

HER1045 + SAM5/DH or HIRO5/FM with HRC-09



**Typical Applications**

1. Circadian rhythm lighting, two modes for selection with settable time zone and automatic seasonal adjustment.
2. Daylight harvest with user over-ride for colour and brightness control.
3. On-demand mood lighting with pre-set scenes for office applications.

Suitable for LED panels - insulated terminal cover with cord restraint:

- Office / Commercial Lighting
- Health Care
- Classrooms

Use for retrofit upgrades & new luminaire designs.

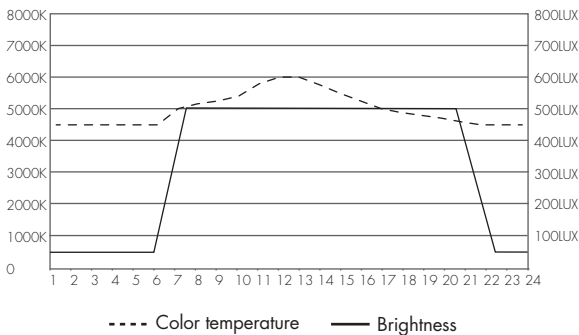
Note: Recommended colour temperature for light fixture: 2700K ~ 6500K

**Features**

- Tunable White
  - Daylight Harvest / Circadian Rhythm
  - Active PFC
  - <math><0.5W</math>
  - Switch-Dim
  - Configurable Constant Current (CC) Output via Dip-Switch
  - Intelligent Thermal Management
  - Thermal Cut-out Protection
  - Short Circuit Protection
  - Over-load Protection
  - 5 Year, 50,000hr Warranty
- } All with Auto-restart

**Circadian Rhythm Principle**

\* Default profile for office mode



**The system comprises of 3 components:**

1. HER1045: 2-Channel 45W fully featured LED driver



2. SAM5/DH or HIRO5/FM: Flush mounting microwave or PIR occupancy sensor, remote control receiver and photocell for daylight harvest integrated into the single unit.

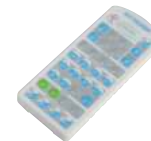


SAM5/DH (HF)

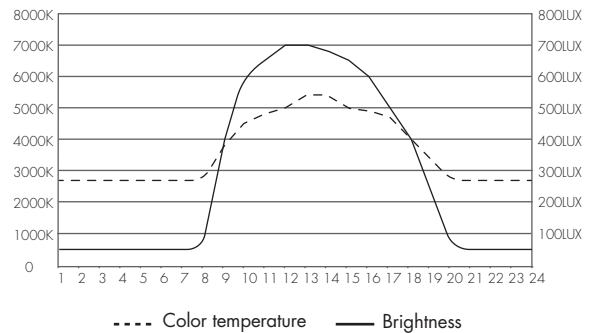
HIRO5/FM (PIR)

3. HRC-09: Remote control handset for both commissioning and user control

△ 2xAAA batteries are required to power the remote control.



\* Default profile for health care mode (8 profiles are available for selection)



## Technical Data

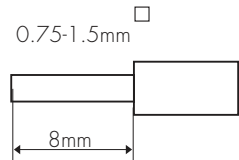
Input	Mains Voltage	220~240VAC 50/60Hz	
	Mains Current	0.22~0.2A	
	Power Factor	0.95	
	Max. Efficiency	85%	
	Dielectric Strength	Input→Output : 3000VAC	
	Leakage Current	< 0.25mA	
Output	Power/Current/ Voltage Range	20W/350mA/10~56V	45W/900mA/10~50V
		28W/500mA/10~56V	42W/1050mA/10~40V
		40W/700mA/10~56V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

## Output Configuration

1200mA	● ● ● ● ● ● ● ●
1050mA	● ● ● ● ● ● ● ● ○ ●
900mA	● ● ● ● ● ● ○ ○
700mA	● ● ● ● ○ ○ ○ ○
500mA	● ● ○ ○ ○ ○ ○ ○
350mA	○ ○ ○ ○ ○ ○ ○ ○

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

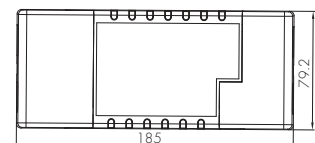
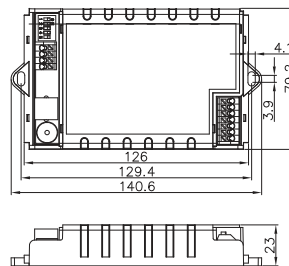
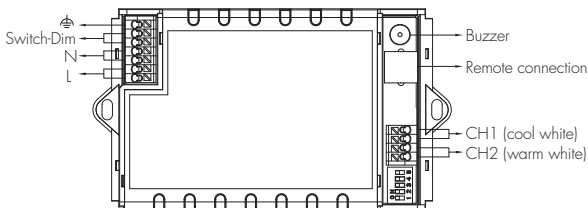
## Wire Preparation



Solid or Stranded wire type 0.75 - 1.5mm<sup>2</sup>.

