FiberPatrol® FP1150 for Data Conduit Protection

Fiber optic third-party interference (TPI) detection for critical telecommunications networks

The FiberPatrol FP1150 advanced fiber optic sensor is specially designed to promote physical security of fiber optic data links and other cable infrastructures. The FP1150 utilizes existing fibers to detect potential TPI events anywhere along the cable's pathway. The FP1150 determines and reports the precise location of such an event.

By providing an early warning and the precise location of an incident, FP1150 helps prevent costly service interruptions, infrastructure damage, and data theft.

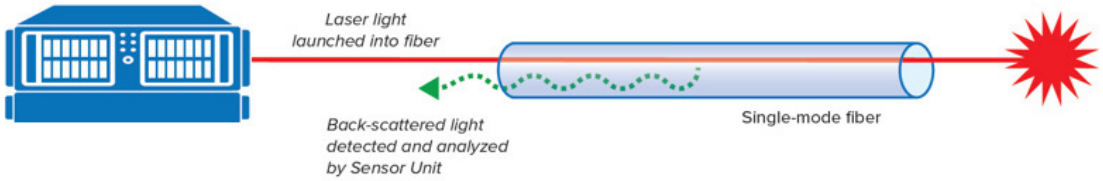
The FP1150 can also be used to verify the location of a fiber optic conduit by monitoring a dark fiber while impacting the ground above the presumed location of the conduit.

FIELD-ADJUSTABLE DETECTION SETTINGS

The FP1150 uses sophisticated algorithms to discriminate between real threats and vibrations from incidental sources. The advanced detection algorithms incorporate disturbance magnitude thresholds, spatial parameters, and timing parameters. The FP1150's algorithms are easy to configure, enabling facility personnel to optimize the system for site-specific conditions.

HOW IT WORKS

FiberPatrol works by transmitting pulses of laser light into a single-mode optical fiber and accurately measuring the minute light reflections that occur along its length. A disturbance of the fiber caused by vibrations changes the amount of light returned from that point. FiberPatrol's reflectometry-based technology does not require the light to traverse the full length of cable. If a cable is cut, FiberPatrol retains the ability to detect and locate intrusions up to the point of the cut, thus enabling the system to support cut-immune configurations.



Features and Benefits

- Detect and locate conduit third-party interference (TPI) events such as nearby digging, presence of heavy vehicles, and direct manipulation for the purposes of tapping or theft
- Covers a distance of up to 100 km (62.1 mi) of fiber per sensor unit
- Requires only one fiber within a cable or cable bundle for sensing purposes
- Pinpoint TPI events with a ±4 m (13 ft) accuracy
- Accurate locating of multiple simultaneous intrusions
- Sensing function continues to operate up to the point of a cut
- Dual sensor channels
- High Probability of Detection (PD) and low Nuisance Alarm Rate (NAR)
- Software-configurable detection zones
- No outdoor power or supporting infrastructure required
- No electronics or grounding points required in the field
- TPI events reported by zone number, cable distance, and/or GPS coordinates
- Multiple options for integration with SMS, VMS and PSIM platforms
- Easy to install and maintain
- Does not connect to active fibers, no possibility of unauthorized data access or injection
- Per-meter licensing

TPI DETECTION

Potential TPI events such as manual digging, machine digging, or the presence of heavy vehicles create characteristic vibrations. The system distinguishes these from background vibrations and declares an alarm when the detection criteria are met.

Within the first 40 km of each sensor channel the FP1150 detects hand and machine digging at distances of up to 20 m (66 ft) and the movement of heavy vehicles at up to 30 meters (100 ft). At the maximum sensor length of 50 km these typical lateral detection distances are halved.

VEHICLE DETECTION AND OPTIONAL REJECTION

The FP1150 is capable of detecting vehicles in the vicinity of the sensor cable due to the vibrations created by their motion or by the engine. In the case of a road parallel to the protected asset the FP1150 can be configured to reject normal vehicle traffic and only raise an alarm if a vehicle drops below a configurable speed setting or stops altogether.

