

Optical Sensing Analyzer | si730

Applications

- Measurements of fiber Bragg grating (FBG) strain gages, temperature probes, accelerometers, pressure, displacement, and other FBG sensors.
- Simultaneous static and dynamic measurements of hundreds of sensors.

Features

- Wide wavelength swept laser supporting more sensors per channel.
- Up to 16 integrated measurement channels.
- Spectral Diagnostic View for optimizing sensor system setup and operation.
- Integrated ENLIGHT eases configuration, data acquisition, and on-board data storage.
- Intuitive touch screen user interface (for easy configuration and visualization of monitoring application).

Deployment

- Civil structures (bridges, dams, tunnels, mines, buildings).
- Energy (wind turbines, pipelines, nuclear reactors, solar panel farms).
- Oil & gas (well reservoir management, platform structural health, pipeline condition).
- Aerospace vehicles (airframes, composite structures, wind tunnels, dynamic tests).
- Marine vessels (hull, mast, rudder, deck, cargo containers).
- Transportation (railways, trains, roadways, specialty vehicles, cranes).
- Homeland security (perimeter intrusion, heat detection, security gate monitoring).
- Medical devices (probes, catheters).

Description

The si730 is a convenient, full-featured dynamic optical sensor interrogation instrument, powered by Integrated ENLIGHT and featuring up to sixteen internal fiber measurement channels, a large 17" touch screen LCD, and is ideally suited for laboratory use.

The si730 Optical Sensing Interrogator is built upon the x30 optical interrogator core, featuring a high power, high speed swept wavelength laser, realized with Micron Optics patented Fiber Fabry-Perot Tunable Filter technology. The x30 interrogator core employs high speed hardware peak detection, optimized for rapid data acquisition of many simultaneous FBG sensors. x30 technology is focused on providing measurements with higher acquisition rates, moderate dynamic range, and continuous lifetime on-board referencing. The combination of high speed and excellent repeatability enables a single x30 interrogator to simultaneously monitor dynamic sensors and measure static sensors with ultra-high resolution. Well over half of the fiber optic sensors deployed today are measured with instrumentation that uses Micron Optics technology.

The Micron Optics "si - Sensing Instrument" platform features an optimized Integrated ENLIGHT environment built on Windows XP Embedded technology. In contrast with the "sm - Sensing Module" platform, Sensing Instruments support on-board management of all optical interrogator core configuration, data acquisition, sensor calibration, data visualization, and data storage tasks. Users of Integrated ENLIGHT interface to the Sensing Instruments through a touch screen LCD, external keyboard/mouse/monitor, or Windows Remote Desktop connections.



si730 Laboratory Instrument

ENLIGHT combines the useful features of traditional sensor software with the specific tools needed to optimize optical properties during the design, implementation, and operations phases of an optical sensor system. Tables, graphs, and additional data visualization features make ENLIGHT easy to use. Learn more about ENLIGHT at http://www.micronoptics.com/sensing_software.php.



Specifications ^B 1

si730-500

si730-800

Optical Properties

Number of Optical Channels	4	16
Scan Frequency	1kHz	250 Hz
Wavelength Range	1510-1590 nm	
Wavelength Stability ²	2 pm typ, 5 pm max	
Wavelength Repeatability ³	1 pm, 0.05 pm with 1,000 averages	
Dynamic Range ⁴	25 dB with user-selectable gain	
Max FBGs per Channel	80 (up to 160 with expanded λ range)	
Internal Peak Detection	Included	
Spectral Diagnostic View	Included	
Optical Connectors	FC/APC	
FBG Requirements ⁵	0.25 +/- 0.05nm, FWHM (-3dB point); >15dB Isolation	

Data Processing Capabilities

Operating Environment	Integrated ENLIGHT Environment (based on XP Embedded)
Enhanced Data Management	ENLIGHT Sensing Analysis Software
Interfaces	USB 2.0, Ethernet, 17" Touchscreen LCD
Storage Capacity	100 GB HDD
Ethernet Pass-through	Supports direct data acquisition by user PC from Optical Sensing Interrogator Core

Mechanical, Environmental, Electrical Properties

Dimensions; Weight	520 mm x 499 mm x 165 mm; 18.1 kg (40 lbs)
Operating Temperature; Humidity	10° to 35°C; 20 to 80%, non-condensing
Storage Temperature; Humidity	-20° to 60°C; 5 to 95%, non-condensing
Input Voltage	7 - 36 VDC (100~240 VAC, 47~63Hz), AC/DC converter included
Power Consumption at 12V	65 W typ, 80 max

Notes:

1. Beta product. For details see www.micronoptics.com/product_designation.php.
2. Captures effects of long term use over full operating temperature range of the instrument. (Assumes an FBG bandwidth of 0.25nm).
3. Per NIST Technical Note 1297, 1994 Edition, Section D.1.1.2, definition of "repeatability [of results of measurements]". (Assumes an FBG bandwidth of 0.25nm).
4. Defined as laser launch power minus detection noise floor. Adjustable 13 dB window within total range.
5. Used for performance qualification (See Notes 2 and 3). Bandwidths other than 0.25nm may reduce performance. Minimum FBG λ spacing is 1.0nm for FBG detection. Typical FBG λ spacing is >2.0nm.

