2.4GHz Mesh Motion Sensor + Light Sensor + 0-10V Dimming

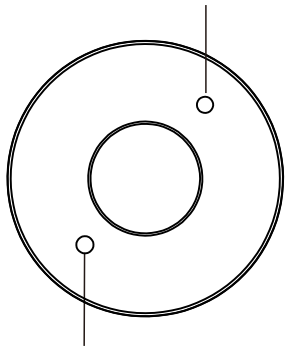
CE FC RoHS COMPLIANT

Important: *Read All Instructions Prior to Installation*

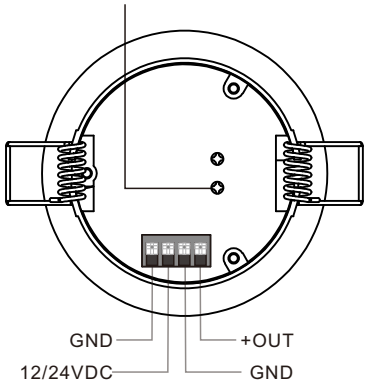
Function introduction

Motion sensor indicator: flash red once when motion is being detected. Stays off when no motion is being detected.

Program key: for programming of the motion sensor and light sensor.



Light sensor: Ambient light detection and daylight harvesting



Product Description

The occupancy sensor is a 4 in 1 device that combines motion sensing, daylight harvesting, 0-10V dimming and 2.4GHz radio circuits. When used with 0-10V LED drivers, it enables any lighting manufacturer to deliver wirelessly-controllable and sensor-equipped fixtures. The sensor is suitable for low bay applications which need medium size detection area and sensor based automation.

Commissioning

All setup is performed via a smart phone APP, and no gateway will be required. The smart APP allows for adjustment of motion sensitivity, dimming level, detection area, time delay and daylight threshold.

After it is commissioned with the smart phone, the sensor can be programmed to apply 100% dimming to Dim-to-Zero compatible 0–10V dimmable lights when motion is detected. When motion is no longer detected and the standby time delay expires, lights can be dimmed according to a set level and can be dimmed to zero/off after a dimming time delay expires. The 0-10V dimmable lights can also be controlled by the smart phone APP and compatible 2.4GHz remote controls. Also the sensor can link with other 2.4GHz mesh light devices to achieve automated control.

Product Data

Physical Information

Dimensions / Weight	See dimensions
Cutting Hole	70-73mm
Material / Color	ABS / White
Wire Gauge	26-16 AWG (0.2-1.3 mm2)
Strip Length	0.28-0.35 in. / 7-9 mm

Electrical Information

Input Voltage	12/24 VDC
Current Consumption	< 30mA (when dimming method = sink)
Dimming Control	Analog (0-10V)
Dimming Output	4mA (sink) / 20mA (source)
Status Indicators	Red (motion detection)

Wireless Communication

Radio Frequency	2.4 GHz
Wireless Protocol	2.4GHz RF Mesh
Wireless Range	100 feet (30m) Line of Sight
Radio Certification	FCC/IC, CE

Lighting Control

Features	Continuous dimming , Individual/group addressing, Scene control, Task tuning (0-100%) Autonomous sensor-based control, Scheduler control

Sensing

Occupancy Sensing Type	PIR sensor
Detection Sensitivity	0-15, 0 is 100% the max. sensitivity, 15 is the min. sensitivity
Lux Detection Range	0-1000 Lux
Mounting Height	Recommended height: 8ft (2.5m)
Detection Angle	130°

Environment

Operating Temperature Range	32˚F to 104˚F / 0˚C to 40˚C (indoor use only)
Operating Humidity	0-95% (non condensing)
Safety Certification	cULus Listed, CE

Key Features

- 2.4GHz mesh network
- PIR motion detection
- Daylight harvesting
- Works with 0-10V dim-to-off LED drivers
- Autonomous sensor-based control
- Controlled by smart phone APP and 2.4GHz mesh remote controls
- Ceiling recessed installation
- Can be use for indoor applications

Applications

- Residences
- Offices
- Meeting rooms
- Corridors

Benefits

- Cost-effective solution for energy savings
- Energy code compliance
- Robust mesh network
- Easythings Smart APP

Operation

Pair/Delete the pairing with a 2.4GHz Mesh Remote

1. Do wiring according to connection diagram.
2. Pair the device with a 2.4GHz mesh remote: please refer to the instruction of the remote that you would like to pair with.
3. Delete the pairing:
   (1) Wire up the device correctly, power on.
   (2) Press and hold down the **" Prog"** button on the device for over 3 seconds (or reset power of the device 8 times continuously to factory reset the device if the button is not accessible) until the connected light flashes, which means the pairing is deleted.

