Instruction Manual

WK-PIR

Rako Wired PIR Sensor

2025
Version 1.0.3

UK CA

MADE IN BRITAIN
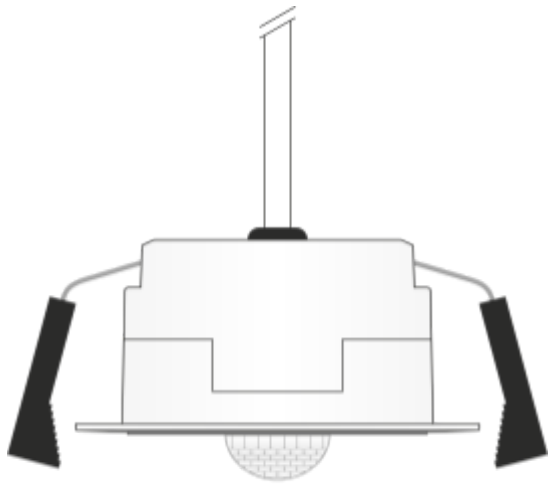
For programming information, see the [Wired programming guide](#)

For further installation information, see the [Wired Application Sheet](#)

Contents

What is the WK-PIR?

The WK-PIR is a presence sensor for use with the Rako wired system. It is supplied with a WK-CONNECT for a CAT5/CAT6 punch-down connection.
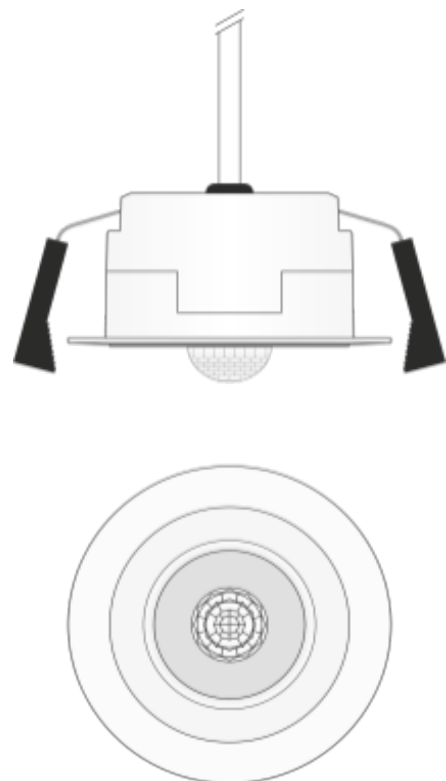
Features include:

- Three modes
    - Always (not time based)
    - Time range mode
    - Sunlight mode
- Webpage programmable
- Absence detection
- Ease of installation via the WK-CONNECT

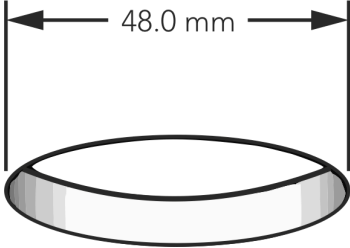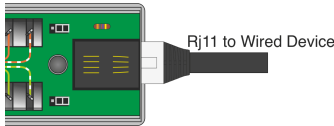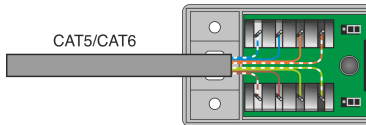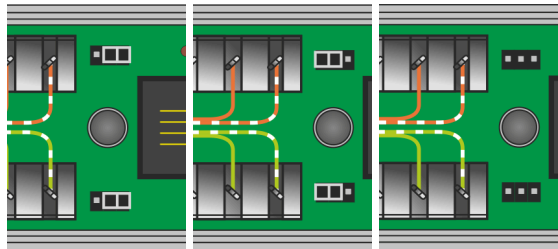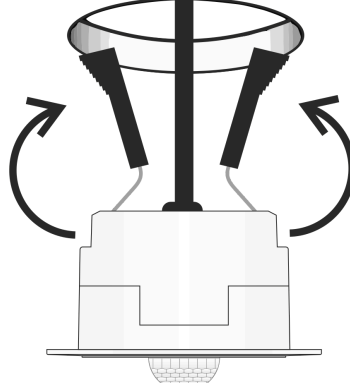The introduction of programming through the WK-HUB via the webpages using 'Hub managed mode', enables time-dependent automatic Scene selection, allowing for different scenes at different times of the day.