ALARM DISPLAY OPTIONS

Several options are available for TPI event display and integration with third-party devices. Customers requiring a single display dedicated to FP1150 perimeter monitoring can use the processor's built-in alarm display. Senstar's StarNet™ 2 and Symphony™ systems provide enhanced capabilities for those requiring multiple workstations and maps as well as the management of additional security equipment. The FP1150 can report TPI event locations by zone number, cable distance and/or GPS coordinates.

Senstar provides an SDK that enables integration of the FP1150 into any security management system or network integrity monitoring system.

TPI events and equipment operational status can also be presented on relays or open-collector outputs using Senstar's UltraLink relay modules.

KEY SPECIFICATIONS

- FP115040x
  - up to 50 km (31.06 mi.) of TPI detection processing per sensor channel, 100 km (62.1 mi) total
  - maximum allowable cable loss, installed, of 12.0 dB @1550 nm per sensor channel
- FP115005x
  - up to 5 km (3.1 mi.) of detection processing per sensor channel, 10 km (6.2 mi) total
  - maximum allowable cable loss, installed, of 4.8 dB @1550 nm per sensor channel
- Sensor Unit MTBF: greater than 87,000 hours
- Detection accuracy: ±4 m (13 ft) typical
- Up to 1,440 software-definable detection zones
- Pd: 95% typical
- FAR: less than 1/km/month typical, NAR: site dependent
- Detection resolution (minimum separation for two disturbances to be reported separately):
  - 15 m (50 ft) in non cut-immune configuration
  - 30 m (100 ft) in cut-immune configuration
- Cut cable response
  - Cable cut detected and location reported to +/- 30 m (100 ft)
  - Operation continues up to the point of the cut

PART	DESCRIPTION
FP115005U	FP1150 unlicensed Sensor Unit capable of providing up to 5 km (3.10 mi.) of detection processing on each of its two sensor channels, up to 10 km (6.21 mi) in total. Requires separately-purchased per-meter activation licenses, FP-PML-05, to enable detection processing.
FP115040U	FP1150 unlicensed Sensor Unit capable of providing up to 40 km (24.8 mi) of detection processing on each of its two sensor channels, up to 80 km (49.7 mi) in total for perimeter protection applications. Up to 100 km total for pipeline or conduit TPI applications. Requires separately-purchased per-meter activation licenses, FP-PML-40, to enable detection processing.
FP-PML-05	Per-meter activation license applicable to FP115005U Sensor Unit. The number of meters licensed needs to cover all cable beyond the initial lead-in section (max 500 m) including all service loops, isolation loops, gate bypasses, etc. Initial lead-in in excess of 500 m needs to be added to the licensed section. Each meter licensed activates both sensor channels.
FP-PML-40	Per-meter activation license applicable to FP115040U Sensor Unit. The number of meters licensed needs to cover all cable beyond the initial lead-in section (max 500 m) including all service loops, isolation loops, gate bypasses, etc. Initial lead-in in excess of 500 m needs to be added to the licensed section. Each meter licensed activates both sensor channels.
FPMA0922	FiberPatrol fiber connection module for FP1150 systems. Includes two patch cords, two end modules, associated splice trays, and 1U rack-mount splice enclosure.
GB0296-17	17 in 1U rack mount KVM (KB/LCD/Mouse)
FPKT0400	8 port KVM switch with 2 sets of cables
FPMA0222	Dual End module for FiberPatrol FP1150
GM0749-24	Field splice enclosure (24 splice capacity, 3 cable ports)
FPKT0200	Splice consumables kit
GH1080-08	3/16" x 08" (0.48 x 20.3 cm) stainless steel cable ties (100 each)
GX0310	Tool – manual tension and cut-off tool for stainless steel cable ties
GM0748	Buried vault for buried cable splices and service loops, 100 x 75 x 45 cm
GM0749-48	Field splice enclosure (48 splice capacity, 3 cable ports)
FPSP0424	Unarmored fiber optic sensor/lead cable, 24 fibers, recommended for fence or wall-top applications
FPSP0624	Single-armor, double-jacket fiber optic sensor/lead cable, 24 fibers, recommended for buried applications
00FG0220	Network Manager service version on USB drive