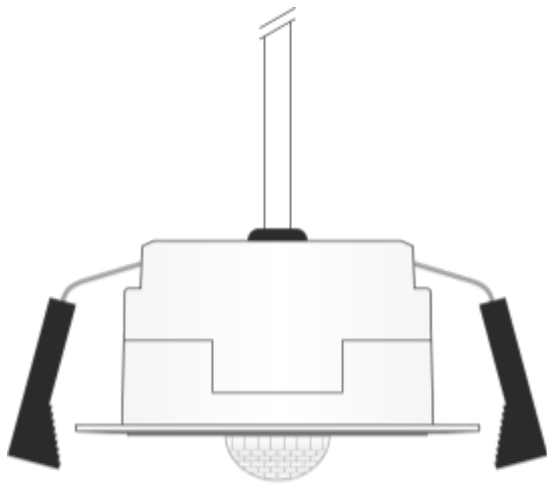# Instruction Manual

# RK-PIR

Rako Wireless PIR Sensor

2024
Version 1.0.0
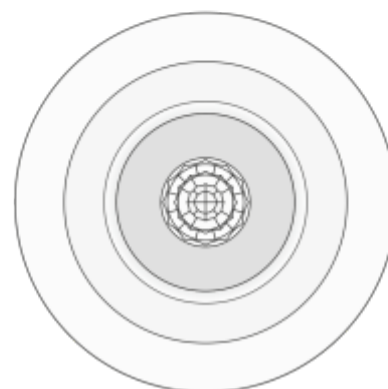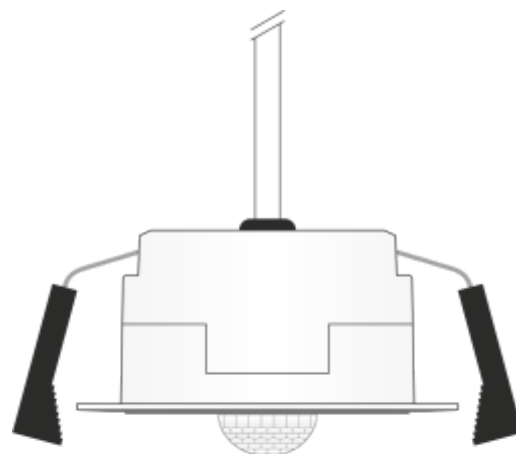
UK CA

MADE IN BRITAIN

For programming information: [Wireless programming guide link](#)

For further installation information: [Wireless application sheet](#)

## Contents

## 1 What is the RK-PIR?

The RK-PIR is a presence Sensor for use with the Rako wireless system. It is supplied with an RK-BP battery pack.
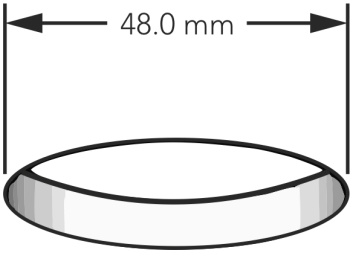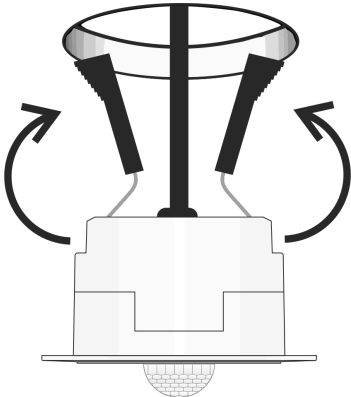
Features include:
- Three modes
  - Always (not time-based)
  - Time range mode
  - Sunlight mode
- Webpage programmable
- Absence detection

The introduction of programming through the HUB via the webpages using 'Hub managed mode', enables time-dependent automatic Scene selection, allowing for different Scenes at different times of the day.

