DTS & DAS

Distributed Temperature / Acoustic Sensing

Quantum Transformation for Critical Infrastructure

The fusion of **DTS + DAS** transforms standard fibre optics into powerful, distributed sensor networks. With **real-time, multi-parameter monitoring**, it provides unmatched insights into the condition of infrastructures. By combining **quantum-ready security measures** with advanced sensing technologies, DTS & DAS enable safer, smarter, and more sustainable operations across industries.

Partner: sdt

Website: https://sdt.inc

Technology Overview

The DTS & DAS system leverages the inherent scattering properties of optical fibres to provide real-time, distributed monitoring of temperature, vibration, and acoustic signals over long distances.

- **DTS (Distributed Temperature Sensing)**
  Utilises Brillouin and Raman scattering to detect temperature variations with high accuracy along fibre optic cables.
- **DAS (Distributed Acoustic Sensing)**
  Converts existing optical fibres into thousands of virtual microphones, enabling detection of vibrations and acoustic events.

Together, DTS + DAS form a multi-parameter sensing solution that enhances the safety, reliability, and security of modern infrastructures.

Technology Benefits

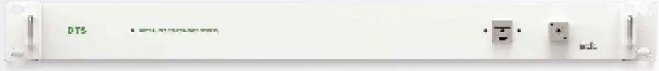
- **Long-Range Monitoring**
  Temperature sensing up to **15 km** and acoustic sensing up to **40 km**, covering vast infrastructures.
- **High Accuracy & Resolution**
  Detects temperature changes at **±2 °C** accuracy and spatial resolution as fine as **1 m**.
- **Real-Time Intelligence**
  Rapid detection and event localisation enable immediate response to anomalies.
- **Cost-Effective & Scalable**
  Uses existing fibre optic networks, reducing deployment costs and enabling flexible integration.
- **Quantum Security Ready**
  Integration with **Quantum Key Distribution (QKD)** enhances secure communications.

Key Features

- **Multi-Scattering Technology:** Rayleigh, Brillouin, and Raman scattering for robust sensing.
- **OTDR-Based Localisation:** Optical Time Domain Reflectometry ensures precise event mapping.
- **Multi-Channel Design:** Supports up to **16 channels** for parallel monitoring.
- **High SNR Performance:** Reliable measurements even in harsh environments.
- **Versatile Fibre Support:** Standard multimode optical fibres (62.5/125 µm).

Applications

- **Energy & Utilities:** Power cable temperature monitoring, smart grids, oil & gas pipelines.
- **Transportation:** Tunnel and railway structural health monitoring.
- **Critical Infrastructure:** Security monitoring, border intrusion detection, smart city surveillance.
- **Environmental & Safety:** Dam integrity, seismic monitoring, leakage detection.



Distributed Temperature Sensing

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