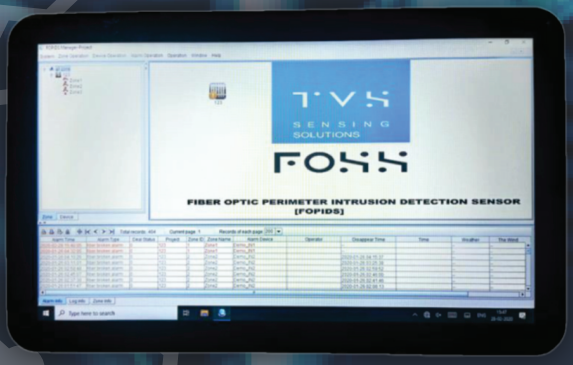
FO-PIDS

PRODUCT BROCHURE



FIBER OPTIC PERIMETER INTRUSION **DETECTION SYSTEM**

MIDFIELD ESTATE, MIDSTREAM
NETWORKSENSE.TECH

CONTACT: **083 376 8427**
INFO@**NETWORKSENSE.TECH**
JOHN@**NETWORKSENSE.TECH**

NETWORK SENSE AFRICA

PIONEERING ADVANCED FIBER OPTIC SENSING TECHNOLOGY

FIBER OPTIC SENSING SOLUTIONS

NETWORK SENSE AFRICA

ABOUT FIBER OPTIC SENSING SOLUTIONS PVT. LTD.

Fiber Optic Sensing Solutions Pvt. Ltd. (FOSS) is a leading manufacturer of cutting-edge Fiber Optic Sensing Technology, specializing in Distributed Acoustic Sensing (DAS) solutions for perimeter security and surveillance. Our innovative product range includes advanced fiber optic sensing devices, system integration solutions, and alarm management software, all designed and manufactured under the FOSS brand. By harnessing the power of fiber optic sensors, we simplify asset management and security monitoring, ensuring real-time threat detection and enhanced situational awareness. With deep industry expertise across various sensing technologies, FOSS continuously innovates to push the boundaries of perimeter security. Our relentless focus on research and engineering has led to the development of the Fiber Optic Perimeter Intrusion Detection System (FOPIDS)—a state-of-the-art security solution designed to provide unparalleled protection against unauthorized intrusions.