## 2 Installation

Ensure that the RK-PIR has been added to Rasoft Pro and configured in the RK-HUB <u>before</u> installing.

| Step 1 | • Using an appropriate hole saw, make a 48mm cutout in the ceiling. |  |
|---|---|---|
| Step 2 | • Ensure the RK-PIR is securely fastened to the RK-BP via the two-pin connector. |  |
| Step 3 | • Raise the fixings on the RK-PIR and insert them into the ceiling cutout.<br><br>• Ensure there is adequate clearance and nothing is obstructing the springs. |  |

## 3 Adding the RK-PIR to Rasoft Pro

- Confirm that there is a project open, the Rooms have been added to the system, and there is a tick box in the communication devices, this can be found at the bottom right-hand side of Rasoft Pro.
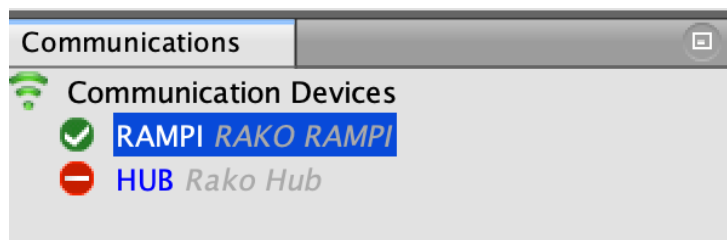


- Place the bottom side of the RAMPI on the domed section of the RK-PIR, the green LED on the RAMPI will illuminate. Keep the RAMPI on the RK-PIR.
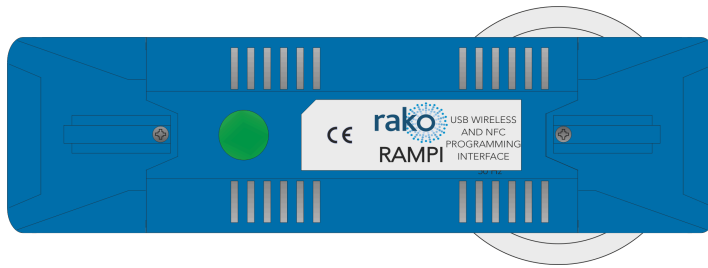
- Give the RK-PIR a name and select 'Next'.
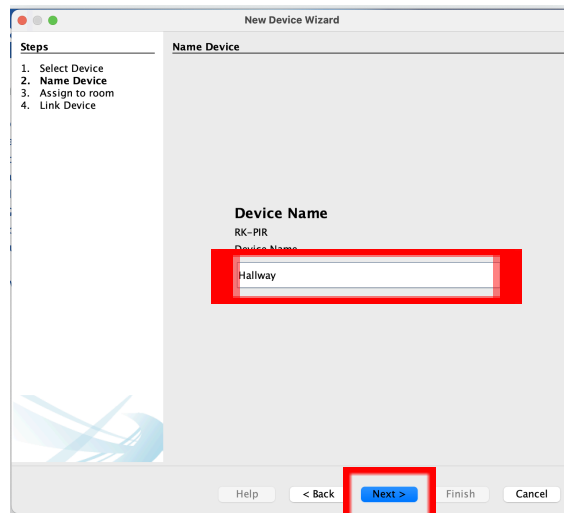


- Select 'Next' (The RK-PIR does not require Room assignment; this is done in the HUB web pages).
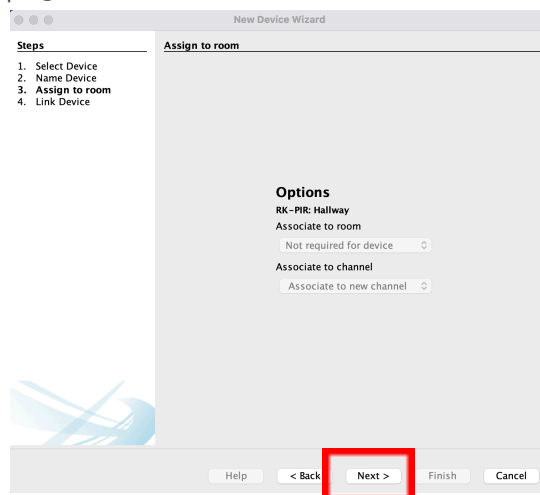


- Remove the RK-PIR from the RAMPI, place the RK-PIR back on the RAMPI, the Green LED should be illuminated on the RAMPI, and select 'Finish'.

