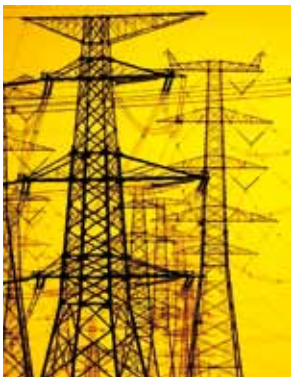
# fTB 2505

Fiber-optic sensing system for distributed strain and temperature monitoring

fibrisTerre



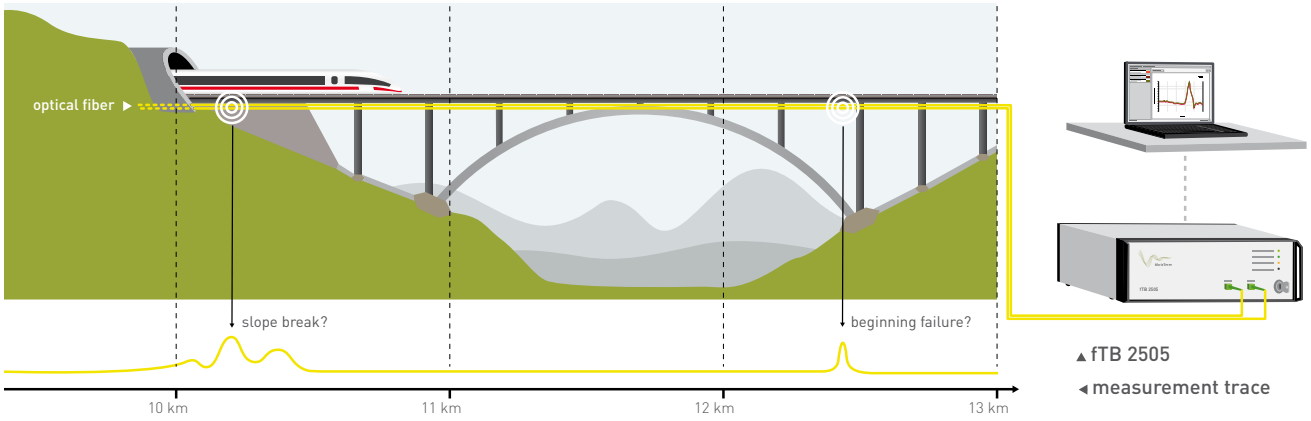
the nerves of your structure

## Reliable and uninterrupted structural health monitoring

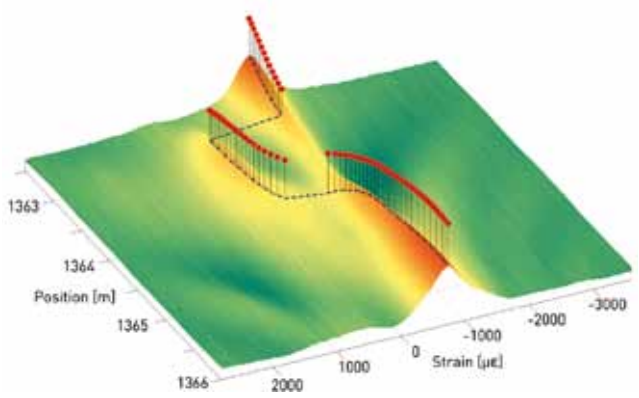
Uninterrupted monitoring is essential to manage risks and maintenance of large structures. Where kilometers of concrete, steel or soil are to be monitored for the early signs of failure, distributed optical fiber sensors are a powerful and highly efficient tool.

With industry-leading accuracy, fibrisTerre's unique digital BOFDA technology answers the demand for reliability in long-term monitoring of pipelines, power cables, railway lines and geotechnical infrastructure.

The fTB 2505 system uses industry standard optical fibers (the same used in everyday telecommunications) as continuous, long-range strain and temperature sensors. Application-specific coating solutions allow for reliable and versatile implementation into earth and rigid structures.




▲ fTB 2505
◂ measurement trace




## Typical applications

- Oil and gas pipeline and borehole monitoring
- Early failure detection in geotechnical structures
- Fatigue monitoring of bridges, tunnels, dams
- Strain and temperature monitoring in mining
- Displacement monitoring of river embankments

## Brillouin distributed sensing

Two light waves, injected into an optical fiber from both ends, meet and make the fiber shiver (literally), creating an acoustic wave inside the fiber. Influenced by this acoustic wave, the light that arrives at the instrument carries information on the fiber's speed of sound – and, consequently, on its strain and temperature.

