

HBTD8200PWM

Bluetooth CV Dimmer | Full Color | Built-in/ Stand alone

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

Compact: 4-channel RGBW Bluetooth dimmer designed for LED strips

Versatile: 3 Color Dimensions - RGBW + xyY + DUV

Flexible: Enables full parameter setup and commissioning via app

Applications

Supermarket/Shop

Entertainment Venues (hotel, bar)

Lounge

Check Out the Complete System Solution on the Website:

<https://www.hytronik.com/product/HBTD8200PWM>



RED

UK
CA

Product Description

HBTD8200PWM is a compact Bluetooth RGBW dimmer designed for constant voltage lighting systems, providing an easy way to add wireless control and enhance lighting flexibility. It supports smooth PWM dimming, full-spectrum RGBW control, and tunable white adjustment to create a wide range of lighting scenes. Commissioning is quick and intuitive via the Koolmesh App, with no additional control wiring required. Featuring a 12–24V DC input and four independent MOSFET-controlled output channels, it delivers stable and reliable control for constant voltage lighting loads. Ideal for architectural, hospitality, and decorative lighting applications.

Functions and Features

See additional details at the end of datasheet



Human Centric
Lighting (HCL)



Insulated
Terminal Cover



Koolmesh - See
bluetooth control
below



Open-Circuit
Protection



PWM 1KHz
(1-100%)



RGBW, xyY and
DUV Color light
Settings



Short-circuit
Protection



nRF52840

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Specifications

Main Capabilities

Dimming (Output) Interface	PWM
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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	12~24VDC
Input current range	6A
Input power range	150 W
Output Voltage	12~24VDC
Output Power	72/144W
Output Current	6A
Stand-by power (Psb)	<0.5W
Efficiency	90.0 %

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Specifications

Technical	
Product height	22.0 mm
Product length	80.2 mm
Product width	53.0 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-40 ~ +70 °C
Humidity max	10 ~ 90%
Case Temp.max	70.0 °C
IP Rate	IP20

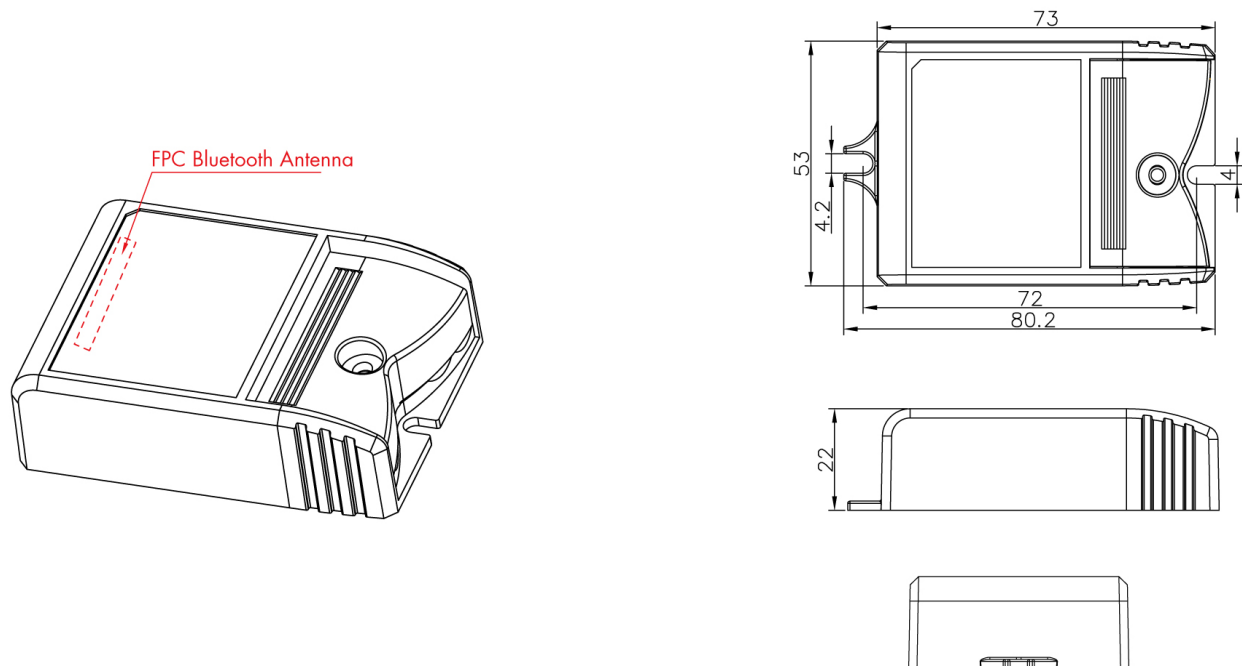
Standard	
EMC	EN 55015, EN61000-3-2/-3-3, EN 61547
LVD	EN 61058-2-1
RED	EN 300328, EN 301489-1/-17, EN 50663

