TECHNICAL MANUAL

TRIAL485 - TRIAL485H

Outdoor triple technology detector equipped with anti-masking and under-crawl protection with RS485 interface

090061111

CE

IMQ-SISTEMI DI SICUREZZA

EL.MO.SPA

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...).

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 with RS485 interface

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 TRIAL485 - TRIAL485H 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 – 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.

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1. GENERALS

TRIAL485 is a high-performance triple technology detector. Its housing shape allows for both outdoor and indoor installation. **A key point of the TRIAL485 detector is the use of 2 digital PIR sensors to obtain very high detection precision and great immunity against noise, and the RS485 interface for full software management.**
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 proper 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 detector is compatible with the control units that feature ULTRABUS interface.
Through the TRIAL485 serial interface, it is possible to fully manage the detector via software (the configuration involves the sensitivity parameters, integration, environmental noise analysis, temperature and the generated events log). The control software is compatible only with **BrowserOne v. 2.7.18** or higher, using the specific module for the control unit in use.
The particular shape of the TRIAL485 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 **SNDTRIAL** code.
The TRIAL485 detector is not equipped with interchangeable lens: if a detector with horizontal protection lens is required, order it by specifying the TRIAL485H model. In this manual we will refer to the TRIAL485 model; informations on the TRIAL485H model will be added if required.
TRIAL485 and TRIAL485H 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.

- Detector manageable via software through RS485 serial interface.

- Real time monitoring of the operating status of the detector and of the environment temperature. Graphic memorization of the last generated alarm.

- Parameters settable via software: sensitivity, integration, AND/OR function, walk test, enabling of the functional LEDs, masking, blinding, orientation change, MW section exclusion if the system is disarmed.

- 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.

- Possibility to save the programming window or only the waveforms as JPG.

- Waveform recording from the browser (up to 4 hours).

- Sophisticated calculation algorithm used by the environmental monitoring circuit with microprocessor conversion on IR stage.

- MW section with DRO device and planar antenna RTTE/99-05 certified, 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-craw device; these lenses are ultrasonically welded and non-replaceable.

- Protection against noise applied to the power supply terminals and to the serial line.

- Detection of the perceived noise from the IR and MW sections with visualization through vertical bars, oscilloscope viewing with zoom and threshold setting.

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- Orientation change detection with accelerometrical sensor on two axes always active and consequent generation of a tamper alarm.

- The TRIAL485 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 TRIAL485 and TRIAL485H models with different frequency can be ordered. For the correct codes, see "4.1 General installation suggestions" on page 6.

- For the TRIAL485 detector, the SNDTRIAL 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 TRIAL485H model is also available: it is equipped with lens providing horizontal curtain protection (already welded).

2.2 Electrical features

Model	TRIAL485 (TRIAL485H)
Performance level	II with or without joint.
IMQ certified Environmental class	EN50131-2-4: grade 3 4
Protection class	IP55
Power supply	12 V (from 7.5 to 15 V).
Tolerated ripple	200 mVpp.
Detector power consumption @12 V:	
Idle	19 mA
In alarm	24 mA
In stand-by, MW exclusion	18 mA
Functions configuration	Via software.
Address setting	Through dipswitch
Timers:	
For alarm or disorientation	5 s
Stand by at power on	20 s
AND function alarm waiting time	10 s

Visualizations	MW section operation, IR section operation, alarm status, faults, orientation change, masking/blinding.
LEDs exclusion	Via software.
Adjustments	Via software.
Alarm and tampering	Generated by the detector and sent via RS485.
Tamper	Protection against cover opening and tearing of the fixing internal base; this function can be excluded through suitable jumper.
IR stage gain	Optimized with temperature and managed via software.
Operating temperature	-10 / +55 °C.
Humidity	93% Ur.
Dimensions, weight	H 167 - W 95 - D 75 mm only body detector, 270 g without joint accessories.
Parts supplied	Screws, dowels, 6° tilted plate and sunshield, protection grommet, technical manual.
Options	SNDTRIAL modular joint; 90° joint (version bent by 90°) also available.

MW SECTION

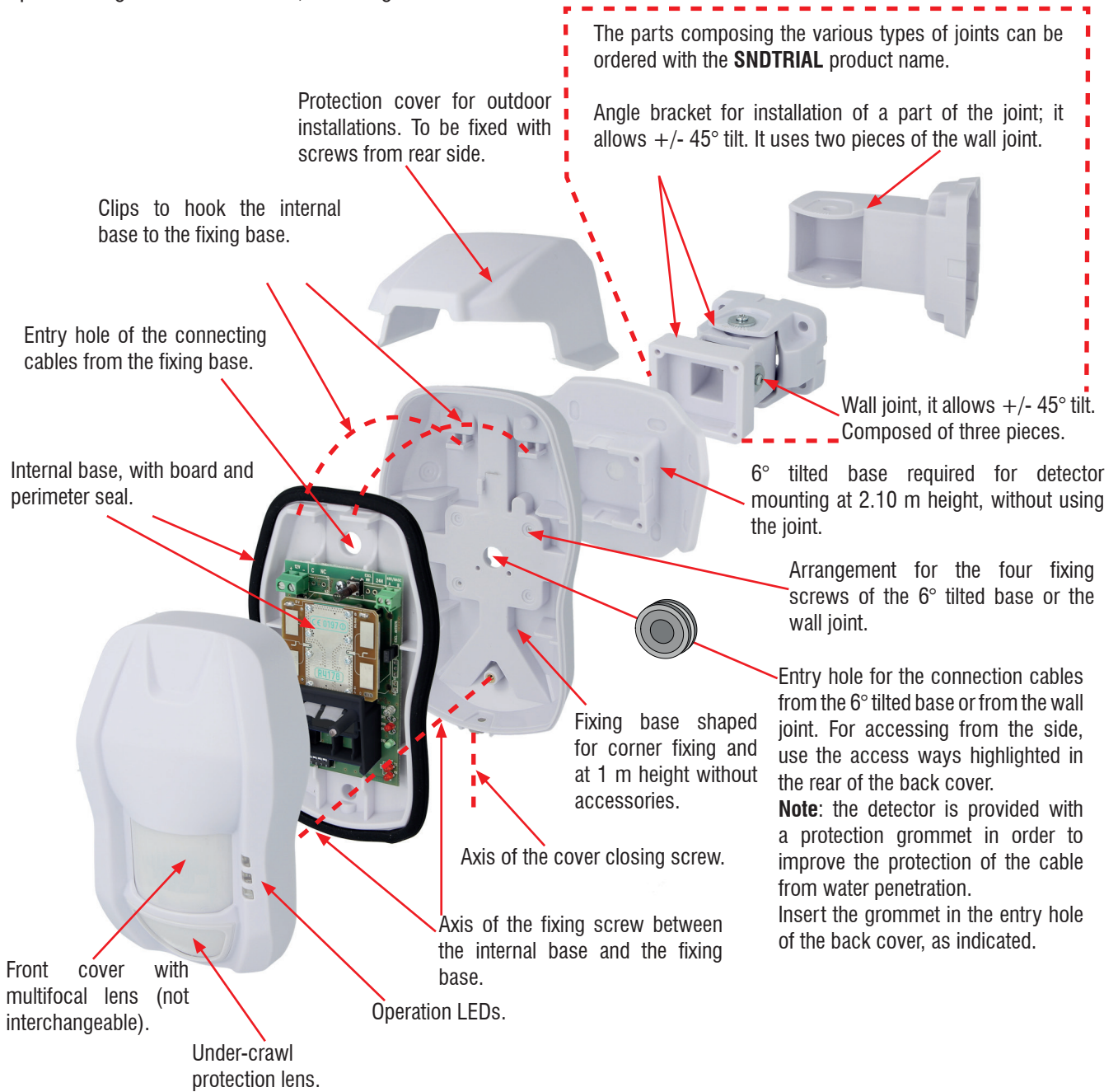|	
Adjustments	Range adjustment via software.
Sensitivity	Adjustment via software.
Noise filter	Neon lamps -21 dB, Power supply -65 dB.
TX frequency	10.525 GHz (standard version); 9.9 GHz (different frequency version)
Emitted power	13 dBm E.I.R.P.
Spurious issued	<-30 dBm.
Signal emitted	Pulsed.
Range	From 3 to 15 m +/-20% adjustable via software in 4 steps.
Coverage area	95° on horizontal plane, 60° on vertical plane.
Timers	Single alarm with pending confirmation from the IR sections and AND/OR operation mode settable via software.

