

HCD038/BT

Bluetooth DALI Control unit | Built-in PSU | Attachable sensor heads

EAN: 6971185220542

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

Adaptable: Small control unit with strain relief

Integrated: Built-in 30 mA DALI PSU simplifying system design

Flexible: Compatible with plug-and-play microwave and PIR sensor heads

Applications

Master luminaire with sensor

Classrooms

Offices

Check Out the Complete System Solution on the Website:
<https://www.hytronik.com/product/HCD038-BT>



Product Description

HCD038/BT is a Bluetooth DALI control base with an integrated 30 mA DALI bus power supply, designed to work with a wide range of plug-and-play microwave and PIR sensor heads. It is especially suitable for plastic luminaires, where Bluetooth signals can transmit more effectively for stable wireless communication. Powered by the upgraded nRF52840 chipset, the device delivers enhanced wireless performance, stronger processing capability and expanded smart control functions, enabling more flexible system configuration and future feature expansion via the Koolmesh app.

Functions and Features

See additional details at the end of datasheet



Built-in DALI PSU



Daylight Harvest



Human Centric
Lighting (HCL)



Koolmesh - See
bluetooth control
below



Live Energy &
Diagnostic Data
Part 252 / 253



Luminaire Asset
Data Part 251



Push-Button
Input



RJ12 Connection



Tri-level Dimming



nRF52840

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Specifications

Main Capabilities

Dimming (Output) Interface	DALI
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Electrical Data

Bluetooth Platform	Nordic nRF52840
Bluetooth frequency	2.4 GHz - 2.483 GHz
Bluetooth range (Phone to Device)	15-40m
Bluetooth range (Device to Device)	15-40m
Bluetooth transmit power	8 dBm
Bluetooth system	Koolmesh
Operating voltage range	220-240 VAC 50/60 Hz
Stand-by power (Psb)	<1W
Warming-up	20 s
DALI bus maximum rated current (I _n max)	80 mA
DALI bus nominal DC voltage range (Un)	16 V
DALI bus nominal current (I guaranteed)	30 mA
DALI Bus Current Consumption	3.0 mA

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Specifications

Technical	
Product weight	46.0 g
Product height	21.0 mm
Product length	120.0 mm
Product width	30.0 mm
Mounting hole	4.5 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-40 ~ +70 °C
Humidity max	10 ~ 90%
Case Temp.max	60.0 °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

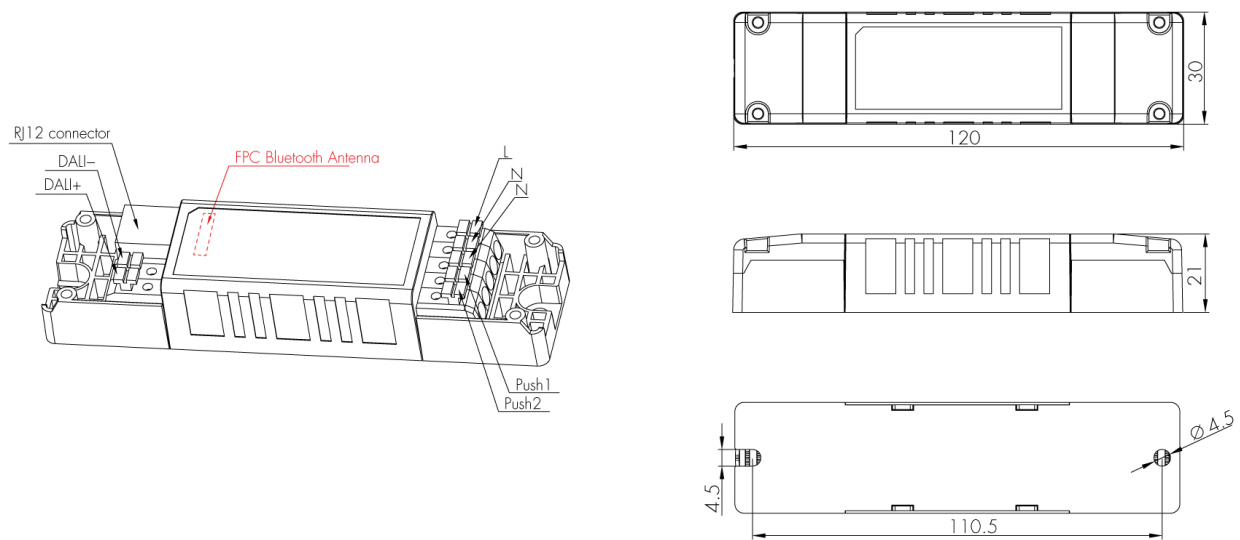
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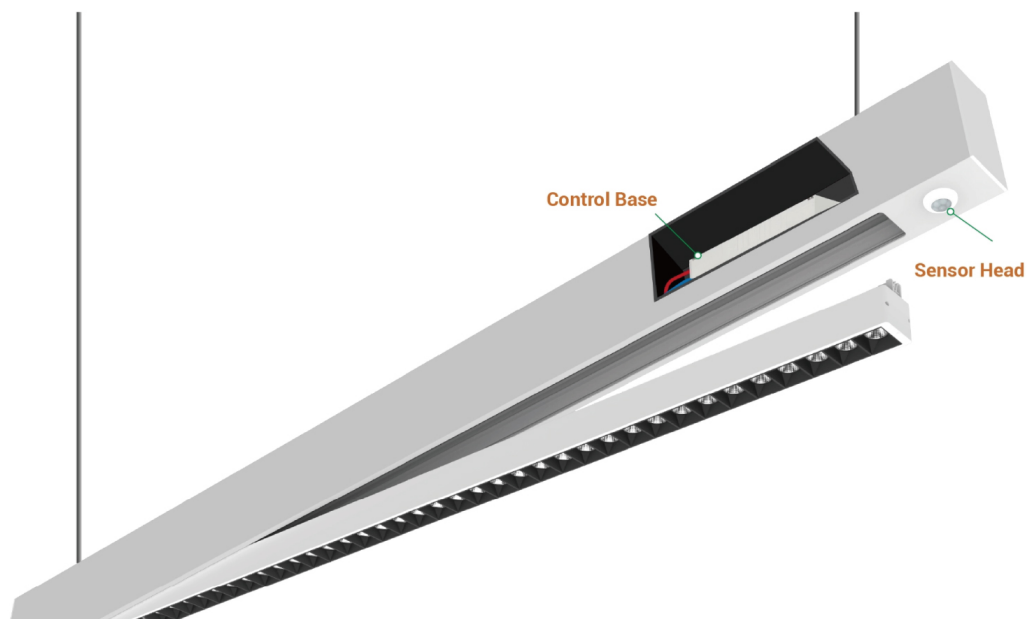
Technical Drawing



