Committed to security.

"This document is the **first Catalogue of Perimeter Security Technologies**. We introduce the technologies used by our company for perimeter security, with special reference to the more technical aspects, the connection diagrams and the configurations. These products have been sold over many years. Since 1974, our mission has been **to satisfy the most demanding customers around the world**. Thanks to our experience, we can meet all requests for security, even the most extreme and delicate. Over the years, our research and development staff have acquired knowledge and skills, which have allowed us to become a **world leader in the security market**. Today, our company offers **the broadest outdoor perimeter protection product portfolio in the world**."

Pietro Capula
President of GPS Standard Srl

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INVISIBLE PROTECTION

Invisible perimeter protection systems are installed below ground level and therefore they can not be sabotaged, as they cannot be seen, nor be tampered with.
They ensure protection without changing the aesthetic appearance of the site.

Main characteristics:
INVISIBLE, underground installation is environment- and building-friendly;
FLEXIBLE, the system follows perimeter and ground shape, it recognizes small animals, avoiding unwanted alarms;
ADAPTABLE, it can be installed under every type of ground, it is weather-resistant;
RELIABLE, thousands of systems installed all over the world;
MAINTENANCE, very low.

GPS Standard PATENTED PRODUCT

GPS Plus PRESSURE DIFFERENCE-BASED system

GPS® Plus, Ground Perimeter System, is the ideal solution for sites at high risk of intrusion.
GPS® Plus is designed with DSP microprocessor technology (Digital Signal Processing).
The signal from the sensor is digitized and analysed in time and frequency domains, providing extremely accurate processing.
In addition to high immunity to weather related interference, typical of the underground tube system, the sensor can also identify signals to be ignored, such as those with a repetitive frequency (rail, road with high traffic density, etc.) and only considers signals generated during the crossing of the sensititve area by intruders.
The system is passive and, therefore, not detectable.

2-tubes compensation valve.

Operation.

GPS® Plus is based on the detection of a difference in pressure between two tubes laid down and buried along the perimeter to be protected, then filled with a liquid that allows operation even at low temperatures (antifreeze) and properly pressurized. Crossing the sensitive strip generates a pressure difference in the tubes; this is detected by a special transducer and the signal thus obtained is analysed by the processor, which will identify the alarm conditions and send them to the control centre. The system can also store signals generated immediately before and after the event that can be reviewed later.
The ability to calibrate the sensitivity of each section independently allows the system to be adapted to the particular characteristics of each individual installation.
GPS® Plus intelligent components are self-protected by a **"watch dog" system**; in case of shutdown, this will automatically restore normal operation.
This system can be combined with other protection systems (perimeter, indoor sensors, CCTV, access control, fire systems) and it can be centralized with flexible solutions for any requirement and application.

Versions.

GPS® Plus is available in 2- and 4-tubes versions. Both versions are available in **Stand-Alone** and **Multiplex**.
The Stand-Alone version, 2- or 4-tube with DSP analyser for outdoor use, ensures maximum protection of 200mt per system.
Multiplex ensures maximum protection of 12.8 Km with a single perimeter control unit (MIND™). The architecture allows interconnection of up to 64 MIND™ units.

The perimeter protection system GPS® Plus
was chosen to protect the "Valle dei Templi" in Agrigento

Components.

The system is divided into 3 main parts: the field, the DSP signal analyser and the central unit.

The field is of the "sensitive" part of the system and it can detect the events generated during a violation of the protected perimeter.
It includes: sensors, valves and tubes with the pressurized fluid, which, if placed in parallel at a distance of 1.2-1.5 mt, form a 3mt-wide sensitive strip for 2-tubes version, and about 6m for the 4-tubes version; this area is up to 200mt long (100mt each zone).
The DSP analyser processes the signals generated by sensors.
The central unit consists of the power supply unit, MIND™ unit and relay boards.
MIND™ unit can handle up to 64 peripheral devices (analysers) connected on a single cable (data and power). The connection between the MIND™ and the peripherals is via a serial high-speed BUS (115,000 bps) and it can reach perimeter lengths of up to 5 km, without signal regeneration. MIND™ can handle a maximum of 16 different types of peripheral (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.
For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.
With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

GP.S sensor is the core of GPS Plus perimeter protection system, patented by GPS Standard.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

Detection of signal energy levels (spectrum analysis).

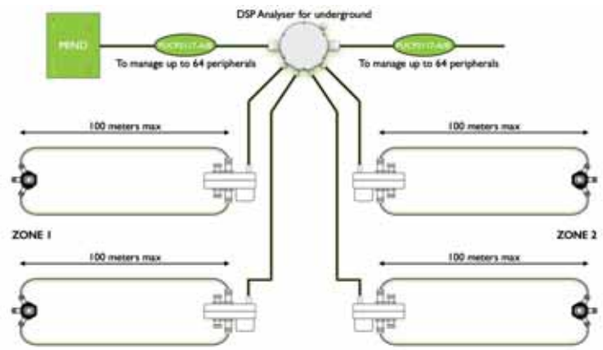
Listing per category of signal energy matrixes.

2 local inputs and 2 relay outputs available (underground version).

8 local inputs and 8 relay outputs available (optional) in the outdoor analyser version.

Local recording, self-calibration.

GPS® PLUS 4-tubes version system configuration.



Features.

GPS® Plus is patented by GPS Standard; the system is based on detection of a difference in pressure between two parallel rubber tubes, buried along the perimeter to be protected.

GPS® Plus is **resistant to weather conditions**, such as rain, snow, hail, etc., because it works using differential signal analysis.

Very low percentage of false alarms due to unwanted vibrations (a train passing by, highway in the vicinity, etc...) thanks to:
-analysis of signals in the time and frequency domain, eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as intrusion attempts, simulated during the calibration.

Invisible: the installation does not compromise the appearance of the site.

Passive: it is not detectable by any instrument (metal detector or other).

Flexible: the system can follow the contours and shape of the site.

Adaptable: it works under virtually any surface, so there is no need for any physical barrier.

Reliable: thousands of systems installed all over the world in over 30 years.

Maintenance: the only maintenance required is periodic inspection of tube pressure; any reduction is automatically reported by the system.

Cost effective: half price compared to RF systems.

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.

It allows **connection**, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.

PPS System with DETECTION of the crossing POINT

PPS™, Perimeter Position System, represents the evolution of the traditional GPS® Plus system. This is also based on **pressure difference detection**. The innovative feature of PPS system is the **ability to determine the crossing point of the protected strip** with a maximum resolution of ± 5 mt, giving detection of a maximum of 20 crossing zones, distributed over 200 mt of protection, obtained with a pair of sensors. The length and number of zones can be configured using the management software.
PPS™ can be easily **interfaced with an integrated video surveillance system with mobile cameras that automatically display the crossing point for video-monitoring of the event**. The system electronics is designed with a DSP microprocessor with exceptional processing and signal analysis power. The signal from the sensor is analysed in the time and frequency domains, distinguishing common events from real alarms.
The signals from sensors are stored in an archive with a time interval before and after the alarm. The type of analysis carried out on signals from sensors ensures **high immunity to environmental and atmospheric events**, making this system suitable for installation in sites subject to particular interference, such as **proximity to railways, roads with heavy traffic or high traffic density**.
The system is passive and, therefore, not detectable.

The pair of GPS sensors are at the heart of the PPS security system.

Versions. PPS™ is available as a **Stand-Alone** version, for maximum protection of 200 mt, and in **Multiplex** version, for maximum protection of 12.8 Km, with a single perimeter control unit (MIND™).
The architecture allows interconnection of up to 64 MIND™ units.

Operation. PPS™ is based on the detection of a **difference in pressure** between two tubes laid down and buried along the perimeter to be protected, then filled with a liquid that allows operation even at low temperatures (antifreeze) and properly pressurized. Crossing the sensitive strip generates a pressure difference between the tubes; this is detected by a special transducer and the signal thus obtained is analysed; any alarm condition is sent to the control centre. At the same time, the DSP analyser processes the signals coming from the two sensors located at the ends of the sensitive area, and defines the exact crossing point. Furthermore, the system can **store signals** generated before and after the event and then **review** them later. The ability to calibrate the sensitivity of each section independently allows the system to be adapted to the particular characteristics of each individual installation.
PPS™ intelligent components are self-protected by a **"watch dog" system**; in case of shutdown, this will automatically restore normal operation. **This system can be combined with other protection systems** (perimeter, indoor sensors, CCTV, access control, fire systems) and it can be centralized **with flexible solutions for any requirement and application**.

Components.

The system is divided into 3 main parts: the field sensors, the DSP signal analyser and the central unit.

The field consists of the "sensitive" part of the system, it can detect the events generated in the course of a violation of the protected perimeter. It includes: sensors, valves and tubes with the pressurized fluid, which, if placed in parallel at a distance of 1.2-1.5 mt, form a 3mt-wide and max 200mt-long sensitive strip, which can be divided in a maximum of 20 zones of 10mt each.

The DSP analyser processes the signals generated by the 2 sensors.

The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripheral devices (analysers) connected on a single cable (data and power).

The connection between the MIND™ and the peripherals is via a serial high-speed BUS (115,000 bps) and it can reach perimeter lengths of up to 5 km, without signal regeneration. MIND™ can handle a maximum of 16 different types of peripheral (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™).

Using the relay boards alarms from sensors are made available via voltage-free relay contacts.

For the Stand Alone product versions with on-board LAN interface, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

PPS™ and all security systems by GPS Standard can be integrated with each other in a simple and intuitive way thanks to the new SCS Supervision and Control software.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

Detection of signal energy levels (spectrum analysis).

Listing per category of signal energy matrixes.

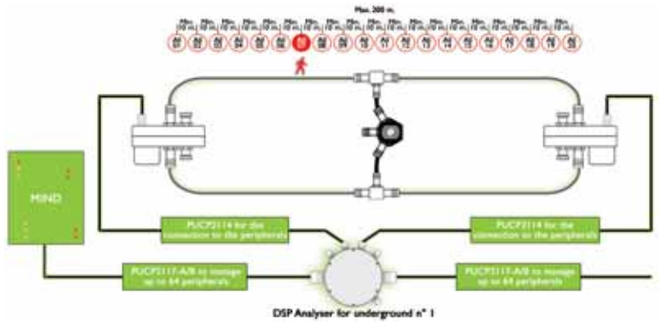
2 local inputs and 2 relay outputs available (underground version).

Identification of the crossing point.

Local recording.

Self-calibration.

System configuration.



Features.

PPS™ is based on detection of a difference in pressure between two parallel rubber tubes, buried along the perimeter to be protected.

PPS™ is **resistant** to weather conditions, such as rain, snow, hail, etc., because it works using differential signal analysis.

