Fiber Optic Based Perimeter Intrusion Detection From JM Fiber Optics!
Introduction

➢ The rising demand for advanced perimeter security detection systems against intrusion at airports, harbors, power substations, water treatment plants, military bases and other government facilities is spearheading the way for fiber optic based perimeter security systems.

➢ Fiber optic intrusion detection systems can detect any attempt to cut, lift, crawl under, climb over a fence or detected area.

➢ Fiber optic based perimeter security systems provide a much better solution than copper based systems, motion detectors or simple video camera’s.
Fiber optic technology offers immunity from lightning problems or from high EMI/RFI environmental conditions.

Copper-based sensor system can cause a problem when a high-powered directional RF transmitter is very near to the system.

Fiber optic cable is lightweight and can be easily installed in most environments.

Fiber optic cable allows great distance of signal transmission without needing to be repeated.

Fiber optic sensor cable is sensitive to vibration and pressure.
Perimeter Considerations

To begin to determine what type of perimeter system may work best for a given situation, there are a number of aspects that are essential to consider. These are . . . . .

- Landscape and topographical features
- Typical climatic conditions
- General environment
- Whether or not there is a physical barrier
- Personnel on site
- Reporting method
- Integration with other types of equipment
Risk of Nuisance Alarms

- When putting a sensor on the boundary or perimeter, the risk of nuisance alarms increases.
- This is related to how much activity exists on the outside of the perimeter (human and wildlife) as well as factors such as trees and other plant growth.
- If the sensor is placed on a boundary structure, such as a fence, the integrity of the structure itself becomes a major issue.
- There is absolutely no single type of technology that will fit every application, but a fiber optic perimeter system makes the most sense.
Not All Fiber Optic Intrusion Detection Systems Are Alike!
“JMFO Fiber PIDS” Versus a “Fiber Fence”

- The JMFO Fiber PIDS system uses Frequency-Detection technology, not an OTDR, which only measures loss in a system from a tug or break in the fiber*
- With the JMFO Fiber PIDS system, the fiber optic cable can be directly buried with full detection capability when the perimeter is not fenced
- Lower cost of ownership
- Easily interfaces with existing security systems and requires little operator training.
- The JMFO Fiber PIDS system can save as much as four man-years of labor versus two-man years with a fiber fence system*

* Source – On Guard Newspaper August 04, 2005
JMFO Fiber PIDS Versus an OTDR System

**JMFO Fiber PIDS**
- Close proximity or light touch will trigger alarm
- Easy to install
- Fiber cable can be mounted on or near a fence, wall or underground
- Does not require fiber meshing
- Does not require an expensive controller

**OTDR Systems**
- OTDR’s only estimates loss
- Heavy strain on fence or cut fiber to set off an alarm
- Mesh installation needed to cover fence vertically
- Difficult Installation on existing fence
- Requires an expensive control center unit
Benefits of an Alarmed PIDS

- Low Investment Cost
- Eliminates Need for Encryption (expensive, slow, key-based)
- Can be used on long runs
- Eliminates inspection requirement
- Immediate intrusion detection
- Configurable Parameters (eliminates nuisance alarms)
Advantages of a JMFO Fiber PIDS

- Designed for any intrusion detection risk level
- Virtually no false/nuisance alarms (FAR/NAR)
- Very high probability of detection (PD)
- Low vulnerability to defeat (VD)
- Easy installation and migration with existing equipment
- User friendly monitoring & calibration software
- Simple expandability
How the Fiber Optic Sensor Unit Works & System Overview
The fiber optic sensing portion of the cable is a two part glass called a core and cladding. The core directs the light flow through the cable, which is detected by the APU...
Because of its unique design, if the fiber optic cable is disturbed (for example by touching or stepping on it), the pattern of conducted light changes.

