

1. Introduction

The SA-01P Digital Wireless Pet Immune Passive Infrared (PIR) Motion Detector is a high-performance ultra low power intrusion sensor made with the highest level of SMD components and microprocessor technologies, making it ideal for both residential and commercial usage. This unit works with Rosslare's control panels.

The PIR senses slight motion within a coverage pattern by detecting infrared energy with a pyroelectric sensor. Serving as an anti-intrusion sensor, the PIR can monitor open space within line of sight while ignoring house pets and other small animals, thus reducing false alarms significantly.

The SA-01P uses a pet lens with fuzzy logic implementing a special algorithm to improve human detection while at the same time ignoring pets and other small animals thus reducing false alarms. It also provides digital temperature compensation and self-test capability.

For high-security, the SA-01P is supplied with a back and cover tamper which detects tampering with the sensor if the case is opened or an attempt is made to remove it from the wall.

As a wireless device, the SA-01P includes a supervision mechanism as well as features such as walk and RF transmission test functions, movement and speed spectrum analysis, selectable pulse counting, ultra-bright LED, cover and wall tamper detection, ultra-low current consumption, APS (Auto Power Save) technology, and automatic low battery detection. The SA-01P also has an optional mount bracket.



Caution: Changes or modifications to this equipment not expressly approved by the party responsible for compliance (Rosslare Ltd.) could void the user's authority to operate the equipment.

2. Technical Specifications

2.1 Optical Characteristics

Lens Type: Pet immune multi-zone, high density polytilan type

Optical Filter: White light protection

Maximum Coverage: 14 x 14 m (45.9 x 45.9 ft) 88°

Vertical Adjustment: By slot (+/- 2°)

2.2 Electrical Characteristics

Battery type: CR123 (3V/1300mAh)

Current consumptions: Standby 15µA, 10mA transmission.

Battery life (nominal): 3 years (150tr/day)

Detector Type: Dual pyro IR element (IR filter 5µm±14µm)

Alarm Signaling: Red LED 2 seconds on event transmission: alarm, tamper, low battery.

Sensitivity: 2 levels fuzzy logic (jumper setting)

Speed Detect: 0.2M/s±5M/sΔt=1.1°C (0.66 ft/s±16.4 ft/sΔt=2° F)

Pet Immune: Up to 25Kg.

Temperature Compensation: Digital dual slope (+/- 1°C)

Tamper Switches: Back & cover tamper

Supervisory Signals: Electronic malfunction or temperature out of range is indicated by a flashing LED.

Arming types: Normal: 2 minutes sleep following last alarm
Dynamic: 2 minutes following last movement (retriggerable).

Test modes: walk test (no sleep) 1 min, radio test (10 transmission) by push button.

RF Characteristics

RF Frequency: G=433.92MHz and H=868.35MHz

RFI Protection: >20 V/m up to 1000 MHz

2.3 Environmental Characteristics

Operating Environment: Indoor use

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 0 to 95% (non-condensing)

2.4 Physical Characteristics

Dimensions: 90mm x 65mm x 52mm (3.5 in. x 2.5 in. x 2.2 in.)

Weight: 84.2 grams (2.97 oz)

Note: The SA-01P is an indoor PIR, and should not be used in outdoor applications.

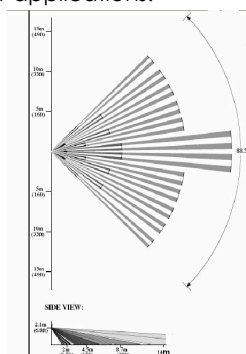


Figure 1: Lens Top and Side View

3. SA-01P General Features

These are the main features of the SA-01P:

- **Advanced micro-controller electronics:** 10-bit A-to-D and advanced algorithms for superior movement speed spectrum analysis.
- **Shielded dual-element pyro:** Inside a dust-proof chamber designed to reduce thermal changes and insect protection.
- **Two levels of sensitivity:** Normal and harsh environments, by jumper selection.
- **Adjustable height calibration of PCB:** The detector may be adjusted and placed at any height from 1.8 meters to 2.3 meters.

- **Back and cover tamper switch:** Protection against opening the cover or wall removal.
- **Power saving:** Two transmission modes set by jumper.
- **Walk and radio tests:** Both can be checked quickly, using LED indication and without opening the case.
- **Energy detection system:** By using fuzzy logic algorithms, detection is improved and false alarms are reduced.
- **Power level discriminator:** Special lens combined with a power algorithm ignores small to medium sized animals while maintaining a high level of human detection.

