

HBT01 / HBT02



### Applications

The freedom of wireless mesh networks configured by smartphone APP's considerably changes the approach to connected lighting controls. Hytronik has designed such lighting controls using  Bluetooth® 4 wireless mesh technology to support the functional demands of most commercial and industrial applications:

- Office / Commercial Lighting
- Classrooms
- Car Parks
- Stairwells / Corridors
- High-bay / Low-bay warehouse

### HBT01 Transceiver + Occupancy Sensor Node

By combining the mesh network transceiver, microwave occupancy sensor and photocell into a single unit, many energy saving and comfort/safety control functions may be achieved. Perfect for applications such as car parks, stairwells and suspended fixtures where space is restricted for cables and traditional externally mounted lighting controls.



### HBT02 Transceiver Node

This device contains all the features of the HBT01 above, except for the microwave occupancy sensor. These transceiver nodes generally make up the majority of the mesh network and may either be linked to the occupancy nodes for automated control, or are also able take commands from elsewhere, such as the Hytronik scene plate wall switch or App.

Both HBT01 and HBT02 nodes may be used with our broadcast DALI and 1-10V PSU's or even connected directly to any of our Hex-drive LED driver range for a powerful, cost effective & complete solution.

 Bluetooth® 4 wireless mesh lighting control with DALI or 1-10V output



Hytronik Hex-drive LED driver  
 Bluetooth® wireless technology

### Features

-  30mA Broadcast DALI output for up to 15 LED drivers per node
-  1-10V output control option
-  Photocell Advance™ built-in daylight control.
-   Switch-Dim with Synchronization for simple manual over-ride
-  Permanent Settings Memory, Protected against Loss of Power
-  5 Year, 50,000hr Warranty

Free smartphone App for set-up and commissioning



Note:  
This datasheet is intended for information related to the hardware only.

For detailed set-up of features available in the App, please refer to the App user guide available from our website.



Compatible with iOS 8.0 or later



Android version coming soon...

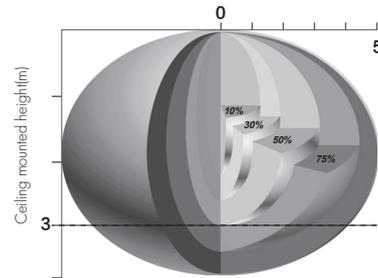
## Technical Data For Transceiver Node (HBT01 / HBT02)

HF Sensor Properties (HBT01 only)	
Sensor principle	High Frequency (microwave)
Operation frequency	5.8GHz +/- 75MHz
Transmission power	<0.2mW
Detection range <sup>1</sup>	Max. (Ø x H) 10m x 3m
Detection angle	30° ~ 150°

Environment	
Operation temperature	Ta: -20°C ~ +70°C
Case temperature (Max.)	Tc: +70°C
Storage temperature	-35°C ~ 80°C
Max. relative humidity	0 ~ 90%
IP rating	IP20

Radio Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	Max.7.5 dBm
Range (Typical) <sup>2</sup>	15~30m

HF Occupancy Detection Pattern



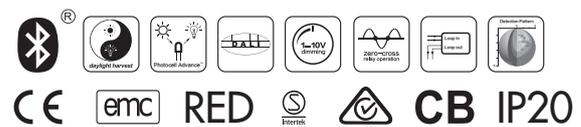
1. The detection range is heavily influenced by antenna placement (angle of approach) and different walking paces. It may be reduced to (Ø x H) of 2 x 3m under certain conditions.
2. Please refer to placement guidance provided later in this document.

