TECHNICAL MANUAL

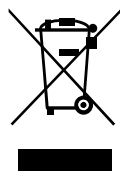# GRIFOX485

Indoor/outdoor advanced dual-technology detector with serial interface and volumetric protection

090041032

CE

IT08020000001624

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:

Indoor/outdoor advanced dual-technology detector with serial interface and volumetric 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 radio equipment GRIFOX485 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 – registrationis quick and easy.

DISPOSAL INSTRUCTIONS - INFORMATION FOR USERS

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. GENERAL INFORMATION

The GRIFOX485 detector is an advanced high-performance miniaturized dual-technology model designed to be installed indoors/outdoors to provide large spaces with volumetric protection. It can be wall mounted, corner mounted or installed so that it can swivel using the optional accessories.

The detector features special cable entries in the base of the housing and in the swivel mount for easy installation and comes with rubber seals to stop water getting in when feeding the serial cable through the entry to the control unit.

The detector's operation and control features are settable via the software for the compatible control unit: there is a special selector for address coding. The detector is compatible with the control units that feature ULTRABUS interface.

One of the key pluses of this detector is its use of digital PIR to achieve extremely high interference immunity and detection accuracy.

The unit's particularly attractive appearance means it sits well in any kind of setting.

GRIFOX485 is IMQ-Security Systems certified.

2. FEATURES

2.0.1 General features

- High-performance miniaturized dual-technology detector.
- Features serial interface for connection with compatible control units.
- Detector has an extremely small attractively designed plastic housing designed to be wall mounted.
- IR lens with volumetric protection with coverage pattern of 81 degrees horizontally, max. 4 - 7m range for maximum protection of the area to be protected.
- Infrared section with high-sensitivity digital PIR sensor, silicon white light filter. Optics are sealed to reduce false alarms from insects getting inside.
- Fully microprocessor-based detector management.
- RS-485 serial interface means detector is fully software configurable and controllable.
- Software-settable parameters: sensitivity, integration, AND/OR function, enabling of operating status LEDs, masking, blinding, look-down (orientation change detection), microwave section disabling with system disarmed.
- Real-time monitoring of detector's operating statuses and ambient temperature.
  Graphical log of the last alarm generated.
- Recording of waveforms by browser for up to 4 hours.
- Advanced operating parameters, such as temperature compensation of IR section properties for detector operation even in critical situations.

- Noise detection feature for noise detected by IR and microwave section with vertical bar display, oscilloscope display with zoom and threshold setting.
- Option of saving programming window or just waveforms in .JPG format.
- Management of IR section fault conditions.
- Sophisticated calculation algorithm used by environmental monitoring circuit with microprocessor conversion of signals from IR section.
- Active anti-blinding circuit in IR section with coded IR RXTX and anti-masking circuit in microwave section.
- Microwave section with ETSI EN30044024-certified 24 GHz planar antenna, low noise, small size, pulsed circuiting with neon light filter, coverage pattern 80° in horizontal plane, 32° in vertical plane.
- Protection against disturbances applied to supply terminals and on serial line.
- Look-down function: orientation change is detected by means of 2-axis accelerometer sensor - always active - and results in tamper alarm being triggered.
- Housing base features knockout cable entries and relevant rubber grommets for feeding connecting cables through.
- Optional extras: ANGSGX bracket for corner mounting, CUPSGX sunshield for outdoor installation and SNDSGX swivel mount for mounting at an angle.
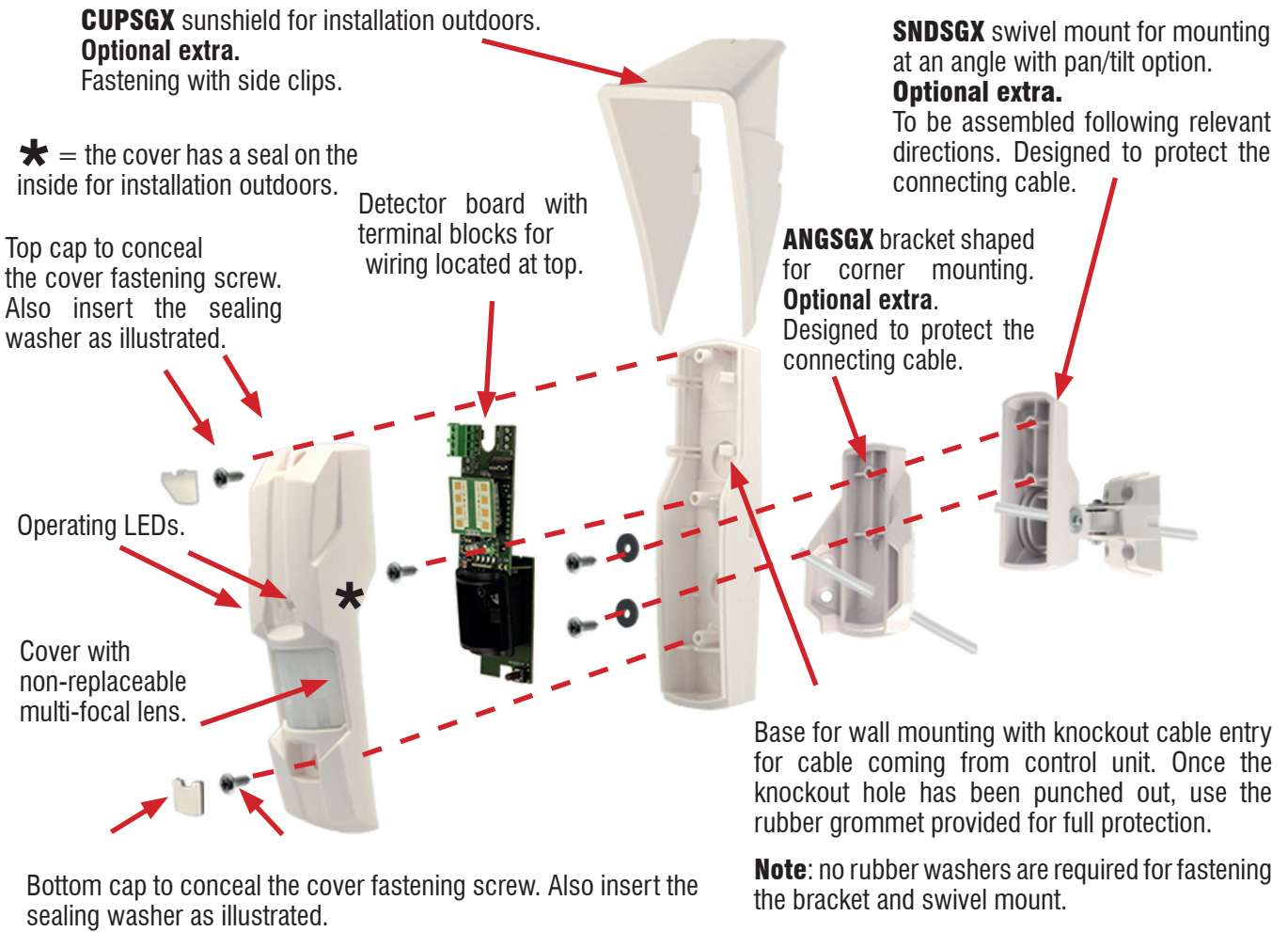
2.1 Specifications

Model:	GRIFOX485	
Protection rating:	IP55 with mandatory use of sealing washers provided.	
IMQ certified:	EN50131-2-4: grade 3.	
Environmental class:	4.	
Power supply:	12 V (range 7.7(8) to 15 V).	
Permissible ripple:	200 mVpp	
Minimum operating voltage:	7.7V with fault event generation.	
Detector current draw @12V		
Idle:	25 мA	
Alarm, look-down, blinding:	25 мA	
Microwave disabled:	18 мA	
Function settings:	managed via software of compatible control unit.	
Address setting:	using DIP switch.	
Operating timers		
Initial power-up:	20s	
Waiting time between first and second IR pulse:	10s only with sensitivity set to minimum.	
IR disabling time after alarm:	1s	