IR SECTION

Lens type	EWA 1.2 GI 12 V2 lens. (AA1.2 GI 12 V1 lens for TRIAL485H). Separated under-crawl lens.
Sensitive areas No.	2 x 28 areas on 4 planes (2 x 15 areas for TRIAL485H). 2 x 3 under-crawl areas on 1 plane.
Coverage area	Volumetric with 94° opening (horizontal curtain 90° opening for TRIAL485H).
Range	15 m with fixing at standard height of 2.10 m (from 1 to 1.50 m for TRIAL485H); the coverage may vary according to the adopted solutions for mounting with tilted bracket and/or SNDTRIAL, see the manual.
Sensitivity	Adjustable via software.
Timers	Single alarm, with pending confirmation from the MW section and AND/OR operation mode settable via software.

3. VIEW OF THE DETECTOR

Exploded diagram of the detector, including accessories.

The parts composing the various types of joints can be ordered with the **SNDTRIAL** product name.

Angle bracket for installation of a part of the joint; it allows +/- 45° tilt. It uses two pieces of the wall joint.

Protection cover for outdoor installations. To be fixed with screws from rear side.

Clips to hook the internal base to the fixing base.

Entry hole of the connecting cables from the fixing base.

Internal base, with board and perimeter seal.

Wall joint, it allows +/- 45° tilt. Composed of three pieces.

6° tilted base required for detector mounting at 2.10 m height, without using the joint.

Arrangement for the four fixing screws of the 6° tilted base or the wall joint.

Fixing base shaped for corner fixing and at 1 m height without accessories.

Entry hole for the connection cables from the 6° tilted base or from the wall joint. For accessing from the side, use the access ways highlighted in the rear of the back cover.
Note: the detector is provided with a protection grommet in order to improve the protection of the cable from water penetration.
Insert the grommet in the entry hole of the back cover, as indicated.

Axis of the cover closing screw.

Axis of the fixing screw between the internal base and the fixing base.

Operation LEDs.

Front cover with multifocal lens (not interchangeable).

Under-crawl protection lens.

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

Note: it is not possible to replace the lens, therefore you will need to purchase the TRIAL485H 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:
  - **TRIAL485** RCRTT02002#00 (standard) and **TRIAL485** RCRTT02010#00 (different frequency);
  - **TRIAL485H** RCRTT02004#00 (standard) and **TRIAL485H** RCRTT02012#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.

YES — Perimeter with not overlapping coverages.

YES — Side with slightly overlapping coverages.

YES — Outdoor, protected by a porch or a balcony (recommended).

NO — Side with completely overlapped coverages, with detectors operating at the same frequency. We suggest that you use detectors operating at different frequencies.

NOT ADVISABLE — Pointing towards outside areas affected by the passage of cars or trucks, also with car-truck distances >> 15 m.

NOT ADVISABLE — Pointing towards trees or shrubs: the minimum distance shall be > 15 m.

NOT ADVISABLE — Directly pointed towards the sun.

NO / NOT ADVISABLE — 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.**
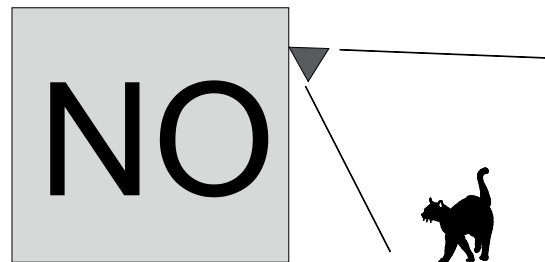
NO — Installation with standard lens, with animals presence. Install the TRIAL485H model at an height of 1 m minimum.

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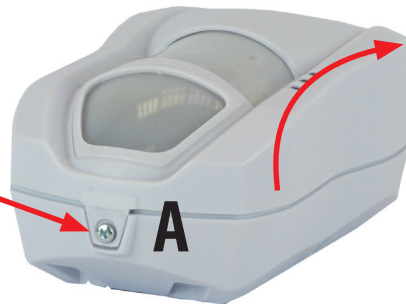
2) Detach the front cover: turn it from below, pivoting on the top of the detector, then unhook the clips indicated by the **B** arrow in the image below.

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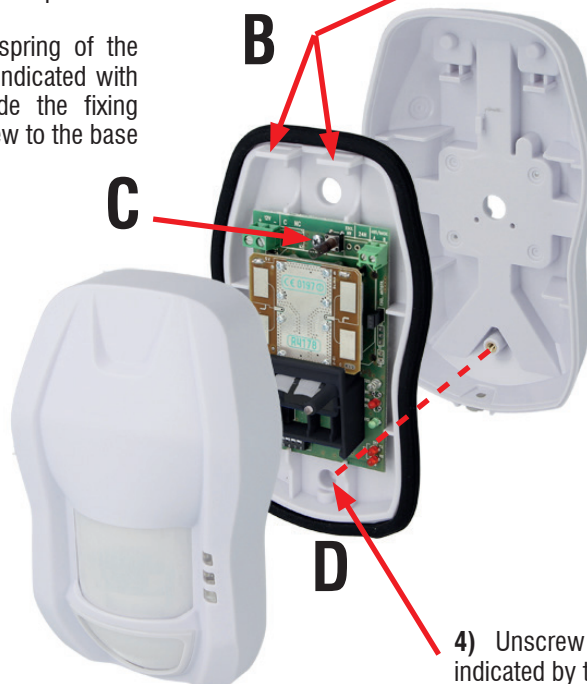
4) Unscrew the inner base fixing screw indicated by the **D** arrow.
Disconnect the internal base applying a force sufficient to contrast the perimetral seal. Detach the fixing base.

4.3 Cables feeding

Internal view and indications for the cables feeding.

Arrangements for drilling and support pins for wall mounting.

Arrangements to insert the fixing screws for the joint.

Feed the cables in upward direction through the hole indicated.

Arrangements for side holes for angle fixing.

Fixing screw for the board.

Cut the edge indicated with **X** to pass with the cable.

Example of cable entry.

