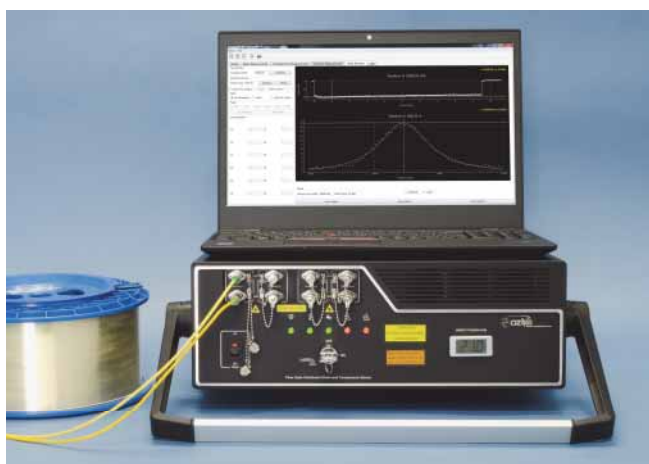# Brillouin DSTS System for Pipeline Monitoring

OZ Optics ForeSight™ Brillouin DSTS Interrogator

Distributed Strain and Temperature Sensing instrumentation equipment provides an effective means to monitor all types of pipelines. The monitoring of corrosion, strain, leaks and intrusion with the same interrogator is possible when using Brillouin Scattering Technology, provided strain and temperature can be measured separately from one another.

OZ Optics ForeSight™ Brillouin DSTS

Solution Requirements

Successful implementation of DSTS systems for pipeline monitoring will require several elements to work in conjunction with each other:

Equipment Housing

Non-condensing humidity facility

AC Power

Sensing Fiber: GeoDetect®

Optional: Interfacings to a SCADA or other monitoring system

Optional: External optical switch enables multiple fiber monitoring with a single unit.

Professional installation team

PERFORMANCE MONITORING*

Strain Detection

Leak Detection

Security Detection

Corrosion Detection

Local and remote control,

recording and reporting

PRECISION

Real-world performances

Strain Detection: ±10 µε

Temperature: ± 0.5°C

SPEED

Standard Model: 3-7 minutes

High Speed Model:

15 seconds to 3 minutes,

1 second dynamic monitoring

Disaster warning mode

Optional: Fire detection mode

For more information on any of our products or services please visit us on the Web at: www.ozoptics.com

Historically, Brillouin measurements were unable to distinguish between strain and temperature. The OZ Optics ForeSight™ Brillouin DSTS interrogator provides three methods to independently measure strain and temperature. ForeSight™ is proven in corrosion monitoring due to it's high precision and ability to separately measure strain and temperature.

Typical fiber application methods are listed below:

- A helical wrap of fiber optic cable provides the maximum coverage of the pipeline. This approach is suitable to measure strain, and temperature. From the precise strain measurement, corrosion can be inferred. Alternate installation methods exist.

- TenCate GeoDetect® is a composite geotextile fabric with multiple fiber optic lines embedded into it. The geotextile provides an excellent interface with the earth and protection of the fiber during installation. As geological changes occur, stain is captured by the geotextile fabric and propagated to the sensing fiber. Intrusion detection and geological strains are most easily captured using this system. Since temperature sensing fibers are also installed, leak detection is provided based upon proximity to the pipeline. It also acts as an absorption media should the pipeline leak. Corrosion monitoring requires a slightly strained installation against the surface of the pipeline.

- Use of an optional optical switch allows many sensing fiber runs to be monitored via one ForeSight™ Brillouin DSTS.

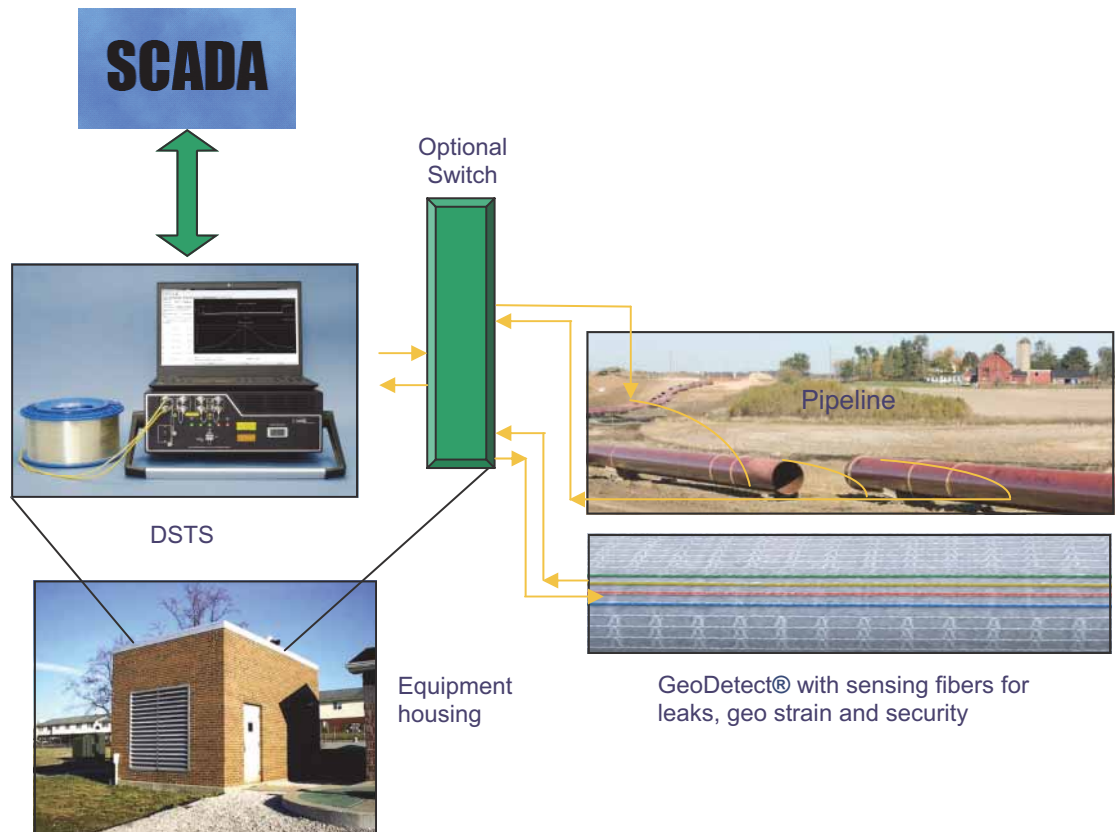*OZ Optics reserves the right to change any specifications without prior notice.

Brillouin DSTS System for Pipeline Monitoring

The OZ Optics ForeSight™ DSTS interrogates, measures, logs, and generates alarms and reports based upon the project's initial setup. No further re-calibration is necessary. It is capable of interfacing via a Remote Database Access (RDA) to a Supervisory Control And Data Acquisition (SCADA) system. Interfaces on the DSTS include Ethernet, USB and RS232.

Measurement time can vary by model. The standard model will take a nominal measurement in 3 minutes and a long range, wide metric measurement in 7 minutes. The high speed model produces the same results in 15 seconds to 3 minutes. Measurement quality is not impacted. OZ Optics' quality of measurement allows the normal speed model be used for corrosion detection on critical pipelines.

Multiple channel configurations can include an optional internal 1x4 switch with each ForeSight™ DSTS System. Additional external optical switches are available from OZ Optics that are controlled via the interface of the DSTS System.

A typical layout for pipeline monitoring is shown:

SCADA

Optional Switch

DSTS

Pipeline

Equipment housing

GeoDetect® with sensing fibers for leaks, geo strain and security