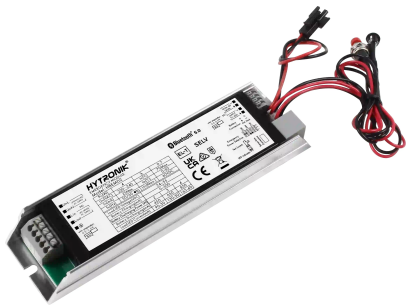
HBEM02

Emergency Inverter Max.4W | Bluetooth | Attachable sensor heads



Benefits

CompactEnabling seamless integration into ON/OFF driver luminaires

Intelligent: Supports plug-and-play sensors and selectable emergency output

Flexible: Allows wireless test scheduling and easy output adjustment.

Applications

Luminaire Built-in integration or standalone

Offices & Classrooms

Industry & Healthcare Spaces

Check Out the Complete System Solution on the Website:
https://www.hytronik.com/product/HBEM02

Product Description

HBEM02 is an emergency inverter with RJ12 connection for optional sensor heads SAM20, SAM21, SAM22, SAM23, HIR05, HIR05/FM, HIR07, HIR11 series, HIR12, HIR63 series. HBEM02 alone is a normal emergency inverter with self-test function. With gateway HBGW01 ready, user can generate emergency testing report through our Koolmesh APP.

Functions and Features

See additional details at the end of datasheet

Automatic Email Alerts on Faults

Battery Status Monitoring

Emergency Operating Modes (4 Modes)

Over-Heat Protection

Over load Protection

Short-circuit Protection

Usage Data & Report History

HBEM02

Emergency Inverter Max.4W | Bluetooth | Attachable sensor heads

Properties

-Designed for On/off control drivers
-Self-contained Emergency with self -test functiond
-EM power selection via DIP switch (2W/3W/4W)
-Plug-andPlay sensor with Photocell Advance Technology for daylight & motion detection
-Abnormal pro-tection for shortcircuit, overload and open-circuit
-SELV classified (indicator LED, battery pack, test switch)
-Customized manual test switch (single press, long press)
-Battery Life Prediction and abnormal protection
-Wireless scheduling of monthly and annual EM tests via Koolmesh app
-Add an emergency function to the main lighting fixtures

Specifications

Main Capabilities	
Dimming (Output) Interface	Bluetooth dimming, Switch-Dim

Electrical Data	
Bluetooth frequency	2.4 GHz - 2.483 GHz
Bluetooth range	10-30m
Bluetooth transmit power	4 dBm
Bluetooth system	Koolmesh
Operating voltage range	220-240 VAC 50/60 Hz
Input current range	0.162~0.15A
Output Voltage	24~55VDC
Output Uout Max.	60V
Power Factor (Max.)	0.7
Efficiency	80.0 %
In-rush current	6.0 A
In-rush current time	120.0 µs
EM output power (Max.)	4 W

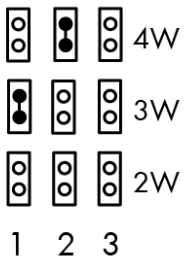
Specifications

Technical	
Product weight	161.0 g
Product height	22.0 mm
Product length	160.0 mm
Product width	40.5 mm
Mounting hole	4.5 mm
Storage temperature	-20 ~ +70 °C
Case Temp.max	80.0 °C
IP Rate	IP20

Standard	
EMC	EN 55015, EN 61000-3-2, EN61000-3-3, EN 61547, EN 300328, EN 301489-17
LVD	EN 61347-1, EN62034, EN 61347-2-7, EN 62493, IEC62133

Output configuration

Emergency Power Selection



Typical Corresponding Parameters for Emergency Power Selection			
Output Power	4W	3W	2W
Output Current	160-80mA	125-60mA	85-40mA
Output Voltage	24-55V	24-55V	24-55V

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

Circuit breaker information

Automatic circuit breaker type	B10A	B13A	B16A	B20A
HBEM02	72	92	114	142

Calculation uses typical values from ABB series S200 as a reference. E.g. Maximum amount =16/(Pn/230). We recommend to use no more than 60% of the data as the actual max. number of drivers in real application.
Actual values may differ due to used circuit breaker types and installation environment.

LED Diagnostics

Indicator Colour / Describe		Status	Meaning
GREEN	SOLID	Device OK	All OK, AC power is present. Battery is connected & charging
	FLASH (0.1s ON, 0.1s OFF)	Monthly test/Functionality test	AC power is present. Monthly test in progress
	SLOW FLASH (1s ON, 1s OFF)	Annual test/Duration test	Annual test are being carried out
RED	SOLID	Emergency LED fault	Emergency LED is open circuit, short circuit or has otherwise failed in some way, Fault can indicate the live status or the result of a test
	SLOW FLASH (1s ON, 1s OFF)	Battery fault	Battery failure (Battery failed the duration or functional test, battery appears to be defective, battery has incorrect voltage).
RED /GREEN OFF		No power available	AC power is lost, unit in emergency mode

If you want to see the diagnostic report, please go to the APP or web platform to see the full report and analysis.
Note: Before powering on, please plug in the sensor head and then plug in the battery, otherwise the sensor is disabled.
Remedy: Only after the APP is reset and re-connected to the network can the sensor head be re-identi ed.

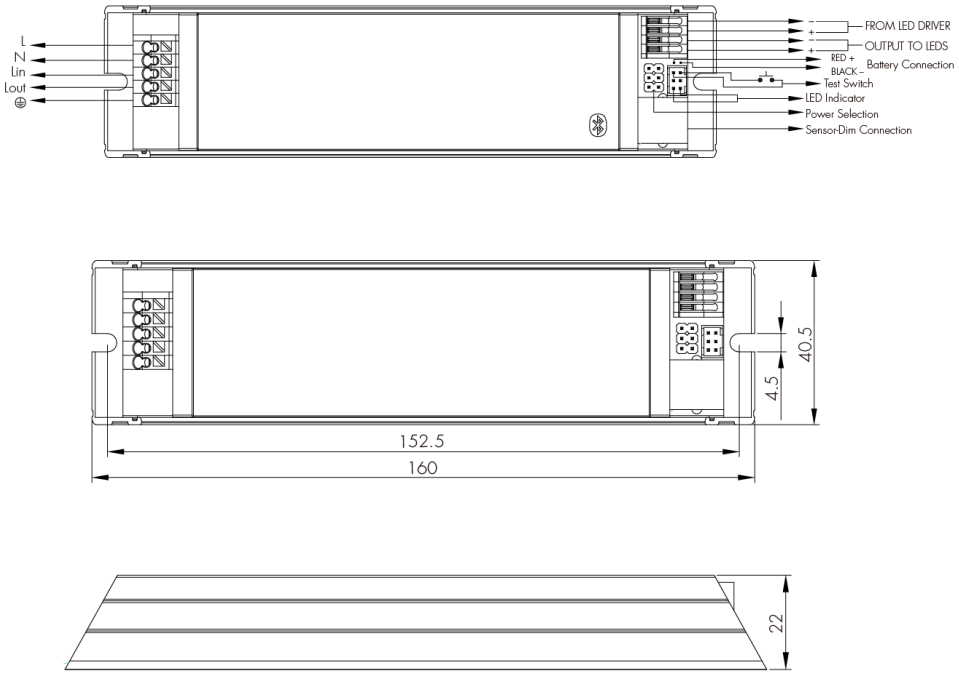
Battery Specifications - battery selection

Battery Selection		
Battery Pack	Battery Type	Size (mm)
BPC83	LiFePO4	105×53×27.5
BPC84	LiFePO4	174.8×26.5×29

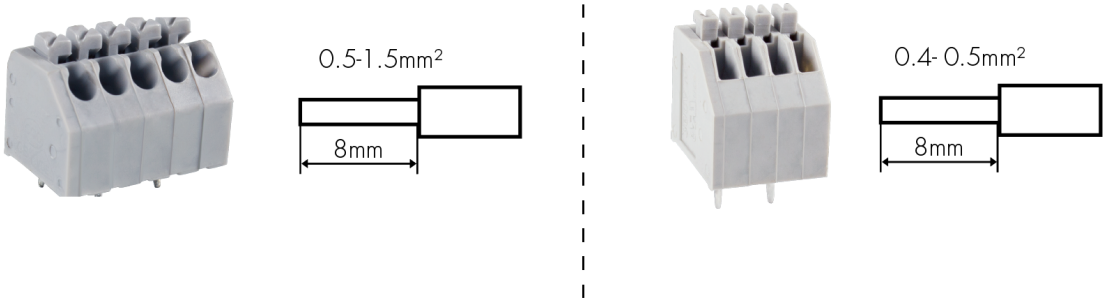
Battery Charge / Discharge Data				
Battery pack	Max. load / Discharge hour	Discharge Current	Charge Current	Recharge Time
BPC83	0.4A, 2W@24 - 55V / 3H	6.4V, 3.6AH	0 - 500mA	24H
	0.65A, 3W@24 - 55V / 3H			
	0.85A, 4W@24-55V / 3H			
BPC84	0.4A, 2W@24 - 55V / 3H	6.4V, 3.6AH	0 - 500mA	24H
	0.65A, 3W@24 - 55V / 3H			
	0.85A, 3W@24- 55V / 3H			

