Fiber Optic Sensing Solutions Private Limited
FOPIDS system is fiber optic intrusion detection sensor system developed for the advanced perimeter security. It has following salient features:

- Third Party Intrusion Detection
- Perimeter Security
- Passive Sensor-OFC
- Vibration Sensor
- Zone Based System
- Real Time Alert and Warning
- Over ground and Underground deployment
- Intelligent software control of device and zones
1. **Hardware / hardwired Zones:**
   In hardware zone application, a perimeter is segregated into different detection zones. Zone size can be varied (e.g. 250 mtrs, 500 mtrs, 1000 mtrs etc) depending on the site conditions.

2. **Plug & Play Installation:**
   The plug and play design with FC connectors facilitates swifter installation by using only simple hand tools.

3. **Hazard free products/ solution:**
   Full passive components design that require no outdoor processors and electrical power to the outdoor components. System is immune to electromagnetic interference (EMI), radio frequency interference (RFI).

4. **Easy maintenance:**
   After the system installation, less or no maintenance is required to remain optimal performance.
5. Invisibility(underground)

When buried underground or installed on wall-top with gravels covering on it, the sensing fiber is completely invisible, thus leaving landscapes unchanged. This prevents tampering and intruder by-pass of the detection area.

6. Intelligent Identification Algorithm

The system with built-in Intelligent Identification Algorithm can reduce the false/nuisance alarm to the lowest level by differentiating actual intrusions from global noises (rain, snow, wind, hail storms and small animals).

7. Integrate with Camera Surveillance

Inspectors can remotely monitor their premise and double confirm if it is a genuine intrusion prior to alerting guards. CCTV and thermal camera integration using TCP/IP or dry contacts available for each zone is possible.
**Hardware Classification:**

Two Product variants:
- **SafeFENCE** (2 Zone hand held device)
- **SafeMAX** (16 zones rack mount design)
• Two zone solution
• Zone size can be varied (e.g. 250, 500, 750, 1000 and 2000 mtrs)
• Embedded touch screen as HMI/ User Interface
• Standalone unit
• Suitable for small scale applications and indoor facilities
• 19 inch 4U rack mountable
• Optical connectors: FC/APC
• 2,4,8 to 16 zones
• Variable zone sizes (e.g. 250, 500, 750, 1000, 2000 mtrs etc)
• Multiple Device cascading option to increase length
• Dry contact output zone wise(NO/NC)
• TCP/IP interface
Detecting vibration intensity
Detecting vibration frequency
Detecting vibration times
Learning environment data

System eliminates interference and improves the accuracy of alarm by analysis of the intensity, frequency, times, etc.,
**Intrusion Behaviors**

<table>
<thead>
<tr>
<th>Over ground Intrusion events detected:</th>
<th>Underground Intrusion events detected:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climbing the fence</td>
<td>Digging and tunneling activities</td>
</tr>
<tr>
<td>Wall Digging/drilling</td>
<td>Running</td>
</tr>
<tr>
<td>Tunnel beneath the fence/Ladder jump</td>
<td>Fast walking</td>
</tr>
<tr>
<td>Cutting the Fiber</td>
<td>Vehicle passing</td>
</tr>
<tr>
<td>Cutting the fence/wall</td>
<td>Tree cutting</td>
</tr>
</tbody>
</table>

**Auto adjust to weather conditions**

Wind, snowing, lightning, raining
Advantages

- Optical signal as detection signal
- Immune to electromagnetic interference, lightning and electronic surge.
- Harmless to human being and animals
- FOPIDS 24x7 continuous working for 365 days
- Needs common single mode optical fiber cable
- Easy to deploy: on the wire net, Under the ground, Inside or on the wall etc
- Auto adjust to the environment
- Fast response for event
- Easy to install and use
## Deployment

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Metal Wire Net (Iron Fence Included)</td>
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<tr>
<td></td>
<td>Laying Fiber Cable On a Metal Wire Net or Iron Fence.</td>
</tr>
<tr>
<td>2</td>
<td>Wire net covering the top of wall</td>
</tr>
<tr>
<td></td>
<td>Laying Fiber Cable on the wire net covering the top of wall.</td>
</tr>
<tr>
<td>3</td>
<td>On/inside the wall</td>
</tr>
<tr>
<td></td>
<td>Laying Fiber Cable on or inside the Wall.</td>
</tr>
<tr>
<td>4</td>
<td>Underground</td>
</tr>
<tr>
<td></td>
<td>Laying fiber cable underground (common on soil, sand, gravel and lawn).</td>
</tr>
</tbody>
</table>
1. Metal Wire Net  (Iron Fence Included)

- Iron Fence
- Barbed net
- Roll net
- Wire net
1. Laying Fiber Cable On a Metal Wire Net or Iron Fence.

- Climb over the net;
- Put a ladder upon the net;
- Kick the net;
- Cut the net;
- Cut the fiber;
- Break the host and terminator.

These behaviors shall trigger alarm.
2. Laying Fiber Cable on the wire net covering the top of wall.

- Climb over the wall;
- Put a ladder upon the wire net;
- Cut the net;
- Cut the fiber;
- Break the host and terminator.

These behaviors shall trigger alarm.
3. 

On/inside the wall

Laying Fiber Cable on or inside the Wall.