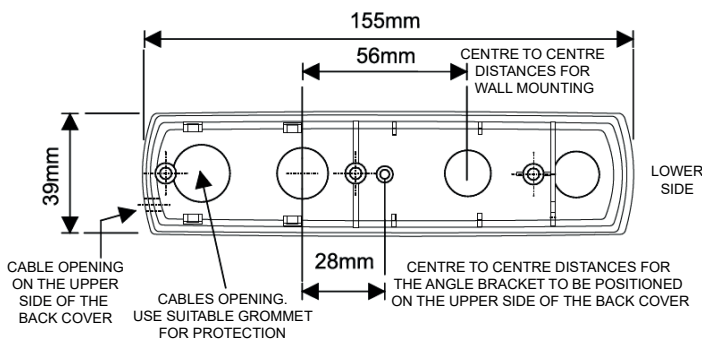| **Microwave section**		**Infrared section**	
Dig. noise filter:	for neon lights.	Lens type:	volumetric protection.
Integration:	software adjustable	N° of detection zones:	see coverage diagrams.
TX frequency:	24.125 GHz.	Coverage area:	see installation diagrams.
Range:	maximum 7 metres adjustable via software in four steps.	Range:	maximum 7 metres see installation diagrams
Sensitivity:	2 IR pulse + 4 microwave pulses.	PIR sensor::	digital model with high RF noise immunity. Features Silicon white light filter
		IR section gain:	optimized with temperature.
Indicators:	blue LED: Power On, alarm, microwave section, alarm and tamper with different flashing patterns. green LED: Power On, alarm, IR section.		
Status indicator examples:	both LEDs steadily lit indicate initial power-up; both LEDs flash to indicate alarm during operation; green LED single flash indicates IR detection during operation; blue LED single flash indicates microwave detection during operation.		
Wiring:	terminal block for connection of RS-485 serial line.		
Protection:	protection against housing being opened.		
Operating temp. and humidity:	-10 / +55 °C - 93% R.H.		
Dimensions and weight:	H 155 - W 39 - D 44 mm, 102g without accessories.		
Parts supplied:	screws, rubber washers, screw anchors, technical manual, rubber grommet, rubber washers for sealing front screws, S4 dowel for protection against removal		

3. VIEW OF DETECTOR

Exploded view of detector with all accessories.

CUPSGX sunshield for installation outdoors.
Optional extra.
Fastening with side clips.

✱ = the cover has a seal on the inside for installation outdoors.

Top cap to conceal the cover fastening screw. Also insert the sealing washer as illustrated.

Detector board with terminal blocks for wiring located at top.

SNDSGX swivel mount for mounting at an angle with pan/tilt option.
Optional extra.
To be assembled following relevant directions. Designed to protect the connecting cable.

ANGSGX bracket shaped for corner mounting. **Optional extra**. Designed to protect the connecting cable.

Operating LEDs.

Cover with non-replaceable multi-focal lens.

Base for wall mounting with knockout cable entry for cable coming from control unit. Once the knockout hole has been punched out, use the rubber grommet provided for full protection.

Bottom cap to conceal the cover fastening screw. Also insert the sealing washer as illustrated.

Note: no rubber washers are required for fastening the bracket and swivel mount.

View of base with centre-to-centre distances for fastening.

Detail of sealing washers for front screws.

155mm

56mm

39mm

28mm

CENTRE TO CENTRE DISTANCES FOR WALL MOUNTING

LOWER SIDE

CABLE OPENING ON THE UPPER SIDE OF THE BACK COVER

CABLES OPENING. USE SUITABLE GROMMET FOR PROTECTION

CENTRE TO CENTRE DISTANCES FOR THE ANGLE BRACKET TO BE POSITIONED ON THE UPPER SIDE OF THE BACK COVER

TO GUARANTEE THE STATED IP PROTECTION CLASS, PLACE THE WASHERS ON THE FRONT SCREWS AS SHOWN IN THE FIGURE, DIRECTION INCLUDED.
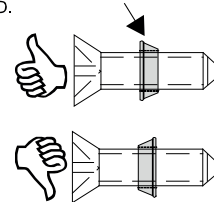
CAUTION
The detector is also suitable for installation outdoors provided it is installed with the seals as illustrated. Whatever the case, running a line of silicone around the holes can improve the seal.

4. INSTALLATION

4.1 General installation advice.

- Do not touch the PIR sensor with your fingers while installing and handling the board.
- When installing indoors with the detector aimed at glazing or plastic curtains, you must ensure that the microwave range does not extend beyond them: where necessary, adjust the microwave range to the minimum setting.

- Do not fit sensors so that they are directly next to each other or so that they are aimed directly at each other without enough distance between them: keep them at least 15 m apart.
- Do not install near swaying metal shutters or vibrating metal walls (e.g. chillers).
- Check the range selection based on the end assembly position.

4.2 How to open, fasten and refit the cover on the housing
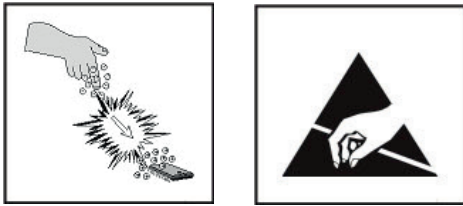
Installers must ensure that they are entirely free of static electricity before even opening the housing: exercise care as the detector's circuit board can be damaged by electrostatic discharge.
These precautions must be taken while installing the unit and during its maintenance.

How to open/close the housing:
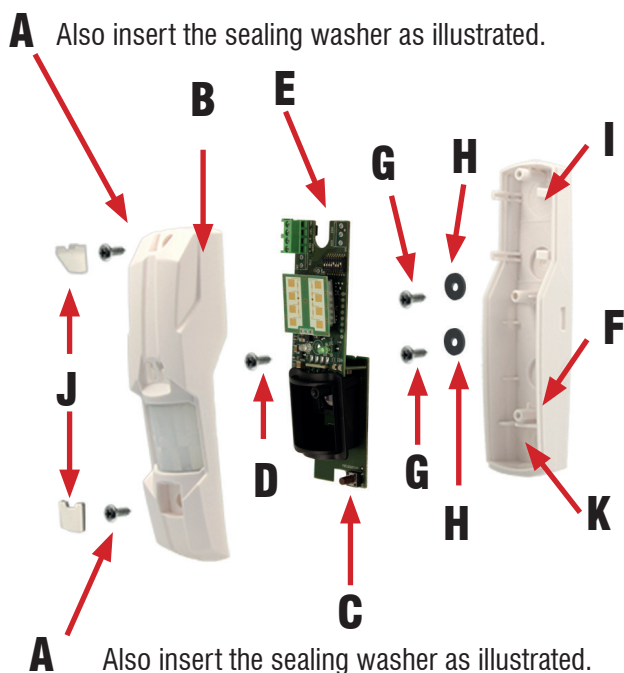
1) Unscrew the cover's fastening screws with the sealing washers found at the top and bottom of the housing, marked **A**.
2) Pull off the front cover **B**.
3) To refit the cover, repeat the procedure described above in reverse, making extra sure that the Tamper protection microswitch closing spring marked **C** is sitting properly in its slot. Complete the fastening procedure by screwing the self-tapping screw into the cover. Lastly, fit the caps marked **J** to conceal the front screws.

How to release and reattach the board:

1) Remove the fastening screw, marked **D**, securing the printed circuit board.
2) Remove the printed circuit board **E** by tilting it carefully forwards and pulling it out until it comes free from the bottom peg marked **F** (also refer to the details on page 11 for slotting the board back in).
3) To reattach the board on the base of the housing, repeat the procedure described above in reverse.

A Also insert the sealing washer as illustrated.

A Also insert the sealing washer as illustrated.

Drilling and wall mounting
Position and fasten the detector's base using the holes illustrated in the figure on page 5 as your template (centre-to-centre distance 56 mm). Also slip on the rubber washers **H** provided under the screws **G**.
Please also read the caution note at the bottom of this page.
Refer to the specific explanatory sheet for information on using the optional corner bracket and swivel mount. Before fastening the detector, make sure you have examined the possible installation options thoroughly and fully understood the warnings and limitations set out herein.

