



Brillouin DSTS System for OPGW Monitoring

OZ Optics ForeSight™ Brillouin DSTS Interrogator

Distributed Strain and Temperature Sensing instrumentation equipment provides an effective means to monitor Optical Power Ground Wires (OPGW) and infer the **performance** conditions of the power line itself. Temperature, strain, lightning strikes, corrosion detection, bullet damage and ice load monitoring are measured or monitored via the same interrogator when using the ForeSight™ Brillouin OTDA.

PERFORMANCE MONITORING

- Lightning Detection
- Strain Detection
- Corrosion Detection
- Preventative Maintenance
- Local and remote control, recording and reporting

PRECISION

- Real-world performances
- Strain Detection: $\pm 10 \mu\epsilon$
- Temperature: $\pm 0.5^\circ\text{C}$
- 160 km sensing range

SPEED

- Standard Model: 3-7 minutes
- High Speed Model:
 - 15 seconds to 3 minutes,
 - 1 second lightning strike monitoring

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OZ Optics ForeSight™ Brillouin DSTS

Solution Requirements

Successful implementation of DSTS systems for Optical Power Ground Wire (OPGW) monitoring will require several elements to work in conjunction with each other:

- Equipment Housing
 - Non-condensing humidity facility
 - AC Power (UPS Recommended)
- OPGW:
 - Utilizes a single strand for measuring.
- Optional: Interfacings to a SCADA or other monitoring system
- Optional: External optical switch enables multiple fiber monitoring with a single unit.

The OZ Optics ForeSight™ Brillouin DSTS interrogator provides fast, extremely accurate multiple measurement modes to provide localized cable temperature and strain measurements along the entire fiber length. ForeSight™ is proven in OPGW monitoring due to its high precision and ability to separately measure strain and temperature. Additionally, the DSTS performance allows it to operate in disaster monitoring mode; generating alarms on heat spikes that can only be associated with lightning strikes.

Examples of OPGW Cable monitoring are described below:

- ❖ **Corrosion** of a power line causes a localized increase in strain. The DSTS can pinpoint such a strain increase to within a few meters.
- ❖ Attempted **Bullet Damage** can be quickly detected and pinpointed by changes in strain.
- ❖ **Ice Load Monitoring** can be accomplished by measuring the cable strain.
- ❖ **Lightning Strikes** can be easily detected and pinpointed due to the massive temperature spikes that they cause.

Fiber Cable Calibration - Prior to installation of your OPGW Cable, the DSTS can be used to establish a baseline measurement for future quality monitoring. Abnormal changes in strain may be an indicator of an impending failure, which allows corrective actions to be taken before such failure occurs.

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

Brillouin DSTS System for OPGW (Optical Power Ground Wires) Monitoring

The OZ Optics ForeSight™ DSTS interrogates, measures, logs, and generates alarms and reports based upon the initial setup. No further re-calibration is necessary. With an optional interface, the DSTS 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, and USB.

Measurement time can vary, depending on the measurement. Lightning strikes can be detected in as little as 1 second. Depending on the set-up, the high speed model produces accurate results in 15 seconds to 3 minutes.

Multiple channel configurations can include an optional internal 1x2 switch with each ForeSight™ DSTS System. Additional external optical switches are available from OZ Optics that is controlled via the interface of the DSTS System. Virtually any number of channels can be provided by using an external bank of switches.

A typical layout for OPGW (optical ground wire monitoring) is shown below:

