Perimitrax®

Buried cable intrusion detection sensor

DESCRIPTION – Perimitrax® is a covert terrain following intrusion detection sensor. Intruders are detected as they pass through an invisible electromagnetic field that surrounds buried cables. The response depends upon the size of the target so people are detected while small animals are not. The speed of the target is used to discriminate between intruders and environmental changes, resulting in reliable detection of intruders with a minimum of nuisance and false alarms.

APPLICATION – Each Sensor Module (SM) creates two zones of detection; one to the left and one to the right. The length of each zone is defined by the cable length (maximum of 200 meters). Longer perimeters are accommodated through the use of multiple processors, whereby the cables are connected using decouplers so power and communications are carried over the cables among multiple processors. The cables can go around corners and up and down changes in elevation. Because the cables are also the sensor, power and data is completely secure. Cables are typically buried 23 cm (9 in.) deep in soil and 5 cm (2 in.) in hard surfaces like asphalt and concrete.

Perimitrax is designed to operate in a variety of surfaces including sand, soil, heavy clay, asphalt, and concrete and is not affected by grass, plants, or shrubs. There are restrictions to the use of the product in proximity to fences and other metallic objects.

VOLUMETRIC SENSORS - BURIED

Features

- Terrain-following volumetric detection field
- Continuous field of detection
- 99% Probability of detection (Pd)
- Operates through vegetation (grass, shrubs and trees) and clay, sand and asphalt
- Insensitive to wind, rain, snow, hail, sandstorms, fog, extreme temperatures, seismic vibration, acoustic, magnetic effects or blowing debris
- Low False and Nuisance Alarm Rate (FAR / NAR)
- Superior height response
- Adaptive algorithms
- Lowest vulnerability to defeat of any outdoor sensor technology
- Power and communications on the same cable set
- PC-based network control with remote sensor adjustment of all operating parameters

Benefits

- Completely covert
- Site aesthetics left unchanged
- Ability to tie together a facility's entire security system of outdoor sensors and auxiliary devices
- Provides a high level of user confidence based on performance

Benefits (continued)

- Rapid return on investment through reduced installation, operating and maintenance costs
- Increased staff efficiency and reduced losses
- All-weather performance

Markets

- Correctional facilities
- Military installations
- VIP residences
- Critical commercial / industrial assets
- Utilities
- Petrochemical
- Nuclear power plants
- Nuclear materials storage
- Airports
- Government agencies and laboratories
- Important historic / cultural sites
- Communications sites

Perimitrax

Buried Cable Intrusion Detection Sensor

How it works

Unlike many sensors, Perimitrax uses a large volumetric field to detect moving targets based on their electrical conductivity, size and movement. Unless a target possesses the minimum alarm characteristics, it will not be detected. This intelligent signal processing provides the highest Probability of detection (Pd) of any sensor type and an extremely low False Alarm and Nuisance Alarm Rate (FAR / NAR).

Because the sensor cables do not change site aesthetics and the detection field is invisible, intruders are unaware of Perimitrax's presence and cannot locate, avoid or tamper with it. Combined with the sensor's advanced technical capabilities, these inherent features result in the lowest Vulnerability to defeat (Vd) of any outdoor sensor.

Perimitrax uses its sensor cables to communicate with and supply power to the Sensor Modules (SMs) and auxiliary sensors. A network of SMs in turn
communicates to a Sennet® Network Controller device via redundant RS-485 connections. From the Sennet Network Controller, alarm and status data can be collected by either the StarNeT 1000™ security management system software or the Sennet Network Manager software.

Perimitrax cable system

Perimitrax uses ported ("leaky") coaxial sensor cables to create an invisible electromagnetic detection field. A gap in the transmit cable outer conductor allows electromagnetic energy to escape and be detected by a corresponding parallel receive cable. The cables can be buried in any surface such as soil, sand, clay, concrete or asphalt to form a uniform detection field that is terrain-following. The cables are located at the center of a 5 m (16 ft.) strip that is free of all moving metallic objects. They should be at least 3 m (10 ft.) from large moving metallic objects such as chain-link fences. The length of each zone can vary from 10 m (33 ft.) to 200 m (656 ft.) and is customized to suit site requirements.

The cables are available in two configurations. SC1 has transmit and receive cables, which are identical, in a single jacket. A single burial trench or slot is required, saving installation time and expense. The resulting detection field is typically 1 m (3.3 ft.) high and 2 m (6.6 ft.) wide. The actual field size depends on the burial depth, the burial medium and the thresholds chosen.

Recognized for its very low false alarm rate.

For those sites where space is not a problem and a wider field is desired, SC2 cables are used. SC2 is a single jacketed cable, so 2 cables are required to be buried separately approximately 2 m (6.6 ft.) apart. This results in a detection field that is typically 1 m (3.3 ft.) high and 3 m (10 ft.) wide. As with SC1 the actual field size depends on the burial depth, the burial medium and the thresholds chosen.

