essence smartcare

Care@Home™

Motion Detector

User Guide

January 2024

essence

Table of Contents

1. Overview

The Essence Passive Infrared Detector (PIR) is a battery operated, bi-directional, wireless motion detector.

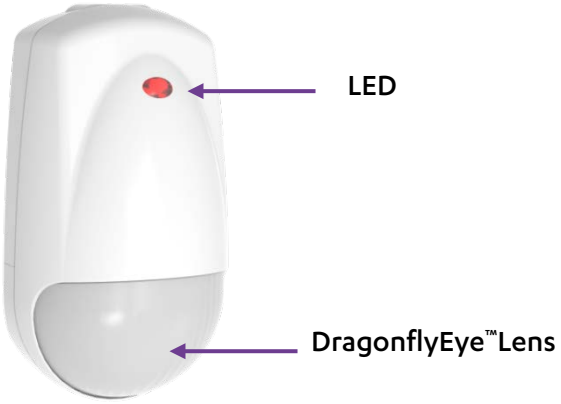


Figure 1: Essence Passive Infrared Detector

2. Installing the PIR

To install the PIR:

- Ensure you have one 3 V CR123A lithium battery

> NOTE: To comply with the UL certification standards, use GP International Ltd. batteries.

- Determine the best location
- Check if an optical limiter is required
- Check if a pet immune lens is required
- Set up the PIR
- Conduct a walk test

2.1. Determining the Best Location

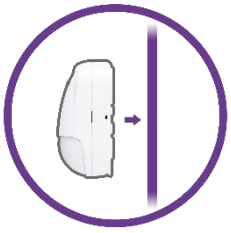
When selecting a mounting location for the PIR, it is important to take account of:

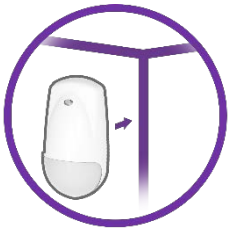
- Basic location requirements
- Locations to avoid
- Room recommendations

2.1.1 Basic Location Requirements

The mounting location should be:

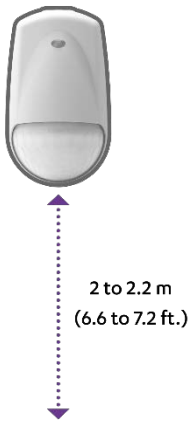
- A flat wall surface or a corner in a room



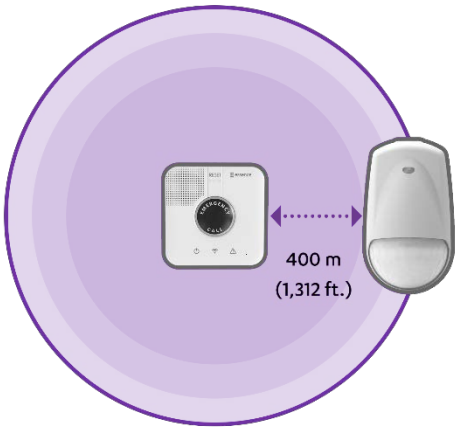


- A surface that is clean, dry, and smooth

- At a height of 2 to 2.2 m (6.6 to 7.2 ft.)



- Within 400 m (1,312 ft.) of the control panel (CP)



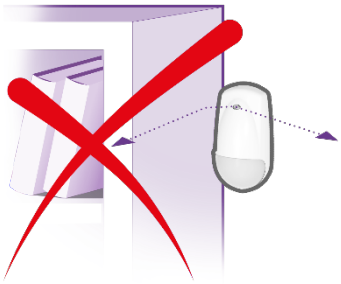
NOTE: The PIR has a maximum detection range of 12 m (40 ft.), and maximum detection angles of 90° horizontal, and 50° vertical.

2.1.2 Locations to Avoid

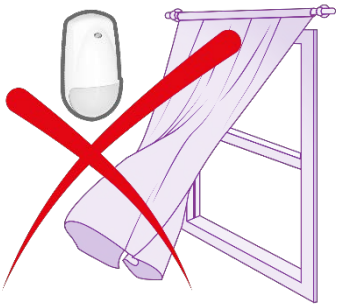
The mounting location should **not** be:

- On a door frame.

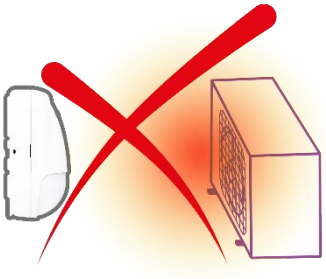
- Where objects obscure the coverage area, even partially. For example, bookcases or cabinets.



