Human Centric Lighting System with Wireless Communication - HBHC25 / HBIR29

Part 1: Master Sensor HBHC25 & Slave Sensor HBIR29

1. Technical Specifications

Master Sensor HBHC25

Input Characteristics	
Operating voltage	220~240VAC 50/60Hz
Stand-by power	<1W

Output Characteristics	
DALI Channel 1	50mA, Max. 25 LED drivers
DALI Channel 2	30mA, Max. 15 LED drivers

Suitable for DALI DT8 LED drivers

Safety and EMC	
EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669, AS/NZS60669
RED	EN300328, EN301489
Certification	Semko, CB, CE , EMC, RED, RCM

PIR Sensor Data	
Warm-up Period	20s
Detection range	$(\emptyset$ x H) 10m x 3m
Detection angle	360°
Mounting height	5m (maximum)

Environment	
Operation temperature	Ta: -20°C ~ +50°C
IP rating	IP20

Bluetooth Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	Max.7 dBm
Range (Typical) *	15~30m

CE [emc] RED (S) (⚠) **CB** IP20

Slave Sensor HBIR29

Bluetooth Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	7 dBm
Range (Typical indoor)	15~30m
Protocol	ⓑ Bluetooth® 4 Wireless Mesh

Sensor Data	
Sensor principle	PIR detection
Detection range (Max.)	(Ø x H) 10m x 3m
Detection angle	360°
Mounting height	5m (maximum)

Environment	
Operation temperature	Ta: -10°C ~ +50°C
IP rating	IP20

Input Characteristics	
Operating voltage	220~240VAC 50/60Hz
	<1W
Switched power	Max. 40 devices, 80mA
Warming-up	20s

| Safety and EMC	
EMC standard (EMC)	EN55015, EN61000, EN61547
Safety standard (LVD)	EN60669-1, EN60669-2-1
RED	EN300328, EN301489
Certification	Semko, CB, CE , EMC, LVD, RCM

Please refer to placement guidance provided later in this document .
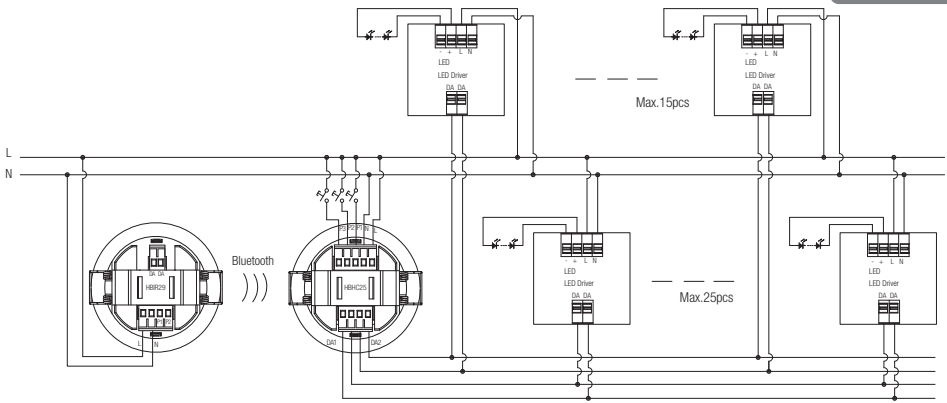
2. Dimensions (mm)
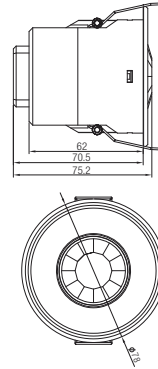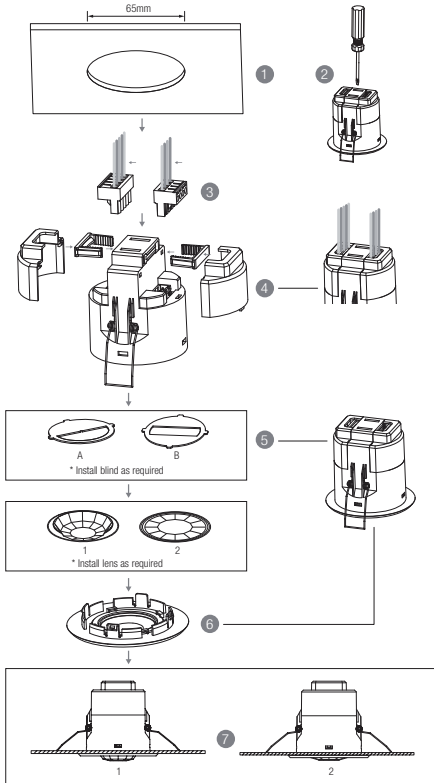
1. Ceiling (drill hole 65mm)
2. Carefully prise off the cable clamps.
3. Make connections to the pluggable terminal blocks.
4. Insert plug connectors and secure using the provided cable clamps, then clip terminal covers to the base.
5. Fit detection blind (if required) and desired lens.
6. Clip fascia to body.
7. Bend back springs and insert into ceiling.