NB
A WK-HUB is required to program and operate the sensor.

Installation Instructions

• Using an appropriate hole saw, make a 48mm cutout in the ceiling.	48.0 mm
• Connect the sensor to the Rako wired network through the RJ11 cable onboard the WK-PIR via the WK-CONNECT *(included with the WK-PIR).*	Rj11 to Wired Device
• Using a punchdown tool, connect the CAT5 cores to the inputs on the WK-CONNECT.	CAT5/CAT6
• Terminate the WK-CONNECT according to its position in the wired network. *See 'Terminating the WK-CONNECT' for more information on page 4.*	STAR TERM NO TERM
• Replace the WK-CONNECT cover and ensure the cables are secured.	rako
• Raise the fixings on the WK-PIR and insert into the ceiling cutout. • Ensure there is adequate clearance and nothing is obstructing the springs	

Terminating the WK-CONNECT

It is important to terminate the WK-CONNECT correctly; otherwise, the wired system will not function. The required termination depends on the nature of the installation and the position of the WK-CONNECT within the system. Examples of wiring within a system can be found in Appendix 2.

No Term: Both Jumpers removed
Used when the WK-PIR is not at the end of line. This is usually identifiable by two cables being punched down to the WK-CONNECT.
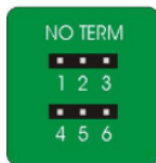
Term: Jumper fitted across 1+2 and 4+5
Used when the WK-PIR is "end of line" in a radial configuration.

Star Term: Jumper fitted across 2+3 and 5+6
Used when the WK-PIR is "end of line" in a STAR wire configuration.
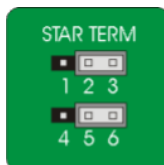
Commissioning the WK-PIR Sensors

The following steps assume:

1) A Rasoft Pro project file has been created and rooms have been added
2) The HUB is set up as a communication device
3) The HUB is added as a device to Rasoft Pro
4) The "Smartphone/web data" tab has been used to upload the Room/Channel/Scene data to the HUB

For information on creating a Rasoft Pro project file and adding the HUB as a device, refer to the links below.

- Wired system setup guide
- WK-HUB instruction manual

To commission the WK-PIR via the HUB webpages:

- Access the HUB webpages by right-clicking the HUB in "Communication Devices" and selecting "Open in browser"

