

TECHNICAL MANUAL

TRIAL2K-TRIALV2K-TRIALH2K



Wireless outdoor dual/triple technology detectors for intrusion detection systems managed by NG-TRX control units

TRIAL2K (and its variants TRIALH2K and TRIALV2K) is a wireless detector belonging to the NG-TRX product family. It can be integrated in systems managed by Villeggio NG-TRX control units, Pregio control units (using the GATEWAY2K optional device) and other expressly compatible models.

The TRIAL family for NG-TRX systems includes the following detectors:

- TRIAL2K:** *triple* technology, volumetric protection;
- TRIALH2K:** *triple* technology, horizontal curtain protection;
- TRIALV2K:** *dual* technology, vertical curtain protection.

The detectors feature two sectors operating in AND mode. **Infrared (IR) section:** IR transparent lens and 1 or 2 digital PIR sensors with temperature compensation, protected by silicon filter against white light.

Microwave (MW) section: DRO planar antenna operating at 10.525 GHz (9.9 GHz alternative version available).

TRIAL2K and TRIALV2K implement the under-crawl function by means of a specific lens (the lower one).

All the detectors can be entirely programmed using the BrowserOne software.

A kit of optional swivel mounts and brackets is also available (SNDTRIAL).



Compatible control units	Firmware vers.
Villeggio	8.3.2 or higher
Pregio (with GATEWAY2K)	2.3.2 or higher

Addressee for this information:



User

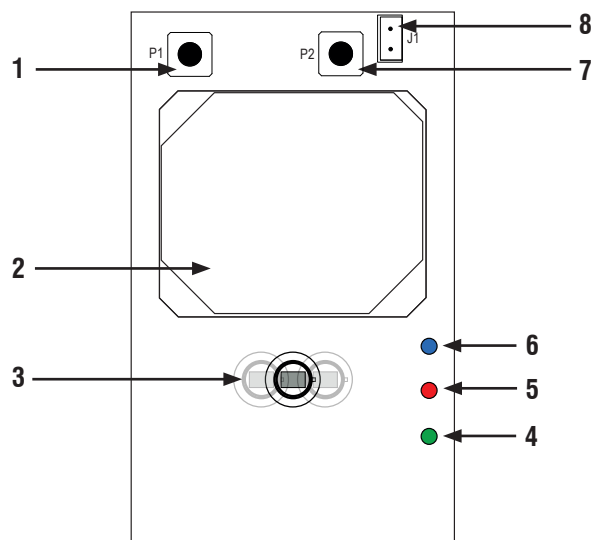


Installer



Technical Assistance

1. ELECTRONIC BOARD



- | | |
|----------------------------|------------------------------------|
| 1. Acquisition button (P1) | 5. Red LED |
| 2. MW antenna | 6. Blue LED |
| 3. PIR sensor(s) | 7. Tamper button (P2) |
| 4. Green LED | 8. Terminal for battery connection |

2. TECHNICAL DATA

Model	TRIAL2K	TRIALH2K	TRIALV2K
Type	2 IR + MW	2 IR + MW	IR + MW
MW SECTION			
Range	15 m (100%), 10 m (75%), 7 m (50%), 3 m (25%)		
Integration pulse No.	4/6/8	4/6/8	2/4/6
Integration time	2.5 - 15 s		
Prealarm time	5 s		
Frequency	10.525 GHz (9.9 GHz for the alternative model)		
Coverage area	80° horizontally; 32° vertically		
IR SECTION			
PIR sensor No.	2	2	1
Range	15 m max ($\pm 20\%$)		
Integration pulse No.	1/2		
Integration time	8 s	8 s	5 s
Prealarm time	5 s		
Time between PIR1 and PIR2 detections	2 s	2 s	-
Lens type ⁽¹⁾	Multifocal, 28 areas on 4 plans	Horizontal curtain	Vertical curtain
ELECTROMECHANICAL FEATURES			
Protection grade	IP55		
Operating temp.	-25 / +55 °C, 93% R.h.		
Power supply	7.2 V from battery (supplied): 2ER14505 7.2V 2.7Ah		
Current draw @ 7.2 V			
Power up:	2.7 mA		
Stand-by:	24 μ A	24 μ A	19.2 μ A
Inhibition after alarm:	24 μ A	24 μ A	19.2 μ A
In transmission:	24 mA (minimum peak)		
Average lifetime ⁽²⁾	2.5 years		
Low battery/reset thresholds	4.9 V / 5.6 V		
Minimum operating voltage	4.5 V		
RX/TX frequencies	868.120 MHz, 868.820 MHz, 869.525 MHz		
Maximum transmitted power	25 mW		
Wireless range (in free space) ⁽³⁾	Nominal: up to 1000 m Maximum: 1900 m		
Under-crawl function	Yes, 3 areas on 1 plan	No	Yes
Timings			
Stand-by after power up	25 s		

Walk test	8 min
Inhibition after alarm	in walk-test: 5 s; in system test: 5 s; in operation, if armed: 5 s for the first 3 alarms; in operation, if disarmed: 5 min by default (settable).
Supervision	240 min
Dimensions and weight	W95 - H167 - D75 mm 270 g without accessories
Compliance with EN50131	EN50131-2-4: grade 2, environmental class 3 EN50131-5-3: grade 1 if supervision time < 60 min; grade 2 if supervision time < 20 min
Parts supplied	Screws, plugs, battery, cable tie for battery fastening, angled stand (inclined by 6°), sunshield, technical manual
Optional accessories	SNDTRIAL kit

Notes:

¹ The lenses can neither be interchanged nor replaced.

