Wireless Passive Infra-Red Detector

N517

Rhino Part # PIRW3

Instructions

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1. Introduction

The Rhino PIRW is a high quality infrared body movement sensor, which is battery operated and communicates with a compatible Rhino receiver via radio frequency (RF) transmission. This detector is easy to install, provides excellent detection sensitivity and has a long battery life (approximately 3 years). This sensor can transmit four different codes to the receiver:

- Alarm – sent when a valid movement is detected
- Tamper – sent when the detector case is opened
- Supervision – sent every 2 ½ hours to the receiver
- Low Battery – sent when the batteries need replacing

1.1. Important notes

- NEVER touch the pyro sensor
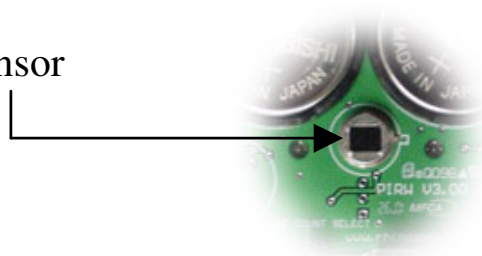
- During the warm up period, (first 3 minutes after installing the batteries) the detector will not respond to the tamper switch or to movement in front of the detector. You must wait 3 minutes before it will respond properly.

- This detector has Intelligent Power Saving (IPS). This means that in normal operation the lights will not flash every time you move in front of the detector. When the red light flashes on for 1 second, this means that the detector has picked up and validated body movement (or an intruder) and an alarm code is transmitted. The detector will now go into IPS mode for approximately 3 minutes. During this time the detector will not trigger and no lights will turn on (see section 4 for more information).

2. Setup

2.1. Powering the detector

When you first remove the detector from its original box it is not powered, although the batteries are in place. To make the detector active, slide the piece of plastic from beneath one of the battery terminals (in the direction indicated in figure 1). As soon as the plastic is removed the red and green lights will flash for a few seconds.

If they do not flash, the plastic has not been removed properly. You may need to clean the battery terminal or where the terminal meets the battery. If all the plastic has been cleared and the detector is still not responding then remove the battery, which the plastic was covering, then slide the battery back into its original position. If after this you still don't have any response from the detector then the batteries may be flat, in which case you may get new batteries from your Rhino dealer. If the batteries are OK and there is still no operation the detector should be replaced. Contact RhinoCo Technical Support on:
(02) 4577 4708 (within Australia)
+61 2 4577 4708 (International)

**pull
out**
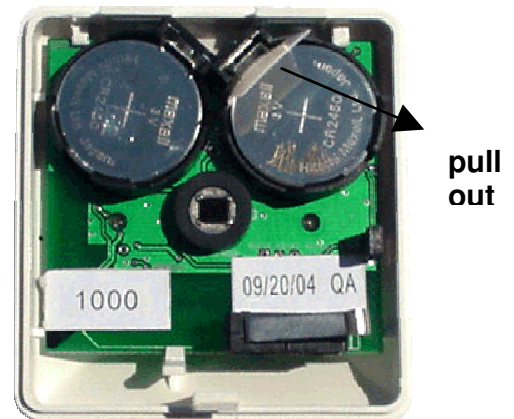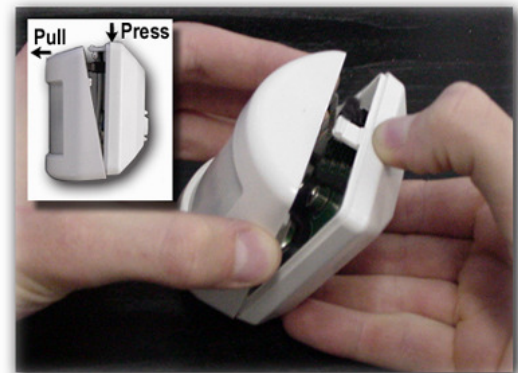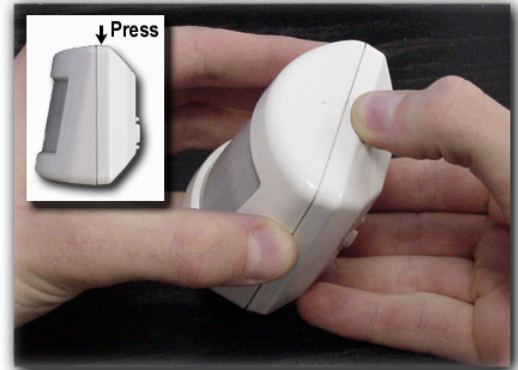
Figure 1

