



FEATURES AND BENEFITS

- Detect and locate pipeline third-party interference (TPI) over a distance of up to 72 km (45 mi) per sensor unit
- Pinpoint interference locations with a ± 10 m (± 33 ft) accuracy
- Invisible and undetectable buried sensors
- Sensor cable continues to operate up to the point of a cut – 100% cut immunity when in redundant configuration
- High Probability of detection (Pd) and low Nuisance Alarm Rate (NAR)
- Software-configurable detection zones
- EMI and lightning immune
- No electronics, outdoor power, communication infrastructure or grounding points required in the field
- Accurate locating for directing response forces
- Field components intrinsically safe
- Alarms reported by zone number, cable distance and/or GPS coordinates
- Accurately locate multiple simultaneous interference events
- Multiple options for integration with SMS, VMS and PSIM platforms
- Easy-to-install and maintain
- Economy-of-scale value

 DATASHEET

Fiber optic buried sensor

Third-Party Interference (TPI), including unauthorized excavation in a pipeline's right-of-way, is a leading cause of pipeline accidents and loss. A single pipeline incident can have devastating effects, causing property destruction, service interruptions, environmental damage and death – all of which can cost pipeline operators millions of dollars in financial losses. Further, incidents involving oil theft can have a significant economic impact by going unnoticed for long periods of time.

Senstar's FiberPatrol-PL is an advanced TPI detection system specifically designed to promote the physical security of buried pipelines and in-ground infrastructure. FiberPatrol-PL uses fiber optic cable buried along the pipeline to detect and locate ground vibrations and acoustic signatures associated with TPI activity.

No powered or conductive items are required in the field. The sensor cable is intrinsically safe within explosive atmospheres and completely immune to all forms of electromagnetic energy from radio communications, radar, electrical power transmission equipment and lightning.

Early warning of threats to pipelines

FiberPatrol-PL is designed specifically to detect activities that threaten your pipeline: machine or manual digging, heavy machinery operating in the nearby vicinity – even people walking within the protected area.

Continued detection after cable cut

If the sensor cable is cut, accidentally or in an attempt to defeat the sensor, FiberPatrol-PL immediately reports the incident, including its exact location. Moreover, the sensor retains the ability to detect and localize intrusions right up to the point of the cut. In redundant configurations, complete cut-immunity is supported.



FiberPatrol-PL Sensor Unit (single processor)

Reject nuisance alarms

FiberPatrol-PL's advanced detection algorithms incorporate threshold, spatial and timing parameters that optimize the detection of interference events while rejecting nuisance alarms. The detection algorithms can also reject vibrations caused by traffic on roads and railways running parallel or perpendicular to the pipeline.

Reuse existing fiber

FiberPatrol-PL uses single-mode fiber within armored telecommunications-grade cable. The sensing function requires typically one or two fibers – additional fibers within the cable can be used for other communications purposes like Ethernet and/or Senstar's proprietary Silver Network protocol (for communication with other Senstar sensors such as OmniTrax® buried RF, UltraWave™ microwave, or XField® electrostatic).

Optical fibers within existing communication cables buried along the pipeline can also be used if requirements regarding positioning, attenuation, and reflective discontinuities are met.

Cost-effective configurations

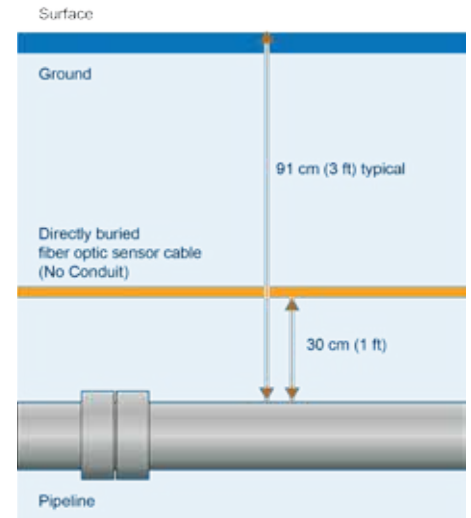
FiberPatrol-PL provides up to 72 km (45 mi) of detection for pipeline protection applications and comes in different length-capability versions ranging from 16 to 72 km (10 to 45 mi).

