HYPERION Optical Sensing Instrument | si155

Description

The si155 is an industrial grade fan-less optical sensing interrogator. Featuring both static and dynamic full spectrum analysis, the si155 provides long-term, reliable and accurate measurements of hundreds of sensors on 4 parallel, 160 nm wide channels.

The si155 features a high-power, low-noise, ultra-wide swept wavelength laser with guaranteed absolute accuracy on every scan which is realized with Micron Optics patented Fiber Fabry-Perot filter and wavelength reference technology.

The HYPERION platform, on which the si155 is based, features groundbreaking capabilities including high-performance DSP and real-time FPGA processing on-board. This enables rapid, full-spectrum data acquisition and flexible peak detect algorithms of Fiber Bragg Gratings (FBG), Long Period Gratings, Fabry-Perot (FP) and Mach-Zehnder (MZ) sensors with low-latency access to data for closed loop feedback applications.

Dynamic and absolute measurements of **FBG** & **FP sensors** on **4 parallel,160 nm** wide channels and **ENLIGHT** compatible.

The HYPERION platform is now compatible with ENLIGHT, Sensing Analysis Software, which provides a single suite of tools for data acquisition, computation, and analysis of optical sensor networks, see http:// www.micronoptics.com/products/sensing-solutions/software/ for more information. The HYPERION platform also includes a a comprehensive Application Programming Interface (API) and examples written in LabVIEW, Python, Matlab, C++ and C#.

Key Features

Standard, and High Speed models, each with an available depolarized source and up to 4 parallel channels

Dynamic and absolute measurements of FBGs, LPGs, FP and MZ sensors from detailed optical spectrum

Deep, continuous dynamic range is available to each sensor on each channel, independent of differential system losses

Data verification key guarantees only valid output. Each data set is calibrated and verified against a permanent NIST traceable reference.

Proven reliability and longevity of the Micron Optics swept wavelength source, with over 100 million hours logged since 2000

Deployments

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

Medical devices (probes, catheters)

Industrial measurements (industrial heaters and metal fabrication process control)

Energy (wind turbines, oil wells, pipelines, nuclear reactors, generators)

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

Security (perimeter intrusion, heat detection, security gate monitoring)

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

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Performance Properties

Measurement option	Enhanced visibility, 10 Hz	Standard, 100 or 1000 Hz	High speed, 5000 Hz
Number of channels	1 or 4 parallel channels	1 or 4 channels	1 or 4 channels
Wavelength range	1500-1600 or 1460-1620 nm	1520-1580, 1500-1600 or 1460-1620 nm	1500-1580 or 1510-1590 nm
Wavelength accuracy / stability [1]	1 pm / 1pm	1 pm / 1pm	2 pm / 3 pm
Wavelength repeatability [2]	1 pm, 0.3 pm at 1 Hz	1 pm, 0.05 pm at 1 Hz	2 pm, 0.05 pm at 1 Hz
Dynamic range / continuous [3]	35 dB peak / 45 dB FS	25 dB peak / 40 dB FS	17 dB peak / 40 dB FS
Full spectrum measurement [4]	Included, data rate at 10 Hz		
Optical connectors	LC/APC		
Compatible sensors [5]	Fiber Bragg Gratings, Long Period Gratings, Fabry-Perot and Mach-Zehnder Sensors		
Depolarizer Option Available [6]	Yes		

Interfaces and Software

Interface	Ethernet
Software	Comprehensive API and example support for LabVIEW™, Python, Matlab, C++, C#

Physical Properties

Dimensions / weight	206 mm x 274 mm x 79 mm / 3.0 kg
Operating / storage conditions	-20 to 60 C, < 80%RH non-condensing / -30 to 70 C, < 95%RH non-condensing
Input voltage	9 - 36 VDC, AC/DC converter included (100~240 VAC, 47~63 Hz)
Power consumption at 12 V	30 W typ, 40 max

Example Configurations

	Descriptions
si255-ST-01-1500-1600–0100-NO	1 ch si155 ST with 1500-1600 nm scan range, 100 Hz scan rate and no internal accessories
si155-EV-04-1460-1620-0010-DP	4 ch si155 EV with 1460-1620 nm scan range, 10Hz scan rate and internal depolarizer option
si155-HS-04-1510-1590-5000-DP	4 ch si155 HS with 1510-1590 nm scan range, 5 kHz scan rate and internal depolarizer option

[7]

Accessories

x55_rkm	19" rack mount kit
x55_smk	surface mount kit
x55_cas	x55 transport case
x55_atx	ATEX certified
x55_ew3	3 year extended warranty
oa2001	LC/APC-FC/APC connectivity kit

Notes

1 Accuracy per NIST Technical Note 1297, 1994 Edition, Section D. 1.1.1, definition of "accuracy of measurement." Stability captures effects of long term use over operating temperature range.

2 Per NIST Technical Note 1297, 1994 Edition, Sect D.1.1.2, definition of "repeatability [of results of measurements]."

3 Loss and/or sensor shape may affect repeatability and accuracy for each option as described in Micron Optics TN 1115.

4 For faster scan rates >10 Hz, data bandwidth may limit rate of multichannel spectral streams.

5 FBG bandwidths of 0.25 nm used for performance qualification.

6 For details regarding the Depolarized laser option, see http://www.micronoptics.com/wp-content/uploads/2016/11/TN1108_x55_Depolarized_Laser_Option.pdf

7 Complies with the WEEE Directive 2012/19/EU for the following European countries: UK, IT, DE, FR, NL, BE, ES, CH.

Ordering Information

si155-mm-cc-lwvl-uwvl-ssss-aa

mm Measurement option
- EV Enhanced visibility
- ST Standard
- HS High speed

cc Number of channels
- 04 4 channel
- 08 8 channels
- 16 16 channels

lwvl Lower wavelength in nanometers

uwvl Upper wavelength in nanometers

ssss Scan rate in Hz

aa Internal Accessory Option
- NO None
- DP Depolarizer

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