TO GUARANTEE THE STATED IP PROTECTION CLASS, PLACE THE WASHERS ON THE FRONT SCREWS AS SHOWN IN THE FIGURE, DIRECTION INCLUDED.
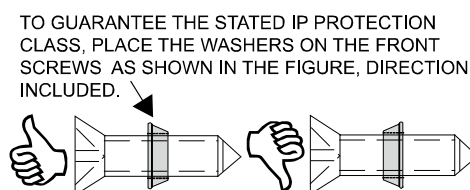
Cable routing
Feed the cables:
- through the **I** hole using the provided gasket, in case of mounting without bracket or joint;
- through the **K** hole, in case of mounting with bracket or joint; to pass the cable, refer to the pictures on page 7.

CAUTION
The detector is also suitable for installation outdoors provided it is installed with the seals as illustrated. Whatever the case, running a line of silicone around the holes can improve the seal.

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.

Mounting without bracket or joint
In case of direct mounting on a wall, only:
-   remove jumper S3 on device board
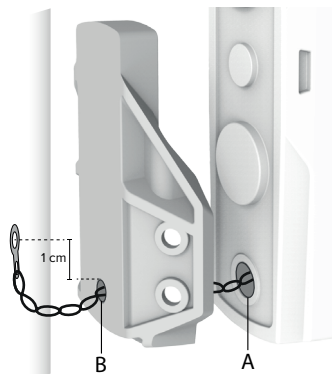-   insert a screw (with its dowel) into the indicated hole
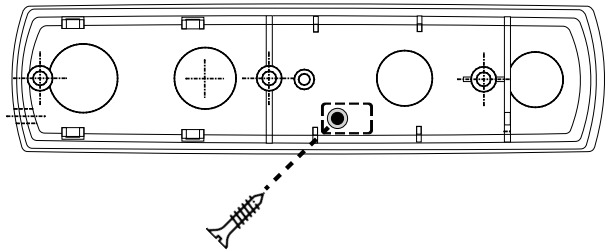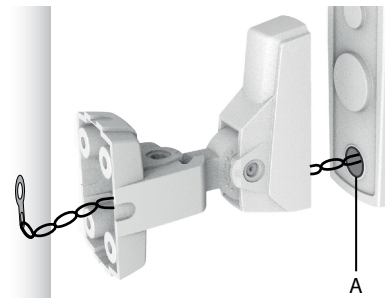

Mounting with bracket or joint
It is necessary to use the proper kit for protection against removal.
Warning: the joint can only be installed on the device lower side.
Install the proper kit <u>before</u> fixing the ANGSGX bracket or the SNDSGX joint to the wall.

KSAS1013 kit (GREEN)   KSAS1032 kit (WHITE)

-   remove the plate for protection against removal from detector bottom
-   drill a hole (diameter: 6,5 mm) on the detector base (A). If you are using ANGSGX, drill a hole on it as well (B)
-   feed the cable in the hole, from the eyelet end. If you are using the ANGSGX bracket or the SNDSGX swivel mount, feed the cable as illustrated above.
-   also feed the system cables into the drilled hole, laying them on board side as indicated

-   arrange the board under the supporting hook and block it with the screw

-   fix a S4 dowel to the wall at a height of 1 cm from the hole
-   fix the eyelet to the dowel
-   fix the detector base (and also the bracket/swivel mount if this is the case) to the wall
-   perform wiring to the terminals
-   open jumper S3 on device board
-   wire the cable connector to S3
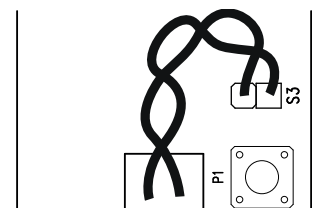
For installation outdoors, with optional sunshield and swivel mount, refer to the following illustrations, which show what mounting positions are and are not allowed:

YES
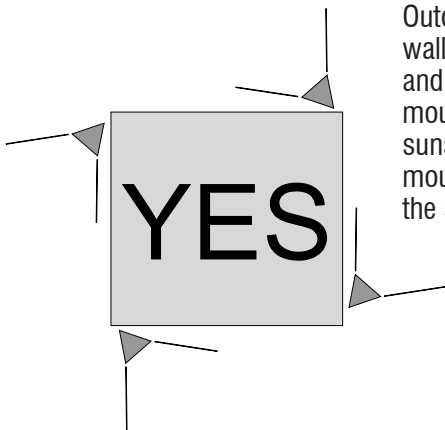
Outdoors to cover walls, with sunshield and corner bracket for mounting at 90° or with sunshield and swivel mount at an angle, as the situation demands.

YES
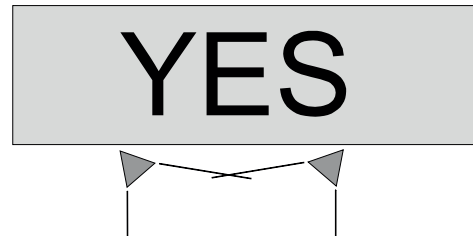
Outdoors, overlapping slightly, to cover walls, with sunshield and corner bracket for mounting at 90° or with sunshield and swivel mount at an angle, as the situation demands.

YES

2.1m
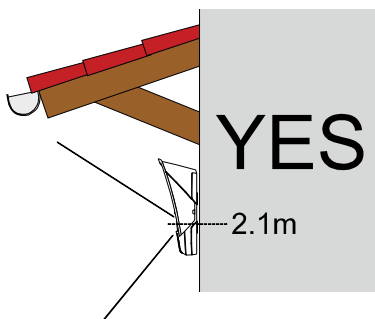
Outdoors in a position protected by a portico or balcony, with sunshield. Use the corner bracket for mounting at 90° or sunshield and swivel mount as the situation demands.

NOT ADVISABLE
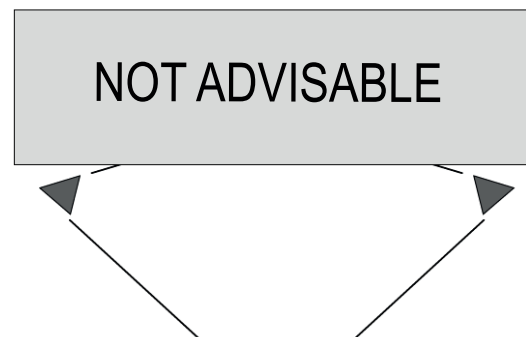
To cover walls outdoors, with coverage overlapping completely and units placed less than 15 metres apart.

NOT ADVISABLE

2.1m
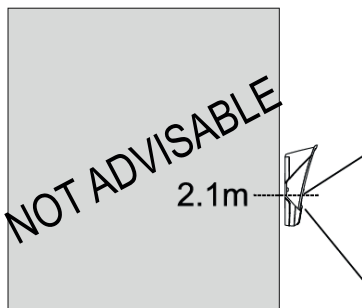
Outdoors placed less than 8 metres from an alley or road with vehicle traffic.

NOT ADVISABLE
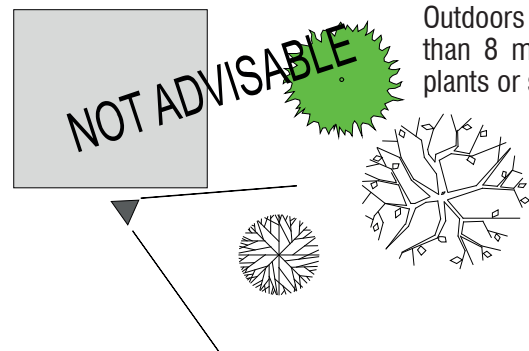
Outdoors placed less than 8 metres from plants or shrubs.

NO

NOT ADVISABLE
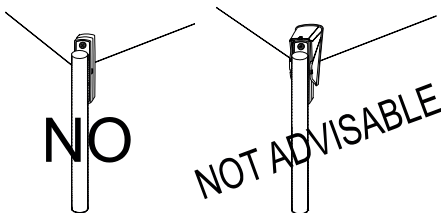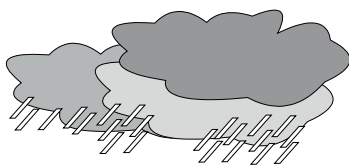
Outdoors mounted on a pole without or with sunshield. **The elements or heavy rain, hail, etc. can cause false alarms.**

NOT ADVISABLE

2.1m
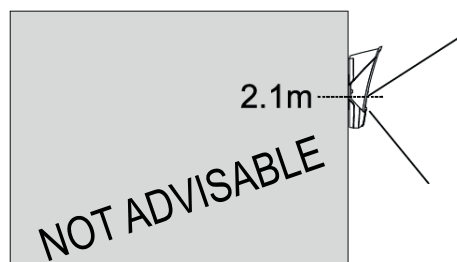
Installation outdoors in an area that animals are likely to pass through

IMPORTANT: do not install the detector so that it is pointing directly at the sun.