2.2. Warm up period

You must wait approximately 3 minutes for the detector to warm up after connecting the batteries. This time starts from when the detector starts flashing both red and green lights after removing the piece of plastic from under one of the battery terminals. During this period the detector **will not** respond and should be left untouched until the 3 minute period is up. 3 minutes after power up, the green and red lights will flash together 6 times to indicate the detector is exiting test mode. The detector will now automatically enter **Intelligent Power Saving** (IPS) mode (see section 4.2).

WAIT 3 MINUTES

3. Installation

Firstly, the mounting bracket must be fixed to the wall using the self-tapping screw and other accessories supplied. Mounting must be at a minimum height of 1.2 metres and maximum of 2.1 metres (preferred).

3.1. Tips for positioning

- This sensor utilises the very latest in detection processing technology to reduce the possibility of false alarms. However, correct mounting of the detector is critical to ensure best detection or "catch" performance. You cannot just screw the sensor directly to a wall up high in a corner and expect best performance. Thoroughly walk test each sensor, and if detection is not acceptable in the location you have chosen, adjust the angle of the sensor slightly & re-test. You will find that a slight up/down angle change may improve catch performance significantly.

Figure 2: Suggested mounting angle at 2.1m

- Mount the detector on your wall using the swivel mount provided at a minimum height of 1.2 metres and maximum of 2.1 metres (preferred). Make sure the detector is a minimum of 5 metres away from your receiver so it doesn't swamp the receiver with a signal that is too strong to decode.

- Always mount your PIRW so that an intruder has to walk across its zones, i.e. walk past the detector, not towards it.

- **DON'T** mount detector facing glass doors or windows. Always mount above windows and doors to look inside.

- **DON'T** mount detector facing hot areas or areas where the temperature may change suddenly, e.g. open fire places, direct sunlight or air conditioning vents.

- Select a location where the detector can provide the best detecting range. Always ensure that you do not cover an area with multiple detectors, so as to avoid simultaneous transmission back to the receiver in your alarm control panel. The receiver can only decode one coded signal at any given time.

- If the unit is mounted close to metal frames or doors, this may reduce the radio transmitting range.

- The detector is not waterproof and is designed for indoor use only.

4. Testing & Operation

It is vital that the detector is tested carefully for each installation. Placing the unit into test mode is the best way of checking the detector. At 25°Celsius, the detector should have a detection range of approximately 10 metres and a scope angle of 90°, i.e. 45° either side of the center position straight ahead of the lens.

4.1. Test Mode

Test mode, as its name implies, is used for testing the detection range and testing the radio transmission back to the receiver. To place the detector in test mode do the following:
- Remove the front cover.
- The green and red lights will flash together, 6 times, to indicate that the detector has entered test mode.
- Replace the front cover.
- The detector will stay in test mode for 3 minutes.
- The green and red lights will flash together, 6 times, to indicate that the detector is exiting test mode.

During test mode the detector will flash the green light when you move into an infrared beam zone or move out of the other side of that infrared beam zone (see section 4.3 for more information on how the sensor detects movement). Each time the green light flashes this is called a pulse.

If the detector is set to 2 pulse counts (most sensitive) then the red light will flash if there are 2 green flashes within 10 seconds. If the detector is set to 3 pulse counts (least sensitive) then the red light will flash if there are 3 green flashes within 10 seconds.

The red light turning on indicates that the detector has sensed valid movement and that the alarm code signal has been sent to the receiver.