- A location that has moving objects in the coverage area. For example, curtains or light fixtures with hanging parts.

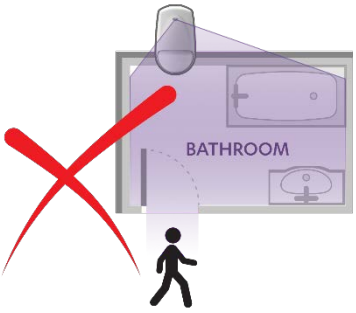


- Directly in front of an air conditioner or heat source.

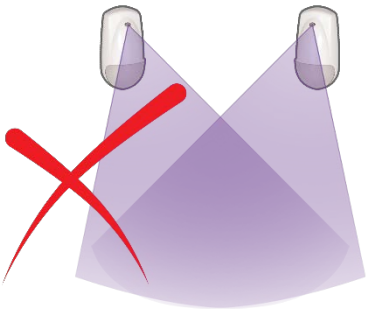


- Directly opposite a door.

  For example, if the bathroom PIR is installed facing the door, when the resident passes the open bathroom door through the hallway, the PIR sends a bathroom event to the CP reporting incorrectly that the resident is entering the bathroom



- A location that has overlapping coverage areas with another PIR. Overlapping coverage can cause false detection reporting. Separate coverage areas ensure distinct identification of the activity area for each PIR.



As a further example, the following figure shows an apartment with a typical installation with multiple PIRs, avoiding overlapping coverage.

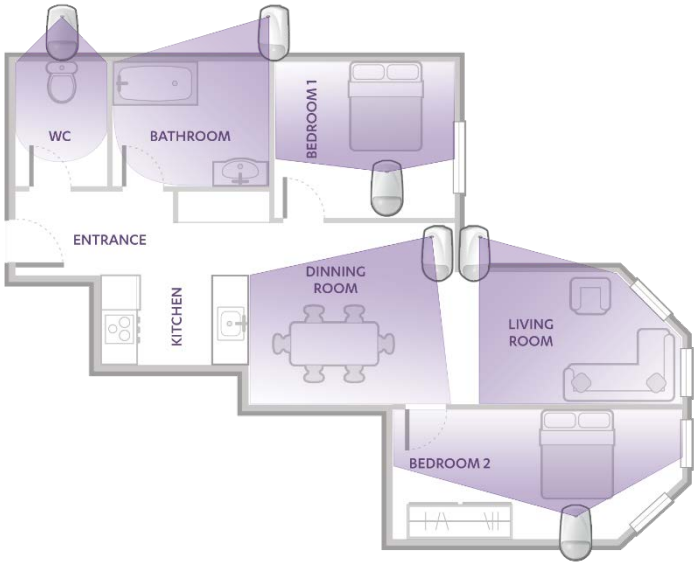


Figure 2: Motion Detector Installation Example

2.1.3 Room Recommendations

To get the best from the PIR, take account of the following recommendations for mounting locations in different room types.

Bedroom		Install the PIR opposite the bed to ensure the entire bed is covered.
Restroom		Install the PIR 30 to 50 cm (1 to 1.6 ft.) above the toilet, depending on the distance from the toilet.
Bathroom		Install the PIR diagonal to the sink and the bathtub or shower cabinet, and if possible, not opposite the door.

Combined bathroom

A combined bathroom is a bathroom that includes a toilet. Because this type of bathroom includes two types of activities – bathroom and restroom - it is important to ensure that both activities are monitored separately.

If there is a combined bathroom, you must install an optical limiter in the restroom PIR, to capture the restroom activities. Refer to 2.2 Checking if an Optical Limiter is Required on page 10.

NOTE: In a combined bathroom, **if an optical limiter is fitted to the restroom PIR**, the coverage area of the two PIRs can overlap.

The following figure shows a possible solution for installation in a combined bathroom.

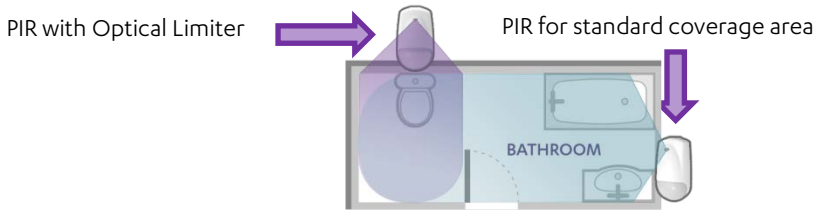


Figure 3: Combined Bathroom Installation

Living room

Install the PIR diagonal to the couch, and if possible, not facing the dining room.