- Continue to hold the RK-PIR on the HUB until the upload process has finished.

# 4 Commissioning the RK-PIR Sensors

The following steps assume:

1) A project has been created and Rooms have been added
2) The HUB is set up as a communication device
3) The HUB has been added to Rasoft Pro
4) The "Smartphone/web data" tab has been used to upload the Room/Channel/Scene data to the HUB
5) RK-PIR's have been added as a device in Rasoft Pro

For each of these prerequisites, please refer to:

- [Wireless programming guide link](#)

- [RK-HUB user manual](#)

To commission the Sensors via the RK-HUB web pages:

- Access the HUB web pages by right-clicking the RK-HUB in the communication devices and selecting 'Open in browser'.

- Select "Configuration" - "Modules," - "PIR".
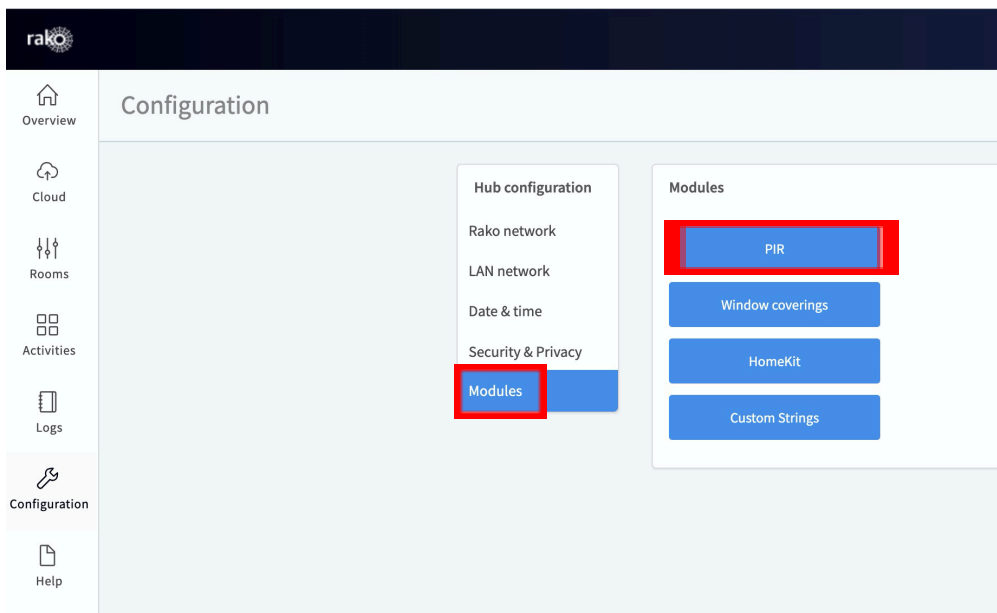


