EBMPIR

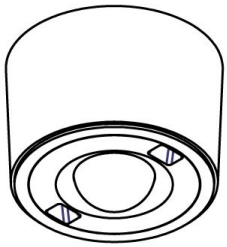
Miniature PIR Presence Detector

Contents

1. Description and Operation

The EBMPIR series of miniature PIR (passive infrared) presence detectors provide automatic control of lighting loads with optional manual control. The miniature size together with multiple mounting options make these products ideally suited for mounting in, or attached to, luminaires to provide local control of individual fittings. Four models are available: basic, premium, direct dim, and analogue dim all of which will switch incandescent, fluorescent and compact fluorescent lighting. The direct dim variant controls DSI or DALI digital dimming ballasts whilst the analogue dim variant controls 1-10V dimming ballasts.

The unit detects movement using a PIR sensor and turns the load on. When an area is no longer occupied the load will switch off after an adjustable time out period. *Note: the basic model has a fixed timeout of 20 minutes.*



Feature	EBMPIR-B Basic	EBMPIR-PRM Premium	EBMPIR-DD Direct Dim	EBMPIR-AD Analogue Dim
5m PIR sensing	✓	✓	✓	✓
3 mounting options	✓	✓	✓	✓
Lux sensor		✓	✓	✓
Absence detection	✓	✓	✓	✓
Presence detection	✓	✓	✓	✓
Infrared remote setting		✓	✓	✓
Infrared user handset		✓	✓	✓
Push button adjustment*		✓	✓	✓
Relay output	✓	✓	✓	✓
Dimming output			✓	✓
Absence switch input		✓	✓	✓
Up/down switch input			✓	✓

*for lux, time and sensitivity

1. Description and Operation cont.

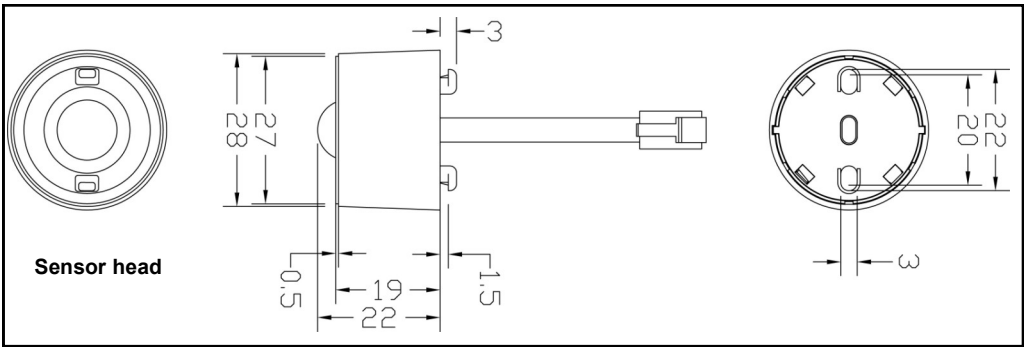
The detector head comes with a pre-wired 300mm lead which plugs into the separate power supply unit.

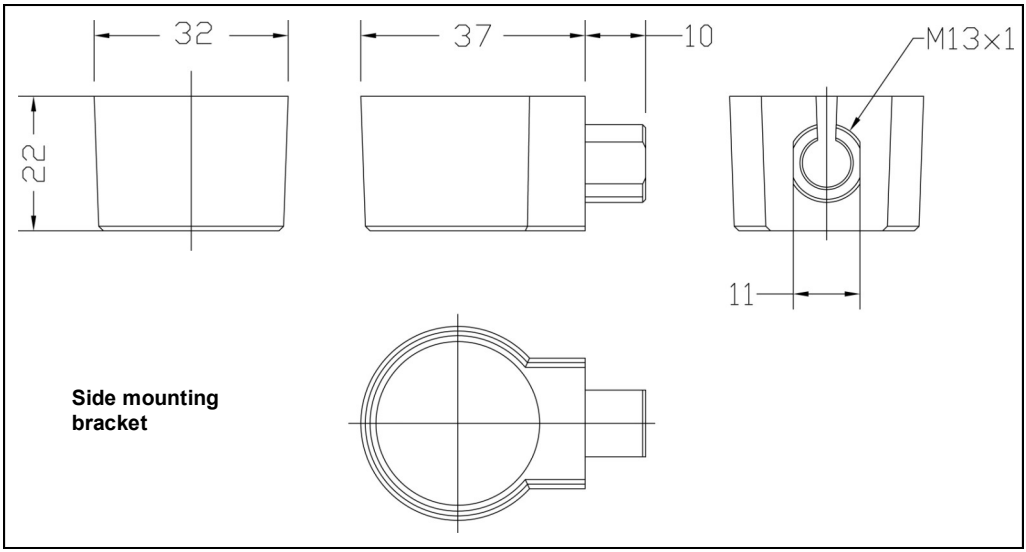
The direct dim and analogue dim variants of the detector have a dimming output that can be used to control the light output of luminaires that are fitted with dimming ballasts. The detector measures the overall light level in the detection area and calculates the correct output for the luminaires, to achieve a preset lux level (maintained illuminance). The output level can be overridden using the switch input (see below) or the user handset.