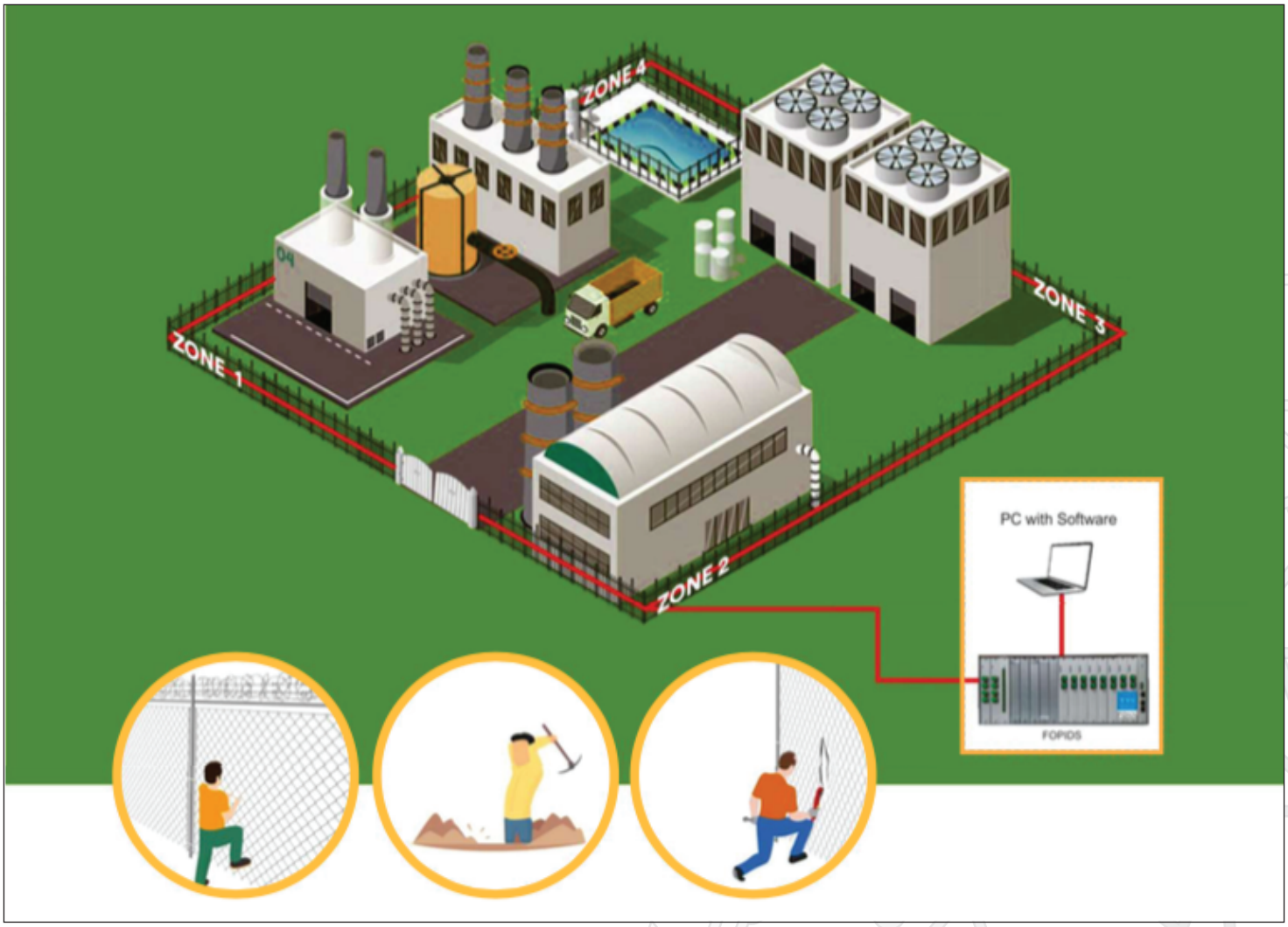
FOPIDS is widely deployed in Homeland Security (HLS), border protection, airports, oil refineries, critical infrastructure, prisons, sensitive industrial sites, VIP premises, armament depots, and other high-security locations.
The system provides real-time intrusion detection with precise location tracking, enabling security agencies and control rooms to take proactive measures before a security breach occurs. As a rapidly growing fiber optic sensing company, FOSS delivers fully integrated security solutions for the physical protection of critical assets. Our system detects and responds to major security threats such as unauthorized intrusions and fence tampering, ensuring rapid response and mitigation. Designed for seamless integration, FOPIDS can be easily connected with third-party security devices, including hooters, floodlights, and surveillance cameras, for a comprehensive security infrastructure.

A PROUD SUBSIDIARY OF TVS SENSING SOLUTIONS

Fiber Optic Sensing Solutions Pvt. Ltd. is a proud subsidiary of TVS Sensing Solutions Pvt. Ltd., a key player in the sensor technology industry. TVS Sensing Solutions delivers advanced sensor products and IoT solutions across various industries, including automotive, industrial, consumer durables, and IT segments. With a state-of-the-art manufacturing facility in Madurai, TVS Sensing Solutions provides high-quality precision micro switches and end-to-end Industrial IoT (IIoT) solutions through strategic ecosystem partnerships.

To learn more, visit: https://tvsss.co.in/

CONCEPT EXPLANATION



FIBER OPTIC PERIMETER INTRUSION DETECTION SYSTEM (FOPIDS)

FOPIDS are advanced intrusion detection systems designed for perimeter security. The benefits of optical fiber—such as its passive nature, immunity to electromagnetic interference, and ease of repair—make FOPIDS robust and highly effective in the security and surveillance industry. With a zone-based deployment, monitoring becomes more efficient and manageable.