## Technical Data For Control Base (HC038V / HCD038)

Input Characteristics	
Mains voltage	220~240VAC 50/60Hz
Stand-by power	<0.5W
Load ratings:	
HC038V	400W (capacitive) 800W (resistive)
HCD038	30mA, 16VDC (max. 15 devices)
Warming-up	20s

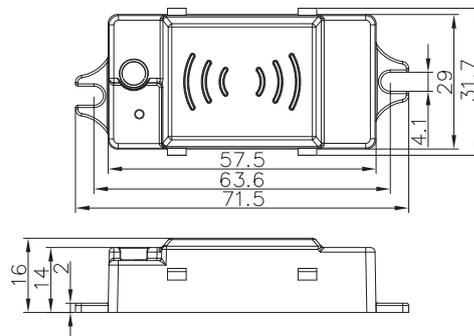
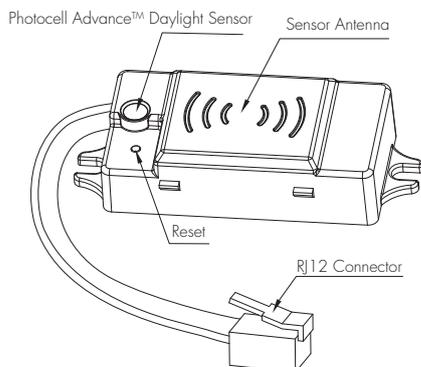
Safety and EMC (Common Data)	
EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669, AS/NZS60669
Radio Equipment (RED)	EN300440, EN301489, EN62479
Certification	Semko, CB, CE, EMC, RED, RCM

Environment	
Operation temperature	Ta: -20°C ~ +55°C
Case temperature (Max.)	Tc: +80°C
IP rating	IP20

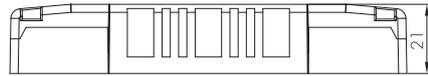
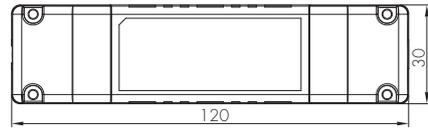
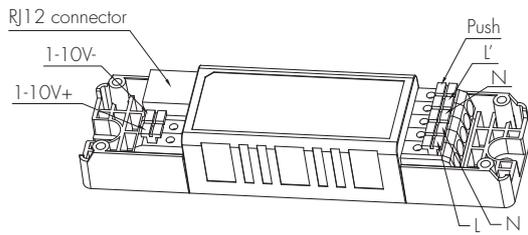


## Dimensions and Terminals

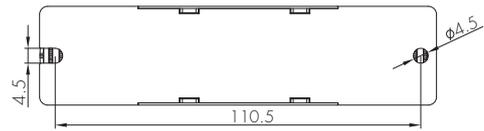
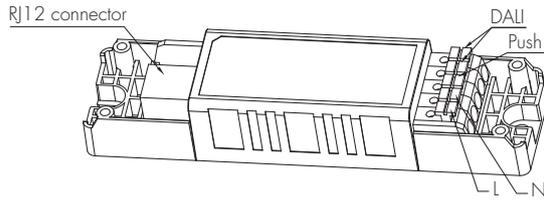
### Transceiver Node (HBT01 / HBT02)



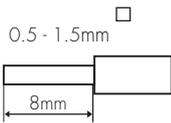
HC038V (1-10V output)



HCD038 (DALI output)