All products support presence and absence detection. Presence detection: when movement is detected the load will automatically turn on; when the area is no longer occupied the load will automatically switch off after an adjustable time period. Absence detection: the load is manually switched on; when the area is no longer occupied the load will automatically switch off after the adjustable time period has elapsed.

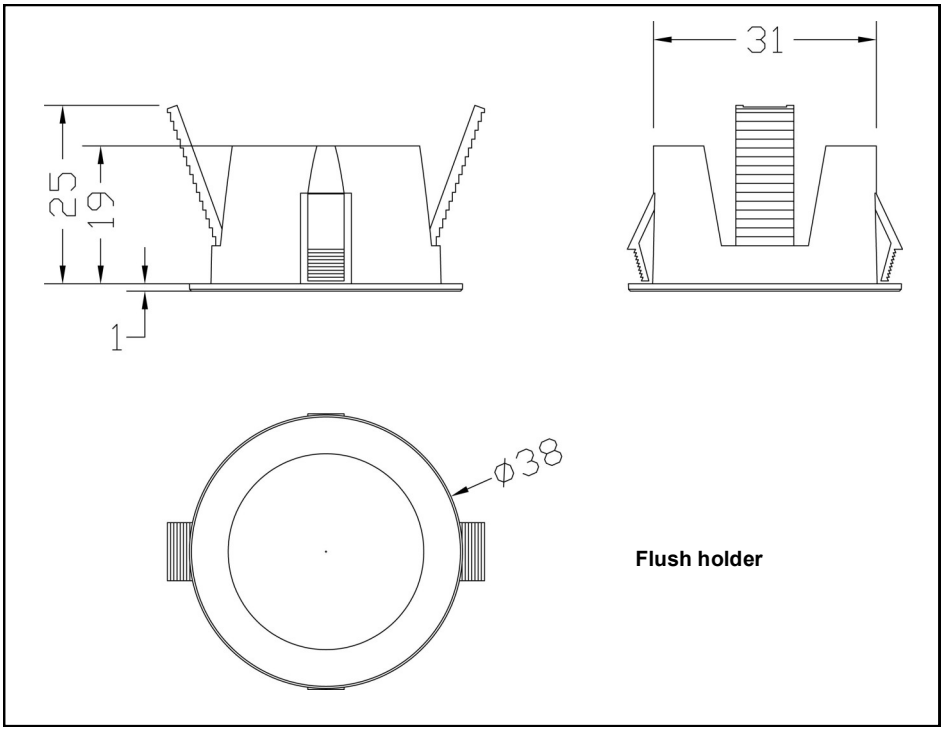
Switch operation:
EBMPIR-B or -PRM single switch: short press turn on, long press turn off.
EBMPIR-DD & EBMPIR-AD single switch: short press turn on, short press turn off, press and hold cycles dimming.
EBMPIR-DD & EBMPIR-AD two way switch: up button short press turns on, press and hold to dims up. Down button short press turns off, press and hold dims down.