- Select "Configuration," "Modules," and "PIR"
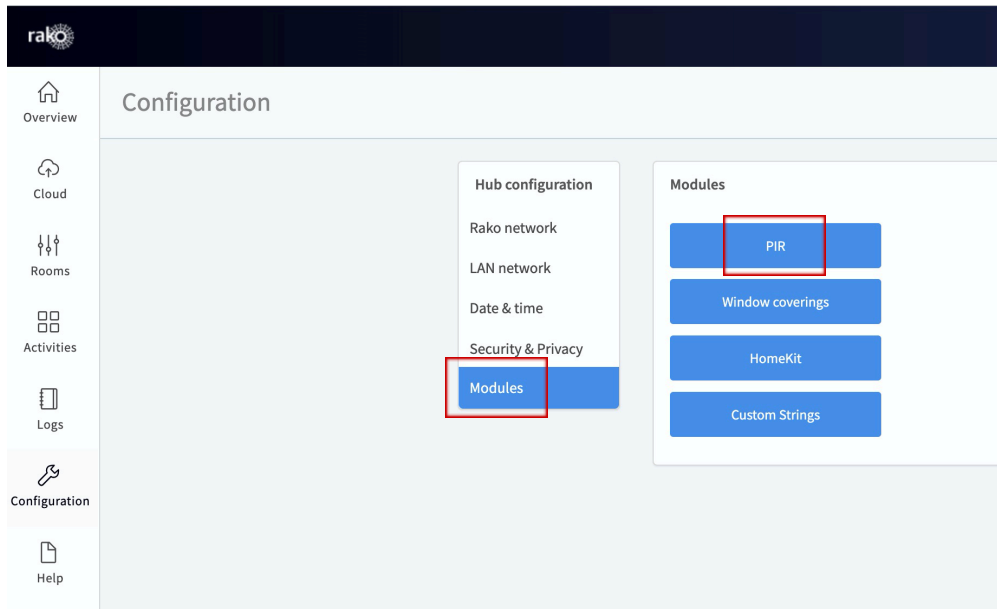
- Select "Go To Sensors"
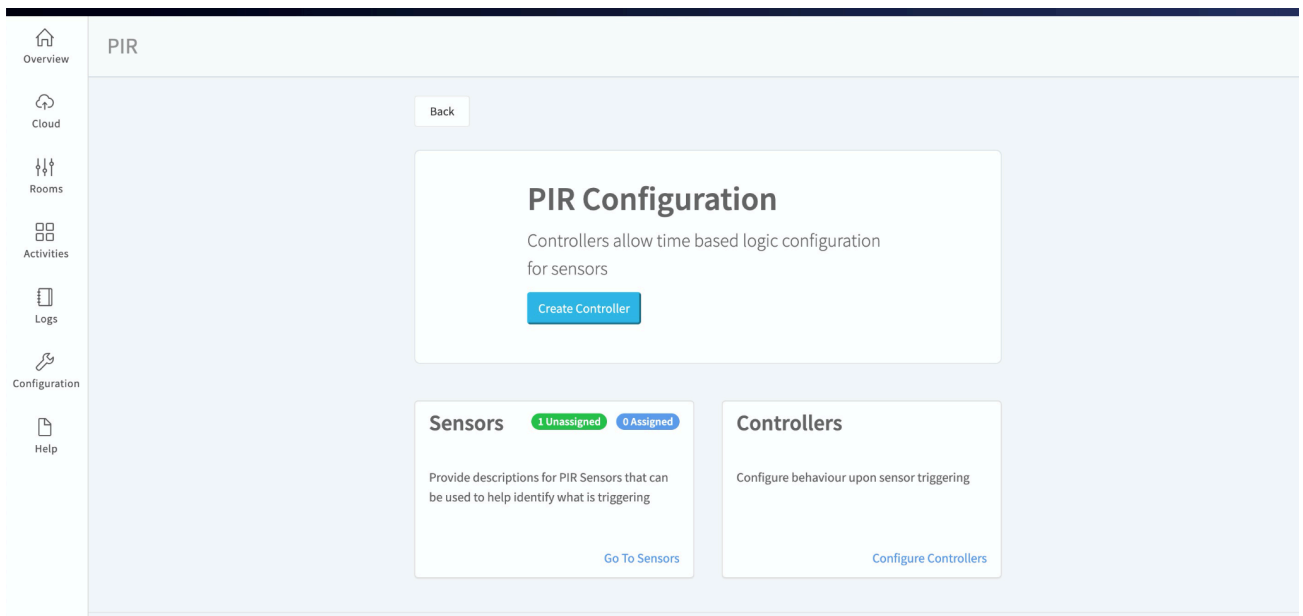
- Select "Commission Sensor"

Sensors

Back

Uncommissioned sensor found
Sensors need to be commissioned for the first time before use.

Commission sensors

↓
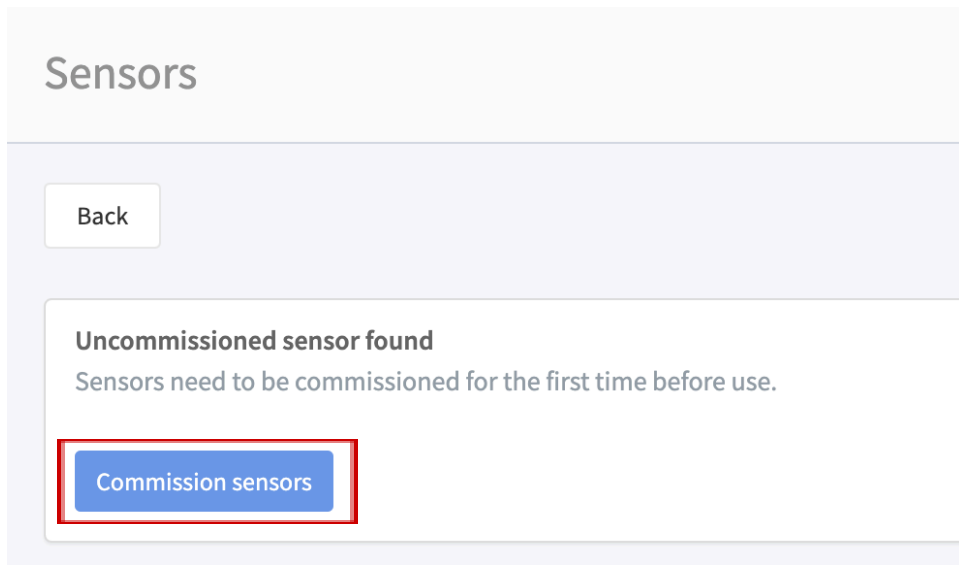
Commissioning sensors

Time estimation: **3 seconds**.

