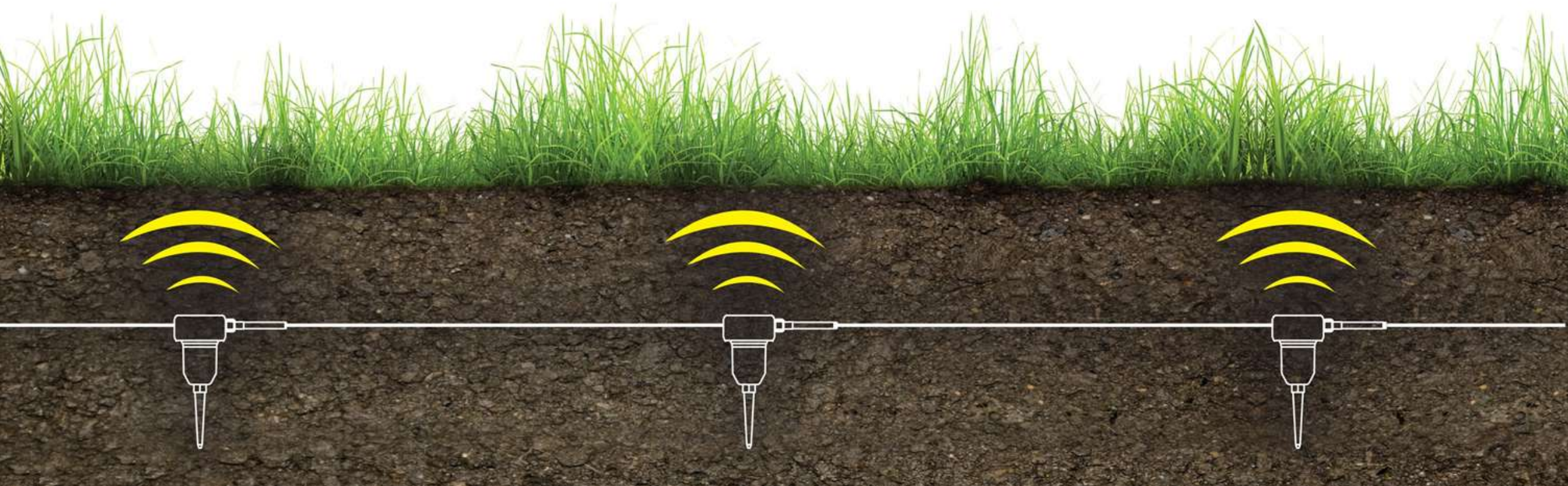


USER MANUAL

MOSS KIT

Mobile Operations Unattended Sensors System



2.0	Version
April 2024	Date

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Overview

System Overview

SensoGuard **MOSS** (Mobile Operations Unattended Sensors System) was designed to assist in mobile / tactical applications which require immediate security solution.

Our Tactical wireless unattended sensors provide immediate complete 360° situational awareness by using a combination of Outdoor and Indoor sensors. The mix of different type of unattended sensors technologies provides a flexible, modular kit which can be assembled according to client operational needs.

The **MOSS** Kit can be installed in few minutes, and doesn't require power or communication infrastructure to operate.

MOSS was designed for Military, LEA (Law Enforcement Agencies), VIP protection and security guards to provide immediate protection in a cost-effective, user-friendly experience.



Indoor Kit



Outdoor Kit

Overview

How it Works?

Every **MOSS** kit composed of wireless unattended sensors, wireless smartphone receiver and a ruggedized smartphone with **SG-Patrol App**.

The components are usually packed inside a ruggedized waterproof suitcase which also contains accessories (rechargers etc.).

Each of the unattended sensors includes a rechargeable lithium battery for continuous operation and a long-range wireless communication capability which forms a private secured RF-UHF network without any setup or infrastructure required for its operation.

Upon intrusion detection, the sensor sends wireless alert to the RF Smartphone receiver, Which forward it to the **SG-Patrol App**.

The field response team, which carry the operational Smartphone, will get an audible alarm and the location and type of alert in real-time.



Overview

MOSS Indoor Kit

The **MOSS** Indoor kit is useful in urban indoor environment. You can easily create an independent security alarm system in vacation house, Hotel, construction site or for intelligence / force protection on any indoor mission. The **MOSS** Indoor sensors can be installed in seconds by using the internal strong magnet for attaching it to a metal object such as: door, elevator, pole, etc. or by using the screw-holes of enclosure.

The Basic MOSS Indoor Kit Components



Ruggedized Waterproof Suitcase With Accessories



X5 TACT-PIR/TACT-RADAR/MINI-VIB Sensors
Default: x5 TACT-PIR



Wireless Smartphone receiver



Ruggedized Smartphone With SG-Patrol App

Overview



Battery Testing Cable



Sensor Charger



Configuration Cable

Overview

MOSS Outdoor Kit

The **MOSS** Outdoor kit is useful for critical access routes protection. The **MOSS** Outdoor can provide field force pre-alarm notification in order to increase awareness and effectivity during field operations.

The **MOSS** outdoor kit can be useful for: Ambush/stakeout missions, force protection etc.

The seismic sensors are completely Plug&Play so you just need to bury it on each point of interest and wait for intrusion alerts on remote & safe location.

The Basic MOSS Outdoor Kit Components



Ruggedized Waterproof Suitcase With Accessories



X5 AIO 2.0 Seismic Sensors



Wireless Smartphone Receiver



Ruggedized Smartphone With SG-Patrol App

Overview



Battery Testing Cable



Sensor Charger



Configuration Cable

Overview

AIO 2.0 Seismic Sensor

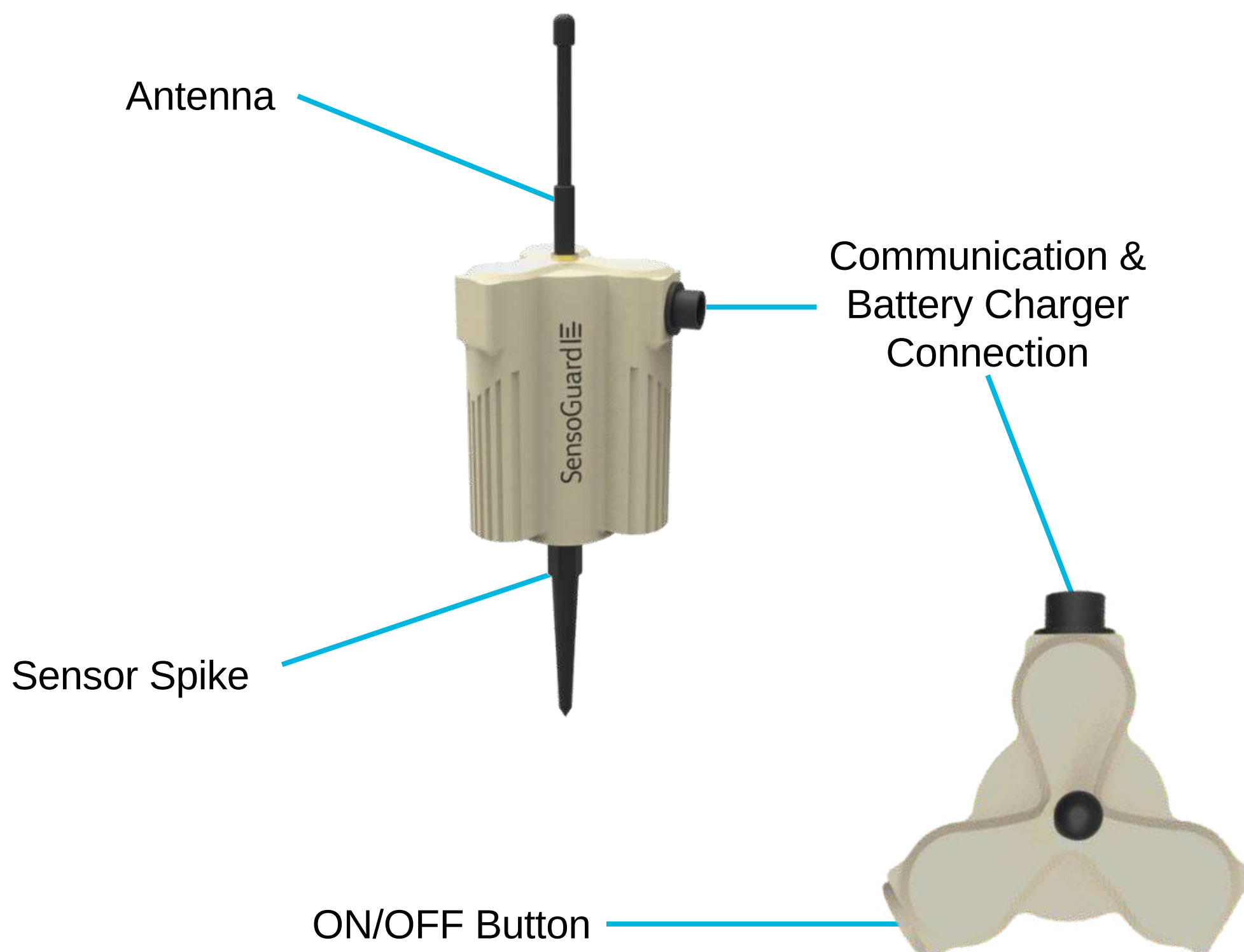
SensoGuard **AIO 2.0** sensor is an autonomous wireless seismic sensor which is designed for tactical/mobile applications.

