

NAT WS SENSOR



DUAL TECHNOLOGY SENSOR

(passive infrared + microwave)

LOW CONSUMPTION

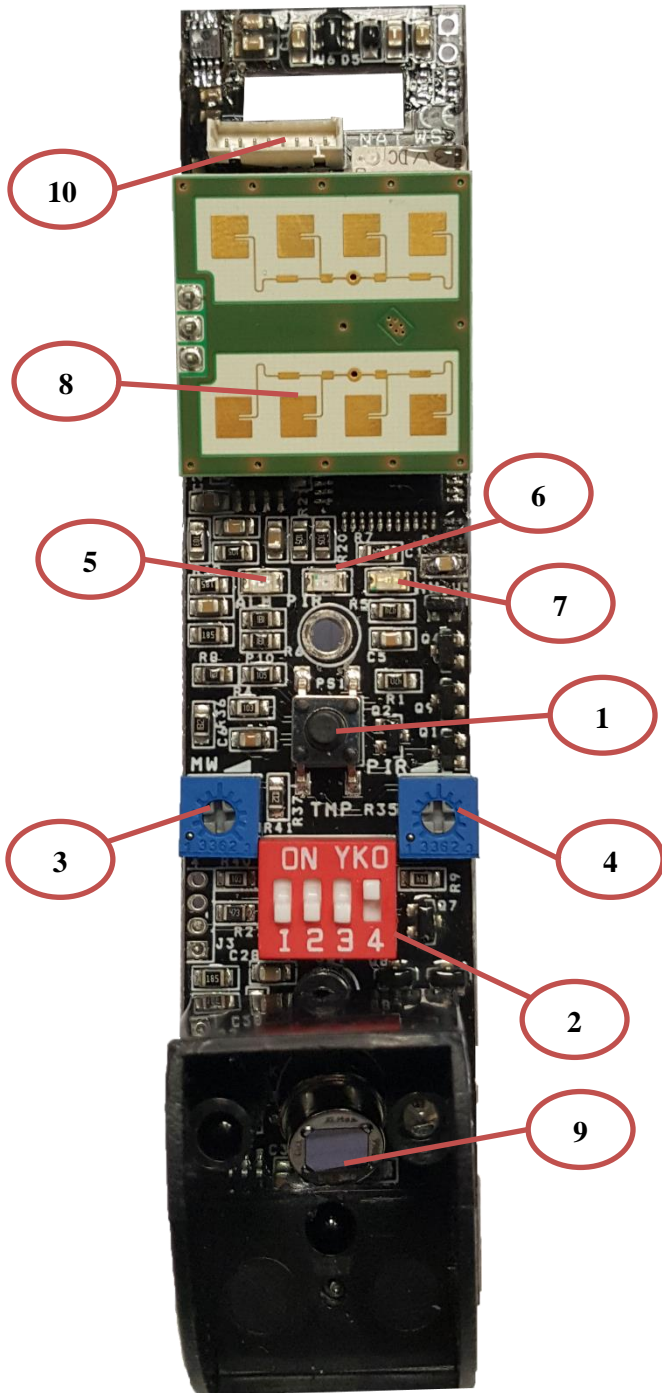
External use

Installation manual

1. DESCRIPTION

- Dual Technology Sensor (PIR + Microwave).
- AND operation in the prevention of "false alarms".
- IP65 (indoor and outdoor).
- Mount directly to the wall or by "L" bracket.
- Sensibility adjustable PIR with angular aperture of about 6 °.
- Microwave K-band 24 GHz.
- IR range adjustable from 0 to 10m with PIR LIMITER.
- MW range adjustable from 0 to 10m.
- Function and output ANTI-MASKING for infrared and microwave.
- RF immunity up to 2Ghz.
- Pet Immunity.
- Insect Immunity
- Small size (150mm x 60mm x 100mm)
- Processing digital signals of PIR and MW.
- Temperature Autocompensation.
- Environmental Autocompensation.
- AND + OR security function
- ENERGY SAVING (no stand-by)
- Tamper output combined anti- removal and anti-tear.
- Battery low output.
- Supply two 3.6V 2.7Ah Lithium Batteries, average duration 2 years.

NAT WS MOTHERBOARD



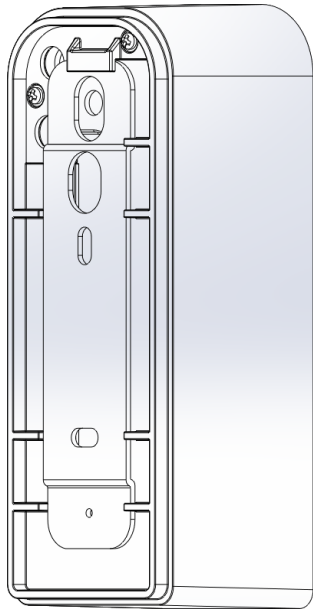
1	TAMPER BUTTONS (anti-removal and anti-tear)	If they get open give the opening of N.C.
2	DIP SWITCHES	System configuration.
3	TRIMMER MW	rotating in clockwise increases the range (sensitivity) of MW.
4	TRIMMER IR	rotating in clockwise increases the range (sensitivity) of IR.
5	RED LED (ALARM)	lit up when there is a general alarm, if enabled.
6	YELLOW LED (PIR)	lit up when there is a PIR alarm, if enabled.
7	BLUE LED (MW)	lit up when there is a Microwave alarm, if enabled.
8	MICROWAVE 24GHZ	Detection sensor MW.
9	PYROELECTRIC SENSOR	Detection sensor IR.
10	CONNECTORS	

NB: Due to the position of the PIR - Microwave sensors and the AND functionality, the system is totally immune to the detection of insects smaller than 5cm.

2. MOUNTING

WALL MOUNTING

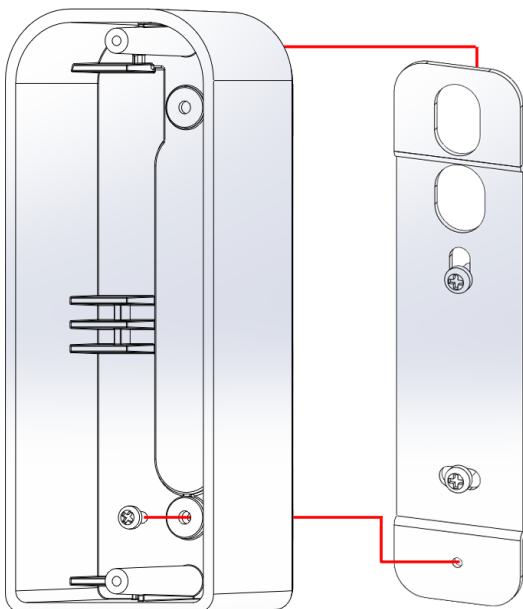
1. Remove the metal plate from the back of battery case.



