

# Optical Sensing Interrogator | sm125

## Applications

- Full Spectrum Measurements of fiber Bragg grating (FBG), extrinsic Fabry-Perot, long period grating (LPG), and other optical sensor components.
- Continuous lifetime health monitoring of bridges, dams, buildings, tunnels, ships, aircraft, trains, and other complex structures.
- Development of fiber optic sensors and transducers.

## Features

- High accuracy absolute measurements of strain, temperature, pressure and other static sensors.
- On-board NIST traceable wavelength reference.
- Wide wavelength swept laser supporting more sensors per channel.

## Deployments

- 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 sm125 Optical Sensing Interrogator is a compact, field proven, industrial grade static sensor interrogation module designed for robust, reliable, long term field operation.

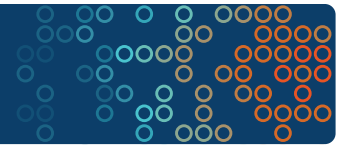
The sm125 Optical Sensing Interrogator is built upon the Micron Optics x25 optical interrogator core, featuring a high power, low noise swept wavelength laser, realized with Micron Optics patented Fiber Fabry-Perot Tunable Filter technology. The x25 interrogator core employs full spectral scanning and data acquisition, providing measurements with high absolute accuracy, flexible software post-processing, and high dynamic range performance. x25 based interrogators support continuous on-board NIST traceable wavelength reference components and are ideally suited to measure many different optical sensor types, including FBGs, long period gratings, extrinsic Fabry-Perot sensors, and many others. Well over half of the fiber optic sensors deployed today are measured with instrumentation that uses Micron Optics technology.

The Micron Optics “sm - Sensing Module” platform responds directly to the user commands of the optical interrogator core and outputs sensor wavelength data via Ethernet port and custom protocol. All module settings, sensor calculations, data visualization, storage, and alarming tasks are run on external pc or sensor processor module. The Sensing Module platform is ideal for custom, client developed system management tools, but is equally compatible with local or remote installations of Micron Optics ENLIGHT.



sm125 Field Module

Micron Optics ENLIGHT Sensing Analysis Software 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 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](http://www.micronoptics.com/sensing_software.php).



Specifications	sm125-200	sm125-500	sm125-700
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## Optical Properties

Number of Optical Channels <sup>1</sup>	1 (up to 16)	4 (up to 16)	4 (up to 16)
Scan Frequency	1 Hz	2 Hz	5 Hz
Wavelength Range	1520-1570 nm	1510-1590 nm	1510-1590 nm
Wavelength Accuracy <sup>2</sup>	10 pm	1 pm	2.5 pm
Wavelength Stability <sup>3</sup>	5pm	1 pm	2.5 pm
Wavelength Repeatability <sup>4</sup>	0.5 pm at 1 Hz, 0.2 pm at 0.1 Hz		
Dynamic Range <sup>5</sup>	40 dB	50 dB	30 dB
Full Spectrum Measurement	Included		
Internal Peak Detection Mode	Included		
Optical Connectors	FC/APC		

## Data Processing Capabilities

Interfaces	Ethernet - other interfaces available via an sp125 Sensing Processor Module
Protocols	Custom Micron Optics protocol via Ethernet (others available)
Remote Software	Spectral analysis, peak detection, data logger, peak tracking, and instrument control
LabVIEW™ Source Code	Allows for customization of remote software
Enhanced Data Management	ENLIGHT Sensing Analysis Software

## Mechanical, Environmental, Electrical Properties

Dimensions; Weight	117 mm x 234 mm x 135 mm; 2 kg (4.5 lbs)
Operating Temperature; Humidity	0° to 50° C; 0 to 80%, non-condensing
Storage Temperature; Humidity	-20° to 70° C; 0 to 95%, non-condensing
Input Voltage	7-36 VDC (100~240 VAC, 47~63 Hz), AC/DC converter included
Power Consumption at 12V	20 W typ, 30 Max

## Options

8 or 16 Channel Expansion	Please see our 8 or 16 channel sm041 multiplexers
Increased Scan Frequency <sup>6</sup>	2, 5, or 10 Hz

### Notes:

1. sm125 accommodates up to 4 integrated optical channels. Max of 16 ch possible when combined with sm041 multiplexer.
2. Per NIST Technical Note 1297, 1994 Edition, Section D.1.1.1, definition of "accuracy of measurement"
3. Captures effects of long term use over full operating temperature range of the instrument.
4. Per NIST Technical Note 1297, 1994 Edition, Section D.1.1.2, definition of "repeatability [of results of measurements]"
5. Defined as laser launch power minus detection noise floor.
6. 10 Hz scan rate available with 40 nm (1525-1565nm) wavelength range.