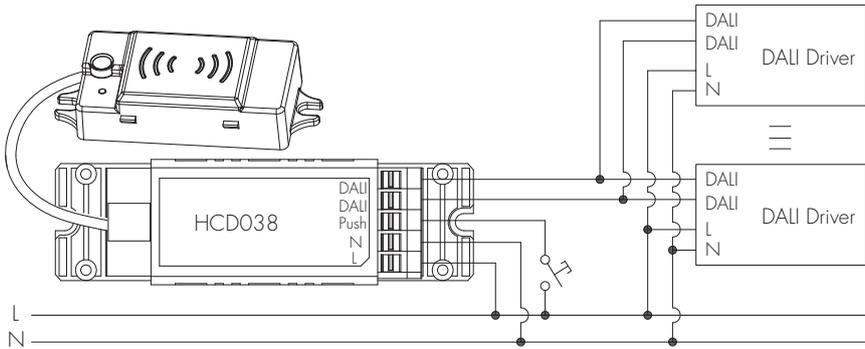
Wire Preparation



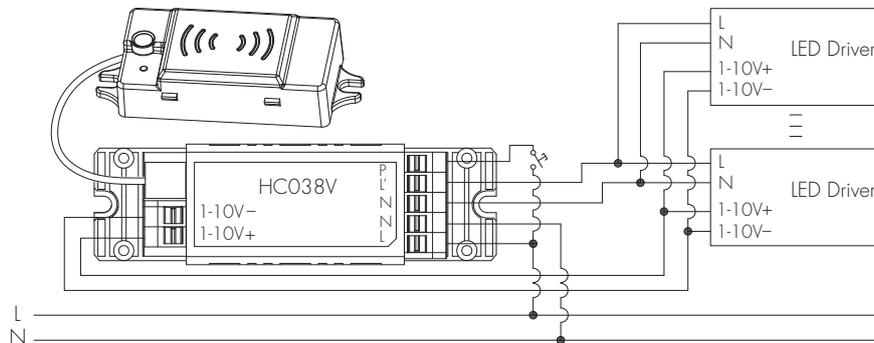
To make or release the wire from the terminal, use a screwdriver to push down the button.

Wiring Diagram

DALI version



1-10V version



To maximise the range in every direction, the following considerations should be taken into account when situating the antenna in the luminaire:

**HBT01**

The HBT01 contains both a HF microwave antenna and the **Bluetooth®** transceiver module and are located within the device as per fig. 1.

When the antenna is mounted to a metallic backplane, such as a gear tray a cut-out opening should be made as large as possible as shown in fig. 2.

If possible, try to position the sensor as far away as possible from the LED driver or other strong sources of HF interference.

**HBT02**

The HBT02 contains only the **Bluetooth®** transceiver module and is located in the same position as per fig.3. The same consideration to mounting on metal gear trays is therefore also as per fig.2.

HF Microwave Antenna

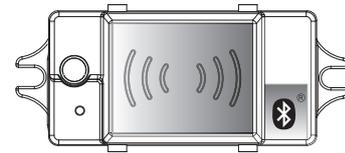


fig. 1. **Bluetooth®** Antenna

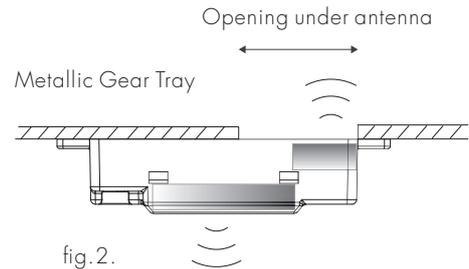


fig. 2.

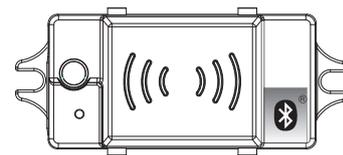
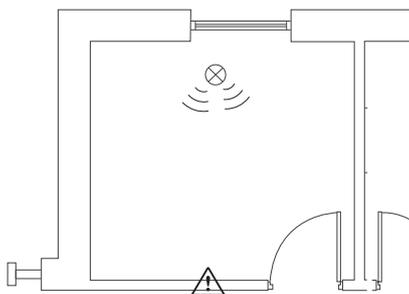
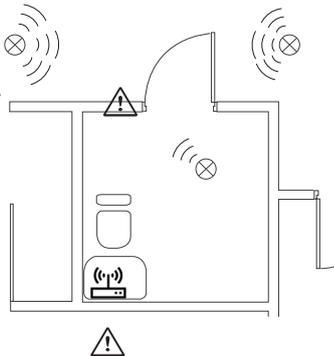


fig. 3. **Bluetooth®** Antenna

Device to Device Placement



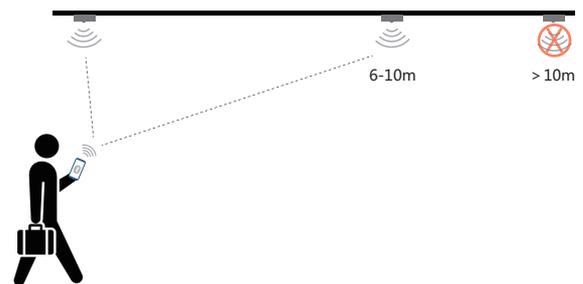
Concrete walls  
Metals, and other  
building materials  
will reduce the range



Strong signal sources such as WiFi routers  
and microwave ovens will affect the range

Device placement may offer upto 30m communication distance. However, we recommend for indoor applications that device placements should be no further apart than 15m.

