

# DATASHEET

## FAZT I4W Interrogator



## Description

The FAZT I4W optical sensing instrument is a revolutionary new breed of interrogator. Featuring 4 monitoring channels the FAZT-I4W is the company's lower cost workhorse model instrument. Enclosed in a field deployable stainless-steel casing, the instrument provides peak detection for up to 30 Fiber Bragg Gratings (FBG) based sensors on each of its 4 channels. The instrument can be operated in full spectrum and sensor peak detection modes. The FAZT I4W is optimized for both static and dynamic measurements.

Our family of rugged FAZ Technology interrogators is used extensively in marine, railways, roads, energy, civil, geotechnical, industrial, security, medical, and many other commercial applications. This workhorse model is specifically useful for security, civil engineering, energy, process control, material qualification labs and R&D programs. The industrial grade design scales well in volume production.

## Benefits

**High resolution, precision and accuracy:** The FAZT I4W Interrogator returns measurements in 1pm steps across its wavelength range. Using patented FAZ Technology scan-by-scan calibration to its internal Gas Cell, the instrument features <0.2pm precision and absolute accuracy of 3pm.

**Top reliability:** The FAZT I4W Interrogator is based on a semiconductor tunable laser that has no movable parts, no tunable filters, and no opto-mechanical switches, which delivers top reliability over a broad temperature range to form an integral part of a very rugged and reliable sensing system.

**Adaptive to more types of sensors:** The integrated electronics and embedded software allow the user to quickly adapt the instrument's performance parameters to fit many different sensor configurations. Designed to monitor many types of sensors from narrow bandwidth (100pm) FBGs used in high-sensitivity accelerometers, pressure sensors, hydrophones, and microphones, to wide bandwidth (1.5nm) FBGs used in bio-sensing. Hardware implementation of peak tracking algorithms for FBG sensors including programmable gain per sensor, width/height thresholds, and distance to sensor setting for accuracy at long distance. The laser output power is -4 dBm to 0 dBm.

**Systems and network ready:** High speed data acquisition and on-board computer processing make the FAZT I4W easy to use and easy to transmit large volumes of data by network connection. The Ethernet port is used for high speed data transfer is 100Mbit/s, with all interrogator settings programmable over a REST interface. NTP (<10ms timestamps) Time accuracy.

**Low Cost and High Quality:** The FAZT I4W Interrogator is based on the company's flagship ultimate performance FAZT I4G Interrogator and it has been optimized to address applications demanding a lower cost while maintaining the quality and reliability of a premium grade instrument.

## Performance

Wavelengths Range	35nm	1529nm to 1564nm
Number of Channels	4	
Number of Sensors per Channel (see Note 1)	1 to 30	4ch * 30 = 120 sensors (assuming 1.2nm spacing of FBG sensors)
Wavelength Sample Size / Resolution	1pm	Raw data. Resolution can be further improved with averaging
Wavelength Absolute Accuracy	< 3pm	With Internal Gas Cell to guarantee long-term performance
Wavelength Precision	<0.2pm	Standard deviation of a tracked HCN P10 Gas Cell line measured >8-hours
Wavelength Repeatability (see Note 2)	<0.2pm	120fm typical achieved with suitable sensors
Laser Line-Width	20 MHz	Self-heterodyne measured line-width at static wavelength
Laser Output Power per Channel (see Note 3)	-4 to 0dBm	
Scan Frequency / FBG Processing	1kHz	
Scan Frequency (Full Spectrum @ 1pm)	4/16Hz	4Hz for 4 channels or 16Hz for 1 channel, with 1pm resolution
Sensor Range / Distance	0 to 10km	Lead-in cable (0 to 7.5km), FBG section (0 to 3.25km)

## Environmental

Operating temperature	0 to +55°C	
Storage temperature	-20°C to +70°C	

## Physical

Dimensions (W x D x H)	325x276x88mm	Color is White
Max. weight	4.4 kg	
Housing material	Stainless steel	
Input Voltage and Power Consumption	12V and 25W	Auto-detect 100V to 240V AC with 12V supply block included
Fiber port	LC/APC	We offer hybrid optical jumpers and adapters to FC/APC, SC/APC, and other sensor connectors
Certifications and Test Reports	YES	CE Certified, Emissions and Immunity to EN61326-1:2013, EN55011:2009+A1:2010, EN61000-3-2:2014, EN61000-3-3:2013, Safety Standards EN61010-1, Laser Safety to IEC 60825, ATEX Compliance Certification Available, REACH and ROHS Compliant.
Communications Interface	YES	100Mbps Ethernet, REST control interface and multiple data output formats/ports
Supplied Software	YES	FEMTOSENSE configuration tool, LABVIEW interface examples, API Support Document

**Note 1:** FBGs from 100pm to 1.5nm BW@3dB (FWHM) are supported. Best performance results obtained using 160pm FBGs.

**Note 2:** Standard deviation measured over a 10 second duration for a stable FBG peak. The FBG FWHM is 100pm and the measured reflected FBG peak power is -15dBm.

**Note 3:** Dynamic programmable receiver gain per sensor (4 levels covering 12dB of gain) delivering >25dB optical power dynamic range (saturation - minimum detectable power levels) at kHz sweep rate.

CONTACT  
INFORMATION

Optics11  
+31 20 598 7917  
[info@optics11.com](mailto:info@optics11.com)  
[www.optics11.com](http://www.optics11.com)

VISITING  
ADDRESS

Optics11  
WN Building  
De Boelelaan 1081  
1081 HV Amsterdam  
The Netherlands

SHIPPING  
ADDRESS

Optics11  
De Boelelaan 1081  
1081 HV Amsterdam  
The Netherlands