The sensor contains internal rechargeable lithium battery for approximately 12 months of continuous operation.

The wireless communication of **AIO 2.0** sensor is RF-UHF and based on the Lora technology.

Upon alarm detection, the sensor sends a message to a remote:

- SG-Hub unit
- Wireless PC receiver
- Wireless Smartphone Receiver



Overview

TACT-PIR Sensor

The **TACT-PIR** is a high-performance thermal sensor designed for accurate motion detection. With its compact and durable design, it's ideal for a wide range of indoor applications. Below are its key features and specifications:

- Detection Capabilities: Can detect motion up to a distance of 10 meters with a 90-degree field of view.
- RF Frequency: Supports a default frequency of 433Mhz, with optional frequencies of 868Mhz or 915Mhz available.
- Transmission Range: Capable of transmitting data up to 300 meters in urban indoor environments.
- Durability: Rated IP67, making it resistant to dust and water ingress, suitable for challenging conditions.
- Temperature Tolerance: Operates effectively in temperatures ranging from -20°C (-4°F) to 60°C (140°F).
- Energy Efficient: With a power consumption of just 2.9mW (0.8mA at 3.6V), it ensures long battery life.
- Battery Life: Designed for efficiency, it operates approximately 6 months before needing a battery replacement.
- Compact and Lightweight: Weighs only 150g (0.33lbs) with dimensions of 32mm x 40mm x 75mm (1.2" x 1.5" x 2.9").

This sensor combines advanced thermal detection technology with energy efficiency and durability, making it a reliable choice for motion detection needs.



Overview

TACT-RADAR Sensor

The **TACT-RADAR** is a cutting-edge motion sensor engineered for discreet placement, ensuring security without compromising aesthetics. Ideal for various applications, it offers reliable motion detection in a compact form:

- Detection Range and Pattern: Provides a circular 360-degree detection pattern, with a range of up to 5 meters.
- RF Frequency: Comes with a default RF frequency of 433Mhz, with the option to switch to 868Mhz or 915Mhz if required.
- Transmission Range: Capable of transmitting data up to 300 meters in urban indoor environments.
- Durability: Features an IP67 rating for superior dust and water resistance, suited for use in harsh conditions.
- Temperature Compatibility: Operates effectively within a wide temperature range from -20°C (-4°F) to 60°C (140°F).
- Energy Consumption: Draws 3mA at 3.6V, equating to a power usage of 11mW, balancing efficiency with performance.
- Battery Life: Offers an operational life of approximately 6 weeks, ensuring consistent performance over short periods.
- Compact and Lightweight: Weighs only 150g (0.33lbs) with dimensions of 32mm x 40mm x 75mm (1.2" x 1.5" x 2.9"), making it easy to install in hidden locations.

The **TACT-RADAR** sensor combines discreet integration with powerful motion detection capabilities, making it an excellent choice for secure, unobtrusive monitoring.



Overview

MINI-VIB Sensor

The **MINI-VIB** sensor is designed for versatile monitoring of vibrations, impacts, and drilling attempts on gates, containers, and other structures. It combines advanced detection technology with robust design features:

- Detection Capabilities: Sensitive to vibrations, hits, and drilling activities, offering comprehensive protection.
- RF Frequency: Operates on a 433Mhz frequency by default, with options for 868Mhz or 915Mhz frequencies available.
- Transmission Range: Capable of transmitting signals up to 300 meters in urban indoor settings.
- Durability: Boasts an IP67 rating, ensuring protection against dust and water, suitable for harsh environmental conditions.
- Temperature Range: Functions in extreme temperatures, from -20°C (-4°F) to 60°C (140°F).
- Energy Efficiency: Extremely low power consumption of 0.3mW (0.1mA at 3.6V), promoting prolonged battery life.
- Battery Life: Engineered for long-term use with a battery lifespan of approximately 3 years.
- Compact Design: Weighs only 150g (0.33lbs) with dimensions of 32mm x 40mm x 75mm (1.2" x 1.5" x 2.9").

The **MINI-VIB** sensor is an ideal choice for securing and monitoring a variety of assets, offering long-lasting, reliable performance in a compact package.



Overview

Wireless Smartphone Receiver

This device transforms a smartphone into a powerful security monitoring tool, compatible with various sensors for comprehensive area surveillance. Ideal for use with the SensoGuard **SG-Patrol** system, it provides instant alarm notifications and critical information directly on your smartphone.

- Connection Compatibility: Supports both USB Type-C and Micro USB connections, ensuring compatibility with a wide range of smartphones.
- RF Frequency: Flexible RF frequency options (433Mhz default, with 868Mhz and 915MHz available) for reliable communication with sensors.
- Device Specifications: With dimensions of 157mm x 42mm x 66mm (without antenna), it's designed to be portable yet robust. Rated IP67, it's protected against dust and water ingress.
- Power Efficiency: Consumes 16mA of power, balancing performance with energy efficiency.
- Ruggedized Display Unit: Operates on Android, equipped with the SensoGuard SG-Patrol App for intuitive monitoring and control. Displays alarm information including map location, unit ID, time, and type of alarm. Enhanced durability with an IP68 rating (compliant with MIL-STD 810G), it's resistant to extreme conditions and capable of indicating intruder alerts, vehicle alerts, low battery, and system status.

This smartphone-based receiver is an innovative solution for real-time security monitoring, offering robustness, portability, and ease of use for on-the-go surveillance.



Overview

SG-Patrol App

- **SG Patrol App** is an Android application for hand-held receivers on field.
- The **SG Patrol App** requires a wireless smartphone receiver connected to the smartphone in order to receive alarms from our sensors.
- The **SG Patrol App** displays sensors locations and alarm notifications on Google Maps.

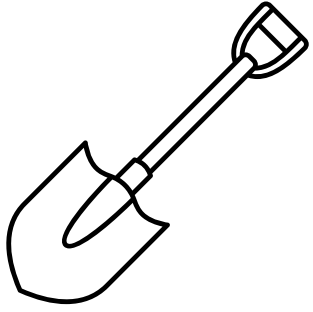


How to Use?

1. Download the **SG Patrol App** from the Google Play store in your smartphone.
2. Open the app and send us the key in order to activate your app (sales@sensoguard.com).
3. Open the app again and enter the activation key we sent you, now you see the main screen of the app, click on “Configuration” in order to set the parameters.
 - Set the number of sensors you have.
 - Set the alarm sound you want.
 - Activate or Deactivate vibration when alarm
 - Set the amount of time the alarm will show on the map.
 - Set the map view
 - Set the app language
4. At the top menu click on “Sensor Table” in order to see the sensor and change their names.
5. Then click on “Map”, there you can place your sensor on the map and when an alarm will come in you will see the event type on the map.
6. In order to use the map in offline mode, you must download the maps (via SG Patrol app settings)
7. At the “Alarm Log” you can see all the alarm that the **SG Patrol App** has been detected.

