



## TRIAL - TRIALH

Outdoor triple technology detector equipped with anti-masking and under-crawl protection

090041111



IMQ-SISTEMI DI SICUREZZA



## FOREWORD

### FOR THE INSTALLER:

Comply strictly with current standards governing the installation of electrical systems and security systems, and with the manufacturer's directions given in the manuals supplied with the products.

Provide the user with full information on using the system installed and on its limitations, pointing out that there are different levels of security performance that will need to suit the user's requirements within the constraints of the specific applicable standards. See that the user looks through the warnings given herein.

### FOR THE USER:

Check the system's operation thoroughly at regular intervals, making sure the equipment can be armed and disarmed properly.

Make sure the system receives proper routine maintenance, employing the services of specialist personnel who meet the requirements prescribed by current regulations.

Ask your installer to check that the system suits changing operating conditions (e.g. changes in the extent of the areas to be protected, change in access methods, etc...).

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This device has been designed, built and tested with the utmost care and attention, adopting test and inspection procedures in accordance with current legislation. Full compliance of the working specifications is only achieved in the event the device is used solely for its intended purpose, namely:

### **Outdoor triple technology detector equipped with anti-masking and under-crawl protection**

The device is not intended for any use other than the above and hence its correct functioning in such cases cannot be assured.

Consequently, any use of the manual in your possession for any purpose other than those for which it was compiled - namely for the purpose of explaining the product's technical features and operating procedures - is strictly prohibited.

Production processes are closely monitored in order to prevent faults and malfunctions. However, the componentry adopted is subject to an extremely modest percentage of faults, which is nonetheless the case with any electronic or mechanical product.

Given the intended use of this item (protection of property and people), we invite you to adapt the level of protection offered by the system to suit the actual situation of risk (allowing for the possibility of impaired system operation due to faults or other problems), while reminding you that there are specific standards for the design and production of systems intended for this kind of application.

**We hereby advise you (the system's operator) to see that the system receives regular routine maintenance, at least in accordance with the provisions of current legislation, and also check on as regular a basis as the risk involved requires that the system in question is operating properly, with particular reference to the control unit, sensors, sounders, dialler(s) and any other device connected. You must let the installer know how well the system seems to be operating, based on the results of periodic checks, without delay.**

Work involved in the design, installation and maintenance of systems incorporating this product should be performed only by personnel with suitable skills and knowledge required to work safely so as to prevent any accidents. It is vital that systems be installed in accordance with current legislation. The internal parts of certain equipment are connected to the mains and therefore there is a risk of electrocution when maintenance work is performed inside without first disconnecting the primary and emergency power supplies. Certain products include batteries, rechargeable or otherwise, as an emergency backup power supply. If connected incorrectly, they may cause damage to the product or property, and may endanger the operator (explosion and fire).

## EU DECLARATION OF CONFORMITY

Hereby, EL.MO. S.p.A. declares that the TRIAL - TRIALH radio equipment is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: [elmospa.com](http://elmospa.com) – registration is quick and easy.

## DISPOSAL INSTRUCTIONS - INFORMATION FOR THE USER



In accordance with Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), please be advised that the EEE was placed on the market after 13 August 2005 and must be disposed of separately from normal household waste.

IT08020000001624



## 1. GENERALS

TRIAL is a high-performance triple technology detector. It is able to perform accurate analysis of the received signal, through sophisticated algorithms. The detector housing shape allows for both outdoor and indoor installation.

**A key point of the TRIAL detector is the use of 2 digital PIR sensors to obtain very high detection precision and great immunity against noise.**

The control and the analysis process can be configured, through proper selections, for general alarm with “AND” operation (generated when the two MW and IR detection sections trigger an alarm), or with “OR” operation (the alarm from a single detection section is sufficient).

The MW section is equipped with a DRO pulse-piloted planar antenna and with an anti-masking device, while the IR section is equipped with a FRESNEL lens and an under-crawl lower lens. In case you need to mount two devices next to each other, a version operating at a different frequency is available.

In the IR section there is a sophisticated monitoring device for in-depth control of the environment and its thermal perturbations; the section has two digital high-immunity PIR sensors to obtain optimal response to the signal caused by the human body motion, thus discarding all the little warming phenomena that can lead to false alarms; the PIR are protected by a particular silicon filter against blinding due to white light; the optics is sealed in order to reduce false alarms due to insects entry.

The detector is protected by two separate circuits for the detection of masking and blinding attempts, the anti-blinding device is active type, both circuits can be activated via software. The condition of masked and/or blinded detector is properly signalled through the blue LED (masking) and the green LED (blinding) slowly blinking; the recovery of full functionality occurs at the next motion detection from both technologies. The detector generates an alarm also if its orientation is changed, thanks to a high sensitivity accelerometric sensor that operates on two axes.

The particular shape of the TRIAL housing simplifies the installation, also with the supplied bracket tilted by 6°; for outdoor installation it is provided with a protective sunshield. The tilt adjustment is improved since a modular joint can be added, also in a 90° tilted version. The joint can be ordered using the **SNDRTRIAL** code.

**The TRIAL detector is not equipped with interchangeable lens: if a detector with horizontal protection lens is required, order it by specifying the TRIALH model. In this manual we will refer to the TRIAL model; informations on the TRIALH model will be added if required.**