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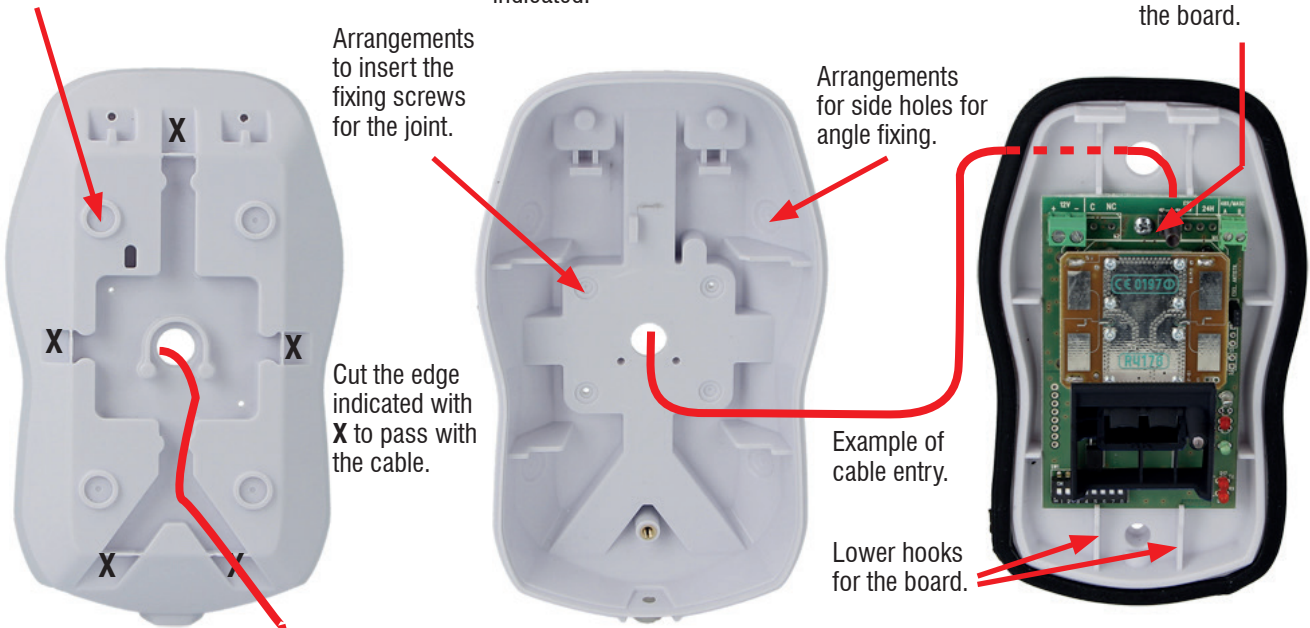
Rear view of the fixing base with assisted paths for the cables.

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 TRIAL485H) 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.

Arrangements for the upper and lower holes for wall mounting.

Arrangements for the upper and lower holes for angle mounting.

YES   **NO**

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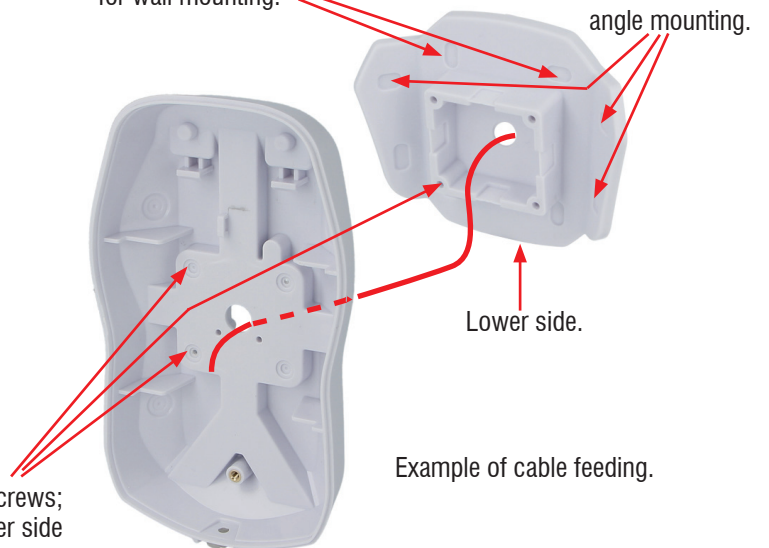
Fix the base with four screws; insert them from the inner side of the base.

Example of cable feeding.

4.5 Sunshield installation

Example of protection sunshield installation.

Note: using the indicated tracks, the sunshield can also be hooked after the detector has been fixed to the plate. The tracks allow to achieve a good degree of steadiness even without the rear screws.

Holes to insert the screws for sunshield fastening, in order to further strengthen the fixing. Inox screws supplied as standard.

Tracks to ease sunshield hooking.
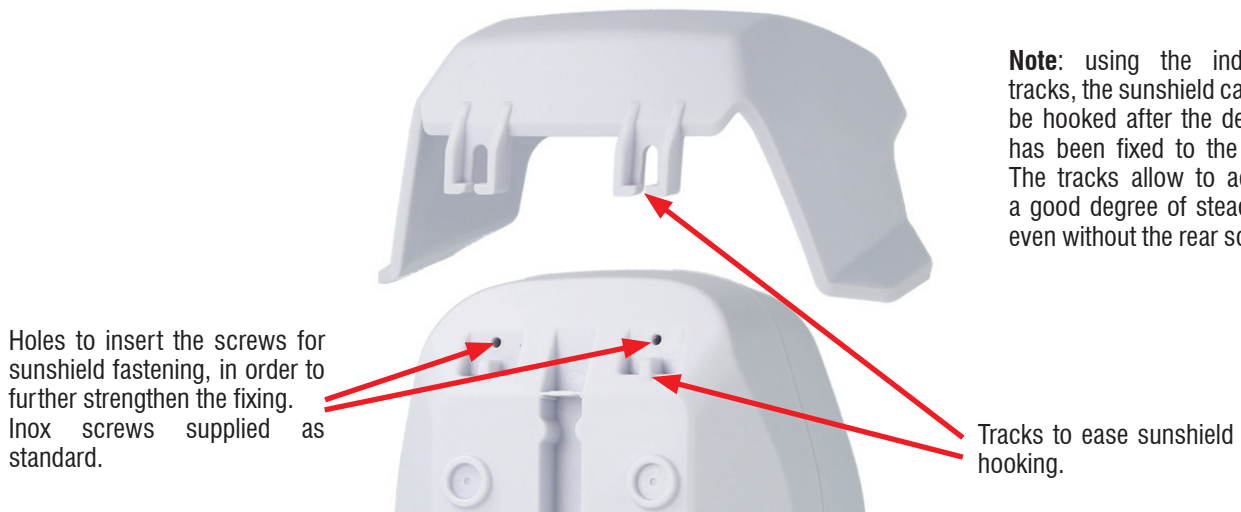
4.6 Optional SNDTRIAL joint

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. TRIAL485 linear fixing at 1 m height (without joint and without 6° tilted bracket).
B. TRIAL485H fixing with 6° bracket at 1 - 1.5 m height (without joint).
C. TRIAL485 corner fixing at 1 m height (without joint and without 6° tilted bracket).
D. TRIAL485H corner fixing at 1 - 1.5 m height with 6° tilted bracket (without joint).
E. TRIAL485 linear fixing at 2.1 m height with 6° tilted bracket (without joint).
F. TRIAL485 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 TRIAL485, with rotation up to + \ -45 ° and maximum tilt + \ - 45 ° (the joint is mandatory for installations at heights from 2.1 m to 3 m maximum).
B. Fixing with 90° joint for TRIAL485 or TRIAL485V (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 +/- 45°.