- Select 'Go To Sensors'.
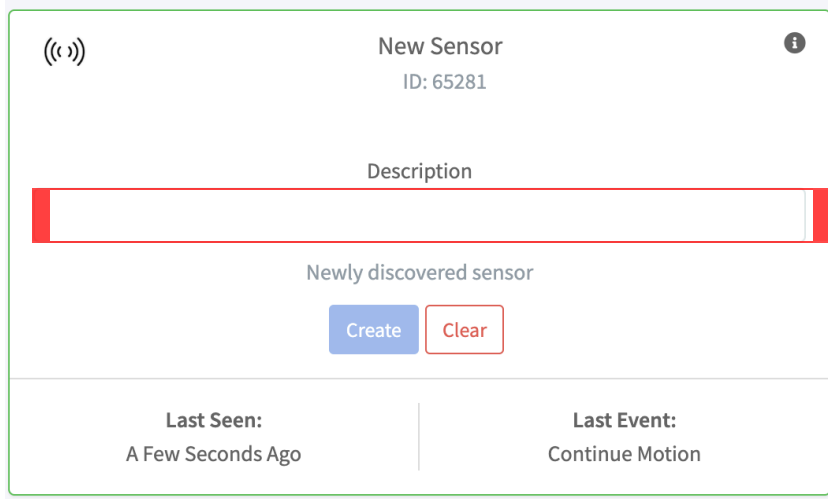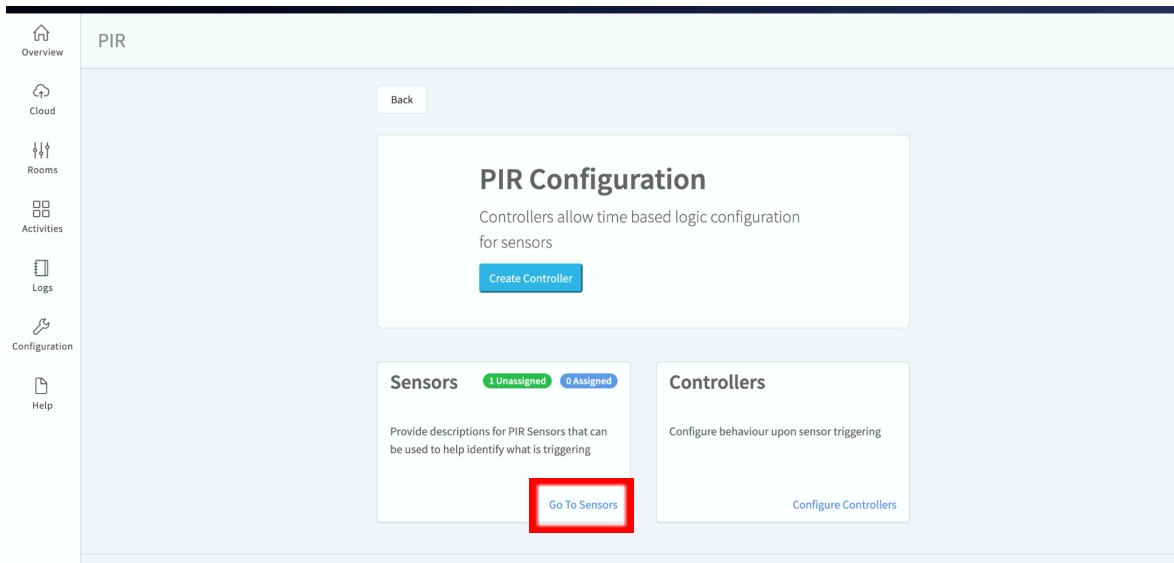
- Enter a Description.

- Select 'Create', and repeat the previous steps if you have more than one Sensor before moving on to the next section.

# 5 Adding a Controller

The Controller defines when the Sensor turns on lights and when it doesn't; this can be conditional to the time of day, keypad inputs, or the status of other Sensors.

- To get to the Controller, press 'Back' on the Sensor commissioning page.

- Select 'Configure Controllers'.

**Controllers**

Configure behaviour upon sensor triggering

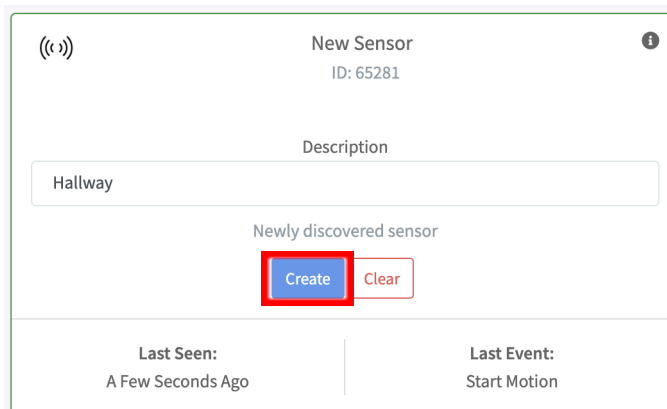Configure Controllers

- Select 'Add' at the top right to create a new Controller.

- Select the Room and Channel the Sensor will control.

- Select the Sensor which the Controller will manage.

- Select a template, the following options are available:

Standard
The Sensor is operational all day and night, on movement, the Controller will switch to scene 1, and on timeout, the Controller will switch Scene Off.

