Description

The sm230 is a rack mounted, industrial grade, dynamic optical sensor interrogation module, field proven for robust, reliable, and long term field operation.

Built upon the Micron Optics x30 optical interrogator core, the sm230 Optical Sensing Interrogator features a high power, low noise swept wavelength laser, realized with Micron Optics patented Fiber Fabry-Perm Tunable Filter technology. The x30 interrogator core employs high speed hardware peak detection, optimized for rapid data acquisition of many simultaneous FBG sensors. The 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.

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.

Key Features

- **Capacity of 100s of sensors** resulting from multiple channels, wide wavelength range and high dynamic range. Expandable to 16 channels.
- **Wide wavelength range** up to 160 nm available
- **Spectral Diagnostic View** for optimizing sensor system setup and operation
- **Proven reliability and longevity** with over 100 million hours logged since 2000
- **Synchronized measurements** among multiple interrogators

**Fast, repeatable measurements** of strain, temperature, acceleration and displacement and many other sensors

Deployments

- **Structures** (bridges, dams, tunnels, mines, buildings, oil platforms)
- **Energy** (wind turbines, oil wells, pipelines, nuclear reactors, generators)
- **Transportation** (railways, trains, roadways, specialty vehicles, cranes)
- **Marine vessels** (hull, mast, rudder, deck, cargo containers)
- **Aerospace** (airframes, composite structures, wind tunnels, static and dynamic tests)
- **Homeland security** (perimeter intrusion, heat detection, security gate monitoring)
## Performance Properties

<table>
<thead>
<tr>
<th></th>
<th>sm230-200</th>
<th>sm230-500</th>
<th>sm230-800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of optical channels</td>
<td>1</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Scan frequency</td>
<td>100 Hz</td>
<td>500 Hz</td>
<td>250 Hz</td>
</tr>
<tr>
<td>Wavelength range</td>
<td>1520-1580 nm</td>
<td>1510-1590 nm</td>
<td>1510-1590 nm</td>
</tr>
<tr>
<td>Wavelength stability</td>
<td>2 pm typ, 5 pm max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength repeatability</td>
<td>1 pm, 0.05 pm with 1000 averages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic range, adjustable gain</td>
<td>25 dB</td>
<td>25 dB</td>
<td>21 dB</td>
</tr>
<tr>
<td>Typical FBG sensor capacity</td>
<td>10 - 20</td>
<td>60 - 120</td>
<td>240 - 480</td>
</tr>
<tr>
<td>Spectral Diagnostic View</td>
<td>Included</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sm041 Switch Compatible</td>
<td>No</td>
<td>No</td>
<td>Included</td>
</tr>
<tr>
<td>Optical Connectors</td>
<td>FC/APC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FBG Recommendation</td>
<td>Bandwidth ~ 0.25 nm, Isolation &gt;15 dB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interfaces and Software

- **Interfaces**: Ethernet - other interfaces available via an sp140 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**: 435 mm x 442 mm x 45 mm; 4.1 kg
- **Rack Mount Hardware**: Included
- **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 (100~240 VAC, 47~63 Hz)
- **Power consumption at 12 V**: 25 W typ, 50 max

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### Options and customizable features

- **Optical channels**: 1, 4, 8 or 16 channels
- **Scan frequency**: up to 2000 Hz
- **Wavelength scan range**: 60, 80 or 160 nm
- **Loss budget boost**: Overcomes additional front end losses of 14 dB for 1-4 channel and 10 dB for 16 channel interrogators

### Notes

2. Scan frequency of 2000 Hz is available for the 40 nm sm230-500.
3. Captures effects of long term use over full operating temperature range of the instrument.
5. Defined as laser launch power minus detection noise floor. Adjustable gain positions 13 dB window within total range.
6. Used for performance qualification. Bandwidths of 0.1 to 1.0 nm are compatible, but some may reduce performance.
7. Assumes nominal wavelength range of +/- 2nm per FBG sensor.
8. Maximum scan frequency of 500 Hz for 160nm.
9. Complies with the WEEE Directive 2012/19/EU for the following European countries: UK, IT, DE, FR, NL, BE, ES, CH.

### Accessories

- **sp140**: Sensing processing module
- **ew300**: Premium extended warranty 3 years
- **ex130**: ATEX certificate

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