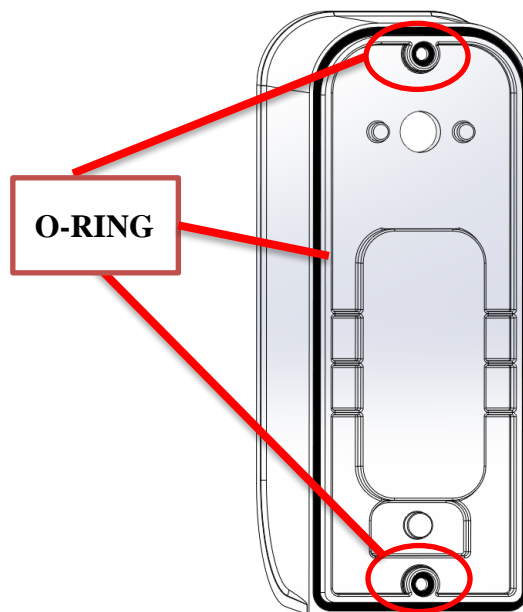
2. Fix the plate at the wall:



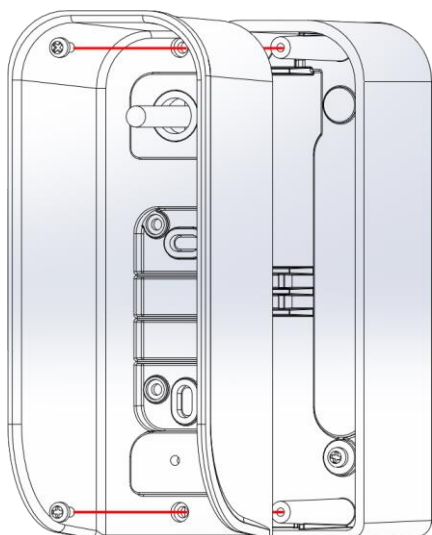
3. Place the battery holder by sliding the upper hook and tighten the screw as shown below



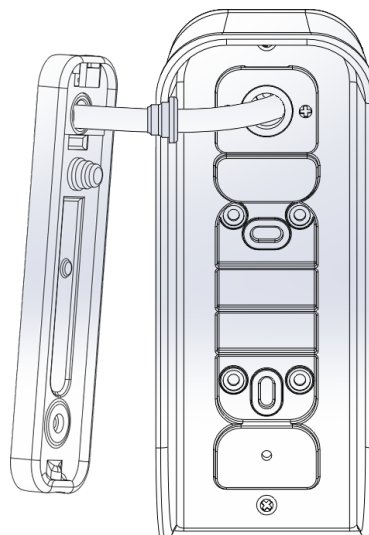
4. Check that the gaskets on the cap are correctly insert



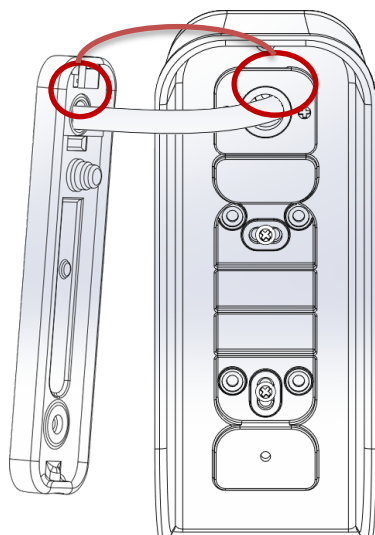
5. Fix the cap at battery case by passing the cable in the upper hole



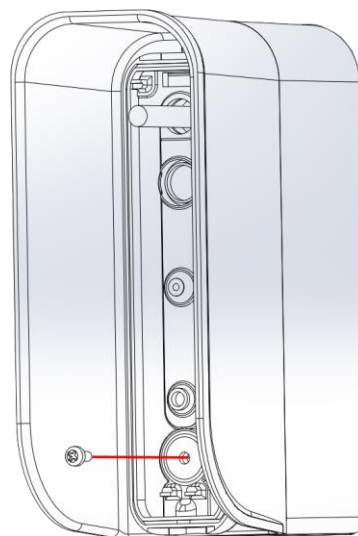
6. Drill hole in the rubber nut and slide inside the cable and insert then in the Nat base



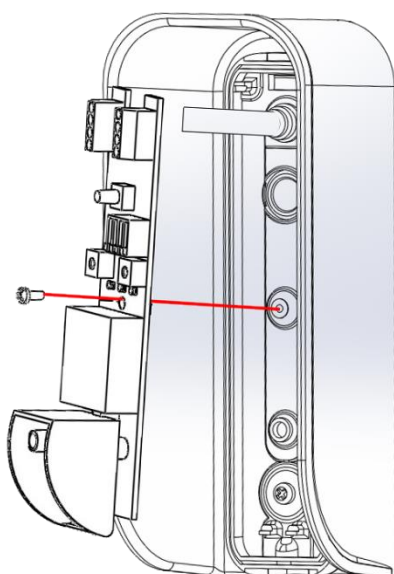
7. Insert the Nat base hook into the cap compartment as shown in the figure



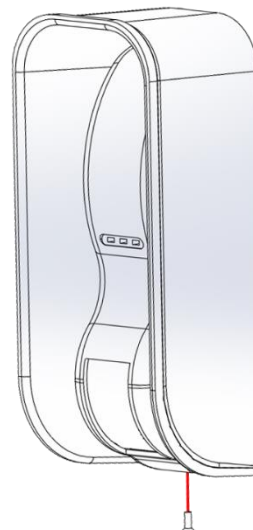
8. Screw the base on the cap



9. Fix the Nat motherboard on the support base

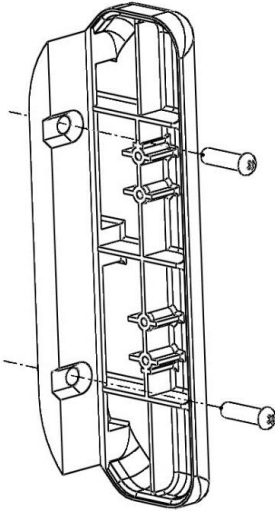


10. After the wiring and operation test close NAT sure that the seals and the O-rings are present and not damaged to ensure the integrity of the product.