Installation Guide

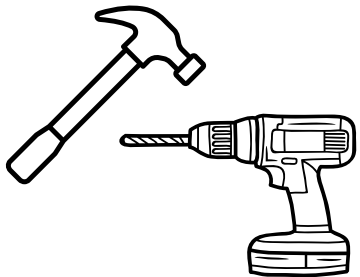
Installation Tools



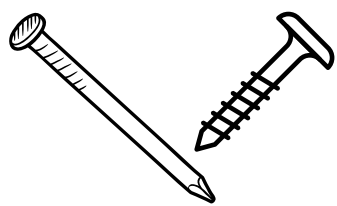
Shovel
For: AIO 2.0 Installation



Gloves
For: AIO 2.0 Installation



Drill / Hammer
For: TACT-PIR, TACT-RADAR and MINI-VIB Installation



Screws / Nails
For: TACT-PIR, TACT-RADAR and MINI-VIB Installation

Installation Guide

AIO Sensor Deployment

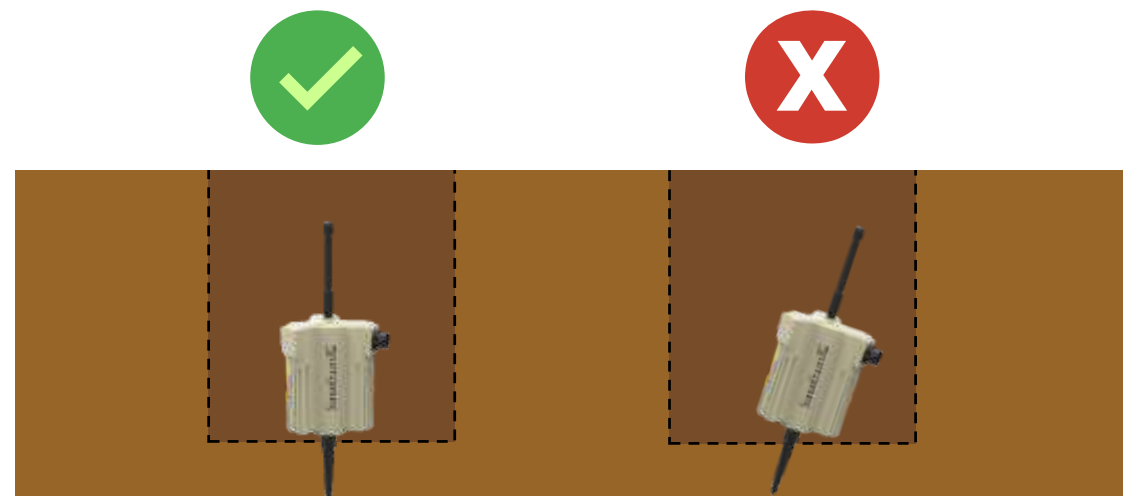
Verify that the Sensors are intact and not damaged in any way (broken, cracked or torn)

Step 1:

Dig a hole in the ground 15cm deep and about 10cm wide.

Stick the sensor inside the hole until the spike is covered, verify that the sensor is tightly connected to the ground

Make sure that the sensor is straight – as shown below



Step 2:

Turn on the **AIO 2.0** sensor by pressing the on/off button.

Cover the sensors with clean soil without stones (The stones create air pockets which reduce detection range).

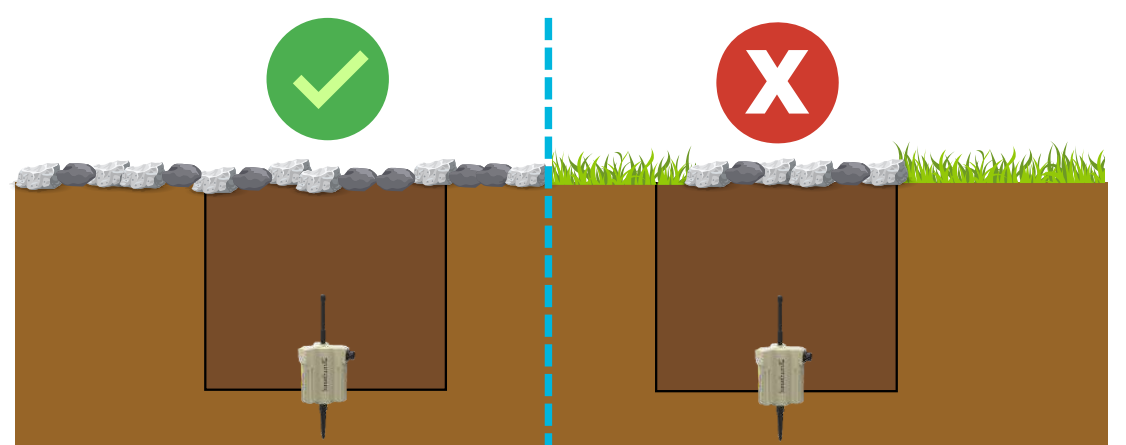
Make sure you cover the sensor properly– as shown below



Step 3:

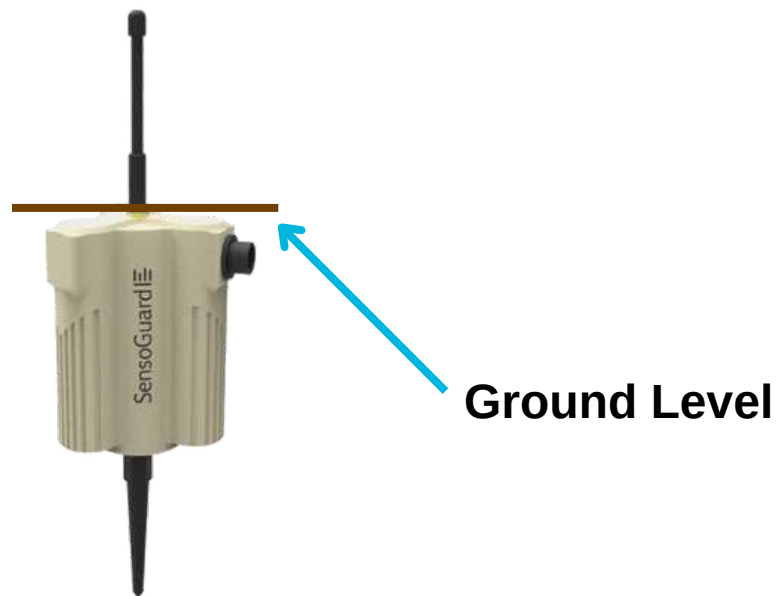
Cover the hole according to the natural environment in order to keep it concealed.

See example – as shown below



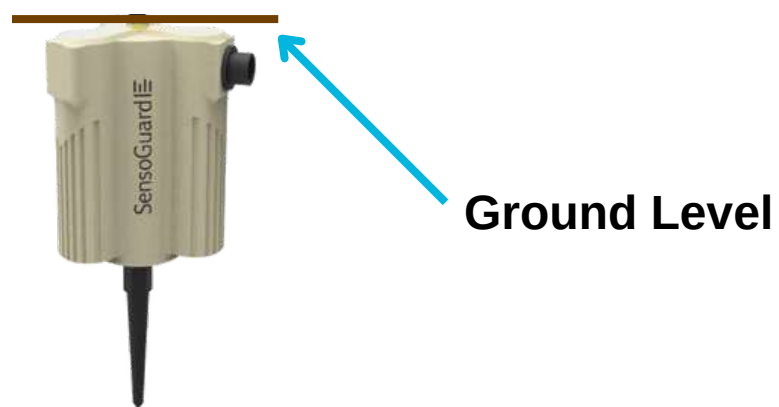
- Mark and record the locations of the sensors with a GPS point or any other landmark in the field (This is very important for future maintenance in case of need).
- If the soil is very dry, it is recommended to pour water around the sensors to allow the soil to tighten around the sensor.

Installation Guide



5cm Antena

Up to 1000m transmission range



Internal Antena

Up to 250m transmission range

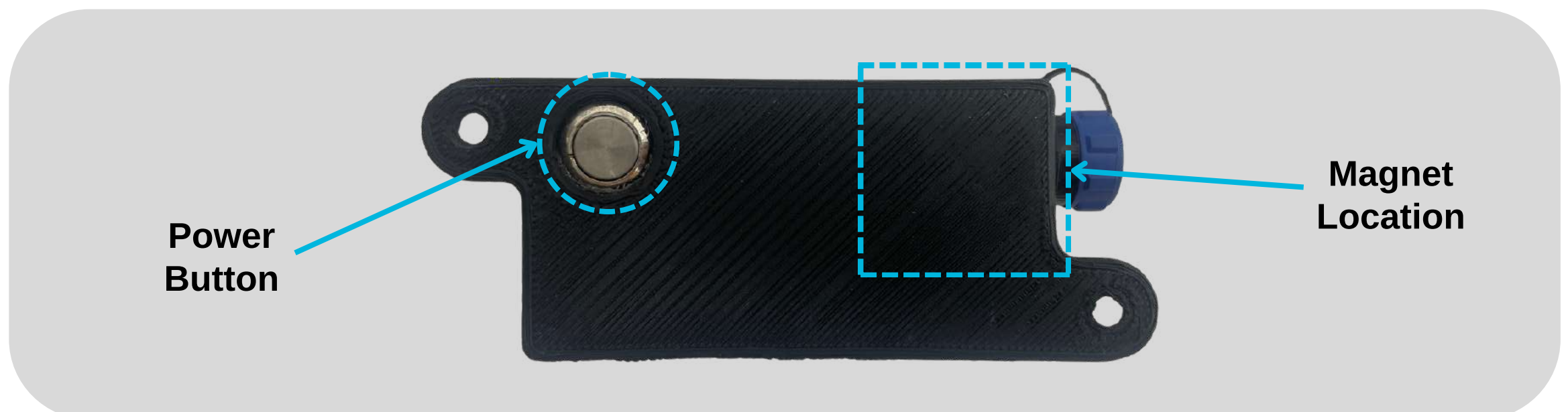
Installation Guide

TACT-PIR/TACT-RADAR/MINI-VIB Sensor Deployment

There are two methods to connect the **TACT-PIR**, **TACT-RADAR** and **MINI-VIB** sensors, using the built-in magnet or the screw holes.