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5. COVERAGE DIAGRAM

Range: 7 - 4 m   **Coverage**: volumetric, 81° **Coverage pattern**:18 zones arranged over 4 planes
Note: the coverage diagram refers to wall mounting without the corner bracket at a height of 2.1m.
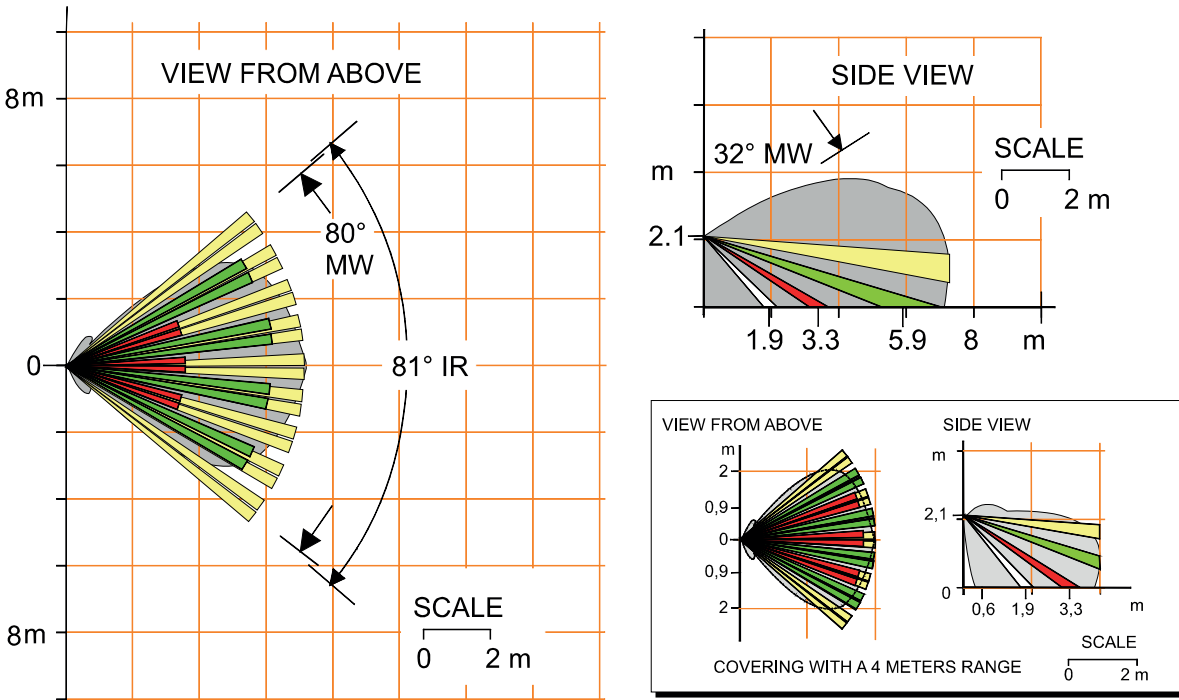
Use of optional **ANGSGX** corner bracket and **SNDSGX** swivel mount:

Fastening with bracket for corner mounting at a height of 2.1m.

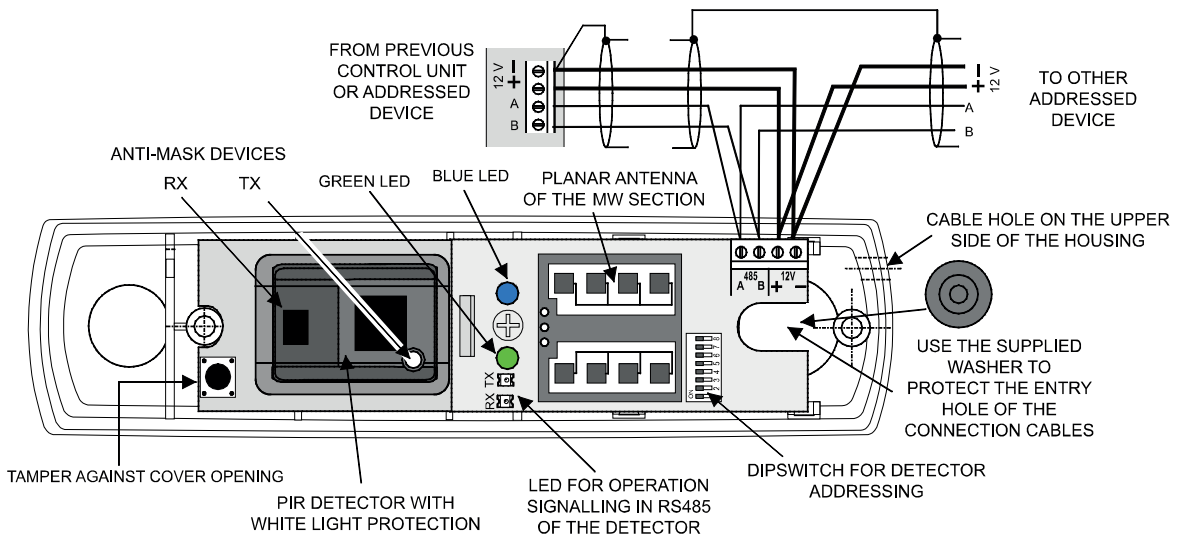Fastening with swivel mount for mounting with vertical and horizontal angle adjustment.

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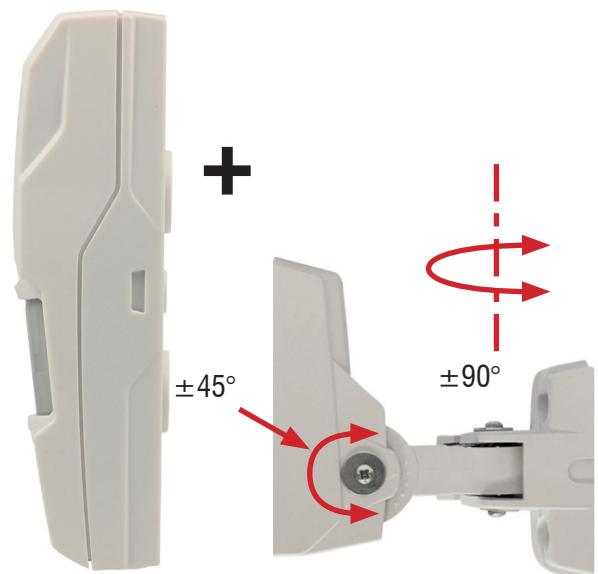
6. WIRING

View of the board inside:

NOTE: THE SERIAL LINE MUST BE TERMINATED WITH A 680 Ω RESISTANCE TO THE CONNECTION TO THE "A" AND "B" TERMINALS OF THE LAST DEVICE