Dining room

Install the PIR diagonal to the dining room table, and if possible, not facing the living room.

Living and dining room

Ensure there is no overlap of the PIR coverage areas when the dining room and living room are combined, or are adjacent and open plan. Install the two PIRs back to back, such that their locations enable separation of the living room and the dining room types of activity event

The following figure shows a possible solution for installation when a living room is adjacent to the dining room.

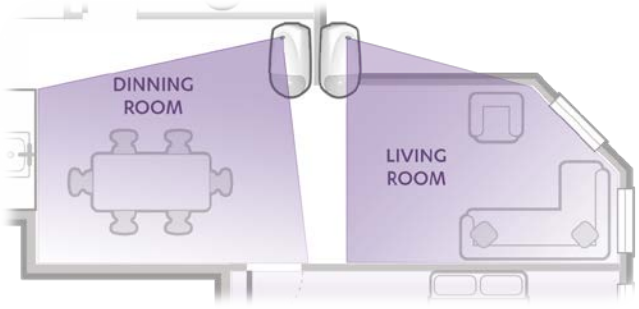


Figure 4: Combined Living Room and Dining Room

2.2. Checking if an Optical Limiter is Required

If the premises include rooms that combine activities, it is important to differentiate these activities by using an optical limiter. For example, where there is a combined bathroom: a bathroom with a toilet. In such a case, an optical limiter should be fitted to the PIR in the restroom.

Instructions for fitting an optical limiter are included in 2.4 Setting Up the PIR on page 11.

The following figure shows the optical limiter.

Figure 5: Optical Limiter

NOTE: The coverage area radius for a PIR with an optical limiter is 0.25 times the installation height. For example, if the PIR is installed at a height of 2 m, the coverage area radius is 0.5 m

2.3. Checking if a Pet Immune Lens is Required

If there are pets on the premises, it is important to differentiate between the movement of the resident and the movement of the pet by using a pet immune lens.

Instructions for fitting a pet immune lens are included in 2.4 Setting Up the PIR on page 11.

The following figure shows the pet immune lens.

Figure 6: Pet Immune Lens

Caution: It is not recommended to install the pet immune lens in a PIR that includes an optical limiter. The coverage area of the PIR may be further reduced.

2.4. Setting Up the PIR

Training Video

To set up the PIR:

1. Identify the location for mounting the PIR. Refer to 2.1 Determining the Best Location on page 4.
2. Clean the surface of the mounting location thoroughly.

3. Release the PIR mounting base by lifting the tab and pushing it forward.

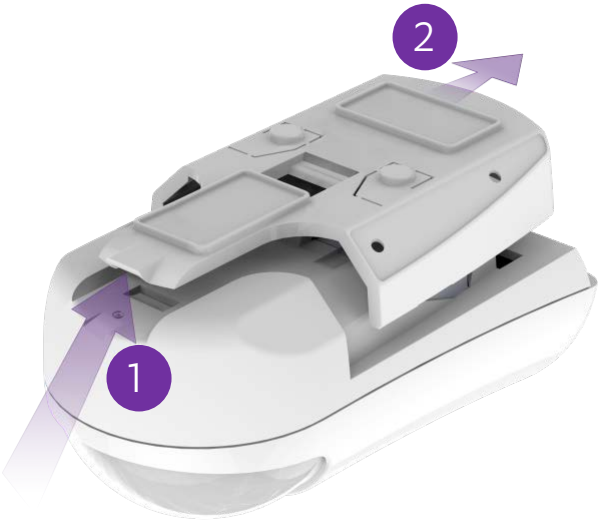


Figure 7: Release the Mounting Base

NOTE: Refer to Using Screws on page 28 for information about installing the PIR using screws.