4.2. Intelligent Power Saving (IPS) & Normal Operation

This detector has Intelligent Power Saving (IPS). This means that in normal operation or normal mode the red light will indicate valid movement detection but the green light will not turn on at all. **Lights will not flash every time you move in front of the detector.** When the red light flashes on for 1 second, this means that the detector has picked up and validated body movement (or an intruder). The detector will now go into IPS mode for approximately 3 minutes. During this time the detector will not trigger and no lights will turn on. After this 3 minutes of IPS the detector will again be ready to sense for any movement in the room. If the sensor detects another valid body movement anytime after the 3 minutes of IPS then it will go back into IPS mode again for 3 minutes and so on. There is no need for the detector to trigger more than once every 3 minutes as your alarm system should be set to sound your siren for 5 minutes after being triggered.

In summary, the detector will only trigger and flash the red light once every 3 minutes in its normal operation to save battery life. The green light will stay off.

4.3. Adjusting the Sensitivity

PULSE COUNT SELECT Jumper	
ON	Least sensitive – 3 pulse counts
OFF	Most sensitive – 2 pulse counts
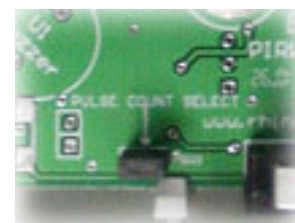
The sensitivity of the detector can be changed by either removing the 'Pulse Count Select' jumper or by placing it across both pins. When the jumper is placed across both pins (default), then the detector is set to 3 pulse counts (least sensitive). When the jumper is removed or only attached to 1 of the pins, then the detector is set to 2 pulse counts (most sensitive).

Once you have set the jumper, you must press the tamper switch in for 1 second then release it for the setting to become active. Now you can place the front cover back on the detector.

Tamper Switch

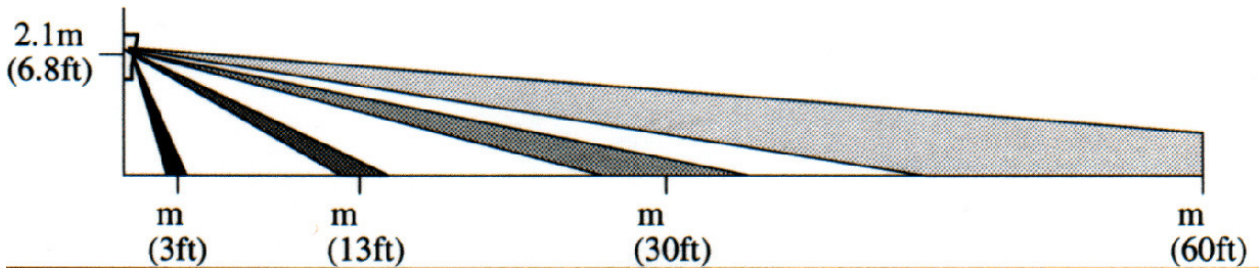## 4.4. Dual Edge Sensing (DES) technology 'explained'

Figure 3 – side view, detection pattern in optimal temperature environment

This detector has Dual Edge Sensing (DES) Technology, developed to eliminate false alarms yet still provide maximum security.

The detector uses a pattern of infrared beam zones to sense body movement. The pattern is shown in figure 3 and figure 4.

Each time you walk into or out of an infrared beam zone this will be sensed and processed by the DES technology built into the detector. The red trigger light will not turn on until the detector has made a valid movement detection in normal mode. This will only happen if the detector is not in Intelligent Power Saving (IPS) mode.

Figure 4 – detection pattern in the optimal temperature environment

Remember that the green light does not operate in normal mode.

TOP VIEW   ✓

= infrared beam zones

**Figure 5 – least
sensitive trigger**

Triggering the detector when set to "<u>least sensitive</u>"

(Default setting)

In figure 5, a body moving from position 1 to position 2, into the infrared beam zone, will create a pulse. Moving from position 2 to 3, out of the other side of the same infrared beam zone, will create a second pulse. Additional movement from position 3 to 4 will create a third pulse. If the detector is set to "least sensitive" (default) and the body moves from position 1 to position 4 within 10 seconds then the detector will have received 3 pulses in 10 seconds. This means the detector will have made a valid movement detection and will trigger, indicated by the red light (only if in test mode or normal mode but not in IPS mode).