**TRIAL and TRIALH are IMQ - Security Systems certified.**

## 2. FEATURES

### 2.1 General features

- Sturdy plastic housing for indoor/outdoor installation. Its design is simple and elegant.
- Detector fully microprocessor-managed.
- IR section with two digital PIR sensors with high sensitivity and with silicon filter for white light protection.
- Sealed lens to reduce false alarms due to insects entry.
- Dip switch selection of the sensitivity of the detector.
- Dip switch selection of the AND/OR function.
- Dip switch exclusion of the front LED indicators concerning the IR and MW sections functions and the alarm circuit.
- Dip switch for the range adjustment of the MW section.
- +12V “ESCL. MW” terminal for excluding the MW section (lessened current draw).
- Advanced parameters for the operation such as the thermal compensation of the features of the IR section, in order to enable operation even in critical situations.
- MW section with DRO device and planar antenna (ref. ETSI EN 300 440-2 2017) with pulsed operation.
- 3D function.
- Anti-blinding active circuit in the IR section with encoded RXTX IRs; anti-masking circuit in the MW section.
- Fresnell lens and lower lens with under-crawl device; these lenses are ultrasonically welded and non-replaceable.
- Static alarm relay against sabotage attempts with external magnets. The output contacts are protected with a resistor.
- Protection against noise applied to the power supply terminals.
- Orientation change detection with accelerometrical sensor on two axes always active and consequent generation of a tamper alarm.
- The TRIAL detector is equipped with a protective sunshield for outdoor installation and a bracket tilted by 6° for installations at 2.1 m.
- Upon request, the TRIAL and TRIALH models with different frequency can be ordered. For the correct codes, see “4.1 General installation suggestions” on page 6.
- For the TRIAL detector, the SNDRTRIAL optional accessory is available: it allows to compose a wall or 90° swivelled mounting, in order to accurately orient the detector position according to the area to be protected.
- The TRIALH model is also available: it is equipped with lens providing horizontal curtain protection (already welded).



2.2 Electrical features

<b>Model</b>	<b>TRIAL (TRIALH)</b>
<b>Performance level</b>	II (none when using SNDTRIAL).
<b>IMQ certified</b>	EN50131-2-4: grade 3
<b>Environmental class</b>	4
<b>Protection class</b>	IP55
<b>Power supply</b>	DC 12 V (from 7.5 to 15 V).
<b>Tolerated ripple</b>	200 mVpp.
<b>Detector power consumption @12 V:</b>	
<b>Idle</b>	19 mA
<b>In alarm</b>	21 mA
<b>In stand-by, MW exclusion</b>	17 mA
<b>Functions configuration</b>	Through dip switches, see wiring diagram.
<b>Timers:</b>	
<b>For alarm or disorientation</b>	5 s
<b>Stand by at power on</b>	20 s
<b>AND function alarm waiting time</b>	10 s

**MW SECTION**

<b>Adjustments</b>	Dip switch for range adjustment.
<b>Sensitivity</b>	Dip switch for selection between min. 8 pulses and max. 4 pulses with 5 s intervals.
<b>Noise filter</b>	Neon lamps -21 dB, Power supply -65 dB.
<b>TX frequency</b>	10.525 GHz (standard version); 9.9 GHz (different frequency version)
<b>Emitted power</b>	13 dBm E.I.R.P.
<b>Spurious issued</b>	<-30 dBm.
<b>Signal emitted</b>	Pulsed.
<b>Range</b>	From 3 to 15 m +/-20% adjustable.
<b>Coverage area</b>	95° on the horizontal plane, 60° on the vertical plane.
<b>Timers</b>	Single alarm with pending confirmation from the IR sections for 10 s in AND mode; direct alarm to the general relay in OR mode.

<b>Visualizations</b>	MW section operation, IR section operation, alarm status, faults, orientation change, masking/blinding.
<b>LEDs exclusion</b>	Through dip switch..
<b>Adjustments</b>	Through dip switch for operating settings.
<b>Alarm relay</b>	Normally energized, NC contacts with 10 Ω resistance and 500 mA capacity.
<b>Masking relay</b>	NC contacts (only active if the proper function is enabled) with 10 Ω resistance and 500 mA capacity.
<b>Tamper</b>	NC contacts with 10 Ω resistance and 500 mA capacity for protection against cover opening and tearing of the fixing internal base; function deactivable with a jumper.
<b>IR stage gain</b>	Optimized with temperature.
<b>Operating temperature</b>	-10 / +55 °C.
<b>Humidity</b>	93% Ur.
<b>Dimensions, weight</b>	H 167 - W 95 - D 75 mm detector body only, 270 g without joint accessories.
<b>Parts supplied</b>	Screws, dowels, 6° tilted plate, sunshield, protection grommet, technical manual.
<b>Options</b>	SNDTRIAL modular joint with alternative 90° joint (version bent by 90°) included.