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
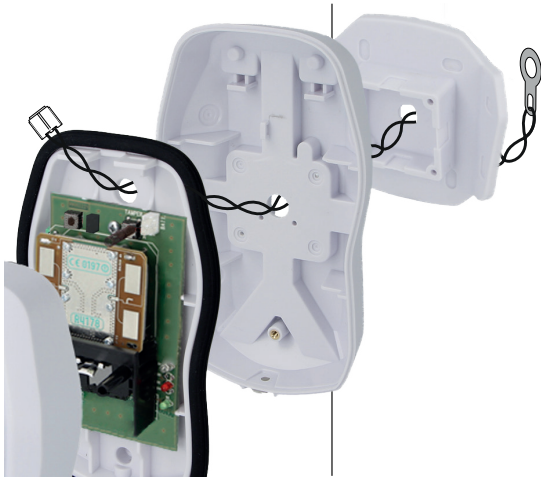
Kit KSAS1032, white

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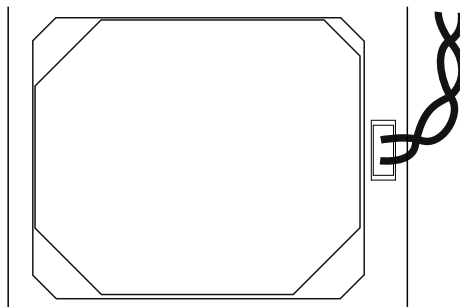
- remove ESCL. ANTISTR. jumper on device board
- connect the cable connector to the jumper

5. ELECTRICAL WIRINGS

View of the detector board.

NOTE: THE SERIAL LINE MUST END WITH 680OHM RESISTANCE: CONNECT IT TO «A» AND «B» TERMINALS OF THE LAST DEVICE

S3 = ANTI-TEAR PROTECTION
= EXCLUDED   = ENABLED **(DEFAULT)**

TO OTHER ADDRESSED DEVICE
12 V + − A B

FROM THE CONTROL UNIT OR FROM PREVIOUS ADDRESSED DEVICE
12 V − + A B

TAMPER AGAINST COVER OPENING

PLANAR ANTENNA OF THE MW SECTION

COMPONENTS OF THE ANTI-BLINDING CIRCUIT

PIR DOUBLE DEVICE OF THE IR SECTION WITH UNDER-CRAWL LENS

DIPSWITCH FOR DETECTOR ADDRESSING, SEE THE TABLE IN THE TECHNICAL MANUAL

SIGNALING LED FOR RS485 OPERATION

BLUE RED GREEN

EVENT	GREEN LED (IR SECTION)	RED LED	BLUE LED (MW SECTION)
FIRST POWER ON	-----	ON	-----
DEFAULT OK	SLOW BLINK	FAST BLINK	SLOW BLINK
LOW POWER	SLOW BLINK	SLOW BLINK	SLOW BLINK
ORIENTATION CHANGE	-----	SLOW BLINK	-----
ALARM	ON	-----	ON
PIR1 FAULT	FAST BLINK	-----	-----
PIR2 FAULT	-----	FAST BLINK	-----
MW PULSE	-----	-----	ONE BLINK
MASKING	-----	-----	SLOW BLINK
BLINDING	SLOW BLINK	-----	-----
MASKING TEST UPON FIRST POWER ON	BLINKING	-----	BLINKING
PREALARM IR	ON	-----	-----
PREALARM MW	-----	-----	ON
IR PULSE	ONE BLINK	-----	-----

NOTES: SEE THE MANUAL FOR THE RESET OPERATIONS OF THE DETECTOR

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6. ADDRESS SETTING

Table 1.
Note: the number of the first row indicates the VIDOMO/PREGIO/PROXIMA encoding, the second indicates the ETR100MG2 encoding, ETR100MG2, the third indicates the ETR128-256-512 G2 and TITANIA encoding.
DO NOT EXCEED THE MAXIMUM MANAGED BY THE CONTROL UNIT.

DO NOT USE THIS POSITION FOR ADDRESSING.
SINCE IT IS NEEDED TO PERFORM THE DETECTOR TOTAL RESET.
FOR RESET OPERATIONS, SEE THE MANUAL.

Table 2.
Note: the number at the side indicates the ETR128-256-512G2 and TITANIA encoding.
<u>**DO NOT EXCEED THE MAXIMUM MANAGED BY THE CONTROL UNIT.**</u>

145 146 147 148 149 150
151 152 153 154 155 156
157 158 159 160 161 162
163 164 165 166 167 168
169 170 171 172 173 174
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265 266 267 268 269 270
271

DO NOT USE THIS POSITION FOR ADDRESSING.
SINCE IT IS NEEDED TO PERFORM THE DETECTOR TOTAL RESET.
FOR RESET OPERATIONS, SEE THE MANUAL.

6.1 <u>Detector reset operations</u>

The detector stores the settings received via serial line from the configuration software. To quickly restore the detector to its factory settings, if no connection to the software is available, proceed as follows:

- Disconnect the power supply.
- Move all the dipswitches to OFF.
- Power up the detector: the blue and green LEDs will blink slowly while the red LED will blink quickly.
- Disconnect the power supply after at least 20 s.
- Set a valid address for the operation with the control unit to which the detector will be connected.
- Power on the detector.
- Proceed to its acquisition and configuration.

Note: If the power supply is removed, the current memory of alarm will be lost.

7. SOFTWARE CONFIGURATION

> **WARNING: The detector can only be configured using the module of the compatible control unit in BrowserOne software, v.2.7.18 or higher.**

Use the module for the specific control unit.

To detect the sensor, perform the following operations:

- Connect to the control unit.

- Select the detector in the zone type list and connect it.

- From the "Actions" menu, select "RS485 device management", and then "All" or "Only Configured" within the "1 input devices" box.
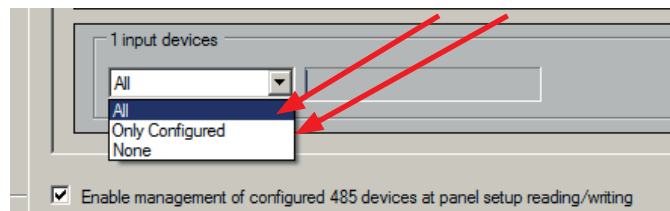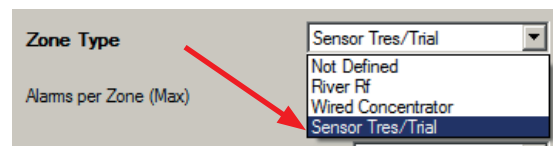
- Click on the "Read" button and check the detector has been properly recognized at the end of the action.