( )

- Once the Sensor commissioning has finished, the HUB will have assigned unique ID's to the WK-PIR's, in the example shown the ID is 1124.

New Sensor
ID: 1124

Description

Newly discovered sensor

Create Ident Clear

Last Seen:	**Last Event:**
9 Minutes Ago	End Motion
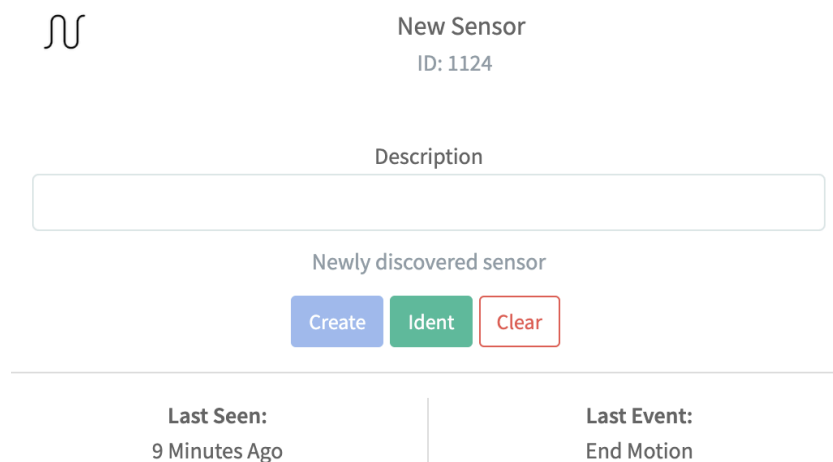
- Enter a Description.

New Sensor

ID: 1124

Description

Hallway

Newly discovered sensor

Create   Ident   Clear

Last Seen:	Last Event:
11 Minutes Ago	End Motion

- Select 'Create', the WK-PIR has now been added as a sensor

If there is more than one WK-PIR, repeat the previous steps before moving on to the next section.

Adding a Controller

The Controller defines when the WK-PIR 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

- Give the Controller a description

- Select the sensor which will be managed by the Controller. Additional sensors can be added to the Controller later

- 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 'Off Command' in the Controller will activate.

Day/Night
The sensor recalls different Scenes depending on the time of the day; between Dawn and Dusk Scene 1 is the 'On Command' and between Dusk and Dawn Scene 4 is the 'On Command'. In both cases, the 'Off Command' will activate on timeout in the Controller. Dawn and Dusk times change throughout the year automatically.

Back

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

Submit

In the example above, the Day/Night template is selected

Programming a Controller

Once the sensor has been added to the Controller, it will operate according to the setup without further programming. Should there be additional programming requirements, such as adding additional sensors to the controller or changing the Time Range Configuration, select 'Manage PIR Controller'.
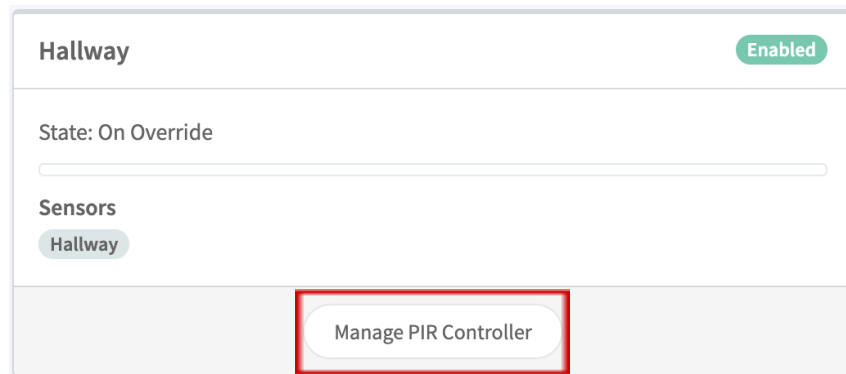
Example setup using a Day/Night Controller template

1. <u>Controller Description</u>
   Give the Controller an accurate description to make the programming clear and easy to understand.

2. <u>Room</u>
   The Room of the Controller, the sensors in the section below will affect the Room selected.

