

HIR15/BLE

PIR Highbay | Bluetooth to DALI | Zhaga Book 18 Standard

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

Standardized: Zhaga Book 18 interface with IP65 for reliable integration

Power Supply: Integrated 10mA DALI-2 bus supply

Wireless: App based commissioning for fast setup

Applications

For highbay luminaire up to 15m height

Warehouse/ Logistic

Outdoor/Street lights

Check Out the Complete System Solution on the Website:

<https://www.hytronik.com/product/HIR15-BLE>



RED



Product Description

The HIR15/BLE is a Zhaga Book 18 compliant Bluetooth PIR motion sensor with D4i certification. It is designed to work with D4i drivers and additionally features an integrated DALI bus power supply that feeds the DALI bus when the driver does not provide one; the sensor requires a 24 V auxiliary supply to operate. It supports dimming, tunable white and daylight harvesting. Thanks to its advanced photocell (Photocell Advance – Natural Light), it distinguishes natural light from artificial light and dims in open loop according to the available daylight. With IP65 protection and a maximum mounting height of 15 m, it is ideal for industrial applications. Bluetooth Mesh technology enables wireless control and fast commissioning via the Koolmesh app.

Functions and Features

See additional details at the end of datasheet



Built-in DALI PSU



D4i Certified



D4i Driver
Compatibility



DALI-2 Certified



Daylight Harvest



Human Centric
Lighting (HCL)

IP65

IP65 Protection



Koolmesh - See
bluetooth control
below



Live Energy &
Diagnostic Data
Part 252 / 253



Luminaire Asset
Data Part 251



Photocell
Advance



Tri-level Dimming



Tunable White
Control



Zhaga Book 18
Standard

HIR15/BLE

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Specifications

Main Capabilities

Dimming (Output) Interface	DALI/DALI-2
Connector Type	Zhaga book 18

Sensor Data

Detection angle	360°
Lux range	0~1000 lux
Max. Detection range (Diameter)	24.0 m
Maximum Mounting Height	15.0 m
Detection area	452 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	24VDC
Stand-by power (Psb)	<0.5W
DALI bus maximum rated current (I _n max)	15 mA
DALI bus nominal DC voltage range (Un)	16 V
DALI bus nominal current (I guaranteed)	10 mA
DALI Bus Current Consumption	2.0 mA

HIR15/BLE

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Specifications

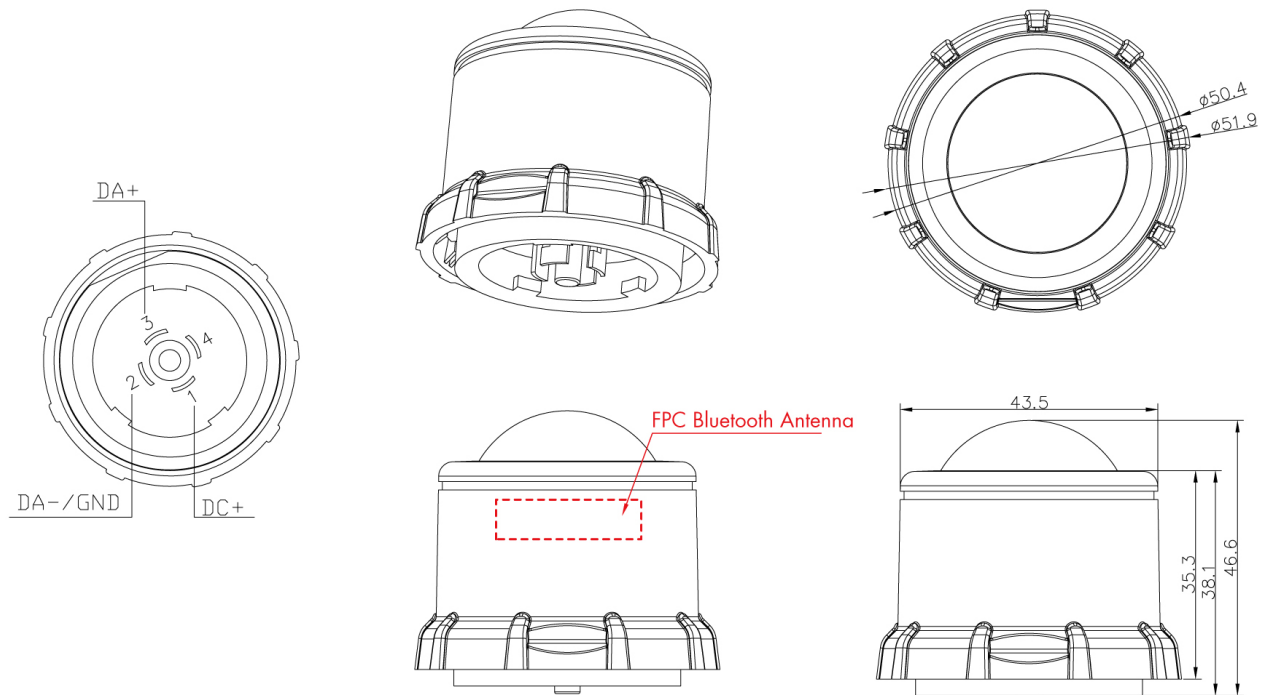
Technical	
Product weight	40.0 g
Product height	43.8 mm
Product length	50.4 mm
Product width	50.4 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-25 ~ +70 °C
Humidity max	10 ~ 90%
IP Rate	IP65