2. Dimensions



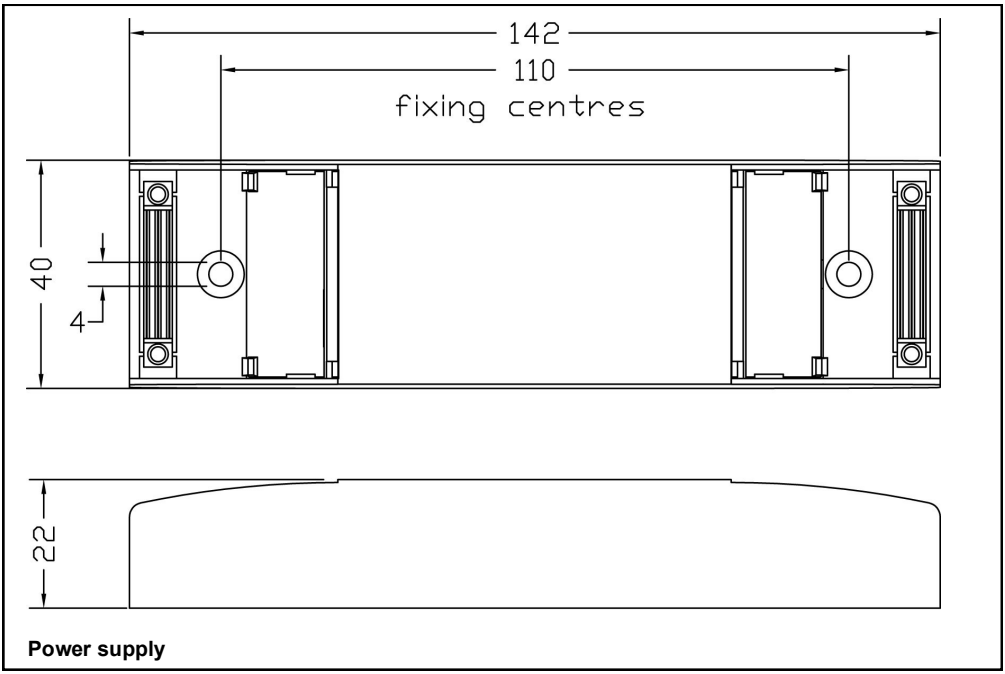


Side mounting bracket



Flush holder

2. Dimensions cont.



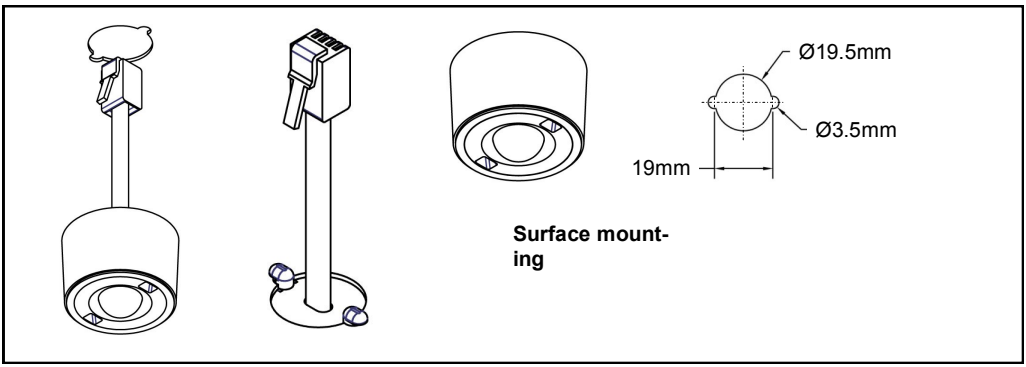
Power supply

3. Fixing

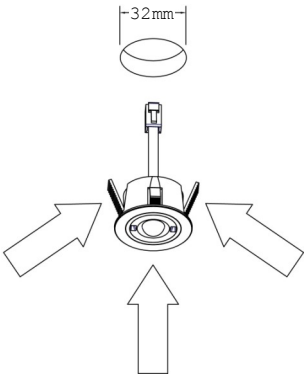
The product is designed to be mounted directly to a luminaire, either on the inside or outside.

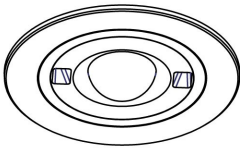
- the PIR lens must have a view outside the luminaire.
- versions with a lux sensor—for optimum operation the lens must shielded as much as possible from the light source.
- If flush mounting in a panel >6mm thick, remove bottom of retention arms with side cutters.

Three mounting options are detailed below:

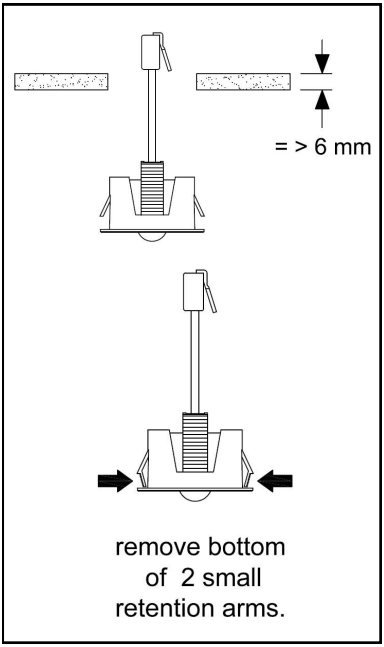


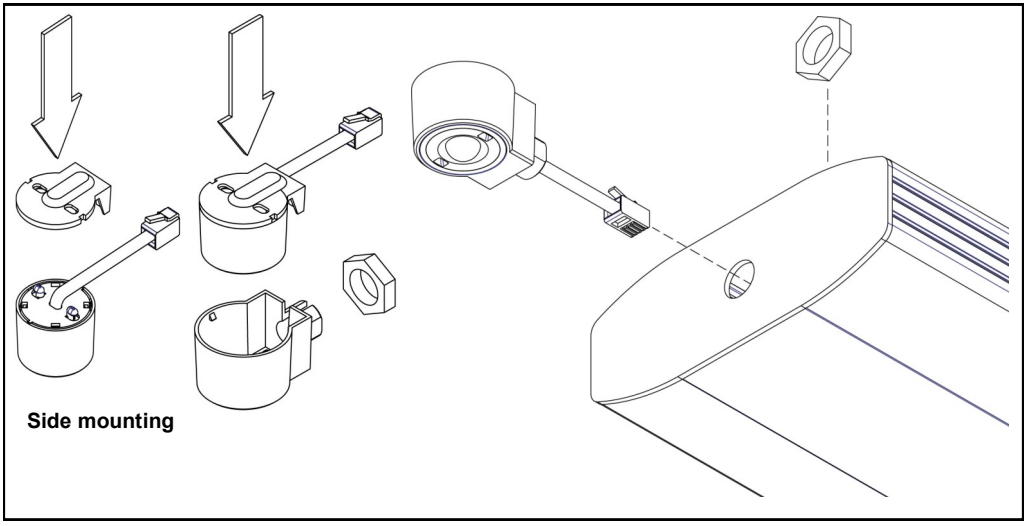
Surface mount-ing





Flush mounting

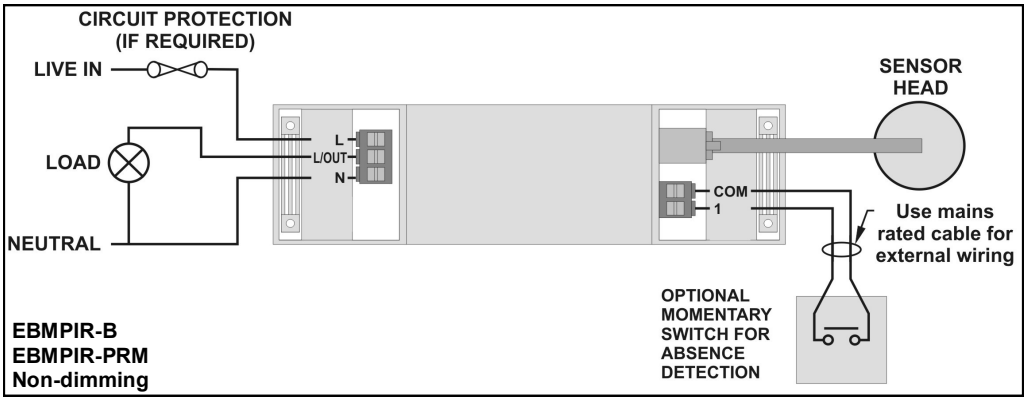


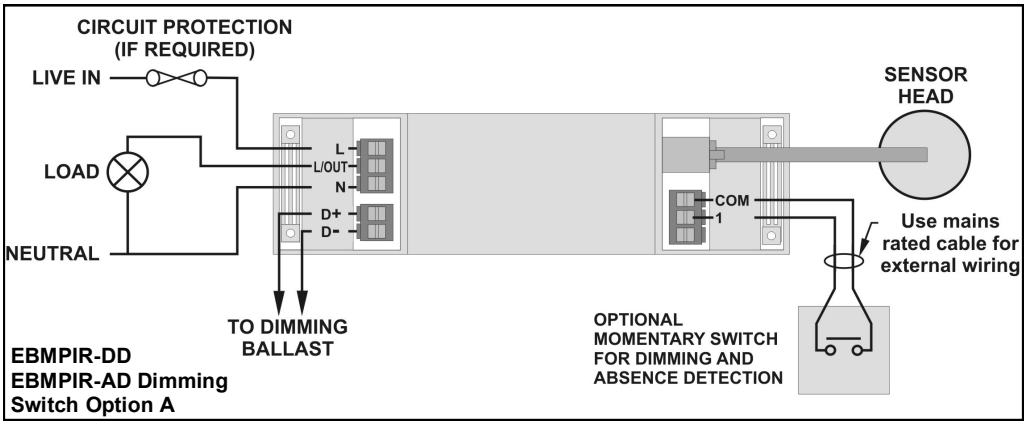


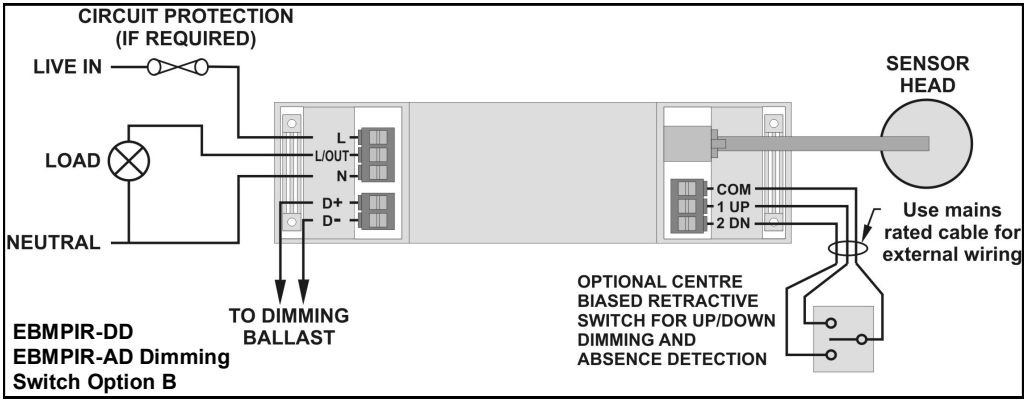
Side mounting

4. Wiring

Wire the products as shown in the diagrams. All switches are optional, however the dimming variants can have two switch configurations. If used with Option A, a single momentary switch can be used for absence detection and dimming up/down—set switch mode *1 position switch together* (see section 6). If used with Option B, a centre biased momentary switch gives the benefit of having separate switches to dim up and down—set switch mode *2 position switch together* in this case.







Positioning

- The detector should be sited so that the occupants of the room fall inside the detection pattern shown in section 7, at a recommended ceiling height of 2.8m. Note that the lower the sensor is installed the smaller the detection range will be, subject to the parameters shown on the diagram.
- Avoid direct sunlight entering the sensor.
- Do not site within 1m of forced air heating or ventilation.
- Do not fix to a vibrating surface.

Settings

Absence or presence mode
EBMPIR-B

- The unit ships with presence detection as default. To change to absence detection, press and release the external switch 5 times within the first minute of power up. The LED will turn on solid for 30 seconds to indicate absence mode has been selected.