4. Peel off the protective strips from the mounting tape required for the installation location.

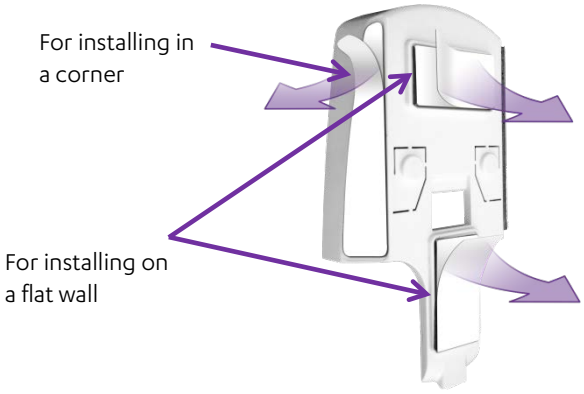


Figure 8: Peel Off the Protective Strips

5. Press the mounting base into place, ensuring it is the right way up.

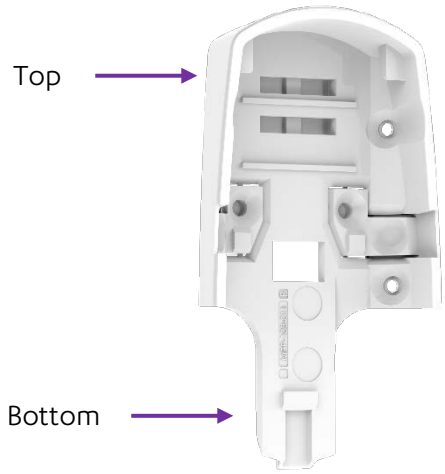


Figure 9: Put the Mounting Base the Right Way Up

6. Remove the battery cover by sliding it upwards.

Figure 10: Open the Battery Cover

7. If the PIR does not require a pet immune lens or an optical limiter, skip ahead to step 16 on page 19.
8. Unscrew the two screws above the battery compartment at the top of the back cover.

Figure 11: Unscrew the Screws

9. Insert a flat screwdriver between the tab of the front panel and the top of the back cover, pushing down and twisting, to separate the front panel and the back cover.

Figure 12: Separate the Front Panel and Back Cover

The following figure shows the front panel and the back cover of the PIR.

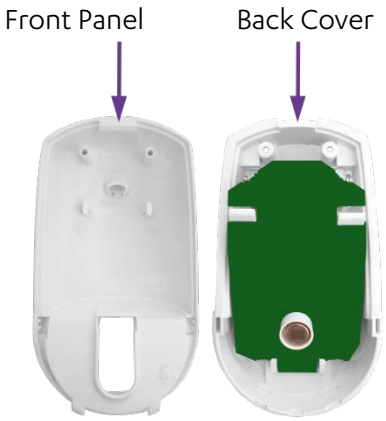


Figure 13: PIR Front Panel and Back Cover

Caution: Be careful not to damage the internal parts of the PIR.

10. To install the **pet immune lens** in the PIR:

Training Video

a. Use a flat screwdriver to release the three latch tabs on the front panel so that the outer lens falls free from the PIR.

Figure 14: PIR Lens Latch Tabs

b. Insert the pet immune lens into the opening for the lens in the PIR front panel. The pet immune lens fits inside the opening of the PIR.

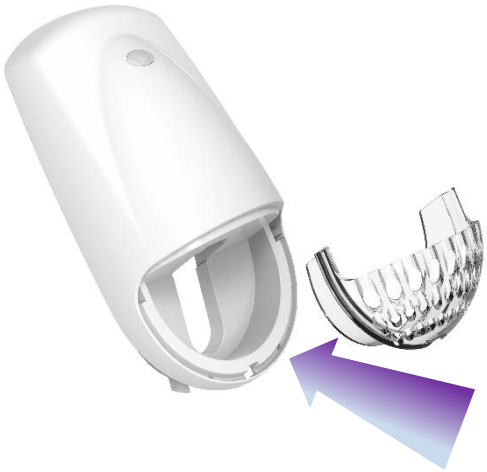


Figure 15: Insert the Pet Immune Lens

c. Insert the PIR outer lens, on top of the pet immune lens, in the groove surrounding the opening for the lenses, putting the outer lens latch tabs into the matching holes.