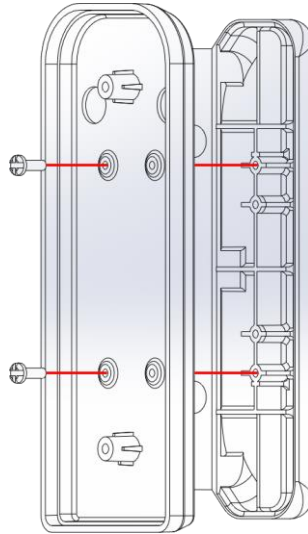


WALL MOUNT WITH "L" BRACKET

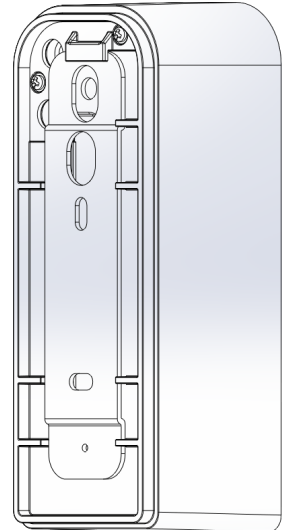
1. Fix the "L" bracket at the wall



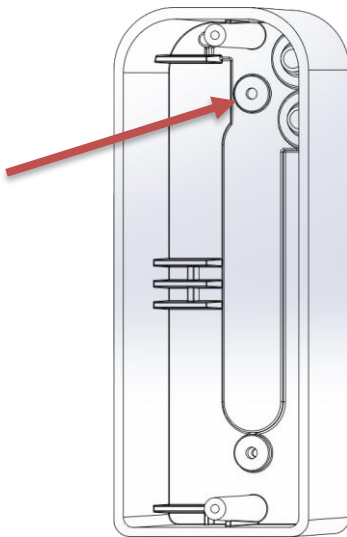
2. Mounting the plastic plate on the "L" bracket



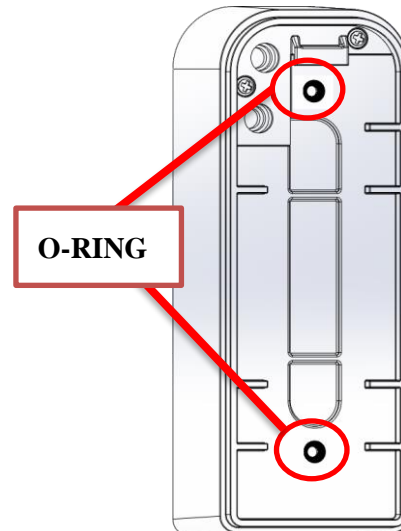
3. Remove the metal plate from the back of battery case.



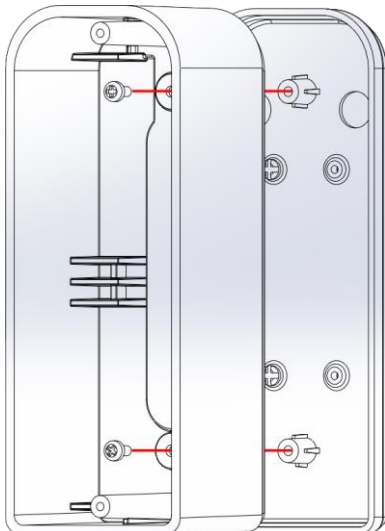
4. Drill the passage of the screw shown in the drawing



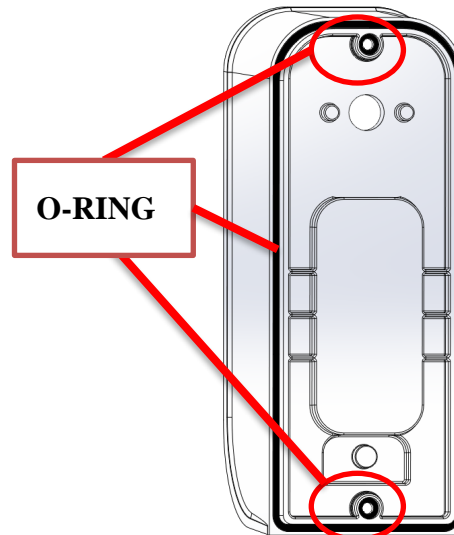
5. Replace the metric screw with those in the bag and insert the seals into the compartments as indicated



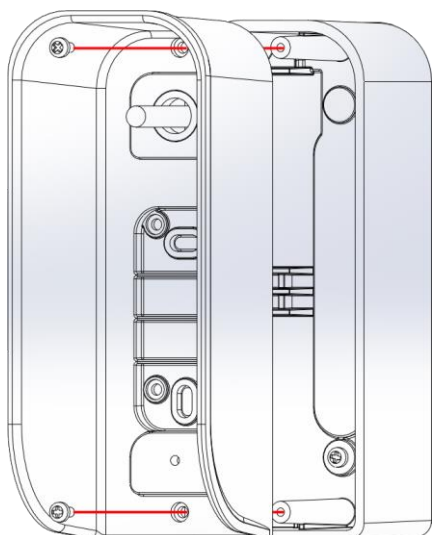
6. Screw the battery case at plastic plate