Sensitivity to motion, vibration, or pressure is regulated by the APU. Since fiber optic cable is non-conductive, it is immune to electromagnetic interference, lightning, and radio frequency emissions.
Laser light from the APU transmits through the fiber sensing cable, which is uniquely integrated into the sensor mat. The system detects shifts in the return light pattern, thus creating an event which can be used to determine how many events equal an alarm.
Because of its unique design, the fiber optic sensing cable can be deployed along a fence or buried under sod or gravel.

Intruders compromising these barriers are detected immediately.
Fence and Wall PIDS Examples ...
Scalable System Components
System Overview

- Alarmed system with head end option.
- Optical fiber sensor cable (immune to EMI, RFI, and lightning) with detection zones up to 5 km.
- Interoperability with alarm panels.
- Highly-configurable control and calibration software.
- Passive infrared sensors and day/night LED cameras.
The advanced processing units are available in rack and standalone models and are equipped with RS-232 and Form C dry relay contacts, which will interface with virtually any security system. The APU allows direct or remote mounting of the electronics away from the fiber-optic sensing zone.
The PRO Series of PIR sensors provide premium performance detection for high security perimeter applications, providing high performance digital signal processing, silicon window and a small dead zone.

The PRO Series have sensing areas that will detect people up to 150 meters (492 feet) away, by sensing temperature differences between them and the background. They provides protection in low visibility conditions such as you would find in tunnel entrances, and the area protected by the detector cannot be identified by an intruder due to passive operation of the unit.
Infrared LED Camera’s

Infrared security camera’s have infrared LED lighting (light from a different region of the electromagnetic spectrum than we normally use to see) installed around the outside of the lens of the camera. This lighting allows the camera to capture a good image in no light at all. With a little bit of light (called low light) the infrared camera can capture a picture that looks just like daytime.
The Fiber Optic PIDS Solution

With our solution you can:

- Sustain virtually no false/nuisance alarms (FAR/NAR)
- Have a very high probability of detection (PD)
- Have low vulnerability to defeat (VD)
- Have all this without incurring major capital equipment costs!
Managing The Project
 JM Fiber Optics has the capability of managing a complete fiber optic perimeter security system for you from start to finish. In the design stage we work closely with you to make sure we address all of your specific needs and concerns so that we can design your system to meet your current and future perimeter security concerns!

Our advanced, yet cost effective design will make it possible to have the kind of perimeter security protection you require without “breaking the bank”. We utilize the latest design tools and our RCDD certified engineers are well versed on all the design standards and criteria.
Installation

- With over 13 years of OSP and ISP installation experience, we can handle all of the installation process for you by using our ETA® technicians and installers or simply oversee and certify work done by the contractors of your choice. Either way, you will have the comfort of knowing that the installation was done right the first time!
- **JM Fiber Optics** is a licensed State of California contractor with extensive experience with Singlemode and Multi-mode fiber optic infrastructure cabling, connector termination, fusion splicing, testing, trouble shooting and maintenance. Our personnel adhere to the latest TIA/EIA 568B installation standards and follow strict OSHA safety guidelines.
Maintenance

➢ Once your system is installed, we will be there to maintain and service it for you!

➢ Day or night, **JM Fiber Optics** service personnel will be available 24 hours a day, 7 days a week, 365 days a year if required!

➢ We will have personnel located locally to you, so our response time and associated service and maintenance costs will be significantly lower than other companies.
This technology will enable you to have a truly reliable architecture that is immune to the effects of EMI, lightning, radio frequency transmissions, and magnetic fields.

Our signal processors in each unit automatically compensates for disturbances from wind, giving you a system that provides maximum zone protection and virtually no nuisance.

A fiber optic based perimeter security system from JM Fiber Optics offers the technological breakthrough to deliver high quality, yet affordable remote detection like never before!
When you’re ready to take the next step, JM Fiber Optics will be there to . . . .

“CONNECT YOU TO THE FUTURE IN PERIMETER INTRUSION DETECTION SYSTEMS”
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