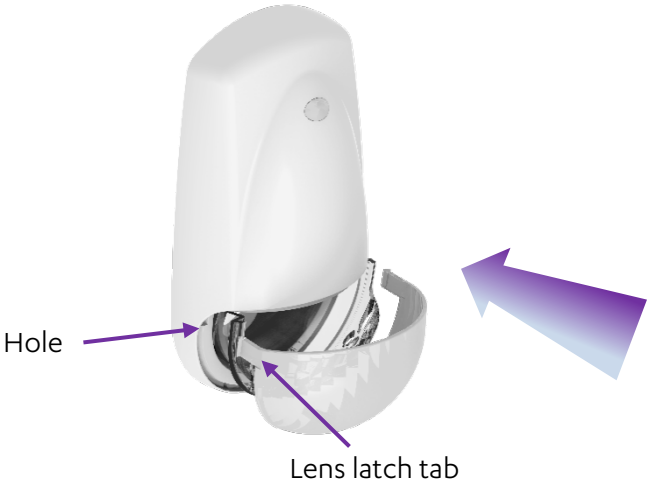


Figure 16: Insert the Lens Tabs

11. To install the **optical limiter**:

    a. Slide the optical limiter into the flat-end slot at the top of the oval opening in the PIR front panel.

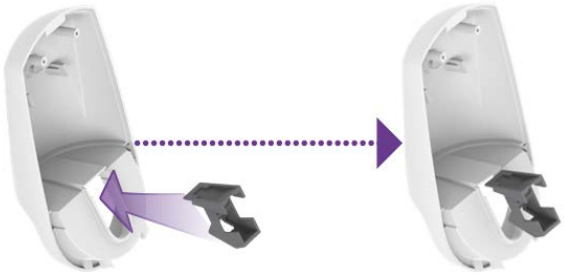


Figure 17: Insert the Optical Limiter

    b. Push the limiter until it completely fits into place. Otherwise, the PIR cannot close properly.

Figure 18: Optical Limiter installed in PIR

12. Insert the tabs, at the bottom of the front panel, into the inner square slots, at the bottom of the back cover.

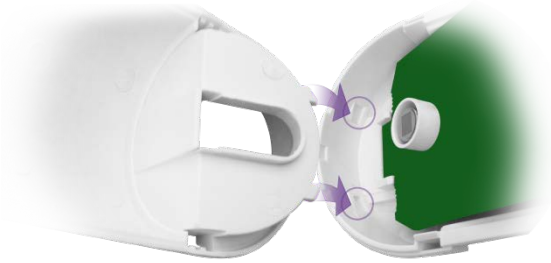


Figure 19: Align and Insert Tabs in Square Slots

13. Put the back cover onto the front cover, aligning the latch tab with the lock tab of the front panel.

Figure 20: Put the Back Cover onto the Front Cover

14. Holding the PIR with the back cover facing you, press your thumbs on the holes for the screws until the latch tab clicks into place.

Figure 21: Press Until Latch Tab Clicks into Place

15. Screw in the two screws above the battery compartment at the top of the back cover.

Figure 22: Screw in the Screws

16. If the PIR is part of a Care@Home™ kit:
    a. Move the PIR at least 2 m (~6 ft. 7 in.) from the CP.
    b. Shake the PIR gently. The rattling sound is the tamper-prevention mechanism.
    c. Insert the battery, observing the correct polarity.

Figure 23 Insert the Battery

When the battery is installed, the LED lights up red, indicating that the PIR has powered up successfully.

d. Skip ahead to step 18 on page 21.

17. If the PIR is **not** part of a Care@Home™ kit:
    a. On the CP, press the **PAIRING** button for three seconds.

Figure 24: Press the CP PAIRING Button

    b. Move the PIR at least 2 m (~6 ft. 7 in.) from the CP.
    c. Shake the PIR gently. The rattling sound is the tamper-prevention mechanism.
    d. Insert the battery, observing the correct polarity.

Figure 25 Insert the Battery

When the battery is installed, the LED lights up red, indicating that the PIR has powered up successfully.

WARNING! A new battery can cause damage if it is incorrectly installed.

e. Ensure that the pairing process is successful. The process can have the following results:

- Success — The CP beeps and the CP ring blinks blue three times.
- Failure — The CP beeps and the CP ring lights up red for two seconds. Try to pair the PIR again.
- Already paired — The CP beeps, the CP ring lights up blue, and the **EMERGENCY** button lights up red.

NOTE: If no additional peripheral devices can be integrated, as when the CP memory is full, the CP beeps and the **EMERGENCY** button ring lights up red.

18. Close the battery compartment cover.
19. Insert the PIR into the mounting base until the PIR clicks into place. Ensure that the lens is pointing downward.

Figure 26: Click the PIR into Place

2.5. Conducting a Walk Test

A **Walk Test** is a function and signal verification check. The test is used to determine the detection area of the PIR.