- To change back to presence detection, repeat the above procedure—the LED will flash for 30 seconds to indicate presence mode has been selected.

EBMPIR-PRM, EBMPIR-DD & EBMPIR-AD
Use the push button adjustment described overleaf or select using the programming handset (see section 6).

Time
EBMPIR-B—the time period is fixed at 20 minutes.
EBMPIR-PRM, EBMPIR-DD & EBMPIR-AD—set the time period using the push button adjustment overleaf or the programming handset (see section 6). The factory default is 20 minutes.

Lux
EBMPIR-B—feature not available

EBMPIR-PRM—*switch level on* lux setting determines the ambient light level at which the lights turn on. This can be set using the push button adjustment overleaf or the programming handset (see section 6). Setting to maximum ensures that lights always come on (this is also the default setting).

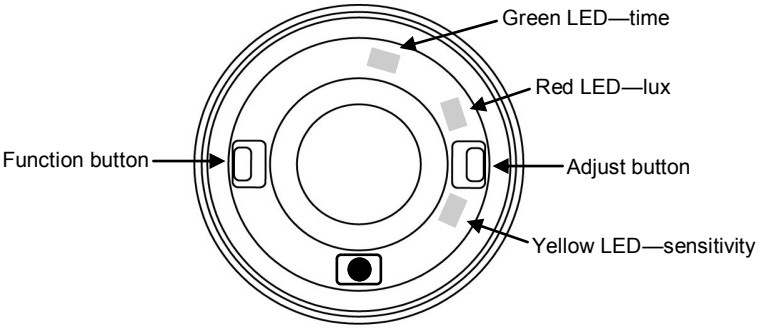
EBMPIR-DD & EBMPIR-AD—*switch level on* described above is available using the programming handset only. The push button lux adjustment determines the dimming output level and can be set using push button the programming handset *light level* and works as follows:

- During operation the output level varies very gradually. However when the level is changed the unit automatically enters setup mode: in this mode the output level varies rapidly. After the setup time the unit reverts to normal.
- When adjusting, allow the output level to settle by changing very gradually.
- To disable the maintained illuminance function completely, set the level to maximum.