² Lifetime evaluated with the device at default conditions, with supervision time of 20 minutes.

Settings resulting in a lifetime change:

- inhibition set to 30 s: -60%
- LED disabled: +5%
- Anti-blinding function enabled: -5%
- Energy saving: +10%

³ the ranges refer to the reception of 99% of the transmitted packets, with the devices in open field at 1.5 m height from the ground, respectively without and with the antenna oriented in the best direction.

3. PREPARATORY CONSIDERATIONS BEFORE MOUNTING



Carefully read the following indications before moving forward with the device installation.

3.1 General considerations

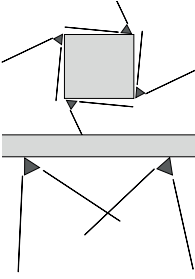
- Ensure the detector field of view is completely free and no portion of it is covered by any obstacle.
- Adjust the detector MW range so that it does not cross any window or glass wall.
- Do not install the detector near oscillating metal shutters, or near vibrating metal walls (e.g. refrigeration units).
- Do not install the detector near heat sources or in positions exposed to air streams.
- If you need to install the detector in locations where people passage often recurs while the system is disarmed, set the inhibition time to 5 minutes in order to limit the number of radio transmissions

and the premature battery fail.

- Do not touch the PIR sensor(s) with fingers.
- When installing two detectors next to each other, the second one has to be a model operating at a different frequency:

Detector	Mod. 10.525 GHz	Mod. 9.9 GHz
TRIAL2K	RWRDTMP02500	RWRDTMP03200
TRIALH2K	RWRDTMP02600	RWRDTMP03300
TRIALV2K	RWRDTMP02700	RWRDTMP03400

3.2 Examples of outdoor installation

Feasible	<ul style="list-style-type: none"> - Perimetral installation with non-overlapping coverings. - Installation on the same side, with slightly overlapping coverings. - Use of TRIALH2K in locations where animals are present. - Installation in a position protected by a porch or a balcony. 	
Not advisable	<ul style="list-style-type: none"> - Pointing towards areas where cars or trucks pass through (even from a distance higher than 15 m). - Pointing towards trees/shrubs from a distance lower than 15 m. - Direct pointing towards the sun. - Mounting on a pole (even with sunshield): the weather may cause false alarms. - Use of TRIAL2K or TRIALV2K in locations where animals are present (use TRIALH2K instead). - Installing two detectors working at the same frequency next to each other. 	

3.3 Environmental limitations

Keep in mind that some building materials can reduce TRIAL2K's signal strength.

For example:

- Plywood or honeycomb walls: 90-100% of full power;
- Full or drilled bricks: 65-95% of full power;
- Reinforced concrete or metal sheet and plaster: 0-70% of full power.

The presence of metal grids, metal doors and mirrors can also affect the range.

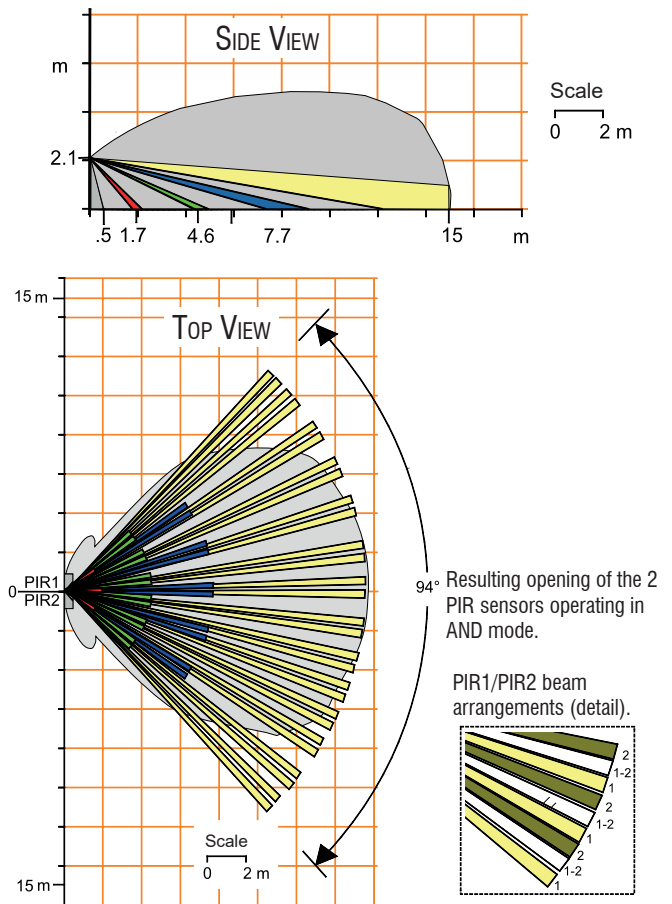
3.4 Choice of the installation position

Refer to the IR and MW covering diagrams below for best defining the installation position.