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



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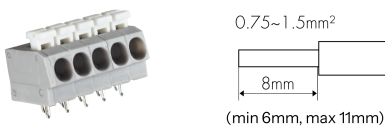
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⚠ Wiring Guidelines

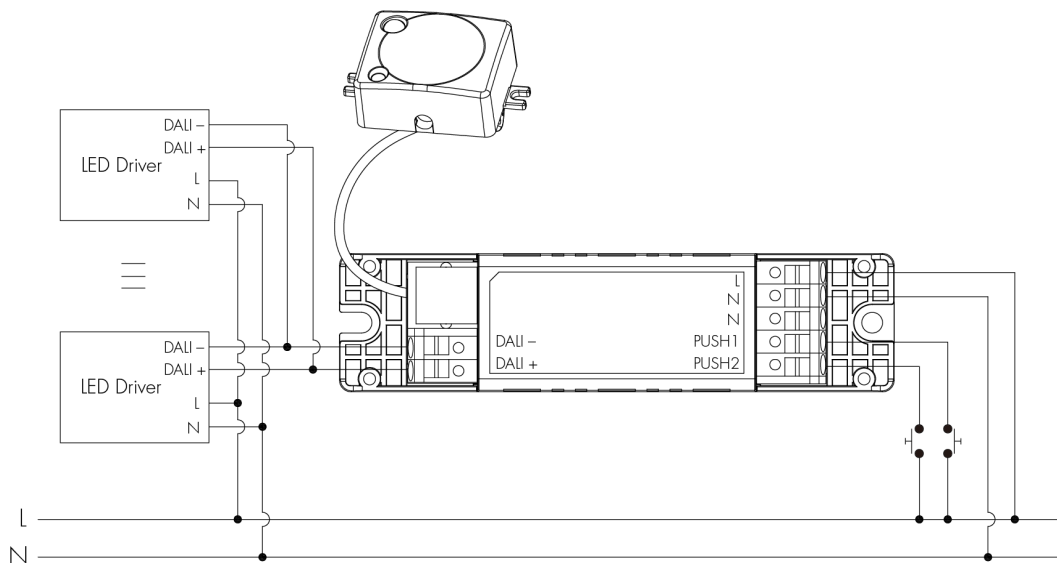
1. Installation by a qualified electrician only and in accordance with local electrical regulations.
2. Disconnect mains power before installation, wiring, maintenance or replacement.
3. Failure to follow the wiring diagram may result in product damage and malfunction.
4. Refer to the Wire Preparation section for recommended wire diameter and strip length.
5. Push inputs are mains-voltage inputs and must only be 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. 200 metres (total) max. for 1mm² CSA (Ta = 50°C) 2. 300 metres (total) max. for 1.5mm² CSA (Ta = 50°C)

Wiring Diagram



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Commissioning Instructions and Precautions

A. Installation Preparations

1. To ensure better detection, keep the sensor lens part beyond the surface of the light fixture.
2. We recommend the mounting distance between sensor to sensor should be more than 2m to prevent sensors from false-triggering.

