maximum Mounting Height	12.0 m
Detection area	314 m²
Detection Methods	Passive Infrared (PIR)

Electrical Data

Bluetooth Platform	Nordic nRF52832
Bluetooth frequency	2.4 GHz
Bluetooth range (Phone to Device)	10-30m
Bluetooth transmit power	4 dBm
Bluetooth system	Koolmesh
Operating voltage range	9.5-22.5 VDC
Warming-up	20 s
Current Consumption	30mA

HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

Specifications

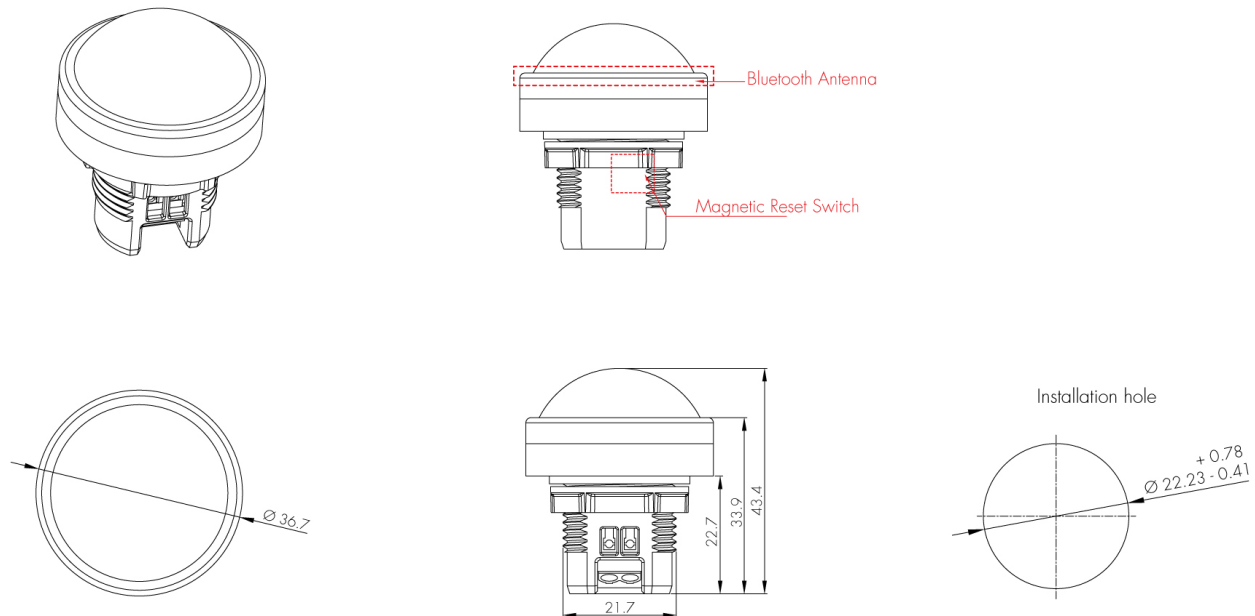
Technical	
Product weight	22.0 g
Product height	43.4 mm
Product length	21.7 mm
Product width	36.7 mm
Mounting hole	22.23 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-25 ~ +70 °C
Humidity max	10 ~ 90%
IP Rate	IP20
IP Rate (facial part)	IP54

Standard	
EMC	EN 55015, EN 61547
LVD	EN 61347-1/-2-11
RED	EN 300328, EN 301489-1/-17, EN 50663

HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

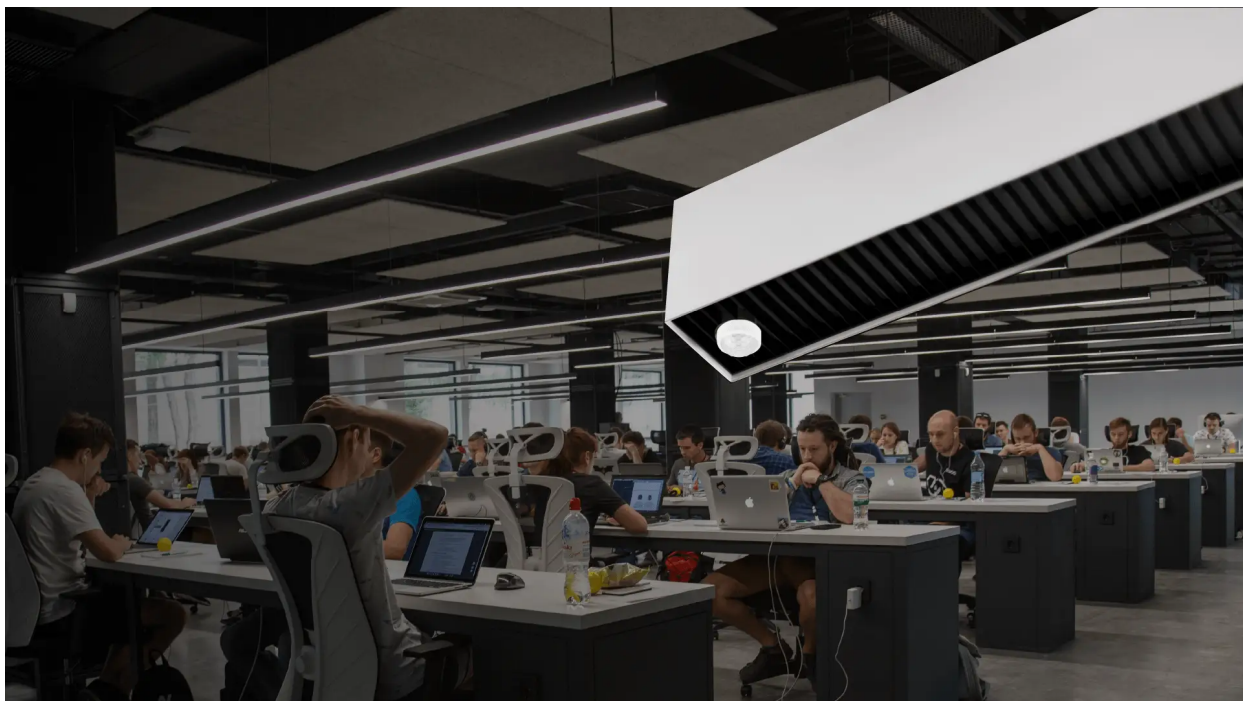
Technical Drawing



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.