3. <u>Channel</u>
   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. <u>Sensors</u>
   Lists the sensors within the Controller, and the corresponding time stamp of their last activity.

5. <u>Add sensors</u>
   Commissioned sensors will appear in the list when "Add sensors" is selected.

6. <u>Time Range Configuration Overview</u>
   Adjusts the parameters of the Controllers "On Command" and 'Off Command'.

Time Range Configuration

The time range configuration determines when the PIR will activate on movement and when it will time out.

1. Always

The sensor will always activate the 'On Command' on movement detection.

2. Time Range

The sensor will activate between specific times as set by the 24-hour clock.

3. Sunlight Mode

The sensor will activate based on the Dawn/Dusk or Sunrise/Sunset conditions.

4. Exit Delay

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 movement is detected while switching the lights off via the switch.

5. Absence Mode

Ensure 'On Command' is disabled in Absence Mode

Triggers the 'Off command' after a specified period if no movement has been detected. This is commonly used to prevent lights from being left on unintentionally.

6. Timeout

When movement is detected, the countdown begins. Upon further movement detection, the countdown timer resets. Once the timer countdown is finished, the 'Off Command' is activated. The countdown timer can be set by hours, minutes and seconds.

7. Set On Command

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. Set Off Command

When the Controller has timed out, the 'Off Command' will be activated. The 'Off Command' can be any Scene including 'Off'.

Appendix 1: Sensor Commands and Controller State

Sensor Commands

The sensor sends three commands:

Start Motion
When movement is first detected, the sensor will send a Start Motion command to the Controller. The Controller logic will then determine whether or not to send the 'On Command based on the time conditions and keypad override state. If the 'On Command' is triggered the timeout will begin.

Continue Motion
Once the sensor has sent 'Start Motion,"when motion is detected, a 'Continue Motion' is transmitted. This will restart the Controller timeout but not re-send the 'On Command'.

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.

Live Status

Live status shows the current state of the Controller.

Live Status		
🚶 Trigger motion		Disable controller

Enabled:	Enabled
State:	Timeout
Last event:	Dec 11, 2023, 9:35:47 AM

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 which is not from a sensor, 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.

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 2 Wiring Examples:

Star Wired

UP TO 16 STAR CONNECTIONS

RAK-STAR
16 Way Star Connection Unit
For Rako Data Network
RAKO CONTROLS LTD
www.rakocontrols.com
Tel: +44 (0) 1634 226666

⚠ WARNING HAZARDOUS VOLTAGES DISCONNECT FROM SUPPLY BEFORE REMOVING COVER ⚠

Lighting Circuit 9
Lighting Circuit 10
Lighting Circuit 11
Lighting Circuit 12
Lighting Circuit 13
Lighting Circuit 14
Lighting Circuit 15
Lighting Circuit 16

RAK
MAINS SUPPLY REQUIREMENTS
200-260V AC ONLY 50Hz
10A 1Ø MAX
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⚠ WARNING HAZARDOUS VOLTAGES DISCONNECT FROM SUPPLY BEFORE REMOVING COVER ⚠

Lighting Circuit 1
Lighting Circuit 2
Lighting Circuit 3
Lighting Circuit 4
Lighting Circuit 5
Lighting Circuit 6
Lighting Circuit 7
Lighting Circuit 8

RAK
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⚠ WARNING HAZARDOUS VOLTAGES DISCONNECT FROM SUPPLY BEFORE REMOVING COVER ⚠

TO RAK-STAR ←

RAK-LINK
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200-260V AC ONLY 50Hz
6A 1Ø MAX
RAKO CONTROLS LTD
www.rakocontrols.com
Tel: +44 (0) 1634 226666

⚠ WARNING HAZARDOUS VOLTAGES DISCONNECT FROM SUPPLY BEFORE REMOVING COVER ⚠

NO TERM   NO TERM   NO TERM   NO TERM

NO TERM   NO TERM   STAR TERM   STAR TERM

STAR TERM   STAR TERM

🟦 IP NETWORK

🟧 RJ11 CONNECTION

🟩 CAT5e/CAT6 CONNECTION

Radial Wired

UP TO 32 CIRCUITS
PER RAK-LINK

Lighting Circuit 9
Lighting Circuit 10
Lighting Circuit 11
Lighting Circuit 12
Lighting Circuit 13
Lighting Circuit 14
Lighting Circuit 15
Lighting Circuit 16