This also applies if moving in the opposite direction to the figures 5 and 6.

Figure 6 shows another way in which the detector may be triggered when the detector is set to "least sensitive".

**Figure 6 – least
sensitive trigger**

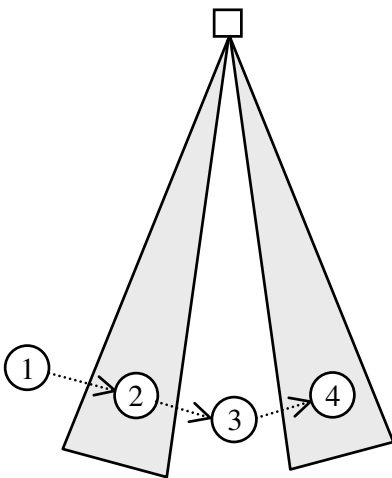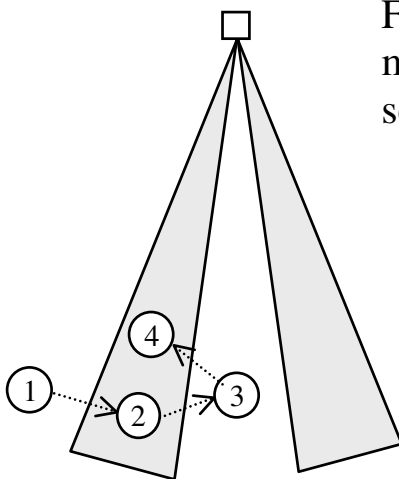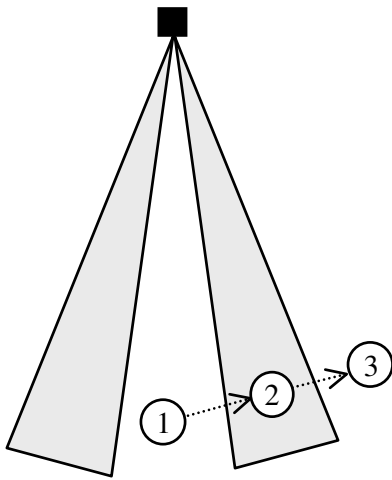✓ **Triggering the detector when set to "most sensitive"**

Figure 7 – most sensitive trigger

In figure 7, a body moving from position 1 to position 2, into the infrared beam zone, will create a pulse. Moving from position 2 to 3, out of the other side of the same infrared beam zone, will create another pulse. If the detector is set to "most sensitive" and the body moves from position 1 to position 3 within 10 seconds then the detector will have received 2 pulses in 10 seconds. This means the detector will have made a valid movement detection and will trigger, indicated by the red light (only if in test mode or normal mode but not in IPS mode). This also applies if the body moves in the opposite direction.

✗ **No trigger body movements**
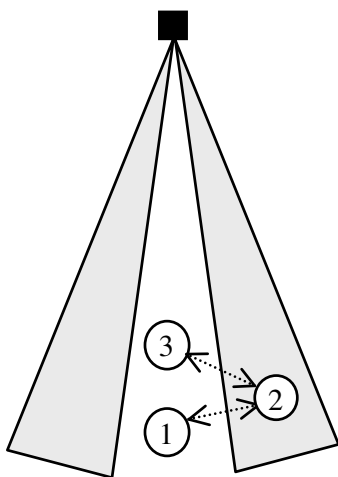
Figure 8 – no trigger

No trigger body movements are body movements which are too small to be recognized as valid body movements to trigger the detector.

In the example, shown by figure 8, a body walking into one side of the infrared beam zone, then back out the same side of the infrared beam zone will not trigger the detector. A body moving from position 1 to 2, into the infrared beam zone, will only create pulsing. A body moving from position 2 back to position 1 or from position 2 to position 3 (out of the same side of the infrared beam zone) may create further pulses but will not trigger the detector. This also applies if the body is moving in and out of the infrared beam zone from the other side.

4.5. The Tamper Switch

The tamper switch will open whenever the front cover of the detector is removed. A tamper signal is automatically transmitted as well as a normal trigger signal. Each time this occurs the detector will also automatically enter test mode.