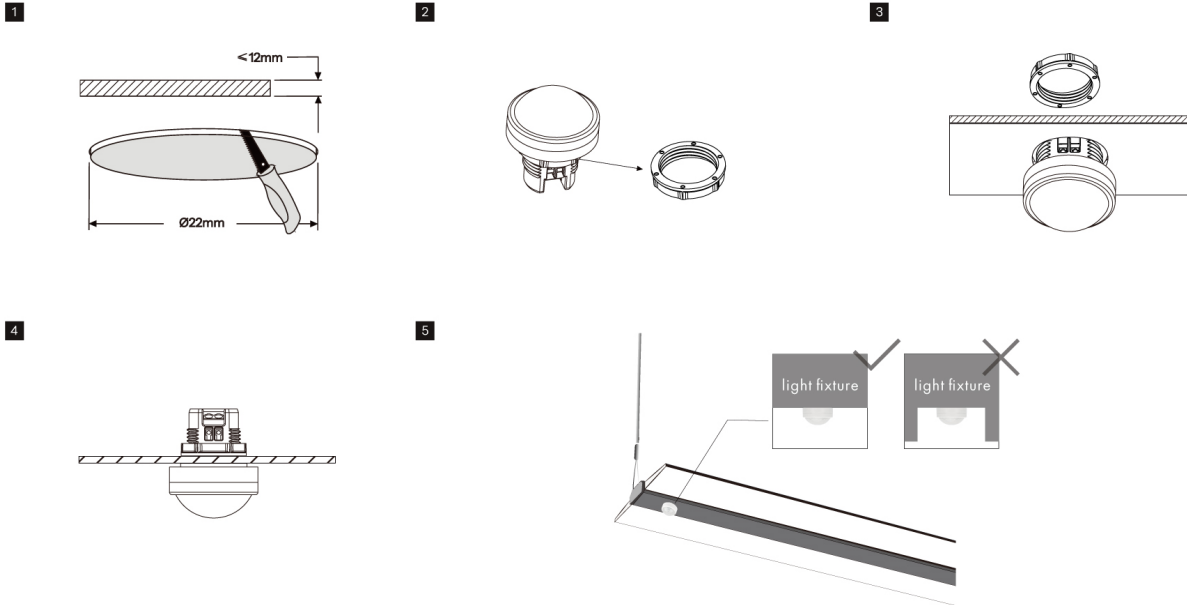
Application Example



HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

Installation Process



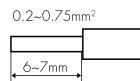
Detailed Installation Instructions

1. Drilling hole in the light fixture (Ø22mm).
2. Remove the plastic nut accessories by turning the knob.
3. Pass the sensor head & cable through the hole. Use plastic nut to secure the light fixture and sensor tightly.
4. Complete.
5. Keep the sensor lens part beyond the light fixture surface for better detection.

⚠ 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/DA), DALI wiring is polarity-free.

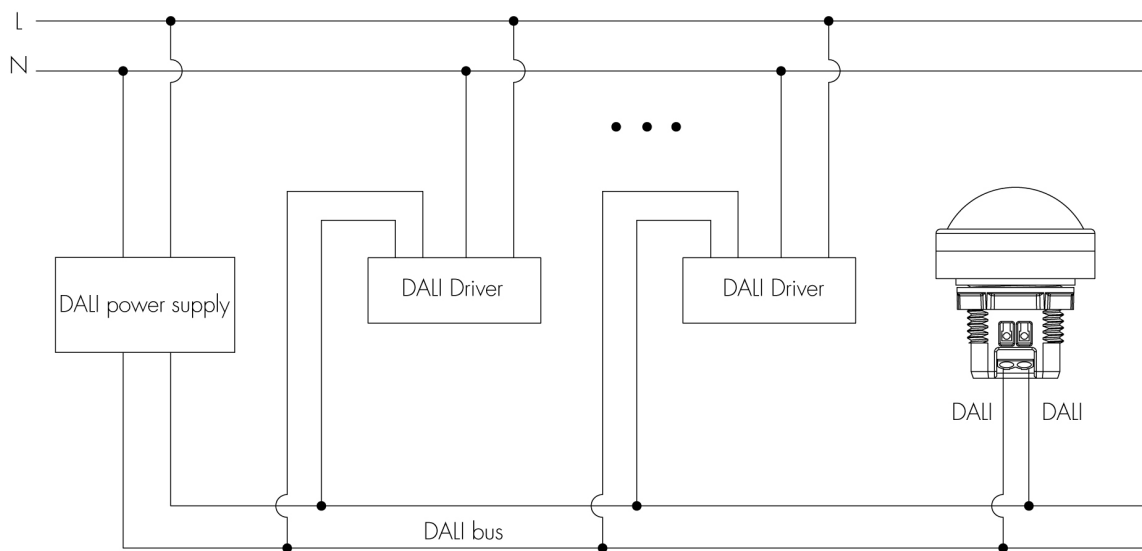
Wire Preparation



To make or release the wire from the terminal, use a screwdriver to push down the button. 1. 100 metres (total) max. for 0.5mm² CSA (Ta = 50°C) 2. 150 metres (total) max. for 0.75mm² CSA (Ta = 50°C)