Built-in Magnets

- Press the power button on the back of the sensor to turn it on.
- Attach the sensor to the magnetized surface by snapping it on.



Screw Holes

- Press the power button on the back of the sensor to turn it on.
- Position the sensor where you want to install it and mark the screw hole locations.
- Drill holes or hammer nails at the marked spots for assembly.



Configuration and Testing

First Operation

Charging The Battery

The Sensors are supplied with rechargeable batteries, in order to use the sensor, the first step is to charge the battery.

Use the supplied battery charger in order to charge the battery.

The battery is fully charged when the LED indicator on charger light is green.

(when fully charged the voltage should be 4.2v)

Configure ID

The Sensors are configured by default as ID1 to ID5 with labels on each sensor indicating his ID. The subnet is not enabled by default, so before installing the sensors you should define a subnet and a unique ID for each sensor.

Read about [Sensor Configuration](#) in section "System Configuration"

Read about [Subnet Configuration](#) in Appendix A "Wireless Network Subnet Mode"

Configuration and Testing

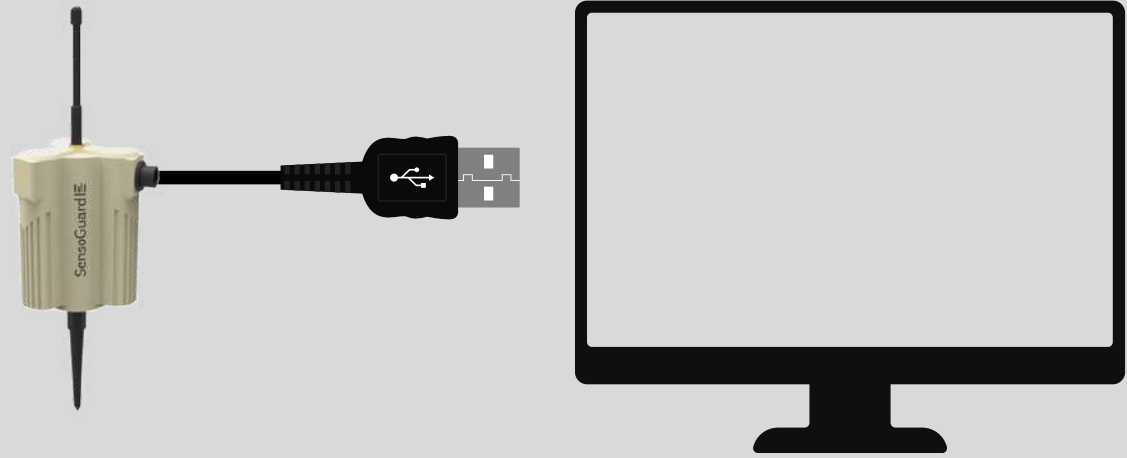
System Configuration

AIO 2.0, TACT-PIR, TACT-RADAR and MINI-VIB Sensors can be configured through **PC Suite** or **SG Patrol App**.

Connecting PC Suite with USB Connection or Wireless Receiver

Connect With USB Cable

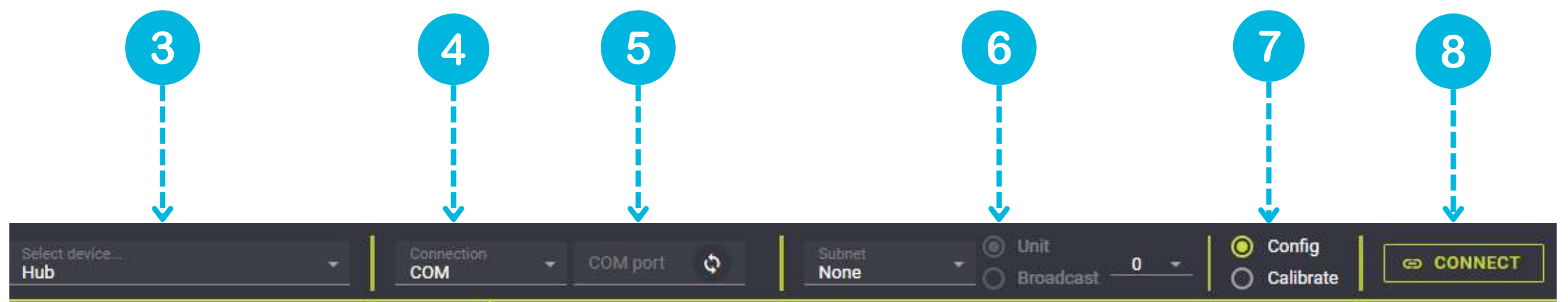
Connect the communication cable to connector outside



Connect With Wireless Receiver



Configuration and Testing

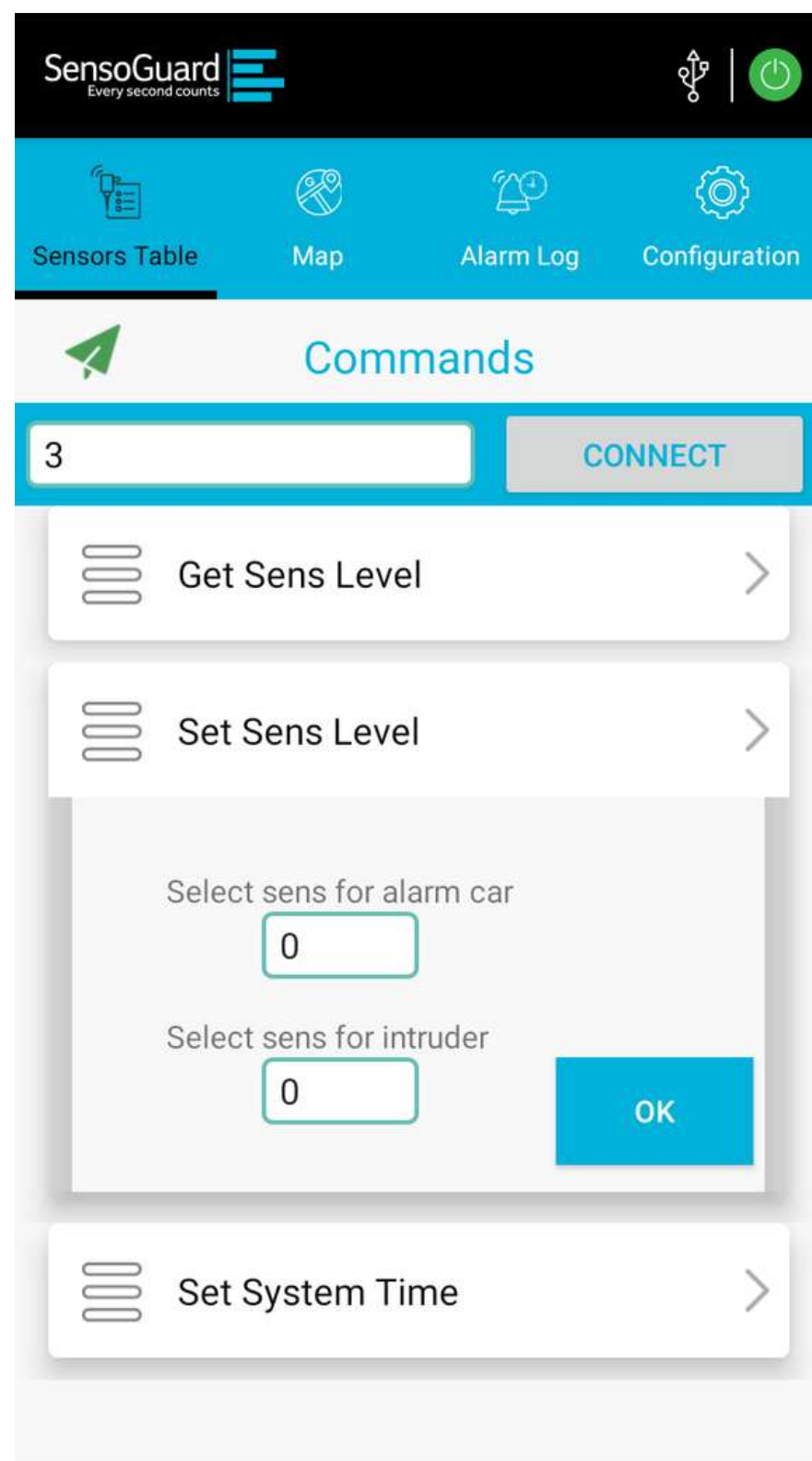
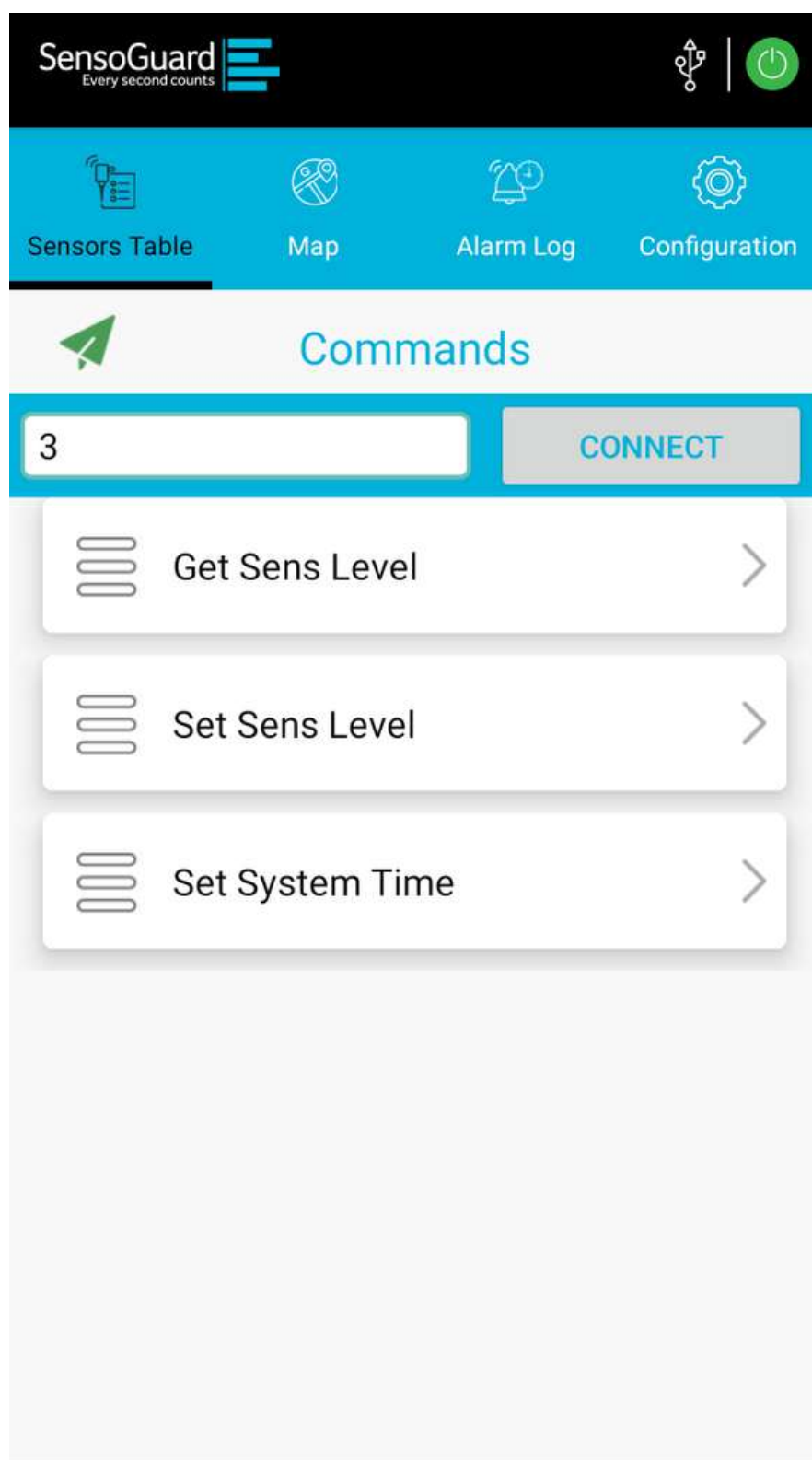