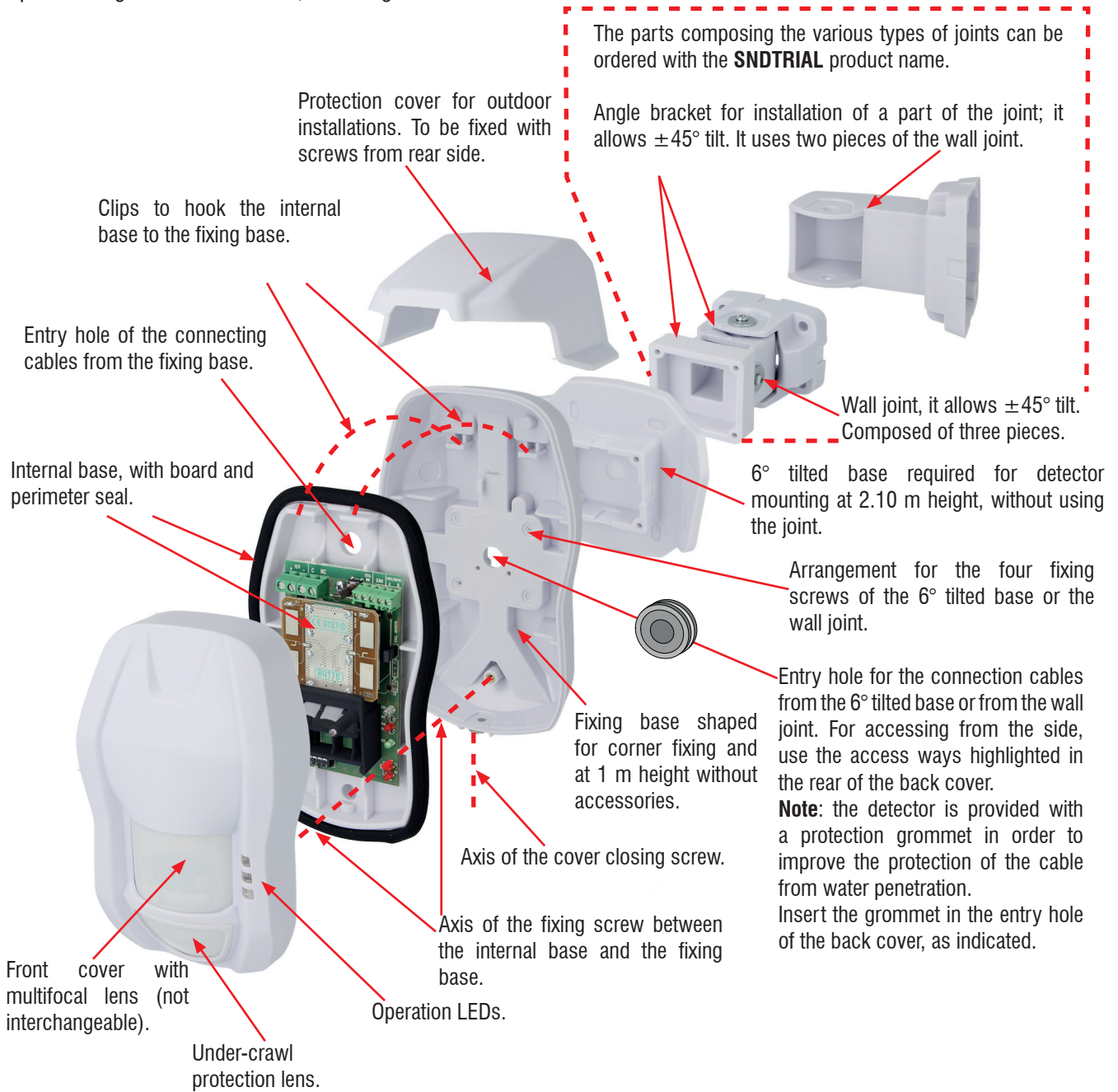
**IR SECTION**

<b>Lens type</b>	EWA 1.2 GI 12 V2 lens. (AA1.2 GI 12 V1 lens for TRIALH). Separated under-crawl lens.
<b>Sensitive areas No.</b>	2 x 28 areas on 4 planes (2 x 15 areas for TRIALH). 2 x 3 under-crawl areas on 1 plane.
<b>Coverage area</b>	Volumetric with 94° opening (horizontal curtain 90° opening for TRIALH).
<b>Range</b>	15 m with fixing at standard height of 2.10 m (from 1 to 1.50 m for TRIALH); the coverage may vary according to the adopted solutions for mounting with tilted bracket and/or SNDTRIAL, see the manual.
<b>Sensitivity</b>	dip switch for selection between min 4 pulses and max 2 pulses with 5s intervals. <b>Note:</b> a single switch commands both sections
<b>Timers</b>	Single alarm with pending confirmation from the IR sections for 5 s in AND mode; direct alarm to the general relay in OR mode.



### 3. VIEW OF THE DETECTOR

Exploded diagram of the detector, including accessories.



**Note:** the joints are supplied with the **SDTRIAL** model. Mount them according to your needs. They are equipped with special rubber washers. For the assembling, see the instruction sheet.

**Note:** it is not possible to replace the lens, therefore you will need to purchase the TRIALH model to realize a horizontal curtain protection. Fix the detector at the height required by the protection you wish to realize (see applications with joint).

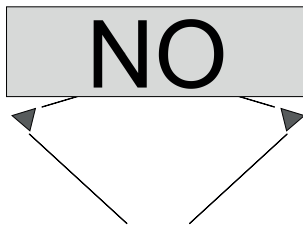
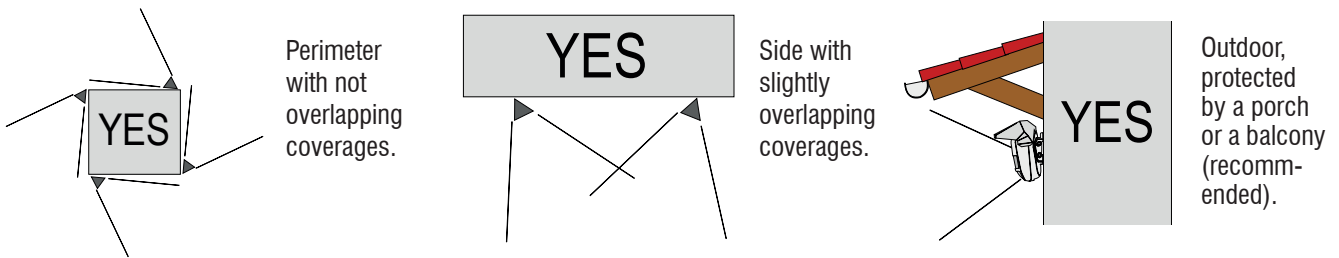


## 4. INSTALLATION

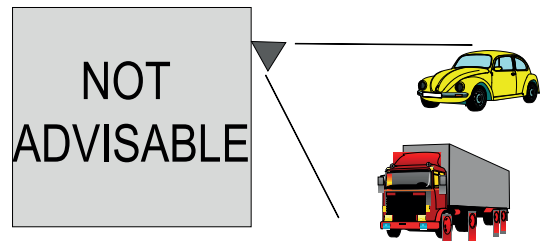
### 4.1 General installation suggestions

- During board installation and handling, avoid touching the PIR sensors with your fingers.
- In case you need to point the detector towards windows or plastic curtains, make sure the MW range does not cross them (if necessary, adjust the MW range to the minimum).
- When installing two detectors next to each other, the second one has to be a model operating at a different frequency:
  - TRIAL** RCRTT02001#00 (standard) and **TRIAL** RCRTT02009#00 (different frequency);
  - TRIALH** RCRTT02003#00 (standard) and **TRIALH** RCRTT02011#00 (different frequency).
- Do not mount the detectors directly pointed towards each other at a distance of less than 5 m.
- Do not install the detector near oscillating metal shutters, or near vibrating metal walls (e.g. refrigeration units).