FROM PREVIOUS CONTROL UNIT OR ADDRESSED DEVICE

TO OTHER ADDRESSED DEVICE

ANTI-MASK DEVICES

RX   TX   GREEN LED   BLUE LED   PLANAR ANTENNA OF THE MW SECTION

CABLE HOLE ON THE UPPER SIDE OF THE HOUSING

USE THE SUPPLIED WASHER TO PROTECT THE ENTRY HOLE OF THE CONNECTION CABLES

TAMPER AGAINST COVER OPENING

PIR DETECTOR WITH WHITE LIGHT PROTECTION

LED FOR OPERATION SIGNALLING IN RS485 OF THE DETECTOR

DIPSWITCH FOR DETECTOR ADDRESSING

ATTENTION: DURING THE INSTALLATION DON'T TOUCH THE SILICON FILTER WITH THE FINGERS

Sequence for removing and refitting the board when wiring the detector.
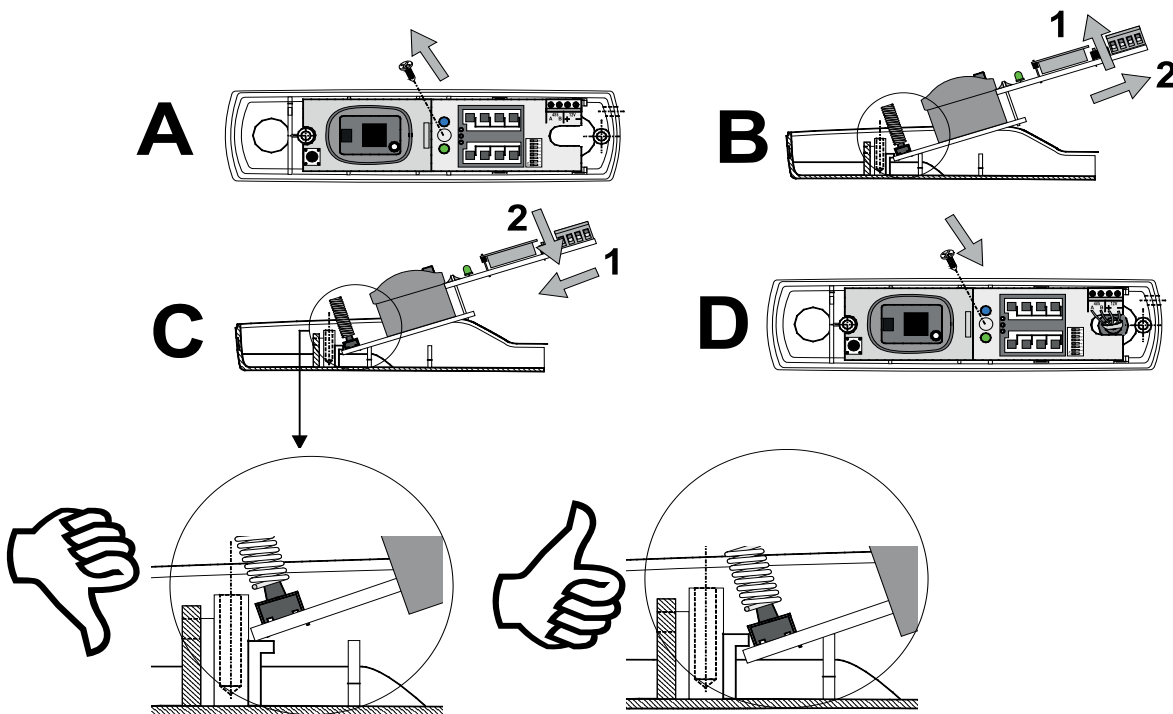
7. ADDRESS SETTINGS

Table 1.
Note: the number on the first line indicates coding for VIDOMO, VIDOMO2K control units (up to 64), PREGIO control units, PROXIMA control units; the second line alongside each switch indicates coding for ETR100MG2; the third line alongside each switch indicates coding for ETR128-256-512 G2 and TITANIA series v.5. <u>DO NOT EXCEED THE MAXIMUM LIMIT THE CONTROL UNIT CAN HANDLE.</u>

DO NOT SET THIS ADDRESS: THIS COMBINATION IS USED TO PERFORM A TOTAL RESET OF THE DETECTOR. SEE MANUAL TO GET INFORMATION ON THE RESET OPERATIONS.

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Table 2
Note: the number on the first line alongside the base of each switch indicates coding for ETR128-256-512G2 and TITANIA series v.5. DO NOT EXCEED THE MAXIMUM LIMIT THE CONTROL UNIT CAN HANDLE.

DO NOT SET THIS ADDRESS: THIS COMBINATION IS USED TO PERFORM A TOTAL RESET OF THE DETECTOR. SEE MANUAL TO GET INFORMATION ON THE RESET OPERATIONS.

The detector stores the settings received via serial line from the configuration software. To quickly restore the detector's factory settings, where you have no connection with the software, proceed as follows:

- Disconnect power.
- Set all DIP-switch switches to OFF.
- Reconnect the detector's power and check that the blue and green LEDs flash slowly while the RX and TX LEDs flash quickly.
- Disconnect power after at least 20 s.
- Set a valid address for operation with the control unit the detector is due to be connected to.
- Power up the detector.
- You can now use the software to detect and program the unit.

Note: when you disconnect the power, any current alarm event log will be lost.

8. PROGRAMMING VIA SOFTWARES

The detector can be programmed **only** using the compatible control unit's relevant module in the BrowserOne software - **v.3.2.8** or higher - with the latest version of the specific module for the control unit in use.

To detect the sensor, you must:

- Establish a connection with the control unit.
- Select the detector from the list of zone connection types and connect it.

- Once the tick appears in the "Connected" box, you will be asked to specify the type of detector.
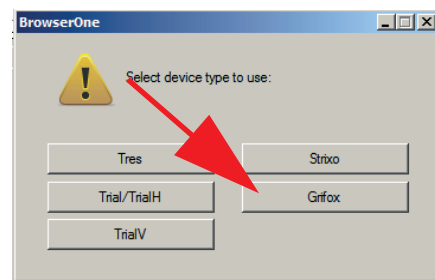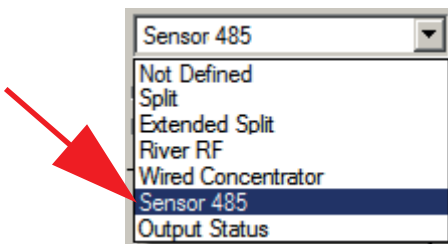
Note: different control units can have different captions.

- Select the "RS-485 device management" option from the Actions menu and, in the next menu, select all or only configured 1-zone devices.
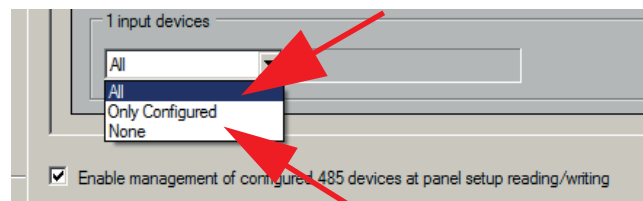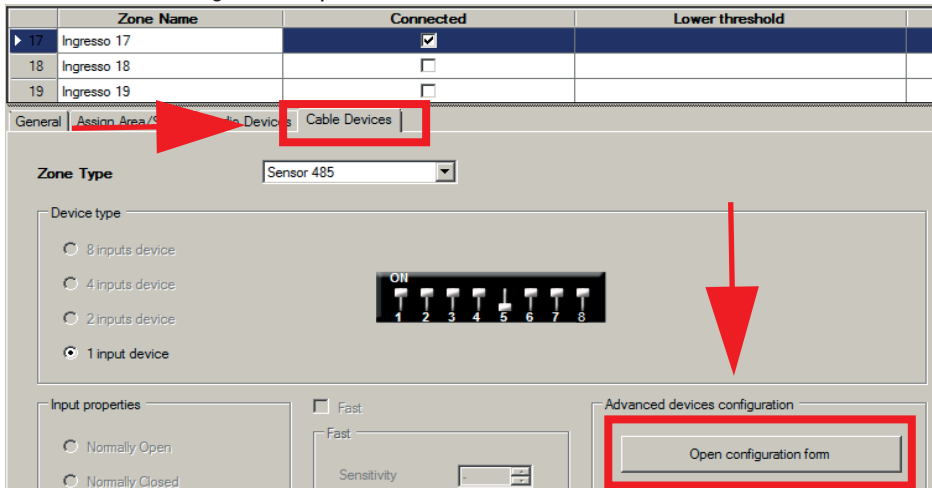

- Click on the "Read" button and make sure that the control unit actually detects the device once it has finished searching.
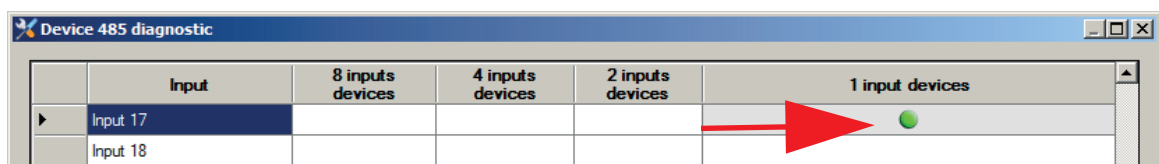
- Select the "Cable Devices" label from the zones menu and click on the "Open configuration form" button in the "Advanced devices configuration" pane.

