HCD405/BT

Bluetooth DALI HF Sensor | Integrated 30mA PSU | Photocell Advance



Benefits

Compact: Sensor and 30mA DALI PSU in one compact unit

All-in-one: Occupancy, Daylight and Human Centric Lighting

Wireless: Bluetooth Mesh reduces extra control wiring

Applications

Round Luminaires · Ceiling Luminaires

Occupancy Control · Daylight Harvest · HCL

Offices · Meeting Rooms · Classrooms

Check Out the Complete System Solution on the Website:
https://www.hytronik.com/product/HCD405-BT

Product Description

HCD405/BT is a compact Bluetooth DALI microwave sensor with an integrated 30mA DALI power supply, designed for built in luminaire control at mounting heights of up to 6 m. It combines occupancy sensing, Photocell Advance daylight control, tri level dimming and Human Centric Lighting functions, reducing the need for additional control components inside the luminaire. Bluetooth Mesh enables wireless communication between luminaires without additional control wiring. All configuration and commissioning can be completed easily via the Koolmesh App.

Functions and Features

See additional details at the end of datasheet

D4i Driver Compatibility

DALI Broadcast Output

DT6/DT8 Lighting Control

Photocell Advance

Zero-Cross Relay Operation

Specifications

Main Capabilities	
Dimming (Output) Interface	DALI

Sensor Data	
Detection angle	30° - 150°
Max. Detection range (Diameter)	10.0 m
Maximum Mounting Height	3.0 m
Detection area	78 m^2
Sensitivity	10%/ 30% /50% /75%/ 100%
HF operating frequency (Ghz)	5.8Ghz+/-75MHz
Detection Methods	Microwave (MW)

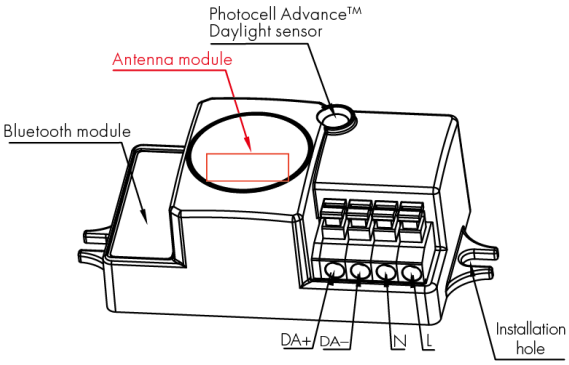
Electrical Data	
Bluetooth Platform	Nordic nRF52832
Bluetooth frequency	2.4 GHz - 2.483 GHz
Bluetooth range (Phone to Device)	10-30m
Bluetooth transmit power	4 dBm
Bluetooth system	Koolmesh
Operating voltage range	220-240 VAC 50/60 Hz
Stand-by power (Psb)	<0.5W
Warming-up	20 s
DALI bus maximum rated current (I max)	80 mA
DALI bus nominal DC voltage range (Un)	16 V
DALI bus nominal current (I guaranteed)	30 mA
HF Transmission power	<0.2mW (HF)

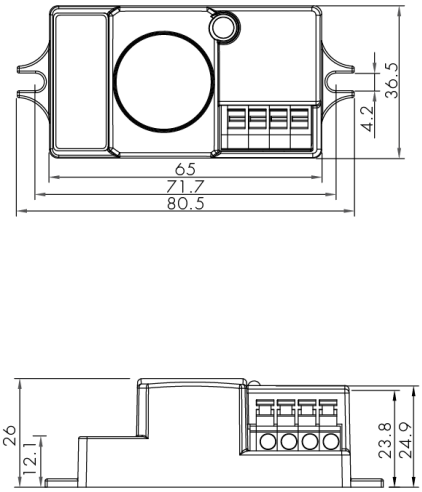
Specifications

Technical	
Product weight	35.0 g
Product height	24.9 mm
Product length	80.5 mm
Product width	36.5 mm
Insulation class	Class II
Mounting hole	4.2 mm
Ambient temperature	-20 ~ +60 °C
Storage temperature	-40 ~ +70 °C
Humidity max	10 ~ 90%
Case Temp.max	75.0 °C
IP Rate	IP20

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

Technical Drawing





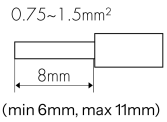
The Bluetooth antenna is located at the marked end of the device.
· Keep the antenna area clear of metal or conductive materials.
· Maintain at least 10 mm clearance around the antenna whenever possible for optimal wireless performance.
· Avoid installing the antenna section inside a metal enclosure or behind large metal structures.

⚠ 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. Do not connect mains voltage (L/N) to the DALI terminals.
6. For polarity-marked DALI terminals (DA+/DA−), observe correct DALI polarity.
7. For non-polarity-marked DALI terminals (DA/DA), DALI wiring is polarity-free.