Performance

The Probability of detection (Pd) for intruders with a mass greater than 34 kg (75 lbs.) is greater than 99%, while intruders less than 10 kg (22 lbs.) are rejected, with a statistical confidence level of 95%. Detection is made for intruder speeds ranging from 2.5 cm/s (1 in. / sec.) to 15 m/s (49 ft. / sec.). Separate, more sensitive thresholds can be set for running / jumping intruders. Any attempt to tamper with the cables, the processor or its enclosure causes an alarm. Perimitrax is recognized for its very low false / nuisance alarms from vegetation, rain, snow, hail, sandstorms, wind, fog, temperature changes, RFI, EMI, seismic vibration, acoustic and magnetic effects.

System calibration

Perimitrax provides a number of options for adjusting system configuration settings and doing calibration. Detection thresholds and other configuration settings of Perimitrax zones can be adjusted directly at each SM using either the Local Interface Assembly hardware device or a laptop computer running Senstar's Universal Configuration Management (UCM) software. A laptop can be connected to the SM via either a USB-to-RS-485 adapter or RS-232-to-RS-485 adapter. For SMs connected together over the Sennet Network, all monitoring and configuration can be done from the network head-end location, either via the StarNeT 1000™ security management system or via the UCM software.Assembly.

Perimitrax® generates an invisible electromagnetic field that detects when an intruder disturbs the field.

Networked configuration features

- Recommended for 4 or more zones.
- Each sensor module provides 2 zones of detection up to a maximum length of 400 m (1320 ft.) per SM.
- Sensor, power and data signals are transmitted on the same cables providing installation and maintenance cost savings.
- Choice of SC1 or SC2 cable sets.
- Up to 9 SMs on a single 48 VDC power supply.
- 8 supervised dry-contact inputs per SM for auxiliary sensor alarm and tamper.
- 4 relay outputs per SM for controlling auxiliary devices.
- Power output for auxiliary devices 12 VDC, 150 mA per SM.
- Remote adjustment of all sensor zone thresholds from the network head-end via either StarNeT 1000 or UCM software.
- Remote display of the analog output of each zone.
- Secure communications of alarm and control data.
- Lightning protection on all inputs and outputs.
- Centralized alarm display with StarNeT 1000 or 3rd-party security management system via the Sennet Network Manager.

Standalone configuration features

- Recommended for up to 6 zones of protection.
- Each sensor module provides 2 zones of detection up to a maximum length of 400 m (1320 ft.) per SM.
- Choice of SC1 or SC2 cable sets.
- 12 VDC input power.
- Separate relay outputs for alarm A, alarm B, tamper, fail.
- Setup using the local interface assembly or UCM.
- Analog outputs for the detection signal in each zone.
- Lightning protection on all inputs and outputs.

Perimitrax communicates via the Sennet Network

Perimitrax processors can communicate alarm, status, and configuration information to and from a central control point using the integrated Sennet Network. Senstar's Sennet Network uses a logical multi-drop communication protocol using dual physical data paths for redundancy. Sennet network interconnects can be RS-485, multi-mode fiber optic,or run over Perimitrax sensor cables. Perimitrax sensor modules support RS-485 and sensor cable communication options allowing first entry to networked SMs to be via RS-485 with the network then being carried via the sensor cables. Up to 62 field units can be connected with a Sennet network. Compatible field units include Perimitrax sensor modules, the Sennet Transponder Unit (TU) and Large Transponder Unit (LTU), and Intelli-FLEX and IntelliFIBER processors equipped with the Sennet communications option.

Communications over the Sennet Network is managed either by Senstar's StarNeT 1000 security management system or by Senstar's Sennet Network Manager (SnNM) software. The SnNM controls network communications and passes Perimitrax alarm and status information to 3rd-party Security Management System (SMS) software. The interface between the PC hardware and Sennet Network-compatible field units, such as Perimitrax, is provided by the Sennet Network Controller (NC). The NC provides a standard RS-232 or RS-422 interface for connecting to a PC,

The SnNM software provides an interface to third party SMS software via the Network Manager Interface (NMI). Via the NMI, a third party SMS can communicate to the SnNM in two ways - either by an exchange of messages at the TCP/IP level or by making calls to the NMI Dynamic Link Library (DLL). To enable third party integration to the SnNM software, Senstar provides a detailed Applications Programming Interface (API) document and sample code.

Technical Specifications

SENSOR CABLE

REQUIRED CABLE: One roll of SC1 or two rolls of SC2 cable for each zone

LENGTH: 50, 100, 150 or 200 m (164, 328, 492, 656 ft.) detection length, each cable with 20 m (66 ft.) or 50 m (164 ft.) integral non-sensitive lead-in cable

ZONE LENGTH: Min.10 m (33 ft.)
Max. 200 m (656 ft.)