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

## Dimensions and Terminals



\* Clever case design for optimal built-in size or insulated terminals for mounting externally to the fixture.

## Loading and In-rush Current

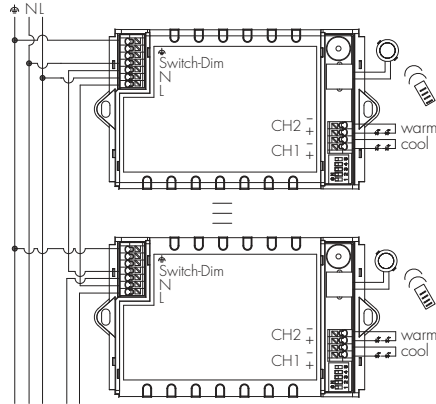
In-rush Current (I <sub>max.</sub> )	7.2A
Pulse Time	100 μs

## Number of Drivers Based upon 16A Circuit Breaker

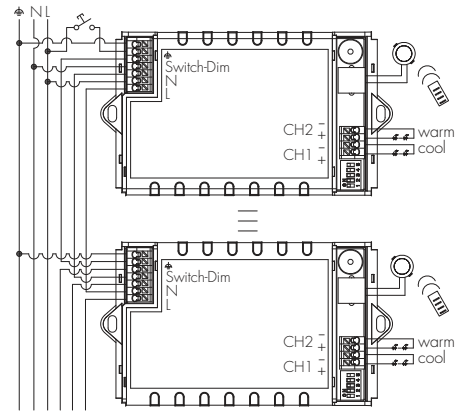
Type B	30
Type C	50

## Wiring Diagrams

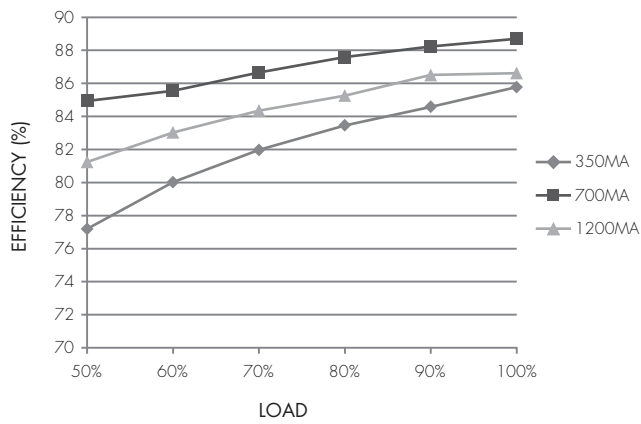
Automatic color tuning and brightness adjustment



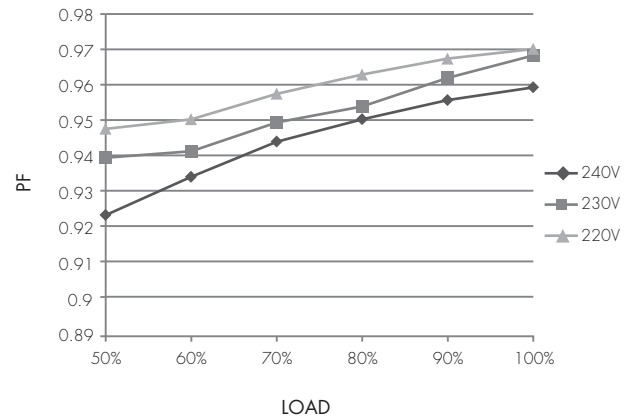
Switch-Dim terminal for manually adjust color temperature and dimming level



