W8 INTERROGATOR

Description

The W8 optical sensing instrument is an economic commercial grade interrogator, featuring 160nm scanning range on each of its 8 monitoring channels. The instrument is optimized for both static and dynamic measurements can be operated in full spectrum mode at 5Hz and in sensor peak detection mode at 50Hz. Faster options available. The W8 supports up to 44 Fiber Bragg Gratings (FBG) based sensors on each of its 8 channels, for a total of 352 sensors per instrument. Also available with 1 or 4 channels for smaller sensor counts, and with 16 channels for higher sensor capacity (see WS, W4 and W16 datasheets for these). Enclosed in a 1U rack mountable enclosure.

The W Series of rugged interrogators represents a significant new entry in the optical sensing instruments marketplace. Our W8 technology leverages the experience we derived from our engineering know-how through the years, and from customers feedback from our FAZT Series, M Series, and S Series Interrogators, which are used extensively in civil engineering, aerospace, marine, railways, roads, energy, geotechnical, industrial, security, medical, and many other commercial applications. The W8 interrogator is also useful for R&D. The industrial grade design scales well for volume production.

Benefits

Repeatability, accuracy, and dynamic range: Using state-of-the-art laser calibration technology and spectral analysis firmware, the W8 interrogator features +/- 2pm repeatability, +/-10pm accuracy, and 25dB dynamic range with automatic gain and threshold control adjustments for measurements across its 160nm scan range. Manual settings option is also included.

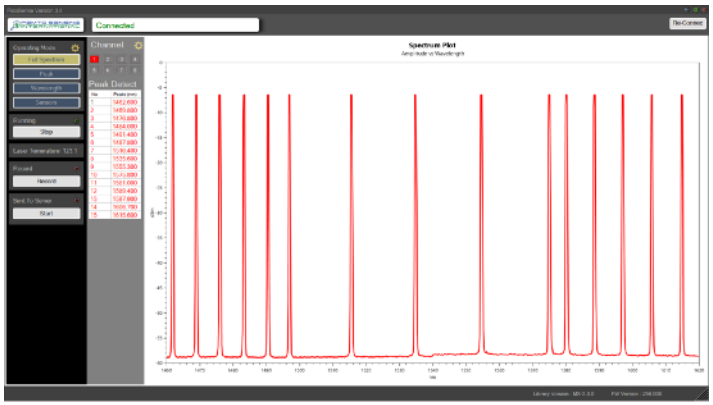
Top reliability: The W8 Interrogator is based on a solid state laser technology platform that has been deployed in volume in various field applications. The interrogator has no movable parts and no tunable filters, which enables top reliability over its operating temperature range of -15C to +55C.

High sensors capacity and adaptive to more types of sensors: Monitors up to 44 sensors per channel. Compatible with most FBG sensors in the market: The W8 advanced internal high-speed hardware and firmware algorithms enable reliable tracking of FBGs with bandwidths from 250pm (as those used in temperature, strain, and pressure sensors) to 3.0nm (as those used in bio-sensing).

Systems and network ready: Fast internal processor, TCP/IP Ethernet, and PicoSense software. Optional second internal processor (Raspberry PI) for customer developed applications software.

Lowest Cost and High Quality: The W8 Interrogator is based on the company's solid state instruments platform and it has been optimized to address applications demanding the lowest cost while maintaining the quality and reliability of a high quality instrument.

Femto Sensing Canada, Sweden, Japan, South Korea, China, and Femto Sensing USA are manufacturing and support facilities of Femto Sensing International, LLC



Applications include Civil Engineering, Geotechnical, Industrial, Energy, Security, Transportation, and Research Centers

Femto Sensing International undertakes a rigorous development process before products release. The company is also firmly committed to continuous improvements after release to ensure performance and reliability to the highest standards. Specifications are subject to update without notice. Femto Sensing International, LLC is a wholly owned subsidiary of Technica Optical Components, LLC. Address: 3657 Peachtree Rd, Suite 10A, Atlanta, GA, 30319, USA / +1 404 326 3469 / sales@femtosensing.com / www.femtosensing.com