SIZE: SC1: 8.5 x 15 mm (0.335 x 0.590 in.)
SC2: 8.0 mm (0.315 in.) diameter

OPERATIONAL TEMPERATURE: -40°C to +85°C (-40°F to 185°F)

REEL DIAMETER:
SC1: 508 mm (20 in.) dia. x 330 mm (13 in.) wide
SC2: 406 mm (16 in.) dia. x 330 mm (13 in.) wide

WEIGHTS:
SC1: 38.6 kg (85 lbs.) max.
SC2: 25 kg (53.5 lbs.) max.

SENSOR MODULE (SM)

NUMBER OF SENSOR ZONES PER SM: 2

TAMPER ALARM: By enclosure tamper switch

SELF TEST FUNCTION: Internal, activated at the SM local interface assembly or via the Sennet nework

MONITOR OUTPUTS: 2 analog outputs for voltmeter or chart recorder

DETECTION THRESHOLD: Adjustable for each zone

VELOCITY RESPONSE: 2.5 cm/s (1 in. / sec.) to 15 m/s (49 ft. / sec.) adjustable

PROBABILITY OF DETECTION: >99% for walking intruder with weight >34 kg (75 lbs.)

FREQUENCY: 40.675 MHz zone A, 40.685 MHz zone B

PROCESSOR ENVIRONMENTAL PERFORMANCE:
- Operating temperature: -40°C to +70°C (-40°F to +158°F)
- Operator humidity: 0% to 95% RH non-condensing

POWER CONSUMPTION: 12 VDC @ 500 mA or 48 VDC @ 175 mA (with auxilliary load)

PROCESSOR SIZE AND WEIGHT:
- Size: 360 L x 230 W x 100 mm H (14 L x 9 W x 4 in. H)
- Weight: 4.5 kg (10 lbs.)
- Housing material: cast aluminum

SM STANDARD INPUTS & OUTPUTS:
- Outputs: 4 relay outputs, 24 VDC max 350 mA DC max.
  - relay outputs are used for Alarm, Tamper and Fail outputs in standalone system, are used as general purpose control outputs in networked systems
- Inputs: 8 auxiliary dry contact inputs (supervised)
  - inputs are not used in standalone system, are used for general purpose inputs in networked system
- Power output (for ext. sensors):
  - 12 VDC @ 150 mA max.
- Controls: 8 position DIP switch for network address selection and unit configuration
- Data Port: RS-485

ALTERNATE FREQUENCY SM:
Information is the same as above, except:
- Frequency: 40.665 MHz zone A and 40.695 MHz zone B

OPTIONS

PROTECTIVE TELECOM ENCLOSURE:
- Size - 254 x 254 x 910 mm (10 x 10 x 36 in.)
- Color - light green enamel over steel
- Protection - IP33

OUTDOOR ENCLOSURE:
- Size - 510 x 510 x 150 mm (20 x 20 x 6 in.)
- Color - gray enamel over steel
- Protection - IP66 / NEMA 4
- Weight - 12.3 kg (27 lbs.)

STANDALONE POWER SUPPLY:
- Power input - 115 / 230 VAC, 60 / 50 Hz, 75 W
- Power output - 12 VDC, 4 A max.
- Max. number of SMs - 1

NETWORK POWER SUPPLY):
- Power input - 115 / 230 VAC, 60 / 50 Hz, 200 W
- Power output - 48 VDC, 3 A max.
- Max. number of SMs - 9 SMs or 2,800 m (9,186 ft.) of sensor cable

LOCAL INTERFACE ASSEMBLY:
- Optional for calibration of standalone SM

UCM INTERFACE CABLES
- USB to RS-422/485
- RS-232 to RS-422/485

SENNET NETWORK CONTROLLER (NC)

QUANTITY: One per network

HOST: Windows® PC running StarNeT™ 1000 or Sennet Network Manager software

HOST INTERFACE: RS-232 or RS-422 serial data link up to 19200 baud

CONTROLS:
- DIP switch for setting host baud rate
- Reset switch
- Diagnostic test switch

LED INDICATORS:
- Network transmit and receive
- Host transmit and receive
- Self-test status

OPERATING TEMPERATURE: 0°C to 55°C (32°F to 131°F)

OPERATING HUMIDITY: 5 to 95% RHNC

STANDARD ENCLOSURE (INDOOR):
- Size - 400 H x 375 W x 120 mm D (15 H x 14 W x 4 in. D) indoor enclosure
- Weight - 9 kg (20 lbs.) with AC power option, without battery
- Enclosure option - IP66 / NEMA 4 rated outdoor enclosure

Specifications are subject to change without prior notice.

www.senstar.com
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