It is **ONLY** at this point that the first (basic) configuration menu is displayed:

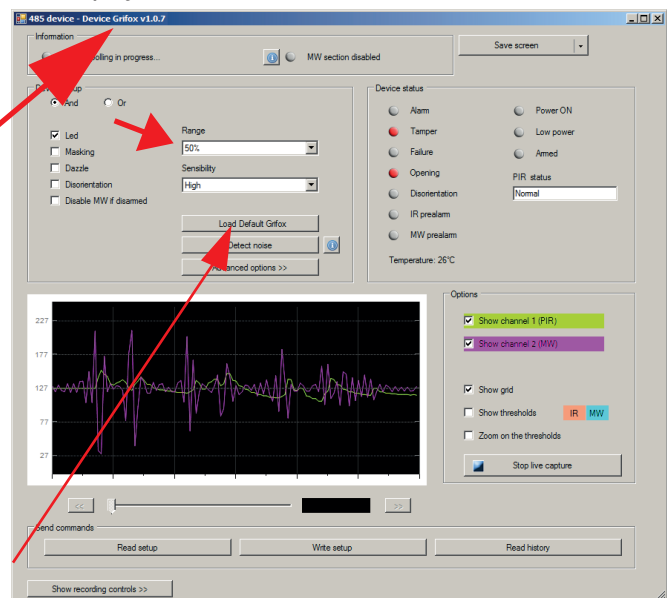Identification of the detector's firmware,
in this case fw.1.0.7.

This menu has various options you can select, including:

Range, choosing from preset values: 25%, 50% (**default**), 75%, 100%.

Sensitivity, with preset integration values:

HIGH = 4 microwave pulses and 2 IR pulse (**default**).
**LOW** = 8 microwave pulses and 3 IR pulses.

Environmental Noise function
Clicking the button indicated opens a pane to the right of the oscillograph window that allows you to detect environmental noise for a given time (at the installer's discretion) for microwave and IR and provide an outcome depending on the set thresholds.
Click the "Start" button to start detection, and the "Stop" button to stop.
The image on the right shows a possible environmental situation: note the oscilloscope display featuring vertical bars and the values detected by the IR and microwave sections.
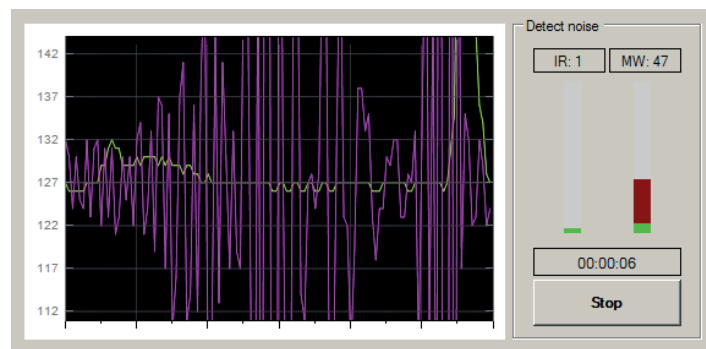
Oscillograph feature

The oscillograph feature is a major plus of the detector's management software as it allows you to effectively view the environmental noise detected and motion in the area protected by the detector. The display options allow you to select the waveforms you are interested in and you can also set the IR and microwave alarm thresholds even graphically, available in "Advanced options".

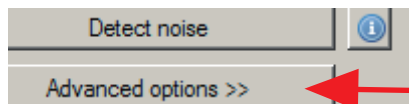| IR thresholds (at 25°C) | 5 |
| MW thresholds | 43 |
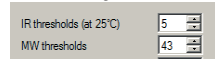
The oscillograph feature is also available while the waveforms are being recorded, as indicated further on.
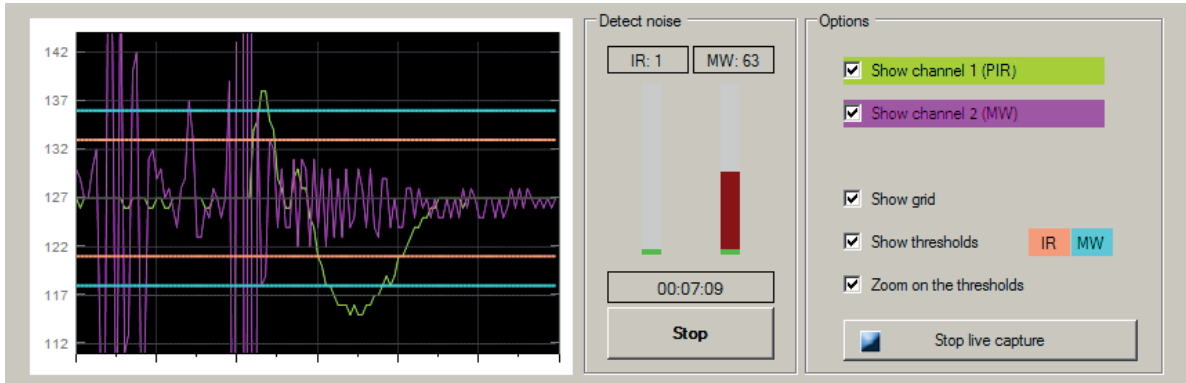
The "Stop live capture" button stops the graph running from right to left.

Clicting the "Advanced options" button calls up the second menu:

Of particular note in this menu are:

"**Disable MW if disarmed**" the purpose of the feature is to disable the MW microwave section when all relevant sectors are disarmed: in this case, a prealarm from the PIR section is all it takes to trigger a general alarm.

Note: in this case, anti-masking is not enabled, only the anti-blinding function is active. Masking will be enabled again when at least one of the sectors associated with the sensor is armed.
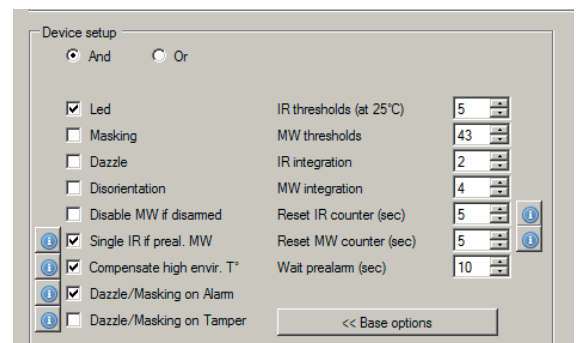
The screen on the right shows the advanced options, most notably:

• High temperature compensation: if ambient temperature is high (>33°), the sensitivity of the IR section can be increased further.

8.1 <u>Operating status</u>

The detector's operating status is indicated by the LEDs on the front, but it can only be analysed fully using the software. The summary pane appears on the right of the basic options and advanced options screens. It clearly shows the status of the PIR sensor and microwave. The information in the operating status section identifies faults more specifically.

Note, in particular, the "Armed" indicator referring to the status of the sectors associated with the detectors; the status of the PIR sensor; and the indication of the temperature detected.
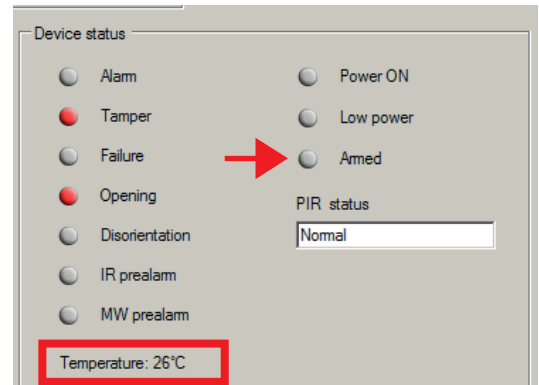
8.2 <u>Send commands</u>

The configuration window features three buttons for sending the following commands:
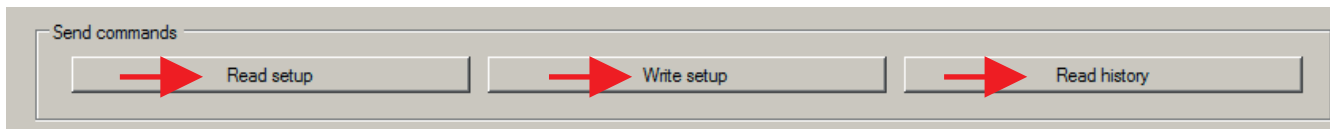
These commands are also available during waveform recording, as described further on.