Note: factory resetting will restore all configured parameters of the device on the APP to factory default setting.

Pair with Smart Phone APP

1. Do wiring according to connection diagram.

2. Download **EasyThings APP** from IOS APP Store or Android Google Play to your smart phone or tablet by searching "**EasyThings**".

3. Enable Bluetooth on your smart phone or tablet.

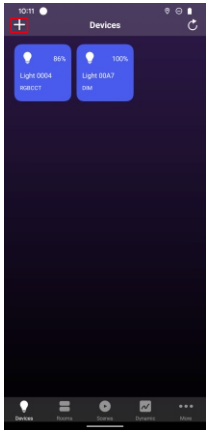


Figure 1

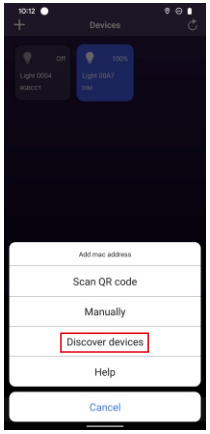


Figure 2

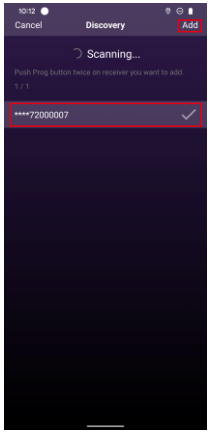


Figure 3

4. Run Easythings APP, on the "Devices" page tap add button " + " on the APP to add device, then choose "**Discover devices**" to discover device, then **short press the "Prog" button on the sensor twice** (or **reset power of the sensor twice continuously**) to set the device into pairing to APP mode. (As shown in **Figure 1** & **Figure 2** & **Figure 3**)

Note: multiple sensors can be discovered by the APP at the same time.

5. Once the sensor/sensors are discovered, tick the sensor/sensors and tap "**Add**" button, the sensor/sensors will be added successfully. (as shown in **Figure 3**)

Note: since the sensor has 0-10V dimming feature, it is discovered and listed on the "**Devices**" page as a light device (as shown in **Figure 4**). The sensor parameters can be configured at the configuration page of the device.

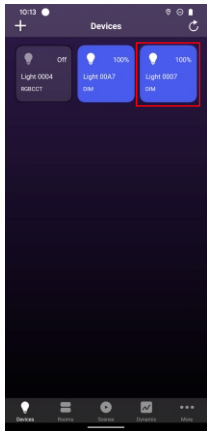


Figure 4

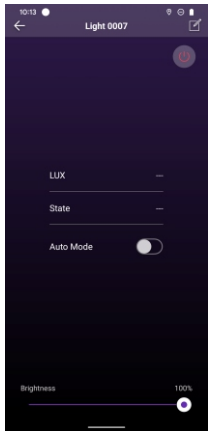


Figure 5

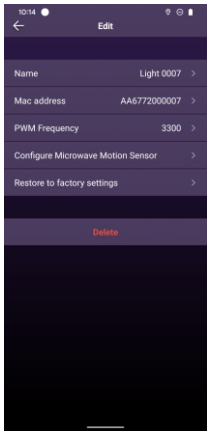


Figure 6

Configure Dimming & Sensor Parameters through the APP

1. Press and hold the device icon on the "Devices" page to enter the status and control interface of the device (as shown in **Figure 4** & **Figure 5**). The "**On/Off button**" at upper right side is to turn on/off the connected 0-10 dimmable light. "**LUX**" means the current illuminance value that the light sensor detected. "**State**" means the motion sensor state, if motion is being detected, the state will show "**Detection**", if no motion is being detected, the state will show "**No Detection**". "**Auto Mode**" can be enabled or disabled, factory default is "disabled". "**Brigtness**" slider at the bottom is used to dim the connected 0-10V dimmable light (as shown in **Figure 5**).

