PIR 915
Wireless Passive Infrared Sensor Radioenge

User Manual

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1 Presentation

The PIR 915 Radioenge wireless passive infrared sensor is a presence detector that uses digital signal processing with artificial intelligence to reduce the occurrence of false alarms. The sensor operates with encrypted bidirectional wireless communication, ensuring confirmation of receipt of each detection by the RX 915 Receiver, also ensuring the security of the transmitted information and making impossible any attempt of cloning or *sniffing*. The PIR 915 sensor performs periodic test transmissions (keepalive) of the battery level and signal level, making it possible to diagnose anomalies or malfunctions.

The PIR 915 uses low-power technology to enable battery life up to 5 years. [1] RF modulation employs *LoRa*^{TM} technology, which has long range and and less susceptibility to interference.

This sensor is compatible with the RX 915 Receiver.

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[1]The battery life depends on factors such as the flow of people in the environment in which the sensor was installed and the length of time the receiver remains armed per day.

2   Technical Specifications

Type of sensor	Passive Dual Element
Detection range	12 m
Detection Angle	91º
Installation height	2,1 m (recommended)
battery	CR123A Lithium (3V, 1440 mAh)
Current consumption	11 μA (ativo), 3 μA (inativo)
Operation Frequency	915 MHz
RF Power	14 dBm

3   Features

- Digital signal processing with artificial intelligence (neural network).

- Encrypted bidirectional wireless communication.

- Retry the transmission if the receiver do not send an ACK.

- Configurable keepalive: : 2, 5, 10 or 15 minutes.

- 3 sensitivity settings, with or without artificial intelligence.

- Installer Mode - LED Indicates the signal level between sensor and receiver.

- Battery level monitored.

4   Instalation

4.1   Pairing

To pair the sensor with the RX915 Radioenge receiver:

1) Enter the receiver pairing mode by pressing the PROG button for 2 seconds. The relay 1 LED will blink;

2) Press the PROG button again to select the relay that a selected device will be paired to.

3) On the **PIR 915** sensor, press PROG until the LED lights up. After that, release the button;

4) When the receiver receives a pairing packet and pairs successfully, it will confirm by returning to normal mode, and the **PIR 915** LED will blink 8 times.
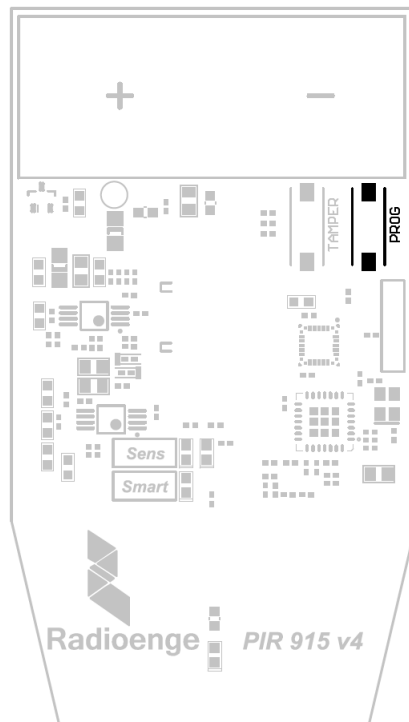

Figure 1: PROG button used for pairing

⚠️ ***Warning!*** *Touching the infrared sensor may damage it or cause malfunction. Wipe the surface with a soft cloth and isopropyl alcohol.*

4.2   Unpairing

To unpair the sensor from the receiver RX 915 Radioenge:

1) Enter the receiver pairing mode by pressing the PROG button for 2 seconds;

2) Press the PROG button 4 times (until all 4 LEDs are blinking);

3) Press and hold the PROG button on the **PIR 915** sensor until its LED lights up, then release it. The receiver should return to normal mode and The LED of the **PIR 915** should blink 8 times rapidly at the end of the process indicating successful unpairing;

⚠️ ***Warning!*** *If the sensor is not used and is already paired with a receiver, it is important to perform its unpairing. If the receiver do not receive the keepalive of a sensor in 1 hour, it will open the relay in which the sensor was paired informing that it is absent.*

4.3   Positioning the sensor

Installed at a height of 2.1 m, the PIR 915 sensor has a coverage radius of 1.5 m up to 12 m away. For larger environments it is recommended to install the sensor in a vertical position for greater range. In smaller environments it is recommended to install the sensor tilted down to cover the smaller area.

You should avoid installing the sensor facing windows, air conditioners, heaters or in places where there are air currents transverse to the sensing beams of the sensor, these beams are represented in Figure 2.

