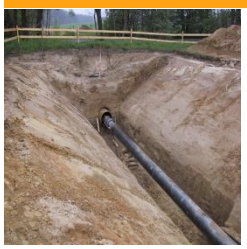
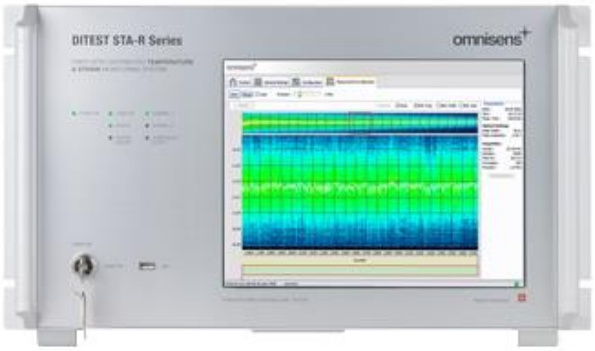
11.2010 DITEST READING UNIT
BRILLOUIN OTDR

For distributed temperature & strain sensing



GENERAL 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 shot. Its inherent high stability and self-referenced principle of operation allows on-line or off-line long-term monitoring of large structures.



TECHNICAL DESCRIPTION

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 standard single mode telecommunication fibers and cables as sensing element, as well as with special single mode fibers. 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 local characteristics of Stimulated Brillouin Scattering are measured thanks to an innovative and highly reliable configuration developed by the Metrology Laboratory of the Swiss Federal Institute of Technology of Lausanne. This measurement technique relies on the use of a single laser source and is therefore totally self-referenced allowing periodic measurements without any preliminary calibration.

The system can operate in two configurations: loop (with both ends of the sensing fiber connected to the measurement unit) or single-ended (with a mirror at the end of the fiber). Multiple fibers can be automatically connected to the instrument through an integrated optical switch. Through the use of optional range extenders it is possible to monitor distances up to 100 km.

The system includes an industrial PC with LCD screen and internal hard-disc storage, allowing great versatility in terms of connections: LAN, wireless, remote control/configuration/maintenance. The integrated software is user-friendly and allows an easy setup of the parameter through the use of self-configuration wizards. Data retrieved from multiple measurements can be simultaneously displayed and compared on screen. When pre-defined warning levels are exceeded, the system can generate alerts and activate relays (optional). The system can operate interactively or in automatic mode, gathering data according to a schedule.

FEATURES

- **High accuracy temperature & strain measurements**
- **High measurement resolution**
- **Fine spatial resolution**
- **Extended range**
- **Long term stability**
- **Automatic monitoring**
- **Transportable**
- **Cost effective**
- **Remote control**
- **Self diagnostic**

TECHNICAL FEATURES

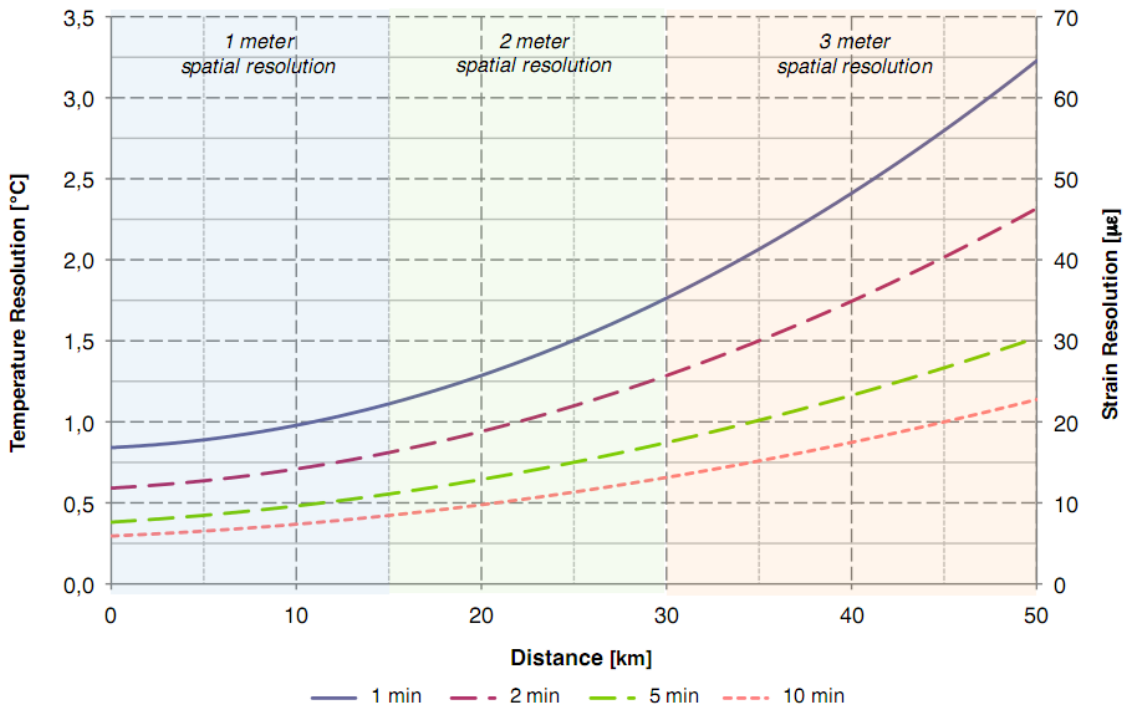
- **Number of channels →** 2 independent (external mux available)
- **Sensor configuration →** loop configuration
- **Optical budget →** standard 10 dB (22 dB loop)
  high 20 dB (25 dB loop)
- **Distance range →** up to 50 km*
- **Spatial resolution →** 0.5 m to 20 m
  1 m @ 20 km, 2 m @ 30 km, 3 m @ 50 km
- **Sampling resolution →** 0.1 m
- **Temperature & strain resolution →** see below
- **Measurement range →** 10 GHz to 13 GHz
  -273°C to +500°C *
  -3% + 3% *
- **Fiber typology →** SMF 9/125 μm (ITU.T G.652.D)

TECHNICAL SPECIFICATIONS

- **Operating temperature →** 0°C to 40°C
- **Humidity →** 5% to 90% RH, non condensing
- **AC Power →** 100V – 240V, 50Hz – 60Hz
- **Power consumption →** 400W maximum
- **Dimension (WxDxH) →**449 x 500 x 266 mm
- **Weight →** 21 kg
- **Communication options →** Ethernet, USB, RS232
- **Optical connectors →** E2000 APC
- **Graphical interface →** SVGA (12'') color screen
- **Data storage →** internal hard disk
- **Data format →** text files, database
- **Laser safety →** EN 60825-1 (2001-03) as Class 1M laser products

***** depending on sensing cable attenuation α (OB / α)

Relationship between DITEST performance parameters



ACCESSORIES AND ORDERING INFORMATION

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

Roctest Ltd. · 665 Pine Avenue, Saint-Lambert, QC, J4P 2P4 CANADA · **Phone** 1-450-465-1113 · **Fax** 1-450-465-1938 · info@roctest.com · **www.roctest.com**
Telemac SA · 10, avenue Eiffel, 77220 Gretz-Armainvilliers, FRANCE · **Phone** +33-1-64-06-40-80 · **Fax** +33-1-64-06-40-26 · info@telemac.fr · **www.telemac.fr**
Smartec SA · Via Pobiette 11, CH-6928 Manno, SWITZERLAND · **Phone** +41 91 610 1800 · **Fax** +41 91 610 1801 · smartec@smartec.ch · **www.smartec.ch**

NOVA METRIX