## Performance Characteristics



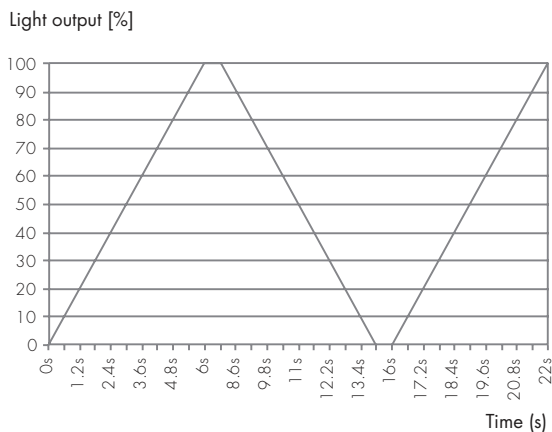
\* Typical Efficiency vs Load



\* Typical Power Factor vs Load

## Dimming Characteristics

Switch-Dim Dimming Curve



## Functions for HER1045

### 1. Manual Control via Push-DIM

#### \* Colour Tuning

Switch Action  
 Step 1: Short press (3 times within 2 seconds)  
 Step 2: Short press (>1 second)

Response  
 Light starts tuning  
 Set the desired colour

#### \* On/off control and brightness adjustment

Switch Action  
 Short press (<1 second)  
 Long press (>1 second)

Response  
 Toggle light on / off  
 Toggle dim light / increase brightness

#### \* Synchronization

Switch Action  
 Long press (>1.5 second)

Response  
 All lights will dim down to minimum then return to 50% brightness and neutral colour.

### 2. Dual Output Control

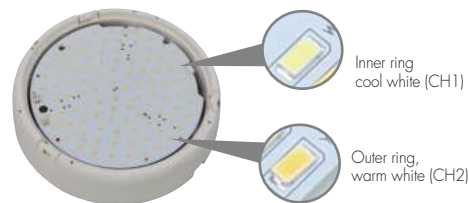
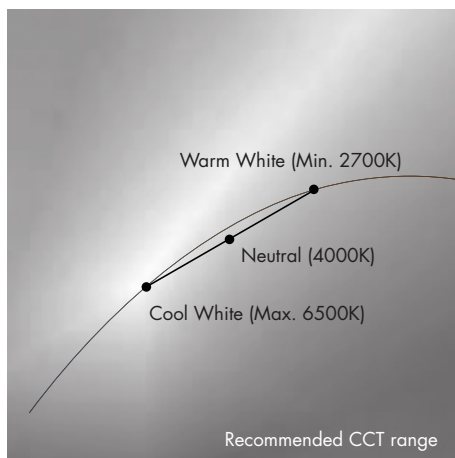
Connection to the LED PCB is made for CH1 and CH2 output connections

CH1 = Cool white LED array  
 CH2 = Warm white LED array

Each channel can supply up to 45W and white balance can be controlled as such:

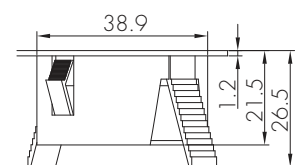
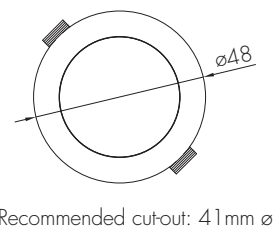
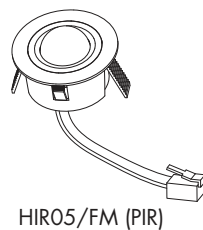
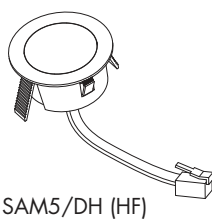
Colour Temperature	Cool White	Neutral White	Warm White
Power Distribution	CH1=45W, CH2=0W	CH1=22.5W, CH2=22.5W	CH1=0W, CH2=45W

#### Linear Colour Tuning Profile



## Functions for SAM5/DH and HIR05/FM



### Dimensions



1. On-off function:

The microwave/PIR sensor will turn off the light in any unoccupied spaces after hold time, and automatically on when the space becomes occupied. No matter it is during daylight harvest or circadian rhythm mode, the algorithm is auto-resumed.

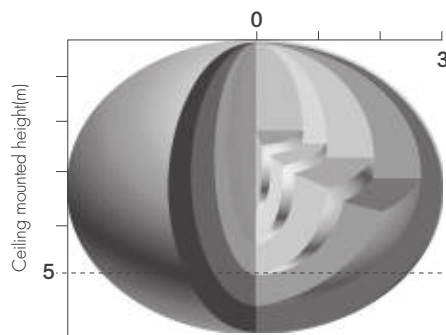
2. Daylight harvest:

Under "office" and "health care" circadian rhythm mode, the sensor measures the available surrounding natural light, and calculates how much electrical light is needed to reach the total lux expected. The target lux level can be adjusted by pressing the brightness  and  buttons on remote control HRC-09.