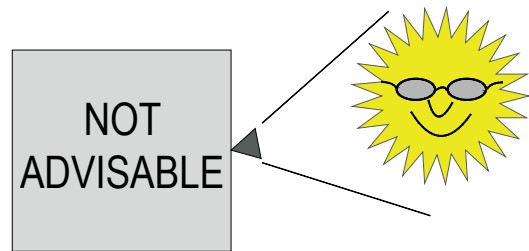
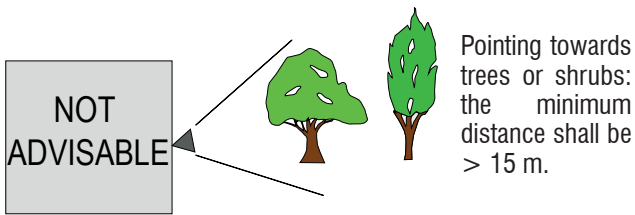
For outdoor installations, see the following images showing allowed/not allowed/not advisable cases.



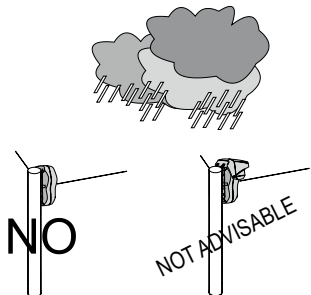
Side with completely overlapped coverages, with detectors operating at the same frequency. We suggest that you use detectors operating at different frequencies.



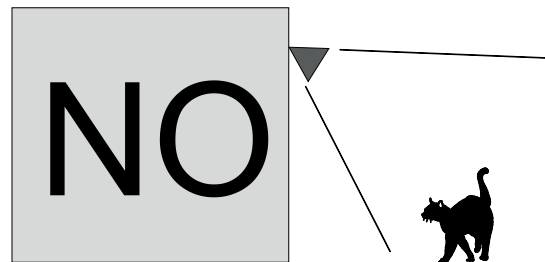
Pointing towards outside areas affected by the passage of cars or trucks, also with car-truck distances >> 15 m.



Directly pointed towards the sun.



Outdoor installation on a pole, with or without protection.  
**Important note: the installation is not advisable because bad weather (such as heavy rain, hail, etc.) can cause false alarms.**



Installation with standard lens, with animals presence. Install the TRIALH model at an height of 1 m minimum.

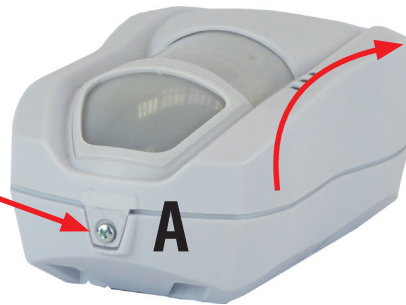


## 4.2 Housing opening and closing operations



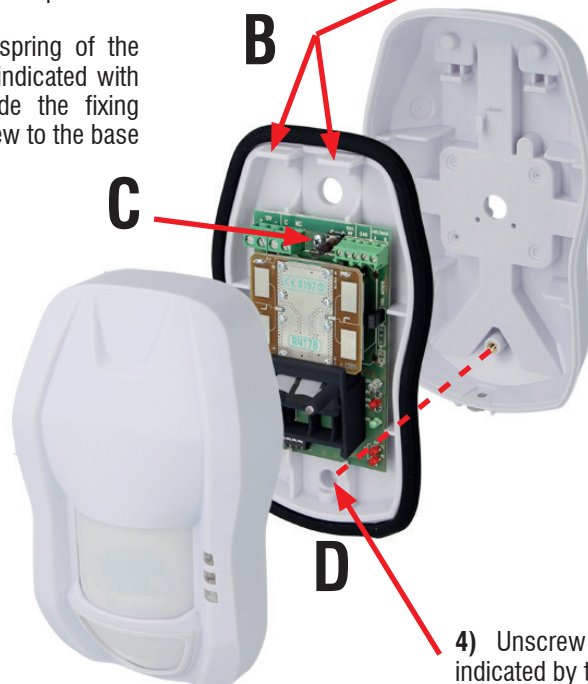
The electronic board can be damaged by electrostatic discharge. The installer shall free himself of electrostatic charges before opening the housing and he shall keep free from electrostatic charges during the whole installation or maintenance process.

1) Unscrew the fixing screw of the cover on the housing bottom, indicated by the **A** arrow.



2) Detach the front cover: turn it from below, pivoting on the top of the detector, then unhook the clips indicated by the **B** arrow in the image below.

3) The closing operation of the cover requires the inverse performing of the operations previously exposed. Pay attention that the closing spring of the Tamper microswitch protection indicated with **C** is seated correctly. Conclude the fixing operation by screwing the **A** screw to the base of the cover.



4) Unscrew the inner base fixing screw indicated by the **D** arrow. Disconnect the internal base applying a force sufficient to contrast the perimetral seal. Detach the fixing base.