Day/Night
The Sensor is operational on different Scenes at different times of the day; between Dawn and Dusk Scene 1 is the On Command, and between Dusk and Dawn Scene 4 is the On command. Dawn and Dusk times change throughout the year automatically.

Room

Hallway (Id: 9, Type: LIGHT)

Channel

Whole room (All channels)

Description

Hallway

Sensor

Hallway

Template

[Day/Night] Scene 1 (day), Scene 4 (night) & Off

# 6 Programming a Controller

- Once the Sensor has been added to the Controller, Select 'Manage PIR Controller'

> **Hallway**                                                    **Enabled**
>
> State: On Override
>
> ──────────────────────────────────────────────
>
> **Sensors**
> Hallway
>
> ──────────────────────────────────────────────
>
> Manage PIR Controller

PIR Controller

Back

Controller Description

| Hallway | ① |

Room

| Hallway (Id: 9, Type: LIGHT) | ② |

Channel

| Whole room (All channels) | ③ |

Sensors

| ● | Hallway | ④ | Last triggered: 2 Minutes Ago | Remove |

| Add Sensors... | ⑤ | 🔍 |

Time range configurations
Items are processed in order                ⑥                                +

≡ DAY: Scene 1 <==> Off                                          Active

≡ NIGHT: Scene 4 <==> Off                                        Active
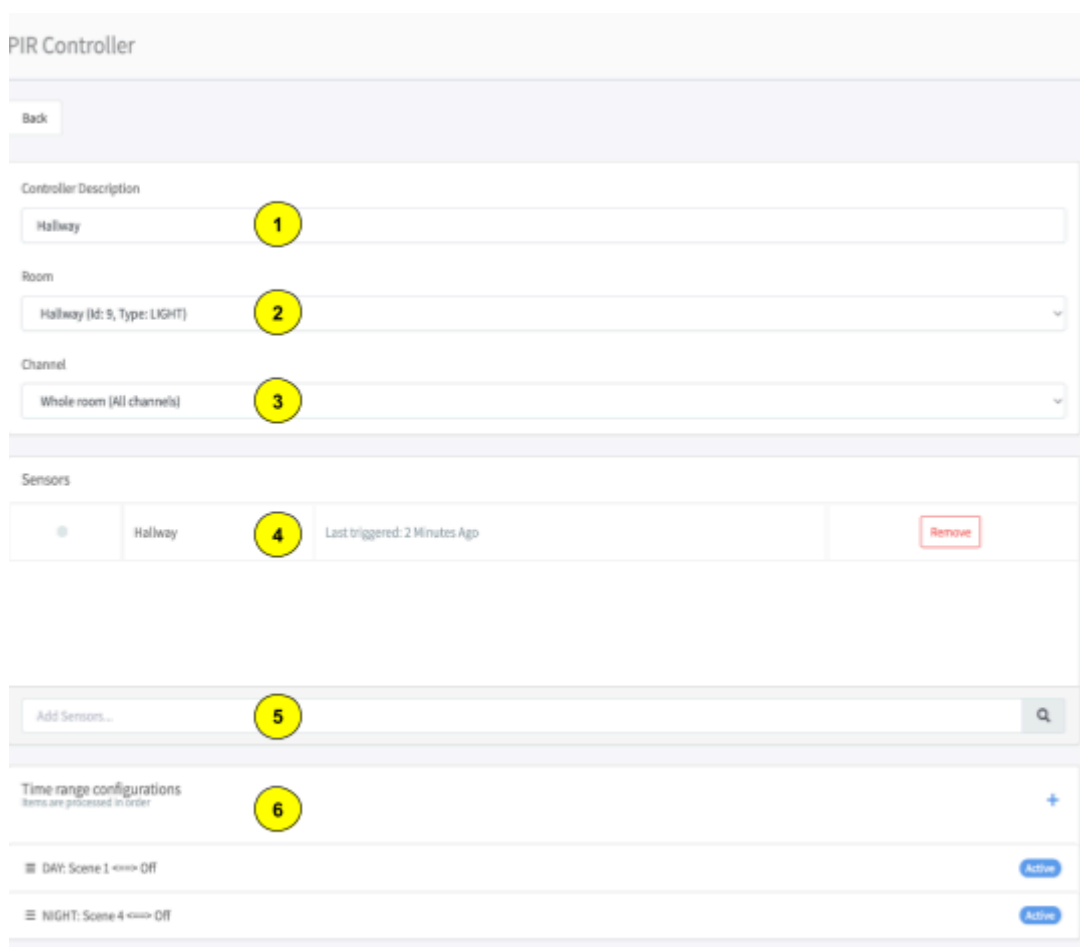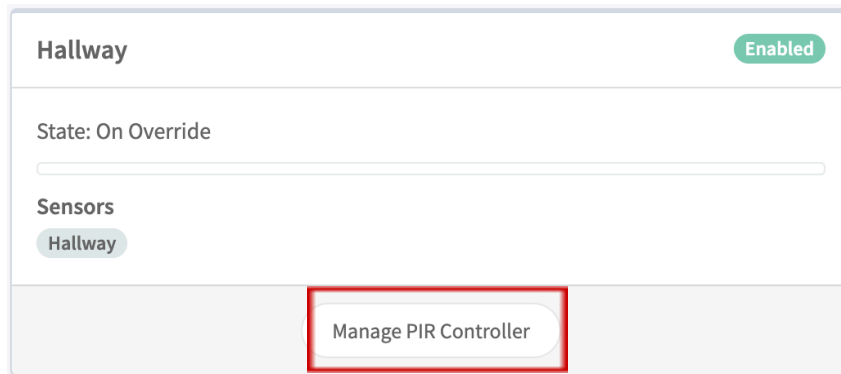
1. Controller Description
   Give the Controller an accurate description to make the programming clear and easy to understand.