2. Press and hold " " button at upper right corner of the state and control interface of the device to enter configuration interface (as shown in **Figure 5** & **Figure 6**).

3. On the device configuration interface, we can configure parameters. "**Name**" is the device name which can be edited as you would like. "**Mac address**" can only be read and can not be edited. "**PWM frequency**" is to adjust the output PWM dimming frequency of the 0-10V output, higher frequency ensures more smooth dimming and less flicker. "**Configure Microwave Motion Sensor**" is to configure the motion sensor and light sensor parameters (as shown in **Figure 6**).

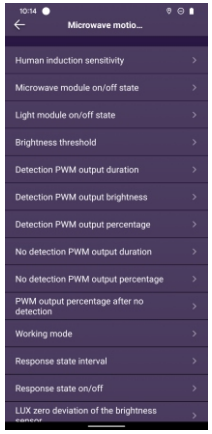


Figure 7

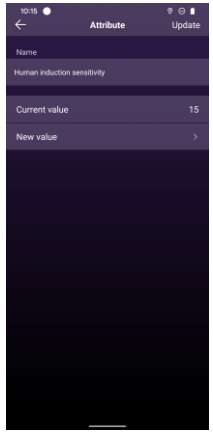


Figure 8

Figure 9

4. Tap “**Configure Microwave Motion Sensor**” to enter motion sensor and light sensor attributes configuration interface. (as shown in **Figure 6 & Figure 7**).

5. The attribute “**Human Induction Sensitivity**” is to set the detection sensitivity of the motion sensor. Tap it to enter setting interface, “**Current value**” means current sensitivity, “**New value**” is to set a new sensitivity value, available setting range is 0~15, 0 is the highest sensitivity, 15 is the lowest sensitivity. Once set a new value, tap “ ✓ ” button at upper right corner to save the setting (as shown in **Figure 7 & Figure 8**).

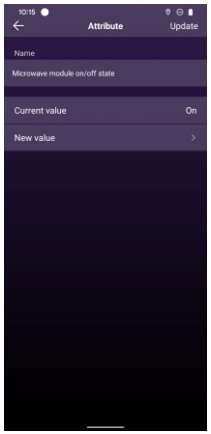


Figure 10

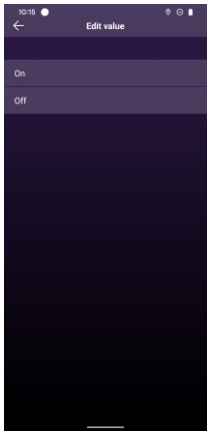


Figure 11

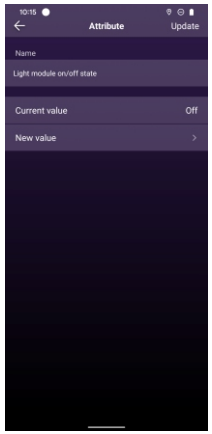


Figure 12

6. The attribute “**Microwave module on/off state**” is to enable or disable the motion sensor. Tap it to enter setting interface, “**Current value**” means current state, “**New value**” is to set a new state value, available setting range is On & Off, On means the motion sensor is enabled, Off means the motion sensor is disabled. Factory default setting is “On”. Once set a new value, tap “**Update**” button at upper right corner to save the setting (as shown in **Figure 10 & Figure 11**).

7. The attribute “**Light module on/off state**” is to enable or disable the light sensor. Tap it to enter setting interface, “**Current value**” means current state, “**New value**” is to set a new state value, available setting range is On & Off, On means the light sensor is enabled, Off means the light sensor is disabled. Factory default setting is “On”. Once set a new value, tap “**Update**” button at upper right corner to save the setting (as shown in **Figure 12 & Figure 13**).