HOW IT WORKS

FOPIDS uses optical fiber as the sensor element, offering distributed sensing properties. The system sends optical signals through the fiber, which return altered by intrusion-related disturbances. These changes are processed by intelligent algorithms, triggering alarms and alerts to inform authorities of the intrusion event and its location within the protected area.

PRODUCT FEATURES

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PERIMETER INTRUSION DETECTION

FOPIDS protects perimeter boundaries from intruders and smugglers by monitoring physical activity and capturing vibration signals, offering reliable security against breaches.

PASSIVE SENSOR

With passive components, FOPIDS requires no electrical power for outdoor units, making it immune to electromagnetic interference (EMI), radio frequency interference (RFI), and lightning.

ZONE-BASED SYSTEM

The perimeter is divided into detection zones with sensing fiber, enabling efficient, targeted monitoring and rapid threat response.

DISTRIBUTED ACOUSTIC SENSING

Using optical fiber as the sensor, FOPIDS provides comprehensive, distributed sensing along the entire perimeter.

REAL-TIME ALERTS AND WARNINGS

FOPIDS delivers quick sensing, real-time alerts, and warnings through both hardware and software for prompt threat response.

OVERGROUND AND UNDERGROUND DEPLOYMENT

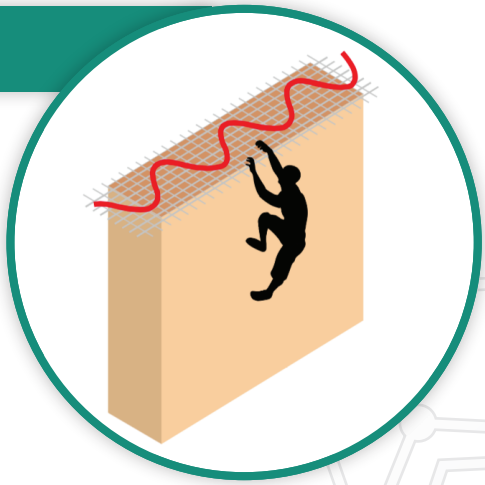
FOPIDS can be deployed overground along fences or walls, or underground where sensor visibility is not desired, ensuring flexible coverage.

INTELLIGENT SOFTWARE CONTROL

FOPIDS features intelligent software for managing zones, alarms, and device operations, automatically adjusting to environmental changes for optimal performance.

DEPLOYMENT TYPES

OVERGROUND DEPLOYMENT

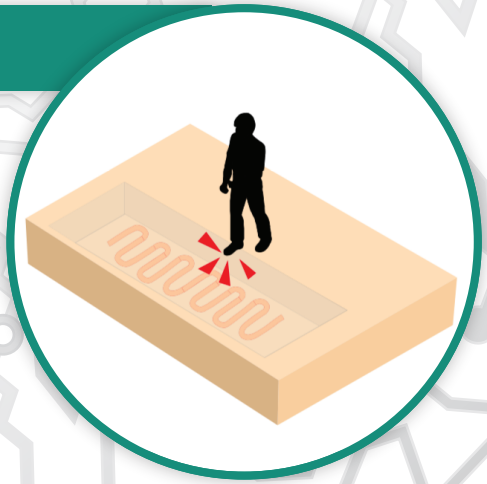


Overground installations are primarily focused on existing physical barriers, such as fences and walls. For fence applications, materials like iron wire, metal mesh, and barbed wire are commonly used.
When deployed on walls, the system is installed along the surface and top, enhancing its ability to detect intrusions effectively.

INTRUSION BEHAVIORS DETECTED

Climbing the fence or wall.	Climbing the post of the fence or climbing wall.
Climbing the fence / wall by step-ladder.	Tearing down and lifting the fence.
Dissembling the fence.	Dissembling the alarm host.
Cutting the fiber.	Cutting the fence.
Digging tunnel beneath the fence / wall.	

UNDERGROUND DEPLOYMENT



In underground applications, vibration and pressure changes serve as the primary detection triggers. To enhance sensitivity, the soil is reinforced with a specialized concrete mixture, improving intrusion detection accuracy.

INTRUSION BEHAVIORS DETECTED

Digging and tunneling activities.	Running and fast walking.
Vehicle passing.	Tree cutting.