Easy installation

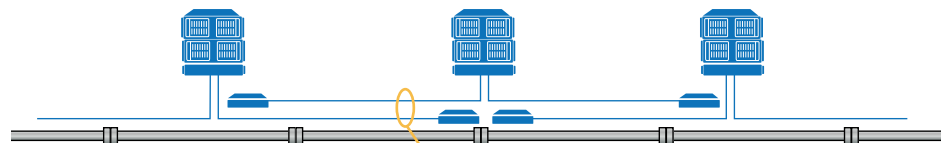
Buried with the pipeline, the fiber optic sensor cable is an armored, multi-fiber, single mode, telecommunications-type of cable suitable for direct burial. For TPI detection purposes, the cable is buried directly approximately 20 to 50 cm (8 to 20 in) above the pipeline.

Cut-immune configuration

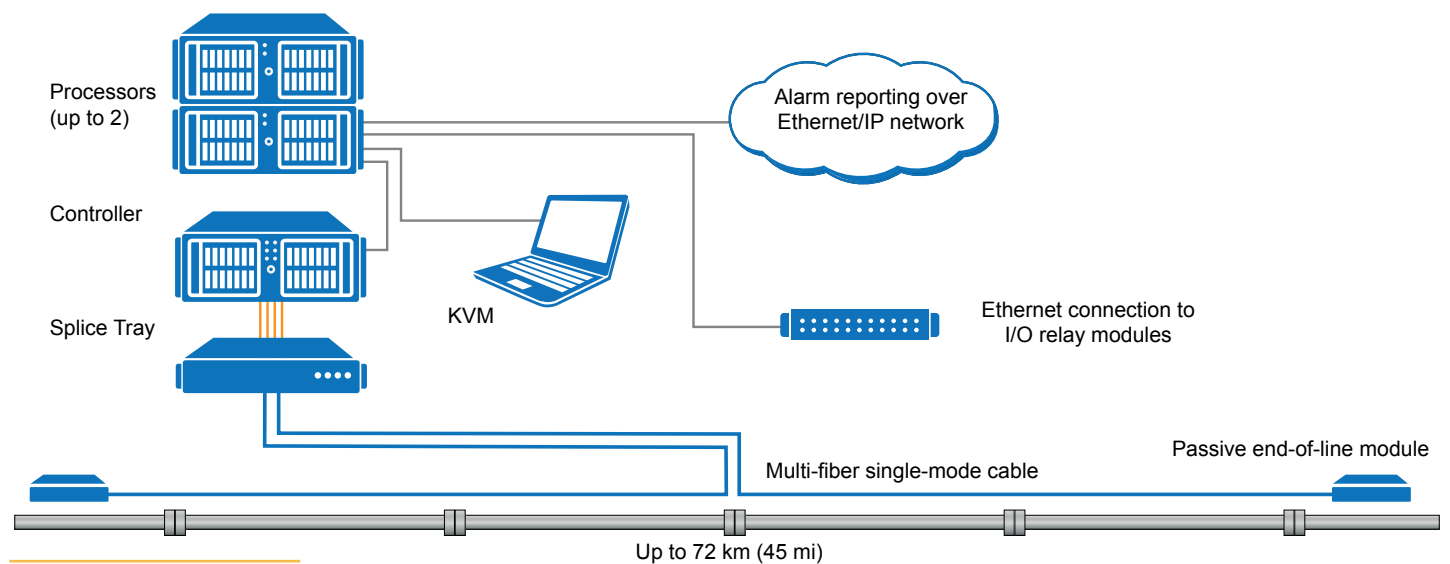
When the cable is connected end-to-end by two sensor units, complete redundancy is achieved. If one end is cut, the system continues to monitor the entire length of the pipeline.



Buried Pipeline Installation



Pipeline protected with two sensing fibers, one from each direction



Buried Pipeline Configuration

Alarm display and third-party integration

Several options are available for alarm display and integration with third-party devices.

Customers requiring a single display dedicated to FiberPatrol-PL monitoring can use the alarm display built-in to the sensor processor.

Senstar's StarNet 2 Security Management System (SMS) offers customers enhanced capabilities, including multiple workstations, an intuitive map-based operator interface, and the ability to manage additional third-party security equipment.