- In the zones menu select "Cable Devices" and click on the "Open configuration form" button in the "Advanced devices configuration" box.
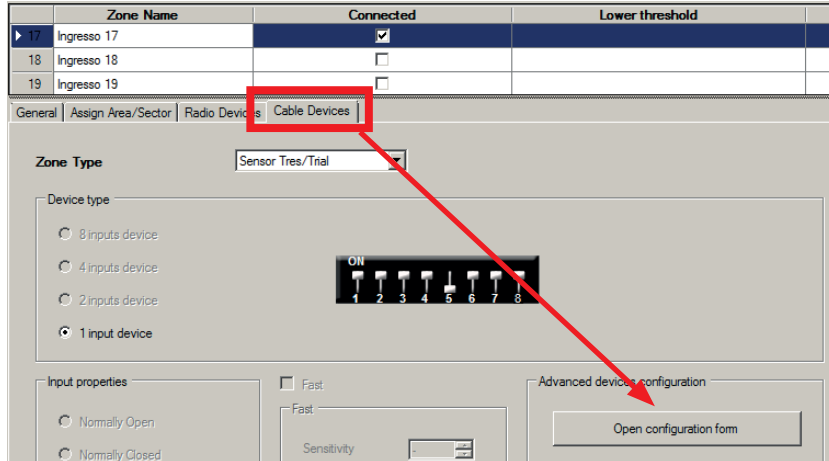
ONLY now the first (basic) setup menu will be displayed:

In the top bar, the detector model and the firmware version will be shown.

In this menu, you can configure the following parameters.

Range: you can choose between the preset values 50% (default), 75% and 100% of the range indicated in the detector technical specifications.

Sensibility: you can choose between two preset integration values:

1. **HIGH** (default)= 4 MW settings and 2 IR settings (from each IR).

2. **LOW**=8 MW settings and 3 IR settings (from each IR).
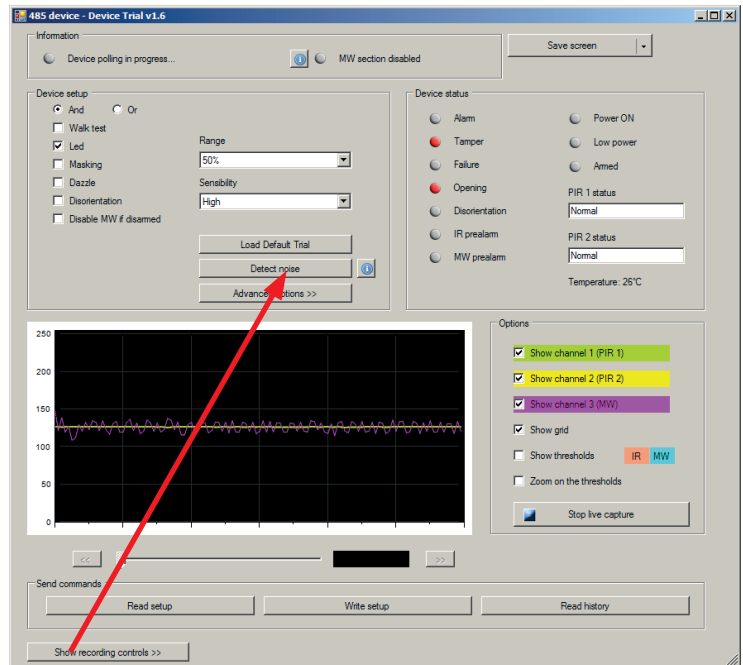
Environmental Noise function
Clicking on the "Detect noise" indicated button, a box will appear on the right of the oscillographic window. This box allows to detect the environmental noise from MW and IR sections for some time (settable by the installer), and it provides an outcome depending on the set thresholds.
Start the detection by clicking on the "Start" button. Stop it by clicking on the "Stop" button.
A possible situation is shown in the picture on the right: the oscilloscopic visualization, the indication through vertical bars and the values detected by the IR and MW sections are displayed.

Oscillographic function

The oscillographic function is a key point of the detector management software, since it allows to efficiently visualize the detected environmental noise and the motion within the area protected by the detector.

The display options allow to select the waveforms; it is also possible to set graphically the IR and MW warning thresholds available in the "Advanced Options".

The oscillographic function is also available during waveforms recording, as shown further.
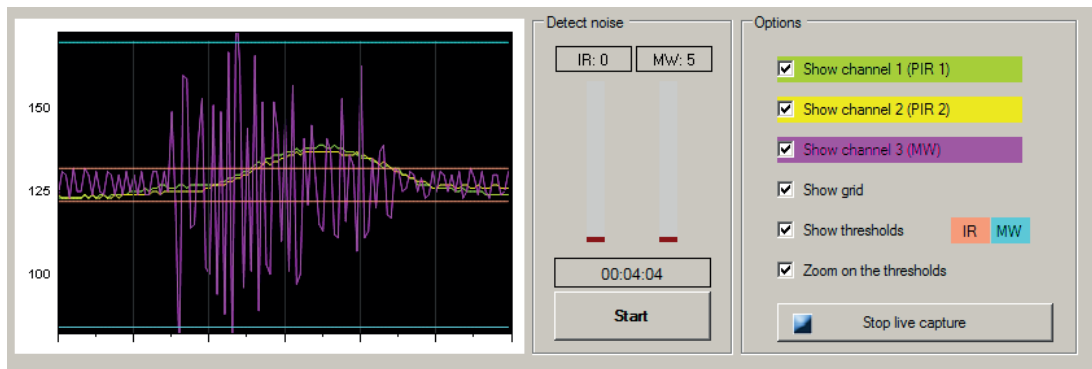
The "Stop live capture" button blocks the graphic flow from right to left.

By clicking on "Advanced Options", the second menu will be displayed:

In this menu, you can configure:

Walk Test: this function is used to monitor the 2 PIRs separately by turning on the LEDs:

Green LED = PIR1
Red LED = PIR2

"Disable MW if disarmed": use this function to disable the MW section when all the sectors associated to the detector are disarmed; in this case the pre-alarm generated by the PIR sections will be enough to trigger a general alarm.

Note: in this case the anti-masking function is not enabled; only the anti-blinding function will be active.

The anti-masking function will be enabled again upon arming of at least one of the sectors associated to the detector.
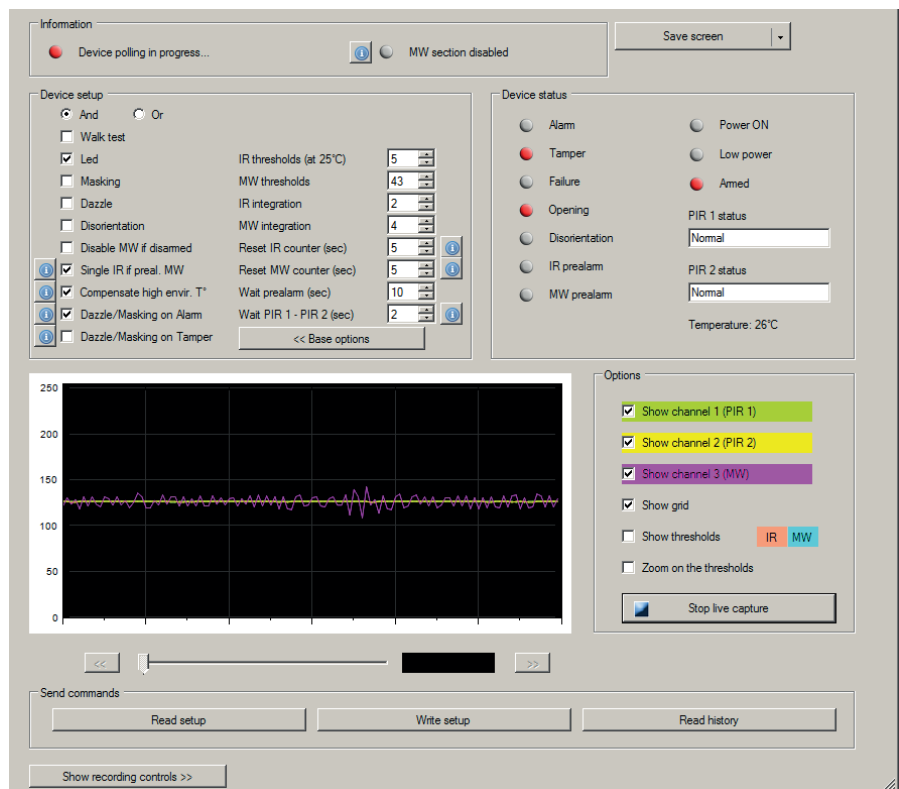
Other remarkable functions that can be found in the "Device setup" box:

- **Wait PIR 1 - PIR 2**: it represents the maximum allowed time between two motion detection pulses from the two PIR sensors. If two pulses are detected within this time, they will contribute to the IR integration counting. **Default: 2 s**.

- **Single IR if preal. MW** (default = enabled): it allows to trigger an alarm upon the first IR pulse (from both PIR sensors), irrespective of the "IR integration" option, provided that a MW pre-alarm has occured before. If no pre-alarm has occured from the MW section, the IR integration counting is performed according to the number specified in the "IR integration" option.
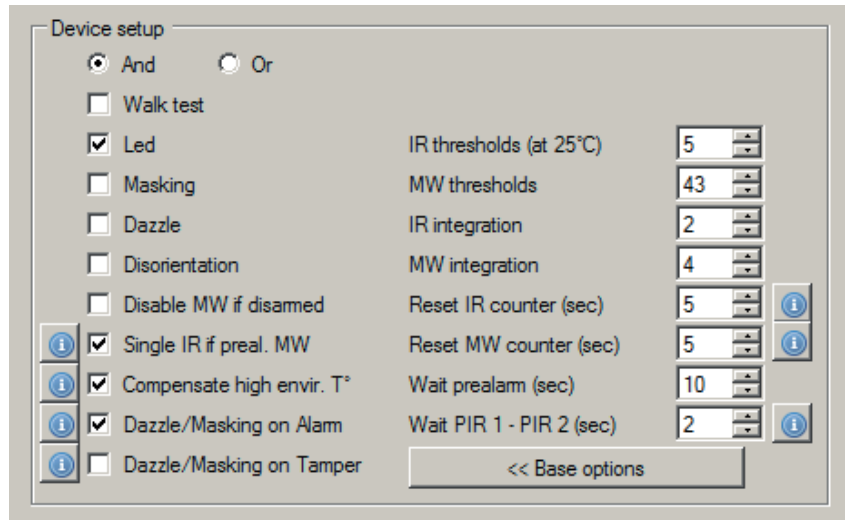
- **Compensate high envir. T°**: this function is **selected by default** in case of high ambient temperature (>33°). It allows to further improve the sensitivity of the IR section.

7.1 Operating status

A visual indication of the detector operating status is given by the front LEDs; the software application provides more complete informations in the "Device status" box on the top-right within the basic and advanced options.

It is worth noticing the "Armed" indication, giving informations on the arming status of the sectors associated to the detector; the status of the two PIR sensors and an indication of the perceived temperature.
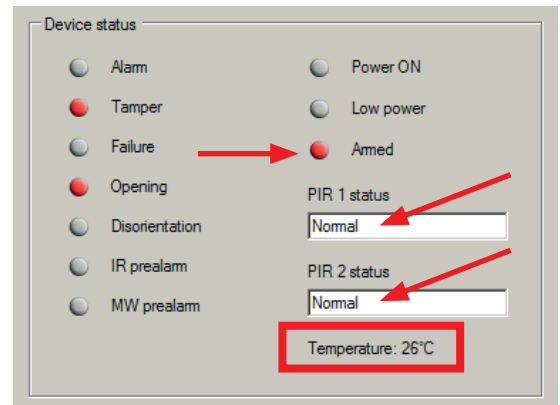
7.2 Command sending

In the configuration window there are three buttons to send the following commands:
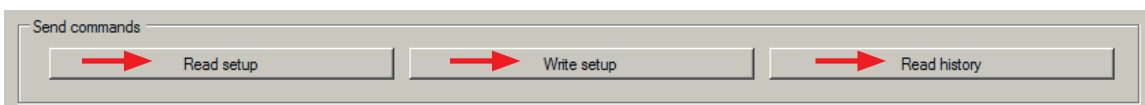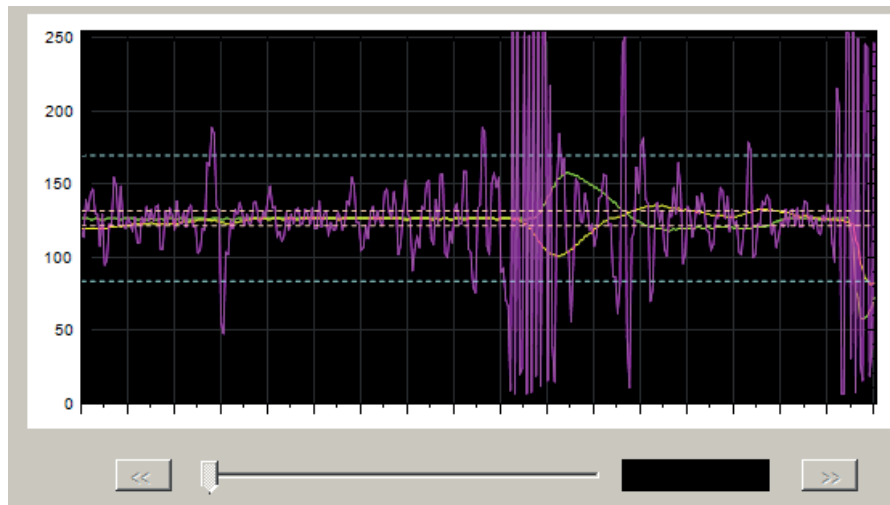

These commands are also available during the waveforms recording as shown further on.

7.3 Alarm memory

The TRIAL485 detector can locally store the waveforms corresponding to <u>the last generated alarm</u>.
The alarm memory of the detector can be read and displayed exclusively using the software application.