Very low percentage of false alarms due to unwanted vibrations (a train passing by, highway in the vicinity, etc ...) thanks to:
-analysis of signals in the time and frequency domain, eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as intrusion attempts, simulated during the calibration.

Detection of the crossing point with an accuracy of ± 5mt using software subdivision of the perimeter into different zones; this feature allows activation of other devices such as, for example, speed dome cameras to view, with precision, the alarmed zone.

Invisible: the installation does not compromise the appearance of the site.

Passive: it is not detectable by any instrument (metal detector or other).

Flexible: the system can follow the contours and shape of the site.

Adaptable: it works under virtually any surface, so there is no need for any physical barrier.

Reliable: thousands of systems installed all over the world in over 30 years.

Maintenance: the only maintenance required is periodic inspection of tube pressure; any reduction is automatically reported by the system.

Cost effective: half price compared to RF systems.

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.

It allows **connection**, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.

PPS™ can detect the exact crossing point within the protected area.

GPS Standard PATENTED PRODUCT

DPS Dual-technology System

DPS®, Dual-Technology Perimeter System, is a dual-technology system created by the **combination of two invisible systems: "GPS® PLUS", detecting pressure difference, and "RFC™" detecting changes in an electromagnetic field.** Using a DSP microprocessor, DPS allows the processing of a large number of signals received in a very short time. **The changes in pressure and electromagnetic field generate signals that, properly processed and analysed, allow the correct determination of system alarm conditions**. The alarm signals obtained this way are then sent to the control centre.
The system is modular and **allows protection of extended perimeters**. It can generate the alarm event when the signal comes separately from the two technologies (OR), or only when the detection comes from both sensors (AND).

RFC™ cable, combined with GPS® Plus security system, creates a dual-technology perimeter protection system.

Operation. **DPS® is based on two different technologies: GPS® Plus and RFC™**, enhancing their main characteristics.
GPS® Plus is based on the detection of the difference in pressure generated by people or objects on the ground, passing over the sensitive area. RFC™ detects changes in the electromagnetic field generated by people or objects crossing the sensitive area; it then makes a comparison between the radiofrequency energy that is transmitted and received.
The signals obtained from two sensors are sent to the analyser, that analyzes and transmits warning or alarm signals to the control unit. Crossing of the sensitive strip generates a significant change of pressure in the tubes, which is detected by an appropriate transducer.
It also generates a change of the electromagnetic field, which is detected by the RCF™ system Mixer.
The signals thus obtained are analysed by the DSP and translated into warning or alarm signals.
The **possibility to calibrate the sensitivity of each leg** allows the system to adapt to the particular characteristics required for each installation.

Versions. DPS® is available as a **Stand-Alone** version, for maximum protection of 200 mt, and in **Multiplex** version, for maximum protection of 12.8 Km, with a single perimeter control unit (MIND™).
The architecture allows interconnection of up to 64 MIND units.

Components.

The system is divided into 3 main parts: the field, the DSP signal analyser and the central unit.

The first consists of the "sensitive" part of the system, it can detect the events generated in the course of a violation of the protected perimeter. It includes: RFC (Mixer) sensor with associated sensitive cables and two GPS sensors, with associated tubes and valves.

Each Mixer is connected, via 4 non-sensitive cables, to 4 sensitive cables (2 transmitters and 2 receivers). Each GPS sensor is connected to the tubes containing liquid under pressure.

The sensitive area created is approx. 3mt-wide, and a maximum of 200mt-long (100mt per zone).

The DSP analyser processes the signals generated by RFC cables, provided by the mixer, and GPS sensors.

The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripheral devices (analysers) connected on a single cable (data and power).

The connection between the MIND™ and the peripherals is via a serial high-speed BUS (115,000 bps) and it can reach perimeter lengths of up to 5 km, without signal regeneration. MIND™ can handle a maximum of 16 different types of peripheral (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.

For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

Analysis of data received by the system in the field using specific algorithms.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

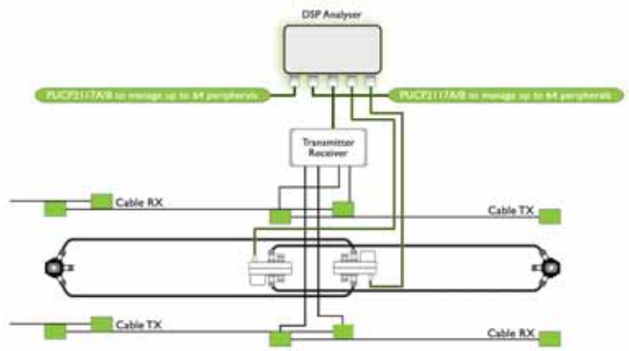
Detection of signal energy levels (spectrum analysis).

Listing per category of signal energy matrixes.

8 local inputs and 8 relay outputs available (optional).

Local recording, self-calibration.

System configuration.



Features.

DPS® uses two perimeter control technologies, thus ensuring high sensitivity and minimizing the percentage of unwanted alarms.

DPS® is based on **detection of the difference in pressure** between two parallel tubes in rubber, buried along the perimeter to be protected.

Interchangeable RFC sensors: sensors work with the same frequency as they use the transmission time scanning, which allows programming the same way the sensors and use them on different legs.

The sensitive cable is of fixed geometry and it guarantees **easy installation** and maintenance; it can be used, replaced, extended anywhere.

Non-sensitive cables used to connect the sensitive cables to the mixer are of standard type and of any length.

It is **resistant to weather conditions**, such as rain, snow, hail, etc., because it works using differential signal analysis.

Very low percentage of false alarms thanks to:
-analysis of signals in the time and frequency domain, eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as intrusion attempts, simulated during the calibration.

Invisible: the installation does not compromise the appearance of the site.

Flexible: the system can follow the contours and shape of the site.

Adaptable: it works under virtually any surface, so there is no need for any physical barrier.

Reliable: thousands of systems installed all over the world in over 30 years.

Maintenance: the only maintenance required is periodic inspection of tube pressure; any reduction is automatically reported by the system.

Cost effective: half price compared to RF systems.

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.
It allows connection, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.

DPP Dual-technology System with detection of the crossing point

DPP®, Dual-Technology Perimeter Position System, is a dual-technology system created by the combination of invisible systems: PPS™, detecting the pressure difference with identification of the crossing point, and RFC™ detecting changes in an electromagnetic field. Through the use of a DSP microprocessor, this system allows processing a large number of signals received in a very short time.
The change of pressure and electromagnetic field generate signals that, properly processed and analysed, allow the correct determination of system alarm conditions. The alarm signals obtained this way are then sent to the control centre. The system is modular and allows the protection of extended perimeters.
It can generate the alarm event when the signal comes separately from the two technologies (OR), or only when the detection comes from both sensors (AND).

All invisible perimeter protection systems do not modify the external appearance of the site.

Operation.

DPP® is based on two technologies, and it uses their main characteristics according to the type of installation: PPS™ and RFC™.
PPS™ detects the pressure differences created by people or objects on the ground, passing over the sensitive area. RFC™ detects the changes in the electromagnetic field generated by people or objects crossing the sensitive area; it then makes a comparison between the radiofrequency energy that is transmitted and received. The signals obtained from the two sensors are sent to the analyser, which analyzes and transmits warning or alarm signals to the control unit.
PPS™ is based on the detection of a difference in pressure between two tubes laid down and buried along the perimeter to be protected, then filled with a liquid that allows operation even at low temperatures (antifreeze) and properly pressurized. Crossing the sensitive strip generates a pressure difference between the tubes; this is detected by a special transducer and the signal thus obtained is analysed; any alarm condition is sent to the control centre. This system identifies the crossing point.
The possibility to calibrate the sensitivity of each leg allows the system to adapt to the particular characteristics required for each installation.

Versions.

DPP® is available as a **Stand-Alone** version, for maximum protection of 200 mt, and in **Multiplex** version, for maximum protection of 12.8 Km, with a single perimeter control unit (MIND™).
The architecture allows interconnection of up to 64 MIND™ units.

Components.

The system is divided into 3 main parts: the field, the DSP signal analyser and the central unit.

The first consists of the "sensitive" part of the system, it can detect the events generated in the course of a violation of the protected perimeter. It includes: RFC (Mixer) sensor with associated sensitive cables and two GPS sensors, with associated tubes and valves.

Each Mixer is connected, via 4 non-sensitive cables, to 4 sensitive cables (2 transmitters and 2 receivers). Each GPS sensor is connected to the tubes containing liquid under pressure. The sensitive area created is approx. 3mt-wide, and a maximum of 200mt-long.

The DSP analyser processes the signals generated by RFC cables, provided by the mixer, and GPS sensors.

The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripherals (analysers) connected on a single cable (data and power). The connection between the MIND™ and the peripherals is via a serial high speed BUS (115.000 bps) MIND™ allows handling peripherals of 16 different types (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.

For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

Alarm signals received by GPS sensors and RFC cables are transmitted to the control centre and analysed.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

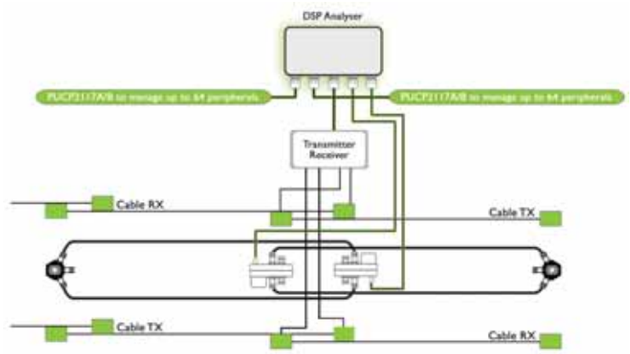
Detection of signal energy levels (spectrum analysis).

Listing per category of signal energy matrixes.

8 local inputs and 8 relay outputs available (optional).

Local recording, self-calibration.

System configuration.



Features.

DPP® uses two perimeter detection technologies, thus ensuring high sensitivity and minimizing the percentage of unwanted alarms.

DPP® is based on **detection of the difference in pressure** between two parallel rubber tubes, buried along the perimeter to be protected.

Interchangeable sensors: all sensors work with the same frequency as they use transmission time multiplexing, which allows all the sensors to be programmed the same way, but they can be used on different zones.

The sensitive cable is of fixed geometry and guarantees **easy installation** and maintenance; it can be used, replaced, extended anywhere.

Non-sensitive cables used to connect the different cables to the control unit are of standard type and of any length.

It is **resistant to weather conditions**, such as rain, snow, hail, etc., because it works using differential signal analysis.

Very low percentage of false alarms thanks to:
-analysis of signals in the time and frequency domain, eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as intrusion attempts, simulated during the calibration.

Invisible: the installation does not compromise the appearance of the site.

Flexible: the system can follow the contours and shape of the site.

Adaptable: it works under virtually any surface, so there is no need for any physical barrier.