1. Connect your **USB Cable / Wireless Smartphone Receiver** to your computer.
2. Launch the **PC Suite** Software.
3. Click on "Select device" within the software. Then, proceed to select "UGS/Tactical Systems" and choose the product you want to configure.
4. Select "COM" connection by clicking on "Connection".
5. Select the appropriate "COM Port" from the provided dropdown list (*Please refer to Appendix "A. Identifying the COM Port on Your Computer"*)
6. Select whether to configure one sensor ("Unit") or multiple sensors ("Broadcast") based on your setup requirements.
7. Choose between "Config" to adjust sensor settings or "Calibrate" for sensor calibration.
8. Click "Connect" to open a link between your PC Suite and the device, completing the configuration process and ensuring your device is ready for operation.

Configuration and Testing

Connecting SG Patrol App USB Connection

1. Connect your **Wireless Smartphone Receiver** to your smartphone.
2. Launch the **SG Patrol App**.
3. Tap on "Sensor Table". Then, tap the green button at the bottom right corner.
4. Select the sensor you want to configure and tap "Connect"
5. A list of command will be open, set the settings you want and tap connect



Configuration and Testing

Performing System Tests In Office

To ensure the seamless operation and reliability of your system, it is highly recommended to perform pre-deployment testing within an office environment. This structured approach allows you to validate the functionality and compatibility of all system components before their field installation.

Simply turn on the sensor and the **SG Patrol App**, configure the sensor inside the app (Refer to the **SG Patrol App** manual for detailed instructions).

- Trigger the alarm by lightly tapping the **AIO 2.0**.
- Trigger the alarm by moving in front of the **TACT-PIR** sensor.
- Stand in front of the **TACT-RADAR** to trigger the alarm.
- Trigger the alarm by gently shaking the **MINI-VIB** sensor.

Ensure that an alarm is displayed on the **SG Patrol App** to validate the system's functionality.

Configuration and Testing

AIO 2.0 Sensitivity Settings

Configure sensitivity levels as needed using **PC Suite** software or **SG Patrol App** (SensoGuard recommends to start with the lowest sensitivity and to increase it as required so the sensor will detect the threats in the area of interest)

You can set different sensitivity level for each threat (footsteps, vehicles) There are 7 sensitivity levels for each threat (1 - the lowest level and up to 7 – the highest level).

Test Steps

1. Walk away about 15m from the sensor, wait by standing still for 1min in order for the sensor to adjust itself to the environmental noise
2. Test the sensor by crossing the protected area nearby sensor. Make sure you receive the alarm indication in the **SG Patrol App**.
3. Wait 60 seconds between each crossing test (without moving).
4. If the unit didn't detect you – try to increase sensitivity level by 1, wait 1 minute away from sensor (without moving) and repeat the test until you will be detected

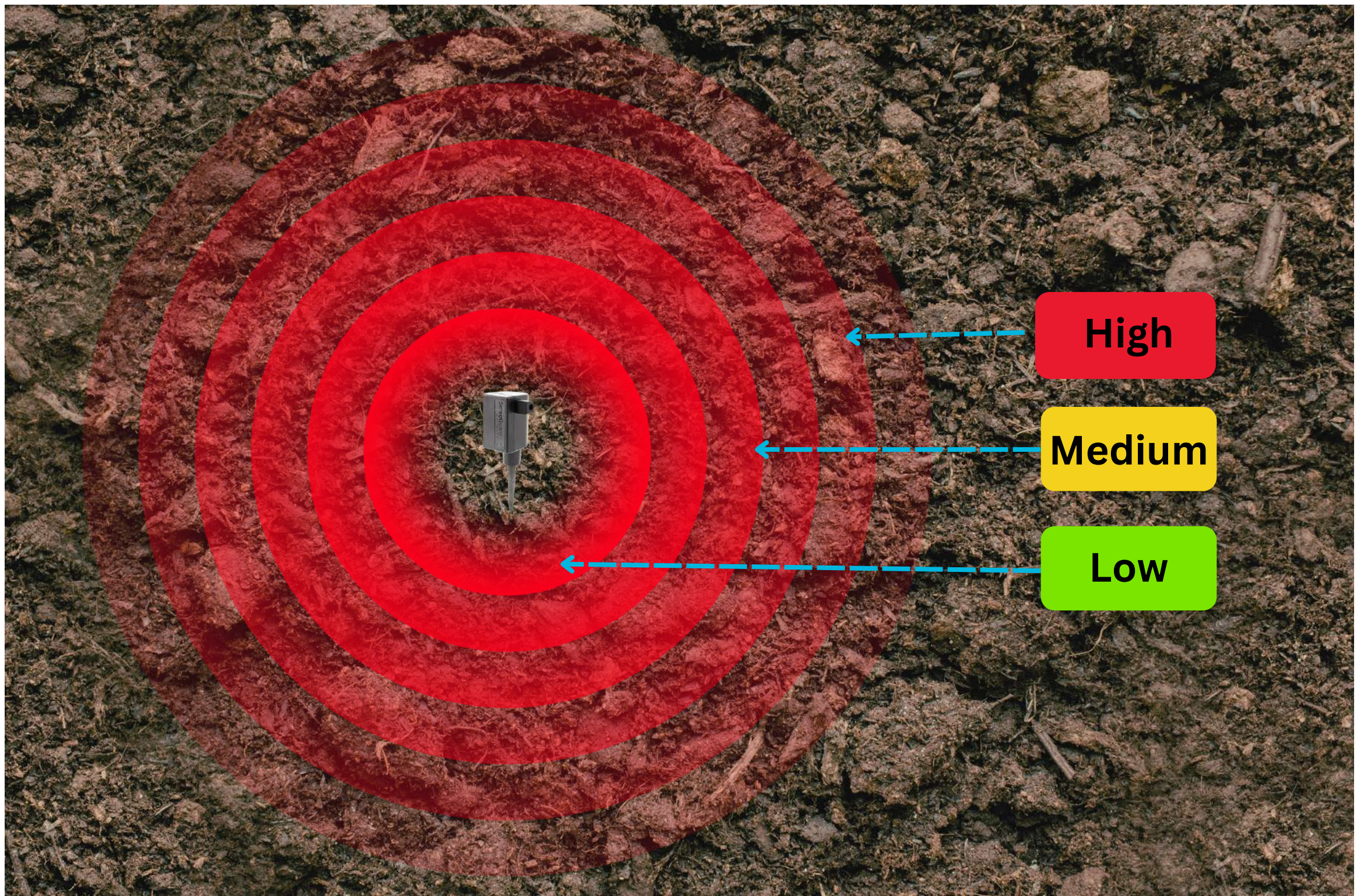
For broader understanding of Calibration process and optimizing system performance we recommend to take our technical course online.