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10A 1Ø MAX

Lighting Circuit 1
Lighting Circuit 2
Lighting Circuit 3
Lighting Circuit 4
Lighting Circuit 5
Lighting Circuit 6
Lighting Circuit 7
Lighting Circuit 8

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200-260V AC ONLY 50Hz
6A 1Ø MAX

■ IP NETWORK
■ RJ11 CONNECTION
■ CAT5e/CAT6 CONNECTION

NO TERM   NO TERM   NO TERM   TERM

Zone 1   Zone 2   Zone 3

Appendix 3 Sensor 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: › ΔT ≥ 4°C › Object speed: 1.0m/s › Object size: 700 x 250mm › Crossing 2 detection zones	**Note 2:** 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

X–Y Cross Section (2.5m) (8.2ft)
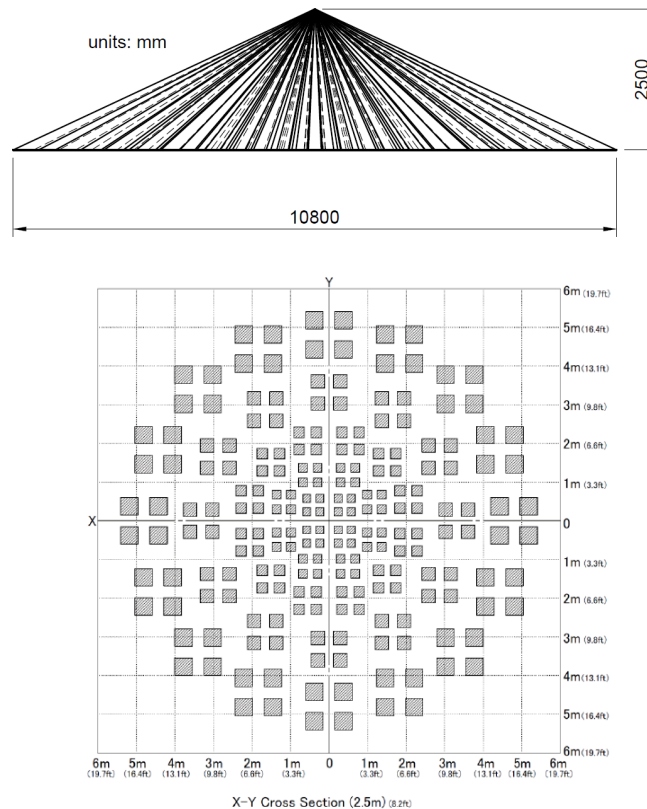
We highly recommend that testing at the intended location be conducted before installation to ensure that the expected results are achieved.

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

Appendix 4: Installation Considerations:

Sensors only provide binary on/off information back to the Rako system. This means they do not provide information about the location or nature of the object in view. Consideration of the environmental factors which could trigger the sensor is of paramount importance in successfully implementing a sensor to the customer's requirements.

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

- Sensors cannot detect stationary objects.
- Sensors are sensitive to environmental conditions which can cause false triggering and other undesirable effects:
  - Avoid locating the WK-PIR in areas intermittently affected by direct sunlight.
  - DO NOT locate a sensor in an area with forced air ventilation, either in the room or ceiling void above the location of the WK-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.
- Sensors are more sensitive to tangential motion than radial motion at the periphery of the sensing area.
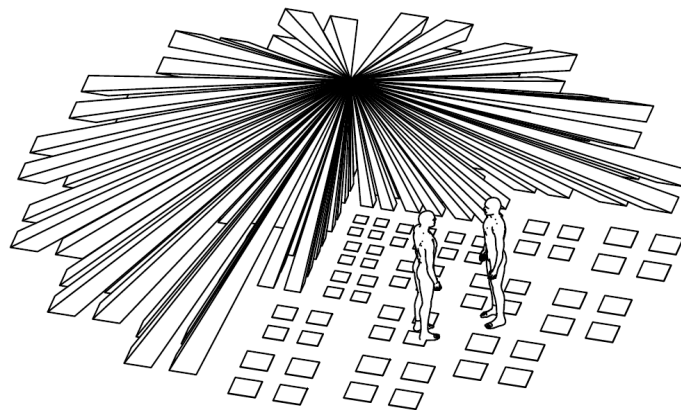
Isometric view of the WK-PIRs field of view

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 sensor's field of view.