

HBEW8040

Bluetooth RGBW Driver 42W (CC) | Full Color | Built-in/Stand-alone

HYTRONIK[®]
SENSORS & LIGHTING CONTROL



Benefits

Compact: Sunlight Spectrum and Chromaticity Tuning LED Driver

Versatile: 3 Color Dimensions - RGBW + xyY + DUV

Simple: Wireless setup for easy system integration

Applications

Supermarket/Shop

Entertainment Venues (hotel, bar)

Lounge

Check Out the Complete System Solution on the Website:
<https://www.hytronik.com/product/HBEW8040>



RED RoHS



Product Description

HBEW8040 is a Bluetooth RGBW LED driver designed for flexible smart lighting integration. It supports full-spectrum blackbody curve and DUV tuning, enabling precise colour adjustment while maintaining consistent brightness for dynamic lighting applications. Its modular design allows optional sensor head connection via an RJ12 interface, enabling lighting manufacturers to add motion sensing functionality when required without changing the driver design. Bluetooth Mesh networking enables wireless communication between luminaires without additional control wiring, reducing installation complexity and project costs.

Functions and Features

See additional details at the end of datasheet

PFC
>0.93

Active PFC design



Insulated
Terminal Cover



Koolmesh - See
bluetooth control
below



Linear Dimming



Multiple Current



Open-Circuit
Protection



Over load
Protection

PWM
1KHz

PWM 1KHz
(1-100%)



Permanent
Memory



RGBW, xyY and
DUV Color light
Settings



Short-circuit
Protection



Tunable White
Control



nRF52840

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Specifications

Main Capabilities

Dimming (Output) Interface	Bluetooth dimming
Operating Mode	Constant Current
Push Button Input	2

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
Input current range	210~190mA
Input power range	50 W
Output Voltage	15~40V
Output Power	42W
Output Current	350mA~1050mA
Output Uout Max.	60V
Stand-by power (Psb)	<0.5W
Power Factor (Max.)	0.9
Efficiency	88.0 %
Warming-up	20 s
In-rush current	15.0 A
In-rush current time	60.0 μs

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Specifications

Technical	
Product weight	132.0 g
Product height	23.0 mm
Product length	140.6 mm
Product width	79.2 mm
Mounting hole	3.9 mm
Ambient temperature	-20 ~ +50 °C
Storage temperature	-40 ~ +70 °C
Humidity max	10 ~ 90%
Case Temp.max	80.0 °C
IP Rate	IP20

Standard	
EMC	EM61547, EN 55015, EN 61000-3-2, EN61000-3-3
LVD	EN 61347-1, EN 61347-2-13, EN 62493
RED	EN 300328, EN 301489-1/-17, EN 50663

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Output configuration

LED Current Selection

1050mA	● ● ●	
1000mA	○ ● ●	
900mA	● ○ ●	
800mA	○ ○ ●	
700mA	● ● ○	
600mA	○ ● ○	
500mA	● ○ ○	
350mA	○ ○ ○	
	1 2 3	

LED Current Selection								
Output Power	5.25-14W	7.5-20W	9-24W	10.5-28W	12-32W	13.5-36W	15-40W	15.75-42W
Output Current	350mA	500mA	600mA	700mA	800mA	900mA	1000mA	1050mA
Output Voltage	15-40V	15-40V	15-40V	15-40V	15-40V	15-40V	15-40V	15-40V

Warning: Please make sure the correct current is selected before starting the driver!

Circuit breaker information

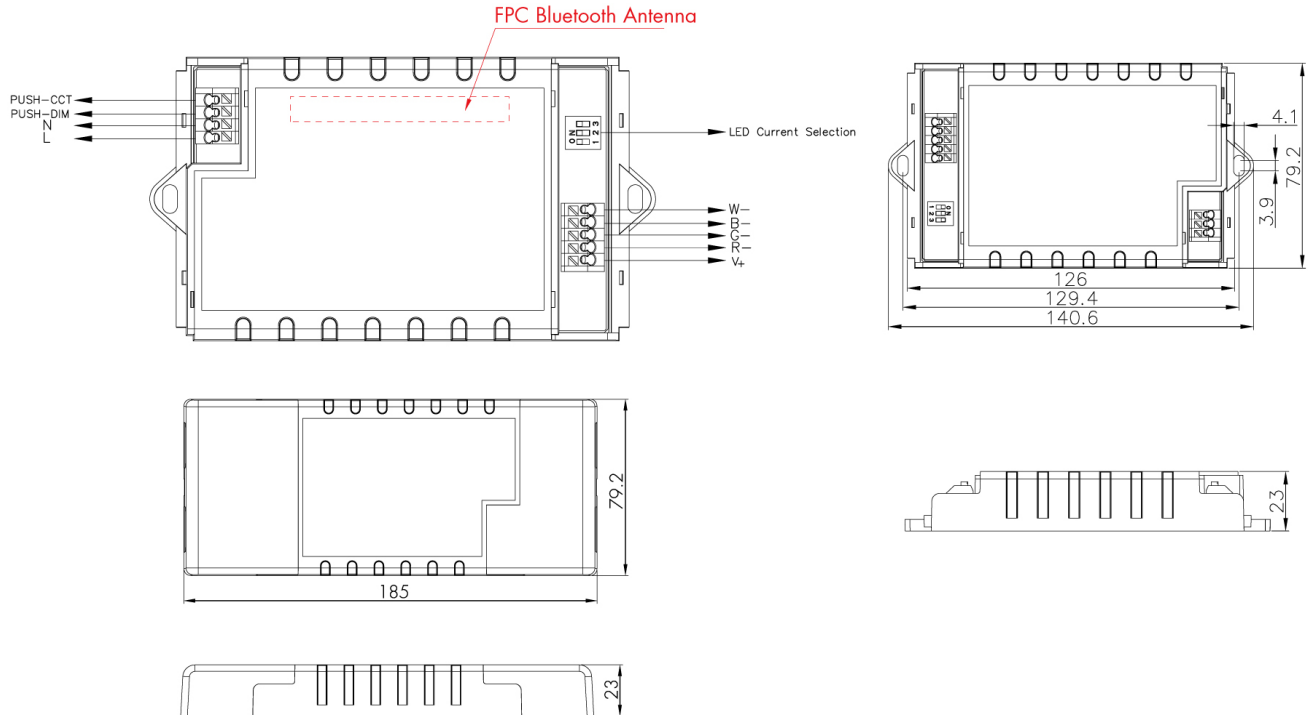
Automatic circuit breaker type	B10A	B13A	B16A	B20A
HBEW8040	21	27	34	42

The data above is calculated according to the formula: Maximum Amount = $16 / (P_n / 230)$. In order to provide a more reliable reference in real application, the data have been revised to take 60% of the number calculated, i.e. $16 / (P_n / 230) \times 60\%$. Please kindly take note that the calculation is based on ABB circuit breaker series S200. Actual values may differ due to different types of circuit breaker used and installation environment.

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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

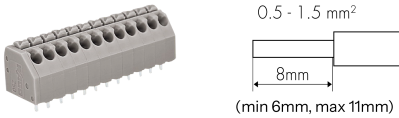


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Wiring Guidelines

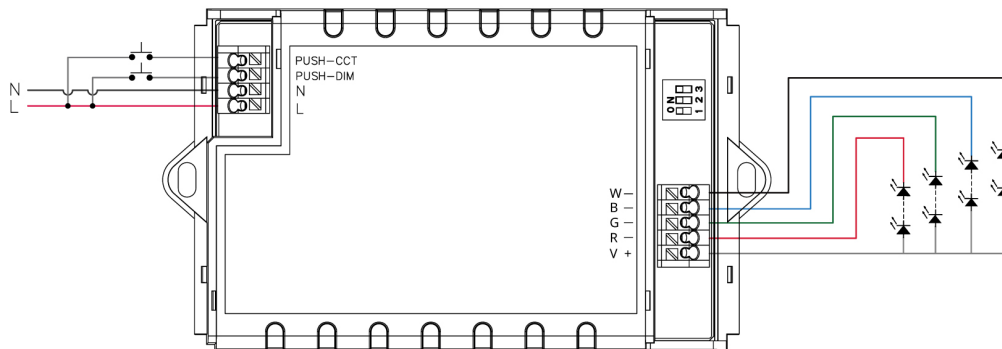
1. Installation by a qualified electrician only and in accordance with local electrical regulations.
2. Disconnect mains power before installation, wiring, maintenance or replacement.
3. Failure to follow the wiring diagram may result in product damage and malfunction.
4. Refer to the Wire Preparation 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