The **Walk Test** mode starts automatically after the PIR powers up, such as:

- When a new battery is inserted
- After adding and pairing a new PIR with the Care@Home™ system

This mode lasts 10 minutes.

During the **Walk Test**, you can check the detection area of the PIR by walking past it at different points. The LED on the PIR lights up for any motion the PIR detects. The PIR sends a notification of the motion detection event to the CP.

3. Operating the PIR

The PIR monitors activity and reports it by sending notifications to the CP.

3.1. Notifications

The PIR sends notifications to the CP for the following events:

- The PIR detects motion
- The room temperature exceeds the configured temperature threshold
- The PIR battery charge is low
- The PIR tamper switch is disturbed

3.2. Supervision

The PIR is a supervised device. The PIR periodically transmits its status to the CP. If after a pre-defined time the CP does not receive the status message, the CP sends a **Supervision lost** message to the monitoring station.

3.3. Configuring the PIR

You can configure parameters for the PIR using "Project" CMS. For example, you can define how and when the PIR issues notifications to the CP. Refer to the "Project" CMS Reference for the version of "Project" system installed on your resident's premises.

4. Replacing the Battery

When the battery charge is low, the battery must be replaced.

WARNING! A new battery can cause damage if it is incorrectly installed. Be careful to replace the battery only with the same or equivalent to the recommended type. Refer to Error! Reference source not found. Error! Reference source not found. on page Error! Bookmark not defined..

To replace the battery:

1. Release the PIR from the mounting base by lifting the tab and pushing it forward.

Figure 27: Dismount the PIR

2. Remove the battery cover by sliding it upwards.

Figure 28: Remove the Battery Cover

3. Remove the old battery.
4. Shake the PIR gently. The rattling sound is the tamper-prevention mechanism.
5. Insert the new battery, observing the correct polarity.

   When the battery is installed, the LED lights up red, indicating that the PIR has powered up successfully.
6. Close the battery cover.
7. Return the PIR to the mounting base.

5. Specifications

The following table lists all the technical aspects and data about the PIR.

Table 1: Device Technical Specifications

Category	Details	
Part Number	Motion detector	ES700PIR
	Pet immune lens	ESPL05785
Power Supply	Battery	One 3 V CR123A lithium
	Approved manufacturers	GP, Energizer, Duracell
	Nominal battery life	Up to three years
	Power test	Upon power-up and periodically
Optical	Sensor	• Dual element low-noise pyro-ceramic sensor • RFI shielding • Insect immunity – sealed optics
	Lens	White ESI 4th generation DragonflyEye™ multi-zone lens • 12 m (39 ft.) detection range • 90° horizontal, 50° vertical • 102 zones, 6 vertical beams • Daylight immunity
		Temperature compensation for the PIR element
		Optional: Pet immune lens – for pets up to 30 kg, and height 50 cm
		Sensor: Sealed optics for insect immunity
		Optical limiter for spot detection option
Wireless	Bi-directional	End-to-end bi-directional ESI protocol Advanced radio supervision algorithm
	Frequency	FSK modulation: • 869.225 MHz (Europe) • 868.3 MHz (China) • 916.5 MHz (North America and Australia)
	RF coverage	400 m (1,312 ft.) – open air
	Encoding	32-bit ID, over 4 billion combinations
Functional	Main MCU	Advanced false alarm suppression algorithms Advanced gain temperature control
	Immunity	Sealed PCB

Category	Details	
	Multiple detection mechanism	Minimal wait time between detections: 20 seconds (PERS: 2.5 minutes)
	Walk test	Automatic after power-up, for 10 minutes
	Visual indications	LED for detection, tampering, and walk test
Environmental	RFI protection:	Over 30V/m
	Operating temperatures	-10° - 55°C (14° - 131°F)
	Storage temperatures	-20° - 70°C (-4° - 158°F)
	Operating humidity	Up to 93% non-condensing
Physical	Dimensions (H x W x D)	106 x 60 x 51 mm - 4.17 x 2.36 x 2.01 in.
	Weight	84 g (incl. battery) / 0.185 lb.
	Color	Glossy white
	Mounting	Standard ESI wall mount and standard ESI 2-screws ceiling/wall mount
Compliance with Standards	CE	EMC Safety
		  

Appendix A Installation Method Alternatives

There are two ways to install the PIR mounting base:

- Using mounting tape
- Using screws

Before choosing the installation method, consider the following:

- Installation with mounting tape is more common.
- Installation with screws is recommended when installing the PIR at an angle.