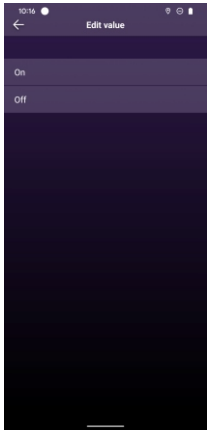


Figure 13

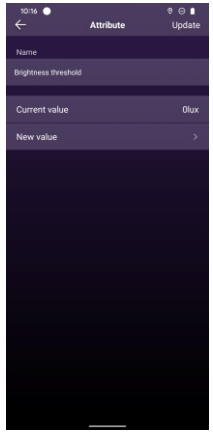


Figure 14

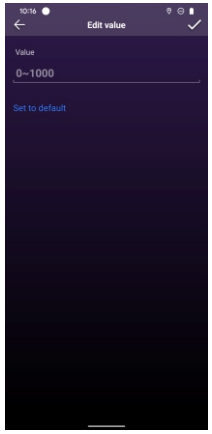


Figure 15

8. The attribute “**Brightness threshold**” **is to set the threshold illuminance value of the light sensor**, when the detected illuminance is over or below the threshold, the connected 0-10V dimmable light will be dimmed down or dimmed up. Tap it to enter setting interface, “**Current value**” means current LUX value, “**New value**” is to set a new LUX value, available setting range is 0~1000lux, factory default threshold is 0. Once set a new value, tap “ ✓ ” button at upper right corner to save the setting (as shown in **Figure 14 & Figure 15**).

9. The attribute “**Detection PWM output duration**” **is to set the hold time of the configured PWM output of the 0-10V dimming when motion is detected**. Tap it to enter setting interface, “**Current value**” means current hold time, “**New value**” is to set a new hold time, factory default hold time is 1 minute. Once set a new value, tap “**Update**” button at upper right corner to save the setting (as shown in **Figure 16**).

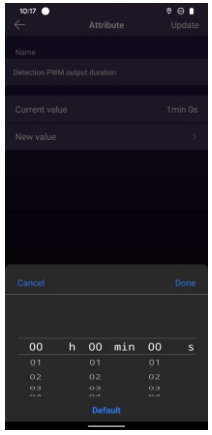


Figure 16

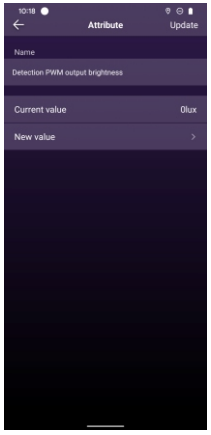


Figure 17

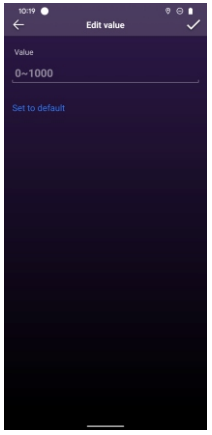


Figure 18

10. The attribute “**Detection PWM output brightness**” **is to set the PWM output brightness value of the 0-10V dimming when motion is detected**. Tap it to enter setting interface, “**Current value**” means current brightness, “**New value**” is to set a new brightness, available setting range is 0~1000LUX, factory default brightness is 0 lux. Once set a new value, tap “ ✓ ” button at upper right corner to save the setting (as shown in **Figure 17 & Figure 18**).

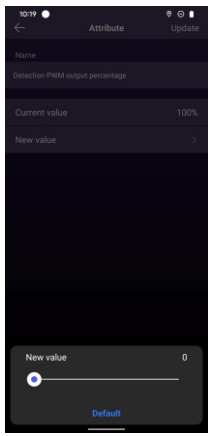


Figure 19

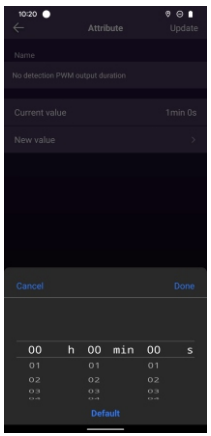


Figure 20

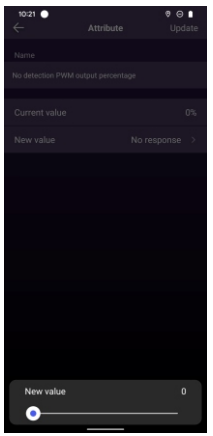


Figure 21

11. The attribute "**Detection PWM output percentage**" **is to set the PWM output percentage value of the 0-10V dimming when motion is detected**. Tap it to enter setting interface, "**Current value**" means current percentage, "**New value**" is to set a new percentage, available setting range is 0~100%, factory default percentage is 100%. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 19**).