Maintenance: the only maintenance required is periodic inspection of tube pressure; any reduction is automatically reported by the system.

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.
It allows connection, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.

MILES FIBRE OPTIC system for PIPELINE and to be BURIED

MILES™ is a protection system for pipelines and to be buried.
It uses a fibre optic cable and it has a very high detection capability, being totally immune to electromagnetic interference and atmospheric conditions.
The fibre optic cable requires no power in the field and, therefore, power supply units along the protected perimeter protected are not required.
The system allows the protection of very long pipelines (up to 25 km) and of areas when buried (lenght of optical calbe up to 4 km).
The area where the sabotage and the crossing of the protect perimeter occur is identified with an accuracy of a few meters.
The fibre optic can be extended for long distances with the only precaution to place power points every 50Km for the analysis units.

The fibre optic is the sensitive part of the MILES™ system, as it is particularly sensitive to mechanical stress produced during attempted sabotage. MILES™ can use an existing fibre optic.

Components.

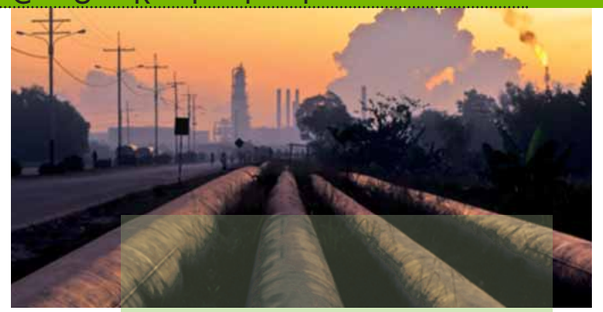
The system is divided into 2 main parts: fibre optic in the field and PC-based signal analyser in a control room.
The fibre optic is the system "sensor" and it is sensitive to mechanical stress produced during attempted sabotage (digging the ground, explosion, hammering, etc.).
The analyser processes the signals generated by the differences between the transmitted and received light beams using sophisticated software algorithms. It consists of the laser light generator, the light reception components and the PC-based signal analyser. Via a LAN interface port, using priority protocol, it generates the alarm signals coming from various parts of the system. With **dedicated control software** it is possible to set system parameters, display the signals and store them in a file for later analysis.

Versions.

MILES™ for pipeline is available in the following versions:
-with sensitive lenght of max 10 km
-with sensitive lenght of max 25 km

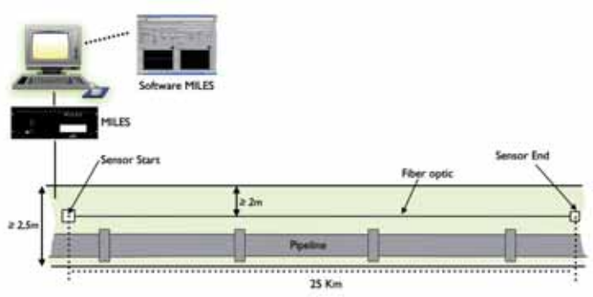
MILES™, buried version, is available in the following versions:
-with sensitive lenght of max 1 km
-with sensitive lenght of max 2 km
-with sensitive lenght of max 4 km

The MILES™ analyser processes the signals generated by the differences between the transmitted and received light beams using sophisticated software algorithms.



Example of protection of pipeline with Miles system

The system allows the protection of buried pipelines by applying the fibre optic cable on the pipeline or using free optical fibres of an existing cable. It detects attempts of digging, drilling or damaging activities on the pipelines.



Operation. **The fibre optic cable is subjected to mechanical stress caused by stimuli, such as pressure, vibration and motion, which changes the transmission characteristics of the light inside the fibre.** The change is minimal, but with a source of coherent light obtained with laser diodes and sophisticated amplifier and processing systems, a signal that can be processed can be obtained.
The careful analysis of the signal and the ability to change, using a calibration and monitoring software, specific parameters that determine the system operation, give this product excellent performance characteristics.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

Detection of signal energy levels (spectrum analysis).

Listing per category of signal energy matrixes.

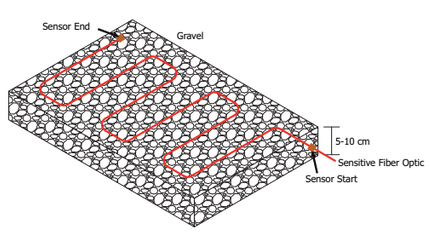
Local recording, self-calibration.

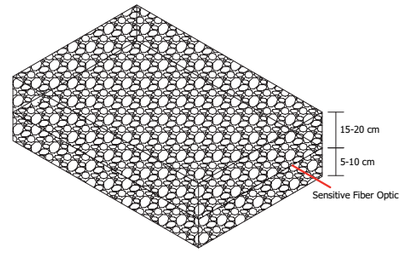
Protection up to 25 km for pipeline, up to 4 km for buried system.

No need for electronic device in the field.

Example of buried protection with Miles system

The system allows the detection of crossing through areas with gravel. The fibre optic cable is buried in a serpentine shape inside of a layer of gravel and it detects any sensitive area crossing.





Features. MILES™ is **resistant** to weather conditions, such as rain, snow, hail, etc., because it works with spectrum analysis of signals.

Very low percentage of false alarms due to disturbances such as wind, vibration caused by heavy loads passing nearby, etc. This is thanks to:

-analysis of signals in the time and frequency domain, thus eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as attempted sabotage, simulated during the calibration.

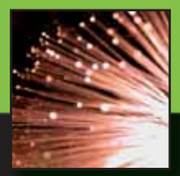
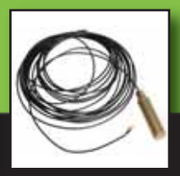
Immune to electromagnetic disturbances.

Calibration is carried out when the system is installed (in real operating conditions), to "simulate" the type of detection desired, thus ensuring very high immunity to any interference.

MILES™ can use fibre optic already installed on the pipeline.





FENCE MOUNTED PROTECTION

The perimeter protection systems associated with fences require a supporting structure; they detect the stress developed in the supporting structure caused by an attempted intrusion.

Two types of protection are associated with fences, microphonic cable and fibre optics. The first consists of a coaxial cable that generates an electrical signal with audio frequencies as a result of the mechanical stress of an attempted intrusion. The signals are then processed to verify the alarm condition.

Fibre optic systems, meanwhile, generate an alarm signal when the attempted intrusion produces a stress on the fibre; the change of the received light intensity is transformed into an alarm.

CPS Plus MICROPHONIC CABLE System

CPS™ Plus, Cable Perimeter System, is a perimeter protection system based on a microphonic cable, that represents an evolution of the traditional CPS™ system. It is based on a microprocessor with DSP technology analyzing the signals in the time and frequency domain highly accurately. In operation, the system can differentiate different types of environmental signals from those of genuine alarms.
The signals generated by the microphonic cable are automatically compared with those previously stored during the system setup. Dependent on the type and duration of the received signal, the system recognizes the signal and, when necessary, activates the alarm.

Very high-sensitivity microphonic cable.

Operation.

CPS™ Plus is based on the detection, by the microphonic cable, of all the mechanical stresses produced by an attempted intrusion such as climbing, lifting or cutting the fence. These stresses produce deformation of the microphonic cable itself, which, due to a piezoelectric effect, converts them into electrical signals.
The DSP analyser can manage separately two or four different zones (channels) with a lenght of 300m each. If the signal exceeds the predetermined threshold, after subsequent comparisons with the pre-set system parameters, it generates an alarm or a warning.
Depending on the shape of the perimeter and on desired degree of sensitivity, the cable layout can follow different configurations.
The system can be connected to any type of alarm control unit and, during system installation, the operating parameters can be adjusted using a personal computer.

Versions.

CPS™ Plus is available in **Stand-Alone USB and Stand-Alone COM115** versions, for a maximum protection of 600 mt (two zones of 300 mt each or four zones of 150 mt each), and in **Multiplex** version, for a maximum protection of 38.4 Km, with a single perimeter control unit (MIND™).
The architecture allows to interconnec up to 64 MIND™ units.

Components.

The system is divided into 3 main parts: microphonic cable in the field, the DSP signal analyser and the central unit. The first is the "sensitive" part of the system and it is especially sensitive to mechanical stress produced during an attempted violation of the protection, such as cutting, climbing, cutting, etc.

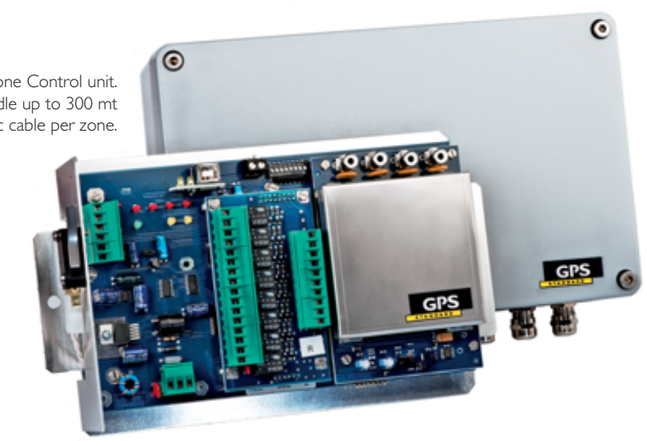
This stress is translated into an electric signal (piezoelectric effect) **and transmitted to the analyser.** Dependent on the shape of the perimeter and desired degree of sensitivity, the cable layout of can follow different configurations, using not more than 300 mt of cable per zone.

The DSP analyser processes the signals generated by the cable.

The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripherals (analysers) connected on a single cable (data and power). The connection between the MIND™ and the peripherals is via a serial high speed BUS (115.000 bps) MIND™ allows handling peripherals of 16 different types (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.

For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.



Dual-zone Control unit.
It can handle up to 300 mt
of microphonic cable per zone.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

Detection of signal energy levels (spectrum analysis).

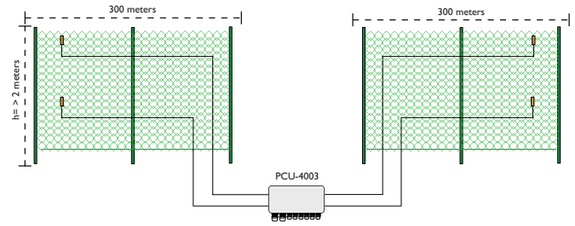
Listing per category of signal energy matrixes.

8 local inputs and 8 relay outputs available (optional).

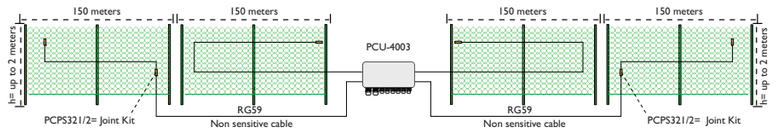
Local recording, self-calibration.

