THE MANUFACTURER OF ALL YOUR DISTRIBUTED FIBER SENSING SOLUTIONS

PIPELINE INTEGRITY MANAGEMENT
STRUCTURAL HEALTH MONITORING
POWER CABLE INTEGRITY
WELL MONITORING
INTRUSION DETECTION
WHAT WE DO

Laser pulse propagating through the fiber

Small part of the pulse back to the equipment due to scattering effect

Hot/cold spot, Vibration, Mechanical strain....

WHO WE ARE

THE MANUFACTURER OF ALL YOUR DISTRIBUTED FIBER SENSING SOLUTIONS

FEBUS OPTICS is an innovative company based in France bringing a new generation of fiber-optic sensing based solution to the market. Solutions proposed by Febus Optic allow monitoring the integrity of infrastructures such as pipelines, umbilical, wells, power cables, civil engineering structures, perimeter intrusion detection, or transportation infrastructure monitoring.

The patented technology uses innovative optoelectronic architecture and unique HPC signal processing algorithm to measure accurately temperature, strain and vibrations over tens of kilometers. Robust and easy to use, Febus Optics devices are fully “plug and work”.

All Febus Optics solutions Require only single ended access to standard single mode optical fibers.
FEBUS A1 (DAS*), FEBUS GS-R (DTS* and DSS*) products, bring an integrated Pipeline Integrity Monitoring Solution (PIMS) by merging strain, acoustic and temperature measurements in one single mode fiber optic cable.

FEBUS OPTICS PIMS ensure a real-time, permanent and simultaneous detection, every meter along several tens of kilometers, of the following events:
- Gas and oil Leak detection,
- Geo-hazard detection such as landslides, mudslides and earthquakes,
- Intrusion detection such as manual excavation, hot tapping, third-party excavation, heavy machine movement, position and scrap tracking as well as agricultural activities.

(*) DAS : Distributed Acoustic Sensing / DTS : Distributed Temperature Sensing / DSS : Distributed Strain Sensing

**KEY ADVANTAGES**

- Unique Merging of Data from DAS, DTS and DSS.
- Long range monitoring (over 50 km distance)
- Interoperability with SCADA or equivalent using MODBUS over TCP/IP
- FEBUS proposes its Test Site Facility for preliminary experiment before field deployment.

**REFERENCES**

**MAIN FEATURES**

- Amplitude and Phase based sensing included
- Up to 0.8 m spatial sampling
- Up to 50 kHz measurement frequency @ 1 km fiber length
- Advanced Alerting and Visualisation Capabilities with FO-View software.

FEBUS A1 device provides vibration and acoustic sensing typically every 2 m along several tens of kilometers with optical fiber cable deployed on or near the infrastructure.

The FEBUS A1 device can be connected to optical fiber cables already in place. The only requirement is for the optical fiber to be single-mode.

This system is specifically designed to meet harsh environment requirements with single-ended connection to the optical fiber sensing cable.
Power Cable related incidents account for 80% of insurance claims and around 60% relate directly to cable damage during construction of offshore windfarm. Thus, cable monitoring is becoming essential.

FEBUS G1-R, G1-C, G2 (DSTS) and A1 (DAS) bring not only temperature monitoring over very long distance, RTTR (Real Time thermal Rating), shock and vibration monitoring but also a unique real-time integrity monitoring during each phases of the cable life cycle: transportation, transpooling, deployment and operation.

It is now possible to monitor the bending radius, tension and traction of the cable during installation as well as fatigue for dynamic cable.

**KEY ADVANTAGES**

- Unique real time integrity monitoring during installation phase (G1-C)
- Easiness and robustness of single-ended DSTS with very high performance (G1-R)
- Independent measurement of Temperature and Strain using one fiber (G2)
- Very long distance: > 100 km
- Partial discharge detection (A1)

**REFERENCES**

MOOG

FEBUS G-Series Interrogation Units provide Strain and Temperature information typically every 1 m along several tens of kilometers along an optical fiber deployed on the infrastructure. FEBUS G-Series are ideal for performing accurate and real-time monitoring with harsh environment requirements using, energy saving configuration (G1-C) and single-ended connection to the optical fiber sensing cable.

**MAIN FEATURES**

- Up to 100 Hz measurement @ 500 m fiber length
- Up to 100 km range @ 10 m spatial resolution (typ.)
- Up to 4 μm/m (Strain) or 0.2°C (Temperature) repeatability
- Possibility of Simultaneous Strain and Temperature measurement with unique patented G2 technology
- FO-Log intuitive User Interface
- Possibility of improving spatial resolution up to 25 cm with an embedded algorithm.
Ageing management of large scale structures, such as Nuclear Power Plants, Tunnels or Dams is key issue for infrastructure owners. With a few percent of investment on monitoring with distributed sensing, lifetime can be significantly increased, security improved, and maintenance costs reduced.

FEBUS G1-R, G1-C, G1-D, as DSTS systems (Distributed Strain and Temperature Sensing) offers a large panel of monitoring possibilities with respectively: high sensitivity, low consumption and dynamic sensing. Real-time monitoring can also be a critical asset, specially for transportation facilities such as railways or viaduct.

For these application FEBUS A1 (Distributed Acoustic Sensing system) can be a precious monitoring asset for vehicle localization, axle failure detection or eigenmodes frequency determination.

**KEY ADVANTAGES**

- Unique set of in-house technologies addressing the most of applications.
- Fastest strain measurement on the market (G1-D)
- Autonomous and compact version of DSTS for service (G1-C)
- Febus Optics experts can advise customer on specific fiber optic cable deployment

**REFERENCES**

- EDF
- RATP

**MAIN FEATURES**

- Lightweight (12 kg) and small form factor (55.1 x 35.8 x 22.6 cm), flight cabin compatible
- Wireless remote control, or embedded touchscreen
- Autonomous operation
- Benefits of most of the G-Series features (spatial resolution improvement, high range, high accuracy, FD-Log intuitive HMI)