8.3 <u>Alarm event log</u>

The GRIFOX485 detector can store locally the waveforms relating to the <u>last alarm triggered</u>. The sensor's alarm log can be read and viewed only with the aid of the software.
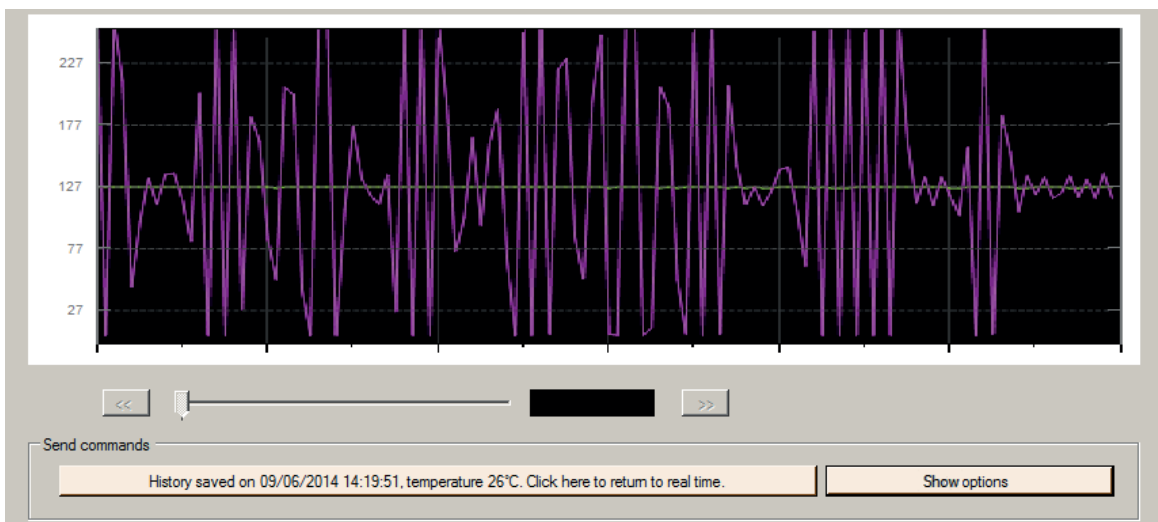
Note: as mentioned earlier, the control unit cannot store the alarm coming from the detector with details relating to waveforms. If the power goes off, the logged alarm is lost.When you click the "Show options" button, the same image is displayed but you also have access to a number of options.
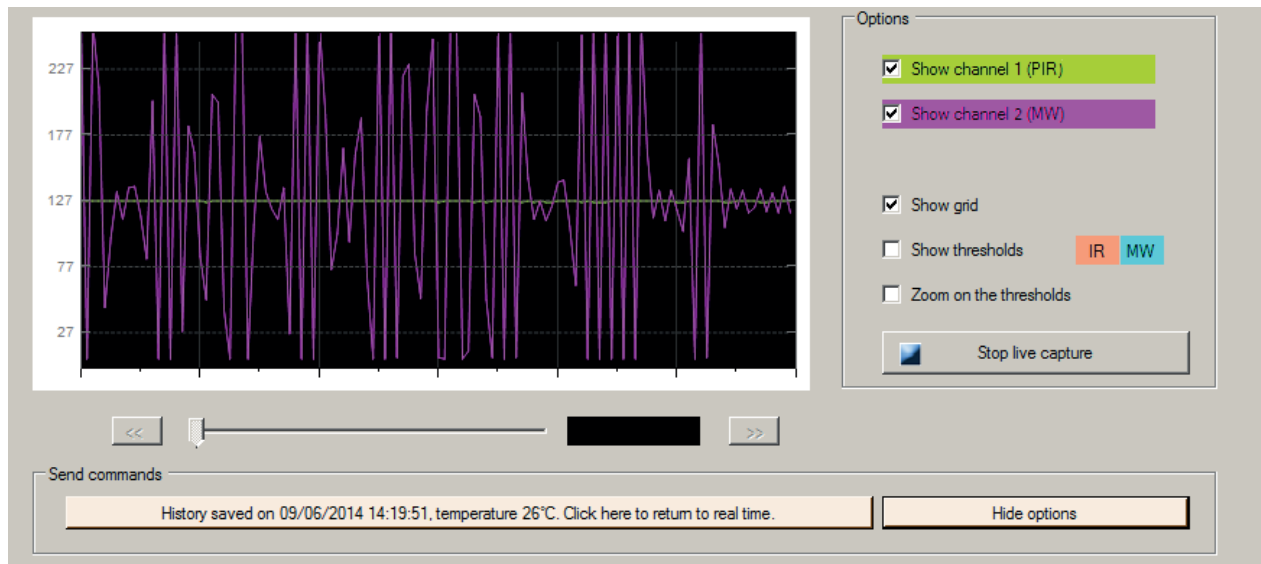
The detector's alarm is only logged if at least one of the sectors belonging to the zone relating to the sensor is armed, in which case the following details are stored:

- The waveforms of the first alarm received after arming.
- The date and time the alarm was triggered.
- The IR and microwave alarm thresholds within which the alarm was triggered; see note.
- The ambient temperature at which the alarm was triggered; the value given is approximate.

Note: do not change the setup before reading a sensor's alarm log: while the alarm log thresholds are always maintained and displayed separately (dashed lines), should the sensor's setup be changed before an alarm log (if any) is read, the parameters indicated in the setup section will be the last ones entered and not the actual ones to which the log refers.

Please also note that:

- Alarms triggered after the first alarm within the same armed cycle are not logged.
- In the event the control unit is reset, the stored alarm is kept.
- In the event of an armed cycle with an alarm followed by disarming and rearming with a new alarm, the log will always refer to the last alarm triggered.
- Should an alarm be logged and then this is followed by other armed cycles, the alarm remains until a new alarm is triggered.
- If the power goes off, the alarm log (if any) is lost.

CAUTION: please refer to the programming manual of the compatible control unit for further information.

8.4 Waveform recording function

This function allows the detector's waveforms to be recorded for up to 4 hours. While the unit is recording, engineers can move inside the area protected by the detector and then return to the PC, stopping the recording, saving it and playing it back at their leisure to assess behaviour during operation. The software actually behaves like a modern graphic recorder, featuring the classic controls and save waveform buttons with playtime given in hours, minutes and seconds alongside a slider bar. The default setting is not to show the pane with the recording function controls: where necessary, you will need to click the button at the bottom of the screen that the arrow is pointing to.
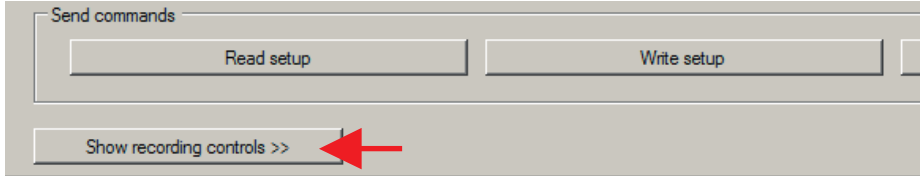
In detail, the main controls are:

Display area showing waveforms that have been or are being recorded.

Seek slider with playtime alongside.

Button to resume capture only after "Stop" has been pressed.

Button to hide recording controls.

Buttons to save and load recordings.

Button to start recording. While the unit is recording, the light to the left of the button will flash slowly.

Playback button.

Pause button

Stop button.

Duration of recording.

While waveforms are being recorded, you can write a new setup for the detector, read the detector's existing setup and read the alarm log, if any.