FO-PIDS DEVICES
& MANAGEMENT SOFTWARE

A single device can manage 2 to 16 zones, featuring a rack-mountable design ideal for control room environments. It seamlessly integrates monitoring components such as alarm and management units, along with additional security layers. The plug-in card system ensures easy maintenance and built-in redundancy for enhanced reliability.

CENTRALISED ALARM MANAGEMENT SOFTWARE
MAIN ATTRIBUTES

ALERTS / WARNINGS		ADMINISTRATOR FUNCTIONS	
No Intrusion	Tamper Alarm	Zone Deployment	Zone Identification
Intrusion Alarm	Power Off Alarm	Alarm Logs	Joint Action Alarms
Fiber Break Alarm	Joint Action Alarm	Alarm Processing	Statistics Report

SYSTEM CHARACTERISTICS

The system detects motion, vibration, and pressure changes, which are processed by intelligent algorithms and management software for precise intrusion detection.

- Versatile Security Integration: FOPIDS is equipped with NO/NC dry contacts, allowing seamless integration with various security devices. When a TAMPER or INTRUDER signal is triggered, the system activates the NO/NC contacts to perform the required security action. It can also connect to external alarm units and surveillance systems.

- Scalable Zone-Based Deployment: Large perimeters with uniform landscapes pose deployment challenges. To ensure accuracy, each detection zone should range between 100 to 250 meters for both overground and underground installations. Multiple zones can be managed by a single hardware device and centralized software.

- Advanced Monitoring & Connectivity: The device includes an LCD display for real-time monitoring of source and receiver settings. Additionally, it supports TCP/IP Ethernet connectivity, enabling centralized alarm management for multiple devices. The software facilitates zone configuration, mapping, real-time monitoring, and record-keeping, allowing integration of multiple projects within a single platform.

SELECTION GUIDE

DEVICE	DESCRIPTION	IMAGE
safeFENCE™	2 Zone Device	
safeMAX™	Multi-Zone Device (4 - 16 Zones)	
	Multi-Zone Device with Camera Integration	

SAFEFENCE

SPECIFICATIONS & DETAILS

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OPTICAL INTERFACE

CONNECTOR:	FC / APC
LAUNCHED POWER:	+ 3 to + 5.5 (dBm)
WAVELENGTH:	1550 nm
RECEIVE SENSITIVITY:	-20 (dBm)

ENVIRONMENT

WORKING TEMPERATURE:	-40°C to 70°C
RELATIVE HUMIDITY:	<95%: no condensation
STORAGE TEMPERATURE:	-40°C to 85°C
HOST DIMENSION:	400mm x 250mm x 60mm

POWER REQUIREMENTS

POWER SUPPLY:	AC 230V | +12 VDC
DC POWER INPUT RANGE:	-36 to -72V DC
AC POWER INPUT RANGE:	176 to 264 V
POWER CONSUMPTION:	3W ± 10%
SURGE PROTECTION:	500 V
MEAN TIME BETWEEN FAILURES:	100 000 hours

ALARM OUTPUT INTERFACE

OUTPUT TYPE:	Contact closure output
CONNECTOR:	Phoenix terminal
OUTPUT NUMBER:	2
ALARM RESPONSE TIME:	< 3 seconds
ALARM RELAY TIME:	From 1 - 10 seconds (default is 3 seconds)
RELAY CONTACT RATING:	1A | 30 V DC 0.5A | 125 V AC

ETHERNET COMMUNICATION INTERFACE (EMU)