Please kindly charge battery for 24 hours before using.
-Do not short-circuit the battery pack.
-Over-discharge can damage the battery. Please avoid deep discharge and recharge promptly after emergency use.
-Do not connect the battery before installing the product. Once the battery is connected, ensure this product powers on and operates normally within 24 hours.
-For more details on battery precautions and usage, please visit the following link:
https://hytronik.com/service/downloads (LiFePO4 Battery Precautions and Usage).

Technical Drawing

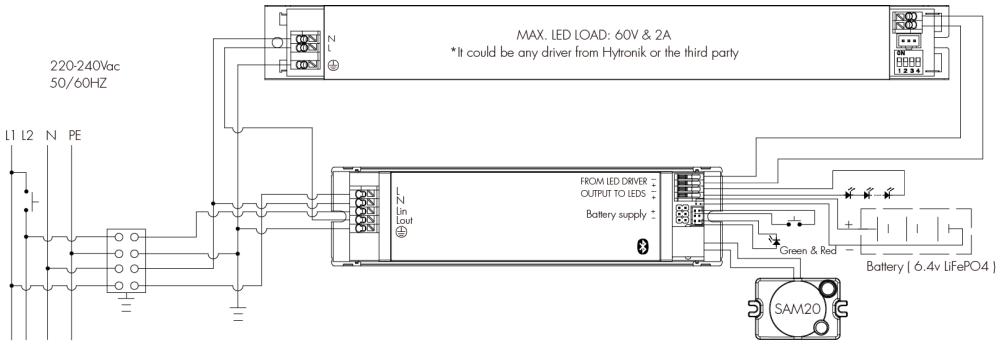


Wire Preparation



Solid or Stranded wire type 0.5-1.5mm², 0.4-0.5mm². To make or release the wire from the terminal, use a screwdriver to push down the button.

Wiring Diagram



Commissioning Instructions and Precautions

A. Installation Notes

1. This product should be installed by a qualifed electrician.

B. Battery Installation

1. Please kindly charge battery for 24 hours before using.

2. Do not shortcircuit the battery pack.

3. Over-discharge can damage the battery. Please avoid deep discharge and recharge promptly after emergency use.

4. Do not connect the battery before installing the product. Once the battery is connected, ensure the HBEMO1 product powers on and operates normally within 24 hours.

5. For more details on battery precautions and usage, please visit the following link: https://hytronik.com/service/downloads (LiFePO4 Battery Precautions and Usage).

C. Battery-Powered Bluetooth Standby

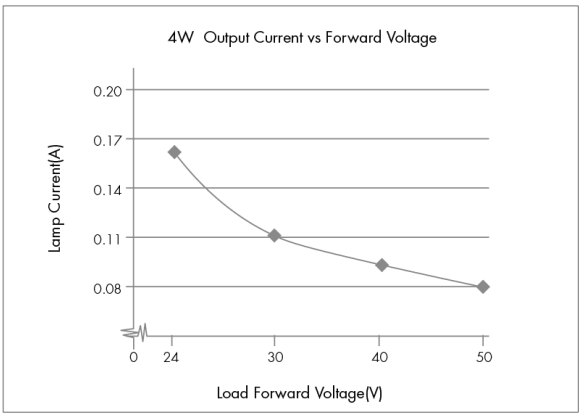
1. To support emergency system logging and monitoring, Bluetooth-enabled emergency drivers are designed to allow the battery to directly power the Bluetooth module when mains power is not present. During this state, the Bluetooth module typically draws -20mA from the battery.