Diagram CPS™ Plus system.

The lengths of the sensitive zones are 300m each.
The starting point of the sensitive zone can be connected to the CPS Plus analyser using a non-sensitive cable (RG59) which can be joined to the sensitive cable using the PCPS321/2 joint kit
For each zone of the CPS Plus system the total lenght of the non-sensitive plus the sensitive cable shall not exceed 300mt. Therefore using the analyser version with four detection zones the arrangement of the zones must comply with this maximum length. The four zones can therefore be connected to the analyser in a star configuration, for example with two zones on the lower part of the fence (one to the right and one to the left) and two zones on the upper part of the fence.



However, if the zones are arranged sequentially the maximum length of the zones will be 150 metres: the starting point of the furthest sensitive zone will be connected to the analyser using a length of non-sensitive cable equal to the length of the zone nearest to the analyser.



Features.

CPS™ Plus is resistant to weather conditions, such as rain, snow, hail, etc., because it works using differential signal analysis.

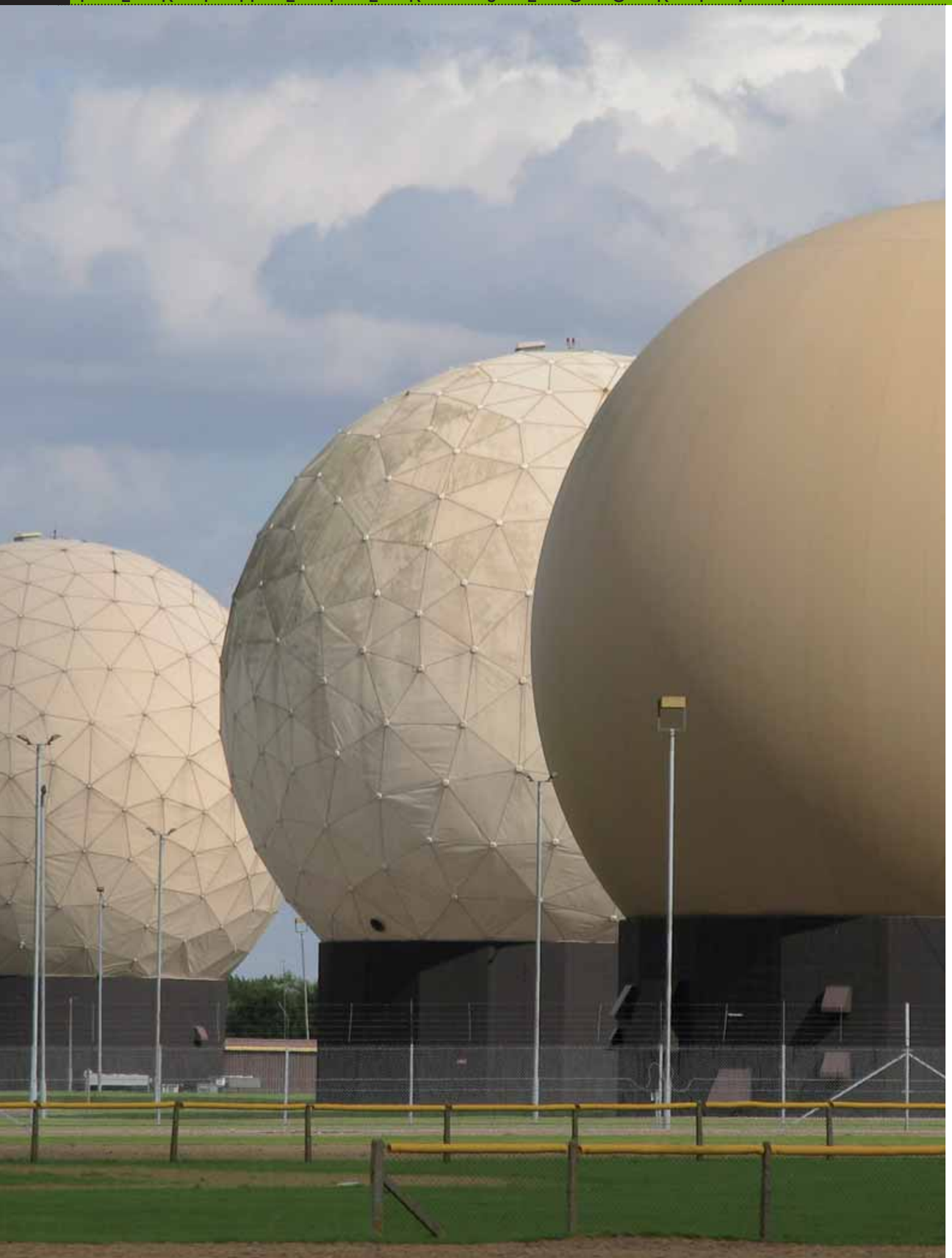
Very low percentage of false alarms due to unwanted vibrations (a train passing by, highway in the vicinity, etc ...) thanks to:
-analysis of signals in the time and frequency domain, eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as intrusion attempts, simulated during the calibration.

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.

The calibration is carried out when the system is installed (in real operating conditions), to "simulate" the type of detection desired, thus ensuring very high immunity to unwanted alarms.

It allows **connection**, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.



SNAKE FIBRE OPTIC System

SNAKE™ is a perimeter protection system using fibre optic, intended both for indoor and outdoor applications.
It uses **opto-phonic technology** to detect, in the case of outdoor applications, all the intrusion attempts such as climbing, cutting or the breaking through a fence; in case of indoor application, it warns against potential attempts to break through or penetrate the wall.
The advantages given by the fibre optic for intrusion detection on a perimeter fence, even the longest, are **the accuracy of detection, the ability to reach long distances without the need for intermediate power supplies, and, in particular, the complete immunity to electromagnetic interference and atmospheric events. It is also particularly suitable for the protection of sites with corrosive or flammable conditions and/or subject to extreme temperatures.**

The light beam inside fibre optic undergoes changes directly related to physical changes induced on the fibre by the attempted intrusion.

Operation.

The sensing element is the fibre optic, through which a laser beam passes. This undergoes changes directly related to physical changes induced on the fibre by the attempted intrusion and the surrounding environment.
The DSP analyser processes the signals generated by the differences between the transmitted and received light beams using sophisticated software algorithms, discriminating any natural event such as wind, rain, hail, etc., from the actual intrusion attempts, bypassing or breakage. Using simulation of events that must be detected, **the detection parameters can be optimized**, thus dramatically reducing any unwanted alarms. SNAKE™ can manage up to four sensitive areas.

Versions.

SNAKE™ is available in a **Stand-Alone** version (single channel, two-channels and four-channels), for a maximum protection lenght of 8,000 mt (four zones with a lenght of 2,000 mt each), and in **Multiplex** version (two-channels and four-channels) for a maximum protection lenght of 512 Km, with a single perimeter control unit (MIND™).
The architecture allows to interconnec up to 64 MIND™ units.

Components.

The system is divided into 3 main parts: fibre optic in the field, the DSP signal analyser and the central unit.
The first is the "sensitive" part of the system and it is especially sensitive to mechanical stress produced during an attempted violation of the protection, such as cutting, climbing, cutting, etc.
The laser analyser processes the signals generated by the differences between the transmitted and received light beams using sophisticated software algorithms.
The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripherals (analysers) connected on a single cable (data and power).
The connection between the MIND™ and the peripherals is via a serial high speed BUS (115.000 bps) MIND™ allows handling peripherals of 16 different types (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.
For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.
With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

SNAKE™, analyser for fibre optic perimeter protection.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

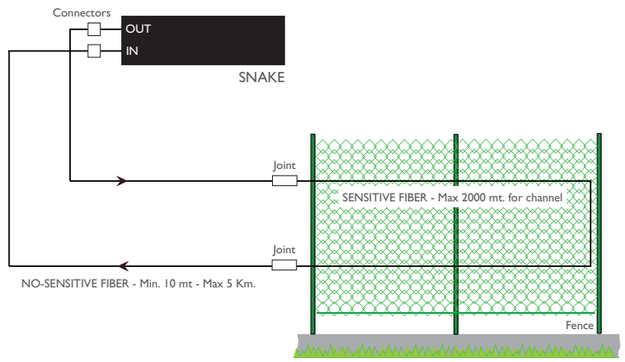
Use of masks to characterize and recognize signals sent by sensors.

Detection of signal energy levels (spectrum analysis).

Listing per category of signal energy matrixes.

Local recording, self-calibration.

System configuration.



Features.

SNAKE™ is **resistant** to weather conditions, such as rain, snow, hail, etc., because it works using differential signal analysis.

Very low percentage of false alarms due to unwanted vibrations (a train passing by, highway in the vicinity, etc ...) thanks to:
-analysis of signals in the time and frequency domain, eliminating background noise.
-system self-learning: the system can be "trained" to recognize certain behaviour, such as intrusion attempts, simulated during the calibration.

Immune to electromagnetic disturbance.

The calibration is carried out when the system is installed (in real operating conditions), to "simulate" the type of detection desired, thus ensuring very high immunity to unwanted alarms.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.

SNAKE™ is resistant to weather conditions such as rain, snow, hail.

SNAKE™ does not need any power supplies in the field.

SNAKE™ is resistant to electromagnetic interference.

MILES FIBRE OPTIC system for FENCES

MILES™ is a protection system for fences.
It uses a fibre optic cable to detects all intrusion attempts, such as: climbing, cutting or breaching of the fence.
It has a very high detection capability, being totally unaffect by electromagnetic interference and atmospheric conditions.
The fibre optic technology guarantees the detection of perimeter trespass along very extended distances (up to 2 km, for each analyser) with the identification of the trespassing point.
The area where the trespass occurs is identified with an accuracy of a few meters.

The fibre optic is the sensitive part of the MILES™ system, as it is particularly sensitive to mechanical stress produced during attempted sabotage. MILES™ can use an existing fibre optic.

Operation. **The fibre optic cable is subjected to mechanical stress caused by stimuli, such as pressure, vibration and motion, which change the transmission characteristics of the light inside the fibre.** The change is minimal, but with a source of coherent light obtained with laser diodes and sophisticated amplifier and processing systems, a signal that can be processed can be obtained.
The careful analysis of the signal and the ability to change, using a calibration and monitoring software, specific parameters that determine the system operation, give this product excellent performance characteristics.

Versions. MILES™ for fences is available in the following versions:
-with sensitive length of max 1 Km
-with sensitive length of max 2 Km

Components. **The system consists of 2 main parts: fibre optic in the field and PC-based signal analyser in a control room.**
The fibre optic is the system "sensor" and it is sensitive to mechanical stress produced during attempted of climbing, cutting or lifting of the fence.
The analyser detects and processes the signals generated by the differences between transmitted and received light beams using sophisticated software algorithms. It consists of the laser light generator, the light reception components and the PC-based signal analyser. The alarm signals, coming from various parts of the system, are managed via a LAN interface port, using priority protocol.
With dedicated control software it is possible to set the system parameters, to display the signals and to store them in a file for subswquent analysis.