W8 INTERROGATOR

PARAMETER	SPECIFICATIONS	NOTES
Wavelengths Range	160nm	1460nm to 1620nm
Number of Channels	8	Also available in 1 (WS), 4 (W4), and 16 channels (W16) configurations
Number of Sensors per Channel	1 to 44	8ch * 44 = 352 sensors (with ~3.6nm spacing between adjacent FBG sensors). See note 1.
Wavelength Accuracy	+/- 10pm	Defined over long-term
Wavelength Repeatability	+/- 2pm	Defined over long-term
Scan Frequency (FBG Peaks Processing)	50Hz	FBG Sensors Peaks vs. Wavelength on all channels. Also available with 100Hz option.
Scan Frequency (Full Spectrum)	5Hz	Full Spectrum display at 5Hz AND Full Spectrum data recording at 5Hz, in parallel. Also available with 10Hz full spectrum display and recording option.
Maximum Laser Output Power	4.4mW	Optical sensing performance is maintained even with 20dB optical power loss. See note 2.
Dynamic Range	25dB	Controlled automatically. Can also be controlled manually. Six gain stages.
Fiber Lead-In and Sensor Range (Distance)	10km	Lead-in lengths up to 5km and FBG1 to FBGn in each array to be within 5 km from each other
Input Voltage and Power Consumption	12V and 8W	Auto-detect 100V to 240V AC with 12V supply block included
Operating Temperature	-15 to +55°C	Designed for commercial field use
Dimensions (WxDxH)	440x298x44mm	All W Series Interrogators have the same dimensions (WS, W4, W8, W16)
Weight	2.6kg	All W Series Interrogators have the same weight (WS, W4, W8, W16)
Color	Black	Other colors and graphics available for OEM purchases of 10 or more units per PO
Optical Connection to Sensors	LC/APC with Internal Shutters	The Internal Shutters are independent for each channel and open and close automatically when LC/APC connectors are inserted or removed from the interrogator, for protection
Compliance to standards	YES	REACH and ROHS Compliant
Communications	YES	TCP/IP100 Mbps Ethernet
Supplied Software	YES	User friendly PICOSENSE Software in .NET environment and API support are included.
Second Internal Processor (Raspberry Pi)	OPTIONAL	Open system available for customers who want to develop and run their own applications specific software and custom communications protocols from within the W8 Interrogator. See note 3.

Note 1: FBGs from 0.1nm to 3nm BW@3dB (FWHM) supported. Best performance results obtained using BW = 500pm FBGs. It is recommended for optical systems designers to leave at least 1nm of safety margin on both sides of the expected wavelength range of each FBG sensor in the network.

Note 2: Optical losses in the sensors network can be caused by cumulative losses from many FBG based sensors that are daisy-chained on the same fiber string, from long fiber distances (hundreds of meters or kilometers) between the instrument and the sensors, or from in-line splices, connectors, and optical splitters/combiners.

Note 3: All W8 interrogators equipped with the secondary Raspberry PI (RPI) processor have two IP addresses, and retain the capability of running in standard mode (bypassing the RPI) until the customer chooses to enable the RPI processor to run their software. Using the RPI brings the ability to turn power on/off to the W8 unit (wake on LAN, wake/sleep on Clock), set alarms or notifications based on FBG sensors status, etc. Customers with the RPI option receive our W8 Developer's Commands Library.

Applications include Civil Engineering, Geotechnical, Industrial, Energy, Security, Transportation, and Research Centers

Femto Sensing International undertakes a rigorous development process before products release. The company is also firmly committed to continuous improvements after release to ensure performance and reliability to the highest standards. Specifications are subject to update without notice. Femto Sensing International, LLC is a wholly owned subsidiary of Technica Optical Components, LLC. Address: 3657 Peachtree Rd, Suite 10A, Atlanta, GA, 30319, USA / +1 404 326 3469 / sales@femtosensing.com / www.femtosensing.com