Using Mounting Tape

Mounting tape is approved for the following surfaces:

- ABS
- Polycarbonate (PC)
- Aluminum
- Galvanized Steel
- Enameled Steel
- Stainless Steel
- Nickel Coated ABS
- PVC
- Glass/Epoxy
- Ceramic
- PBT
- Glass (with and without silane coating)
- Acrylic/Polyurethane paint
- Polyester Paint

Using Screws

You can use screws to install the PIR:

- Flat on a wall

- At an angle facing to the right or the left
- In a corner

Required Equipment

Before beginning, prepare the following equipment:

- A drill with a standard bit
- 3 X 35 DIN 7982 C screws and wall anchors:
  - 2 for installation on a flat wall
  - 3 for installation at an angle
  - 6 for installation in a corner
- A standard Philips screwdriver

Installing the PIR with Screws

To install the PIR using screws:

1. Release the PIR mounting base by lifting the tab and pushing it forward.
2. Clean the surface where the PIR is to be installed.
3. Use a flat screwdriver to clear the holes appropriate for the mounting location. Refer to **Screw Holes** on page 29.
4. Place and hold the mounting base on the desired location and mark the drilling spots.
5. Drill the holes.
6. Insert wall anchors if needed.
7. Place the mounting base over the wall anchors and screw in the screws.

Screw Holes

The following figures show the screw holes to use for each type of installation. The corner support holes are blocked by the mounting tape. You can drill through the tape.

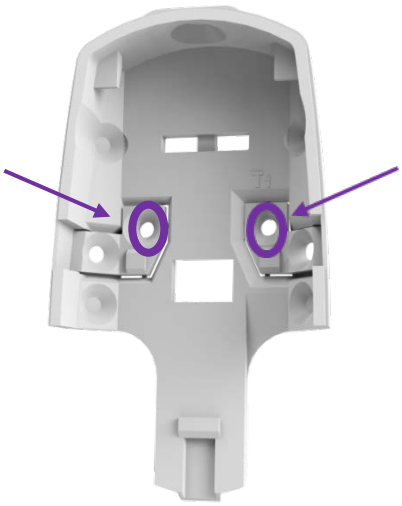


Figure 29: Holes for Installing on a Flat Wall

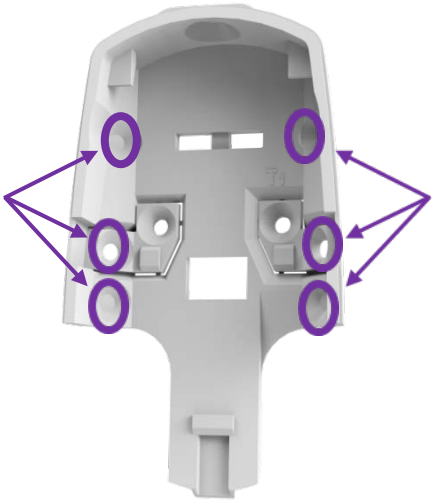


Figure 30: Holes for Installing in a Corner

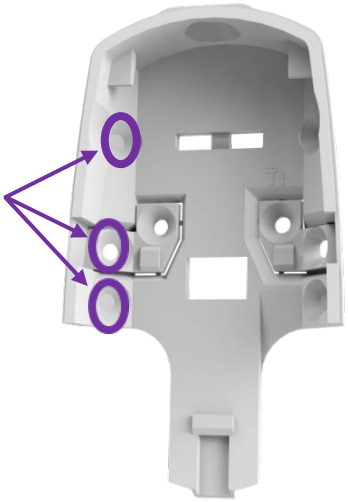


Figure 31: Holes for Installing on Left Side

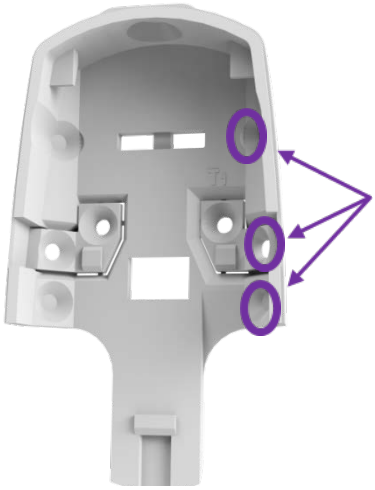


Figure 32: Holes for Installing on Right Side

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