- **Environment temperature compensation:** Maintains constant detection capability.
- **Adaptive filter:** Compensates for changes in a detected object's speed.

- **Continuous monitoring:** Sends visual alerts in case of malfunction (digital and analog) and temperature alerts if the environment temperature is out of range.
- **Silent monitoring:** Low battery, tamper, and periodic beacon

4. Pet Immune Feature

The SP-01P is immune from the following interferences:

- One dog up to 25kg
- Two dogs no more than 20kg each
- Several cats
- Unlimited number of small animals such as hamsters, birds, rodents, etc.

5. Installation

5.1 False Alarm Reduction Effort

To reduce false alarms caused by detector installation:

- **AVOID:** Placing the PIR facing windows, or in direct sunlight as this heat energy can cause false alarms.
- **AVOID:** Wiring of the SA-01P in such a way that it is parallel to and sitting close to 110V AC or 220V AC transmission equipment or mains power line.
- **AVOID:** Placing near or over heat and air ducts, ovens, heat sources, radiators, and air conditioners as this may cause a false detection.
- **AVOID:** Placing near PL lamps, electrical ballasts, above cookers, and ovens, and above steam sources.
- **AVOID:** Placing the detector where the house pet can be within 1.2M, like a sofa, and less than 5M from stairs and such where the animal can climb (see Figure 2).
- **NEVER:** Touch the pyroelectric sensor on the PCB as this causes permanent damage and loss of sensitivity.

Important Note: PIR works according to field of view and cannot detect through walls. Avoid placing near obstructions such as large plants, curtains, behind open doors, and continuously moving objects.

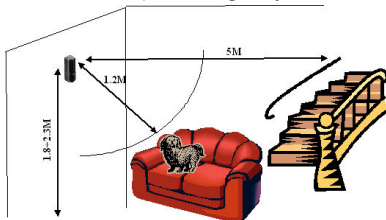


Figure 2: SA-01P installation guidelines with pets present

5.2 Selecting the Physical Location

Select the best physical location to install the PIR.

- 1) Select a corner or a flat wall within a room or hallway between 1.8 and 2.3M that best matches the criteria in False Alarm Reduction Effort.

- 2) Ensure that the PIR is mounted on a non-moving, non-vibrating surface, or corner of the room.
- 3) Mount the PIR in the location.
- 4) After the installation, perform a walk test from the mounting location to ensure that the sensor pattern can detect within the coverage area (see Testing the Detector).

5.3 Mounting the PIR

Mount the SA-01P PIR on a flat wall surface or to a corner. Flat Surface Mounting

To mount the PIR to a flat surface:

- 1) Remove the PCB from the back case.
- 2) Remove the knockouts from the back case, labeled "B" by using a sharp tool or using a nail.
- 3) Affix the four screws onto the wall.
- 4) Replace the PCB and tighten the PCB locking screw.
- 5) Set the jumpers (refer to Jumpers Setting section).
- 6) Pull out the paper strip located over one battery pole. This will energize the detector.
- 7) Replace the top cover of the PIR.
- 8) The detector goes into test mode indicated by the LED flashing for about 90 seconds. After a successful test, the LED goes off. At this stage it is ready for a walk test.

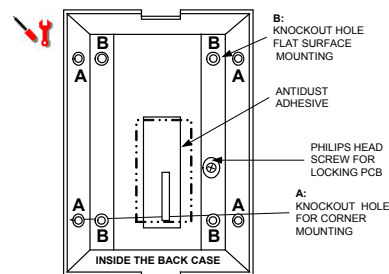


Figure 3: Inside the Plastic Case - Back

6. Jumpers Setting

6.1 Setting the Sensitivity (JP2)

SA-01P has two jumpers, JP1 and JP2, to set the operation method of the PIR. Insert a jumper to activate the desired setting.

To prevent false alarms caused by house pets or harsh environments two sensitivity modes were designated:

- Medium - for normal usage.
- High - for harsh environments and where the total pet's weight is more than 25Kg.

To set the jumpers:

- Medium - jumper off

- High - jumper on

6.2 Radio Mode Jumper (JP1)

To save power, the SA-01P goes into sleep mode after sending an alarm. The time the device will be latent is set by JP1.

- *Normal* - (always 2 minutes between alarms) - jumper off.
- *Dynamic* - (2 minutes retriggered between alarms) - jumper on.