<https://www.sensoguard.com/training/>

Please notice:

- *Detection performance improves after one or two days due to learning algorithm and because sensors connection to ground become better over time.*
- *SensoGuard recommend avoiding using sensitivity level 7 for standard projects – it is meant for very high risk sites.*

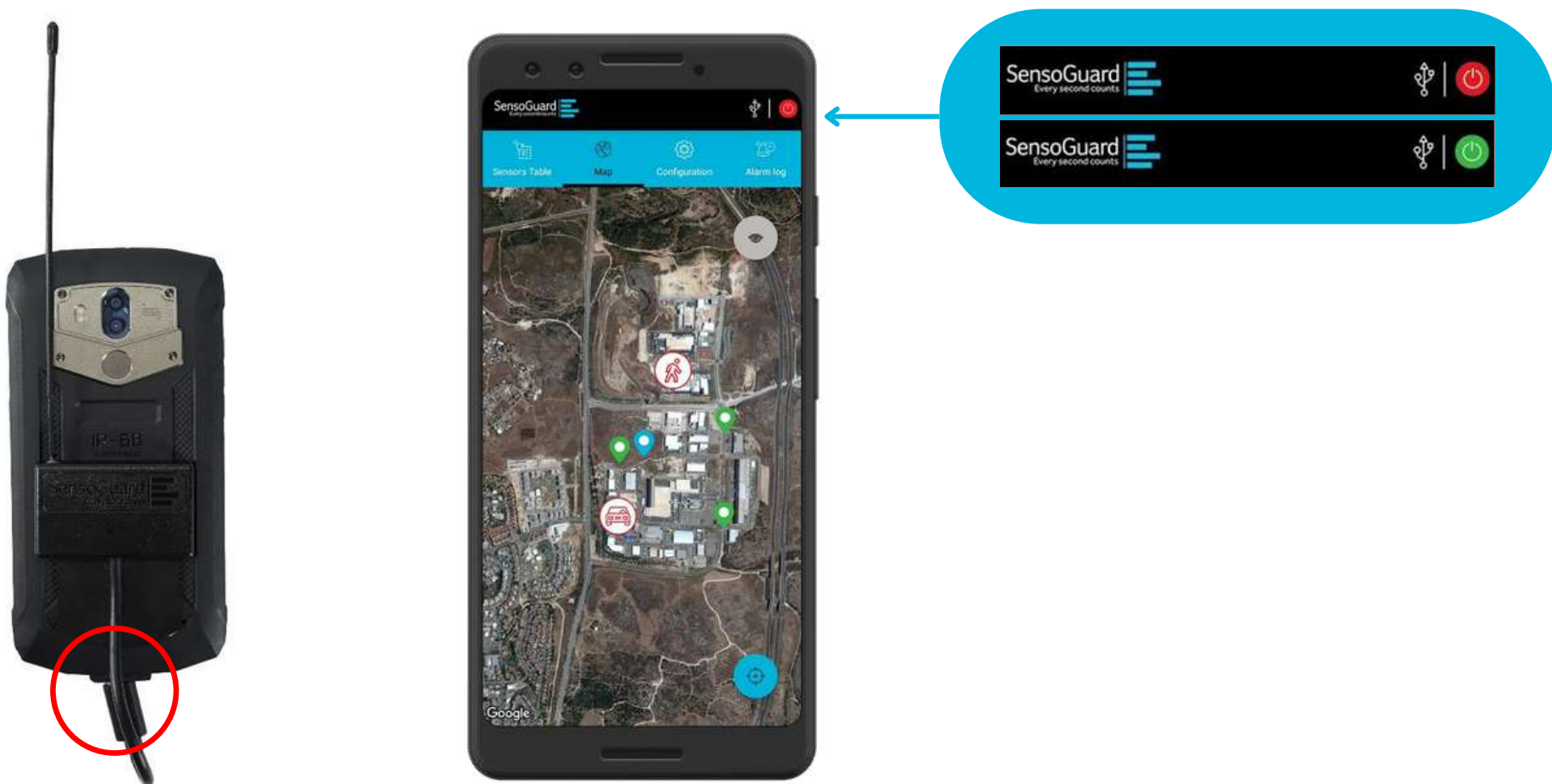
Configuration and Testing



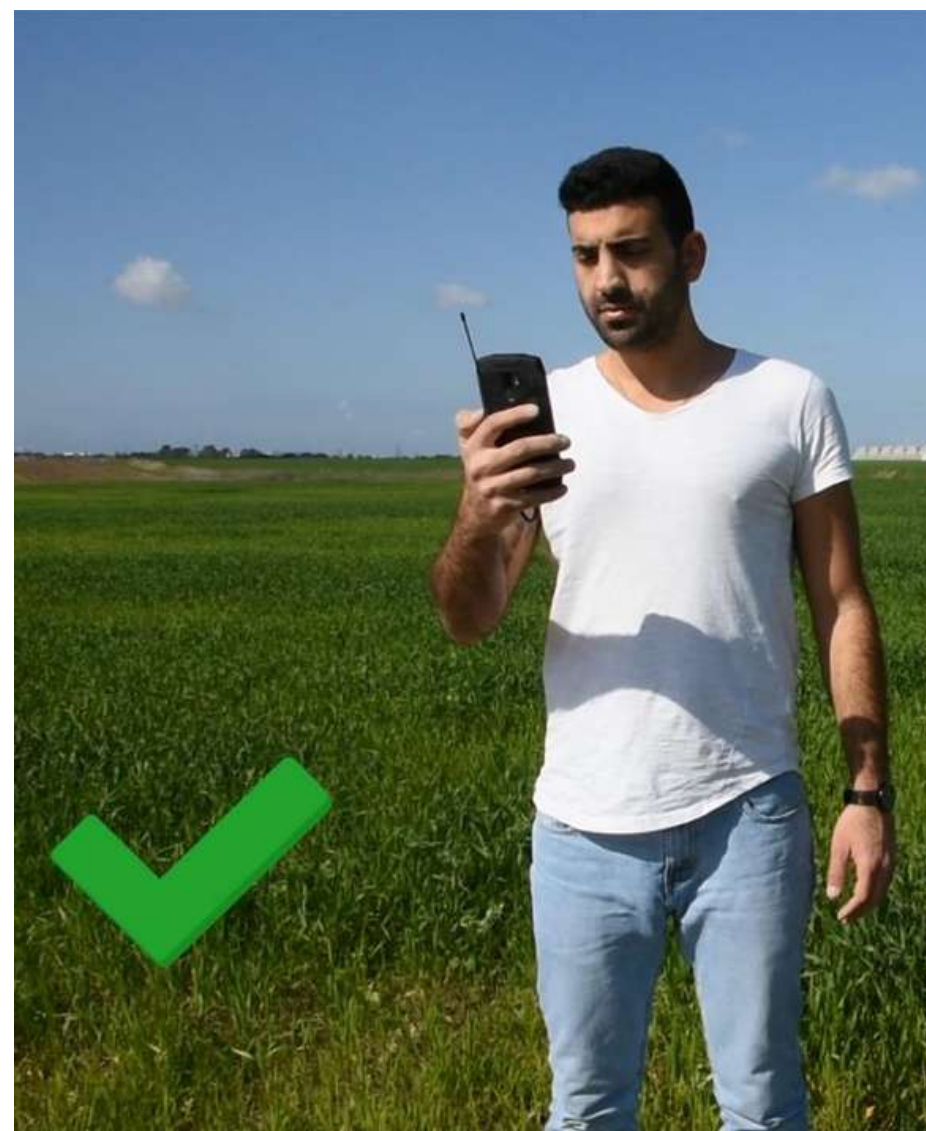
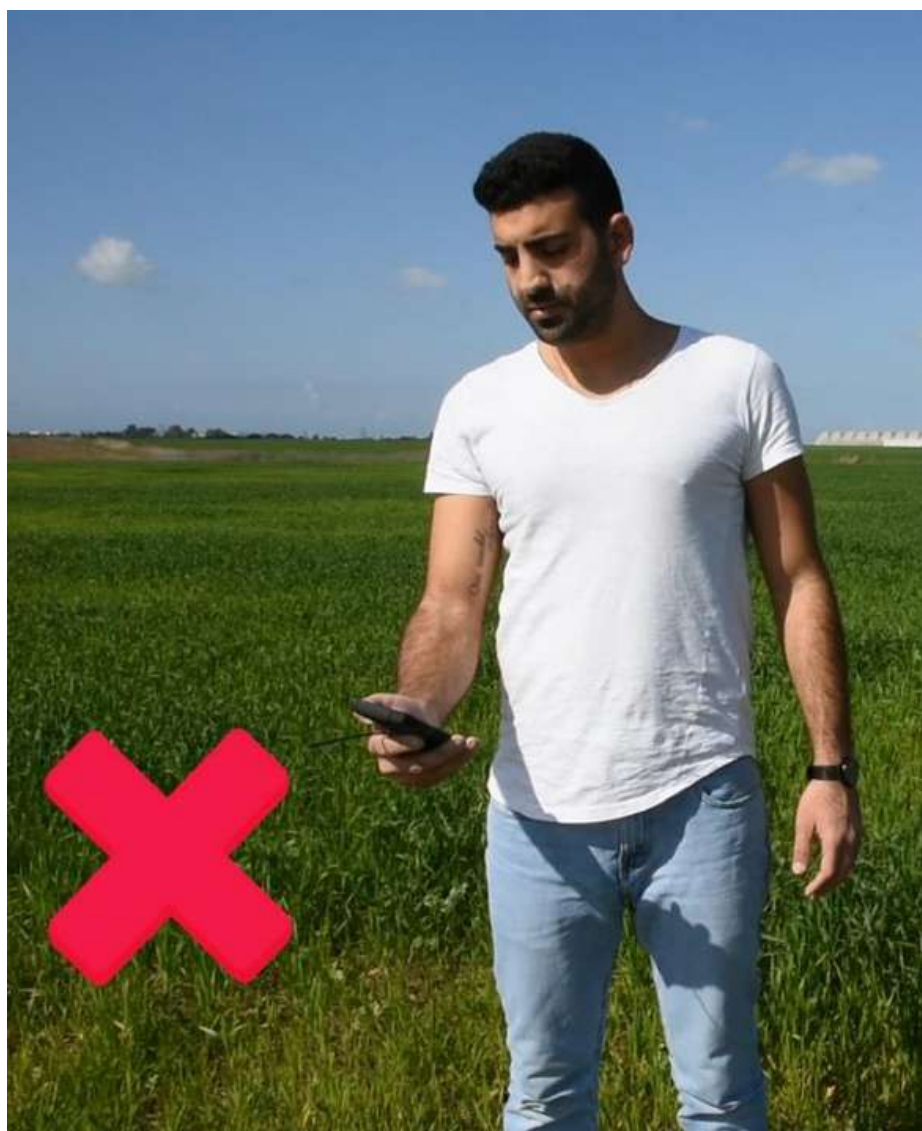
Configuration and Testing

SG Patrol App

In order to turn on the app to operational mode you must connect the wireless receiver to the phone and click on the red button in right top of the screen.



Keep receiver antenna aiming upwards (to sky) and not parallel to ground



Maintenance and Troubleshooting

Battery Level Testing and Charging

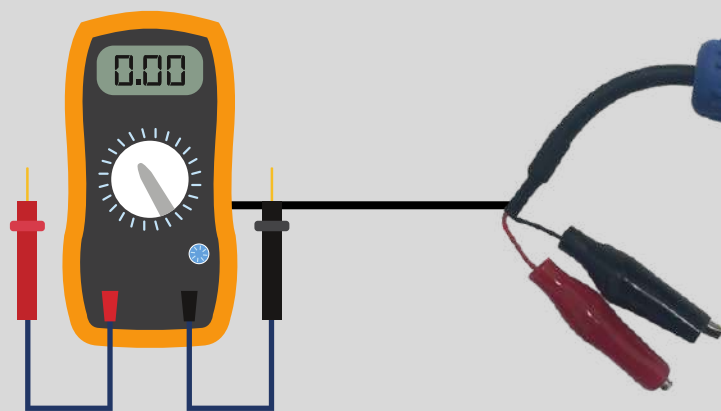
Battery Level Testing

Connect the “Battery Testing” cable to the sensor and connect a voltmeter to the alligator clips.

Fully charged battery should be 4.2V

If the battery level is 3.5V the sensor should be charged.