Standard	
EMC	EN 55015, EN 61547
LVD	EN 61347-1, EN 61347-2-11
RED	EN 300328, EN 301489-1/-17, EN 50663
DALI-2 D4i type	Typ D
DALI-2 Standard	IEC62386-101, 103, 351

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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.
- This product contains an internal FPC antenna. The antenna is attached to the inside of the housing. When opening the housing, separate the housing halves carefully to avoid pulling the antenna or damaging the antenna to PCB connection.

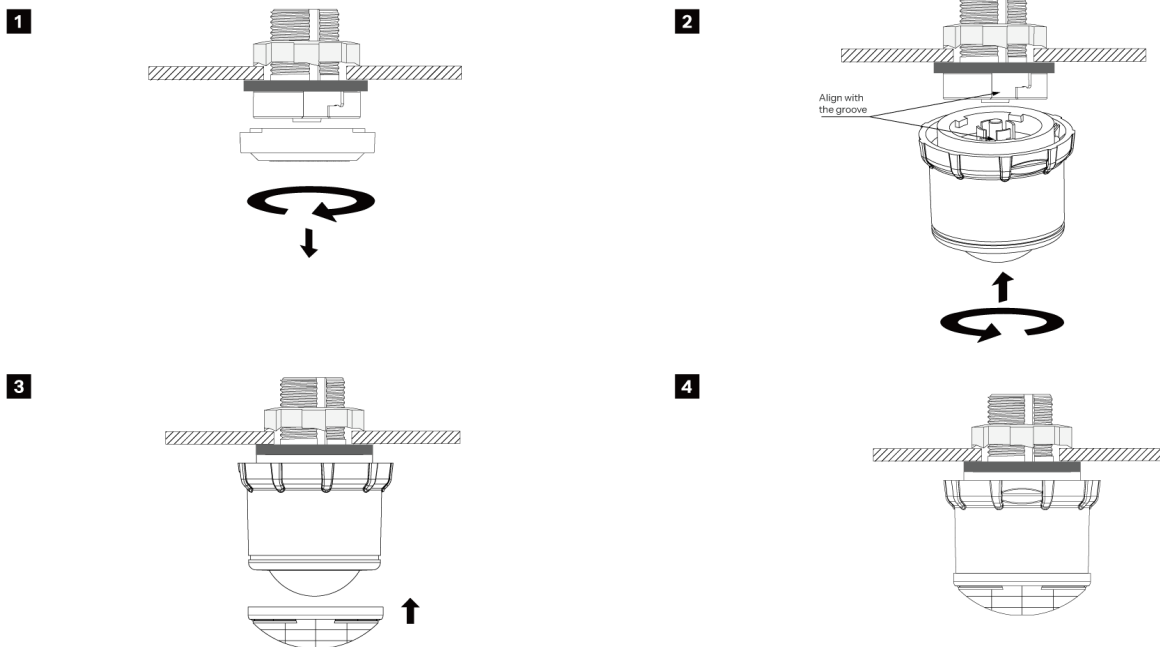
Application Example



HIR15/BLE

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Installation Process



Detailed Installation Instructions

1. Remove the receptacle cap

Unscrew and remove the protective cap from the receptacle before installation.

2. Install the sensor

Align the large groove on the receptacle with the corresponding large protrusion on the sensor. Push the sensor upward firmly until fully seated, then rotate counterclockwise until a clear click is heard. Ensure the sensor cannot be pulled out to confirm it is securely locked.

3. Install the HAS15 cover

Cut the cover to the required shape before installation. Refer to the last page for cutting examples.

Align the HAS15 cover with the HIR15 series sensor. Press down evenly until a clear sound is heard, indicating the cover is securely fitted.

*If you want to remove the cover, locate the release notch on the edge of the cover. Lift gently from the notch to detach the cover.

4. Installation complete

Note:

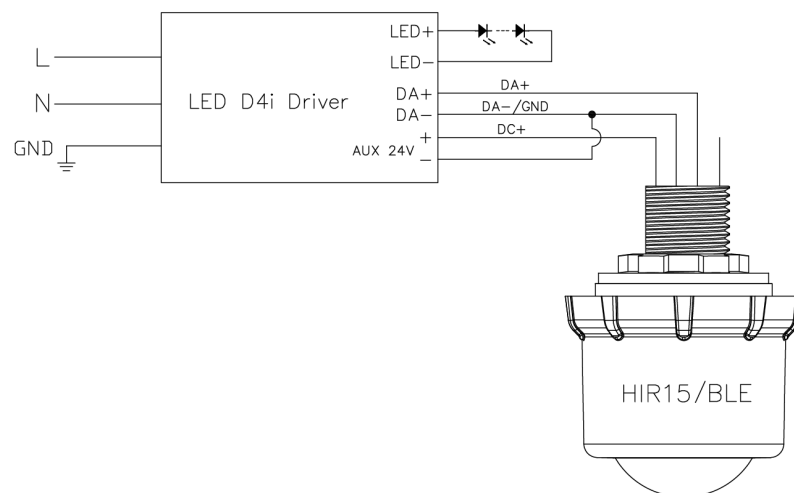
- Any luminaire that complies with the Zhaga Book 18 standard allows plug-and-play connection by simply mating the pins with the base.
- Socket not included, it must be supplied by the customer or purchased separately.

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. Do not connect mains voltage (L/N) to the DALI terminals.
5. For polarity-marked DALI terminals (DA+/DA-), observe correct DALI polarity.
6. For non-polarity-marked DALI terminals (DA/DA), DALI wiring is polarity-free.
7. Terminal block 4 is left unpopulated by default. No wiring required.
8. For reliable operation, ensure at least one DALI PSU is present on the bus. If multiple PSUs are connected in parallel, the total output must not exceed 250 mA. (For better compatibility, a single PSU is recommended.)