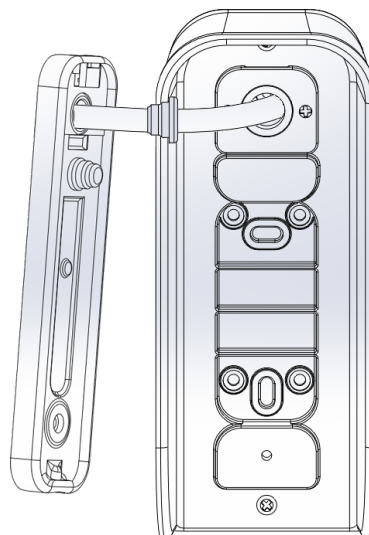
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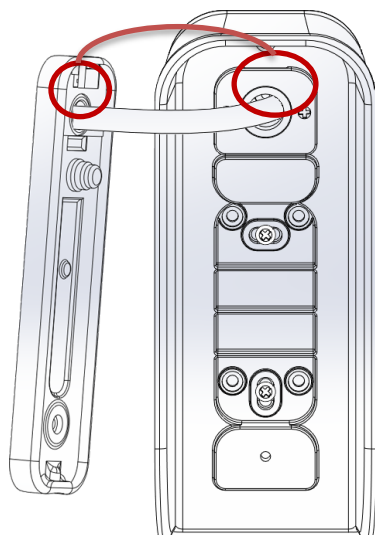
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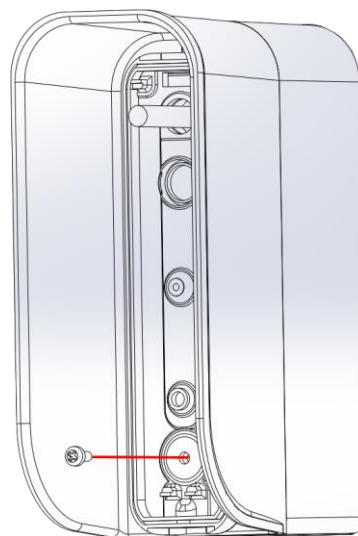
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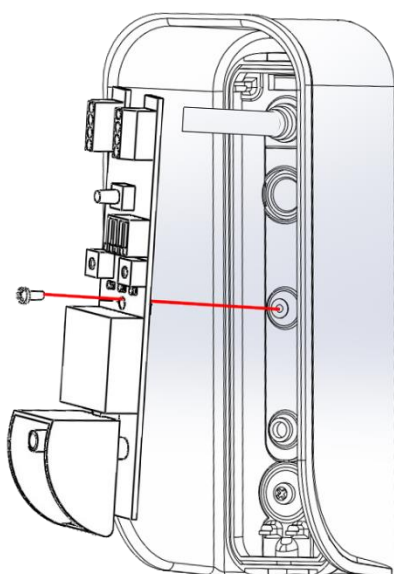
10. Insert the Nat base hook into the cap compartment as shown in the figure



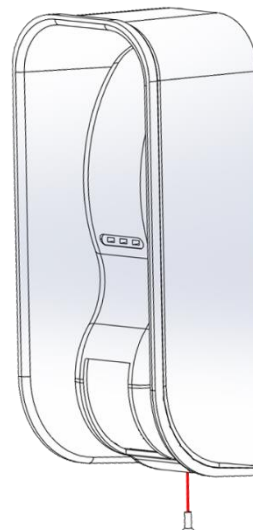
11. Screw the base on the cap



12. Fix the Nat motherboard on the support base

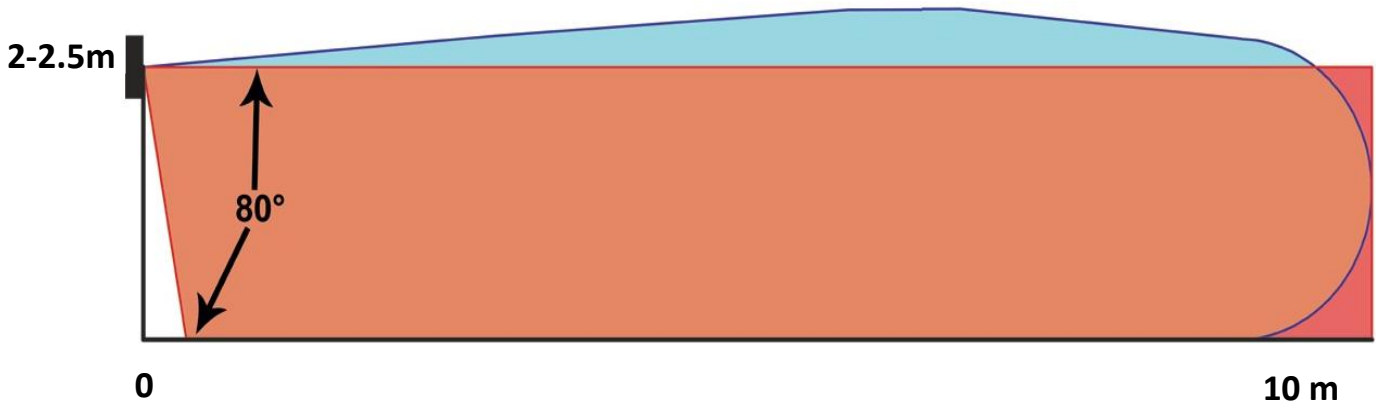


13. After the wiring and operation test close NAT sure that the seals and the O-rings are present and not damaged to ensure the integrity of the product.



3. COVERAGE AREA

SIDE VIEW



NB: UNDERCRAWL:

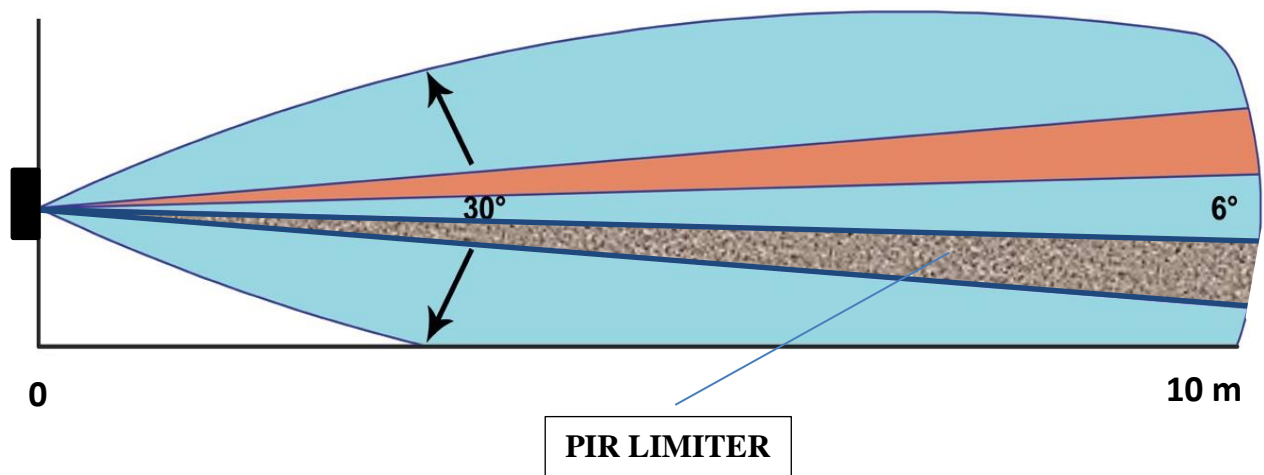
If mounted to a height below 2.5m, the sensor can also detect the areas under the NAT WS sensor by appropriately adjusting the sensitivity of the two technologies (IR and MW)

This is due to the inclination of the microwave board and the PIR.

This solution allows to limit the detection area even without the use of the junction bracket.

NB: The detection area may vary depending on the installation height of the sensor and the surrounding environment.