The MILES™ analyser processes the signals generated by the differences between the transmitted and received light beams using sophisticated software algorithms.

Characteristics.

Signal processing in the time domain.

Signal processing in the frequency domain.

Combined frequency-time processing.

Use of masks to characterize and recognize signals sent by sensors.

Detection of signal energy levels (spectrum analysis).

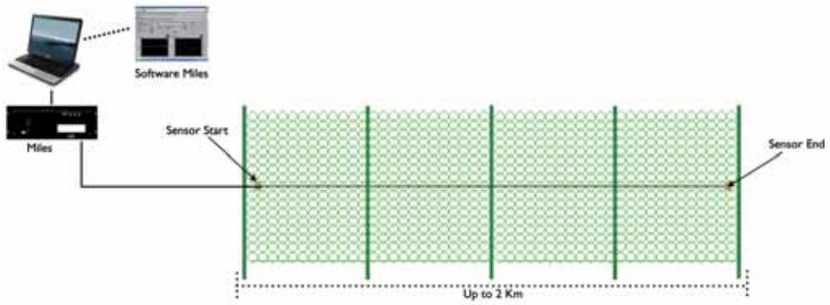
Listing per category of signal energy matrixes.

Local recording, self-calibration.

Protection up to 4 Km.

No need for electronic device in the field.

MILES™ system, fence version.



Plus. MILES™ is **unaffected by electromagnetic disturbances** since it's based on fiber optic technology.

Very low percentage of false alarms due to disturbances caused by environmental factors such as wind, rain, etc.

This is thanks to:
-the analysis of signals in the time and frequency domain, thus eliminating background noise.
-the system self-learning: the system can be "trained" to recognize certain behaviour, such as attempted sabotage, simulated during the calibration.

The calibration is carried out when the system is installed (in the real operating conditions), to "simulate" the type of desired detection, thus ensuring very high immunity to possible interfer ring signals.





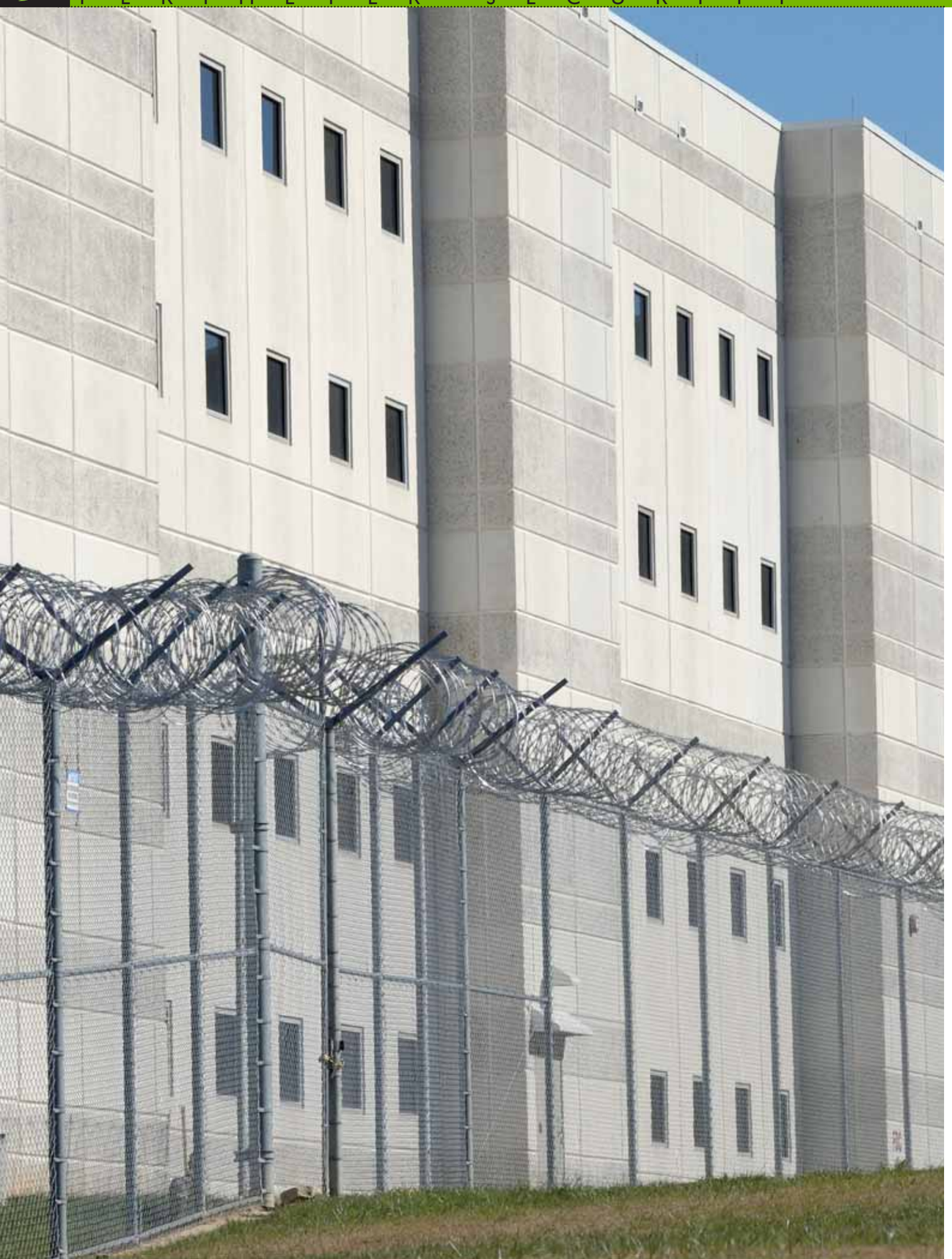

FREE-STANDING PROTECTION

This type of system does not require the installation of any specific structures, it can be integrated into existing structures or may form a self-standing protective structure.

The wire-based systems use a taut, sensitive cable and detect any mechanical stress caused to the structure, generating an alarm signal. They are normally used to prevent climbing over pre-existing walls or fences.

Sensitive pole barriers fit any length and perimeter shape; they can be installed also over or behind pre-existing boundary walls.

Infrared barriers provide effective protection especially for long perimeters. The narrow beam of infrared light emitted by the transmitter is particularly suitable for installation in narrow spaces.



WPS SENSITIVE WIRE System

WPS™, Wire Perimeter System, self-standing system, is a real perimeter barrier consisting of sensitive wires, positioned about 15 cm apart, supported by support poles placed along the entire route about 2.5 to 3.0 mt apart, fastened to 2 terminal poles.
The barrier thus formed is sensitive to cutting or wire separation, resulting from a possible intrusion attempt.
WPS™ is a modular system that allows protection of any size and shape of the perimeter. It can be installed also over or behind pre-existing boundary walls.

WPS sensor, sensing unit and amplification of the signal generated by the sensitive cable; the amplified signal is transmitted to the concentrator for real-time processing.

Operation. **WPS™ is based on the electro-constriction property and is sensitive at every point of its length.**
The active part is a cable with steel central core. Its special characteristics make it sensitive to any act of sabotage.
As a result of mechanical stress, the cable generates an electrical signal due to the motion between the cable core and the dielectric; this signal is pre-amplified locally and transmitted to a control unit that analyzes it intelligently, with a resulting alarm signal.
The microprocessor unit can discriminate any signals due to weather events - such as wind, hail, rain, thermal effects - from alarms generated by a real intrusion.

Versions. WPS™ is available as a **Stand-Alone** version, for maximum protection of 2,400 mt, and in **Multiplex** version, for maximum protection of 153 Km, with a single perimeter control unit (MIND™).
The architecture allows interconnection of up to 64 MIND™ units.

Examples of WPS system installations

Components.

The system is divided into 3 main parts: the sensitive wire with amplifier, the signal concentrator and the perimeter control unit.

The **sensitive wire** is connected to the amplifier unit. Each sensitive cable can have a max length of 300 mt and, by means of pulleys, it can be installed in different configurations, depending on the height of the zones. The amplifier units, which are directly connected to the sensitive cables, receive electrical signals from the cables and, after appropriate amplification, send them to concentrators.
They also generate an alarm if the sensitive wire is cut.
The concentrator is a microprocessor unit that intelligently analyzes signals from a maximum of 8 amplifier units, with subsequent generation of alarm signals. It can also discriminate any signals generated by wind, hail, rain, etc.., or thermal effects from real alarms.
The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripherals (analysers) connected on a single cable (data and power).
The connection between the MIND™ and the peripherals is via a serial high speed BUS (115.000 bps) MIND™ allows handling peripherals of 16 different types (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE,™ WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.
For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.
With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

The WPS cable generates an electric signal in proportion to the mechanical stress and energy applied to the cable.

Characteristics.

Modular system.

Max 300 mt-long wire per area.

Real physical barrier.

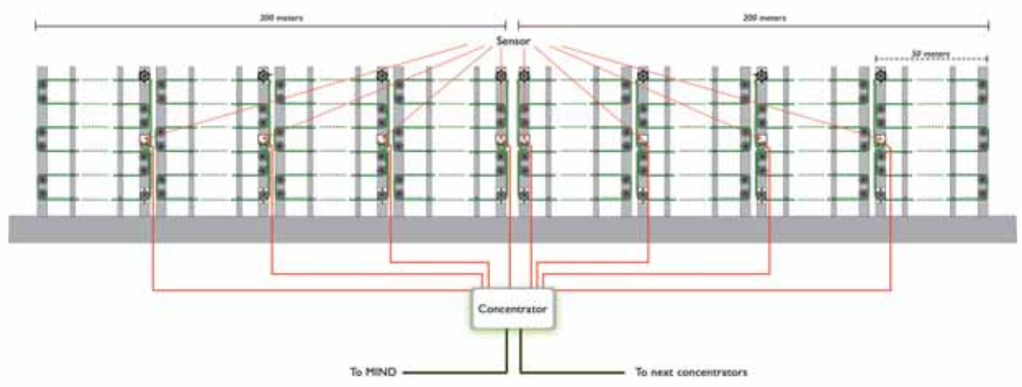
Detection of mechanical stress.

It can be installed also over or behind pre=existing fencing or walls.

Resistant to low temperatures.

Customized sensitivity calibration per zone.

System configuration.



Plus.

WPS™ is the only system using a wire sensitive to stretching and at the same time, forming a physical barrier.

Very low percentage of false alarms due to disturbances such as heavy loads passing nearby, thanks to automatic alarm threshold control. If a similar signal is detected on adjacent zones, the alarm threshold is increased by a value equal to the minimum value of the signal detected on all zones monitored by the single analyser.

