



TECHNICAL DATA SHEET

# DAST

Distributed Acoustic Strain &  
Temperature optical fibre sensor interrogator

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Distributed Acoustic Strain & Temperature  
optical fibre sensor interrogator

The **DAST** is a new **disruptive** interrogator **equipment** for **distributed** optical fibre sensors that can turn an optical cable, even already existing, into an array of thousands of sensors for **SOUND**, **TEMPERATURE**, **DEFORMATION** and **PRESSURE**.

Thanks to its **patented** technology that combines **DSTS (Brillouin analysis)**, **DAS (phase-sensitive reflectometry)** and **polarization-sensitive reflectometry**, the **DAST** creates a "virtual sensor" made out of light pulses that travels along the fibre for many km and reads the different parameters individually at any point.

Moreover, thanks to its unique **multi-parameter sensing** capability, the **DAST** allows to **correlate** the changes detected in different domains that refer to anomalies acting on more of them, such the **vibrations** that influence both **polarization** and **phase**, so that to improve the **sensitivity** and the **false alarm rejection ratio**.

## Technical characteristics

Common design characteristics:

Sensing fibre type:	Any single-mode fibre
Number of optical channels:	4 (standard), up to 16 with external multiplexer
Optical connectors:	PLCD duplex LC/APC (IP65)
Power supply:	9 to 36V DC 54W max
Batteries:	2 x Li-Ion 18V 4Ah, individually hot-swappable
Dimensions:	470 x 370 x 180 mm (portable option)
Protection grade:	IP65 (portable option, during transportation)
Weight:	11.8 kg
Case material:	ABS bright orange (black on request)
Operating temperature:	+5 to +40°C
Interfaces:	Ethernet 10/100/1000 IEEE 802.3At Wi-Fi IEEE 802.11n Analog audio, mono, 3mm headphone jack, 1W out max
Interfaces with galvanic insulation (1.5kV @ 1min)	2 x RS485 with supply out 12V 2W (total) 1 x 9-15V AC/DC input for remote power control 3 x 9-15V AC/DC inputs for user key functions 3 x relay outputs (250VAC 2A) for system OK, warning and alarm
Data export file format:	ASCII CSV or binary raw



## DSTS - Brillouin analyser mode:

Distance range:	2.5, 5, 10, 25, 50km options
Distance sampling:	settable between 0.08m, 0.1, 0.25 and 0.5m
Distance accuracy:	0.5 m
Distance resolution:	settable between 0.25, 0.5, 1, 2.5, 5 and 10m
Brillouin frequency shift range:	9 to 13 GHz
Brillouin frequency shift resolution:	< 10kHz typically equivalent to 0.1°C and 4µε
Brillouin frequency shift noise (2σ accuracy):	±50kHz typically equivalent to ±0.1°C and ±20µε
Optical dynamic range:	10dB (20 dB on request)

## DAS - Phase-sensitive OTDR mode:

Distance range:	5, 10, 25, 50km options
Distance sampling:	settable between 0.5, 1, 2.5 and 5m
Distance accuracy:	0.5 m
Equivalent gauge length:	5m
Relative event distance resolution:	10m
Sensitivity (noise density):	1nε /√(Hz)
Acoustic bandwidth:	from 0.1 Hz to 5 kHz @ 1km, 1 kHz @ 50km
Acoustic dynamic range:	6 dB
Optical dynamic range:	> 6 dB

## P-OTDR - Polarization-sensitive OTDR mode:

Distance range:	5, 10, 25, 50km options
Distance sampling:	settable between 0.08m, 0.1, 0.25 and 0.5m
Distance accuracy:	0.5 m
Sensitivity (intrinsic 2σ noise density):	0.001°/√(Hz)
Frequency bandwidth:	from 0 Hz to 5 kHz @ 1km, 1 kHz @ 50km
Optical dynamic range:	> 6 dB

## Integrating Multiple Technologies for Comprehensive Fiber Monitoring

Multi-technology integration allows sensing of up to 4 different physical parameters on the same fiber

- Brillouin analysis (BOTDA) for distributed strain and temperature sensing
- Phase-sensitive reflectometry (PS-OTDR) for dynamic & acoustic strain, seismic, fast thermal glitch
- Polarisation-sensitive reflectometry (P-OTDR) for fibre squeezing, pressure and strong vibrations
- Special hardware interfaces for direct integration with solar panels, other sensors and industrial controls
- Portable (12kg) waterproof (IP65) case (option), battery operated with hot-swappable Li-ion packs
- Easy-to-use interface with wireless local control from 10.5" tablet and remote control from any browser
- Upcoming options for FBG interrogation (also time-division multiplexed) and Wavelength-shift OTDR

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## More info

### ADVANTAGES OF FIBRE OPTICS



**Safe in any environment**



**Invisible and non-invasive**



**Environmental-friendly**



**Immune to interference**

### FIELDS OF APPLICABILITY



Structural Health  
Monitoring (SHM)



Energy



Nuclear



Defense



Oil & Gas



Museum  
masterpieces  
monitoring



Transportation



Mechatronics

## Contact

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