To make or release the wire from the terminal, use a screwdriver to push down the button.

Wiring Diagram



Commissioning Instructions and Precautions

A. 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.

B. App Feature Precautions

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

C. Product Default Setting

1. Driver Default Settings:

Dimming method: Logarithm, Brightness level range: 1%-100%, Color temperature range: 2700K-6500K.

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.

D. Logarithmic Dimming Notes

1. Logarithmic dimming is not supported in the current version. Only linear dimming is available.

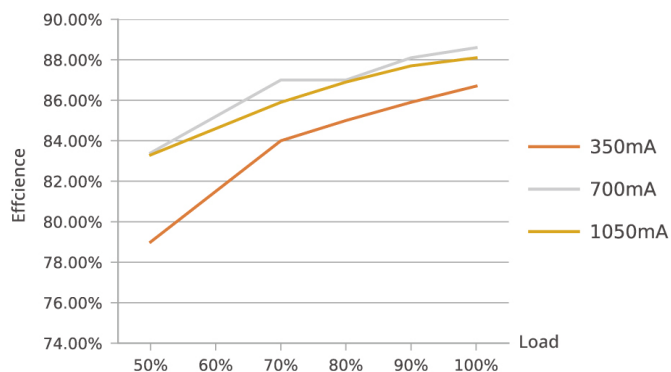
Warning: For additional important documents, including installation precautions, product guidelines, and guarantee conditions, please refer to the official downloads.

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

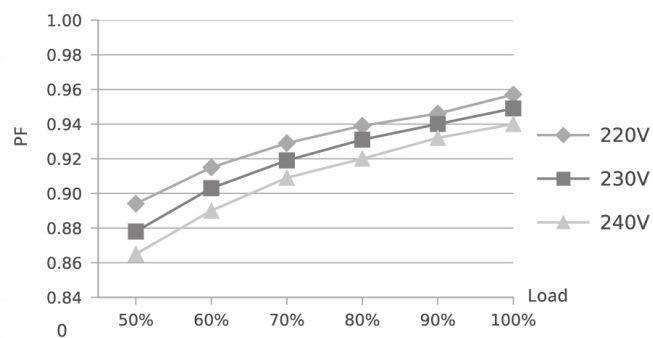
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Performance characteristics