Note: the control unit can not store the alarm coming from the detector with the waveforms details; in case of power failure, the alarm saved is lost. By clicking on the "Show options" button, the same image will be displayed together with some selectable options.
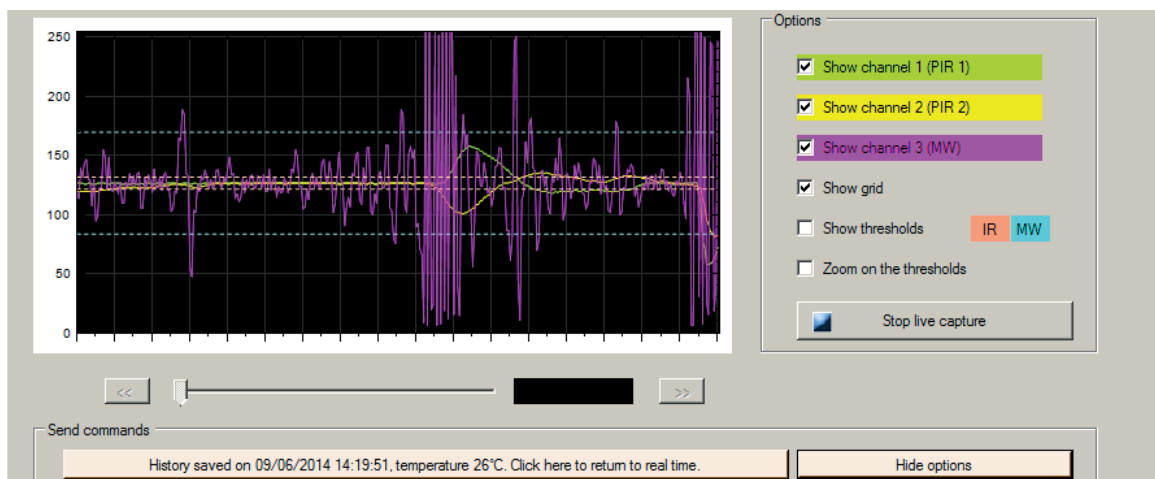
The detector alarm is stored only if at least one of the sectors belonging to the detector zone is armed; in this case, the following data will be stored:

• The waveforms concerning the first received alarm after arming.
• The date and time when the alarm occurred.
• The IR and MW alarm thresholds which triggered the alarm, see note.
• The environmental temperature when the alarm occurred (the value shown is indicative).

Note: do not change the configuration before reading the sensor alarm memory: if you change the sensor configuration before performing an alarm memory reading, the parameters in the setup section will be the last inserted ones and not the ones used during memorization.
The alarm memory thresholds are always maintained and displayed separately (dashed lines).

In addition, it is worth pointing out that:

- The alarms generated after the first, within the same arming cycle, are not stored.
- In case of control unit reset, the stored alarm is maintained.
- In case an alarm occurs within an arming cycle, then the system is disarmed, then the system is armed again and another alarm occurs, only the last generated alarm will be stored.
- If, after an alarm is stored, other arming cycles take place, the stored alarm will be kept in memory until another alarm occurs.
- In case of any power failure, the alarm memory is lost.

> **WARNING: further information can be found in the programming manual of the compatible control unit.**

7.4 Waveforms recording function

This function is available only using BrowserOne v.2.5.5 or higher. It allows to record the detector waveforms for up to 4 hours. During the recording operation, the installer can freely move within the area protected by the detector and then return to the PC to stop the recording, save it and watch it more easily in order to examine the operational behaviour.
The software provides the standard recording management keys and allows to save the waveforms with time indications (expressed in hours, minutes and seconds) displayed next to a browsing bar.
The commands for the recording function are not displayed by default: click on the "Show recording controls" button on the bottom of the screen, as indicated by the arrow.
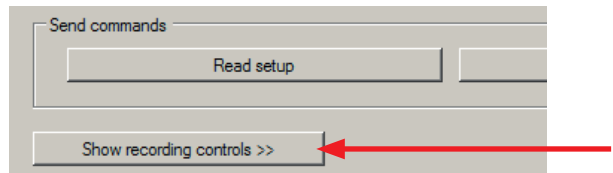
Main commands in detail:

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elmospa.com

During waveform recording, it is possible to write a new detector setup, read the existing detector configuration, read any alarm memory.

During the recording it is also possible to perform the noise test independently of the viewing situations (Live, Playback or REC). In case the noise test is launched while recording, a reminder of contemporaneity with other activities will be displayed in the area indicated in the picture below.
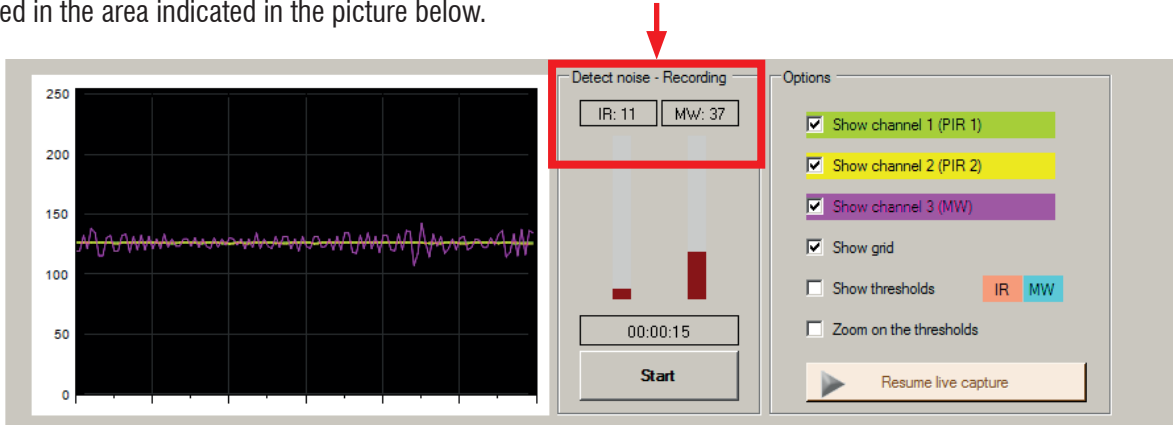
8. OPERATION

8.1 Environmental monitoring

The IR section of the TRIAL485 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.

8.2 MW section exclusion

It is possible to disable the TRIAL485 MW section via software, in order to reduce the power consumption when the control unit is disarmed: in this condition, only the PIR sensors perform the detection and the operation mode switches to **OR**.

When the control unit/area is armed, the MW section will switch on again and the **AND** mode (or anyway the mode specified in the configuration settings) will be restored.

Note: if the MW section is excluded via software and the sectors associated to the detector are disarmed, the anti-masking function will be disabled too; only the anti-blinding function will be active. The anti-masking function will be enabled again upon arming of at least one of the sectors associated to the detector.

8.3 AND mode

By default, the TRIAL485 detector is set to operate in AND mode.

In this mode, an alarm is triggered only when both sections (IR and MW) generate an alarm within a defined maximum time (set via software application; the default time is 10 s).

If this is not the case, the section that has generated the single alarm is reset after the set time.

CLEARANCE AREA FOR THE ANTI-BLINDING FUNCTION: 20 cm FROM THE DETECTOR OUTWARDS.

8.4 OR mode

The TRIAL485 detector can be configured via software application to operate 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.

8.5 Anti-masking/anti-blinding functions

The TRIAL485 detector features an anti-masking and anti-blinding device. The anti-masking function can be enabled via software only if the detector is fully operative and in AND mode, and only if the "MW section exclusion" function is not active.

Note: if the "MW section exclusion" function is active, at least one of the sectors associated to the detector must be armed. 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 software) 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: if the v.1.6 firmware is used, the event generated by the Masking/Fault circuit is sent by default to the compatible control unit as "**Zone fault xxx**" + "**Zone alarm xxx**". If required, you can configure the "Device setup" section via software in order to send only the "**Zone fault xxx**" event or, alternatively, the "**Zone fault xxx**" + "**Zone Tamper xxx**". To take advantage of this possibility, it is necessary to use BrowserOne v.2.5.5 or higher, and control unit compatible modules VIDOMO v.5.0.10 (or higher) or ETRG2 v.1.1.9 (or higher). With previous versions, this function is not available.
For further indications, see "4.1 General installation suggestions" on page 6.