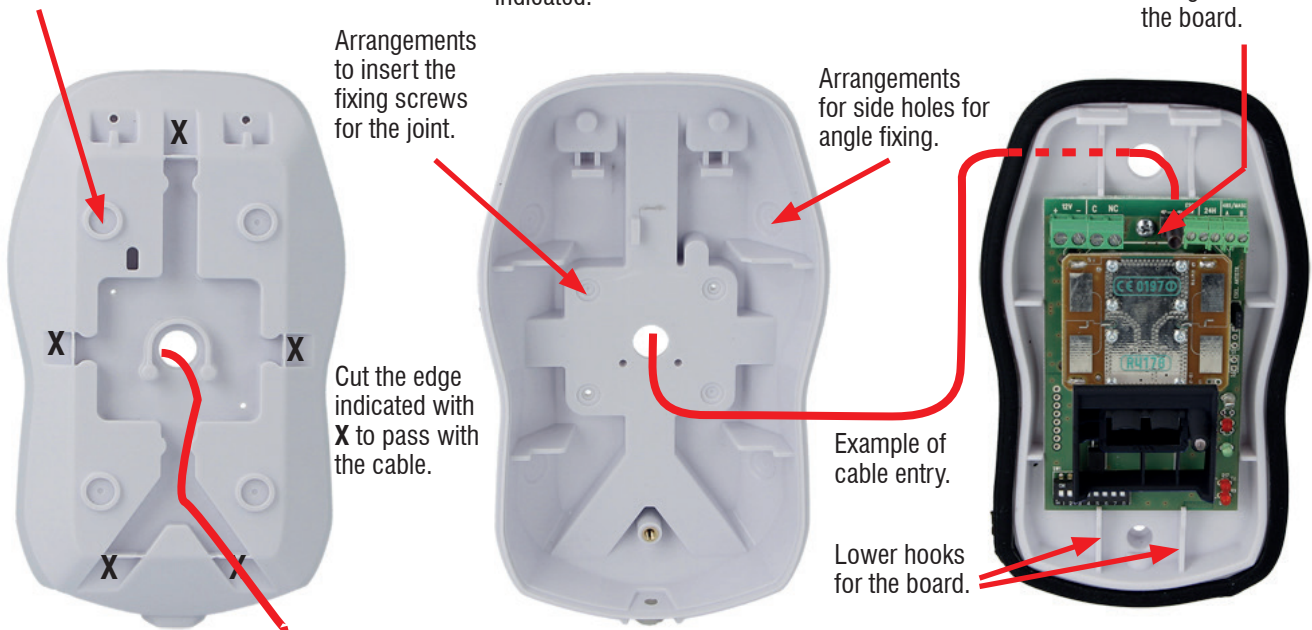
### 4.3 Cables feeding

Internal view and indications for the cables feeding.

Arrangements for drilling and support pins for wall mounting.

Feed the cables in upward direction through the hole indicated.

Fixing screw for the board.



Rear view of the fixing base with assisted paths for the cables.

Internal view of the fixing base.

**Note:** to proceed to the wiring, do not remove the board from the base. In case of necessity, pay attention to the spring of the internal tear-protection system.

### 4.4 6° tilted plate

The use of the 6° tilted plate is required for the detector mounting at a 2.1 m (1 m for TRIALH) height for both wall and corner application. First, feed the cable (use a properly long cable) through the plate and fix it to the wall or corner, then feed the cable through the housing base. Finally, fix the base to the plate using the four screws provided.

#### WARNING

With a wrong mounting, the detector protection range will be moved upwards.

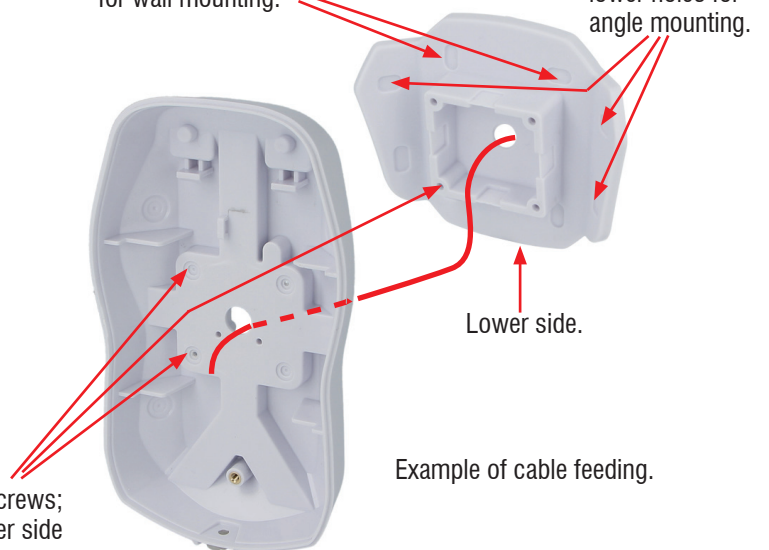


**YES**

**NO**

Arrangements for the upper and lower holes for wall mounting.

Arrangements for the upper and lower holes for angle mounting.



Lower side.

Example of cable feeding.

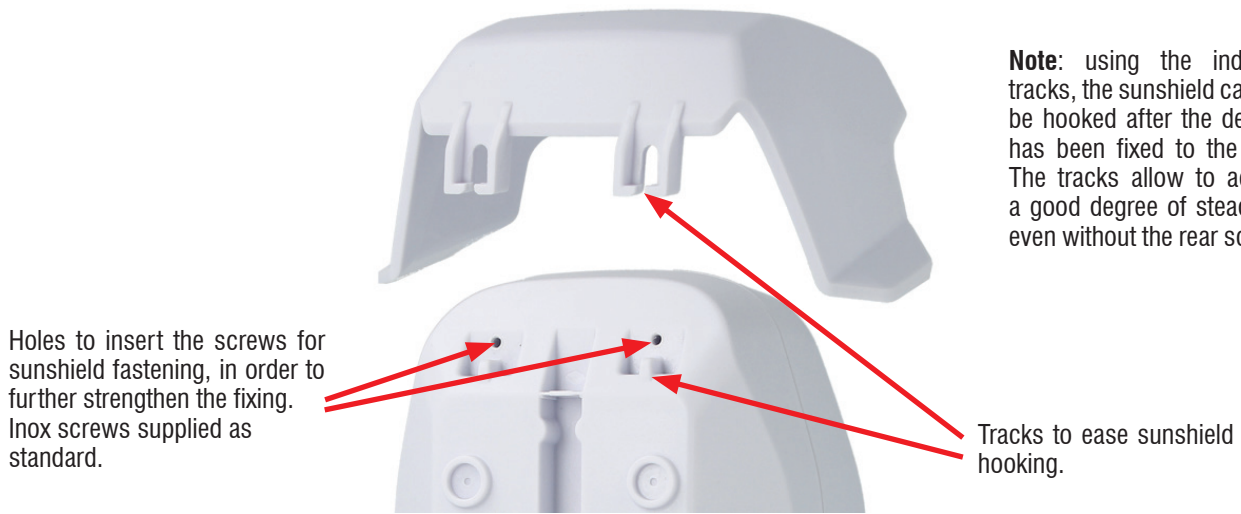
Fix the base with four screws; insert them from the inner side of the base.





#### 4.5 Sunshield installation

Example of protection sunshield installation.



#### 4.6 Optional SNDTRIAL joint

The details concerning the **SNDTRIAL** joint are described in a specific data sheet which includes several installation modes for all possible combinations.

##### Summary of the installation modes for the joint according to the fixing heights and the type of detector used.

Installation options:

- A. TRIAL linear fixing at 1 m height (without joint and without 6° tilted bracket).
- B. TRIALH fixing with 6° bracket at 1 - 1.5 m height (without joint).
- C. TRIAL corner fixing at 1 m height (without joint and without 6° tilted bracket).
- D. TRIALH corner fixing at 1 - 1.5 m height with 6° tilted bracket (without joint).
- E. TRIAL linear fixing at 2.1 m height with 6° tilted bracket (without joint).
- F. TRIAL corner fixing at 2.1 m height with 6° tilted bracket (without joint).