It will trigger an alarm when intruders use a force to knock on or drill the wall.
4. Underground

Laying fiber cable underground (commonly soil, sand, gravel, and lawn).

Underground deployment can be:
• Loop
• Single Line/double line
CONSTITUENTS OF SYSTEM

Mandatory

System hosts
  • SafeFENCE supporting 2 detection zones
  • SafeMAX supporting 16 detection zones

Terminators
  • Splitters
  • Couplers

Optical fiber cables
  • single mode optical fiber cables

Management software
  • FOPIDS Planner: Tuning Software
  • FOPIDS Manager: Management software

Optional (may be bought by SI)

  • Alarm host
    Joint-action system
  • SMS text message module
    Joint-action system
  • Camera and monitor
    Joint-action system
  • ODF
    Optical Distribution Frame
  • Battery system
    Power supply backup system
SafeFENCE connection Layout

ZONE #1

ZONE #2

ALARM HOST

ALARM HOST/JOINT-ACTION EQUIPMENT

GROUND

+12V

SENSITIVE FIBER

INSENSITIVE FIBER
SafeMAX Connection Layout

Fiber cable connections
FOPIDS Manager: Centralized Alarm Management Software – User Interface

FOPIDSManager can manage SafeFence and SafeMAX through IP net.

The quantity of devices that can be managed by FOPIDSManager depends on the quantity of IP address.

- Multiple device management
- Device cascading facility

Install detection area
Online detection
Alarm record
Intrusion analysis
Alarm Joint-Action management

Map position
- Device parameter controlled through software to reduce false alarms.
- Filter and threshold setting according to deployment scenario can be done to reduce false alarm.
- The parameter setting software for overground and underground systems help control false alarm.
Vibration/Intrusion is detected and alerted through alarming methods like:
- Buzzer
- LED
- Zone Drawing in FOPIDS viewer

**Warning Device**

**Manual Alarm acknowledgment card**

**Alarm Details:**
- Zone wise
- Time of alarm
- Date of alarm
- Fiber cut alarm

**Alarm Treatment:**
- Weather inclusion
- Operator based
Integrated Alarm Management - 3rd party device integration

1. Contact closure signal
2. IP Connecting
3. Alarm
4. DVR/NVR
5. Alarm Output
Increasing Intrusion threats being faced across various Industries

- Smuggling & Embezzlement
- Environmental Crimes
- Theft: Crude Oil from Pipeline
- Animals & Human Trafficking
- Theft: Copper Cable from Base station
- Drug & Weapons Trafficking
- Terrorism activities
- Intrusion
- Theft: Crude Oil from Pipeline
- Complex Break-ins
- Piracy & Illegal Fishing
- Industrial Sabotage
- Illegal Immigration across Borders

- Theft: Copper Cable from Base station
- Animal & Human Trafficking
Applications

- Home Land Security
- Prisons/ farmhouses/jewellery shops/ banks etc.
- Airport perimeters
- Petroleum/Power plants/ sub stations/ solar parks/ industry
- Manufacturing facilities/ factories
- Museum and other critical infrastructures
- Forest /Agricultural lands
- Nuclear power plants/critical infra
- Research facilities and laboratories
- All kind of critical and secular structures where third party intrusion chances are high
a) **Zone based intrusion Detection**: Even if one zone becomes defective, rest of the zones continue to function and report intrusion without any problems.

b) **Scalable solution**: More zone/fence can be added later so customer pays only for what is being used currently.

c) **Hardwired Zones**: Each Zone is hard wired so it is impossible to hack and defeat the system.

d) **Cost Efficient**: Overall solution is very cost effective. Per km cost is very low as compared to foreign competitors.
FOPIDS Operational Advantages

a) **Indigenous solution**: Design and technology owned by Indian company. No dependency on foreign supplier for after-sales support.

b) **Local manufacturing**: Equipment manufactured in India so valuable FOREX is saved.

c) **Patent owned by Indian company**: FOSS owns the patent on the solution design.

d) **In-house Software**: User Interface software is developed and designed locally in India so it is secure against any external cyber threat.
Operational since 1994
100% export oriented unit in 2005
Space: Land 450 K, Built up - 50 K Sqft
Employees: (175 –On roll, 130 –Contract)
Products: Switch assemblies, Sensor assemblies, Solenoids, Electronic component carrier & custom assemblies
Annual Capacity: 20 million assemblies
UL / VDE / ENEC approved for Switch manufacturing
Four Sales Offices and ten Distributors across the India.

Founded in 1911 as transport service company
Based in Chennai and Madurai, India
Leading Indian automotive conglomerate with USD ~6 bn sales
Encompasses more than 45 companies with ~25,000 employees
Visit our group Companies at www.tvsss.co.in/index.php?user/tvsgroup
100% owned subsidiary of TVS Sensing Solutions:

- Manufacturer of advanced Fiber Optic Sensing Technology products and solutions based on Distributed Acoustic Sensing (DAS) for Perimeter security and surveillance.

- Deliver a complete functional solution for the major layer of fiber optic physical security.

- Industry knowledge and expertise across broad range of technologies.

- Service customer requirements through direct sales & network of distributors in India & rest of the world.

- Tie-up with other OEMs to cover diverse applications
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THANK YOU