TOP VIEW



NB: Avoid positioning the sensor near mobile objects such as cloths or plants within the detection area

NB: The detection area is based on the mass of a man of about 70 kg. The sensor could detect higher mass objects (such as cars, trucks, etc.) with a mass higher over the detection area

4. PROGRAMMING AND OPERATION

Make sure that the interface board connector is correctly connected.



POWER LED ON FOR DETECTION TEST

Turn on the dipswitch number 4 for the functionality of the LEDs detection.

	1	2	3	4
ON				■

NB: At the power on moment, for the duration of about 30 seconds if the DIP4 of the LEDs is activated you will see an alternate flashing of these, to stabilize the system. At the end of flashes you can proceed with the following settings.



MW RANGE (SENSITIVITY) 1-10m REGULATION

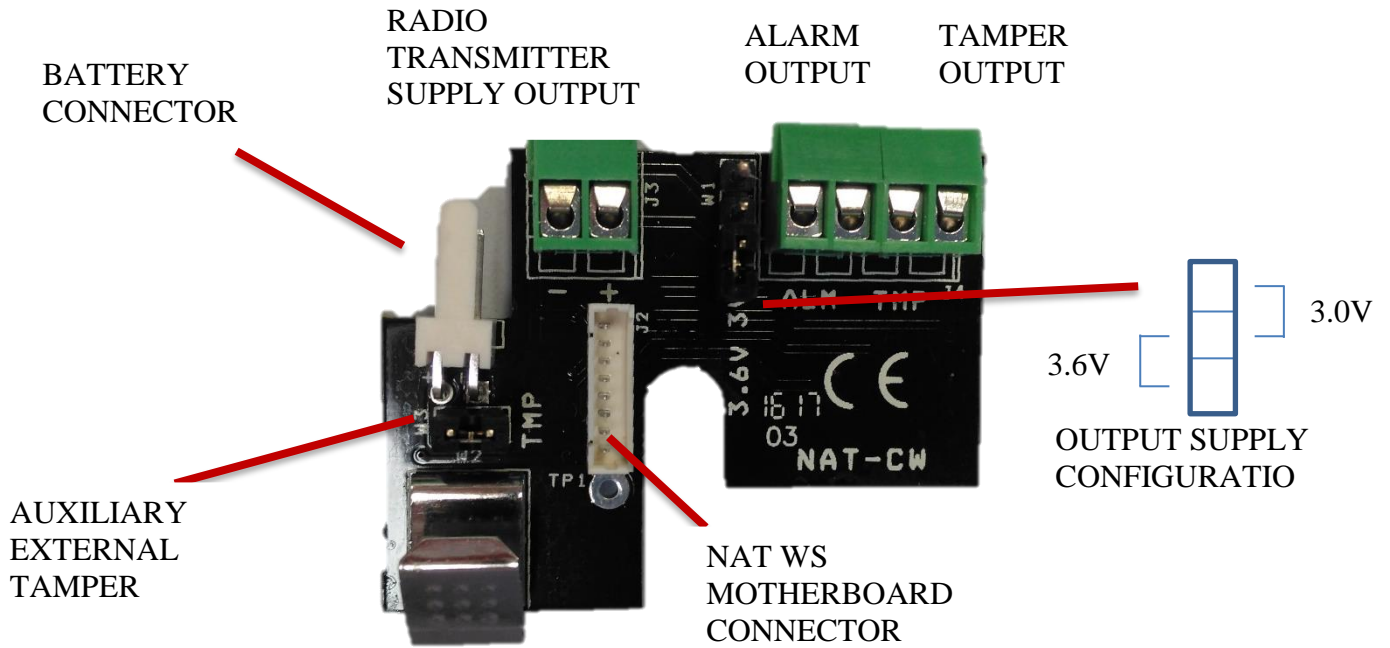
TRIMMER: Adjust the microwave range through the trimmer, implementing with crossing test. Submitting GREEN LED will help to verify the detection of the passage in different areas (exp. 1m, 2m, 5m, 8m). Test the goodness of the coverage of the affected areas, by adjusting the PIR.



**PIR RANGE (SENSITIVITY) 1-10m
REGULATION TRIMMER:** Adjust the PIR range through the trimmer, implementing with crossing test. Submitting ORANGE LED will help to verify the detection of the passage in different areas (exp. 1m, 2m, 5m, 8m). Test the goodness of the coverage of the affected areas, by adjusting the MW.

N.B.: Trimmers will not necessarily have to be adjusted equally because of the surrounding environment:
es. In case of protection of a metallic door, the MW will be adjusted with a lower sensitivity then the PIR due to the reflections given by the metal.

INTERFACE BOARD CONNECTIONS



It is possible to power the 3.6V or 3V radio transmitter by using the same power as the NAT WS Sensor.

5.5. ADDITIONAL FEATURES

ENERGY FUNCTION

If the DII is activated, the power saving function is activated. With this feature enabled, the system enters low power mode, especially the microwave is activated as soon as the IR technology records a pre-alarm. In this mode, the sensor consumes basic 0.1mA and 1.5mA alarm.

There is no standby time.

With this mode the microwave is more sensitive and can easily reach 10m coverage areas.

If the energy function is not activated, the sensor will have the microwave always switched on and a constant consumption independent of the 0.3mA alarm number. In this case, the maximum range is approximately 8m depending on the application.

	1	2	3	4
ON				

ANTI-MASK FUNCTION

Activate with Dipswitch Number 2 the function of ANTI-MASK.

When an object is placed in front of the sensor to blind and render the system ineffective, it activates the masking signal through the serial output dedicated to the Tamper.

The anti-mask checks for the presence of an object in 20 seconds and provides the signal through the dedicated anti-mask output.

To activate the ANTI-MASK function also for the microwave, low and raise dip n ° 2 a second time. Once this procedure is completed, the sensor will confirm that it is activated by blinking the BLU LED.

This function can only be used if the Energy function is OFF.

N.B. If DIP n.2 (anti-mask) and n.4 (led) are active when blinking mode blinks, a blue-yellow LED flashes the opening of the ANTI-MASK contact.

WARNING: When DIP n.2 is activated before leaving the system running, you **MUST** close the NAT sensor within 2 minutes.

	1	2	3	4
ON		■		
	■		■	■

SECURITY FUNCTION

Turn on the dipswitch number 3 functionality SECURITY. Activating this function if the MW sensor provides at least 7 distinct surveys in 30 seconds, the alarm signal from a system independently of the PIR sensor readings. Dually the IR sensor provides at least 4 separate surveys in 30 seconds, the system by an alarm signal regardless of the sensor readings MW.