User handset
Using the UHS or UHS3 infra-red handset: the override on button turns the unit on permanently; the override off button turns the unit off permanently; the cancel button cancels the overrides. When an override is selected an LED will flash inside the unit. The UHS handset can also be used to set the lux levels (see section 6).

Programming handset
A host of other functions and settings are available using the programming handset—see section 6. Not available on EBMPIR-B.

5. Setup cont.



Push button adjustment

Time, Lux and Sensitivity

- Press and hold either button for at least 5 seconds then release: one of the LED's positioned behind the lens will flash to show which function has been selected.
- The LED will flash a number of times (between 1 and 7) to indicate the current setting (minimum = 1 flash, maximum = 7 flashes).
- To change between Time (green), Lux (red) and Sensitivity (yellow) press and release the function button until the required LED shows.
- When the function has been selected press the adjustment button to increase the setting by 1 step. Pressing the button after reaching 7 flashes will return the setting to 1 flash.
- Time settings are as follows: 1 flash = 1 minute; 2 flashes = 5 min.; 3 flashes = 10 min.; 4 flashes = 15 min.; 5 flashes = 20 min.; 6 flashes = 25 min.; 7 flashes = 30 min.
- Lux settings
  EBMPIR-PRM—1 flash turns on when very dark ; 7 flashes turns on regardless of ambient light.
  EBMPIR-DD & EBMPIR-AD—1 flash gives dim output level; 7 flashes gives maximum illuminance.
- Sensitivity: 1 flash minimum; 7 flashes maximum.
- After finishing adjustment, the LED will show the new setting 5 times and then return to operational mode.

Default settings

- Pressing and hold both buttons together: after 3 seconds the green LED lights. Release immediately to restore the factory settings.

Absence/Presence mode

- To check the mode press and hold both buttons together: after 3 seconds the green LED lights—leave the buttons pressed. After a further 3 seconds the following LEDs will light:
  Green/Yellow = Presence Detection mode
  Green/Red = Absence detection mode
- To accept the current mode release the buttons immediately.
- To change the mode keep the buttons pressed for another 5 seconds until the LEDs change, then release.

All the following functions can be programmed using the remote control DD-LCDHS handset:

1. Detector Parameters (factory default in brackets):

1.1 Time adjustment (20 min)	10 seconds to 99 minutes time delay (select 0 for 10 second delay – use for commissioning only).
1.2 Sensitivity On (8)	Sensitivity level when the detector is already operational adjustable between 1 (min.) and 9 (max.)
1.3 Sensitivity Off (8)	Sensitivity level for switching the detector on – adjustable between 1 (min.) and 9 (max.).
1.4 Power Up On (Y)	Select No for a 30 second delay on start up. If Yes is selected, there will be no delay on start up and the detector will always power up detecting.
1.5 Walk Test (N)	An LED behind the detector lens will flash to show movement has been detected (use for commissioning).
1.6 Disable Detector (N)	Disables detection, leaving the relay output permanently off with the dimming output operational. This mode is used when the unit is for maintained illuminance only.
1.7 Factory Default	Restores factory default settings.

2. Modes (factory default in brackets):

2.1 Channel Modes

2.1.1 Switch only	N/A
2.1.2 Switch and dim together (default)	The detector will switch and dim the lighting together.
2.1.3 Switch and dim separate	N/A

2.2 Switch Modes

2.2.1 2 position switch together (default EBMPIR-DD, -AD)	A single centre biased retractive switch will be used to control both channels together.
2.2.2 2 position switch separate	A single centre biased retractive switch will be used to control only the dimming channel.
2.2.1 3 position switch together (default EBMPIR-PRM)	A single position retractive switch controls both channels together.
2.2.4 1 position switch separate	N/A

3. Switching Channel 1 functions (factory default in brackets):

(EBMPIR-DD & EBMPIR-AD—this channel controls the relay output, whereas Channel 2 controls the dimmed output. The parameters below should be programmed as well as the corresponding parameter on Channel 2)

3.1 Presence detection	Auto switch on with detection, auto off after movement cease and time delay ends.
3.2 Absence detection	Manual switch on, auto off after movement ceases and time delay ends.
3.3 Switch level on (9)	Lux level setting to prevent the luminaires being switched on if the ambient light level is sufficient (adjustable between 1 and 9). The luminaires will always be switched on at level 9. For a higher resolution of 'switch level on' a scale of 101-199 is available in the 'Special menu'.
3.4 Switch level off (9)	Lux level setting to switch the luminaires off during occupancy if the ambient light level goes above the setting (adjustable between 1 and 9). Level 9 will always keep the lights on. This setting can be used for "window row switching". For a higher resolution of 'switch level off' a scale of 101-199 is available in the 'Special menu'.

