PROTECTION OF PRIVATE RESIDENTIAL AREA WITH PERIMETER INTRUSION DETECTION (PIDS)

The Scenario

In Brazil, the trend in the private residential security sector has been towards high tech solutions and increased levels of automation. Traditional doormen are being supplemented or replaced by efficient and cost effective technology such as fingerprint scanning access systems, networked control centers that are operating as "remote doorman" and now advanced Perimeter Intrusion Detection Systems (PIDS) based on fiber optic sensing technology.

With an increase in the number of sophisticated control centres, fiber optics PIDS systems are ideal for integration with state of the art CCTV systems and Physical Security Information Management (PSIM) systems.

This particular site is a large, open plan area with extensive green space and fauna across the complex. The perimeter of the complex is around 6km and has a combination of fence and wall along the route with CCTV at discrete intervals providing only partial coverage.

Client Requirements

The client is a security consultant for one of the high-end condominium complexes in Brazil. The consultant wanted to implement a perimeter intrusion detection system that gave them early warning of a potential threat. The chosen solution must be reliable, with minimal nuisance alarms and must provide an accurate location of an intruder to effect a fast response.

In order to maintain the appropriate look and feel of the complex they were looking for a high tech yet discrete solution to ensure the security of the residents.

Monitored | Secured | Safe

Figure 1: Schematic of Site Perimeter

Figures 2 and 3: Example of Different Fence Types

What Did We Do?

Bandweaver, together with MinipaSense worked with the security consultant to design and install a fiber optic PIDS system based on the Bandweaver FenceSentry Distributed Acoustic Sensing (DAS) system. The system covered the entire perimeter.

The FenceSentry system is an advanced PIDS system in which smart zones can be configured and tuned according to the specific environment of each zone. The system needed to integrate with the existing security system and to be able to adapt to the different fence types, each of which had different physical characteristics (stability, height, etc.) and required different cable configurations and positioning.

These differences meant that each of the specific zones needed to be calibrated accordingly. Bandweaver's FenceSentry is an extremely versatile PIDS system, which can detect movements to within 1m and has the flexibility to enable calibration of each zone according to the specific environments.

Figure 4: Position of sensing cable

The pictures above show the specific location and configuration of the sensing cable.

There were a number of factors which need to be taken into account during the calibration phase. One example is wildlife. The picture below shows a bird on the sensing cable which was a regular occurrence.

Figure 5: Intelligent tuning can remove nuisance alerts such as wildlife

The system needed to be sensitive enough to detect any intrusion events whether they are climb or cut events but configured so that environmental factors such as weather and wildlife do not cause nuisance alerts.

Benefits to the Client

When evaluating the system, the client used a number of factors to make the choice across the lifetime of the project. Below are the following benefits which helped persuade the client that fiber optic PIDS systems offered a number of benefits over other technologies

Low Cost of Ownership: Fiber optic sensors are completely passive and are immune to EMC interference, not affected by dust or other environmental factors and are completely non-corrosive. Therefore, the lifetime of a fiber optic cable can be greater than 30 years, without any maintenance required.

High Reliability: Another benefit of the passive, inert nature of fiber optics is that they are very reliable and so there is no downtime. In addition to the lower maintenance costs, they also provide a higher level of coverage which lowers the overall risk and improves protection levels.

Precision of Detection: The FenceSentry PIDS system can locate an intrusion event to within 1m which means that events can be located extremely accurately and early action can be taken to prevent any escalation of any intrusion incidents. With the integration with the CCTV a secondary form of verification can be employed in order to further clarify and improve decision making.