3. Lux off function (bright out):

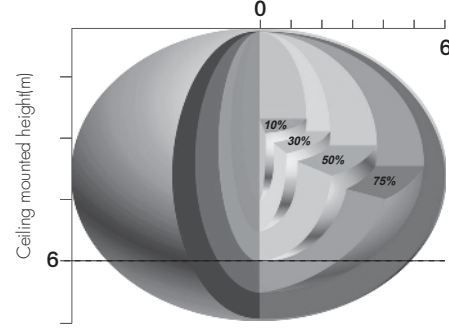
During daylight harvest and circadian rhythm mode, the built-in photocell can measure ambient natural light and switch off the fixture automatically whenever artificial light is not required, even there is motion detected.

PIR Occupancy Detection Pattern (HIRO5/FM)



PIR Sensor Data	
Sensor principle	PIR Detection
Detection range	Max. (Ø x H) 6m x 5m
Detection angle	360°

HF Occupancy Detection Pattern (SAM5/DH)



HF Sensor Data	
Operation frequency	5.8GHz +/- 75MHz
Transmission power	<0.2mW
Detection range	Max. (Ø x H) 12m x 6m
Detection angle	30° ~ 150°

**Settings (Remote Control HRC-09)**

**Circadian Rhythm Set-up**

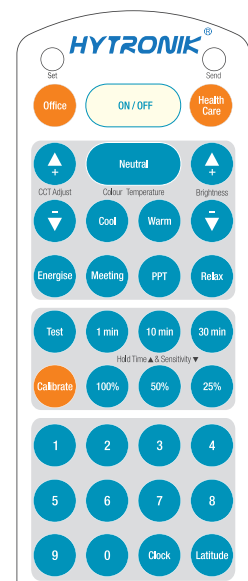
1. Time and Date

Circadian rhythm mode requires the remote control HRC-09 to first be programmed with the time and date. This can be done by following the procedure below:

Press and hold the "Clock" button until the "Set" LED in the top left corner starts to flash (approximately 2 seconds) to indicate clock setting mode. The settings should be made in the strict following order:

- Enter the 4 figure year using the numbers 0-9: YYYY (e.g. 2016)
- Enter the 2 figure month: MM (e.g. 09 for September)
- Enter the 2 figure date: DD (e.g. 06 for the 6th)
- Enter the 2 figure hour in 24 hour time format : HH (e.g. 08 for 8 am)
- Enter the 2 figures for minutes: mm (e.g. 05)

After the 12 digits have been entered in the correct sequence, press "Clock" button to store the settings. The "send" LED at the top right of the remote will flash 5 times to indicate a valid entry. If the entry was not valid (the 5 send LED flashes were not seen) the procedure will need to be repeated. If a programming mistake is made anytime during the sequence, press "Clock" once to cancel the programming mode and re-start from the beginning of the procedure.



## 2. Latitude adjustment (Health care mode only)

To allow regional variations and automatic seasonal adjustment, the latitude of the installation may be set. The default setting is Latitude 01 (0° Equator).

Press and hold the "Latitude" button until the "Set" LED in the top left corner starts to flash (approximately 2 seconds) to indicate city setting mode. Enter the 2 figure number as per the table below:

No.	Latitude	Summer Time	Winter Time
01	0° Equator	06:00 ~ 18:00 (12 Hours)	06:30 ~ 18:00 (11.5 Hours)
02	15° North	06:00 ~ 18:30 (12.5 Hours)	08:00 ~ 18:30 (10.5 Hours)
03	30° North	06:30 ~ 19:30 (13 Hours)	08:00 ~ 18:00 (10 Hours)
04	45° North	06:00 ~ 19:30 (13.5 Hours)	08:00 ~ 17:30 (9.5 Hours)
05	60° North	05:30 ~ 19:30 (14 Hours)	08:00 ~ 17:00 (9 Hours)
06	15° South	07:00 ~ 19:30 (12.5 Hours)	08:00 ~ 18:30 (10.5 Hours)
07	30° South	06:30 ~ 19:30 (13 Hours)	08:00 ~ 18:00 (10 Hours)
08	45° South	06:00 ~ 19:30 (13.5 Hours)	08:00 ~ 17:30 (9.5 Hours)

Press "Latitude" button to store the setting. The "send" LED at the top right of the remote will flash 5 times to indicate a valid entry. If the entry was not valid (the 5 send LED flashes were not seen) the procedure will need to be repeated.

The remote is now programmed and should be handed to the responsible person of the installation when commissioning is completed.