Smart Phone to Device Range



Notes:

The range for which a smart phone or smart device will vary from model to model and is dependant on its **Bluetooth®** capability

Placement of the antenna within the luminaire will also effect the smart phone communication range and may appear different for each luminaire variant.

Finally, other environmental factors (as per opposite) will influence the ultimate achievable range of communication between smart phone and luminaire device.

## Hardware Features

### 1 Manual Override (HCD038 / HC038V 'Push' Terminal)

The Switch-Dim terminal reserves the access of manual override function for the end-user to switch on/off, or adjust the light level by push-switch. Furthermore, by using the "push-sync" option in the App, entire groups of fixture may be wirelessly controlled by a single switch. Please refer to the App user guide for further information.

\* Short Push (< 1 s): on/off function;

On → Off: the light turns off immediately and cannot be triggered ON by motion until the expiration of pre-set hold-time. After this period, the sensor goes back to normal sensor mode.

Off → On: the light turns on and goes to sensor mode, no matter if ambient Lux level exceeds the daylight threshold or not.

\* Long Push (> 1 s): adjust the target lux level by turning the light up or down. Both the adjustment on App and push switch can overwrite each other, the last adjustment remains in memory.

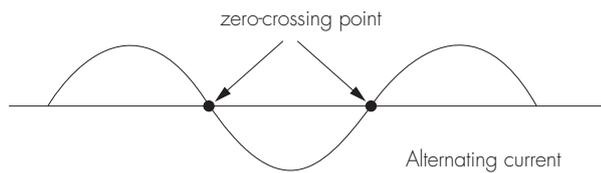
*Note: If this feature is not required, simply leave the "push" terminal unconnected.*

### 2 Photocell Advance™ Function (Built into HBT01 / HBT02)

It's well known that LED lights have a totally different spectrum to natural light. Hytronik uses this principle with a custom-designed photocell and sophisticated software algorithm to measure and differentiate natural light from LED light, so that this photocell can ignore the LED light and only respond to the natural light.

### 3 Zero-cross Relay Operation (HC038V)

Designed into the software, the relay switches the load right at the zero-crossing point, to ensure that the in-rush current is minimised thus enabling the maximum lifetime of the relay.



## Using HBT01 / HBT02 with Hex-Drive

### Constant Current LED Drivers

Hytronik offer a simplified range of intelligent LED drivers which can meet the requirements of many applications and luminaire designs. There is no need for any configuration or programming tools, just by simply connecting either HBT01 or HBT02 via the RJ12 connector, the LED driver is automatically enabled for control via the Bluetooth® 4 mesh network.

Once the HBT01 or HBT02 is connected to the Hex-drive LED driver, all other control inputs (i.e. DAI & 1-10V) are disabled and control of the LED driver resumes via the wireless network commands sent and received by the HBT01 / HBT02.

A wired switch input maybe introduced to one or more of the LED drivers to enable manual switching of individual or wirelessly grouped lighting points.

Hytronik Hex-drive LED drivers feature a high level of specification which includes:

- Active PFC Design
  - Configurable Constant Current (CC) Output via Dip-Switch
  - Analogue Flicker-free Dimming
  - Logarithmic Dimming with Multiple Dimming Inputs:
  - Intelligent Thermal Management
  - Thermal Cut-out Protection
  - Short Circuit Protection
  - Over-load Protection
  - Permanent Settings Memory, Protected against Loss of Power
  - 5 Year, 50,000hr Warranty
- } All with Auto-restart