3. Wire Preparation

0.75 - 2.5mm

8mm

(min 6mm, max 11mm)
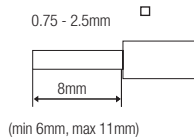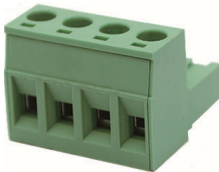
Pluggable screw terminal. It is recommended to make connections to the terminal before fitting to the sensor.

HYTRONIK®

L
N

Bluetooth

LED
LED Driver
DA DA

Max.15pcs

LED
LED Driver
DA DA

HBIR25

HBHC25

LED
LED Driver
DA DA

Max.25pcs

LED
LED Driver
DA DA

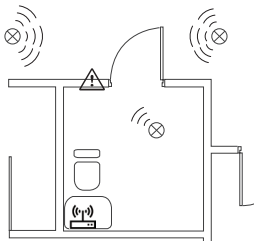Note: DALI output & terminal P1 / P2 of HBIR29 are disabled in HCL system.

4. Installation and Placement Notes

To maximise the bluetooth transmission range in every direction, the following considerations should be taken into account when situating the control base in the luminaire:
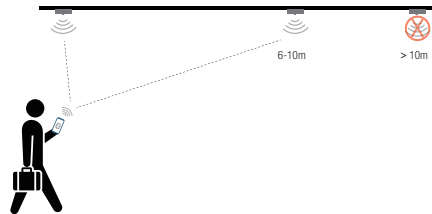
Device to Device Placement

Smart Phone to Device Range
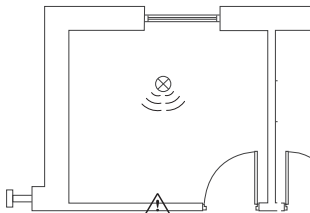
Concrete walls metals, and other building materials will reduce the range

6-10m   > 10m

Notes:

The range for which a smart phone can communicate with the lighting points will vary from model to model and is dependant on its Bluetooth® apability.

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

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.

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

5. Functions

1 Circadian Rhythm Lighting

Controlled light output brightness colour appearance can enhance a user's day-to-day mood, wellbeing, productivity and attention levels. The user can select and customize the biodynamic lighting curve with pre-programmed colour (CCT) and brightness (LUX) control which automatically changes according to the time of the day.

Time sustainability: Each Hytronik circadian rhythm sensor or touch panel can keep the time runing for up to 2 weeks (sensor) or 1month (panel) during power failure.

2 Daylight Harvest and Lux Off Function

The built-in photocell performs the function of reading the natural daylight, and maintaining the lux level by calculating how much artificial light is needed according to the target lux level required by the profile preset.

3 Bluetooth® Transceiver Nodes

Communication between the master sensor HBHC25, extender sensor HBIR29 and wall panel HBP01is performed wirelessly. This not only reduces system wiring complexity and costs, it is also beneficial in that the DALI power supply resources can be dedicated to the DALI DT8 LED drivers, such Hytronik HHC2045 and HHC2050L. Commissioning and programming of the system is via the Hytronik APP using a Bluetooth® enabled smart device using Android or iOS operating systems.Please refer to our App user guide for more details.

4 Dual DALI Output Control

Two channels of self-powered DALI output are available on HBHC25 for connection of two groups of LED drivers. Each group can be set to support different circadian rhythm profiles on the App. Please note that both channels share the same control settings sent from the occupancy sensor and photocell.

System Capacity	DALI channel	DT8 Driver = 2mA
HBHC25 includes 2 channels total 80mA max. DALI PSU	DALI PSU Channel 1 (max 50mA)	25
	DALI PSU Channel 2 (max 30mA)	15

5 Manual Override (Push Function)

Three push terminals (P1, P2, P3) are available on the HBHC25 master sensor for end-users to switch on/off or change the light brightness and colour temperature of the two DALI channels temporarily. The settings will revert to the automatic timing profile (circadian rhythm mode) after sensor time-out.