When the dynamic mode is set, an alarm event will be sent only if there were 2 minutes of silence prior to the current

alarm. This setting is useful for places with a high level of traffic such as factories.



Normal – JP1 off



Dynamic – JP1 on

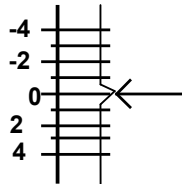
6.3 Back and Cover Tamper

There are two kinds of tamper protection in this detector. The cover tamper protects against the opening of the case and the back tamper (optional) protects against taking the unit off the wall. To enable the back tamper, cut the R11 wire.

6.4 Vertical Calibration

If the SA-01P PIR is to be mounted at a height above 2.1 meters or below 1.9 meters, calibrate the PCB by moving the PCB up or down in the PIR housing accordingly before fixing it. The calibration scale on the PCB and the calibration marker on the PIR housing will help you achieve the optimum calibration setting.

The PCB calibration scale is located on the top right hand side of the PCB (left). The calibration marker is located on the inside of the PIR housing (right).



If mounting the PIR above 2.1 meters, move the PCB (+) up in the PIR housing so that the calibration marker is parallel to a + scale (e.g. 2). This will ensure that the detection area is focused closer to the unit.

If mounting the PIR below 1.9 meters, move the PCB down (-) in the PIR housing so that the calibration marker is parallel to a - scale (e.g. -2). This will ensure that the detection area is focused further from the unit, therefore maximizing detection range.

Either way, refrain from installing the detector higher than 2.3M or lower than 1.8M since it will reduce efficiency.

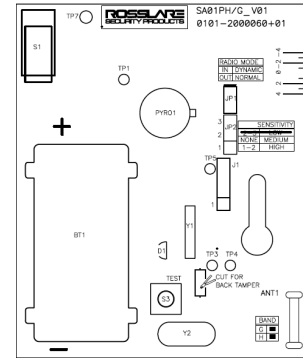


Figure 4: Front of PCB

7. Enrolling the detector

After a successful self test, you can enroll the detector to a specific zone in the alarm system.

The easiest way to do so is to open and close the front tamper. For specific steps to be followed for the enrollment, refer to the manual supplied with the alarm panel.

8. Low Battery Supervision

Prior to each RF transmission, the battery voltage is sampled. If the voltage is low for 3 sequence transmissions, a "low battery" message is sent with the next transmission. When the battery is

low, the LED is blinks during alarm and tamper events. Once the battery level returns to the minimum preset value, fault transmissions cease.

9. Testing the Detector

9.1 Self Check

Perform a self check by pressing the pipe light for less than 3 seconds.

9.2 Walk Test

Evaluate the performance of the detector by executing a 2-minute walk test.

- 1) Ensure all of the settings in the PIR are adjusted as necessary for the location according to the installation instructions above, and that the PIR case is closed and the locking screw is firm.
- 2) Apply power to the unit. The LED flashes on for 2 seconds and off for 2 seconds for a period of 1 minute. During this time, all PIR paths are being self tested. After the test is successful, the LED switches off. At this point a walk test can be performed.

- 3) During the walk, test the LED flashes every time the detector detects motion. There is a two second wait period before the next detection.
- 4) It is recommended that the installer test the detection by going over the protected area and seeing that the detection pattern is good.
- 5) The test mode can be entered for a one-minute period, by depressing S3 from the pipe light for less than three seconds.

9.3 Radio Test

Evaluate the RF path quality by pressing the pipe light on the front of the PIR for more than 3 seconds.

The detector will transmit 10 transmissions to the control panel in 4 second intervals. Refer to the alarm panel manual for RF quality test.

10. Signaling

The LED on the front of the SA-01P is used to send several signals to the user. The following table describes the signals for different activities:

Activity	LED Signal
Warm-Up	The LED flashes on for 2 seconds and off for 2 seconds for a period of 1 minute. If the warm-up is successful, the LED stops flashing and the system is ready for detection.
Detect Condition	The LED flashes on for 2 seconds and then turns off.

Activity	LED Signal
Tamper OPEN/CLOSE	The LED flashes on for 2 seconds and then turns off.
PIR Problem	The LED flashes on for 1 second and then off for 1 second. A PIR check is conducted once every hour.
Temperature Problem	The LED flashes on for 0.5 seconds and then off for 0.5 seconds.
Low battery	The LED flashes rapidly in detect and tamper events.