12. The attribute "**No Detection PWM output duration**" **is to set the delay time of the configured PWM output of the 0-10V dimming when no motion is detected after hold time expires**. Tap it to enter setting interface, "**Current value**" means current delay time, "**New value**" is to set a new delay time, factory default delay time is 1 minute. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 20**).

13. The attribute "**No Detection PWM output percentage**" **is to set the PWM output percentage value of the 0-10V dimming when no motion is detected after hold time expires**. Tap it to enter setting interface, "**Current value**" means current percentage, "**New value**" is to set a new percentage, available setting range is 0~100%, factory default percentage is 0%. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 21**).

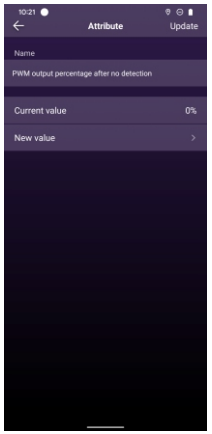


Figure 22

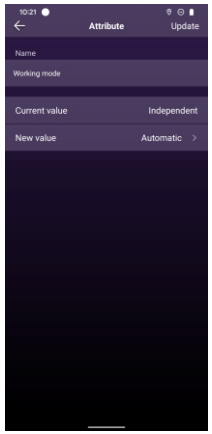


Figure 23

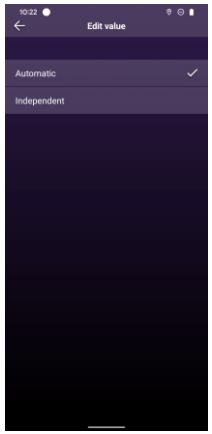


Figure 24

14. The attribute "**PWM output percentage after no detection**" **is to set the PWM output percentage value of the 0-10V dimming after delay time expires**. Tap it to enter setting interface, "**Current value**" means current percentage, "**New value**" is to set a new percentage, available setting range is 0~100%, factory default percentage is 0%. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 22**).

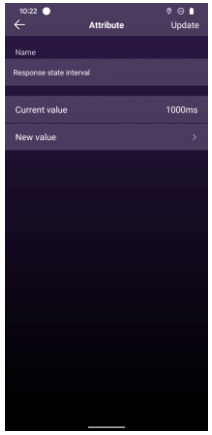


Figure 25

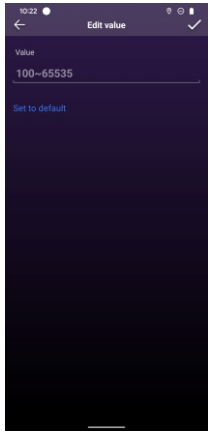


Figure 26

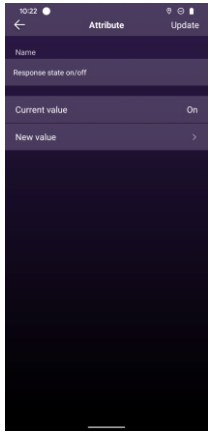


Figure 27

15. The attribute "**Working mode**" **is to set the working mode of the device**. Tap it to enter setting interface, "**Current value**" means current mode, "**New value**" is to set a new mode, available settings are **Automatic & Independent**, **Automatic** means the 0-10V dimming can be controlled by the motion sensor and light sensor, **Independent** means the 0-10V dimming can not be controlled by the motion sensor and light sensor, and can only be controlled by the 2.4GHz Mesh signal. factory default is **Automatic**. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 23 & Figure 24**).

16. The attribute "**Response state interval**" **is to set the time interval to report the sensor state**. Tap it to enter setting interface, "**Current value**" means current interval, "**New value**" is to set a new interval, available setting range is 100~65536mS, factory default is 1000mS. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 25 & Figure 26**).

17. The attribute "**Response state on/off**" **is to enable or disable sensor state report**. Tap it to enter setting interface, available setting range is **On & Off**, On means state report enabled, Off means state report disabled, factory default is Off. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 27 & Figure 28**).