2. Room
   The Room of the Controller, the Sensors in the section below will affect the Room selected.

3.  Channel

    The Channel within the Room, with "Whole Room" set, the Controller will switch the whole
    Room; with a single Channel set, the Controller will switch a single Channel.

4.  Sensors

    Sensors assigned to the Controller will be shown in this section.

    Multiple Sensors can be added to a single Controller allowing a Room to be controlled from
    by multiple Sensors.

5.  Add Sensors

    Commissioned Sensors will appear in a list when "Add Sensors" is selected.

6.  Time Range Configuration Overview

    Adjust the parameters of the Controllers "On Command" and "Off Command".

# 7 Time Range Configuration

The time range configuration determines when the PIR will activate on movement and when it
will time out, once this occurs, the 'Off Command' will trigger if it is enabled.

1. <u>Always</u>
   The Sensor will always activate the "Set On Command" on movement detection.

2. <u>Time Range</u>
   The Sensor will activate between specific times as set by the 24-hour clock.

3. <u>Sunlight Mode</u>
   The Sensor will activate based on the Dawn/Dusk or Sunrise/Sunset conditions.

4. <u>Exit Delay</u>
   When 'Off' is pressed for the Room, the Sensor will not activate the lights on movement for 30 seconds. This option prevents unintentional activation if the user is detected while switching the lights off via the switch.

5. <u>Absence Mode</u>
   <span style="color:red">Ensure 'On command' is disabled in Absence Mode</span>
   Switch the lights off after a specified period if no movement has been detected. This is commonly used to prevent lights from being left on unintentionally. Keypads no longer override the PIR Controller.

6. <u>Timeout</u>
   The countdown timer can be set by hours, minutes and seconds. When movement is detected, the countdown begins, upon further movement detection, the countdown timer resets, once the timer countdown has finished, the 'Off Command' is activated.

7. <u>Set On Command</u>
   When the Sensor has detected movement, the 'On Command' will be activated by the Controller, provided that the conditions are met, such as 'After Dusk' or 'After 13:00'.

8. <u>Set Off Command</u>
   When the Controller has timed out, the 'Off Command' will be activated. The 'Off Command' can be any Scene including 'Off'.

