

Static Optical Sensing Interrogator | sm125



Description

The sm125 is a compact, industrial grade, static optical sensor interrogation module, field proven for robust, reliable, and long term field operation.

Built upon the Micron Optics x25 optical interrogator core, the sm125 Optical Sensing Interrogator features 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, high dynamic range performance and flexible software post-processing. The 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.

**High accuracy,
absolute measurements
of strain, temperature,
displacement, pressure
and many other sensors**

The Micron Optics “sm - Sensing Module” platform responds directly to the user commands

that controls the interrogator and outputs sensor wavelength data via Ethernet port and custom protocol. 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.

Micron Optics ENLIGHT Sensing Analysis Software is included with x25 interrogator systems and provides a single suite of tools for data acquisition, computation, and analysis of optical sensor networks. More information on ENLIGHT software can be found [here](#).

Key Features

Capacity of 100s of sensors resulting from multiple channels, wide wavelength range and high dynamic range. Expandable to 16 channels.

Proven reliability and longevity with over 100 million hours logged since 2000

Detailed optical spectrum enables versatile measurements of fiber Bragg gratings, long period gratings and Fabry-Perot sensors

Automatic calibration with on-board NIST traceable reference



Deployments

Structures (bridges, dams, tunnels, mines, buildings, oil platforms)

Oil & gas (well reservoir management, platform structural health, pipeline condition)

Medical devices (probes, catheters)

Aerospace (airframes, composite structures, wind tunnels, static tests).

Industrial measurements (industrial heaters and metal fabrication process control)



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Performance Properties

	sm125-200	sm125-500	sm125-700
Number of optical channels ¹	1	4	4
Scan frequency ²	1 Hz	2 Hz	5 or 10 Hz
Wavelength range	1520-1580 nm	1510-1590 nm	1510-1590 nm
Wavelength stability; accuracy ^{3,4}	5; 10 pm	1; 1 pm	2.5; 2.5 pm
Wavelength repeatability ⁵	1 pm at 1 Hz	0.5 pm at 1 Hz, 0.2 pm at 0.1 Hz	
Dynamic range ⁵	40 dB	50 dB	30 dB
Typical FBG sensor capacity ^{1,7}	10 - 20	60 - 120	60 - 120
Full spectrum measurement	Included		
sm041 switch compatible ¹	No	Yes	Yes
Optical connectors	FC/APC		

Interfaces and Software

Interfaces	Ethernet (other interfaces available via an sp125 Sensing Processor Module)
Enhanced data management	ENLIGHT Sensing Analysis Software
Remote software	Spectral analysis, peak detection, data logger, peak tracking, and instrument control

Physical Properties

Dimension; weight	117 mm x 234 mm x 135 mm; 2kg (4.5 lbs)
Operating temperature; humidity	0 to 50 degrees C; 0 to 80%, non-condensing
Storage temperature; humidity	-20 to 70 degrees C; 0 to 95%, non-condensing
Input voltage	7 - 36 VDC, AC/DC converter included (100~240VAC, 47~63Hz),
Power consumption at 12 VDC	20W typ, 30 max

The sm125 interrogators comply with the following ⁷



Accessories

sm041: Expansion from 4 channels to 8 or 16 channels.

sp125: Sensing processing module

rmk-25: 19" Rack Mount Kit for 125

Options

Below are options and customizable features:

Optical channels: 1, 2, 3 or 4 channels

Scan frequency: 1, 2, 5, or 10 Hz²

Wavelength scan range: 40, 60 or 80 nm

Loss budget boost: Overcomes additional front end losses of 5dB

Connectors: E2000 Connectors

Premium extended warranty: 3 years

Notes

- Expansion requires 4 integrated optical channels to operate an sm041-408 or sm041-416 switch-type multiplexer.
- 10 Hz scan rate available with 40 nm (1525-1565nm) wavelength range.
- Per NIST Technical Note 1297, 1994 Edition, Section D.1.1.1, definition of "accuracy of measurement."
- Captures effects of long term use over full operating temperature range of the instrument.
- Per NIST Technical Note 1297, 1994 Edition, Section D.1.1.2, definition of "repeatability [of results of measurements]."
- Defined as laser launch power minus detection noise floor.
- Complies with the WEEE Directive 2012/19/EU for the following European countries: UK, IT, DE, FR, NL, BE, ES, CH.