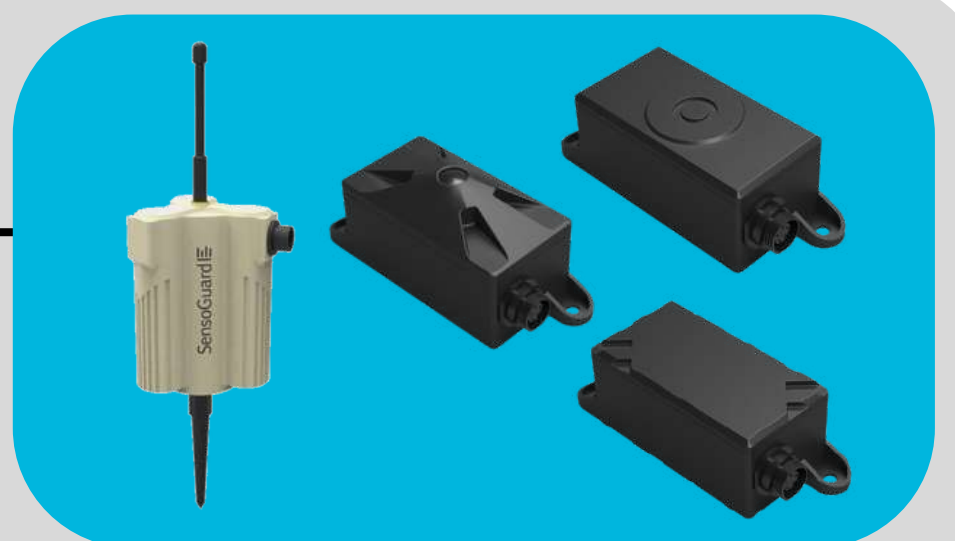
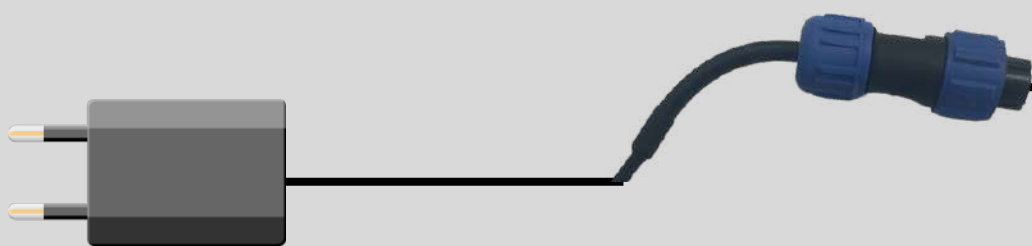
Test Sensor Battery Level



Battery Charging

Connect the “Sensor Charger” cable to the sensor and connect charger to 110V/220V supply

Charge Sensor Battery



Once you finished charging the unit, make sure you close the cap of the connector (only by hand, don't use any tools)

Maintenance and Troubleshooting

Regular Maintenance

Routine Inspection and Cleaning:

- Conduct regular visual inspections of the installation site to check for any physical damages or changes in the environment that might affect the system's performance.
- Remove any debris or buildup around sensors areas to maintain optimal sensitivity and functionality.

System Testing:

- Perform routine system tests to verify operational efficiency. This can include conducting controlled test scenarios to ensure the system accurately detects and reports intrusion attempts.

Software Updates:

- Follow SensoGuard guidelines for updating system firmware and software.
- Backup system configurations before applying updates to prevent data loss.