WARNING:
- If you need to install a TRIAL485 detector in locations where continuous people motion occurs, we suggest that you disable the anti-masking/anti-blinding functions via software application.
- If the distance is lower than 20 cm, we suggest that you disable the anti-masking/anti-blinding functions via software application.

8.6 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.

8.7 Look-down function

The TRIAL485 detector is provided with circuitry that implements protection against orientation change. An accelerometric sensor detects orientation changes on 2 axes.
If TRIAL485 is subjected 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 use the software application to disable the look-down circuit.
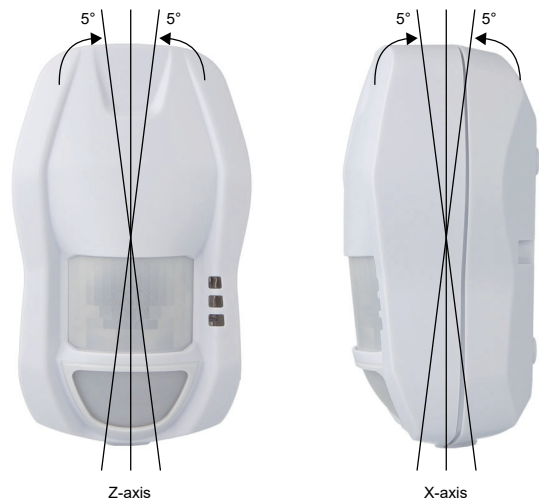
8.8 Low supply voltage detection

Upon this detection, only the "Failure" event will be triggered. The alarm circuit will be inhibited.
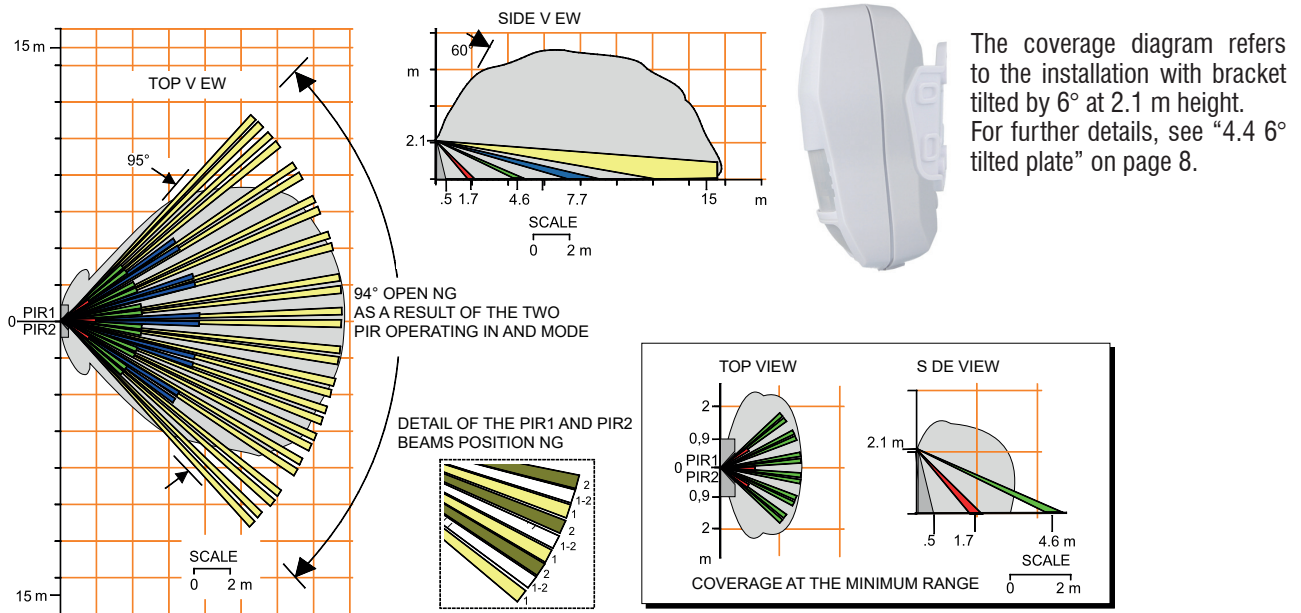
9. COVERAGE DIAGRAM

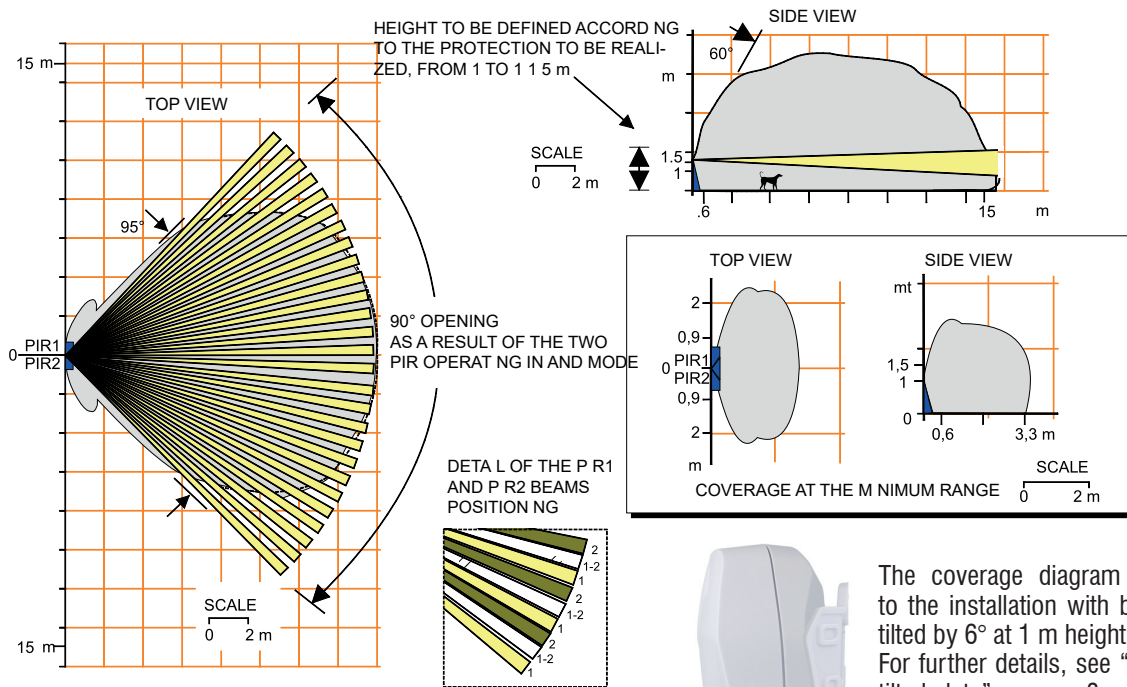Coverage diagram of the detector mod. TRIAL485 equipped with standard lens (EWA 1.2 GI 12 V2).

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.

The coverage diagram refers to the installation with bracket tilted by 6° at 2.1 m height. For further details, see "4.4 6° tilted plate" on page 8.

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. TRIAL485H equipped with horizontal curtain lens (AA 1.2 GI 12 V1).

The coverage diagram refers to the installation with bracket tilted by 6° at 1 m height. For further details, see "4.4 6° tilted plate" on page 8.

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

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