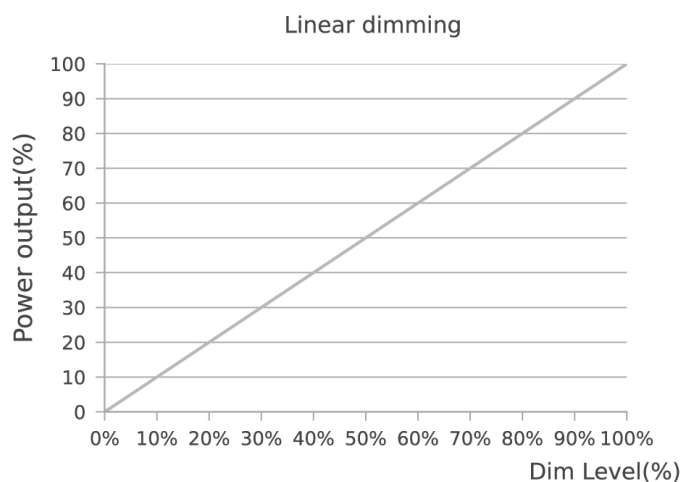


* Typical Efficiency vs Load

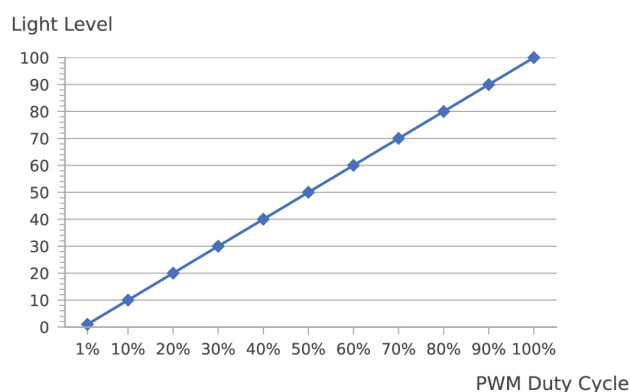


* Typical Power Factor vs Load

Dimming characteristics



Dimming Profile



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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

Included Accessories



Insulated terminal cover with cord restraint

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

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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) |  Partition control with HBTD8200P |
|  4 push inputs supported |  Push scene cycling |
|  Compatible with EnOcean kinetic switches |  Push switch configuration |
|  DALI & D4i failure email reporting |  RGBW functionality |
|  Displays luminaire status & energy consumption Data |  Tri-level luminaire control |
|  Mesh OTA & remote commissioning (under development) |  Troubleshooting & diagnosis |

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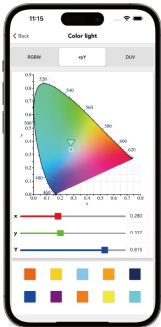
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RGBW Color light Settings via Koolmesh app



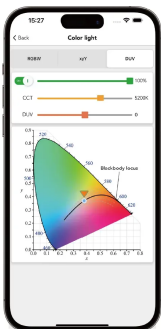
RGBW

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.

Bluetooth Mesh Network Installation & Device Access Range

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

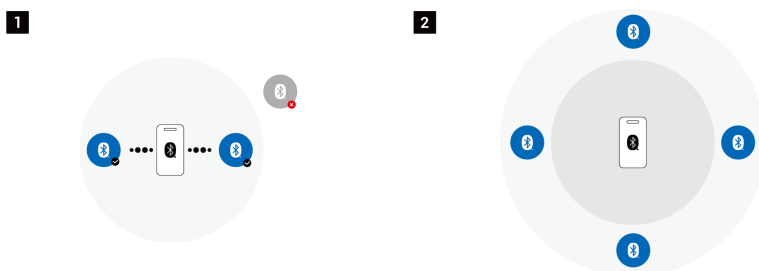
During commissioning, the installer must remain within Bluetooth range of the target device when adding it via the App.

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



HPAD-TSJASE1

Bluetooth Touch Tablet | Gateway Integrated | Switch Boxes
www.hytronik.com/product/HPAD-TSJASE1

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Functions and Features



Active PFC design

This product features an active PFC (Power Factor Correction) design, improving power factor and reducing harmonic distortion. It helps increase energy efficiency, optimize power utilization, and comply with relevant power quality requirements.



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.



Linear Dimming

The product supports a linear dimming curve, where the light output changes in direct proportion to the control signal. This provides smooth and predictable dimming behaviour, making it suitable for applications that require consistent visual response across the full dimming range.



Multiple Current

The product supports multiple selectable output current levels, which can be adjusted via DIP switch or the Koolmesh app to match different luminaire requirements. This flexibility simplifies system design and ensures optimal performance and reliability across various load conditions.



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.



Over load Protection

This product incorporates overload protection that limits or disables the output when the connected load exceeds the rated capacity. This protection helps prevent overheating, excessive component stress and unstable operation, ensuring safe and reliable system performance.



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.



Permanent Memory

The product includes permanent memory that preserves all settings and configuration data even when power is removed. This ensures consistent operation after power interruptions and eliminates the need for reconfiguration during maintenance or unexpected outages.



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.

Functions and Features



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.



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.



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>