Wiring Diagram

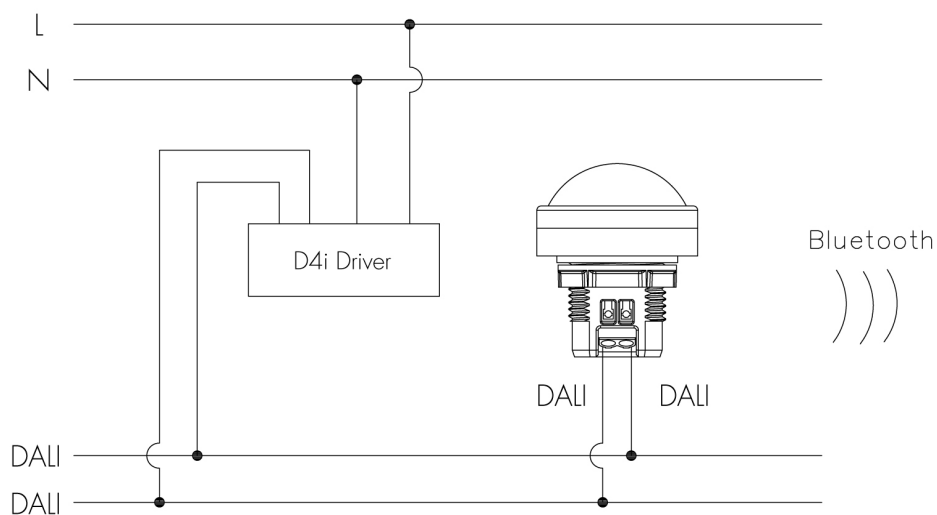
Connective with DALI Driver



HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

Connective with D4i Driver

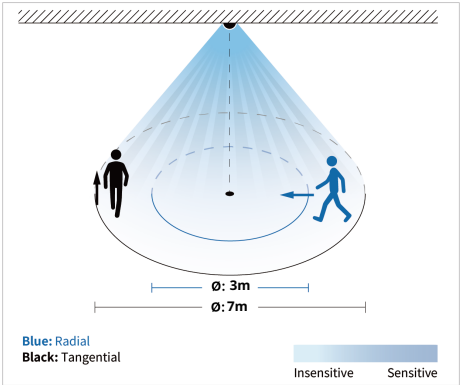


Detection Range

Single Person Walk (Ceiling mount)

- The data below 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 3m mounting height:



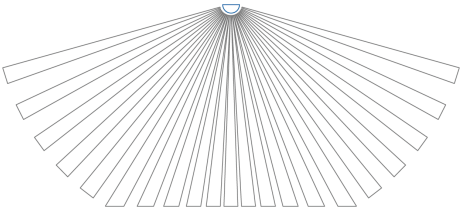
Tangential movement

H[m]	3	4	5	6	7	8
Ø[m]	7	8	8	9	11	12

Radial movement

H[m]	3	4	5	6	7	8
Ø[m]	3	3	3	4	4	4

Detection schematic diagram

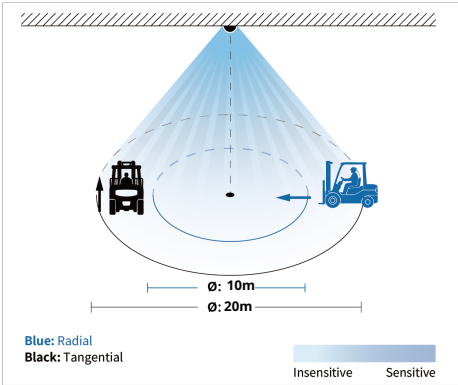


Detection Range

Forklift (Ceiling mount)

- The data below is tested under following conditions:
- Forklift driving at a speed of 5km/h
 - 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 12m mounting height:



Tangential movement					
H[m]	8	9	10	11	12
Ø[m]	16	17	18	20	20

Radial movement					
H[m]	8	9	10	11	12
Ø[m]	8	8	9	10	10

Commissioning Instructions and Precautions

A. Installation Preparations

1. To ensure better Bluetooth transmission, keep the sensor lens part beyond the surface of the light fixture.
2. After installed, please put the terminal seat back to the LED light source to avoid direct irradiation and ensure the accuracy of the daylight sensor.

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

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

Switch Input Function Configuration

The Virtual Push interface provides a software-based dimming control method without the need for a physical wall switch. Push functions are simulated via the Koolmesh app, where detailed push behaviors and parameters can be flexibly configured.