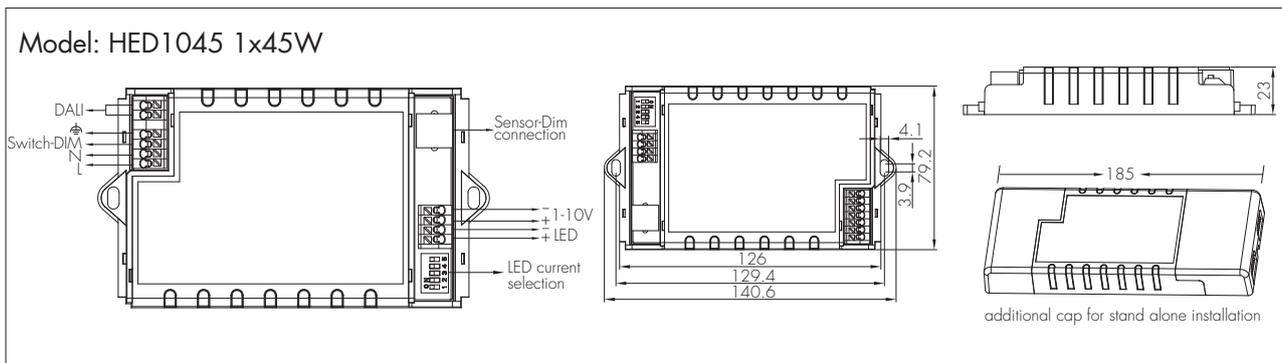
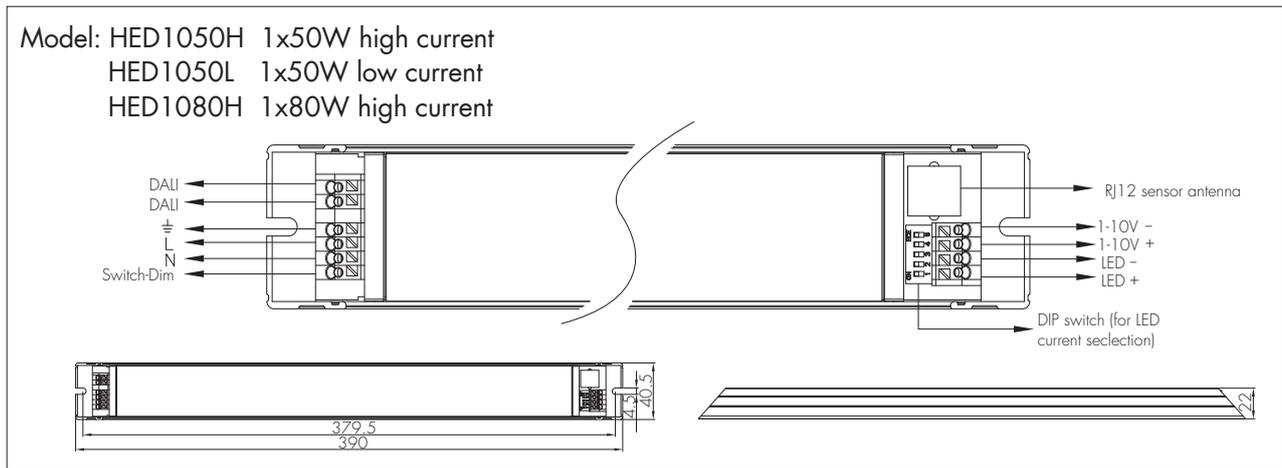
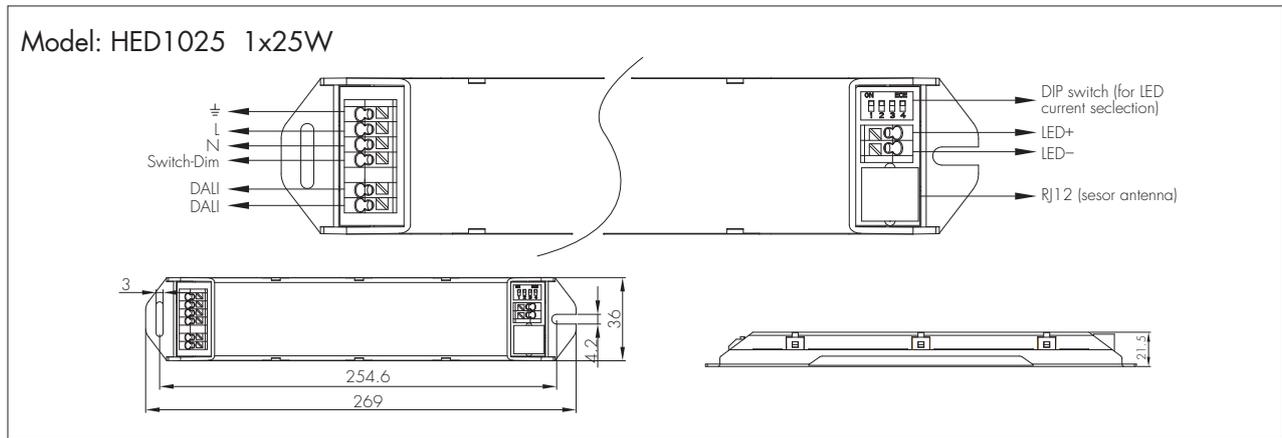
## Technical Data