B. Sensor head Precautions

1. The control base can be used only after it is connected to the sensor head via RJ12 connection.
2. The push function and commission type are determined by the included sensor head.

C. 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.

D. Bluetooth Range Precautions

1. Device-to-device communication can extend up to 40m under indoor test conditions. In open outdoor environments, the transmission distance may be reduced due to fewer surrounding structures and signal reflections. Actual performance may vary depending on the installation environment.

E. Version Precautions

1. This datasheet applies to the nRF52840 version. Certain functions and specifications may differ between the nRF52840 and nRF52832 versions. For the nRF52832 version datasheet, please refer to the "Phased-out Products Library" in the Download section of our website, or contact our technical support team for further assistance.

F. App Feature Precautions

1. Features marked with green icons in the "Device-specific Koolmesh App Features" section are available only for the nRF52840 version.

G. Product Default Setting

1. Controller Unit Default Settings:

Dimming method: Logarithm, DALI dimming mode: standard DALI Dimming, Brightness level range: 1%-100%.

2. Sensor setting:

Note: The controller unit does not include occupancy detection by default. Sensor-related functions and settings are only available after connecting a compatible sensor head through the RJ12 interface. The default sensor parameters below will be applied once the sensor head is connected.

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.

3. 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

Accessories



Reinforced Bluetooth Antenna | Easy installation | Black color

HA01/B

www.hytronik.com/product/HA01-B



Reinforced Bluetooth Antenna | Easy installation | White color

HA01/W

www.hytronik.com/product/HA01-W

Compatible products (for full functionality)



HBGW04/R

Multi-protocol BMS Gateway | Dual-band Wi-Fi and Ethernet
| DIN-rail Mounting

www.hytronik.com/product/HBGW04-R



HIR11/F

PIR Highbay | Circadian Rhythm | RJ12 connector to control
body

www.hytronik.com/product/HIR11-F



HIR05

PIR Lowbay | Circadian Rhythm | RJ12 connector to control
body

www.hytronik.com/product/HIR05



HIR63

PIR Lowbay Sensor Head | RJ12 connector | Conduit Screws

www.hytronik.com/product/HIR63



HIR07

PIR Lowbay | Photocell Advance | RJ12 connector to control
unit

www.hytronik.com/product/HIR07



HIR63/R

PIR Midbay Sensor Head | RJ12 connector | Conduit Screws

www.hytronik.com/product/HIR63-R



HIR11/C

PIR Highbay | Circadian Rhythm | RJ12 connector to control
body

www.hytronik.com/product/HIR11-C



SAM88

HF Low-bay | Tri-level dimming | RJ12 connector to control
body

www.hytronik.com/product/SAM88

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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

- | | |
|--|---|
|  3 DALI channels with independent control (under development) |  Mesh OTA & remote commissioning (under development) |
|  4 push inputs supported |  Motion sensor range test |
|  Compatible with EnOcean kinetic switches |  Motion sensor trigger diagnosis |
|  DALI & D4i failure email reporting |  Partition control with HBT8200P |
|  Detailed motion sensor settings |  Push scene cycling |
|  Dusk/Dawn photocell (twilight function) |  Push switch configuration |
|  Dynamic daylight harvest auto-configuration |  Tri-level luminaire control |

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Bluetooth Mesh Network Installation & Device Access Range

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

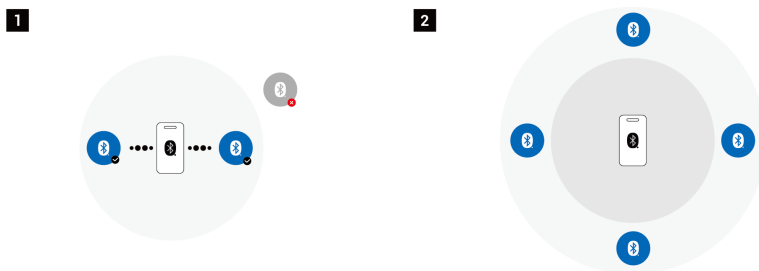
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

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

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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.



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.



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.



RJ12 Sensor Connection

The product features an RJ12 plug-and-play connection interface, enabling quick, tool-free installation and easy maintenance. The standardized connector supports flexible integration between drivers, sensor bases and sensor heads, ensuring reliable communication and simplifying replacement or system expansion. This modular connection method enhances installation efficiency and reduces wiring complexity in both new and retrofit applications.

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Functions and Features



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.



nRF52840

Powered by Nordic nRF52840 Bluetooth® 5.0 SoC, the product delivers enhanced memory capacity and processing performance for advanced Bluetooth Mesh lighting applications. The larger Flash and RAM resources support OTA updates, complex commissioning, diagnostics, and future firmware expansion. External EEPROM provides reliable storage for configuration data, network parameters, and device settings, ensuring stable operation and easy maintenance.

Check out for further explanation of features

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