Possible installations with **SNDTRIAL** optional joint:

- A. Fixing with joint at any height only for TRIAL, with rotation up to  $\pm 45^\circ$  and maximum tilt  $\pm 45^\circ$  (the joint is mandatory for installations at heights from 2.1 m to 3 m maximum).
- B. Fixing with 90° joint for TRIAL or TRIALV (model with vertical curtain lens) at any height up to 3 m, with 90° rotation (right or left depending on bracket mounting) and maximum tilt  $\pm 45^\circ$ .



#### 4.7 Protection against removal from the mounting surface

Compliance with EN 50131 regulation grade 3 requires that the device is protected against removal from the mounting surface. Install the proper kit for protection against removal before fixing the tilted plate or the joint to the wall. Use KSAS1032 kit (white) in case of tilted plate use, KSAS1055 kit (red) in case of joint use.

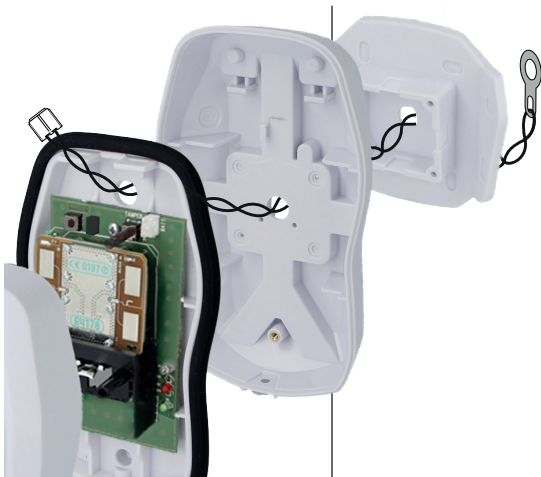
- fix a S4 dowel (supplied) to the wall
- fix the eyelet to the dowel

##### If you are using the tilted plate:

- drill a hole (diameter: 6,5 mm) on the centre of the tilted plate
- feed the cable in the hole
- fix the plate to the surface

##### If you are using the joint:

- feed the cable in the joint, as indicated in picture below
- fix the joint to the surface, covering the eyelet



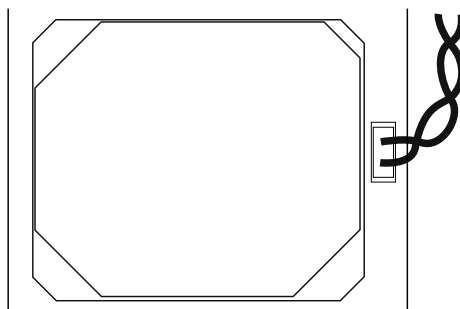
Kit KSAS1032, white



Kit KSAS1055, red

Once the plate or the joint have been installed:

- feed the cable through the hole on device housing back
- fix the housing back to the plate or to the joint
- feed the cable through the upper hole on device inner base
- lean the inner base on the back, hooking it to the tabs



- remove ESCL. ANTISTR. jumper on device board
- connect the cable connector to the jumper



## 5. OPERATION

### 5.1 Environmental monitoring

The IR section of the TRIAL detector includes a sophisticated device that performs 3D environmental monitoring for in-depth control of the thermal perturbations of the environment itself. The microprocessor analyses the signals coming from the two PIR sensors. This feature has been designed in order to get an accurate motion analysis and thus to reduce false alarms.

### 5.2 MW section exclusion

In order to reduce the power consumption while the control unit is disarmed, it is possible to disable the TRIAL MW section by applying a +12 V tension to the “MW.ESCL.” terminal. In this condition, only the PIR sensors perform the detection and the operation mode switches to **OR** regardless of the position of dip 5. When the “MW ESCL.” terminal is not powered, the detector switches to the mode set on dip 5.

### 5.3 AND mode

With dip 5 ON, the TRIAL detector operates in AND mode. In this mode, an alarm is triggered only when both sections (IR and MW) generate an alarm within 10 s. If this is not the case, the section that has generated the single alarm is reset after the set time.

### 5.4 OR mode

With dip 5 ON, the TRIAL detector operates in OR mode. In this mode, an alarm is triggered if either technology (double PIR or MW) generates an alarm due to motion detection within the area protected by the detector.

### 5.5 Anti-masking/anti-blinding functions

The TRIAL detector features an anti-masking and anti-blinding device with a separated relay output that only works if the detector is in AND mode (because of dip 5 and of no tension on the “MW ESCL.” terminal) and dip 3 is ON. In case of masking/blindness, the “ALARM” relay will activate along with the “MASK/FAULT” relay.

The condition of masking is marked by the MW blue LED slowly blinking.

The condition of blinding is marked by the IR green LED slowly blinking.

The normal operation mode will be recovered upon the first motion detected by both the sections, or upon removal of the anomaly cause.

**Note:** the anti-blinding function detects blinding attempts made using a reflector in close proximity to the lens. The anti-masking function detects an interfering body placed close to the detector.

**Note:** the activation of the anti-masking function (if activated via dip 3) can be visually checked only during the power supply stabilization phase after detector power on (red LED steadily on). Within this phase, when a person comes close to the sensor, the green and blue LEDs will blink simultaneously.

**Note:** the Masking/Fault output has to be connected to a different alarm input than the “ALARM” output of the detector. If you want to use a 24H inpt, program it to be silent. The best performance of the detector can be achieved by connecting it to a control unit that can manage separate alarm and tampering/fault events. For further indications, see “4.1 General installation suggestions” on page 6.

#### WARNING:

- If you need to install a TRIAL detector in locations where continuous people motion occurs, we suggest that you disable the anti-masking/anti-blinding functions (dip 3 OFF).





### 5.6 3D function

The **3D function** is the combined set of circuits that perform the temporal integration of the motions detected by the PIR sensors and by the MW section. The result is the alarm generation.