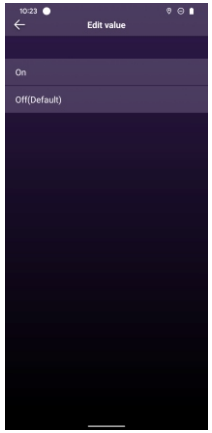


Figure 28

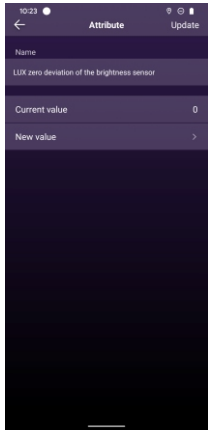


Figure 29

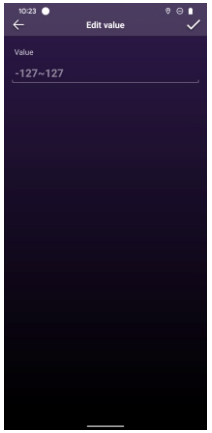


Figure 30

18. The attribute "**Lux zero deviation of the brightness sensor**" **is to set the compensation lux value for the detected brightness to prevent deviation of the detected brightness value**. Tap it to enter setting interface, "**Current value**" means current compensation value, "**New value**" is to set a new compensation value, available setting range is -127~127lux, factory default is 0. Once set a new value, tap "**Update**" button at upper right corner to save the setting (as shown in **Figure 29 & Figure 30**).

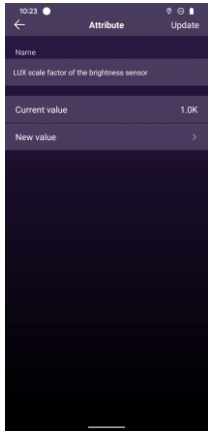


Figure 31

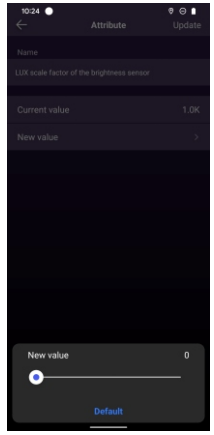


Figure 32

19. The attribute “**Lux scale factor of the brightness sensor**” **is to set the compensation scale factor for the detected brightness in the event that the light sensor is covered and can not fully detect ambient brightness.** Tap it to enter setting interface, “**Current value**” means current compensation scale factor, “**New value**” is to set a new compensation scale factor, **factory default is 1.0K, which means the reported lux value equals to detected lux value times 1**. Once set a new value, tap “**Update**” button at upper right corner to save the setting (as shown in **Figure 31 & Figure 32**).

Link the Sensor with a 2.4GHz Mesh Light Device and Set Automation through the APP

1. Add 2.4GHz Mesh Light Devices to the APP

Step 1: Add 2.4GHz Mesh light devices to EasyThings APP (please refer to the instruction of EasyThings APP to learn how).

Step 2: Press and hold an added device icon to enter into control interface of the device, then tap button “ ” at upper right corner to enter into edit page of this device (As shown in **Figure 33** & **Figure 34** & **Figure 3**5).