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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



HBTD8200PWM

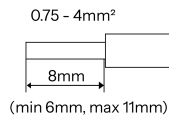
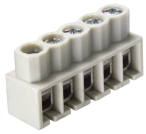
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⚠ Wiring Guidelines

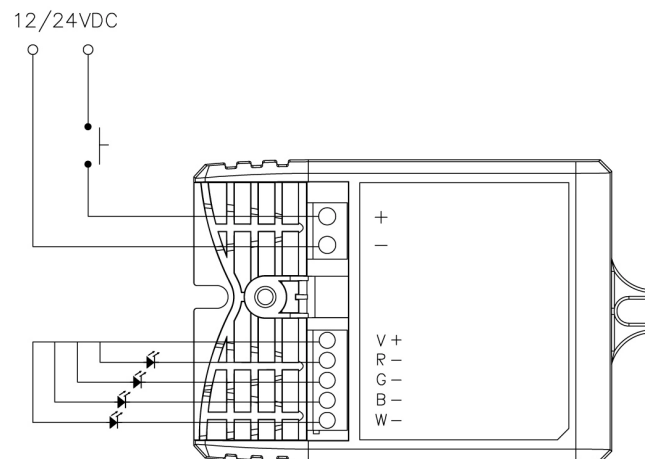
1. Installation by a qualified electrician only and in accordance with local electrical regulations.
2. Disconnect mains power before installation, wiring, maintenance or replacement.
3. Failure to follow the wiring diagram may result in product damage and malfunction.
4. Refer to the Wire Preparation section for recommended wire diameter and strip length.
5. Push inputs are mains-voltage inputs and must only be connected to mains-rated switches.

Wire Preparation



Use a Phillips screwdriver to loosen or secure the cable at the contact screw connections

Wiring Diagram



Commissioning Instructions and Precautions

A. Configuration Mode Selection

This controller supports two selectable operating modes, which can be chosen when adding the device in the Koolmesh App:

1. Unlimited Power Mode (8200PWM) – Total output power of the R, G, B and W channels can reach up to 400%, allowing each channel to be adjusted independently for flexible colour mixing.
2. Constant Power Mode (HBTD8200PWM) – The combined output power of the R, G, B and W channels is limited to 100%.

Note: The factory default setting is Unlimited Power Mode (8200PWM).

B. Bluetooth Range Preparations

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.

C. App Feature Preparations

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

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 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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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

- | | |
|---|---|
|  4 push inputs supported |  Push scene cycling |
|  Compatible with EnOcean kinetic switches |  RGBW functionality |
|  Mesh OTA & remote commissioning (under development) |  Tri-level luminaire control |
|  Partition control with HBTD8200P | |

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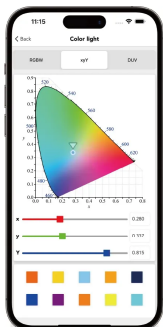
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RGBW Color light Settings via Koolmesh app



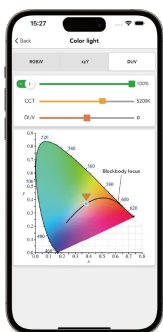
RGBW

You can adjust the color of the luminaire by dragging the RGBW slider or moving the position on the color wheel. In addition to adjusting the color, you can also fine-tune the saturation of the luminaire as needed. This can usually be done by dragging the saturation bar.