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Thank you for choosing Rako Controls; we hope that you are pleased with your system. Should you require further assistance, please contact us via our website, www.rakocontrols.com, or by calling our customer support helpline on 01634 226666.

# Appendix 1: Sensor Commands and Controller State

## Sensor Commands

The RK-PIR can send one of three commands to the Controller every 30 seconds.

### Start Motion

When movement is first detected, the Sensor will send a Start Motion command to the Controller. The Controller logic will determine whether or not to send the 'On Command' based on the time conditions and keypad override state.
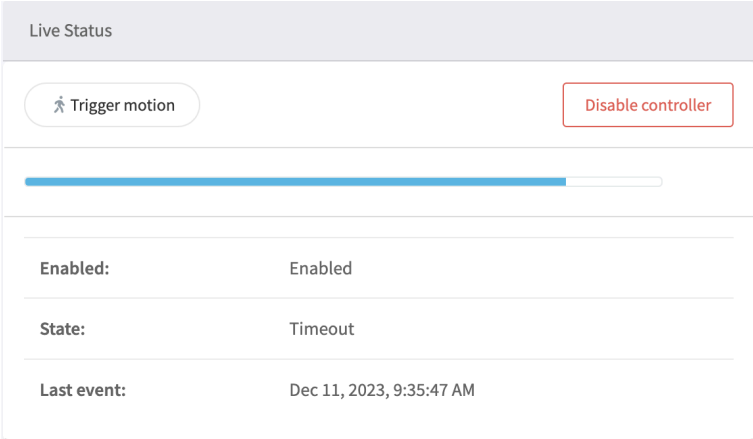
### Continue Motion

Once the Sensor has sent 'Start Motion', when further motion is detected, a 'Continue Motion' is transmitted within 30 seconds from the Sensor.

### End Motion

When movement is no longer being detected by the Sensor, an 'End Motion' command will be triggered by the Sensor to the Controller. This will start the Controller timeout, once this reaches the end, the 'Off Command' will be triggered on the Controller.

## Live Status

Live status shows the current state of the Controller.



### Trigger Motion

Forces the Controller to send the 'On command' as if movement has been detected on a Sensor.

### Trigger Timeout

Forces the Controller to begin the timeout; once the timeout has been reached, the Controller will send the 'Off Command'.

### Disable Controller
Disables the Controller indefinitely; this will not remove the Controller, to delete the Controller, select 'Delete' at the bottom of the Controller menu.

### Enabled
If the Controller has been disabled, this will show as 'Disabled'; the default setting is 'Enabled'.

### Last Event
The last time a Sensor detected movement, and updated the Controller.

## State

The current state of the Controller, there are four states:

### On Override
When a Scene or Level of 1% or higher is sent from the Room of the Controller <u>which is not from a Sensor</u>, the Controller will enter an override state. When an 'Off' or Level 0% is sent from the Room, the Controller will no longer be On Override.

### On
Movement has been detected by the Sensor, and the Controller 'On Command' has been triggered.

### Timeout
The Sensor is no longer detecting movement; the Controller Timeout has started.
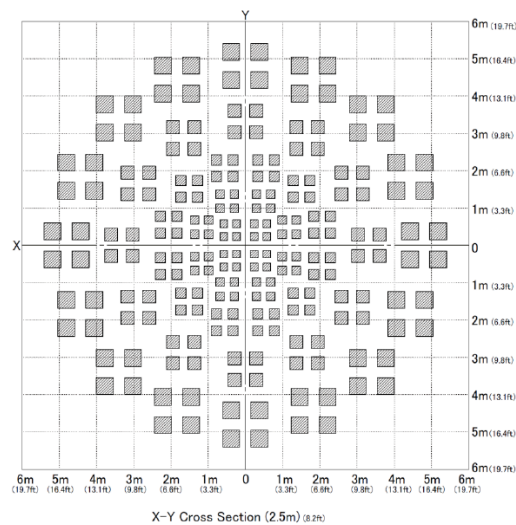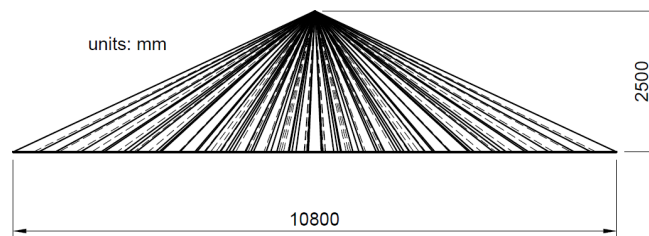
### Off
Once the Controller Timeout reaches the end and no movement has been detected during the timeout period, the 'Off Command' will be triggered.