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
Virtual-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

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

- | | |
|---|---------------------------------|
| 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 |
| Dynamic daylight harvest auto-configuration | |

Bluetooth Mesh Network Installation & Device Access Range

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

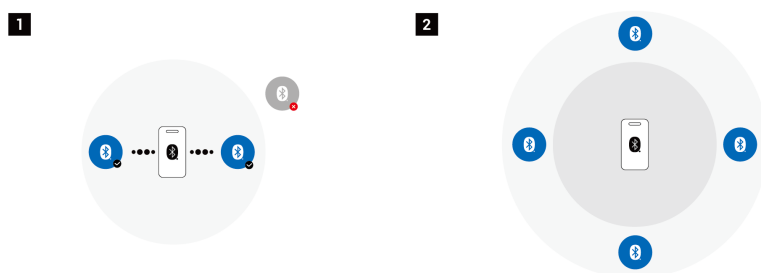
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

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



D4i Driver Compatibility

Designed to operate with D4i-certified drivers within D4i luminaires, supporting standard DT6 / DT8 control behaviour in D4i systems.



Daylight Harvest

Right time, right place and the right amount of light! Daylight harvest (Also known as daylight regulating or daylight interaction) is a must in the future lighting norms. It automatically measures available natural light and adjusts artificial lighting output to maintain the target illuminance level. Using daylight sensor feedback, control signals are transmitted to the LED drivers via DALI or 0-10V interfaces, ensuring the required light output is delivered only when needed, improving visual comfort and reducing energy consumption.



Human Centric Lighting (HCL)

Human Centric Lighting (HCL) helps reduce energy consumption while supporting human wellbeing and productivity in artificially lit environments. Through Hytronik's decentralised tunable white control with integrated time-based operation, HCL enables cost-effective circadian rhythm lighting without the complexity of centralised lighting systems. Designed as a simple and flexible solution, it is ideal for offices, schools, and healthcare applications requiring dynamic white light adjustment throughout the day.



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.



Magnetic Reset Switch

The product features a magnetic reset function that restores factory default settings by applying a magnet (40 Gs) to the designated reset area within 10 mm for approximately 5 seconds. The omnipolar magnetic detection supports both north and south poles, enabling quick and convenient on-site reset and reconfiguration without physical access to switches or buttons.



Manual Override

With the help of a push switch, the sensor can be manually overridden by the end user to switch the light on/off or adjust the target lux level, providing greater flexibility and improved user experience.

Short press (<1s): On/Off control

On Off: The light turns off immediately and cannot be re-triggered by motion until the preset hold-time expires, after which the sensor returns to normal operation.

Off On: The light turns on and enters sensor mode, regardless of the ambient light level.

Long press (>1s): Target lux adjustment

The target lux level can be adjusted by dimming the light up or down.

Adjustments via push switch and remote control can overwrite each other, with the last setting stored in memory.

Note: If manual override is not required, the "PUSH" terminal can be left unconnected.

Functions and Features



Semi-Automatic Mode (Absence Detection)

In semi-automatic mode, the sensor operates as an absence detector, where the lighting must be switched on manually via a wall push switch and remains on while occupancy is detected.

Once the area is vacated, the sensor automatically switches off the lighting after the preset hold-time, improving energy efficiency and ensuring controlled operation.

Manual ON: The light will not turn on automatically and must be switched on manually via the wall switch. The sensor remains inactive while the light is off.

Auto OFF: After the light is switched on, the sensor becomes active and monitors occupancy. When no presence is detected, the light will automatically switch off after the defined delay time.

Note: The wall switch can be configured either for Manual Override or Semi-automatic Mode (Absence Detection), but not both simultaneously. The default setting is Manual Override.



Tri-level Dimming

Hytronik's tri-level dimming products offer 3 levels of light control: 100% dimmed light off, with settable time periods between each phase, as well dimming level and daylight threshold.

*All Hytronik's tri-level dimming products can also be configured as bi-level control (by setting the stand-by period to infinity), so that the light always remains in the dimmed mode in absence for areas where there are safety, security or enhanced comfort requirements.



Zhaga Book 20 Standard

This product complies with the Zhaga Book 20 standard, defining a standardised mechanical, electrical and communication interface for sensor nodes used primarily in indoor smart lighting applications. It ensures interchangeability and interoperability within connected lighting systems, supporting flexible sensor integration and scalable system design.

Check out for further explanation of features

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

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.

HIR60/R

PIR Midbay | Bluetooth to DALI | Zhaga Book 20 Standard

Additional Diagram