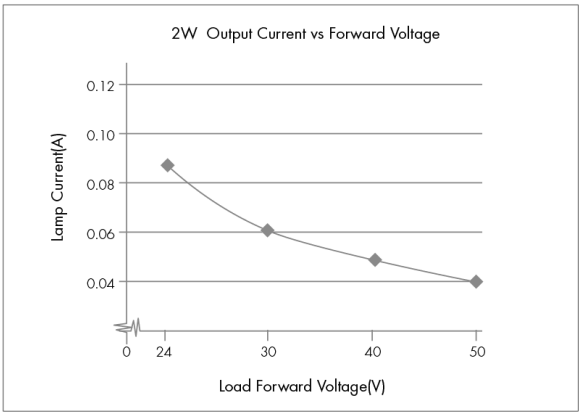
2. Please take this standby consumption into account when assessing battery life in long-term mains-disconnected scenarios.

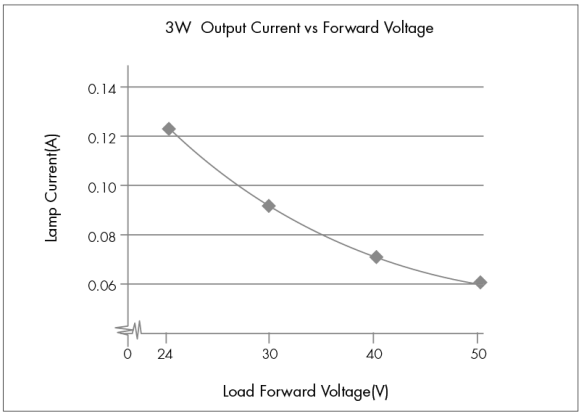
Warning: For additional important documents, including installation precautions, product guidelines, and guarantee conditions, please refer to the official downloads.

https://hytronik.com/service/downloads

Performance characteristics







Emergency Operating Modes

Normal Mode

It is the mode in which mains supply is available, with the battery either charged or charging. In this mode, the device operates as a combined Bluetooth LED driver, capable of creating scenes and being controlled by motion sensors, Push switches, and the mobile app.

Emergency Mode

It is the mode in which mains supply has failed and the control gear is powered by the battery until deep-discharge protection is reached. In this mode, the device cannot be controlled by motion sensors, Push switches, or the app. However, certain emergency parameters can still be configured via the app, such as scheduled self-test time, extended emergency duration, etc.

Rest Mode

It is the mode in which the luminaire is intentionally turned off while the control gear is powered by the battery. To enter this mode, mains supply must not be present. In this mode, the luminaire turns off automatically while the device continues to draw power from the battery. If the luminaire is forced on, the device will switch to emergency mode. When mains supply is restored, the device will return to normal mode.

Inhibit Mode

It is the mode in which the device is powered from the mains but prevented from entering emergency mode in the event of a mains failure. This mode is intended only for special applications where emergency functionality is not required, such as when electricians need to temporarily disable emergency operation during inspection or maintenance work.

Extended Emergency Mode

It is the mode in which the device continues operating the luminaire in the same manner as emergency mode for a programmed extended duration after mains power is restored. When enabled, the device remains in emergency mode even when mains supply returns. Once the programmed extended time expires, the device will switch back to normal mode.

Emergency Self-Test Functions

Self-test (Monthly)

The device performs routine tests on emergency lighting based on pre-programmed schedules via the app or upon receiving manual commands. During the monthly self-test, load connections (e.g., open-circuit, short-circuit) and battery connections (e.g., open-circuit, short-circuit, polarity reversal) are inspected. After the device reports a functional fault, a new monthly functional test shall be carried out after corrective actions to verify that the fault has been eliminated.

Self-test (Annually)

The annual test is mainly used to evaluate battery capacity and condition. The user must ensure that the battery is fully charged before the test begins. Battery lifetime statistics will be analysed and presented graphically. When the device reports insuficient battery capacity and the battery is replaced, an annual test shall be performed to ensure that the new battery meets the required performance criteria.