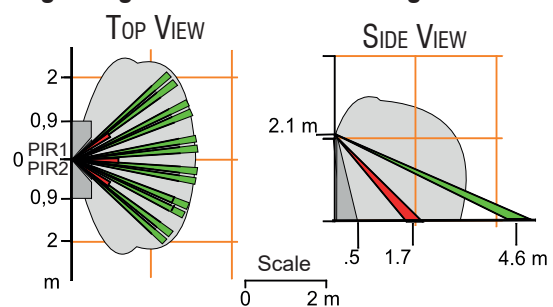
3.4.1 TRIAL2K

In the following diagrams, it is assumed that the device is mounted using the angled stand, at the standard height of 2.1 m.

Coverage diagrams at maximum range:



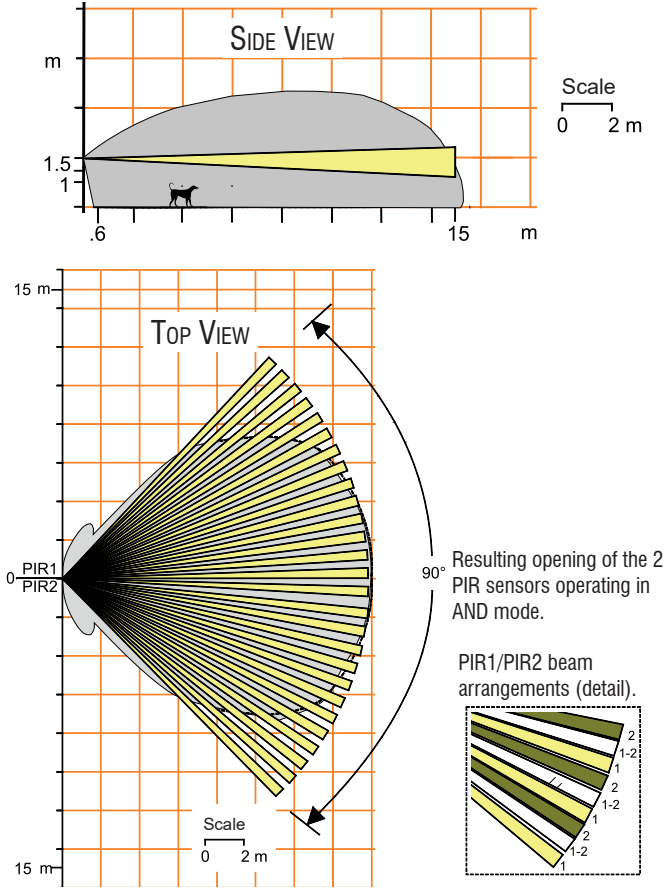
Coverage diagrams at minimum range:



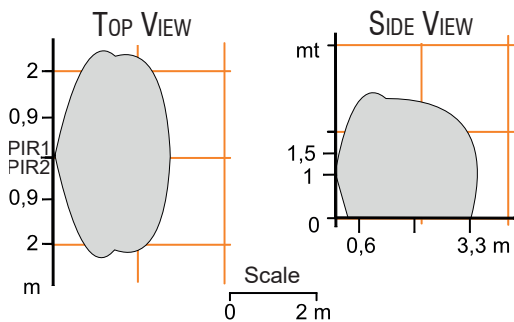
3.4.2 TRIALH2K

In the following diagrams, it is assumed that the device is mounted using the angled stand, at the height of 1 m. Set the height according to the protection you want to achieve (from 1 to 1.5 m).

Coverage diagrams at maximum range:



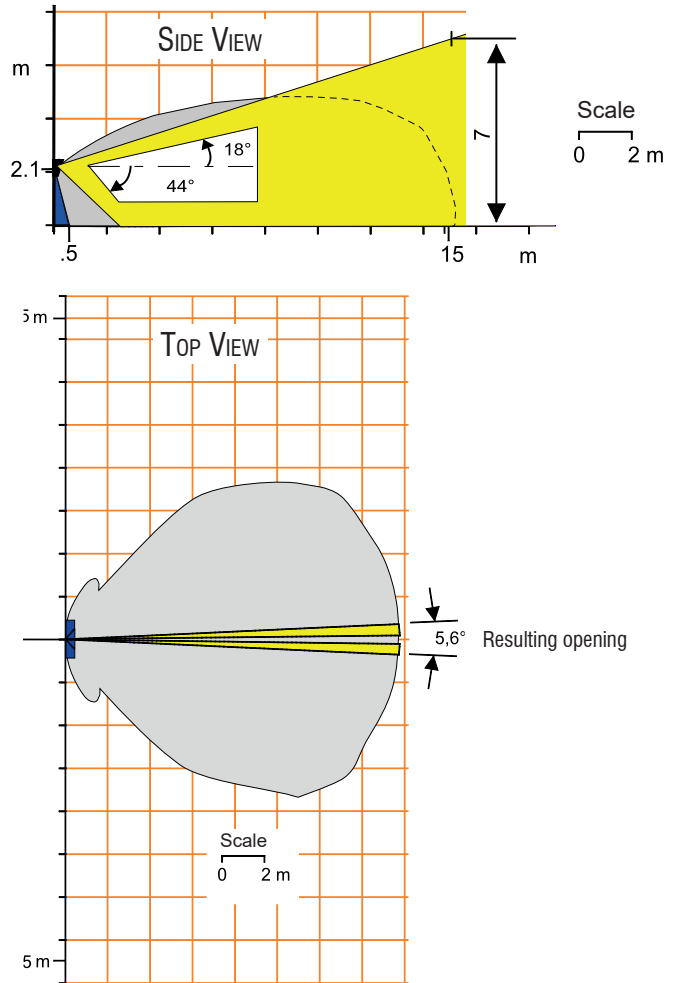
Coverage diagrams at minimum range:



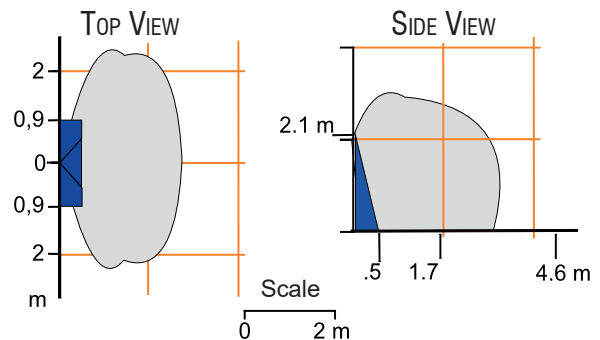
3.4.3 TRIALV2K

In the following diagrams, it is assumed that the device is mounted using the angled stand, at the standard height of 2.1 m.

Coverage diagrams at maximum range:



Coverage diagrams at minimum range:



3.5 Protection from electrostatic discharge

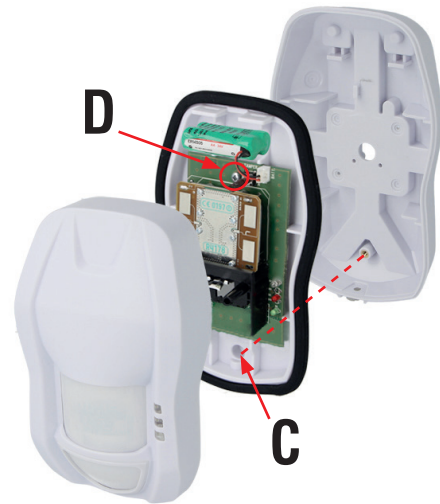
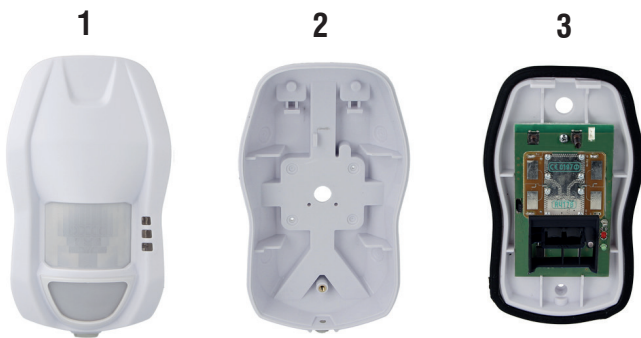
The detector's circuit board can be damaged by electrostatic discharge. Installers must ensure that they are entirely free of static electricity before even opening the housing: these precautions must be taken while installing the unit and during its maintenance.

4. MOUNTING OPERATIONS



The detector consists of 3 parts:

1. Front cover
2. Housing back
3. Inner base

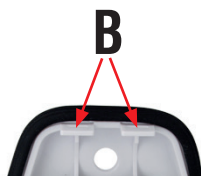


1. Housing opening

Unscrew the cover fastening screw (A).



Pull off the front cover by detaching it from the tabs (B), pivoting on them.



4. Housing back fastening

The standard fixing of the housing back includes the use of the *angled stand*, that gives the sensor an inclination of 6° downwards.