Sensor Calibration:

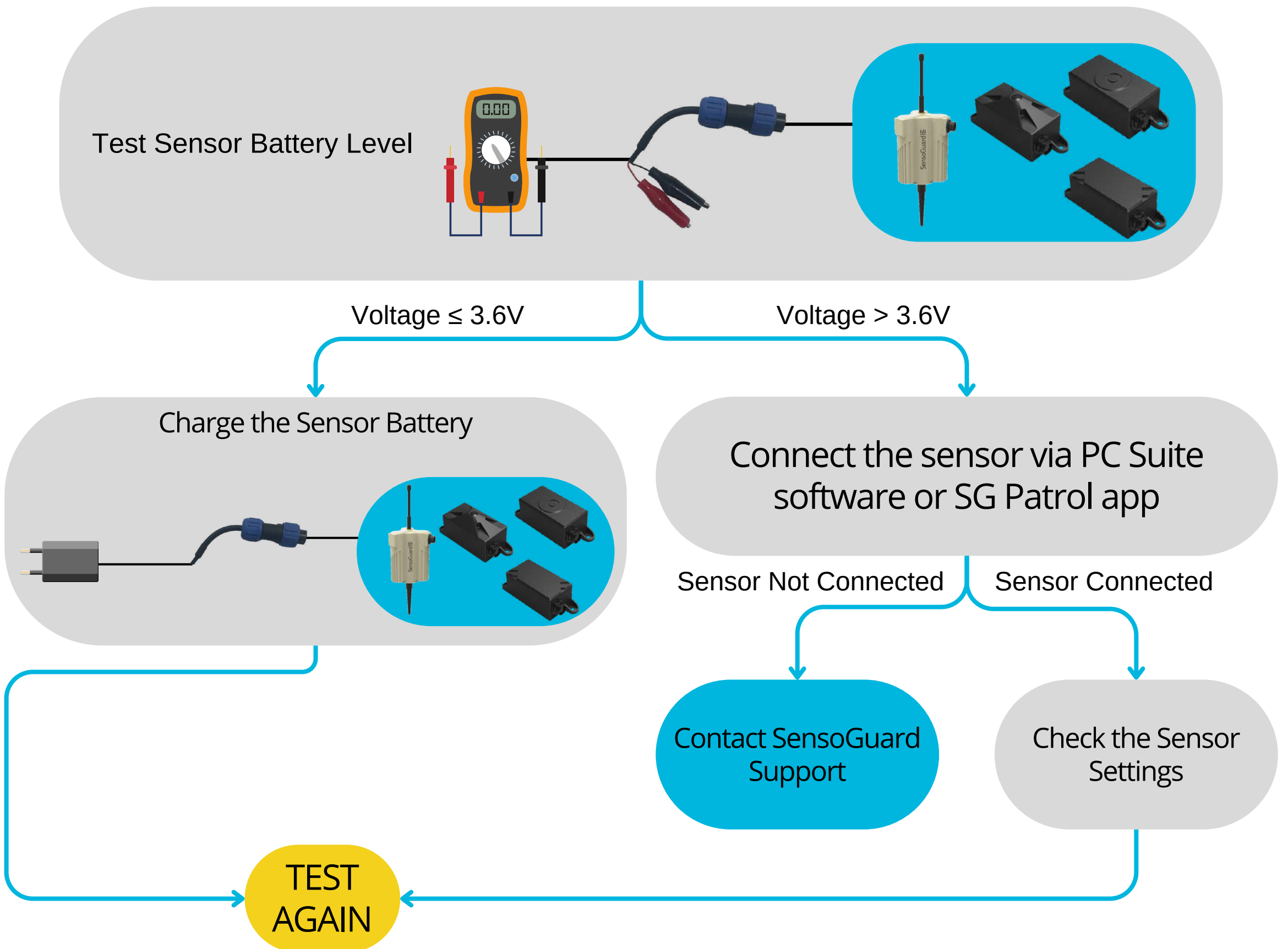
- Follow the SensoGuard instructions for calibration processes.
- Perform routine tests and adjust sensitivity settings accordingly based on environmental changes or specific security needs.

Maintenance and Troubleshooting

Troubleshooting Common Issues

- **Sensors Not Working**

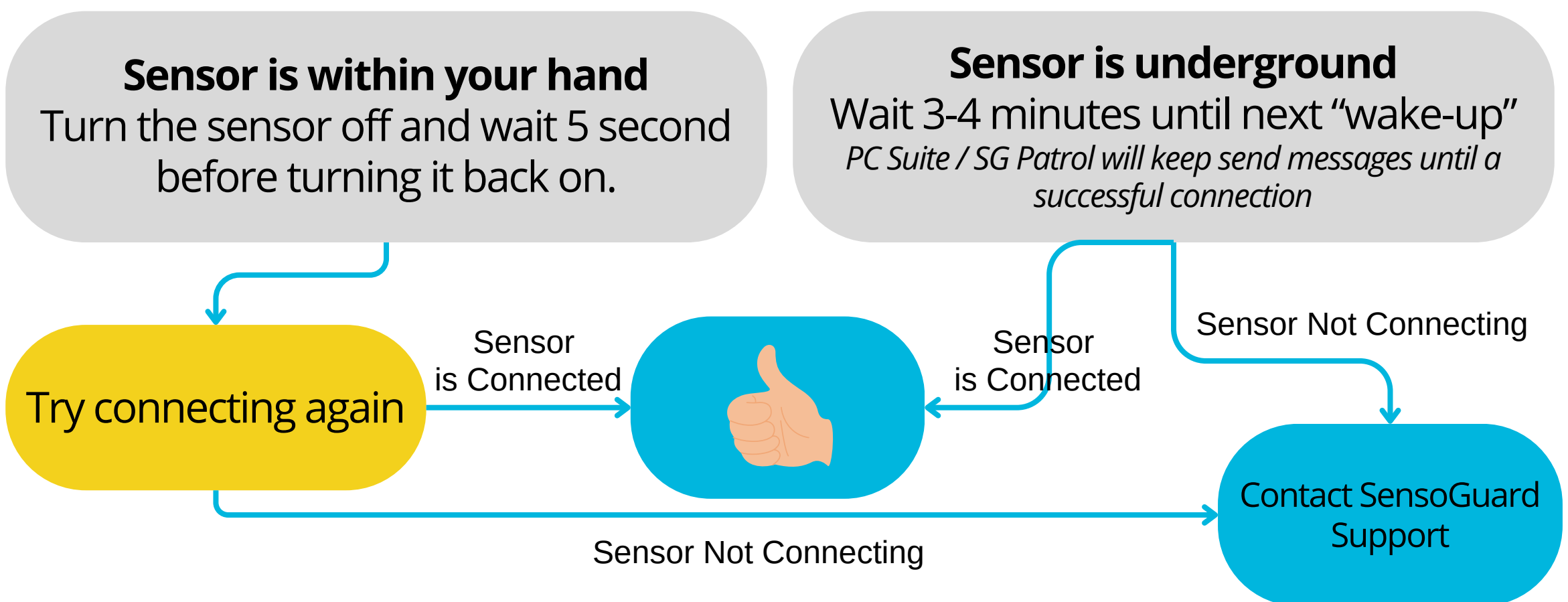
- Description: system is installed and working, one or more sensors are not communicating (not triggering alarms and not responding to commands)



Maintenance and Troubleshooting

- **Sensors Not Connecting**

- In order to increase operational time, all of our wireless sensors turned off the wireless communication 1 minute after turned on. Once every 3 minutes the sensor “wake-up” for 5 seconds, unless you they get any command from the PC Suite \ SG Patrol the sensor is turned off for extra 3 minutes.



- **Wireless Receiver doesn't work**

- The wireless receiver have to be connected directly to the mobile phone, don't use any adapter or charge the phone during SG Patrol operation.

Maintenance and Troubleshooting

Technical Support

Availability:

- Sunday to Thursday - 9AM - 5PM (GMT+2)

Communication Channels:

- Phone Support: +972-773012687
- Email Support: sales@sensoguard.com

Online Support Portal:

- To access the training, simply visit Sensoguard Training Page and explore the available resources to your learning preference and training needs.

Appendix

A. Wireless Network Subnet Mode

SensoGuard wireless sensors has two network operation modes:

- **Flat network** – in this option, subnet option is disabled – a Hub will be able to receive alerts from 250 sensors.
- **Network Subnets** – in this option you can group a localized network under a private subnet.

For example – there are two neighbors which use SensoGuard sensors and don't want to get alerts from next door sensors.

it is the recommended mode of operation in order to separate nearby networks.

The first step is to Enable SUBNET mode (SET Subnet command and choose Enable). Next, you define the Network Subnet + Sensor ID in the Set ID command according to below table.

Hub ID = Network Subnet*32

Unit ID = Network Subnet*32+Sensor ID

So for example :

Subnet 3, Hub Unit = > Set Unit ID = 96

Subnet 3, Sensor 2 = > Set Unit ID = 98

Network Subnet	Hub ID	Sensor ID	ID to configure in PC Suite
0	0	1-30	1-30
1	32	1-30	33-62
2	64	1-30	65-94
3	96	1-30	97-126
4	128	1-30	129-158
5	160	1-30	161-190
6	192	1-30	193-222
7	224	1-30	225-254