While the unit is recording, you can also run the noise test regardless of whether the display is in Live, Playback or REC mode. If you start the noise test, writing in the area highlighted in the figure will show that it is running at the same time as other activities.
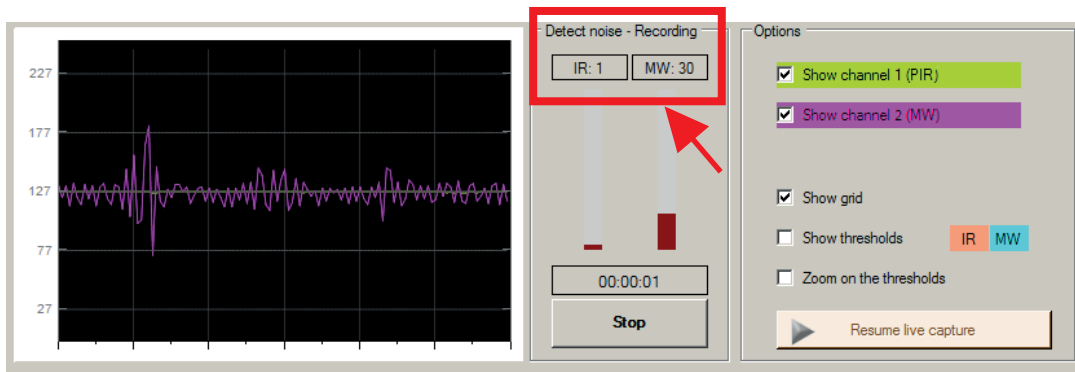
9. OPERATION

9.1 Environmental monitoring

The IR section of the GRIFOX485 detector features a sophisticated environmental monitoring device (3D) for detailed control of the environment and its temperature disturbances with microprocessor-based analysis of the signals coming from the PIR sensor. This circuit performs its task for the purpose of analysing motion thoroughly and thus drastically reducing false alarms.

9.2 3D function

The term **3D function** refers to the combination of circuits integrating the motion detected by the PIR sensor and by the microwave section versus time, with the resulting signal triggering an alarm.

9.3 Disabling the microwave section

The GRIFOX485 detector can be software programmed to disable the microwave section and reduce energy usage. If the control unit managing it is disarmed, the microwave section is not active and, in this case, detection takes place with the PIR sensor only and the unit automatically switches to **OR** mode.
If the control unit managing it is armed, the microwave section resumes operation in the resulting **AND** mode or, in any case, according to the programmed settings.
Note: if the microwave section is disabled via software and in the event the sensor's relevant sectors are disarmed, then the anti-masking feature, where applicable, will be disabled and only the anti-blinding function, where applicable, will still be active. Masking will be enabled again when at least one of the sectors associated with the sensor is armed.

9.4 AND mode

The GRIFOX485 detector can be software programmed for AND operating mode.
In this mode, the alarm is triggered only when both technologies (IR and microwave) report an alarm within a maximum software-set time: default setting 10 s. In the event this does not happen, the technology reporting the alarm resets once this time has elapsed.

9.5 OR mode

The GRIFOX485 detector can be software programmed to set it to OR operating mode. In this mode, the alarm is triggered when either of the two technologies (PIR or microwave) report an alarm due to motion in the area being covered.

9.6 Anti-masking/Anti-blinding function

The GRIFOX485 detector features an anti-masking and anti-blinding device. The anti-masking section can be software enabled only where the sensor is fully operational and in AND operating mode, and provided the Disable MW function is not active.
Note: if the Disable MW function is active, then at least one of the sectors associated with the detector must be armed. The microwave section's blue LED will flash slowly to indicate masking status.
The IR section's green LED will flash slowly to indicate blinding status.
<u>Return to normal operating conditions occurs when the first movement is confirmed by the technologies or when the cause is removed.</u>
Note: the anti-blinding section detects an attempt to obscure the unit's vision with a reflective body placed in the immediate vicinity of the lens. The anti-masking section detects an interfering body placed near the detector.
**Note**: the indicator lights to indicate that the "Anti-masking" feature is on - where enabled via software - only while the detector's power supply is stabilizing. During this stage, if a person comes close to the sensor, the green and blue LEDs will go off for a moment.
Note: the default setting is for the event generated by the Masking/Fault circuit to be sent to the compatible control unit as "**Fault line xxx**" + "**General Alarm line xxx**". Where necessary, <u>it can be software programmed</u> "**Device setup**" to send just the "**Fault line xxx**" event or, alternatively, "**Fault line xxx**" + "**Tamper line xxx**".

For further information, refer to the "Installation advice" chapter.
Warnings
- If the GRIFOX485 detector is mounted somewhere that people are going to pass near, it is best to disable the "anti-masking" feature via software.
- If the distance is less than 20 cm away, it is best to disable the "blinding" function via software.

CLEARANCE AREA
FOR THE ANTI-MASK
FUNCTION: 20 cm FRO
THE DETECTOR INWAR
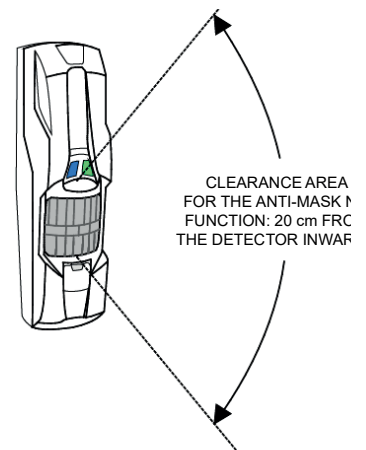
9.7 Look-down function

The GRIFOX485 detector features a circuit that is always active to protect, with 2-axis operation, against any change in orientation detected by an accelerometer sensor.
If the GRIFOX485 detector is rotated 5° around its **Z**-axis or **X**-axis relative to the position it was originally mounted in, a tamper alarm lasting 5 s is produced, indicated by the green and blue LEDs flashing in an alternating pattern.

CAUTION: despite the circuit's good immunity to random vibrations, these precautions must still be taken:

- The wall it is installed on must be solid and stable.
- The swivel mount, where used, must be fastened securely. The detector must be positioned first, then switched on. Of course, during installation, the sensor may be moved even after the system has been switched on and this will inevitably result in a 24H alarm. Consequently, when conducting tests and/or maintenance, the warning/indicator devices will need to be disabled.
- Whatever the case, do not drill or hammer in the immediate vicinity of the detector unless you have switched the system off first.
- Where necessary, the look-down function circuit can be disabled via software.

Asse Z   Asse X
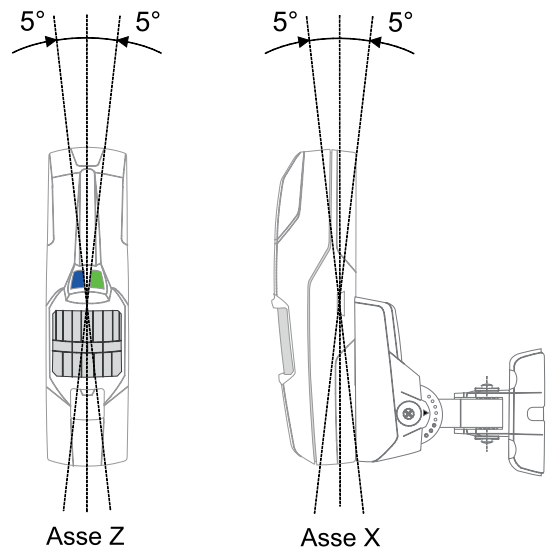
9.8 Detection of low supply voltage

When detected, only the "Fault" event is generated. The alarm circuit is disabled.

10. INDICATORS

The GRIFOX485 detector's LEDs indicate the following operating statuses:
Green LED = during operation, it flashes when the IR section signals a prealarm status; it lights on together with the microwave section's blue LED to indicate alarm status.
Blue LED = during operation, it flashes when the microwave section signals a prealarm status; it lights on together with the IR section's green LED to indicate alarm status.

Details of information provided by the LEDs' lighting patterns:

- **Blue and green LEDs steadily lit** = stabilizing following initial power-up.
- **Blue and green LEDs single flash** = microwave masking test during power-up.
- **Blue and green LEDs flashing slow and Serial line's RX and TX LEDs flashing fast** = default settings being loaded at power-up.
- **Blue and green LEDs flashing fast** = low power fault.
- **Alternating slow flashing** = orientation change (look-down function).
- **Both LEDs come on for approx. 2s** = alarm.
- **Green LED flashing fast** = PIR fault.
- **Green LED flashing slow** = blinding.
- **Blue LED flashing fast** = MW fault.
- **Blue LED flashing slow** = masking.
- **Green LED on** = IR section prealarm.
- **Blue LED on** = microwave section prealarm.
- **Green LED single flash** = motion detected by IR section.
- **Blue LED single flash** = motion detected by microwave section.