4.6. Low battery warning

If the detector has near flat batteries, then red light will flash 6 times in a row instead of once. The detector will send a low battery radio transmission at this time. The batteries should be replaced immediately.

Test for low battery by removing the front cover to release the tamper switch. When the cover is opened and the tamper switch is released, the detector will enter test mode. Both red & green lights flash 6 times. If the detector has low battery voltage then the red light will flash an additional 6 times in a row. The sensor will send a low battery radio transmission to your receiver. The batteries should be replaced immediately.

The detector constantly monitors for low battery and will send a low battery transmission within 2 ½ hours of identifying a low battery.

4.7. Supervision

Every 2½ hours (approximately) the detector will send a supervision transmission. This is used as a security measure to alert the user(s) of the system if a detector is no longer functioning or if the detector has been taken out of receiving range of the wireless system.

Although as standard the detector will send supervision reports this does not mean that the receiver connected to your alarm has been wired up or programmed to utilise this feature. Please refer to your installation notes, system notes or the installer of the system to find out whether your system supports this feature.

5. Maintenance

5.1. Replacing the batteries

The batteries can be removed by depressing the battery retention clip by pushing it in the direction indicated by the arrow in the image to the right. The new batteries must be handled only by the edges as leaving fingerprints can cause a poor battery connection over time. Fingerprints can be cleaned off the batteries with a soft cloth and some alcohol solution.
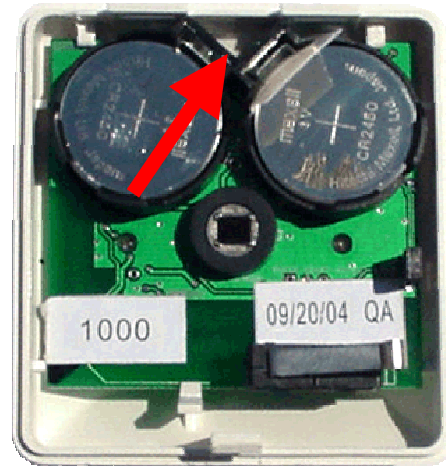
The new batteries can now be placed, bottom edge first, into the battery holder and then pushed down till they clip into place. Just after each battery is replaced the lights will begin flashing 6 times to confirm the detector is now powered. The warm up period now applies (see section 2.2).

When replacing the batteries you must take the following into consideration:
- You must replace both batteries at the same time. Don't just replace one of them.
- Be sure not to touch the pyro sensor on the removal or replacement of the batteries.
- Carry out a walk test to ensure the detector is operating correctly.

Battery Specifications

Battery Type	2 x Lithium button cells
Model	CR2450
Voltage	3 Volts

5.2. Cleaning the pyro sensor

The pyro sensor must be clean at all times for optimum performance. If the pyro sensor appears to have any dust, dirt or fingerprints on it, then it should be cleaned.

To clean the pyro, use a soft cotton cloth (lint free and not a tissue), which has been dampened with Metholated Spirits (Alcohol). Gently wipe across the window of the pyro sensor with the dampened cloth.

5.3. Cleaning the case and lense

Detectors are often left in position for long periods and spiders or other pests might stay around the detector. It is important that the lens, especially, is kept clean of any spider webs or pests from being in front of it. It is recommended to keep the whole case clean by wiping over it with a soft cloth to remove dust, pests or other obstructions as required. This will also reduce the risk of a false alarm due to pests. Do not spray on or near the lens with insect/repellant spray. Remember not to move the position or angle of the detector as it may affect the performance of the detector. If in doubt, carry out a walk test to ensure the detector is operating correctly.

6. Warranty

While this system is an advanced design security system, it does not offer guaranteed protection against burglary, fire or any other emergency. Any alarm system, whether commercial or residential, is subject to compromise or failure to warn for a variety of reasons. For example:

- Intruders may gain access through unprotected openings, or have the technical sophistication to bypass an alarm sensor or disconnect an alarm warning device.

- Intrusion detectors (e.g., passive infrared detectors), smoke detectors, and many other sensing devices will not work without power. Battery operated devices will not work without batteries, with dead batteries or if the batteries are not put in properly. Devices powered solely by AC will not work if their AC power supply is cut off for any reason, however briefly.

