



SmartSonic Interrogator

Key Features

- Measure in between FBGs
- Retrofittable to Existing FBG Systems
- Broad Bandwidth / Low Noise Floor
- Tolerant of High Optical Attenuation
- Dense Multiplexing Capability
- Precise Spatial Resolution
- No Noise from Unwanted Zones
- Highly Remote Measurement
- All Optical Sensing with Zero EMI

About SmartSonic

The SmartSonic interrogator is an interferometric instrument able to detect at acoustic frequencies the small changes in the lengths of fibre between selected pairs of sensors on a fibre Bragg grating (FBG) array. The high bandwidth and low noise floor of this measurement is such that the addition of a remote SmartSonic interrogator turns a FBG array into a string of sensitive optical microphone.

Unlike conventional distributed acoustic sensing (DAS), where the signal is modulated by very low intensity Rayleigh back scattered light, the SmartSonic interrogator sets up a series of virtual fabry-perot cavities between selected FBGs and then tracks the minute changes to these cavity lengths using an interferometer and advanced data processing. In effect, a quasi-distributed acoustic sensing, or Q-DAS, monitoring system, is established. The unique optical and data processing architecture of a SmartSonic Q-DAS system has certain key advantages over alternative technologies:

- the process of amplitude normalisation allows measurement from very remote sensors with highly attenuated connection to the instrument;
- low noise floor allows discrimination of features invisible to DAS
- precise knowledge of the sensing location allows for speed of sound measurements;
- the low optical power employed makes ATEX certification straightforward;
- the use of COTS telecoms components makes for a low cost interrogator

SmartSonic is a collaborative development between Smart Fibres (UK) and Optics 11 (NL).

Specifications

Measurement and Processing	
Sensor Type	FBG Zones (adjacent)
Displacement Noise	Down to $600 \text{ f}\epsilon / \sqrt{\text{Hz}}$
Dynamic Range	160 dB
Sampling Speed	DC up to 750 kHz
Signal Acquiring	True simultaneous
Operation Wavelength	C & L band
Sensor Potential ¹	Up to 80
Data Output	USB / LabVIEW
Fibre Type	Single mode
Connector Type	FC/APC
Software	Included

Mechanical, Environmental and Electrical	
Mass	7 kg
Dimensions H x W x D	100 x 450 x 310 (2U)
Operating Temperature Range	+5 to +75 °C
Comms Interface	USB2 & RS232
Optical Connector	FC/APC
Input Voltage	+230V
Power Consumption	~10 W

¹ Depending on the configuration of your existing FBG network.

Specifications may change without notice