CONNECTOR:	RJ45
BIT RATE:	10 Mb/s | 100 Mb/s

CONSOLE INTERFACE

CONNECTOR:	RJ45
BAUD RATE:	19 200 bps
BITS:	8
STOP BIT:	1
PARITY CHECK:	None

SAFEFENCE ALARM

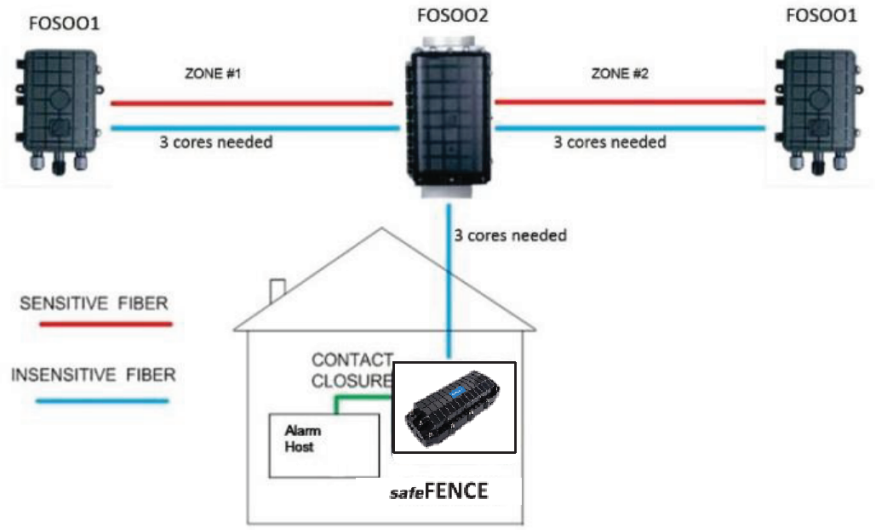
INDICATORS & DESCRIPTIONS

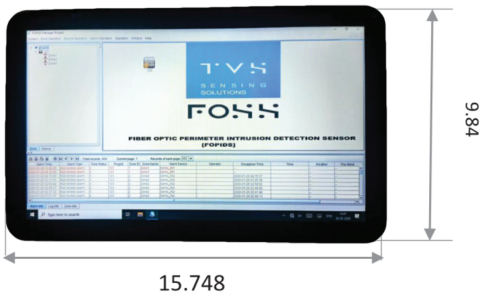
INDICATOR	DESCRIPTION
RUNNING	Green light indicates the system status. **BLINKING**: System running normally. | **ON/OFF**: System running abnormally.
ALARM1 & ALARM2	Red alarm indicators for Zone #1 & Zone #2. **ON: Fiber is broken.** | **ON (3 sec)**: Intrusion or tampering. | **OFF**: No alarm. *Alarm relay time is configurable between 1 to 10 seconds (default: 3 sec).*
VOICE ALARM	Siren sound and voice descriptions for each type of alarm, configurable in the software.
ALARM TERMINALS FOR ZONE #1 TO ZONE #16	Contact closure output interface using a Phoenix terminal.
NC (NORMALLY CLOSED)	**Default State**: Closed. **Alarm Triggered**: Opens. **No Alarm**: NC remains closed, NO remains open. **Power Down / Fiber Break**: NC stays open, NO stays closed.
COM (COMMON TERMINAL)	Shared terminal for alarm connections.
NO (NORMALLY OPEN)	**Default State**: Open. | **Alarm Triggered**: Closes.

SOFTWARE SPECIFICATIONS

CENTRALIZED ALARM MANAGEMENT SYSTEM

CENTRALISED ALARM MANAGEMENT SOFTWARE CAN BE INTERFACED WITH THIRD PARTY COMMAND CONTROL SYSTEMS	
DEVICE INTERFACE PORT: Ethernet port- RJ45 connector	**DEVICE INTERFACE:** TCP/IP-http web interface
ALERT INFORMATION UPDATES	Date of alarm | Time of alarm | Zone of alarm Log Information | Zone Information
GUI	Region Map | Buzzer | LED
REAL TIME INDICATION	Zone representation blink indication **(Green to Red)** Selected voice / sound alarm
SYSTEM REQUIREMENTS	Embedded computer RJ45 / Ethernet connectivity Operating System: Windows 7 and above RAM: Minimum 4GB System Type: 64-bit operating system





FIBER OPTIC PERIMETER INTRUSION DETECTION SYSTEM

- Supports **above-ground** and **underground** installation.
- Uses a **passive single-mode optical fiber** for high-sensitivity monitoring.
- Seamlessly integrates with **camera surveillance systems** for enhanced security.
- Supports **customized zone configurations** for flexible security coverage.
- **Above-Ground Deployment:** Suitable for fences and walls.
- **Underground Deployment:** Designed for buried installation under soil.