Wiring Diagram

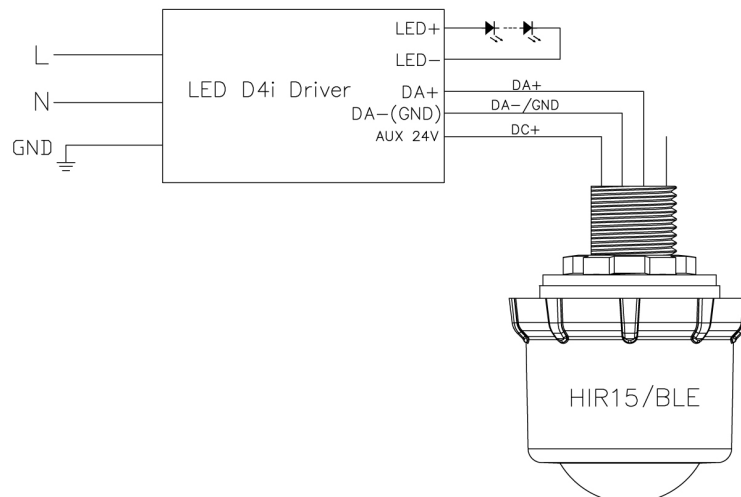
D4i Driver with Isolated Negative



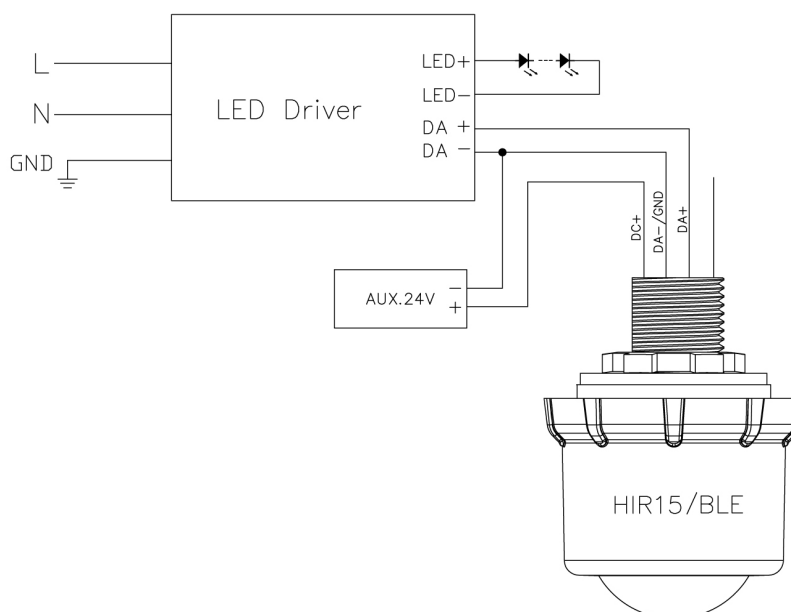
HIR15/BLE

PIR Highbay | Bluetooth to DALI | Zhaga Book 18 Standard

D4i Driver with Common Negative



Standard Driver with External AUX Power

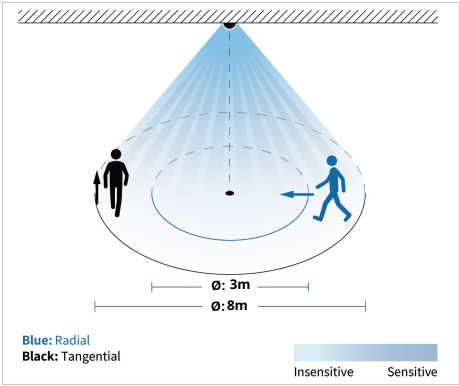


Detection Range

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.
- The sensor detection area shown in this table is based on an open space. In environments with hard surfaces such as metal racking or glass corridors, the detection range may be extended by up to 30% due to reections or signal penetration.

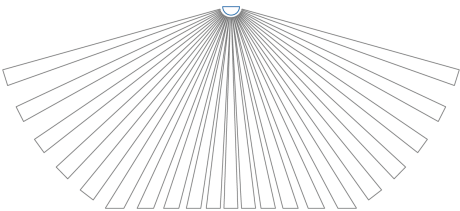
Detection example 3m mounting height:



Tangential Movement				
H[m]	3	5	8	12
Ø[m]	8	10	14	20

Radial Movement				
H[m]	3	5	8	12
Ø[m]	3	3	4	4

Detection schematic diagram

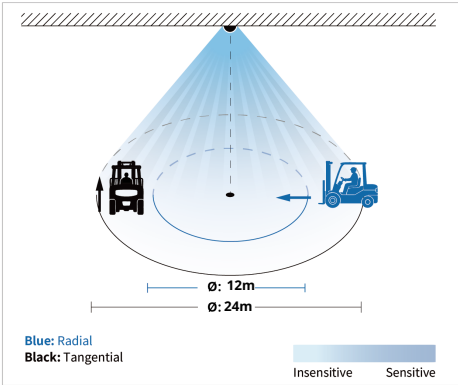


Detection Range

Forklift (Ceiling mount)

- The data 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 15m mounting height:



Tangential Movement						
H[m]	10	11	12	13	14	15
Ø[m]	22	24	24	24	24	24

Radial Movement						
H[m]	10	11	12	13	14	15
Ø[m]	16	16	16	15	13	12

Commissioning Instructions and Precautions

A. Function Notes

1. HIR15/BLE is equipped with a built-in PSU switch function, which can be enabled or disabled via the Koolmesh App. This function is disabled by default and should be switched on in the App when the built-in PSU is required.
2. When HIR15/BLE is connected to a standard driver, basic lighting control can be supported, but D4i data such as energy, diagnostics and driver information cannot be read. D4i data availability requires a D4i driver and the correct D4i system configuration.

B. DALI Bus Current Notes

1. 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.