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.

It allows connection, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard.

TPS TAUT-WIRE System

TPS™, Taut-wire Perimeter System is a **self-standing pole structure, constituting a real physical barrier, sensitive to any stress generated by attempted intrusion**.
This system is especially suitable for anti-climb protection (over a wall), or whenever a physical barrier is needed (fence).
Two types of pole sensors are available: TPSE100 and TPSM200.
The first uses an electronic sensor, while the second a mechanical one.
The system is modular and allows protection of long perimeters.
TPS™ consists of a variable number of parallel plain or barbed wires, at a min. distance apart of 15 cm for TPSM and 9cm for TPSE, connected to a pole sensor, which is the active part of the system.

TPSM200 TPSE100

The active part of the system is the sensitive pole, having special characteristics that make it sensitive to any type of attempted violation, such as cutting, breaking down and separation of barbed wire, which makes up the physical barrier.

Operation.

The electronic TPS™ pole sensor detects any movement of the taut wire as a result of mechanical stress via the sensitive component, which is a microphonic cable. Dependent on the separation force applied to the taut wires, a signal is generated which, after appropriate amplification stages, is sent to the concentrator. This, in turn, examines and translates the signal into warning or alarm signals. The threshold is tailored to the needs of each individual installation. The mechanical TPS™ pole sensor houses the mechanical sensors (joystick), mechanically connected to the wires.
A movement of the wire during the intrusion attempt, moves the joystick that mechanically acts on a switch, generating the alarm condition.

Versions. Mechanical

TPS™ cannot be configured as a multiplex system and the protection of one pole sensor covers 60 mt.
Electronic TPS™ is available as a **Stand-Alone** version, for maximum protection of 480 mt, and in **Multiplex** version, for maximum protection of 31 Km, with a single perimeter control unit (MIND™). The architecture allows interconnection of up to 64 MIND™ units.

Examples of TPS system installations

TPSM200 components.

Mechanical TPS™, TPSM200, uses a sensor pole. Barbed wire is stretched and connected inside the sensor pole to Joystick sensors. TPS "Joystick" sensor provides the N.O. alarm contact on the terminal block. Therefore, TPSM200 consists only of one sensor, with two positions: ON (alarm) and OFF (rest); it goes from OFF to ON only if a certain force is applied to the connected wire. Obviously, this force generates an alarm, according to the system calibration. The sensitivity is mechanically adjusted with the nut located on the "Joystick" lever.

TPSE100 components. Electronic TPS™, TPSE100 is divided into 3 main parts: the sensor pole, the signal concentrator and the central unit.

The sensor pole contains a microphonic cable inside, which is fastened to the taut wires. The microphonic wire is connected to the amplifier unit.

The concentrator is a microprocessor unit that intelligently analyzes signals from a maximum of 8 amplifier units, with a subsequent generation of alarm signals. It can also discriminate any signal generated by wind, hail, rain, or thermal effects from real alarms.

The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripherals (analysers) connected on a single cable (data and power). The connection between the MIND™ and the peripherals is via a serial high speed BUS (115.000 bps) MIND™ allows handling peripherals of 16 different types (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.

For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

Caratteristiche.

Modular system.

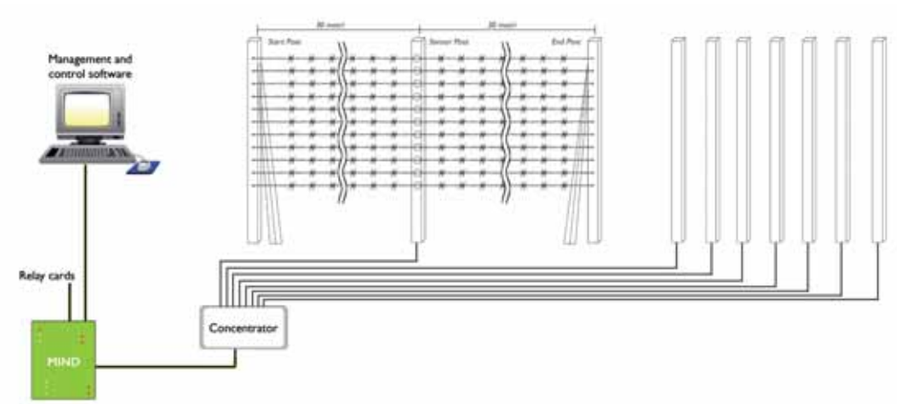
Detection of mechanical stress.

Differential analysis of signals.

Sensibility calibration per leg (60m).

Constituting a real physical barrier.

System configuration.



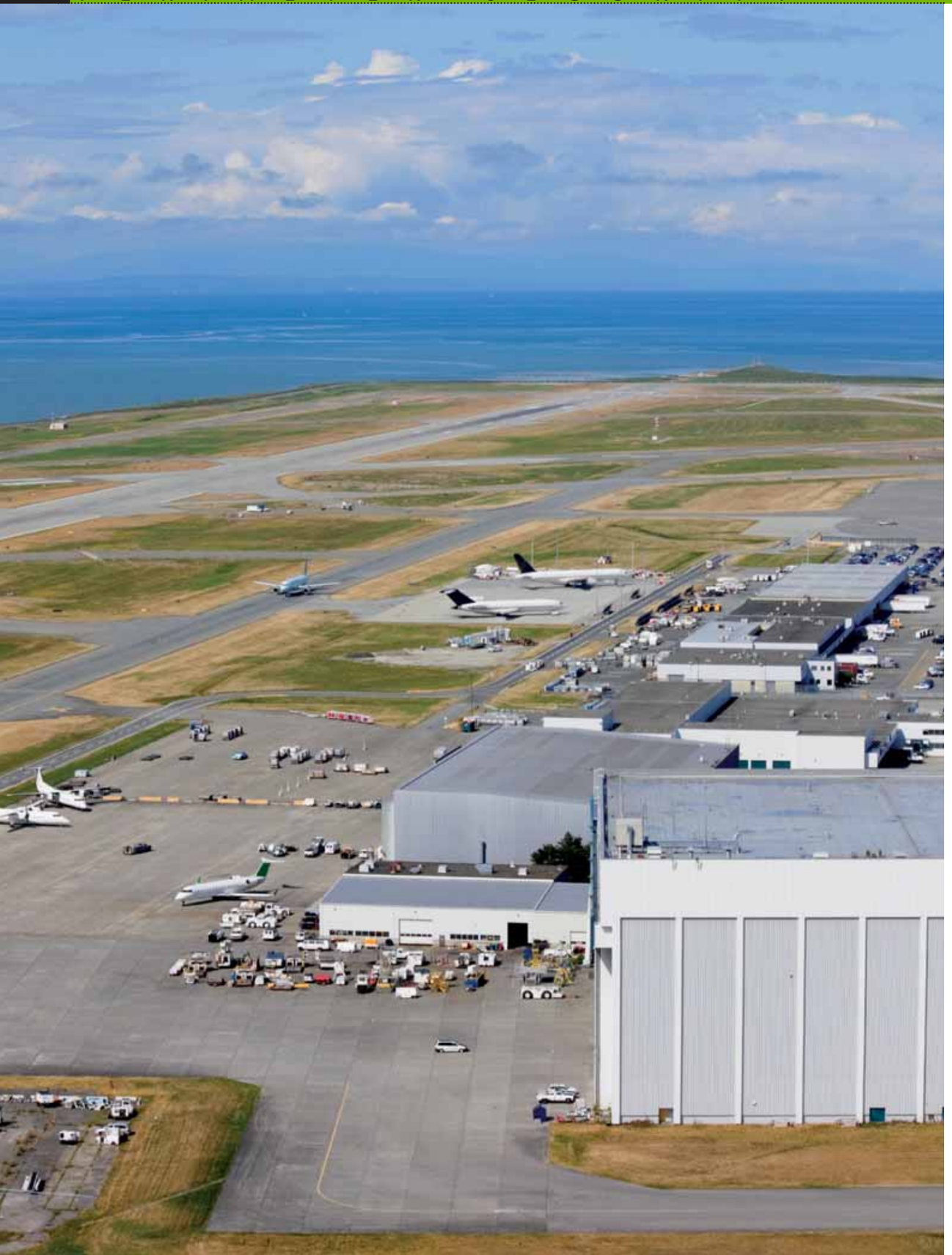
Features. TPS™ uses sensor poles to alarm taut wires, while forming a physical barrier.

Very low percentage of false alarms due to disturbances such as heavy loads passing nearby, thanks to automatic alarm threshold control.
If a similar signal is detected on adjacent zones, the alarm threshold is increased by a value equal to the minimum value of the signal detected on all zones monitored by the single analyser (in electronic version).

Local interface with other systems via serial data port, e.g. to speed dome, sirens, lights, etc.

It allows **connection**, via auxiliary inputs, of other stand-alone sensors installed nearby.

It can be **integrated** with other perimeter protection technologies, by using the same communication BUS, creating mixed systems from the various perimeter solutions provided by GPS Standard



IPS INFRARED System

IPS™, Infrared Perimeter System is a perimeter protection used for both internal and external applications to protect properties and access gates.
It is based on beams with automatic power adjustments on TX modules and automatic control gain on RX modules; this allow to reduce any kind of interferences.
As it is based on microprocessor technology, thanks to intelligent analysis of the received signal, **it can eliminate false alarms due to cells masking attempts**.
IPS™ is resistant to weather conditions such as rain, snow, hail.
In case of reduced visibility, due to fog, heavy rain, snow, the system triggers an automatic control gain in order to restore the optimal level of received light.
When this is not possible, the concentrator disables the beam generating a disqualification alarm; normal operation is automatically restored when normal visibility is achieved.
Each barrier can manage up to 16 beams in three different configurations: single beam, AND of two beams, AND of three beams.

The receiver and transmitter components are assembled on micrometric mechanics, allowing variation of 190° in the horizontal and 15° in the vertical.

Operation. The concentrator, which can be connected up to a maximum of 16 single-beam receivers, sends commands, via the sync cable, to turn on the transmitters connected to the synchronizer.
Simultaneously, it enables the receiver corresponding to a particular transmitter. The concentrator processes the light pulses received from the various connected cells. If the beam between TX and RX is interrupted, for the pre-set crossing time, it generates an alarm.
The maximum capacity of the PIU-8000 series is 250mt internal and 200mt external, and 200mt internal and 100mt external for PIU-7000 series.

Versions. IPS™ is available as a **Stand-Alone** version, for maximum protection of 250 mt internal and 200 mt external, and in **Multiplex** version, for maximum protection of 32 Km (internal) or 25.6 km (external), with a single perimeter control unit (MIND™). The architecture allows interconnection of up to 64 MIND™ units.

Components.