4 Dimming Channel 2 functions EBMPIR-DD & -AD only (factory default in brackets):

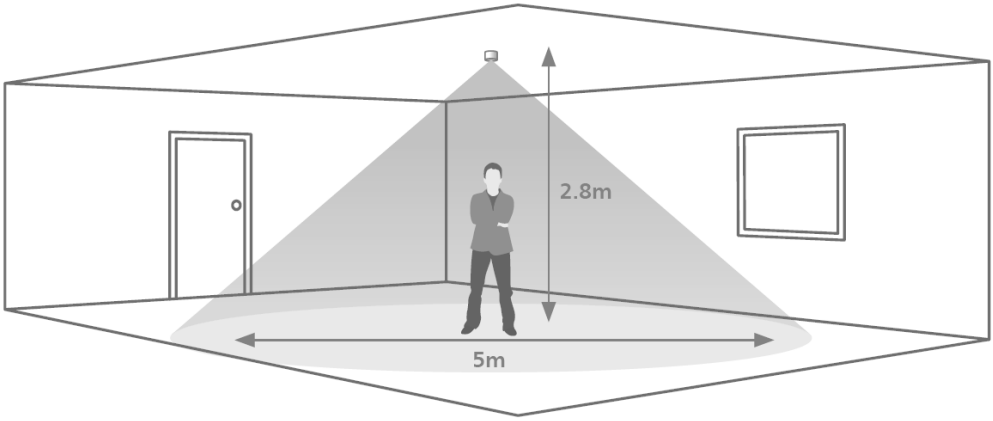
4.1	**Light level**	Maintained illuminance level (adjustable between 1 and 999). At 999 the output will be always be at maximum.
4.2	**Presence detection** (default)	Auto switch on with detection, auto off after movement ceases and time delay ends.
4.3	**Absence detection**	Manual switch on, auto off after movement ceases and time delay ends.
4.4	**Switch level on** (9)	Lux level setting to prevent the luminaires being switched on if the ambient light level is sufficient (adjustable between 1 and 9). The luminaires will always be switched on at level 9. For a higher resolution of 'switch level on' a scale of 101-199 is available in the 'Special menu'.
4.5	**Switch level off** (9)	Lux level setting to switch the luminaires off during occupancy if the ambient light level goes above the setting (adjustable between 1 and 9). Level 9 will always keep the lights on. This setting can be used for "window row switching". For a higher resolution of 'switch level on' a scale of 101-199 is available in the 'Special menu'.
4.6	**DSI** (default)	Selects DSI dimming (not applicable on EBMPIR-AD)
4.7	**DALI**	Selects DALI dimming (not applicable on EBMPIR-AD)
4.8	**Memorise** (N)	If this is set to Yes, the last manual lux level set will be memorised and used as the new switch on level.
4.9	**On value** (99)	Dimming output level when switched on (0-99).
4.10	**Off value** (0)	Dimming output level when switched off (0-99). If a non-zero off value is set, then the output will toggle between this value and completely off depending on the switch level on and off values. For example, if it is light outside, the fittings will be off if there is no occupancy. If it is dark outside, they will adopt the preset off value. This feature is only enabled if 'Min value' is set to 99.
4.11	**Fade value** (10)	After occupancy ceases, this dimming output level is loaded for the fade time (adjustable between 0 and 99).
4.12	**Fade mins** (0)	This is the time period (adjustable between 0 and 99 minutes) that the luminaire will be held at the fade value before turning off. A value of 0 disables the fade function.
4.13	**Max value** (99)	Maximum dimming output level (adjustable between 0 and 99).
4.14	**Min value** (1)	Minimum dimming output level (adjustable between 0 and 99).
4.15	**Speed on** (40)	Determines the dimming response speed after the setup time has finished. Measured in 0.1 sec intervals.
4.16	**Speed set** (5)	Determines the dimming response speed during the set up time. Measured in 0.1 sec intervals. If set to 0 will disable dimming for "Set seconds" below, used if fittings are required to warm up before dimming.
4.17	**Set seconds** (120)	Determines how long the dimming response set-up period lasts on power-up or on setting change (adjustable between 1 and 999 seconds). This enables the desired lux level to be achieved rapidly when the lights come on, or during setup.
4.18	**Burn-in** (0)	Determines how long the output will be at 100% so that lamps 'burn-in' (adjustable between 1 and 999 hours). The 'burn-in' time is not affected by power supply interruptions. To disable burn-in set to 0.
4.18	**DALI on** (off)	Provides a permanent voltage to DALI ballasts when DALI has not been implemented correctly in the ballast. Maximum number of ballasts is 5 unless the relay is disabled then it is 10. This is a Special menu option.