Recomenda-se instalar o sensor em áreas onde a movimentação de pessoas é principalmente transversal aos feixes de detecção do sensor.
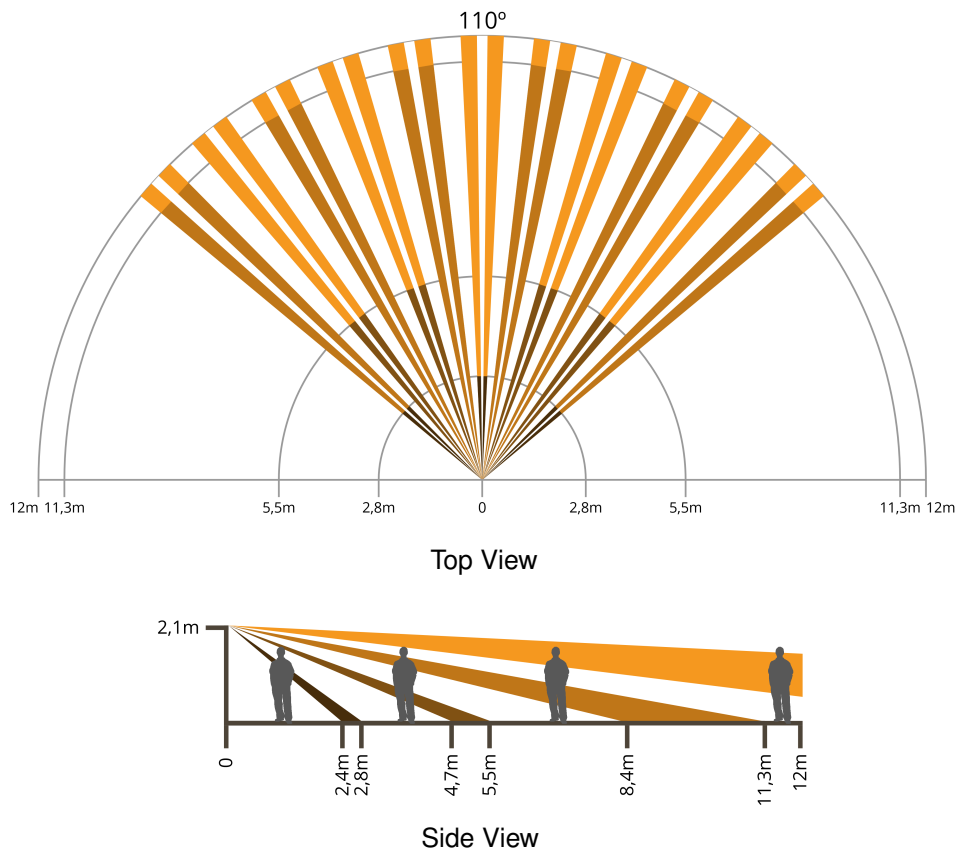
Top View

Side View

Figure 2: Beam Pattern

4.4   Installer Mode

The PIR 915 sensor has a test mode that allows to measure both the signal quality and the detection area. By pressing the TAMPER button briefly, the sensor will enter test mode for 3 minutes. In this period he will continually detect movement and transmit events. You can walk through the environment that must be protected by observing the sensor LED, which will indicate the detection with a long blink, followed by quick blinks that indicate the quality of the signal. If necessary, reposition the sensor for better detection coverage and RF reach.
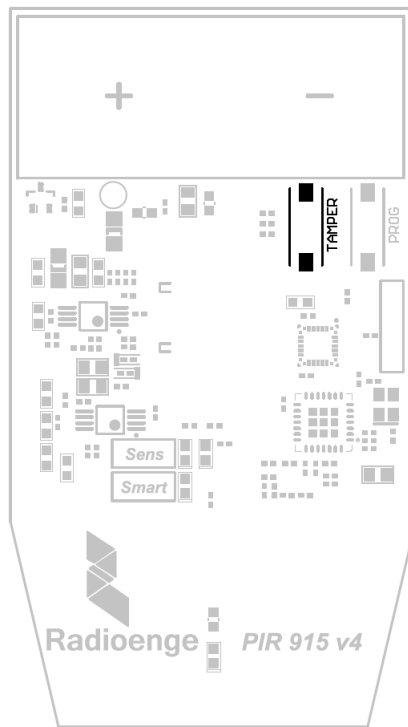

Figure 3: TAMPER Button

Signal quality is verified through the following range of short LED flashes:

- No blink after detection in installer mode: insufficient signal.