### 5.7 Look-down function

The TRIAL detector is provided with circuitry that implements protection against orientation change. An accelerometric sensor detects orientation changes on 2 axes.

If TRIAL is subject to a rotation of 5° on the Z or on the X axis, with respect to the initial installing position, a 5-second tamper alarm will be triggered; the alarm is marked by the red LED blinking.

**WARNING:** the circuitry features an high degree of immunity against random vibrations. Nevertheless, the following precautionary measures shall be taken:

- The wall where the detector will be installed must be solid and stable.
- The joint, if used, must be fixed properly. Firstly set the detector in position, then turn it on. During installation, the detector can be moved even after the system power up: this will inevitably trigger a 24H alarm, therefore we suggest that you disable the signalling devices before performing test or maintenance sessions.
- Avoid making holes or hitting the surface in the close proximity of the detector, unless you have previously disabled the system.
- You can turn dipswitch 6 OFF to disable the look-down circuit.



### 5.8 Low supply voltage detection

Upon this detection, only the “Failure” event will be triggered. The alarm circuit will be inhibited.

### 5.9 Walk test

If the WALK-TEST is active, the IR pulse signalling is counted separately for each PIR channel. This is useful during installation in order to understand the effective capacity of the two sections according to the used lenses. The first PIR channel activates the green LED, the second PIR channel activates the red LED.

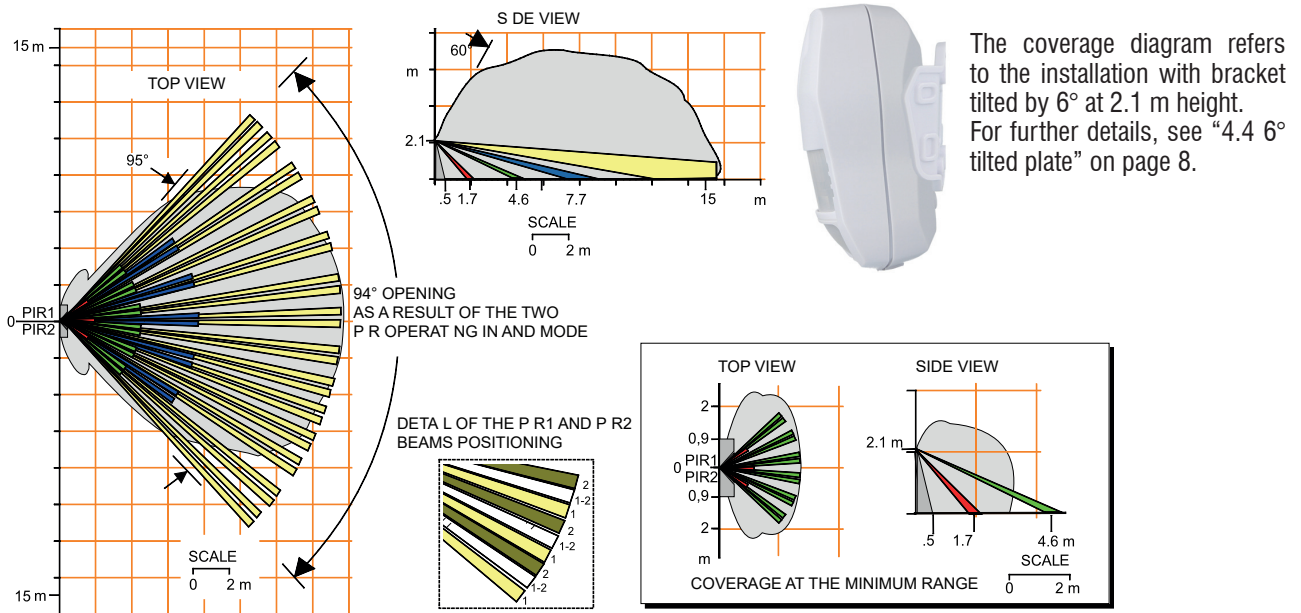


## 6. COVERAGE DIAGRAM

Coverage diagram of the detector mod. TRIAL equipped with standard lens (EWA 1.2 GI 12 V2).

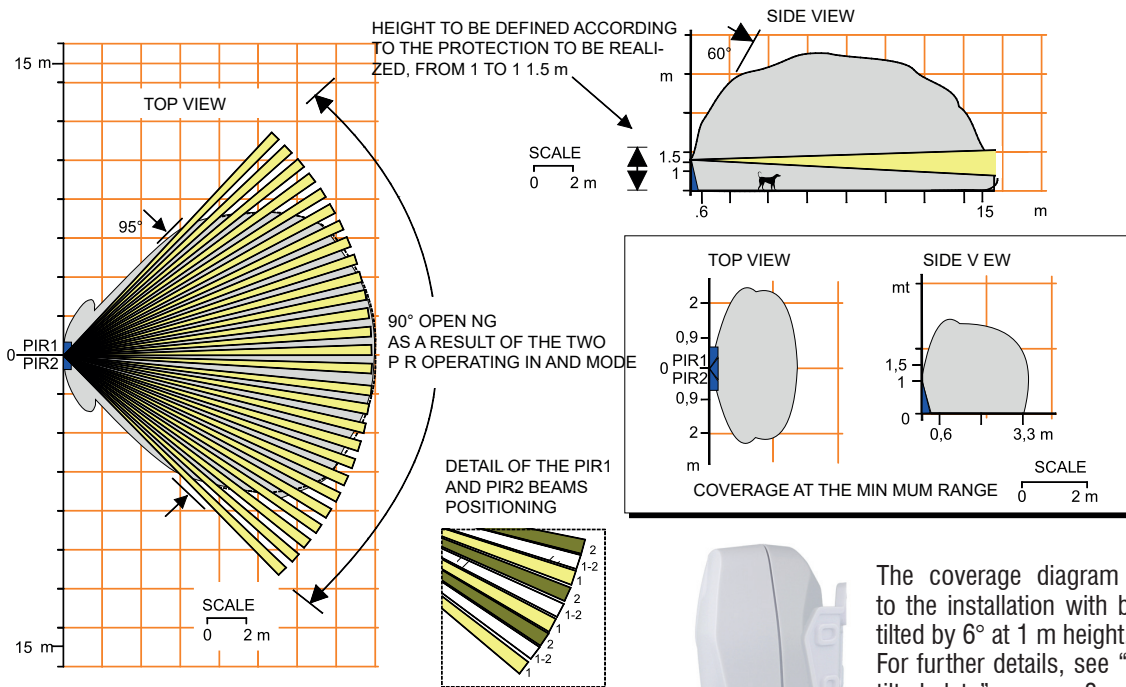
**Range:** 15 m. **IR coverage:** Volumetric, IR 94° opening.