Standard installation heights:

- TRIAL2K: 2.1 m
- TRIALV2K: 2.1 m
- TRIALH2K: 1 ÷ 1.5 m

Make sure you are going to mount the angled stand correctly, as shown in the picture below.



2. Inner base releasing

Remove the screw (C) that keeps the inner base fixed to the housing back.

Detach the inner base from the housing back strongly enough to overcome the friction between the housing back and the perimeter seal gasket.

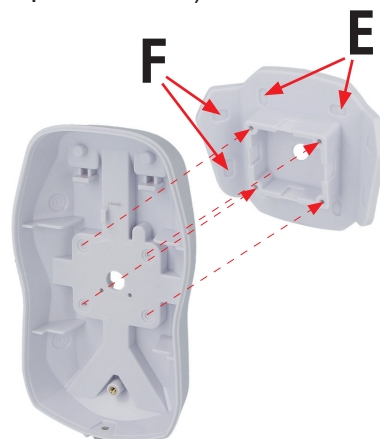
3. Board releasing

Remove the board fixing screw (D).

Pull the board out from the holding pegs.

Use a screwdriver to pierce the 4 pre-drilled areas: choose the suitable ones for wall (E) or corner mount (F).

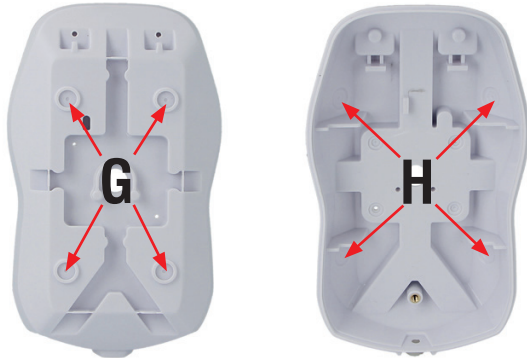
Fasten the angled stand to the surface using screws and dowels. Fasten the housing back to the angled stand using 4 screws (see picture below).



Fastening without angled stand

In case you wish to install TRIAL2K at a height of less than 2.1 m (i.e. approximately between 1 and 1.5 m), you can also directly fasten the housing back to the mounting surface, without the angled stand.

Use a screwdriver to pierce the 4 pre-drilled areas: choose the suitable ones for wall (G) or angle mount (H).



Fasten the housing back to the surface using screws and dowels.

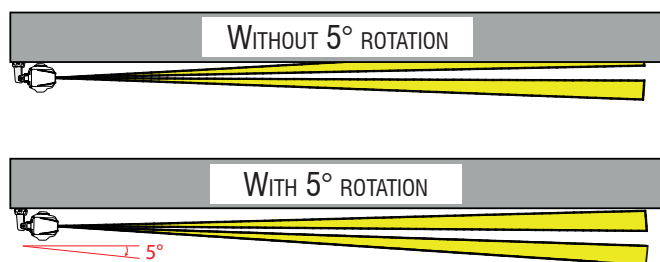
SNDTRIAL optional swivel mount

A specific kit - SNDTRIAL - is also available to improve installation possibilities. It includes a swivel mount to adjust the detector position horizontally/vertically, and a bracket to mount the device parallel to a wall.

You must use SNDTRIAL for installation at a height of more than 2.1 m (up to 3 m).

Refer to the specific technical leaflet for information on assembling.

Note: if you need to install TRIALV2K parallel to the wall using the bracket included in SNDTRIAL, further rotate it 5° away from the wall. This will prevent the beam from being cut by the wall itself.



To adjust the rotation of the detector arranged on the swivel mount, use the reference notches. 10° separate two consecutive notches; to give a rotation of 5° from the initial position, set the arrow halfway between the central notch and the previous/following one.



5. Board reinsertion

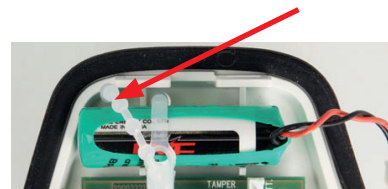
Perform the board releasing operations in reverse order: set the board in position on the holding pegs and fasten it using the screw.

6. Battery fastening to the inner base

Feed the cable tie through the two holes indicated below.



Place the battery on the indicated supports. Firmly fasten the battery by tightening the cable tie. Insert the remaining cable tie portion where suggested below.



7. Housing closing

Insert the inner base into the housing back, using the holes indicated in the picture below.



Proceed with the first powering and acquisition (see chapter "5. COMMISSIONING").

Lean the cover on the back, hooking it to the tabs.

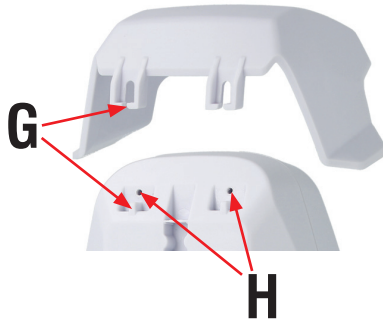
Ensure the Tamper protection spring perfectly fits in place.