5 User Menu

DD-LCDHS user menu or UHS handset functions:

5.1	**Lux up**	Increase light level. Reverts when occupancy cycle complete.
5.2	**Lux down**	Decrease light level. Reverts when occupancy cycle complete.
5.3	**Scene up**	Steps up between 6 pre-defined scenes.
5.4	**Scene down**	Steps down between 6 pre-defined scenes.
5.5	**Scene#**	Select the individual scene, between 0 and 6. (1 = min. output; 2 = 10%; 3 = 25%; 4 = 50%; 5 = 75%; 6 = 100%)
5.6	**Override on**	Permanently overrides the luminaire output on.
5.7	**Override off**	Permanently overrides the luminaire output off.
5.8	**Cancel**	Cancels the on or off override, returning the detector to normal operation.
5.9	**Set**	If sent before using lux up or lux down, it will set the light level as in 4.1

7. Detection Patterns



8. Fault Finding

LOAD DOES NOT COME ON

Check to see if the live supply to the circuit is good. Strap across the *L* and *LIVE OUT* terminal to turn the load on.

If the supply and wiring are good, check the LUX level setting. Increase the LUX level setting to allow the controller to turn on at higher ambient natural light level.

If the detection range is smaller than expected, check the diagram above. Rotating the sensor slightly may improve the range.

LIGHTS DO NOT GO OFF

Ensure that the area is left unoccupied for longer than the selected timer setting.

Make sure that the sensor is not adjacent to circulating air, heaters or lamps.

If the unit “false triggers” reduce the sensitivity using the sensitivity settings (see section 5 and 6).

9. Specification

LOAD
6 Amps fluorescent and incandescent lighting.
3 Amps compact fluorescent lighting.
3 Amps low energy lighting.
3 Amps low voltage lighting (switch primary of transformer).
Switch SON lighting loads via a contactor.
-DD Digital Dimming output power supply versions - up to 10 dimming ballasts. Refer to section 4.18 for DALI ON ballast quantities.
-AD Analogue Dimming output power supply versions - up to 10 dimming ballasts.

SUPPLY VOLTAGE	220-240 Volts AC 50 Hz
LIGHT LEVEL	Light to dark (select products only)
TERMINAL CAPACITY	1.0mm^2
MATERIAL	Sensor head, side mounting bracket, power supply —PA (polyamide) Flush holder—Flame retardant ABS Lens—PMMA (Clear acrylic)
TYPE	Class 2
TEMPERATURE	-10°C to 35°C
CONFORMITY	EMC-89/336/EEC CE LVD-73/23/EEC

10. Part Numbers

EBMPIR-B	Basic sensor head
EBMPIR-PRM	Premium sensor head
EBMPIR-DD	Direct dim sensor head (suitable for –DD and –AD)
EBMPSU	Non-dimming power supply (suitable for –B and –PRM)
EBMPSU-DD	Direct dim power supply (suitable for –DD)
EBMPSU-AD	Analogue dim power supply (suitable for –AD)

Kits—complete with sensor head and power supply

EBMPIR-B/C	Basic sensor head with power supply
EBMPIR-PRM/C	Premium sensor head with power supply
EBMPIR-DD/C	Direct dim sensor head with power supply
EBMPIR-AD/C	Analogue dim sensor head with power supply

Accessories

DD-LCDHS	IR remote control programming handset with LCD screen
UHS	IR remote control user handset with lux and scene setting functionality
UHS3	IR remote control user handset with on/off override only

IMPORTANT NOTICE!
This device should be installed by a qualified electrician in accordance with the latest edition of the IEE wiring regulations.

FM 45789 EMS 534520

energy services and technology association

C.P. Electronics Ltd
Brent Crescent
London
NW10 7XR
United Kingdom
Tel: + 44 (0) 333 900 0671
Fax: + 44 (0) 333 900 0674
www.cpelectronics.co.uk
enquiry@cpelectronics.co.uk