The following data is given as an overview of the Hex-drive range for reference in accordance with the HBT01 and HBT02  Bluetooth® wireless technology products. For full data, please refer to our dedicated Hex-drive datasheets.

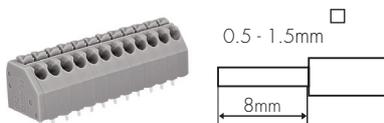
Model No.	HED1025	HED1045	HED1050H	HED1050L	HED1080H	
Input	Mains Voltage	220~240VAC 50/60Hz				
	Mains Current	0.15~0.13A	0.22~0.2A	0.3~0.25A	0.3~0.25A	0.45~0.4A
	Power Factor	0.9	0.95	0.95	0.96	0.95
	Max. Efficiency	88%				
	Dielectric Strength	Input→Output : 3000VAC				
	Leakage Current	< 0.25mA				
Output	Ripple Current	<3%	<3%	<3%	<3%	<3%
	Uout Max.	90V	75V	110V	200V	120V
	Turn-on Time	< 0.5s	< 0.5s	< 0.5s	< 0.5s	< 0.5s
	Dimming Interface	DALI, Switch-Dim	DALI, 1-10V, Switch-Dim			
Environment	Operation Temp.	Ta: -20~+50°C	Ta: -20~+45°C	Ta: -20~+50°C	Ta: -20~+50°C	Ta: -20~+50°C
	Case Temp. (Max.)	80°C	85°C	80°C	80°C	80°C
	IP Rating	IP20				
Safety and EMC	EMC Standard	EN55015, EN61547, EN61000-3-2, EN61000-3-3				
	Safety Standard	EN61347-1, EN62493, EN61347-2-13				
	DALI Standard	IEC62386-101 ; IEC62386-102 ; IEC62386-207				
	Certifications	Semko, CB, RCM, CE , EMC				