Wire Preparation

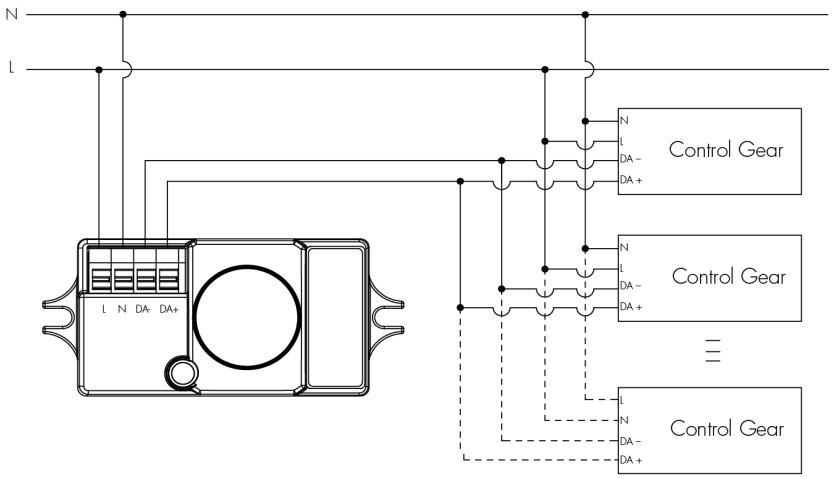




(min 6mm, max 11mm)

To make or release the wire from the terminal, use a screwdriver to push down the button. 1. 200 metres (total) max. for 1mm² CSA (Ta = 50°C) 2. 300 metres (total) max. for 1.5mm² CSA (Ta = 50°C)

Wiring Diagram

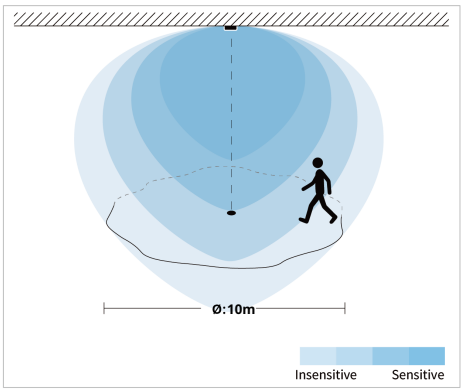


Detection Range

Single Person Walk (Ceiling mount)

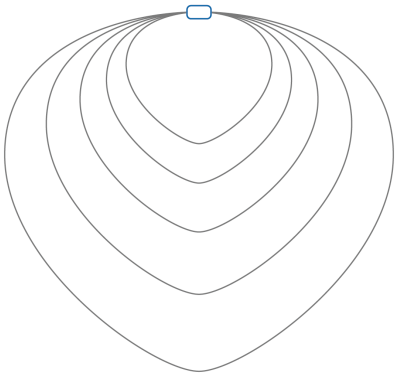
The data is tested under following conditions:
- Single person walking
- Sensor not connected to any driver that may have soft-on period
- Testing temperature Ta = 20°C

Detection example 3m mounting height:



	Sensitivity
H[m]	100%
	Ø[m]
3	10

Detection schematic diagram



Commissioning Instructions and Precautions

A. Bluetooth Antenna Note

1. This product is equipped with a built-in Bluetooth antenna. When the device is installed in a ceiling or recessed environment, ensure that the sensor head remains exposed and is not covered by metal structures or dense building materials, as this may affect Bluetooth communication performance. For optimal signal reliability, avoid installing the device inside fully enclosed metal housings or areas with strong signal interference.

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. A single action cannot activate multiple functions.

Switch function	Action	Description
Virtual-Normal PUSH (Retractive Switch)	Single press (>0.1s) Double press Press and hold (>=1s)	• ON/OFF • ON only • OFF only • Recall this scene • Sensor take over • Not in use * Application Notes: 1. ON/OFF:The PUSH ON/OFF function follows an alternating command sequence (ON - OFF - ON - OFF) based on the previous PUSH command, rather than the current luminaire state. Changes made by other controls, such as sensors or the App, do not reset this PUSH command sequence. Therefore, if the luminaire state has been changed by another control, two presses may sometimes be required to achieve the desired ON/OFF state. Where supported, separate ON only and OFF only commands can be used to avoid this behaviour. 2. Brightness dimming: With Cumulative Adjustment, luminaires that are already OFF within the group remain off during Dim- operation. This function is supported on nRF52832 V55 or later and all nRF52840 versions.

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

Device-specific Koolmesh App features

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

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.

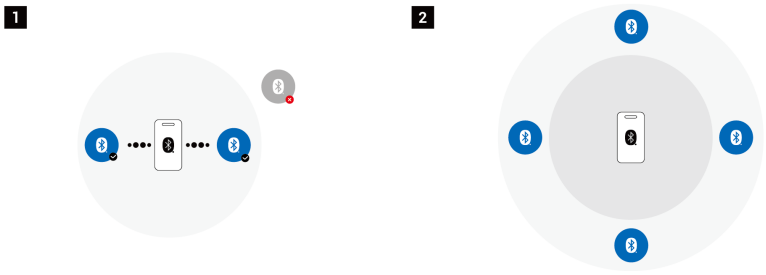
2. Device to Device Range (Mesh Network Communication)

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:

a. Bluetooth range varies by product. Refer to the Specification section for details.

b. 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



HBGW04/R

Multi-protocol BMS Gateway | Dual-band Wi-Fi and Ethernet | DIN-rail Mounting
www.hytronik.com/product/HBGW04-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

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.



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.



Photocell Advance

This advanced daylight-sensing function accurately measures ambient light while minimising interference from the luminaire itself and distinguishing natural light from artificial light. It automatically switches lighting on or off and adjusts brightness according to the available daylight, providing reliable dusk-to-dawn control, improved visual comfort and greater energy efficiency.



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