xyY

x-coordinate and y-coordinate: These two values define the position of the luminaire on the CIE 1931 chromaticity diagram, thus determining the color of the luminaire. You can adjust the color by dragging the color slider or by sliding directly on the coordinate axis. Y value: This value represents the brightness of the luminaire. You can adjust it by dragging the brightness



DUV

You can adjust the brightness and color temperature of the luminaire by dragging the brightness and color temperature sliders. You can adjust the color by dragging the sliders or adjusting the DUV curve. Positive values usually mean the luminaire hue tends to be warmer, while negative values tend to be cooler.

Application Reference

1. Art Galleries: Adjusting DUV ensures accurate color reproduction of exhibits, avoiding distortions caused by light color deviation.
2. Photo Studios: Adjusting DUV helps ensure the true color rendering of exhibits or photographed objects.
3. Office Spaces: Adjusting DUV provides a comfortable lighting environment, enhancing employee productivity.

Note:

Non-Bridgelux luminaires only support RGBW and xyY standard color tuning and do not provide a DUV interface. Due to differences in color mixing methods and color parameter definitions among LED manufacturers, deviations in RGBW color tuning may occur. For further technical information or application-specific tuning support, please contact us.

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Bluetooth Mesh Network Installation & Device Access Range

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

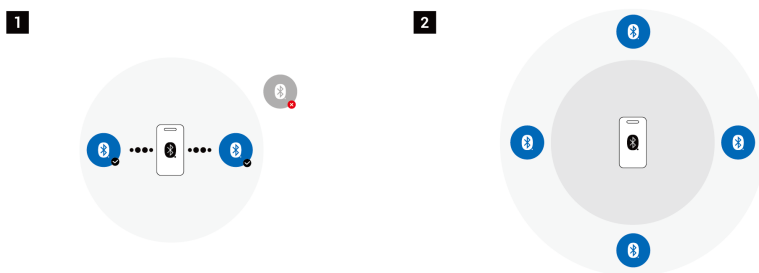
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

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



HBKS02/W

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



HBGW02/D

Bluetooth Mesh Gateway | Dual-band Wi-Fi | wall/flat surface mounting
www.hytronik.com/product/HBGW02-D



HBKS02D/W

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



HBGW03/R

BACnet Gateway | Dual-band Wi-Fi or Ethernet | DIN rail/wall/flat surface mounting
www.hytronik.com/product/HBGW03-R



HBKS03/W

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



HBKS01/W

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



HBLM01

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



HBKS01D/W

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



HBP02

Bluetooth Touch Panel | Real-time keeper | 4 Scenes
www.hytronik.com/product/HBP02

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Functions and Features



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.



Insulated Terminal Cover

The product includes an insulated terminal cover that provides electrical protection for wiring connections and ensures compliance with safety requirements. When the cover is installed, the device can be used as an independently mounted unit rather than a built-in component, offering greater installation flexibility while maintaining safe and secure terminal insulation.



Open-Circuit Protection

This product incorporates open-circuit protection to safeguard the device and connected system in the event of a disconnected load or open wiring condition. When an open circuit is detected, the output is automatically limited or disabled to prevent abnormal operation or component damage, ensuring safe and reliable system behaviour.



PWM 1KHz (1-100%)

This product supports PWM control at 1 kHz, with a duty cycle adjustable from 1% to 100%, enabling smooth and precise output control. The high PWM frequency helps minimize visible flicker and ensures stable performance across the full control range.



RGBW, xyY and DUV Color light Settings

The product supports RGBW color control together with xyY color coordinates and DUV adjustment, enabling flexible color mixing, precise chromaticity control, and fine tuning of white light appearance. This allows accurate and consistent color performance to meet various professional lighting application requirements.



Short-Circuit Protection

This product incorporates short-circuit protection that automatically disables the output in the event of a short circuit. Normal operation is restored automatically once the fault condition is removed, protecting the device and connected components from damage.



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>