* Long push on P1: adjust the hold-time light brightness of DALI channel 1;
  Short push (<1s) on P1: on/off function
* Long push on P2: adjust the hold-time light brightness of DALI channel 2;
  Short push (<1s) on P2: on/off function
* Long push on P3: cycles through colour tuning on both channels.
 Short push (<1s) on P3: resume automatic circadiam rhythm mode.

*Note:

The push inputs are fixed by hardware

and are not configurable in the app.

Part 2: . Hytronik Tunable White LED Drivers for Human Centric Lighting System

HHC2045 and HHC2050L are specially designed to work with the Hytronik Human Centric sensors. Dual channel tunable white LED driver for accurate white balance and intensity control.

LED Current Selection (HHC2045)

1200mA
1050mA
900mA
700mA
500mA
350mA
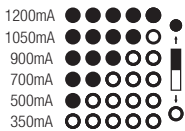
⚠ Warning: Please make sure the correct current is selected before starting the driver!

LED Current (HHC2050L)

Single current 1.05A

Loading and In-rush Current

HHC2045 & HHC2050L

Inrush Current (Imax.)	53A
Pulse Time	36 µs

Number of Drivers

16A Circuit Breaker HHC2045 & HHC2050L

Type B	37

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Conversion table for max. quantites of drivers on other types of Miniature Circuit Breaker

MCB Type	Rating	Relative number of drivers
B	16A	100% (see table above)
B	10A	63%
B	13A	81%
B	20A	125%
B	25A	156%

| MCB Type	Rating	Relative number of drivers
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%

* Environmental factors (such as temperature) will also influence the maximum number of the drivers. Please refer to the MCB manufactures datasheet for loading and derating factors.

Load distribution

Each channel can supply the maximum load and white balance can be controlled as such:

	Colour Temperature	Cool White	Neutral White	Warm White
HHC2045	Power Distribution	CH1=45W, CH2=0W	CH1=22.5W, CH2=22.5W	CH1=0W, CH2=45W
HHC2050L	Power Distribution	CH1=50W, CH2=0W	CH1=25W, CH2=25W	CH1=0W, CH2=50W

Wire Preparation

0.75-1.5

8mm
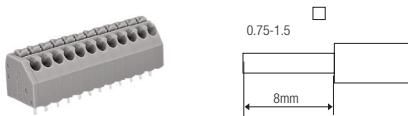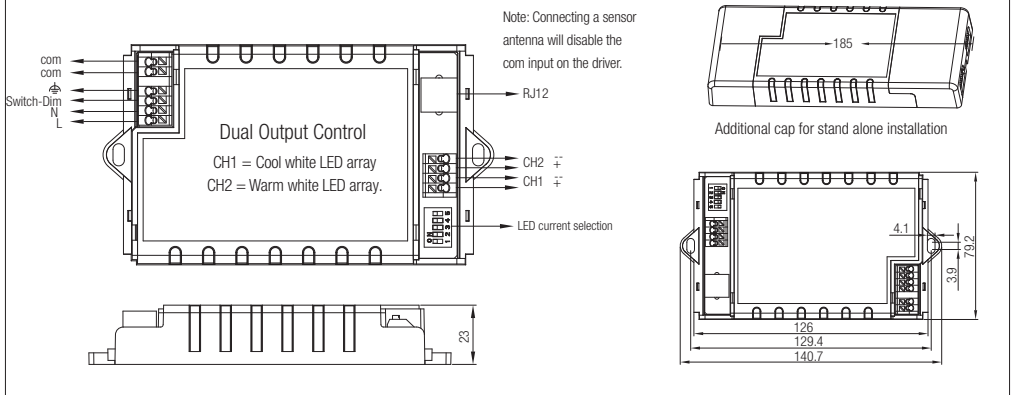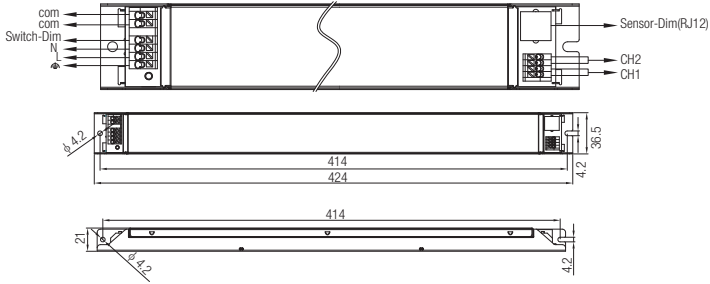
Solid or Stranded wire type 0.75 - 1.5mm².
To make or release the wire from the terminal, use a screwdriver to push down the button.