The system is divided into 2 main parts: the field with the columns and the central unit.

The field is the "sensitive" part of the system, it can detect the events generated during a violation of the protected perimeter. It includes: Columns equipped with accessories, Tx and Rx beams, single or double, the concentrator and the synchronizer. The max leg length is 250mt internal and 200mt external.

The central unit consists of the power supply unit, MIND™ unit and relay boards. MIND™ unit can handle up to 64 peripherals (analysers) connected on a single cable (data and power).

The connection between the MIND™ and the peripherals is via a serial high speed BUS (115.000 bps) MIND™ allows handling peripherals of 16 different types (GPS®PLUS, PPS™, RFC™, DPS®, DPP®, SNAKE™, WPS™, TPSE™ and IPS™). Using the relay boards alarms from sensors are made available via voltage-free relay contacts.

For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

With the **control software** (MPX2000™) it is possible to set system parameters, display the signals and store them in a file, for later analysis.

Tubular external cover of IPS column is polycarbonate, a very light and resistant material.

Characteristics.

Time multiplexing: beam switching in “one by one” mode.

Micrometric orientation (horizontal / vertical).

Automatic Control Gain.

Automatic Power Adjustment.

Crossing times programmable for each individual beams.

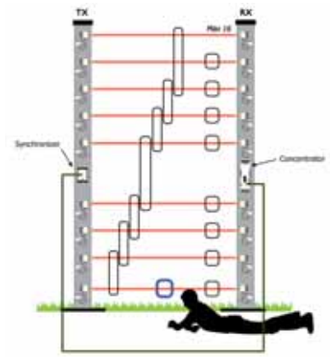
Connection to serial bus COM115 “Concentrator/ MIND”.

Cable Synchronization.

Different beams configurations: single, AND.

Range
IPS 8000: 200 m external and 250 m internal
IPS 7000: 100 m external and 200 m internal

System configuration.



Features.

Total absence of interference between beams in the same or adjacent columns, as multiplexed analysis of the beams is carried out.

No interference between beams as they are activated one by one for each column.

Detection of beam masking: the concentrator turns on the Rx and, before turning on the TX, checks that there is no interfering light signal due to deliberate interference. If a light signal is detected, it generates a warning signal.

Differentiated programming of alarm threshold: field crossing time can be programmed for each single beam. Longer times for lower beams and shorter for higher beams can be set.

Automatic control gain on the Rx cells to maintain the effectiveness of the system even in the harshest weather conditions; IPS™ increases the signal amplification in case of bad visibility, by up to four times.

IPS™ disables the affected beams sending a disqualification alarm. When visibility is restored, the beam function is automatically restored.

Possibility to configure the beams of the individual barriers for operation in mode:

-MONO: single cell,-DOUBLE: two cells in AND,-TRIPLE: three cells in AND (as shown in the figure).

Local interface with other systems (Speed dome, sirens, lights, etc.) via dry relays contacts. Auxiliary inputs for other stand-alone sensors installed nearby.

In BUS configuration it can be **integrated** with other perimeter protection technologies, creating integrated systems with the various perimeter solutions provided by GPS Standard.

SUN FIBRE OPTIC System for SOLAR and PHOTOVOLTAIC PANELS

SUN™ protects solar and photovoltaic panels from attempted removal, joining the panels together with a fibre optic cable.
The system allows the protection of very large photovoltaic fields with detection of the area subject to attack.

Operation. SUN™ generates an infrared light that is sent along the fibre optic. At the same time, it analyzes the light that reaches the end of the protected area. The emitted light is appropriately modulated to avoid masking the receiver, placed at the end of the security fibre optic, with another source of light. In real time, SUN™ analyses of the light received and if this is insufficient, because of an attack, it generates an alarm. The alarm signal is generated via a relay contact (C, NO, NC). Each SUN™ unit can handle 1200 mt of optical fibre, on which a maximum of 6 joints can be placed for easy installation of fibre optic panels.

Versions. The system is divided into 2 main parts: fibre optic and the sensor. The fibre optic "ties" the panels together, while the sensor generates the modulated light and analyzes the light received via the fibre optics.

Features. **The multi-mode fibre optic** can be equipped with connectors and can be connected using cold connectors, without the use of any special joining device.

Absence of false alarms due to disturbances, such as wind, rain, vibration.

SUN™ analyzer

SUN™ is **simple, inexpensive** and allows protection of hundreds of panels with a single cable.

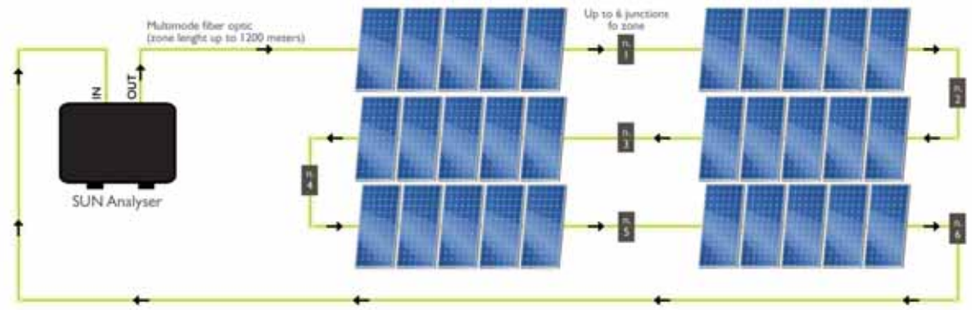
The fibre optic has a **small diameter** and is easily installed on solar panels.

The fibre optic does not deteriorate, does not rust and **lasts for many years**.

SUN is a mechanical system, that **can not be seen or removed**.

Resistant to weather conditions and electromagnetic disturbances.

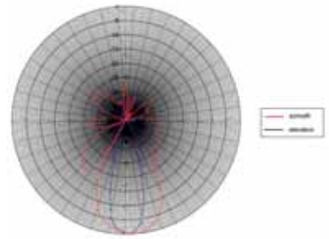
System configuation.



RADAR BLADE

ELECTROMAGNETIC WAVES system

RADAR BLADE™ is a perimeter protection system realized with microwave volumetric sensors based on CHIRP RADAR effect.
It is a high performance system that creates an invisible barrier using the electromagnetic waves beamed along the protected perimeter.
RADAR BLADE™ is the development of the RADAR system, introducing improved characteristics relevant the analysis and the width of the detector beam.
Respect to the standard intrusion detection systems based on the doppler effect, having the intrinsic limit to detect only the speed of the intruder, RADAR BLADE™, is able to detect, with the Cross Technology, any kind of crossing of its sensitivity area and it can also indicate exactly the crossing point with an accuracy of 1m in any weather or light condition.



Polardiagramm RADAR BLADE.

Operation. The RADAR BLADE™ electronics is realized with a DSP microprocessor, with **exceptional processing power and signals analysis**.
These characteristics allow the RADAR BLADE™ to distinguish a real intruder from the environmental noise, offering an extraordinary detection capability, accompanied by great capacity to reject the false alarms.
The system can detect, with a probability greater than 99%, human intruders (with a weight >20Kg) crossing the protected area, with any movement and a speed beetween 0.02m/s and 18m/s.

Versions. There are two versions available, depending on the length of the barrier to be created: **80 and 120 meters.**
Both versions are available in **Stand-Alone** and **Multiplex** configuration.

Components. The antenna of the RADAR BLADE™ system works in the **24GHz band**. It is a planar type and it is able to emit a directional lobe that can be customised.
The shape and dimensions of the detection field make it **particularly suitable for the protection** of both areas completely free from obstacles and areas that has irregular shape, even with fixed obstacles.
The system detect every pass through the beam.
The barrier is generated by the radar waves emitted by the sensor; the waves are reflected by a body crossing the protected area and are received by the antenna itself. RADAR BLADE™, after processing the signal, by using Cross Technology, can also determine the exact crossing point.
RADAR BLADE™ does not generate false alarms thanks to its scenario learning capability.
For the **Stand Alone product versions with on-board LAN interface**, the alarm signals, coming from the various zones of the system, are managed through the Ethernet port, through the proprietary protocol or the ModBus protocol.

The barrier is generated by the radar waves emitted by the sensor.

Characteristics.

Microwave barrier with adjustable lobe

Advanced and innovative software algorithm to distinguish between intruders and ambient background noise.

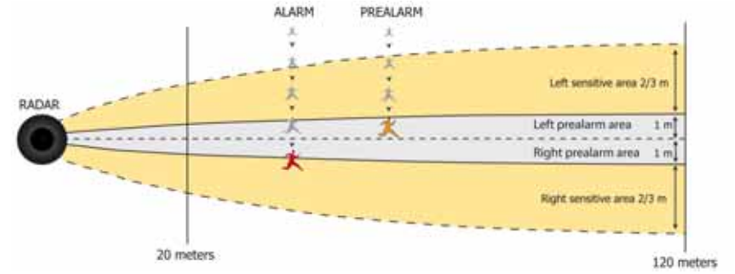
Alarm generation by the actual beam midline crossing.

Provides clear indications of the crossing point with an accuracy of 1m (Cross Technology).

Provide alarm indications based on intruder direction.

RADAR BLADE.

The barrier is really narrow with a width of the beam around 4 metres on the horizontal plane with a pre-alarm range of 1 meter on the right side and 1 meter on the left side of the beam centre line.
Alarm signal is generated by the actual crossing of the beam centre line. On the vertical plane the beam reaches around 10m in height.



Plus. It offers a modern and elegant design and it can be perfectly integrated into the surrounding environment, as a light fixture.

The shape and dimensions of the detection field make RADAR BLADE™ **particularly suitable to protect both areas completely free from obstacles and irregular shaped areas, even in the presence of fixed obstables**.

It is particularly suitable for public and private contexts that require compliance with certain aesthetic rules but that meet, at the same time, the needs for protective measures of people and properties, through not identifiable security system.

Ability to create a RADAR BLADE™ sensors network to meet all installation requirements.

Detection of the crossing point (Cross Technology) with an accuracy of one meter.
This feature allows to enable other local devices such as, for example, speed dome cameras to capture the specific alarm image with extreme precision.

Different scenarios for sensibility and direction for any zone which can be activated by a simple triggering of the auxiliary inputs embedded in the sensor.

Integration with the video surveillance system that can enable PTZ cameras to be moved directly to display the intruder.






CONFIGURATION SYSTEMS

Centralization and control systems are used to integrate, control and centralize the various types of intrusion systems.

They use high-speed communication lines.

The operating parameters of these systems are programmable directly from the control centre via a personal computer, using a special software. For each alarm handled, it is possible to select and enter a specific procedure to be followed.