**Beams arrangement:** 2 × 28 areas on 4 planes, 2 × 3 under-crawl areas on 1 plane.



**IMPORTANT:** the user shall check that the field of view of the detector is not partially or totally obscured.

Coverage diagram of the detector mod. TRIALH equipped with horizontal curtain lens (AA 1.2 GI 12 V1).

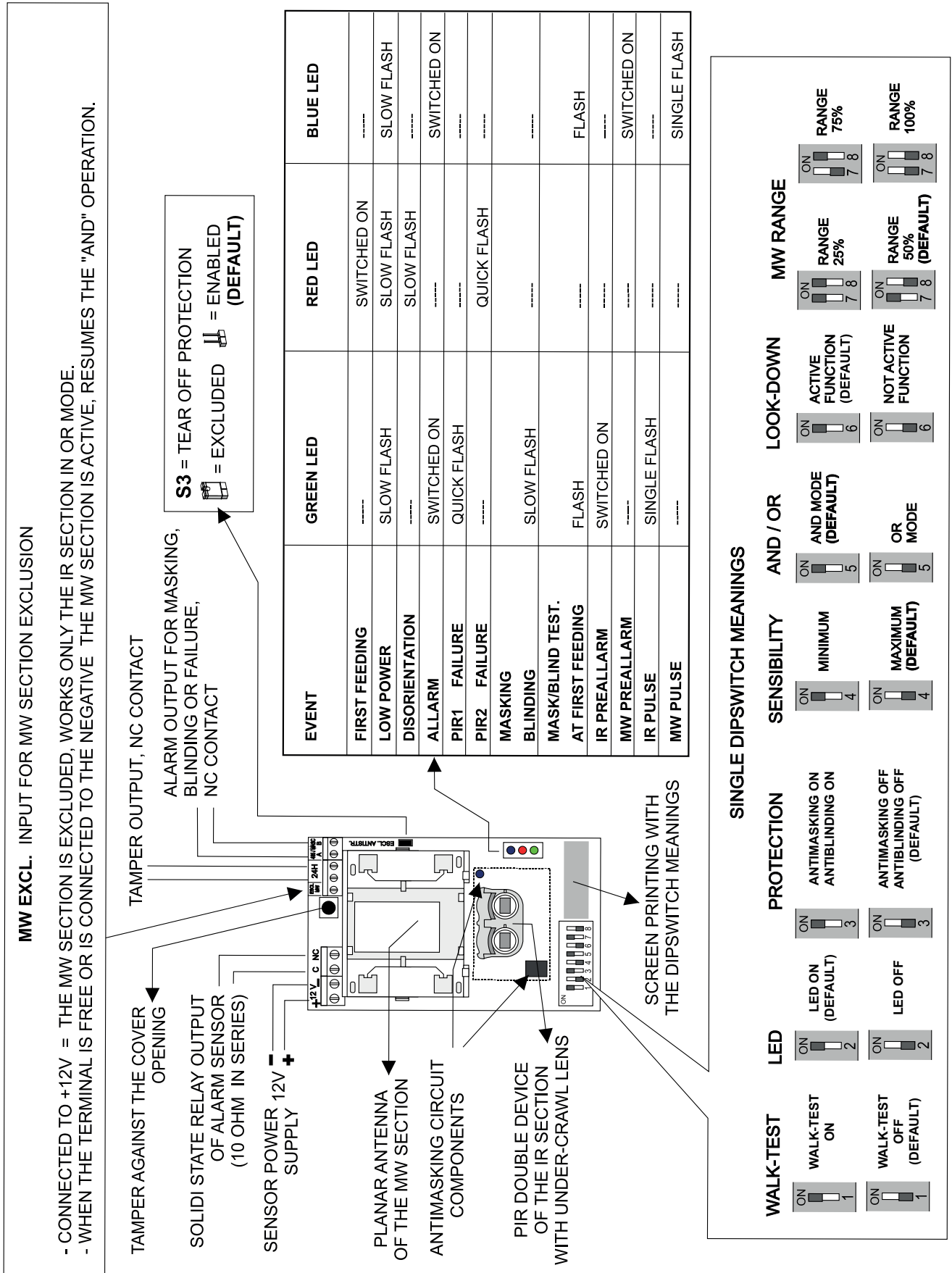


**IMPORTANT:** the user shall be careful that the under-crawl protection is still active even with perimeter protection lens.



### 7. ELECTRICAL WIRINGS

View of the detector board.





## 8. TABLE OF CONTENTS

1. GENERALS .....	3
2. FEATURES .....	3
2.1 General features .....	3
2.2 Electrical features .....	4
3. VIEW OF THE DETECTOR .....	5
4. INSTALLATION .....	6
4.1 General installation suggestions .....	6
4.2 Housing opening and closing operations .....	7
4.3 Cables feeding .....	8
4.4 6° tilted plate .....	8
4.5 Sunshield installation .....	9
4.6 Optional SNDTRIAL joint .....	9
4.7 Protection against removal from the mounting surface .....	10
5. OPERATION .....	11
5.1 Environmental monitoring .....	11
5.2 MW section exclusion .....	11
5.3 AND mode .....	11
5.4 OR mode .....	11
5.5 Anti-masking/anti-blinding functions .....	11
5.6 3D function .....	12
5.7 Look-down function .....	12
5.8 Low supply voltage detection .....	12
5.9 Walk test .....	12
6. COVERAGE DIAGRAM .....	13
7. ELECTRICAL WIRINGS .....	14
8. TABLE OF CONTENTS .....	15

TRIAL - TRIALH - Outdoor triple technology detector equipped with anti-masking and under-crawl protection  
TECHNICAL MANUAL - February 2021 edition

090041111

The information and product features herein are not binding and may be changed without prior notice.

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