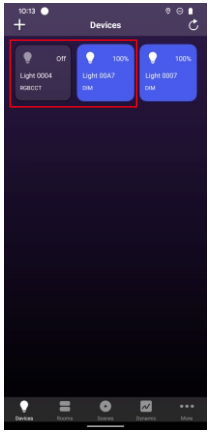


Figure 33

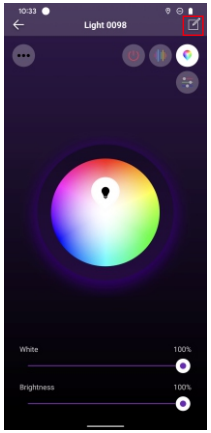


Figure 34

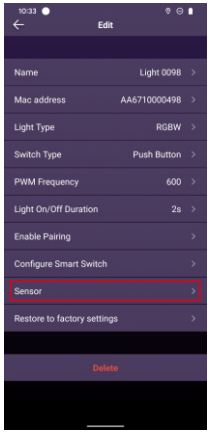


Figure 35

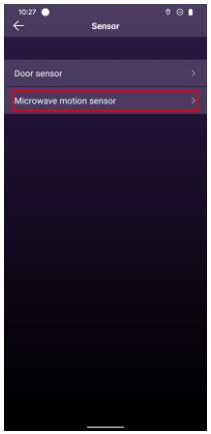


Figure 36

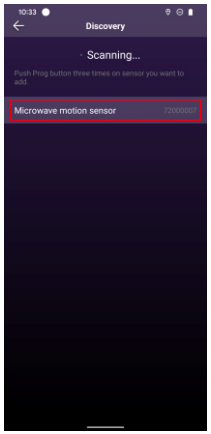


Figure 37

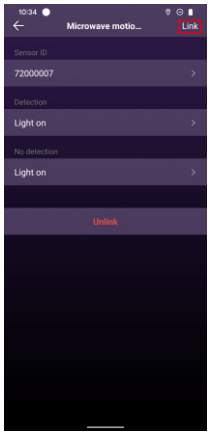


Figure 38

2. Link Motion Sensor and Set Automation

Step 1: Tap **“Sensor”** (As shown in **Figure 35**) and then tap “**Microwave motion sensor**” (As shown in **Figure 36**) to enter link motion sensor interface (As shown in **Figure 37**).

Step 2: Short press "Prog" button 3 times on the sensor or reset power of the sensor 3 times as instructed by the APP (As shown in **Figure 37**) to enable the sensor to enter pairing to light device mode. Then the sensor will be discovered by the light device and sensor ID will be displayed (As shown in Figure **37**).

Step 3: Tap the sensor ID to enter link page of the sensor (As shown in **Figure 37** & **Figure 38**). Then tap **"Link"** at upper right corner to link the sensor and the light device, the 2.4GHz Mesh light device will flash twice to indicate successful linking. (As shown in **Figure 38**).