	1	2	3	4
ON			■	
	■	■		■

6. DESCRIPTION OF NOT SETTABLE FUNCTION

PET IMMUNITY SYSTEM

The system of pet immunity is able to discriminate the small animals up to a maximum of 10kg and not to give an alarm signal. In the case of animals such as dogs and cats perform function tests.

BLINDNESS AUTO-COMPENSATION

In the event of sudden light blinds (es. sun or high beam), the system performs an internal compensation to react to the infrared section of the disturbance signal.

THERMAL AUTO-COMPENSATION

The system detects the temperature of the surrounding environment through a dedicated sensor and it modifies the IR sensor detection parameters in order to adapt to the most extreme environmental conditions.

LOW ENERGY CONSUMPTION

The system has a very low power consumption that guarantees battery life (2 lithium at 2.7Ah) for at least 2 years.

The system consumption is:

- 340 uA with ENERGY OFF function regardless of the alarm signal.
Average battery life of 2 years.
- 150 uA at rest and 1.5mA in alarm with ENERGY ON function.
Average battery life of 3 years with 3000 alarms per day.

7. APPLICATION



Example 1

“Curtain” for windows or doors



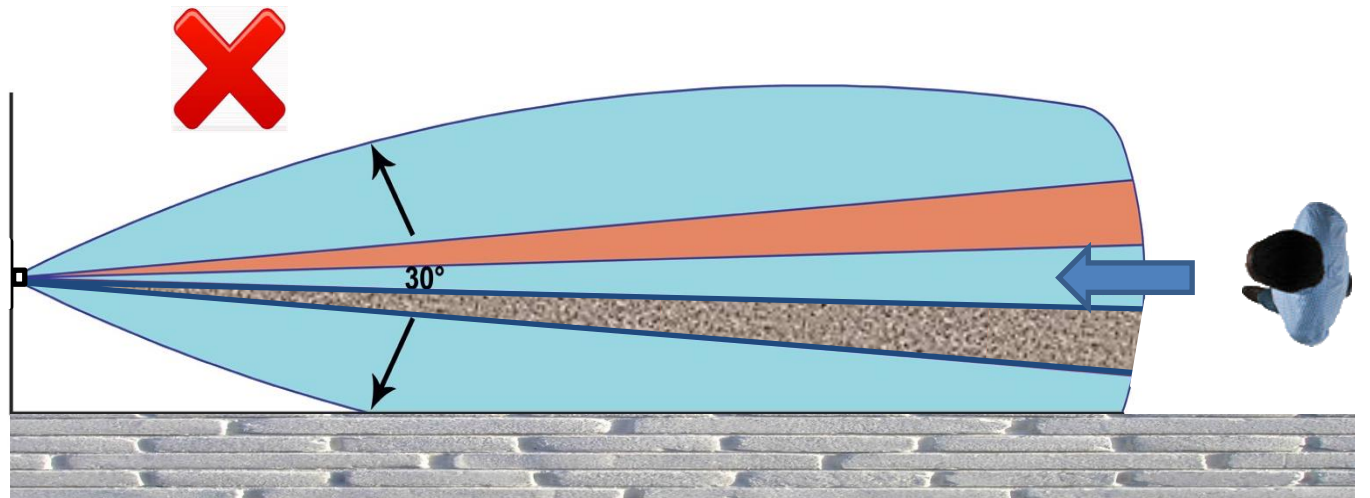
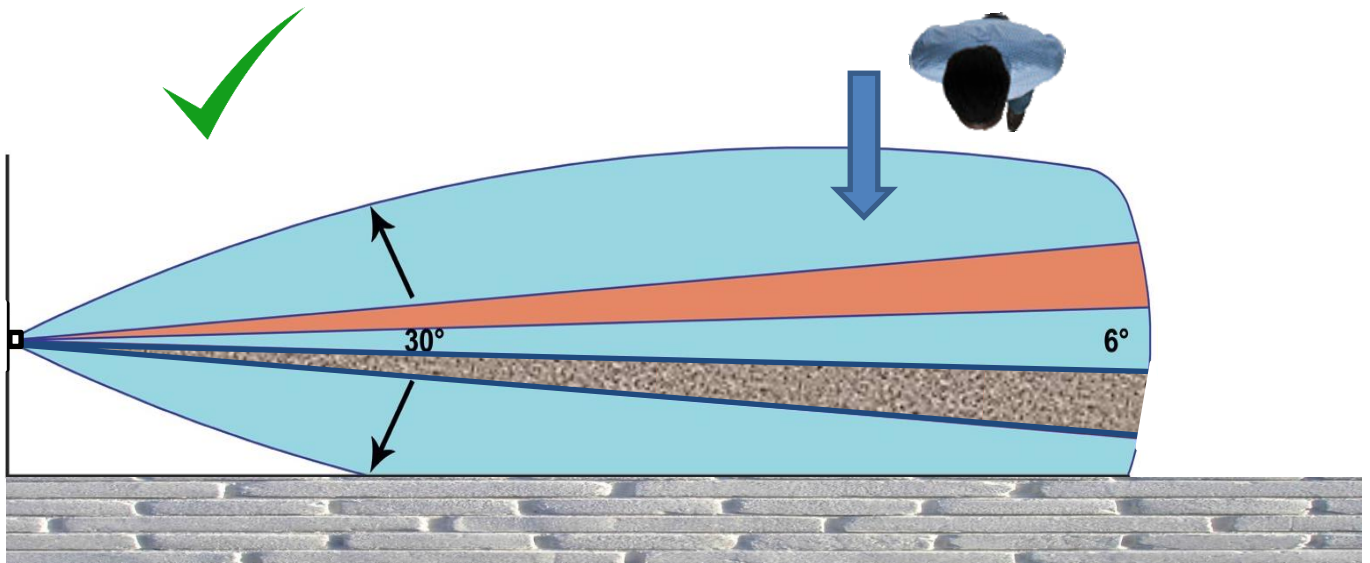
Example 2

“Double installation”