## The complete monitoring solution

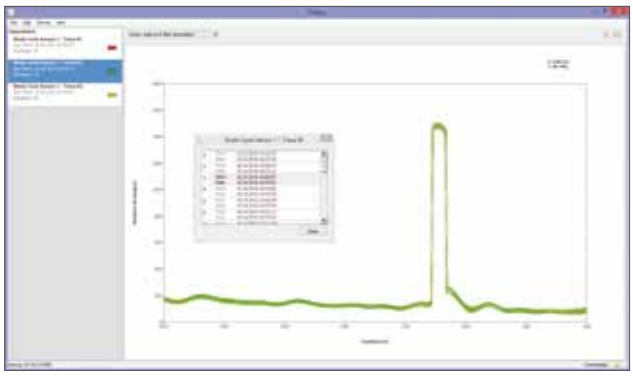
fibrisTerre provides

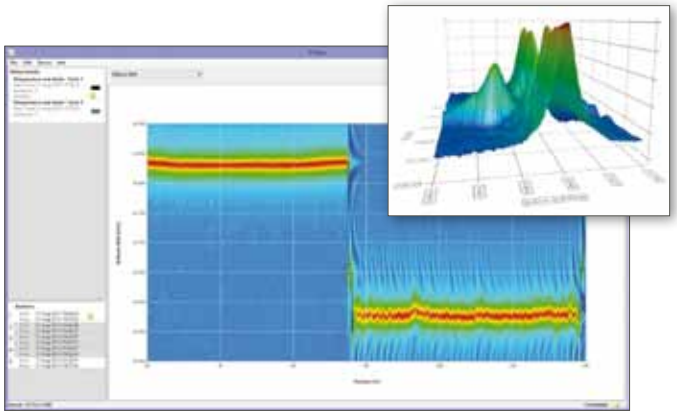
- Quality installation and management through a strong network of partners and integrators
- Tailored service packages for new constructions
- Specific solutions for retro-fitting of existing structures
- A long-term partnership for reliability in service, maintenance and system upgrades


## Key features

fibrisTerre's patented Brillouin Optical Frequency Domain Analysis (BOFDA) provides

- Industry leading data accuracy: < 2 με for strain and < 0.1°C for temperature
- Spatial resolution down to 20 cm
- Distance range up to 50 km fiber length
- Superior attenuation budget
- Full loop measurement, no return fiber needed
- High-precision measurement of fiber length
- Access to all raw data
- Field friendliness due to light weight and low power consumption





## The user interface

The fTB 2505 readout unit is controlled by a remote or local PC or workstation via Ethernet.

fTView, fibrisTerre's powerful monitoring software, enables the user to configure, perform, display and manage measurements.

- Easy measurement setup
- Automatic long-term monitoring in user defined intervals
- A unique, powerful signal processing engine
- Multiple data export, management and visualization options

# fTB 2505 series

## Performance, features and technical data

| | | | |
|---|---|---|---|
| Fiber type | | Standard single-mode | |
| Optical connectors | | E-2000 / APC | |
| Sensor configuration | | loop | |
| Distance range (fiber loop) | | 50 km [1] | |
| Spatial resolution | up to 2 km fiber | 0.2 m [2] | |
| | up to 25 km fiber | 0.5 m | |
| | up to 50 km fiber [1] | 1.0 m | |
| Spatial accuracy | | 0.05 m | |
| Optical budget [3] | | > 20 dB | |
| Measurable parameters | | Brillouin frequency shift, temperature, strain | |
| Accuracy and range | | Accuracy | Range |
| | strain | < 2 με | -3% to +3% [4] |
| | temperature | < 0.1°C | -273 to +1000°C [4] |
| | Brillouin freq. shift | < 100 kHz | 10 – 13 GHz |
| Typical acquisition time [5] | 0.2 km fiber | 20 seconds | |
| | 2 km fiber | 1 minute | |
| | 10 km fiber | 8 minutes | |
| | 25 km fiber | 25 minutes | |
| Communication interface | | Ethernet | |
| Data export formats | | binary, ASCII | |
| Measurement modes | | Single measurements on demand; continuous monitoring | |
| | | Automatic detection of fiber length and attenuation | |
| Remote operation | | Remote measurements, system diagnostics | |
| Operating temperature | | 5 - 40°C | |
| Dimensions | L x W x H | 495 x 482 x 145 mm (19" rack case) | |
| Weight | | 13 kg | |
| Power consumption | | 60 W | |
| Laser class | | 1M | |

[1] Standard distance range is 25 km. Distance range enhancement to 50 km available upon request
[2] Software resolution enhancement selectable in user interface
[3] High optical losses along the sensing fiber may degrade the strain / temperature accuracy
[4] Limited by optical fiber
[5] Estimated for typical measurements. Measurement time will vary with resolution, accuracy and strain / temperature range

## The company

fibrisTerre is a Berlin based designer and manufacturer of distributed fiber optic sensing solutions for simultaneous strain and temperature measurements. Empowered by the pioneering Brillouin Optical Frequency Domain Analysis (BOFDA), fibrisTerre's systems leave no critical spots of a structure unattended.

With a strong focus on research and development, fibrisTerre offers cutting edge solutions for structural health monitoring projects in the energy sector, in civil construction and geotechnical engineering.

a spin-off of:

BAM Bundesanstalt für Materialforschung und -prüfung

fibrisTerre

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