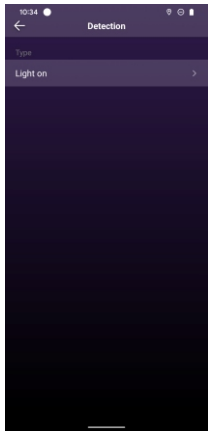


Figure 39

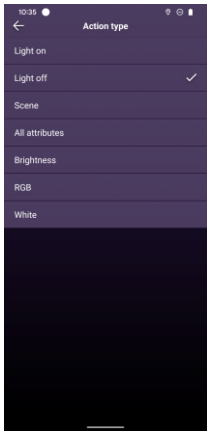


Figure 40

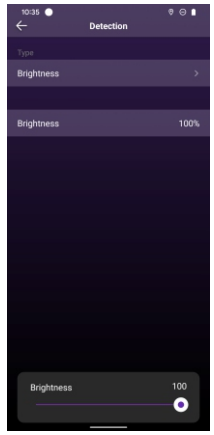


Figure 41

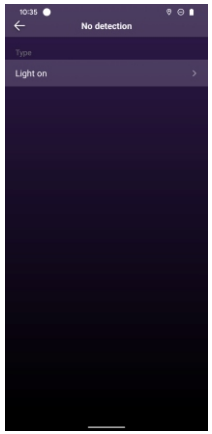


Figure 42

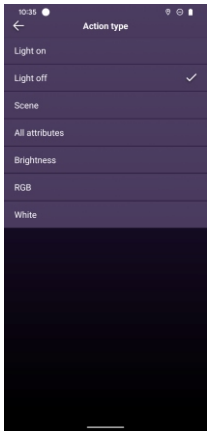


Figure 43

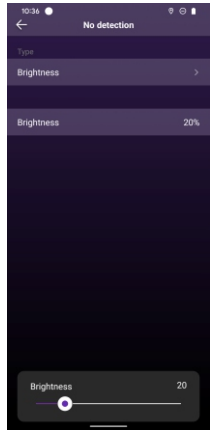


Figure 44

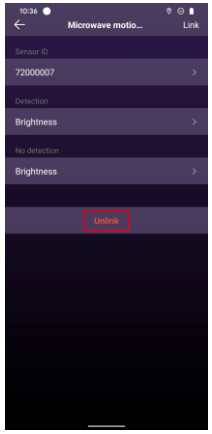


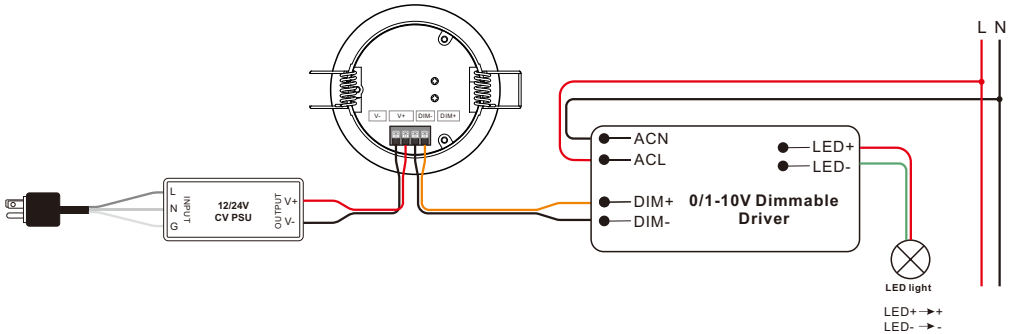
Figure 45

Step 4: Once linked successfully, tap the action under "Detection" to set a triggered action when motion is detected (As shown in **Figure 38 & Figure 39**). Available actions which can be triggered depends on the light device type, the example device is an RGBW device, available actions are: Light on, Light off, Scene, All attributes, Brightness, RGB, White (As shown in **Figure 40**). Here we choose Brightness, and the set the triggered brightness as 100% (As shown in **Figure 41**).

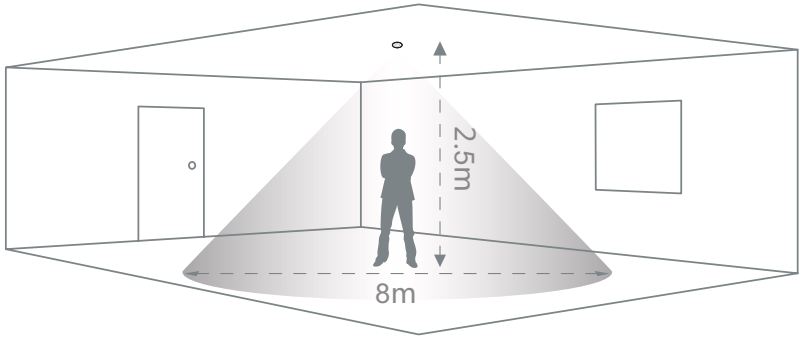
Step 5: Tap the action under "No detection" to set a triggered action when no motion is detected (As shown in **Figure 38 & Figure 42**). Available actions which can be triggered depends on the light device type, the example device is an RGBW device, available actions are: Light on, Light off, Scene, All attributes, Brightness, RGB, White (As shown in **Figure 43**). Here we choose Brightness, and the set the triggered brightness as 20% (As shown in **Figure 44**).

Step 6: Once automation set is completed (As shown in **Figure 45**), the linked 2.4GHz Mesh light device will be controlled by the motion sensor automatically. If you would like unlink the sensor and the device, just tap "Unlink" to unlink them (As shown in **Figure 45**).

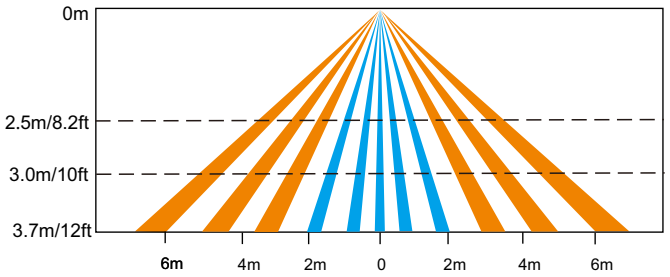
Wiring Diagram



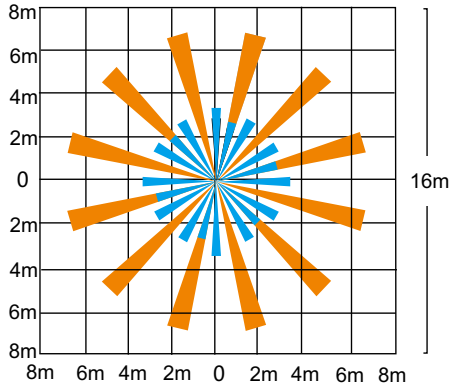
Detection Pattern



Coverage Side View



Coverage Top View



The detection area for movement sensor can be roughly divided into two parts:

Slow movement (person moving < 1.0'/s or 0.3m/s)

Quick movement (person moving > 1.3'/s or 0.4m/s)

Product Dimension