- Signals sent by wireless transmitters may be blocked or reflected by metal before they reach the alarm receiver. Even if the signal path has been recently checked during a weekly test, blockage can occur if a metal object is moved into the path. A user may not be able to reach a panic or emergency button quickly enough.

- While smoke detectors have played a key role in reducing residential fire deaths, they may not activate or provide early warning in as many as 35% of all fires, for a variety of reasons, according to data published by the US Federal Emergency Management Agency (Figures from USA Statistics only). Some of the reasons smoke detectors used in conjunction with this system may not work are as follows: Smoke detectors may have been improperly installed and positioned. Smoke detectors may not sense fires that start where smoke cannot reach the detectors, such as in chimneys, in walls, or roofs, or on the other side of closed doors. Smoke detectors may not sense a fire on another level of a residence or building. A second floor detector, for example, may not sense a first floor or garage fire. Moreover, smoke detectors have sensing limitations. No smoke detector can sense every kind of fire. In general, detectors may not always warn about fires caused by carelessness and safety hazards like smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson. Depending on the nature of the fire and/or the location of the smoke detectors, the detector, even if it operates as anticipated, may not provide sufficient warning to allow all occupants to escape in time to prevent injury or death.

- Passive Infrared Motion Detectors can only detect intrusion within the designed ranges as diagrammed in their installation manual. Passive Infrared Detectors do not provide volumetric area protection. They do create multiple beams of protection, and intrusion can only be detected in unobstructed areas covered by the beams. They cannot detect motion or intrusion that takes place behind walls, ceilings, floors, closed doors, glass partitions, glass doors, or window. Mechanical tampering, masking, painting, or spraying of any material on the mirrors, windows or any part of the optical system can reduce their detection ability. Passive Infrared

Detectors sense changes in temperature; however, as the ambient temperature of the protected area approaches the temperature range of 32°c to 65°c, the detection performance can decrease.

- Alarm warning devices such as sirens, bells or horns may not alert people or wake up sleepers who are located on the other side of closed or partly open doors. If warning devices sound on a different level of the residence from the bedrooms, then they are less likely to waken or alert people inside the bedrooms. Even persons who are awake may not hear the warning if the alarm is muffled by noise from a stereo, radio, air conditioner or other appliances, or by passing traffic. Finally, alarm warning devices, however loud, may not warn hearing-impaired people or waken deep sleepers.

- Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily out of service. Telephone lines are also subject to compromise by sophisticated intruders.

- Even if the system responds to the emergency as intended, however, occupants may have insufficient time to protect themselves from the emergency situation. In the case of a monitored alarm system, authorities may not respond appropriately.

- This equipment, like other electrical devices, is subject to component failure. Even though this equipment is designed to last as long as 10 years, the electronic components could fail at any time.

- The most common cause of an alarm system not functioning when an intrusion or fire occurs is inadequate maintenance. This alarm system should be tested weekly to make sure all sensors are working properly.

- Installing an alarm system may make one eligible for lower insurance rates, but an alarm system is not a substitute for insurance. Homeowners, property owners and renters should continue to act prudently in protecting themselves and continue to insure their lives and property.

We continue to develop new and improved protection devices. Users of alarm systems owe it to themselves and their loved ones to learn about these developments.

LIMITED WARRANTY

Cornick Pty Ltd (ABN 74 001 621 610) (Seller), warrants its products to be in conformance with its own plans and specifications and to be free from defects in materials and workmanship under normal use and service for twelve months from the date of original purchase. Sellers obligation shall be limited to repairing or replacing, at its option, free of charge for materials or labor, any part which is proved not in compliance with Sellers specifications or proves defective in materials or workmanship under normal use and service. Seller shall have no obligation under this Limited Warranty or otherwise if the product is altered or improperly repaired or serviced by anyone other than Seller. For warranty service, return transportation prepaid, to 9 Hannabus Place Mulgrave NSW 2756. Seller has no obligation to attend the buyer's location to retrieve the goods or make repairs onsite.

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