Senstar's UltraLink sensor integration components are used to integrate FiberPatrol-PL with third-party sensors. The UltraLink Network Manager Service provides an IP-based interface common to Senstar's other industry-leading sensors, including OmniTrax® buried RF cable sensors, XField® electrostatic sensors, UltraWave™ microwave units and the FlexZone™ cable-based fence sensor.

FiberPatrol-PL can be configured to report alarm locations by zone number, cable distance and/or GPS coordinates. Alarms and status can also be presented on relays or open-collector outputs using I/O modules.

Technical specifications

SENSOR UNIT

Main features

- Provides intrusion detection for pipelines from a central location
- Localization of intrusion and software assignment of detection zones
- Redundant bi-directional dual receiver operation provides industry-leading resilience to cut or damaged cable
- Central adjustment of all sensor parameters over long distances
- Simple integration with SMS and CCTV systems

SPECIFICATIONS

Detection performance

- Up to 72 km (45 mi)
- Detection accuracy: ± 10 m (33 ft) typical
- Detection resolution: 45 m (150 ft) (minimum separation for two disturbances to be reported separately)
- Detection zones software-assignable (recommend 10/km or 16/mi)
- Pd: 95% against TPI (digging, tapping)
- FAR: less than 1/km/month typical
- NAR: site dependent

Cut cable detection

- Operation: as specified up to the cable cut
- Accuracy of cut location: 30 m (100 ft)

Optical

- Laser classification: Class 1, 1550 nm wavelength
- Connector type: FC/APC

Interfaces and software

- Networking: Dual Gigabit Ethernet
- Operating system: Windows 7 Pro 64-bit
- HDD: minimum 2x500 RAID array
- Standard alarm interface – Standard API over TCP/IP from Network Manager
- Optional alarm interface – Relay closures via UltraLink I/O modules

Environmental (sensor unit)

- Operating temperature: 10 to 35 °C (50 to 95 °F)
- Humidity: 20% to 80% non-condensing

Energy consumption

- Voltage, frequency: 100 – 240 VAC, 50/60 Hz
- Power:
 - Single processor: 400W maximum
 - Dual processor: 800W maximum

Mechanical

- Standard 19-inch rack-mount, 51 cm (20 in) deep
- Height: processor 4U (each), Controller 3U, splice enclosure 1U, KVM 1U
- Rack clearance required: 5 cm (2 in) front, 15 cm (6 in) back
- Weight:
 - Single-processor: 48 kg (105 lbs) total with single processor, controller and 1U splice enclosure
 - Dual-processor: 71 kg (157 lbs) total with two processors, controller and 1U splice enclosure

FIBER OPTIC SENSOR CABLE

- We provide fiber optic sensor cable that is tailored to meet the requirements of the specific application.
- Existing optical cable may be used for sensor cable providing requirements regarding positioning, attenuation and reflective discontinuities are met

General characteristics

- Gel-filled loose tube construction
- 12 fibers per tube
- Central strength member
- Single mode fiber with optical loss of less than 0.25dB/km
- Single corrugated steel tape (CST) armor option
- Double polyethylene jacket

Environmental

- Temperature: –40 to 70 °C (–40 to 158 °F)
- Humidity: no restrictions

REGULATORY COMPLIANCE

- FCC Part 15 Class A
- CE: EC Low Voltage Directive 2006/95/EC

| Part | Description |
|------------|--|
| FP6100X-xx | FiberPatrol-PL sensor unit. Provides up to xx km of detection processing, where xx can be 24, 36, 48, 60 or 72 (1 km = 3280 ft). |
| GB0296-15 | 15 in 1U Rackmount KVM (KB/LCD/Mouse) (MONIT1) |
| FPKT0400 | 8 port KVM switch w/ 2 sets of cables (KVM8) |
| FPKM0400 | 1U rack-mount splice enclosure kit (SPLENC) |
| FPMA0121 | Dual Start module for FiberPatrol-PL |
| FPMA0112 | Single End module for FiberPatrol-PL |
| FPMA0113 | Mid module for FiberPatrol-PL |
| GM0749-24 | Field splice enclosure (24 splice capacity, 3 cable ports) (SPLHW) |
| FPKT0200 | Splice consumables kit (SPLCON) |

Contact Senstar for training and installation support services.



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