Dimensions and Terminals

HHC2045

com
com
Switch-Dim
N
L

Note: Connecting a sensor antenna will disable the com input on the driver.

RJ12

Dual Output Control
CH1 = Cool white LED array
CH2 = Warm white LED array.

CH2
CH1

LED current selection

185

Additional cap for stand alone installation

4.1
79.2
3.9
23
126
129.4
140.7

HHC2050L

com
com
Switch-Dim
N
L

Sensor-Dim(RJ12)

CH2
CH1

414
424
36.5
4.2

414

21
4.2
Ø 4.2

Note: Connecting a sensor antenna will disable the com input on the driver.

Dual Output Control
CH1 = Cool white LED array
CH2 = Warm white LED array.

Technical Data

Input	Mains Voltage	220~240VAC 50/60Hz		
	Mains Current	0.22~0.2A(HHC2045); 0.3-0.25A(HHC2050L)		
	Power Factor	0.95		
	Max. Efficiency	85%		
	Dielectric Strength	Input→Output : 3000VAC		
	Leakage Current	< 0.25mA		
Output	Power/Current/ Voltage Range (HHC2045)	20W/350mA/10~56V 45W/900mA/10~50V	28W/500mA/10~56V 42W/1050mA/10~40V	40W/700mA/10~56V 40W/1200mA/10~34V
	Power/Current/ Voltage	50W/1.05A/12-48V (HHC2050L)		
	Output power handling	Channel 1 (CH1) + Channel 2 (CH2) = 45W (HHC2045) / 50W (HHC2050L) max.		
	Output channel function	CH1 = Cool white CH2 = Warm White		
	Ripple Current	<3%		
	Uout Max.	75V(HHC2045); 70V(HHC2050L)		
	Turn-on Time	< 0.5s		
Environment	Operation Temp.	Ta: -20~+50℃		
	Case Temp. (Max.)	80℃		
	IP Rating	IP20		
Safety and EMC	EMC standard	EN55015, EN61547, EN61000-3-2, EN61000-3-3		
	RED standard	EN300328, EN301489-1, EN301489-17		
	Safety standard	EN61347-1,EN62493,EN61347-2-13		
	Certifications	CB, CE , EMC, RCM		

With the bluetooth module built in, the touch panel can be grouped with the master sensor HBHC25 and slave sensor HBIR29.

The end-user can:

1. Turn off/on the lights for a certain time
2. Select the circadiam rhythm profiles (office/classroom or healthcare)
3. Temporarily dim up or down the light brightness
4. Temporarily adjust the colour temperature of the lights
5. Select suitable scene programmed on the App for different applications

Please note that these over-ride functions are available under occupancy conditions. When the sensor times out, the automatic circadian rhythm profile will be resumed. 4 Scenes may be set up for 1-touch recall of comfort or activity settings.
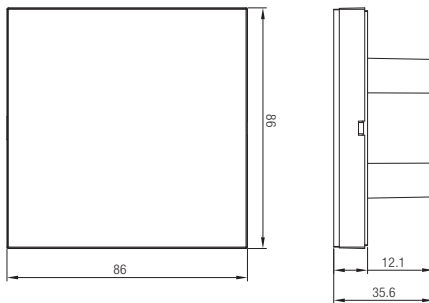
Technical Data

Bluetooth Transceiver	
Operation frequency	2.4 GHz - 2.483 GHz
Transmission power	7 dBm
Range (Typical indoor)	15~30m
Protocol	Bluetooth® 4 Wireless Mesh

Input Characteristics	
Operating voltage	220~240VAC 50/60Hz
Stand-by power	<1W
With night light	0.35W

Environment	
Operation temperature	Ta: 0OC ~ +50OC
Relative humidity	20% ~ 90%
IP rating	IP20

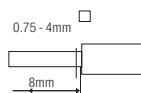| Safety and EMC	
EMC standard (EMC)	EN55015, EN61000, EN61547
Safety standard (LVD)	EN60669, AS/NZS60669
Certification	Semko, CB, CE , EMC, RED, RCM

Dimensions and Terminals

86

86

12.1

35.6

Wiring Diagram

N

L

L N

HBP01

Wire Preparation

Rising clamp terminal.

0.75 - 4mm

8mm

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