- 1 blink: weak signal.

- 2 blinks: good signal.

- 3 blinks: strong signal.

It is recommended to operate with the good or strong signal. If the signal is insufficient, reposition the sensor in a region with better reception.

5   Operation

When connecting the battery to the sensor, the LED should blink 3 times. If it is registered, the sensor will communicate with the central or receiver and indicate the successful communication with 1 quick blink on the LED indicating that it transmitted the keepalive to the receiver. If the sensor has not been paired it will enter idle mode with low power consumption.

5.1   Sensibility Adjustment

The PIR 915 sensor has 3 detection sensitivity settings and the option to enable or disable artificial intelligence on detection.

To configure:

Press and hold the **PROG** button for about 10 seconds. The **Sens** and **Smart** LEDs will light indicating the current configuration state.

To change the parameters click the PROG button.

To change which option to change, press TAMPER.

Press the TAMPER button again to exit.

The low sensitivity mode is shown when only the left LED is lit (Located next to the writing "Sens"). The most sensitive mode is indicated when both LEDs are on.

Figure 4: Sensibility Levels

The **Smart** LED indicates whether the artificial intelligence is active. It is on when the LED is lit or off when the LED is off.
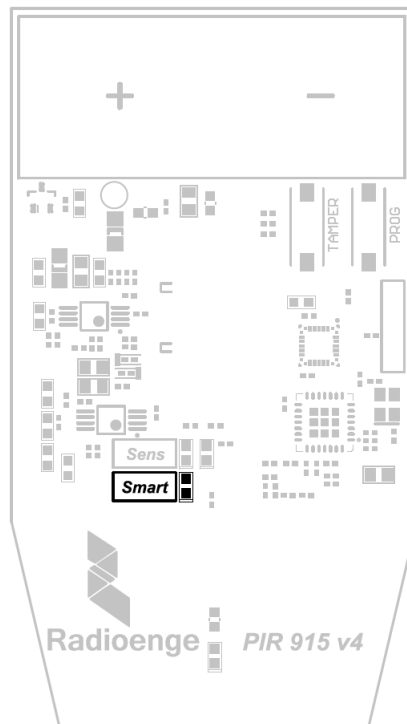

Figure 5: Smart LED - indicates if artificial intelligence is active

The artificial intelligence offers the sensor more reliability against false detections, as it is able to differentiate the movement of people from temperature changes or drafts of air. This feature, which can be used with any sensitivity, is suitable for environments where there is a high false detection count.

Examples of environments and recommended sensitivities:

- In environments with few air currents or few windows, you can configure the sensor for maximum sensitivity.

- In environments with some airflow, many windows and sunlight, you can configure the sensor for medium sensitivity.

  In semi-open environments, with drafts, many windows and sunlight, curtains or blinds, the least sensitivity is recommended.

It is up to the installer to recognize the best positioning and sensitivity for each environment.

5.2   Keepalive

The keepalive period can be defined in the jumper Keepalive at anytime. It can be configured to send a keepalive signal every 2, 5, 10, or 15 minutes. If no jumper is inserted, the sensors will send a keepalive every 15 minutes by default. Every X minutes the sensor sends a periodic test signal to the receiver containing the RF signal level and the battery level information. If the receiver checks that the sensor battery is low or does not receive a keepalive in 1 hour, the relay in which the sensor was paired will trigger.

This feature allows the receiver and the alarm central unit connected to the receiver to detect a malfunctioning sensor.

5.3   Detection

When the receiver is armed (without the ”Arma via PGM” jumper OR, if the jumper is on, the Alarm central connected to the PGM borne is armed) it will indicate it to the PIR sensor in its next periodic test (in up to 15 minutes) that it must enter into active mode. In case of a motion detection, the sensor transmits a packet to the receiver. The receiver responds with a confirmation of reception. Each transmission is indicated on the PIR 915 by a long LED blink. After confirmation from the receiver, the sensor goes into idle mode for 5 seconds without detecting movement. If the sensor receives no response, it will repeat the transmission up to 10 times at intervals of approximately 5 seconds. After 3 detections within 5 minutes (with receiver acknowledge), the sensor goes into idle mode for 5 min in order to save battery. After this, the PIR sensor starts detecting again.

When the alarm control panel or receiver is disarmed, the sensor goes into idle mode with very low power consumption, without detection or sending of detections. However, it keeps sending keepalive packets.

6   Contact Us

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