ZONE SPECIFICATIONS

DEPLOYMENT TYPE	OVER GROUND	UNDERGROUND
NUMBER OF ZONES (PER DEVICE)	2	
TYPICAL ZONE LENGTH	250 m	
DEPLOYMENT SCENARIOS	Fence | Walls	Under Soil | Concrete
DEPTH	Depends on height of fence / wall	1.5 feet below soil
EVENTS DETECTED	Climbing fence	Digging
	Cutting fence	Normal walking
	Cutting fiber	Running
	Tampering fence / wall	Drilling ground
	Drilling wall	Excavations
DEPLOYMENT PATTERNS	Parallel lines | Wave	Parallel lines | Wave | Dolphin

SAFEMAX

SPECIFICATIONS & DETAILS

NETWORK SENSE AFRICA

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CONNECTOR:	FC / APC
LAUNCHED POWER:	+ 3 to + 5.5 (dBm)
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RECEIVE SENSITIVITY:	-16 (dBm)

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WORKING TEMPERATURE:	-40°C to 70°C
RELATIVE HUMIDITY:	<95%: no condensation
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HOST DIMENSION:	330mm x 178mm x 482mm

POWER REQUIREMENTS

POWER SUPPLY:	AC 220V | DC-48V
DC POWER INPUT RANGE:	-36 to -72V DC
AC POWER INPUT RANGE:	176 to 264 V
POWER CONSUMPTION:	3W ± 10%
SURGE PROTECTION:	4 000 V
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SAFEMAX ALARM

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SYSTEM REQUIREMENTS	External PC / laptop
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	RAM: Minimum 4GB
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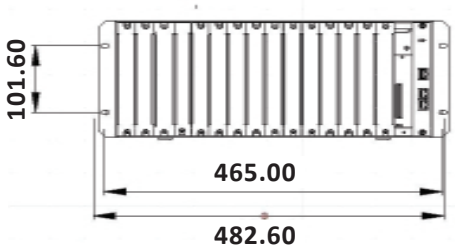
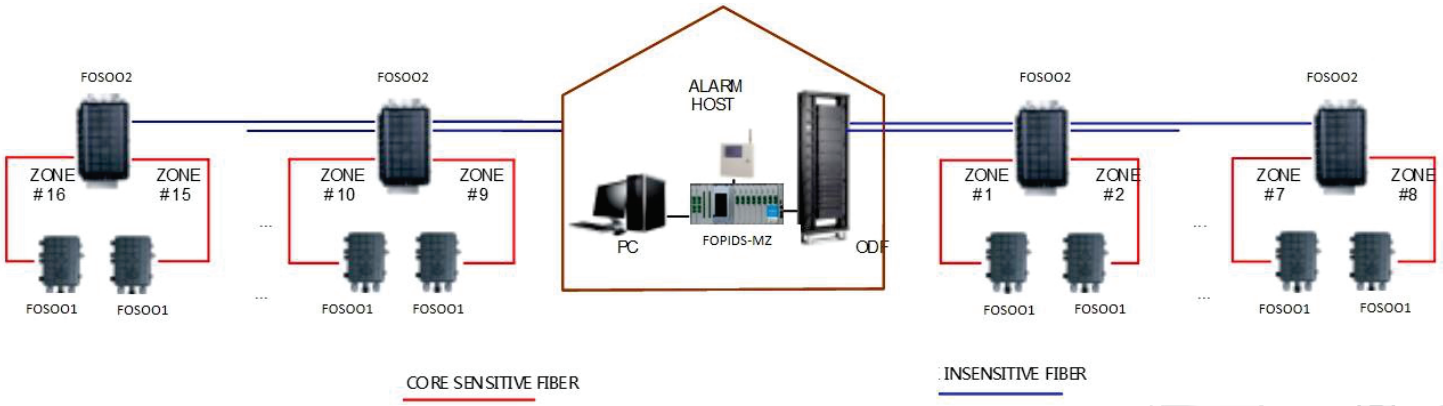


