



SINGLE- ENDED (BOTDR) AND LOOP (BOTDA) CAPABILITIES IN ONE BOX HIGH ACCURACY AND LONG RANGE DISTRIBUTED STRAIN AND TEMPERATURE SENSING SYSTEM

Reliable and high performance Brillouin Interrogator (BOTDA/BOTDR) for field applications. Measure full strain and temperature profile over fiber optic sensing cables.

Description

The DiTeSt is a unique tool for the evaluation of distributed strain and/or temperature over several tens of kilometers. It is a powerful diagnostic instrument for the identification and localization of potential problems. It allows the monitoring of local strain and temperature at thousands locations by mean of a single optical fiber and in just one measurement. Its inherent high stability and self-referenced principle of operation allows on-line or off-line long-term monitoring of large structures.

The DiTeSt is a laser-based measurement system using an optical scattering measurement principle within the sensing fiber: Stimulated Brillouin Scattering. It can operate using dedicated fibers and cables as sensing element. Stimulated Brillouin Scattering is an intrinsic physical property of the fiber material and provides information about the strain and temperature distribution actually experienced by the sensing fiber.

The DiTeSt-Dual provides 4 channels with fast and accurate strain and temperature measurements up to 60 km in BOTDA mode and up to 45km with single-end mirror-less measurement.

Multiple fibers can be automatically connected to the instrument through an integrated optical switch. The system includes an industrial PC and internal hard-disk storage, allowing great versatility in terms of connections. The integrated software is user-friendly and allows an easy setup of the parameter through the use of self-configuration wizards. The system can operate interactively or in automatic mode, gathering data according to a schedule.

Compatible with SMARTEC DiView software for automatic data management and visualization

Key Features

- Fine spatial resolution 1m
- Single-ended or loop configuration
- Extended range, up to 60km
- Long term stability
- Automatic monitoring
- Transportable
- Easy configuration
- Remote control
- Self diagnostic

Applications

- High accuracy distributed temperature & strain measurements
- Integrity monitoring
- Slope stability monitoring
- Dams/dykes deformation
- Settlements/ sinkholes localization
- Tunnel monitoring
- Crack detection
- Penstock monitoring

| Technical features | BOTDA operating mode | BOTDR operating mode |
|--------------------------------|--|---|
| Number of channels: | Default: 4 built-in channels | |
| Sensor configuration: | BOTDA (user selectable), loop configuration | BOTDR (user selectable), single-end configuration |
| Optical budget: | 14 dB sensing (28 dB total loop loss budget) | 10 dB |
| Distance range (per channel): | 60 km (120km max. total fiber loop distance) | 45 km |
| Spatial resolution: | 1 m to 20 m (by increment of 0.1 m) | 1.5 m to 20 m (by increment of 0.1 m) |
| Sampling resolution: | 0.25 m (1 m at max. distance range) | 0.25 m (2 m at max. distance range) |
| Acquisition time: | 1-5 minutes typical 5 -15 minutes for high resolution measurements | |
| Measurement range: | Brillouin Freq. Shift: 0.1 MHz ; Range from 9.5 GHz to 12.5 GHz Temperature : 0.1 °C ; Range from -150 °C to +1000 °C (fiber dependent) Strain: 2 µε ; Range > 5% | |
| Fiber typology: | Standard single mode optical fibers (ITU G.652, ITU G657, ITU G.655) | |
| External Switch compatibility: | 1 channel can be extended to up to 20 channels (BOTDA or BOTDR, user selectable), with DiTeSt Multiple Channel Optical Switch | |

Technical specifications

| | |
|------------------------|---|
| Operating temperature: | 0°C to 45°C |
| Humidity: | Max 95% non-condensing |
| Protection rating | IP20 |
| Power supply: | 100-240 VAC Typ. (90-264 VAC) / 50-60 Hz Typ. (47-63 Hz) / <150VA |
| Dimension (WxDxH): | 449 x 500 x 177.8mm (19" rack mountable - 4U high) |
| Weight: | 15 kg |
| Communication options: | 2 x Ethernet port (RJ45) |
| Optical connectors: | E-2000 / APC (rear panel) |
| Graphical interface: | Configuration Software and Data Viewer Software DiView (Optional) automatic visualization, post-processing and alarming Software on external |
| Operating system | LINUX- 64 bit OS on Solid State Drive (SSD) |
| Data storage: | Internal hard disk (> 500 GB or more) or Optional Solid State Drive (SSD) (> 250 GB). Optional additional data storage - External data storage (SATA port on rear panel) |
| Data format: | Proprietary Database, Text Files |
| Laser safety: | DITEST products emit invisible infra-red radiation in the 1550 nm wavelength range classified to EN 60825-1 (2014) as Class 1M laser products |

Certification and compliance

CE mark (Council Directive 2006/95/EC and 2004/108/EC), RoHS (Council Directive 2002/95/EC), WEEE (Council Directive 2008/34/EC) CSA US + CA (UL-61010-1 3 Ed; CAN/CSA C22.2 NO61010-1-2)

Accessories and Ordering information

- 11.2020 DiTeSt Multiple Channel Optical Switch
- 20.2010 DiView Data Management Software

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