Fasten the housing cover using its screw.

8. Sunshield assembling

Hook the sunshield to the detector body, having the G parts slotted in.

To make fastening stronger, insert the supplied inox screws in the holes (H).



5. COMMISSIONING



5.1 First powering up

1. Plug the battery connector (with the battery already arranged in position, see "Battery fastening to the inner base") into the dedicated terminals on the board.
2. Press and release the tamper button 3-4 times.
3. Reset any memory of low battery in control unit or in the compatible receiving device.

Note: if the battery is new or has been unused for a long time, a low battery condition might be improperly signalled. This is related to the chemical features of Lithium Thionyl Chloride batteries, and it can be solved by performing the operations described above. It is advisable to keep the battery at room temperature before using it in low temperature environments.

5.2 Acquisition in NG-TRX control units

Before starting the TRIAL2K acquisition procedure, remove the detector front cover (as described in the mounting process) in order to reach the acquisition button **P1**.

Moreover, make sure the battery is not discharged, otherwise the acquisition will not take place.

Acquisition procedure:

1. From the control unit keypad, enter the configuration menu by typing the installer code and pressing OK.
2. Use the arrow keys to reach the **Learn radio detector** entry. Press OK.
3. Press the arrow keys to reach the zone where the device will be memorized (or type the number of such zone). Press OK.
4. Press 1 (storing to control unit).
5. Press and hold the acquisition button (P1) on TRIAL2K for 3 seconds. The blue LED flashes twice and its buzzer beeps twice when the device enters acquisition mode.
6. If acquisition has not been successful, the control unit gives no confirmation; TRIAL2K emits a beep

error sound and its LED does not switch on. Restart the procedure from step 5.

7. If acquisition has been successful, the control unit buzzer beeps twice for confirmation. TRIAL2K's blue LED switches on for 1 s.
8. Exit the control unit configuration menu. When prompted, press OK to save configuration.

6. CONFIGURATION USING BROWSERONE



TRIAL2K can be entirely programmed using the BrowserOne software platform (version v3.5.17 or higher).

1. Load one of these modules, according to the control unit in use:
 - Villeggio 8.5.9 (or higher version);
 - Pregio 2.3.4 (or higher version), in case you are using a Pregio unit equipped with GATEWAY2K.
2. Start connection to the control unit.
3. Read the control unit configuration.
4. In the **Zones** page, select the row corresponding to the first zone you used during device acquisition.

Zones		Areas	Outputs	Users	Telephone Dialler	System Options
	Zone Name	NG-TRX				
18	Zone 18	Yes				
▶ 19	Zone 19	Yes				
General		Assign Area/Sector	Radio Devices	Cable Devices	Radio Devices NG-TRX	

5. Click on the **Radio Devices NG-TRX** tab.

6.1 Options NG-TRX

Set in this pane the general parameters *that are the same for each NG-TRX device*. For more details, see the control unit programming manual.

Buzzer activation	Buzzer disabled
Performance tuner	Automatic
Supervision interval	Default
<input type="checkbox"/> Delay supervision anomaly	
<input type="checkbox"/> Tx Boost	

Buzzer activation: it activates the device buzzer in case of alarm (if disabled, the error tone will be played anyway).

Performance tuner: set the balance between energy saving and transmitted power.

Supervision interval: set how often you want the control unit to send supervision transmissions to check the device is present and properly operating.

Delay supervision anomaly: any signalling of anomaly due to failed supervision is delayed by 6 times the supervision interval.

Tx Boost: the transmitted power is increased (with an actual increase of 10÷30% in the effective range). Battery life can be significantly affected.

6.2 Options sensor TRIAL2K

Set in this pane the parameters that are *specific for TRIAL2K (and its variants)*.

Enable Led: if this checkbox is not flagged, TRIAL2K's LED does not flash in case of alarm/tamper (but it does in walk test mode or during acquisition).

Antidazzle: flag this checkbox to enable the function (default: disabled). In case of blinding, a failure event will be sent, together with an alarm or tamper event according to the item selected from the close **Antidazzle Echo** drop-down menu.

Removal from the mounting surface: flag this checkbox to enable the function (default: disabled).

Energy saving: if this checkbox is flagged, alarms from the MW section will only be accepted once the device is in IR prealarm state. This allows to increase the battery lifetime.

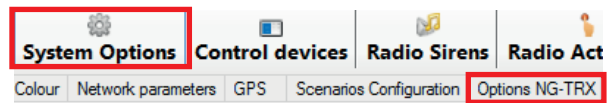
This function cannot be enabled if the range is set to 100%. Default: not flagged.

Other settable parameters:

- **Time inhibition:** after transmitting an alarm, the device will be inhibited for this amount of time;
- **Range;**
- **Sensitivity IR/MW:** number of IR/MW pulses to detect in a defined time interval before either technology enters prealarm state.

6.3 Control unit communication options

In order to configure the communication between the NG-TRX devices and the control unit, click on the **System Options** page and select the **Options NG-TRX** tab.



Receiving multichannel: if *On*, the control unit receives on all its three channels at once; if *Off*, the control unit receives on one single channel (default/preferential) at a time. We suggest keeping this option *Off* if you are aware that noise is present in any specific channel.

Default channel: select it from the drop-down menu (default: channel 1). The control unit will receive on this channel if no disturbance is detected. In case disturbances are present, the control unit will define a *preferential* channel (possibly different from the default one) according to the detected disturbance level, and it will receive on this one.

Supervision interval (default: 240 minutes): the common supervision interval set here will be applied to all the devices for which no specific (*Default*) interval has been defined.

Flag the **Enable detection RF interference** checkbox in order to allow the control unit to detect any disturbance on the three radio channels.

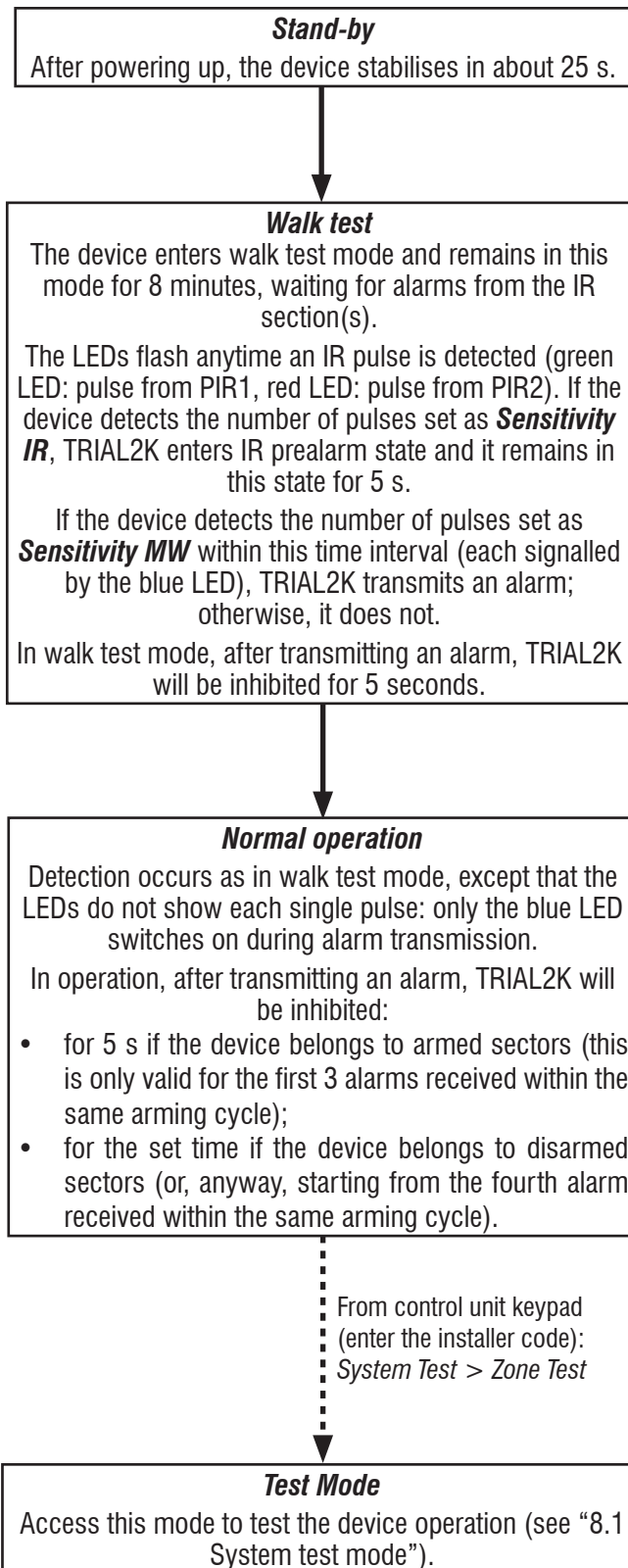
See the control unit programming manual for further information on all the options available in this tab.

After you have finished editing, write the configuration to the control unit. The new configuration will be transferred to TRIAL2K upon the first communication to the control unit: the device will beep to confirm the successful operation.

7. OPERATION



Operation sequence after powering up:



7.1 LED indications

Condition		Red LED	Green LED	Blue LED
Power up				Steady 2 s
Stand-by		Steady 25 s		
Acquisition OK				Steady 1 s
Walk test	Pulse from PIR1	Flash		
	Pulse from PIR2		Flash	
	MW pulse			Flash
	IR prealarm		Steady	
	MW prealarm			Steady
	Alarm TX		Steady 1.5 s	Steady 1.5 s
	Tamper TX / Tamper reset	Flash		
Operation	Alarm TX			Flash
	Tamper TX	Flash		
	PIR1 fault	Fast flash		
	PIR2 fault		Fast flash	
	Blinding		Slow flash	

7.2 Anti-blinding function

TRIAL2K features an anti-blinding function which can be enabled via BrowserOne. It detects blinding attempts carried out by placing a reflector before the lens.