NETWORK SENSE AFRICA

FIBER OPTIC PERIMETER INTRUSION DETECTION SYSTEM



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OPTICAL SPLITTER

FOS 001

FOS 002

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SPECIFICATIONS	1X2 FUSED SPLITTER (FOS 001)	1X4 PLC SPLITTER (FOS 002)
INSERTION LOSS	<= 3.7 dB	<= 7.40 dB
UNIFORMITY	<= 0.70 dB	<= 0.80 dB
REFLECTANCE	<= -50 dB	
BAND PASS	1310 and 1550 nm +/- 40 nm	
OPERATING TEMPERATURE	-20°C to 55°C	
CONNECTOR TYPE	None or FC/APC	
DEGREE OF PROTECTION	IP 65	IP 68
DIMENSION	240mm x 190mm x 89mm	385mm x 248mm x120mm
MATERIAL	ABS engineering Plastic	

FIBER OPTIC SENSOR CABLE

DESCRIPTION	SPECIFICATIONS
FIBER TYPE	G.652D (OS2) | Single Mode
ATTENUATION	**At 1310 nm**: ≤0.38 dB / km
	At 1550 nm: ≤0.25 dB / km
	At 1625 nm: ≤0.26 dB / km
CHROMATIC DISPERSION	**At 1285-1330 nm**: ≤3.5 ps / nm.km (min)
	At 1550 nm: ≤18 ps / nm.km
	At 1625 nm: ≤23 ps / nm.km
ZERO DISPERSION WAVELENGTH	1300 - 1324 nm
ZERO DISPERSION SLOPE	≤0.092 ps / nm².km
POLARISATION MODE DISPERSION	≤ 0.20 ps / vkm
MODE FIELD DIAMETER	**At 1310 nm**: 9.2 ± 0.4 µm
	At 1550 nm: 10.4 ± 0.5 µm
CLADDING DIAMETER	125 ± 0.7 µm
COATING DIAMETER	**Uncoloured**: 245 ± 10 µm
OPERATION / INSTALLATION / STORAGE TEMPERATURE	-30 °C to 70 °C

ORDERING INFORMATION

safeMAX™

PART NUMBER	DESCRIPTION
FO-IDS-ZONE2	2-Zone Monitoring System
FO-IDS-ZONE4	4-Zone Monitoring System
FO-IDS-ZONE8	8-Zone Monitoring System
FO-IDS-ZONE16	16-Zone Monitoring System
FO-RFM001-JC-IP65	FOS001: Optical Splitter
FO-RFM003-JC-IP65	FOS002: Optical Splitter
UNIT OF MEASUREMENT (UOM):	Each

safeFENCE™

PART NUMBER	DESCRIPTION
FO-CPTV-2Z	2-Zone Device
FO-RFM001-JC-IP65	FOS001: Optical Splitter
FO-RFM003-JC-IP65	FOS002: Optical Splitter
UNIT OF MEASUREMENT (UOM):	Each

APPLICATIONS OF USE

NETWORK SENSE AFRICA

FOPIDS IS DESIGNED FOR CRITICAL PERIMETER PROTECTION ACROSS VARIOUS HIGH-SECURITY AND SENSITIVE AREAS, INCLUDING:

Restricted Zones: Country borders, military bases, and protected force areas.


Environmental Protection Areas: Forests, agricultural lands, and wildlife sanctuaries.



Urban & Commercial Spaces: Office buildings, schools, banks, airports, and transport hubs.




High-Security Facilities: Prisons, nuclear plants, research centers, and power stations.



REAL-TIME MONITORING

FOPIDS enables simultaneous and individual calibration and monitoring of zones using high-performance software. Its intelligent system minimizes nuisance and false alarms to the lowest possible level. It can also detect environmental noise—such as rain, wind, snow, and hailstorms—and filter it out through advanced software, ensuring highly accurate intrusion detection.

INTEGRATED ALARM JOINT ACTION