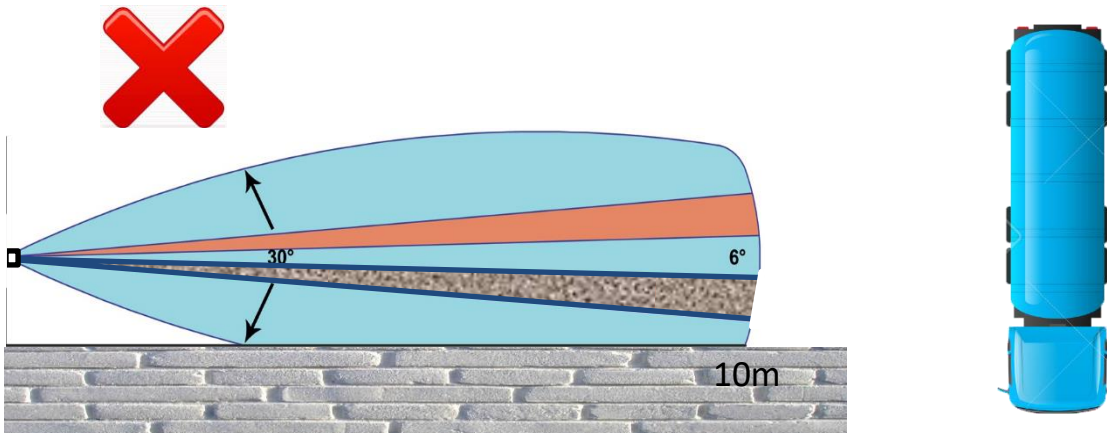
N.B. The two sensors placed in front of the other do not disturb each other

DETECTION METHODS AND INSTALLATIVE ADVICE

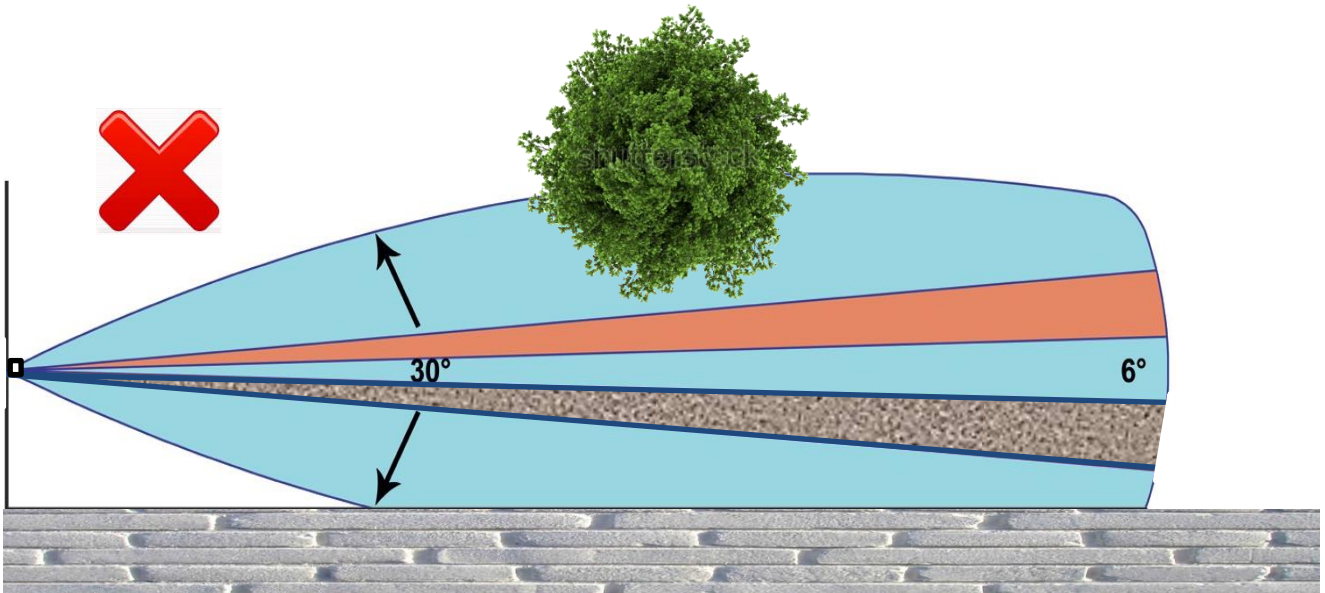
TOP VIEW



**The sensor is designed for cross-tracing detection.
Properly use the PIR Limiter for proper detection (Chapter 8).**

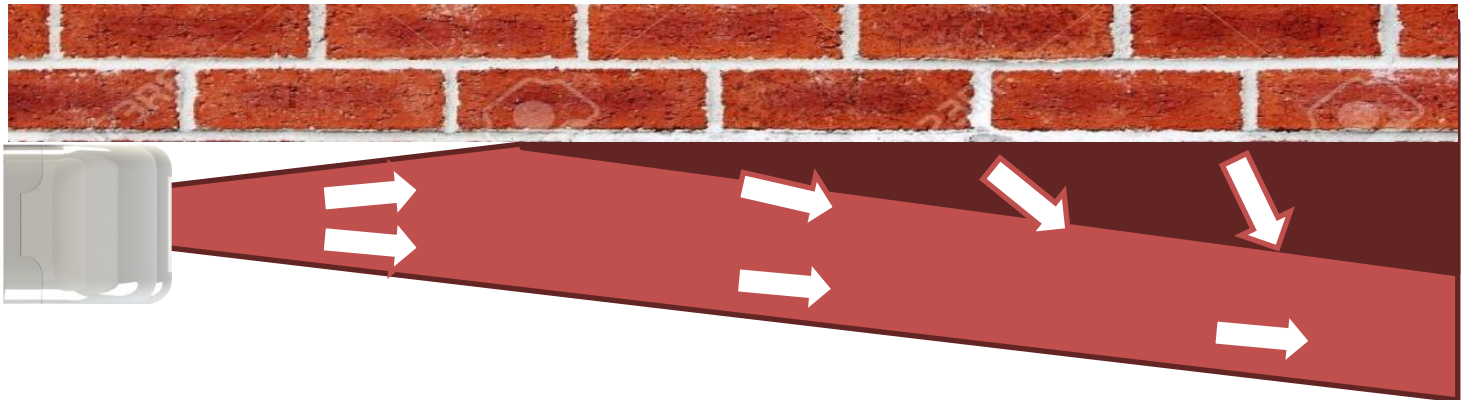


NB: The sensor can detect objects such as cars and /or trucks beyond the detection zone, Then avoid installing the sensor facing a vehicle passage or use the kunction bracket and tilt down the sensor to reduce the coverage area.