MULTIPLEX2000

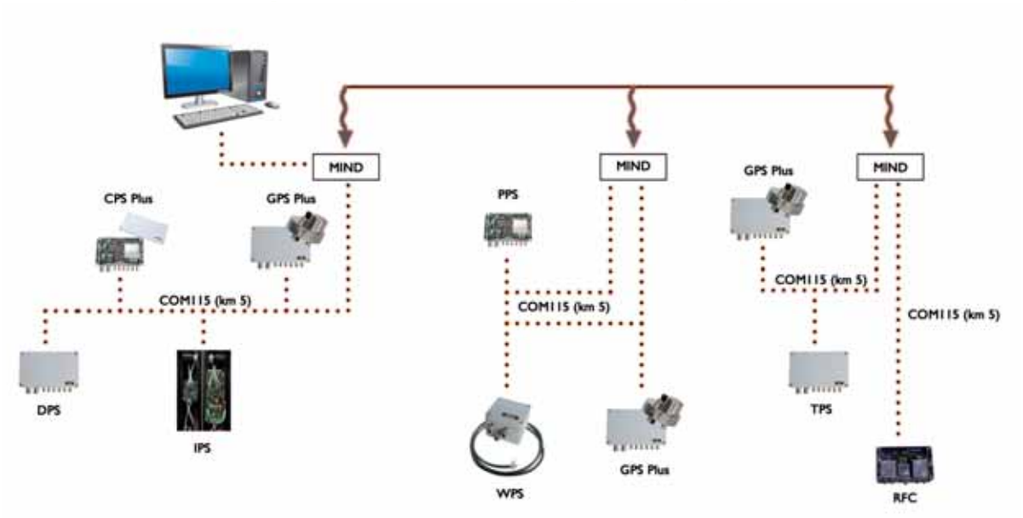
MULTIPLEX2000™ has two management levels, hardware and software. The hardware architecture refers to a control unit called MIND™, which allows different types of security system to communicate, using a high-speed communication line called COM115. The second management level, however, is a software type and is called MULTIPLEX2000™.

MIND, single perimeter control unit.

MIND™ unit uses two high-speed serial lines (115 kbaud) and the communication protocol GPS COM115 to communicate with remote peripherals. The two lines may be independent or loop-connected to ensure continuity of communication with the peripheral devices in case of attack or damage to the communication line. Each MIND™ unit can connect up to 64 remote devices of 16 different types, distributed in any combination along the two lines. For larger systems (thousands of km) up to 64 units MIND™ can be interconnected.
The MIND™ unit is connected to a personal computer - via an USB connection - to allow real-time monitoring of signals from sensors, configuration and programming of the relays, recording alarm events and associated analogue signals from the field sensors.

Multiplex2000 software allows the configuration and handling of all the perimeter security systems in the field.

Multiplex2000™ architecture – Max configuration for 64 analysis units.



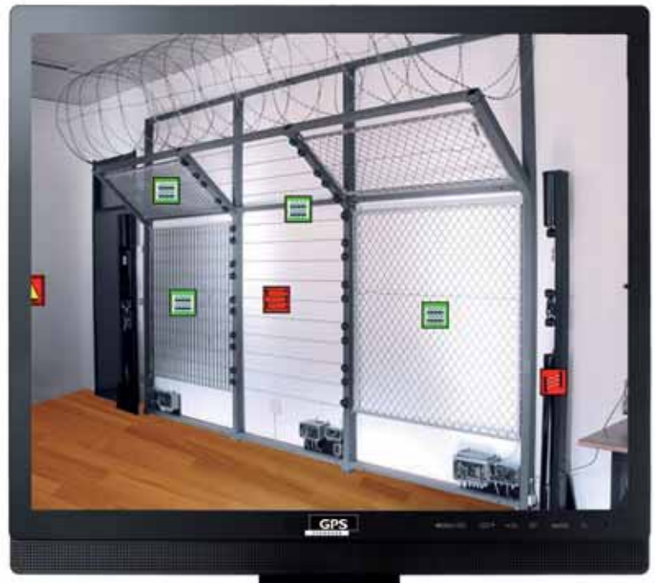
"COM115" serial line. COM115 is a high-speed communication line between control unit and peripherals. If two serial lines are used, the maximum distance covered by the system can be 40 km with repeaters (20 km +20 km).

Remote Control Centre. The operating parameters of the systems are directly programmable from the control centre using a personal computer, and, using MPX2000™ specific software the signals detected by the sensor are displayed and stored in a file. These can then be analysed, to determine the optimum calibration conditions of each system unit.

Graphic maps. Via graphical maps, the MPX2000™ Software, "Maps" version, allows the management of perimeter systems based on the Multiplex2000™ system, by concentrating all signals from sensors. For each alarm handled by the software, it is possible to select and to enter the specific procedure to be followed when an alarm is highlighted.

MIND™ Control unit.

MPX2000™ Software MAPS version.



Show Room GPS Standard. Different security systems configured using MPX2000™ Software.

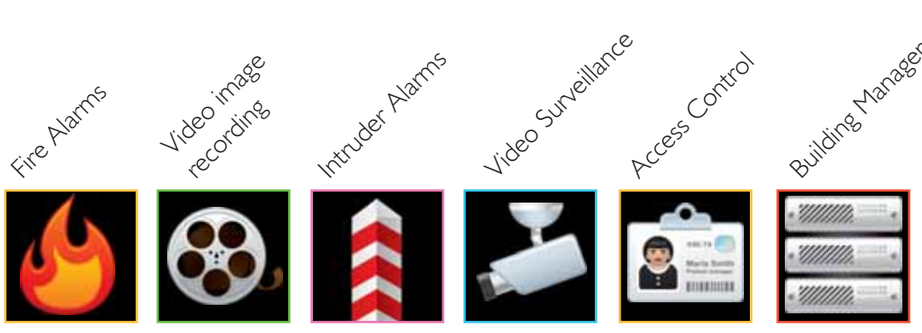
SCS Supervision and Control Software

The SCS system, Supervision and Control Software, permits the supervision and the control of complex systems using an extremely simple interface, aligned with the most up to date data presentation technologies.

SCS integrates the management of various different types of device: **intruder control units, fire alarm control units, access control systems, video recording systems, building monitoring systems.**
The management and control of the system is realized by navigating **graphical maps**. Icons are positioned on the map, which **provide in real time, using appropriate shapes and colours, the status of the element or group of represented elements**.

The operator also has the capability to send commands to the system, for example isolation of a sensor, arming of a particular area, display of a specific camera as well as groups of commands to the devices that make up the system.
As well as recording the events or alarms provided by the field devices the system also records all the operator actions taken on the supervision computer.
This allows a subsequent analysis of everything has happened on the system, for example a list of entries via the access control system, alarm events, operator actions in response to an event, alarm images from cameras and many others.

SOFTWARE architecture
The SCS system is deigned on the Microsoft ".NET" platform and implements a Client –Server architecture. **The system manages a virtually unlimited number of HW devices**, which can be field devices (control units, sensors, cameras, badge readers, etc…) or control devices (Control terminals either traditional or wireless, image display devices, image recording devices, etc…).
To store all the data relating to the system such as maps, icons, sounds, device configurations, operators, event priorities, recordings, the system uses an SQL database.



DATA LOGGER

This is the software module used for the acquisition of data from the peripherals. The datalogger has a multiplicity of drivers, one for each type of connected device.
The system can require as many dataloggers, as many are necessary for connection to the equipment in order to make a scalable system.
As for the video sub-systems (cameras and videostore), that basing on resolution or frame rate requirements, can require considerable processing power, it may be necessary to sub-divide their management over multiple dataloggers.

VIDEOSTORE

This is a software module associated with the datalogger, used when the datalogger manages video devices. It manages the Hard Disc storage as well as the high quantity of images coming from the cameras.
Any computer present in the system installation can provide the Videostore function.

PROXY

This is also a software module associated with the Data Logger, when used to control video devices. It is used to receive video streams originating from a camera or a codec and to send them to all petitioners. The object is to reduce the requests for video streams from hardware devices. This avoids multiple requests for the same video stream from the same device.

CLIENT

This is a software module that provides the user interface.
Each Client position can be connected simultaneously to different systems. In a system there are as many Clients as there are workstations for controlling the system. The Client integrates the management of the system on maps and simultaneously the display of live and recorded images.
Using a dual monitor board it is possible to simultaneously display the images from the cameras (in 1/4/6/8/9/16/25/36 image formats) on one monitor and the graphic maps or any other menu required by the user (physical structure, historical events, etc. ..) on the otherone.

DATABASE

Contains all the data that define the system, the devices configuration tables, the users tables with related access rights, the historical events, the rules relating to the automatic activation of commands following an event (macro); it is installed on a PC which functions as a server for the SCS system. There is one for every system, that is one for every Control Centre.

COMMAND SERVER

This is the software module that manages the access to the database for the users, checking the access rights on system login, managing the restrictions on specific commands or devices, up to enabling the transfer of information from the system devices (database, live and recorded video streams, etc..) to the users. Any demand for access is controlled by the "Command Server". Generally resides on the server containing the database but it can be installed on any computer that forms part of the SCS system network. There is one for every Control Centre.

PLAYER

In the control center it is often necessary to display a high number of images coming from the cameras; in this case, when the display performance of the client is not sufficient, the use of one or more "Players" is planned.
The Player is a SW module installed on a computer with an associated monitor on which the images from the cameras are displayed.

HARDWARE architecture

The SCS allows the centralisation of very complex systems and it is completely scalable.

Various types of devices can be supported:
- **Perimeter sensors** with different technologies such as IPS infrared barriers, GPS buried sensors, CPS microphonic sensors, Snake fibre optic sensors and all of the devices used with the Multiplex2000 architecture.
- **Alarm control units** of all types that can be connected to sensors of all technologies and types: volumetric, magnetic contacts or contacts provided by generic systems (switchboards, door controls, etc)
- **Fire alarm control units**
- GPS Standard and Samsung **access control devices**, which can control and manage the complete status of an entrance.
- **Samsung Codec, IP cameras and DVR.**
- **GPS Standard Codec** with intelligent image analysis.
- Any brand of **camera** interfaced using the GPS Standard and Samsung codec/DVR.

Dependant on the complexity of the system and on the level of security required, it is possible to assign to a single PC all the functions necessary to the operation of a complete system or to distribute the tasks over different PC. In the example of the figure below it is possible to identify different PCs that, depending on the installed programs, carry out different functions (Server, Client, Player, Data Logger). The PC are interconnected using a LAN/WAN.

Using a simple and intuitive programming logic, it is possible to correlate events and actions between devices with different types, for example:

- **Automatic display of a group of cameras,** following a system alarm event such as detection by a perimeter sensor;
- **Arm or disarm an area** following a clocking in at an access control terminal;
- **Automatic launch of a video clip on a Player monitor** giving evacuation instructions following a fire alarm.

The diagram below shows a graphical representation of the various devices that can be managed.