# Appendix 2 PIR Performance Data:

Technical Specifications:

| | |
|---|---|
| **Specified detection distance (Note 1)** | 2.5m ~ 5.9m |
| **Typical ceiling installation height(Note 2)** | 3.0m |
| **Field of view** | 130° x 130° |
| **Detection zones** | 208 |
| **Note 1:**<br>› ΔT ≥ 4°C<br>› Object speed: 1.0m/s<br>› Object size: 700 x 250mm<br>› Crossing 2 detection zones | **Note 2:**<br>The sensitivity of passive infrared sensors is influenced by environmental conditions, so a performance evaluation test under representative conditions is recommended |

Detection area (2.5m):

units: mm

2500

10800

6m (19.7ft)
5m (16.4ft)
4m (13.1ft)
3m (9.8ft)
2m (6.6ft)
1m (3.3ft)
0
1m (3.3ft)
2m (6.6ft)
3m (9.8ft)
4m (13.1ft)
5m (16.4ft)
6m (19.7ft)

6m (19.7ft) 5m (16.4ft) 4m (13.1ft) 3m (9.8ft) 2m (6.6ft) 1m (3.3ft) 0 1m (3.3ft) 2m (6.6ft) 3m (9.8ft) 4m (13.1ft) 5m (16.4ft) 6m (19.7ft)

X–Y Cross Section (2.5m) (8.2ft)

We highly recommend that testing at the intended location is conducted before installation to ensure that the expected results are achieved.

If the application requires sensitive operation with a coverage of (8m+) we highly recommend that multiple RK-PIR Sensors are installed as required.

# Appendix 3 Installation Considerations

PIR Sensors only provide binary on/off information back to the Rako system. In context, this means they do not provide information about the location of the object in view or what the object is, which means consideration of the environmental factors which could trigger the Sensor are of paramount importance in successfully implementing a PIR Sensor to the customer's requirements.

The function of PIR Sensors gives rise to certain limitations about their operation:

- PIR Sensors cannot detect stationary objects.
- PIR Sensors are sensitive to environmental conditions which can cause false triggering and other undesirable effects:
  - Avoid locating the RK-PIR in areas intermittently affected by direct sunlight.
  - DO NOT locate a PIR in an area with forced air ventilation, either in the Room or ceiling void above the location of the RK-PIR.
- Sensing areas are non-uniformly distributed, causing areas of higher and lower sensitivity, requiring larger motions to trigger the Sensor in some areas than others.
- PIR Sensors are more sensitive to tangential motion than radial motion at the periphery of the sensing area.

Isometric view of the RK-PIRs field of view:
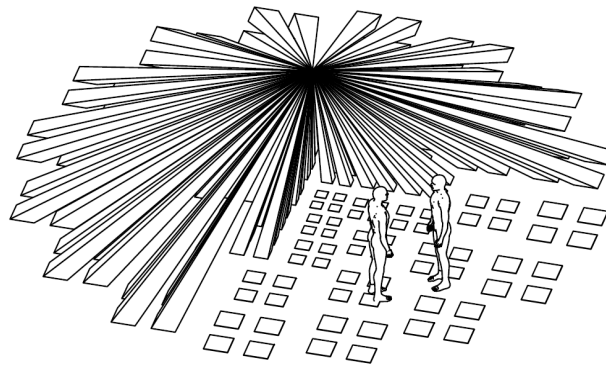


The sensitivity at the extremities of the field of view shown above will have reduced sensitivity compared to the centre.

Expect reduced performance at the extremities of the field of view of the Sensor.