11. Limited Warranty

ROSSLARE ENTERPRISES LIMITED S (Rosslare) TWO YEAR LIMITED WARRANTY is applicable worldwide. This warranty supersedes any other warranty. Rosslare's TWO YEAR LIMITED WARRANTY is subject to the following conditions:

Warranty

Warranty of Rosslare's products extends to the original purchaser (Customer) of the Rosslare product and is not transferable.

Products Covered By This Warranty and Duration

ROSSLARE ENTERPRISES LTD. AND / OR SUBSIDIARIES (ROSSLARE) warrants that the SA-01P Digital wireless PIR, to be free from defects in materials and assembly in the course of normal use and service. The warranty period commences with the date of shipment to the original purchaser and extends for a period of 2 years (24 Months).

Warranty Remedy Coverage

In the event of a breach of warranty, ROSSLARE will credit Customer with the price of the Product paid by Customer, provided that the warranty claim is delivered to ROSSLARE by the Customer during the warranty period in accordance with the terms of this warranty. Unless otherwise requested by ROSSLARE ENTERPRISES LTD. AND / OR SUBSIDIARIES representative, return of the failed product(s) is not immediately required.

If ROSSLARE has not contacted the Customer within a sixty (60) day holding period following the delivery of the warranty claim, Customer will not be required to return the failed product(s). All returned Product(s), as may be requested at ROSSLARE ENTERPRISES LTD. AND /OR SUBSIDIARY'S sole discretion, shall become the property of ROSSLARE ENTERPRISES LTD. AND /OR SUBSIDIARIES.

To exercise the warranty, the user must contact Rosslare Enterprises Ltd. to obtain an RMA number after which, the product must be returned to the Manufacturer freight prepaid and insured

In the event ROSSLARE chooses to perform a product evaluation within the sixty (60) day holding period and no defect is found, a minimum US\$ 50.00 or equivalent charge will be applied to each Product for labor required in the evaluation.

Rosslare will repair or replace, at its discretion, any product that under normal conditions of use and service proves to be defective in material or workmanship. No charge will be applied for labor or parts with respect to defects covered by this warranty, provided that the work is done by Rosslare or a Rosslare authorized service center.

Exclusions and Limitations

ROSSLARE shall not be responsible or liable for any damage or loss resulting from the operation or performance of any Product or any systems in which a Product is incorporated. This warranty shall not extend to any ancillary equipment not furnished by ROSSLARE, which is attached to or used in conjunction with a Product, nor to any Product that is used with any ancillary equipment, which is not furnished by ROSSLARE.

This warranty does not cover expenses incurred in the transportation, freight cost to the repair center, removal or reinstallation of the product, whether or not proven defective.

Specifically excluded from this warranty are any failures resulting from Customer's improper testing, operation, installation, or damage resulting from use of the Product in other than its normal and customary manner, or any maintenance, modification, alteration, or adjustment or any type of abuse, neglect, accident, misuse, improper operation, normal wear, defects or damage due to lightning or other electrical discharge. This warranty does not cover repair or replacement where normal use has exhausted the life of a part or instrument, or any modification or abuse of, or tampering with, the Product if Product disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim.

ROSSLARE does not warrant the installation, maintenance, or service of the Product. Service life of the product is dependent upon the care it receives and the conditions under which it has to operate.

In no event shall Rosslare be liable for incidental or consequential damages.

Limited Warranty Terms

THIS WARRANTY SETS FORTH THE FULL EXTENT OF ROSSLARE ENTERPRISES LTD. AND IT'S SUBSIDIARY'S WARRANTY

THE TERMS OF THIS WARRANTY MAY NOT BE VARIED BY ANY PERSON, WHETHER OR NOT PURPORTING TO REPRESENT OR ACT ON BEHALF OF ROSSLARE.

THIS LIMITED WARRANTY IS PROVIDED IN LIEU OF ALL OTHER WARRANTIES. ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE SPECIFICALLY EXCLUDED.

IN NO EVENT SHALL ROSSLARE BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, OR FOR ANY OTHER INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF TIME, COMMERCIAL LOSS, INCONVENIENCE, AND LOSS OF PROFITS, ARISING OUT OF THE INSTALLATION, USE, OR INABILITY TO USE SUCH PRODUCT, TO THE FULLEST EXTENT THAT ANY SUCH LOSS OR DAMAGE MAY BE DISCLAIMED BY LAW.

THIS WARRANTY SHALL BECOME NULL AND VOID IN THE EVENT OF A VIOLATION OF THE PROVISIONS OF THIS LIMITED WARRANTY.

12. Declaration of Conformity

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation

13. Contact information

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