## Circadian Rhythm LED Driver (HER1045) Calibration

Each HER1045 on the installation now needs to upload the time and date and also latitude settings from the remote control handset HRC-09. This is simply performed by pressing the calibrate "Calibrate" button at each antenna receiver point. The remote control is directional and confirmation of the upload is given by an audible beep.

Note! If the supply to the HER1045 is interrupted, it will need to be re-calibrated via the remote control handset as per the above procedure.

## Sensor Settings (HIRO5/FM or SAM5/DH)

The sensor can be set for hold time (the time period the lights are required to be on after the last person has left the room) and detection range. The time period may be adjusted by selecting any one of the "1min", "10min", "30min" buttons as required.

The detection range may be adjusted by selecting one of the detection ranges setting buttons "100%", "50%", "25%" (SAM5/DH only)

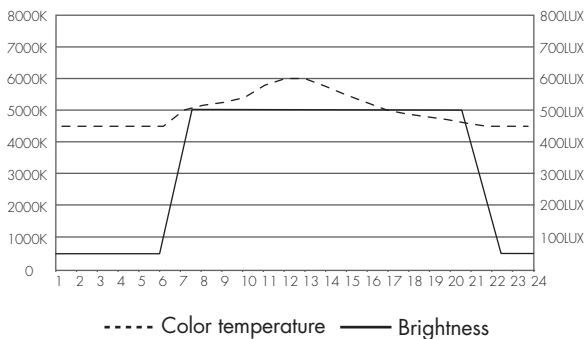
Please note microwave occupancy detectors can 'see' through glass, plastic and plaster board, so attention must be given to the correct settings of the sensitivity to avoid nuisance triggering. To assist commissioning, a 2 second test mode has been provided to avoid unnecessary waiting time. This mode is accessed by pressing the "Test" button.

The lights may be turned off manually at any time by pressing the "ON/OFF" button. Please note the occupancy detector is disabled when the off button is pressed. Pressing the "ON/OFF" button again will resume fully automatic operation with the occupancy sensor enabled.

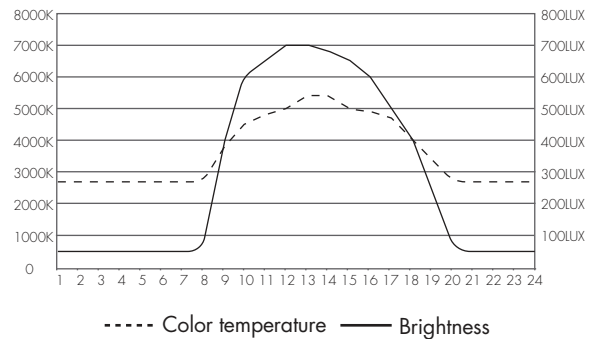
## Office and Health Care Circadian Rhythm Mode

Short press "Office" or "Health Care" button to select office circadian rhythm profile or health care circadian rhythm profile.

\* Default profile for office application



\* Default profile for health care application



## Circadian Rhythm & Manual Adjustments

In circadian rhythm operation, the light brightness and color temperature will automatically change according to the selected office or health care profile. The microwave sensor will turn off the light in any unoccupied spaces, and automatically resume the above algorithm when motion is detected.

Manual adjustment of the profile is possible to suit individual lighting needs. Press and hold the "  brightness  " buttons to change the light brightness, and the "  CCT Adjust  " button to adjust color temperature.

Notes on manual adjustments:

\* If the circadian rhythm curve is changed via manual adjustment, press "  or  " more than 3 seconds to go back to the default settings at any time.

### Scene Selection - Human Centric Lighting (non-circadian rhythm mode)

Each point may take commands from the remote control to suit an individual's lighting needs from any of the one-touch mood lighting pre-sets, in which the light brightness and color temperature is pre-defined. In these scene modes, the circadian rhythm profiles and photocell functions are disabled, however the occupancy sensor remains active.

Manual adjustment of the profile is possible to suit individual lighting needs. Press and hold the "  brightness  " buttons to change the light brightness, and the "  CCT Adjust  " button to adjust color temperature.



Any manual adjustment of light brightness and color temperature of a scene can be stored in the remote controller HRC-09 by a long press (>2s) on the desired scene button.

Note: 1) The circadian rhythm profiles may be resumed at any time by pressing the "  or  " buttons.

2) In office mode, the default profile will be re-instated after a long period of absence (hold time has finished and the lights have automatically turned off).

3) In health care mode, the default profile will be re-instated at 00:00 hours.

End-users can change the color temperature directly by pressing on "Warm", "Cool" and "Neutral".

By pressing both  and  simultaneously for more than 5s, all settings will go back to default.