Model No.	Max. output power/current/voltage range				
HED1025	19.5W/ 325mA /12~60V	21W/ 350mA /12~60V	22.5W/ 375mA /12~60V	24W/ 400mA /12~60V	
	25.5W/ 425mA /12~60V	27W/ 450mA /12~60V	26W/ 475mA /12~55V	27.5W/ 500mA /12~55V	
	26W/ 525mA /12~50V	27.5W/ 550mA /12~50V	26W/ 575mA /12~45V	27W/ 600mA /12~45V	
	28W/ 625mA /12~45V	28W/ 650mA /12~43V	27W/ 675mA /12~40V	28W/ 700mA /12~40V	
HED1045	28W/ 500mA /12~56V	40W/ 700mA /12~56V	45W/ 900mA /12~50V	45W/ 1050mA /12~42V	
	40W/ 1200mA /12~34V	40W/ 1400mA /12~28V			
HED1050H	40W/ 500mA /12~80V	44W/ 550mA /12~80V	49W/ 600mA /12~80V	49W/ 650mA /12~75V	
	49W/700mA /12~70V	50W/ 750mA /12~66V	50W/ 800mA /12~62V	50W/ 850mA /12~59V	
	49W/ 900mA /12~55V	49W/ 950mA /12~53V	50W/ 1000mA /12~50V	50W/ 1050mA /12~47V	
	50W/ 1100mA /12~45V	50W/ 1150mA /12~43V	50W/ 1200mA /12~42V		
HED1050L	34W/225mA /36~150V	38W/ 250mA /36~150V	41W/ 275mA /36~150V	45W/ 300mA /36~150V	
	49W/325mA /36~150V	50W/ 350mA /36~140V	50W/ 375mA /36~130V	50W/ 400mA /36~125V	
	50W/ 425mA /36~115V	50W/ 450mA /36~110V	50W/ 475mA /36~105V	50W/ 500mA /36~100V	
	50W/ 525mA /36~95V	50W/ 550mA /36~90V	50W/ 575mA /36~86V	50W/ 600mA /36~83V	
HED1080H	67W/900mA /16~75V	71W/ 950mA /16~75V	75W/ 1000mA /16~75V	78W/ 1050mA /16~74V	
	79W/ 1100mA /16~72V	80W/ 1150mA /16~70V	80W/ 1200mA /16~66V	80W/ 1250mA /16~64V	
	80W/ 1300mA /16~61V	80W/ 1350mA /16~59V	80W/ 1400mA /16~57V	80W/ 1450mA /16~55V	
	80W/1500mA /16~53V	80W/ 1550mA /16~51V	80W/ 1600mA /16~50V	80W/ 1650mA /16~48V	

## Dimensions and Terminals

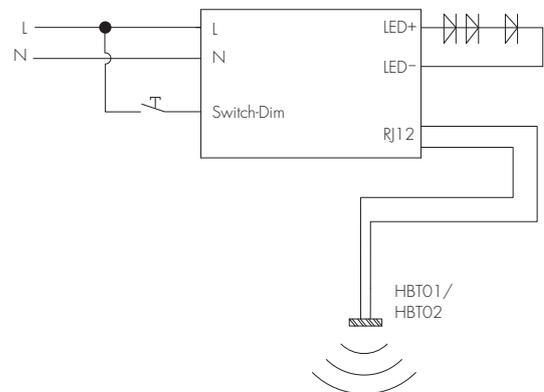


### Wire Preparation



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

### Transceiver Node Connections (with optional Switch-Dim)



## Hardware Features

### 1 Manual Override (Hex-Drive 'Switch-Dim' terminal)

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It's well known that LED lights have a totally different spectrum to natural light. Hytronik uses this principle with a custom-designed photocell and sophisticated software algorithm to measure and differentiate natural light from LED light, so that this photocell can ignore the LED light and only respond to the natural light.

### 3 Hardware Reset Button

The HBT01 and HBT02 feature a hardware reset button which will Erase the device from any mesh network it may have been added to. The sensor and Photocell Advance™ settings will be re-set to the factory defaults as in the table below:

Tri Level Default Settings					HF Sensor and Photocell			Daylight Harvest				CCT			Global
Hold Time	Hold Time Level	Stand-by Time	Stand-by Level	Fade Time	Sensitivity (HBT01 only)	Sensor Link	Photocell Advance™	Start Output Brightness	End Output Brightness	Start Natural Light	End Natural Light	CCT	CCT Max	CCT min	Min Brightness Level
5S	100%	0S	10%	0.7S	100%	Enabled	Disabled	100%	10%	30 Lux	300 Lux	2000K	8000K	2000K	10%

Note: Dimming mode refers to either tri-level control or daylight harvest control, daylight harvest is disabled as default.

To perform the reset:

\* The HBT01/HBT02 must be connected and powered up.

\* Press and hold the reset button until the lamp flashes twice to confirm the reset is complete (It will take around 2- 5 Seconds).

A HBT01/HBT02 may also be removed from a Network via the App via the devices menu and it is recommended that points be removed using the App. Please refer to the App user manual for further details.

This feature is provided in the case that the network has accidentally been deleted from within the App, or the device is otherwise undiscoverable in a device search.