C. DALI-2 Compliance

1. This product has been tested in accordance with IEC 62386 and complies with the relevant DALI-2 application parts. DALI-2 testing was performed using the official DALI test sequence software (version 2.4.0.0), covering the applicable IEC 62386 parts (e.g. Part 101, Part 103, Part 351). DALI-2 certification verifies compliance within the defined test scope.

However, certification does not eliminate the possibility of system-level compatibility issues arising from differences in device implementation or system design among manufacturers. Therefore, functional verification and on-site testing are required as part of the final system commissioning to ensure proper operation and compliance with project requirements.

D. PIR Application Note

1. PIR sensors operate based on infrared detection and are sensitive to ambient temperature and surrounding heat sources. In outdoor or high-temperature environments (above 50°C), elevated ambient temperature and thermal interference may reduce detection sensitivity and accuracy. For applications exposed to strong sunlight or significant heat sources, it is recommended to evaluate the installation environment carefully and consider selecting a more suitable sensing technology, such as microwave sensors, to ensure stable and reliable operation.

E. 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>

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

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Options

Included Accessories



Shielding Accessory-HAS15

Compatible products (for full functionality)



HA18SKT

Receptacle | Zhaga Book 18 Standard | Black Color
www.hytronik.com/product/HA18SKT

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 |

Bluetooth Mesh Network Installation & Device Access Range

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

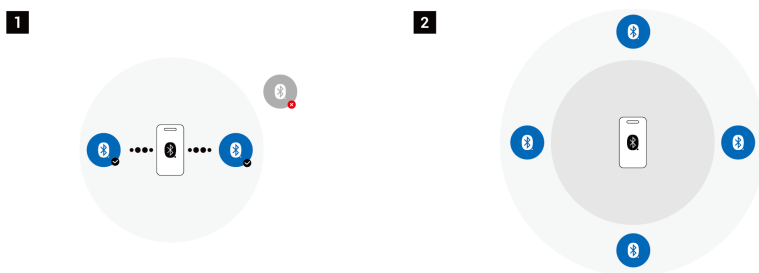
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

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



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.



D4i Certified

This product is certified under the D4i specification by the DALI Alliance, ensuring compliance with the relevant DALI-2 and D4i requirements for interoperability, safety and performance. Certification guarantees that the device meets the standardized electrical, digital interface and device-type requirements defined for D4i ecosystems.



D4i Driver Compatibility

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



DALI-2 Certified

The product is DALI-2 certified, ensuring compatibility with DALI-2 control devices and compliance with relevant international lighting control standards. Certified product details can be verified via the DALI Alliance product database.



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.



IP65 Protection

This product features an IP65-rated enclosure, providing complete protection against dust ingress and low-pressure water jets to ensure reliable operation in demanding indoor and outdoor environments. The robust environmental sealing supports long-term stability and consistent performance in applications such as warehouses, parking areas and industrial facilities.



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.

Functions and Features



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.



Photocell Advance

This advanced daylight sensing function accurately measures ambient light levels while minimising interference from the luminaire itself, ensuring reliable dusk-to-dawn control and daylight priority over motion detection. It automatically switches lighting on and off and dynamically adjusts brightness in response to available natural light, delivering visual comfort and improved energy efficiency.



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.



Tunable White Control

Tunable White Control allows smooth adjustment of light colour temperature to create comfortable and adaptable lighting environments. By enabling dynamic white light changes throughout the day, it supports visual comfort and user wellbeing while helping improve energy efficiency in artificially lit spaces. With a simple and decentralised control approach, it provides a flexible solution for applications such as offices, schools, and healthcare environments where adjustable white light is required.



Zhaga Book 18 Standard

This product complies with the Zhaga Book 18 standard, providing a standardised mechanical, electrical and digital interface for indoor and outdoor luminaires, including high-bay and exterior applications. It enables plug-and-play interchangeability of sensor and connectivity modules, ensuring interoperability, future-ready upgrades and reliable operation in demanding installation environments.

Check out for further explanation of features

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

Additional Notes

Shielding accessory (HAS15) detail expiation

Achieve precise adjustment of the detection range, block interference sources (such as moving machines and elevators) to prevent triggering the sensor. the line pattern of the shielding accessory can be freely removed by cutting to achieve a different range of shielding induction, for example, rectangular detection and semi-sphere detection. The portable design also provides an easy installation, which only needs to buckle the shielding accessory onto the lens.

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

