Principle of Operation

Using a combination of Rayleigh backscatter and time of flight, Praetorian determines the presence, location, intensity and frequency of vibrations along an optical fibre in real time.

Rayleigh backscatter responds to physical vibrations imparted on the fibre by disturbances to the application. HAWK'S signal analysis software allows Praetorian to quickly determine the most likely origin of the vibration and report any nefarious signals to security personnel without notifying an intruder of their detection.

Location of vibration is determined using a "Time of Flight" calculation. When a laser pulse is emitted from the system a very fast clock is started. As backscattered light returns to the detector they are recorded for further analysis and time stamped. Due to the speed of light being constant within a fibre (approximately two thirds of normal light speed) this time stamp corresponds to a distance on the fibre.

Function

Praetorian acts as an infinite series of microphones within the fibre recording in real time. The system analyses an enormous amount of data using ultra fast FPGA architecture to give real time feedback on the likely origin and type of the disturbance. Utilizing proprietary pattern recognition software Praetorian reduces the incidences of false positives normally associated with other Fibre Optic Sensors.

Praetorian uses a series of pattern recognising modes to detect, identify and report nefarious movements at, on or around the perimeter being monitored.

Multiple outputs are available from simple Alarm/No-Alarm States to full digital integration such as Modbus over Ethernet and can be fed directly into existing DCS and SCADA control systems for high speed integration. Alternatively, Praetorian can be operated directly with a keyboard and mouse through the units inbuilt Human Machine Interface (HMI).

Praetorian's fast processing speed and pulse rate allow it to detect minute interferences that may otherwise go unnoticed. Some examples of detectable activities include:

- Intruder movement along a perimeter
- Intruder movements either side of a perimeter via covert sub terrain detection (Intruders cutting a fence)
- Intruders climbing a fence
- Vehicle movement along a perimeter
- Digging, excavation, trenching and undermining

Praetorian also Geo-tags alarms allowing security or surveillance teams to respond immediately.

Detection of digging / trenching close to fence

Primary Areas of Application

Installation locations:

- Army barracks
- Airports
- Prisons
- Explosive storage areas (Magazines)
- Country borders
- Hazardous areas
- Unmanned sites

Applications:

- Cyclone fence perimeter
- Concrete, block or brick wall perimeters
- Covert subsoil installation
- Sterile zone monitoring
- Gate traffic monitoring
- Boarder protection
- Barbed or concertina wire
- Security patrol tracking