

Tunnels disclosure

Underground Activity Detection System

ELPAM Electronics Ltd. cutting edge technology provides the ideal system for Tunneling Detection.

ELPAM system has the impressive ability of alerting to any digging

The offered system is installed underground and is able to recognize a variety of activities digging, drilling, scraping, jack-hammering, etc., measure their intensity and duration.

The system is stationary and fixed after seismic sensors inserted into the ground.

The proprietary detection algorithms intelligently filter out non-threatening vibrations, from traffic on nearby roads and underground subways, in order to minimize false alarms. This underground Seismic System from **ELPAM Electronics Ltd** incorporates innovative technology that delivers data fusion capabilities, significantly differentiating the system from current technologies available in the market.

The system allowing real time detection of any hostile activities

The system is resistant to extreme environmental conditions, such as:

- Weather & temperature changes
- A large variety of terrains
- No interference by vegetation

Important features of the system are its excellent flexibility and adaptability to various types of terrain, such as beach sand, dirt roads, agricultural areas and even bushes.

The **ELPAM** system is universal, and due to its flexibility, can be adapted to any site's needs and requirements.

The system is computerized for detecting and locating tunnels. The control system includes display screens which through Internet communication can be transferred to the findings for each position in the world.

ELPAM system can be combined with smart fence.

The **ELPAM** system has been developed according to the highest standards and is functioning in a completely reliable manner during several years, with minimum maintenance. The system is a "state of the art" with an advanced performance.

Markets

The **ELPAM** system is for detecting any tunneling and digging nearby any infrastructure. It is typically used to protect prisons, security installations, sea ports, any government facilities, airports and banks.

Detection Method - How it works?

The method employed by our technology is based on Geophones (Seismic Sensors) that are placed at recommended depth of five feet (1.5 meters) into the ground. These Geophones measure energy waves in the earth.

When an activity is registered in the protected area, the seismic sensors (Geophones) produces a signal which is processed in real time through the advanced algorithm, identifying which type of activity has been registered, digging, walking, vehicle etc.

The underground sensors can be installed at varying depths and distances from each other. Each sensor has an adjustable detection range that is usually overlapped by several units for increased reliability.

By design, installation of sensors can be divided into the areas (zones) of disclosure. In this method can pinpoint the excavation tracks.

The Seismic Sensors combines Geophones with advanced technology intrusion recognition algorithms that analyze the seismic signals to effectively filter out false alarms. This intelligent signal processing provides a high probability of detection and an extremely low false and nuisance alarm rate.

The computerized system processes the signals picked from the seismic sensors (Geophones), processes them, and by smart algorithms developed especially by **ELPAM** gives the results over the monitors (including cellular phones).

The drawing below demonstrating the functioning of ELPAM system which expose the underground tunnels of the Palestinians from Gaza :

Underground tunnels of the Palestinians, used to smuggle large amounts of firearms and other sabotage materials into the Gaza Strip. The method employed by geophones those are placed five feet (1.5 meters) into ground. These geophones measure energy waves in the earth and are equipped with acoustic components.