In case of blinding, a “fault” event will be sent along with an alarm or tamper event (based on the item selected from the **Antidazzle Echo** drop-down menu).

Warning: in case “fault + tamper” has been selected, any blinding attempt detected will result in the activation of the sirens.

The blinding condition and its reset will be detected within 1 min 30 s in operation, or within 10 s in walk test mode.

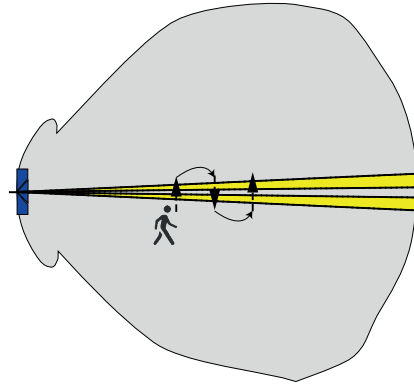
Note: we suggest disabling the function if TRIAL2K is installed in crowded locations, with people passing at a distance of less than 20 cm.

8. MAINTENANCE



TRIALV2K

Move across the sensor coverage area, in both directions.



8.1 System test mode

Access the SYSTEM TEST → ZONE TEST control unit menu to enter system test mode.

The device behaves as it does in walk test mode, except that the built-in buzzer activates upon each alarm.

The device remains in this mode as long as the control unit is in ZONE TEST mode.

Note: the device will actually enter test mode only after the first transmission, therefore it may take up to 5 min (default) since the control unit is set to ZONE TEST.

Note: battery life may be affected if the device remains in test mode for an extended time.

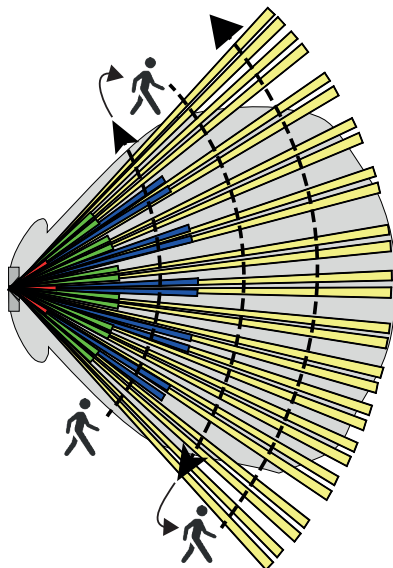
8.2 Periodic test

Periodically carry out a simple test to check TRIAL2K's functionality and coverage.

Set the device to system test mode (as described above). The detector LEDs shall react as indicated in the "7.1 LED indications" table, in *walk test* condition.

TRIAL2K, TRIALH2K

Move within the sensor coverage area, walking in half-round paths around the detector (as shown in the picture below) from opposite directions, in order to define the coverage area boundaries on both sides.



8.3 Battery replacement

TRIAL2K employs a 7.2V 2.4Ah 2ER14505 lithium battery. This must be replaced only with a new one of the same model, as follows:

1. Open the housing (see the mounting procedure). Remove the inner base.
2. Loosen the cable tie and remove the discharged battery. The cable tie can be reused.
3. Press and release the Tamper button 3-4 times in order to discharge any charged capacitors.
4. Insert the new battery (see "Battery fastening to the inner base").
5. Press and release the Tamper button 3-4 times.
6. Reset any memory of low battery in control unit or in the compatible receiving device.

Disposal of the discharged battery must be done in proper waste collection containers, in compliance with the regulations in force.

The used material is highly polluting if released in the environment.

9. EU DECLARATION OF CONFORMITY

Hereby, EL.MO. S.p.A. declares that the radio equipment TRIAL2K / TRIALH2K / TRIALV2K 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.



10. WARNINGS

10.1 Warnings to 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.
- 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).

10.2 Warnings to 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...).

10.3 General warnings



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:

Wireless outdoor dual/triple technology detectors for intrusion detection systems managed by NG-TRX control units

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.

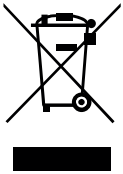
We hereby advise you (the system's operator) to see that the system receives regular routine maintenance, at least in accordance with the provisions of current legislation, and also check on as regular a basis as the risk involved requires that the system in question is operating properly, with particular 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).

10.4 Basic safety rules

- It is forbidden for the appliance to be used by children or unassisted disabled persons.
- It is forbidden to touch the appliance with wet hands or body when barefoot, or to splash or throw water directly on it.
- It is forbidden to pull, detach or twist any protruding electrical wires, even if the appliance is disconnected from power supply mains.

10.5 Disposal instructions



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 13th August 2005 and must be disposed of separately from normal household waste.

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