Options

Included Accessories

LED indicator | Used to display the status of the product

Test switch| For checking the device function

Compatible products (for full functionality)

BPC83

Battery | LiFePO4 with 3.6Ah | 6.4V
www.hytronik.com/product/BPC83

BPC84

Battery | LiFePO4 with 3.6Ah | 6.4V
www.hytronik.com/product/BPC84

HIR05

PIR Lowbay | Circadian Rhythm | RJ12 connector to control body
www.hytronik.com/product/HIR05

HIR07

PIR Lowbay | Photocell Advance | RJ12 connector to control unit
www.hytronik.com/product/HIR07

HIR11/AA

PIR Highbay | Adjustable Angle | RJ12 connector to control body
www.hytronik.com/product/HIR11-AA

HIR12

PIR Highbay | Ciradian Rhyhm | RJ12 connector to control body
www.hytronik.com/product/HIR12

HIR63

PIR Lowbay Sensor Head | RJ12 connector | Conduit Screws
www.hytronik.com/product/HIR63

HIR63/R

PIR Midbay Sensor Head | RJ12 connector | Conduit Screws
www.hytronik.com/product/HIR63-R

SAM20

HF Lowbay | Daylight Harvest | RJ12 connector to control body
www.hytronik.com/product/SAM20

SAM21

HF Lowbay | Ciradian Rhyhm | RJ12 connector to control body | IP65
www.hytronik.com/product/SAM21

SAM22

HF Lowbay | Ciradian Rhyhm | RJ12 connector to control body
www.hytronik.com/product/SAM22

SAM22/AA

HF Lowbay | Ciradian Rhyhm | RJ12 connector to control body
www.hytronik.com/product/SAM22-AA

SAM23

HF Highbay | Photocell Advance | RJ12 connector to control body
www.hytronik.com/product/SAM23

Koolmesh - Operating guide

Bluetooth 5.0 SIG Mesh

Smartphone(ios) Smartphone (Android) iPad Web

For additional information, including project and network, device, and scenes, please refer to: http://faq.koolmesh.com/faq/en/index.html

Shared Koolmesh App Features

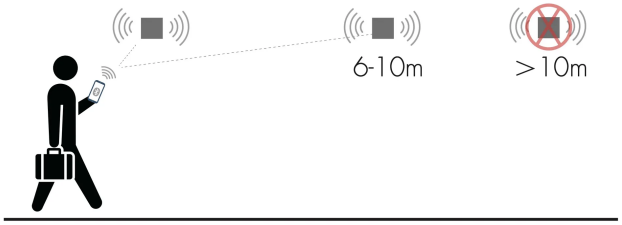
- Alert for excess lux / temperature / humidity via multi-meter HBLM01
- Astro timer (sunrise and sunset)
- Bulk commissioning (copy and paste settings)
- Compatible with Shelly energy metering
- Continuous development in progress...
- Device firmware update over-the-air (OTA)
- Device social relations 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)
- Motion sensor range test
- Motion sensor trigger diagnosis
- Push switch configuration

Smart Phone to Device Range

1. The smart device with the installed App typically has a range of 10m, which may vary between devices.
2. During the commissioning process, the installer must be within range of the devices while searching for them to add to the network.
3. Once the devices are added to the network via the App, they will begin communicating within the wireless mesh.
4. After the network is complete, all devices can be accessed from the smart device within a 20m range of a single point.



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

Automatic Email Alerts on Faults

When a fault is detected, the system automatically sends email notifications to alert maintenance personnel, enabling timely intervention and reducing system downtime.

Battery Status Monitoring

Users can monitor battery status in real time via the Koolmesh app, including battery condition and operating status. This enables timely maintenance actions and helps ensure reliable emergency operation.

Emergency Operating Modes (4 Modes)

The product supports four emergency operating modes: Normal Emergency Mode, Rest Mode, Inhibit Mode and Extended Emergency Mode. In the event of a mains power failure, it provides standard emergency lighting operation. During normal mains operation, the emergency output remains inactive while the battery is charged to preserve battery capacity. Emergency operation can be temporarily inhibited via control commands for maintenance or testing purposes. An Extended Emergency Mode, configurable via the Koolemsh app, allows the emergency light to continue operating for a preset duration after mains power is restored, reducing the risk of darkness in the event of a subsequent power interruption.

Over-Heat Protection

The product incorporates an internal thermal switch that protects critical components from excessive temperature. When the internal temperature reaches the defined threshold, the driver automatically shuts down to prevent damage. Normal operation resumes once the temperature drops back within the safe range, ensuring reliable and protected performance

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.

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.

Usage Data & Report History

The system stores usage data and historical reports, supporting inspections, maintenance analysis and compliance documentation.

Check out for further explanation of features

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