System Advantages

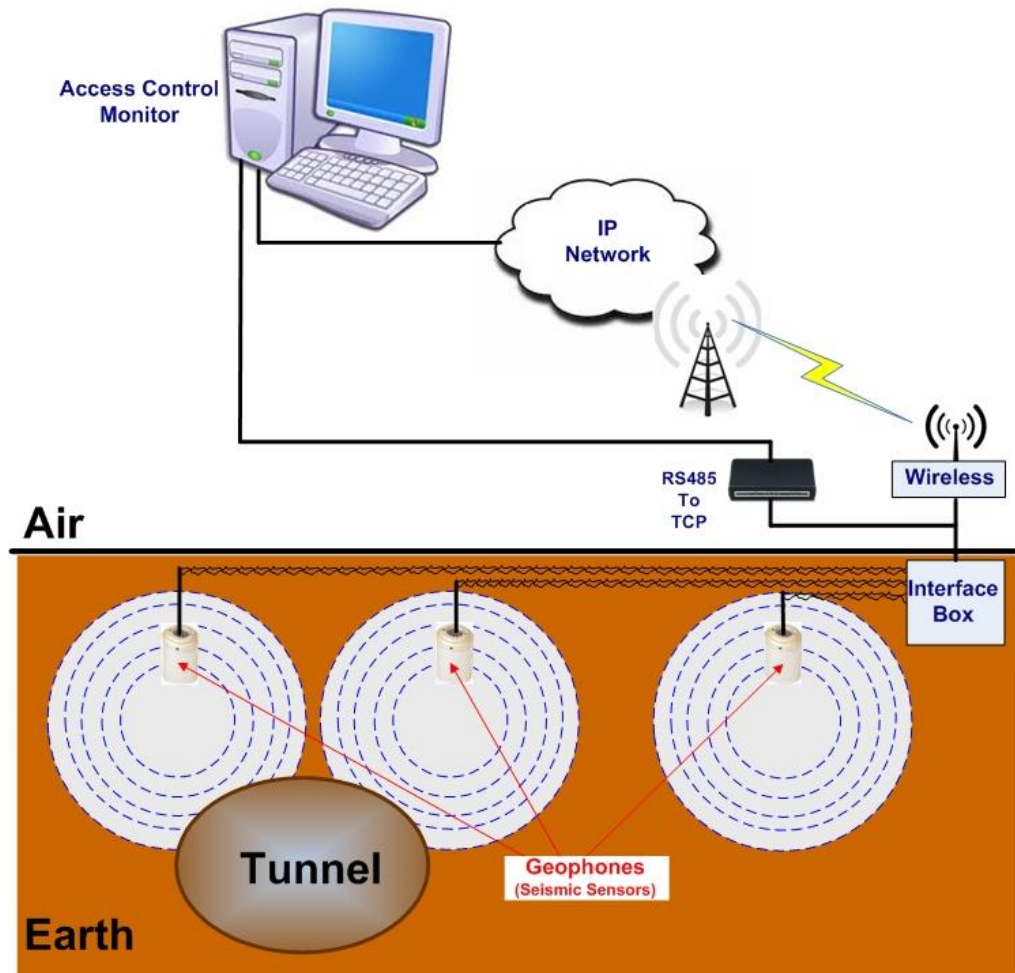
- Adaptable to various types and wide variety of terrain e.g. sand, clay, soil, etc.
- Answering intrusion scenarios such as walking, crawling, digging, drilling, tunneling etc.
- Underground invisible seismic detection system (can be supported by GPS devices as an option)
- Ability to be fine-tuned according to operational requirements
- Ideal for applications that require site to remain unchanged
- Extremely difficult to locate and disconnect
- Adjustable sensitivity and detection radius
- Easily integrates with other systems like PA systems.
- Full control of system features from remote center.
- Very low infrastructure expenses
- Universal system that due to its flexibility, can be adapted to any site's needs and requirements.

System layout

A typical **ELPAM** system can consist unlimited number of seismic sensors which are connected through various means to the main computer.

A computer collects the data from each seismic sensor or from a group of sensors.

Typical configuration:



System Features

- Weather Proof : Sensors are resistant to temperature changes, humidity, snow and wind
- Detection Resolution: +/- 10 meters
- Full Control of the system features from remote center
- Very low infrastructure expenses
- Low System Power - Use inexpensive cabling solutions
- Options detectable by pre-selected areas or zones
- Integration capability to alarm system

System Specifications

- Operating temperature -30°C to +60°C
- Relative humidity 100%
- Operating voltage 30-40 V D.C.
- Power requirements 10mw /sensor
- Enclosure sealed to IP67, UV protected
- Detection range adjustable

GEOPHONE - Technical Specifications

- Resonance Frequency: 14Hz \pm 2%
- Resistance: 395 Ω \pm 2%
- Sensitivity: 0/275v/Cm/Sec
- Working temperature: -30 °C \div +60 °C
- Weight: 0.6 Kg
- Diameter: 60 mm
- Height: 88 mm
- Material: Aluminum 60-61T6
- Coating: anodized natural