

# Optical Sensing Interrogator | sm230

## Applications

- Measurements using FBG strain gages, temperature probes, accelerometers, pressure sensors and other FBG sensors
- Dynamic and static simultaneous measurements of hundreds of sensors
- Permanent installations for tracking the condition and performance in smart structures like bridges, dams, buildings and tunnels
- Continuous, decades-long, structural health monitoring of ships, aircraft, trains and other complex structures

## Features

- More sensors - 160nm swept laser scanning means more sensors per channel (4x the competition)
- More channels - 16 channels can be built into the compact sm230 package.
- Faster dynamic measurements - Up to 2KHz
- Full Spectrum - observe sensor optical characteristics during setup
- Distance Measurement - measure distance to all sensors during setup
- Synchronized Measurement - sync multiple sm130s to acquire simultaneous data for 1000s of sensors

## Description

The sm230 Optical Sensing Interrogator provides simultaneous, static and dynamic interrogation for hundreds of fiber optic sensors. The combination of high speed (2KHz) and repeatability (1µstrain) allows a single instrument to interrogate dynamic sensors and measure ultra-static sensors with ultra-high resolution (e.g., 0.005°C).

In its standard 16 channel configuration, the instrument seamlessly integrates:

- Wide-scanning swept laser technology
- Advanced parallel PC control-analysis-communications architecture (coming soon)
- Solid-state electro-optical switching
- ENLIGHT<sup>Pro</sup> sensing analysis software

Like all Micron Optics instruments, the sm230 uses patented state-of-the-art sub-picometer optical referencing technology so that the instrument never requires recalibration. Balancing world-leading capabilities with a sensible price, the commercial grade sm230 is available in various configurations and targets to delight both users desiring to monitor merely a handful of sensors and heavy-users whose applications demand parallel monitoring of hundreds of sensors.

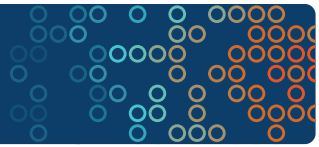


Front Panel



Back Panel

ENLIGHT<sup>Pro</sup> is included with Micron Optics sensing interrogator systems and provides a single suite of tools for data acquisition, computation, and analysis of optical sensor networks. ENLIGHT<sup>Pro</sup> combines the useful features of traditional sensor software with the specific needs of the optical sensor system, making it easy to optimize optical properties during the design and implementation phase of an optical sensor system. Intuitive data display and additional graphing and data visualization features make ENLIGHT<sup>Pro</sup> easy to use.



## Specifications <sup>B</sup> 1

	sm230-200	sm230-700	sm230-800
<b>Optical Properties</b>			
Number of Optical Channels <sup>2</sup>	1	4	16
Scan Frequency	100 Hz	1kHz	250 Hz
Wavelength Range	1510-1590 nm		
Wavelength Stability <sup>3</sup>	2 pm typ, 5 pm max		
Wavelength Repeatability <sup>4</sup>	1 pm, 0.05 pm with 1,000 averages		
Dynamic Range <sup>5</sup>	25 dB		
Optical Connectors	FC/APC (SC and E2000 available)		

<b>Mechanical Properties</b>			
Dimensions	17.5 mm x 18 mm x 1.75 mm		
Weight	4.1 kg (9 lbs max)		

<b>Environmental Properties</b>			
Operating Temperature	0° to 50°C		
Operating Humidity	0 to 80%, non-condensing		
Storage Temperature	-20° to 70°C		
Storage Humidity	0 to 95%, non-condensing		

<b>Electrical Properties</b>			
Input Voltage	7 - 36 VDC		
AC/DC Convertor	Included (100~240 VAC, 47~63Hz)		
Power Consumption	35 W typ., 50 max	46 W typ., 85 max	45 W typ., 85 max

<b>Data Processing Capabilities</b>			
Enhanced Data Management	ENLIGHT <sup>Pro</sup> in Windows XP Environment		
Processor Speed/ Type	1.4 GHz/ Low Voltage Pentium (fanless)		
Interfaces	Dual USB 2.0, Dual Serial (RS232/422/465), Dual Ethernet, GPIO, 3 in 3 out, Keyboard, Mouse, Video		
Memory & Storage Media	512 MB DDR, 100 GB 2.5" HDD		

<b>Options</b>			
8 or 16 Channel Expansion <sup>1</sup>	Optional	Optional	Included
Expanded Sensor Capacity <sup>6,8</sup>	λ range of 1460 - 1620nm doubles max sensors to 160 per channel, 2pm λ Repeatability at full acquisition speed		
2 kHz Scan Rate <sup>6</sup>	Available with 40nm λ range, (1525-1565nm), 0.5pm λ Repeatability		
1310nm λ Range <sup>6</sup>	Available custom λ range of 1280-1360nm		
Full Spectrum Data Display	Optional	Included	Included
Sensor Distance Measurement <sup>7</sup>	Optional	Optional	Included

Notes:

1. Denotes Beta product. For details see [www.micronoptics.com/product\\_designation.php](http://www.micronoptics.com/product_designation.php).
2. Expansion requires 4 integrated optical channels and 1 KHz scan rate to operate a sm041-408 or sm041-416 switch-type multiplexer. (500Hz scan rate is sufficient with 160nm λ range).
3. Captures effects of long term use over full operating temperature range of the instrument. (Assumes an FBG bandwidth of 0.25nm).
4. 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).
5. Defined as laser launch power minus detection noise floor. Adjustable 15 dB window within total range.
6. Available now in Beta prototype release.
7. Minimum FBG λ spacing is 1.5nm; FBGs must be in ascending λ order along the fiber; distance measurement accuracy is ~2m, 1KHz/80nm max.
8. Maximum scan frequency of 500Hz.