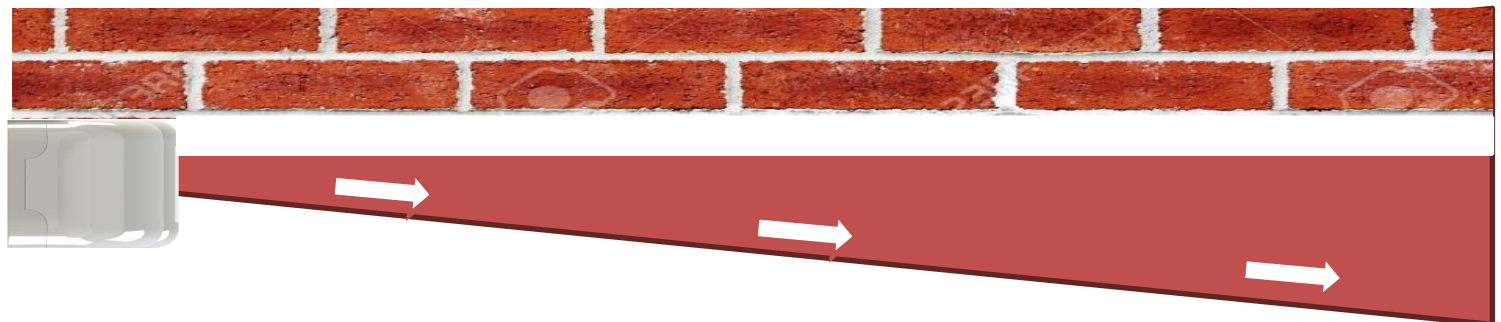


NB: Avoid the presence of plants, air conditioners and moving objects in the detection area

8. PIR LIMITER

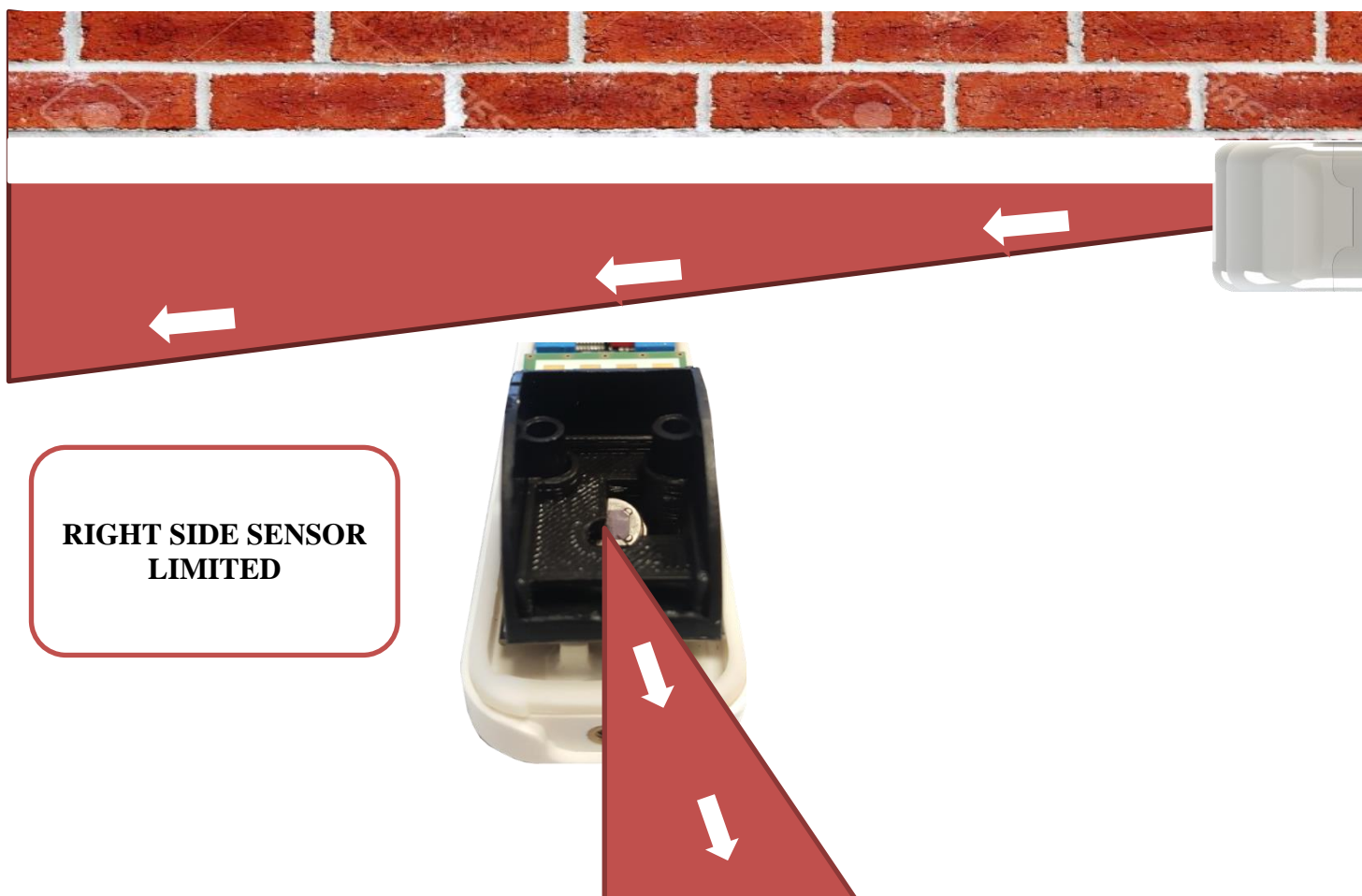


If the NAT sensor is applied along a wall, it is possible that the PIR detects an area of none interest that can generate more or less important reflections and false detections depending on the type of material present. In order to obtain a more precise and safe area of detection it is possible to apply the PIR LIMITER supplied which limits the angle of view of the sensor. In this way, the sensor detects only interested area.



**LEFT SIDE SENSOR
LIMITED**





**RIGHT SIDE SENSOR
LIMITED**

9. TECHNICAL SPECIFICATION

Max range detection IR	Adjustable 0 a 10 m
Max range detection MW	Adjustable 0 a 10 m
MW Frequency	24Ghz
Angle IR coverage	80° vertical – 6° horizontal
Angle MW coverage	80° verticale – 30° horizontal
Battery supply	3.6V
Absorption ENERGY OFF	350uA
Absorption ENERGY ON	150uA + 1.5mA in alarm
Alarm output	N.C.
Tamper output	N.C.
Antimask output	Tamper output
Condivisione Alimentazione TX radio universale	3V-3.6V selectable
Operating Temperature	From -20° C to +65° C
Dimensions	150mm x 60mm x 100mm

TOTAL WARRANTY 2 YEARS