

# FiSpec<sup>®</sup> FBG X100

Ultraminiature, robust and cost-effective fully-integrated FBG-interrogation system with embedded light source for mobile and industrial applications.

## Overview

With an outstanding and unprecedented small size, the FiSpec FBG X100 integrates all necessary components for the analysis of fiber Bragg grating (FBG) and Fabry-Perot sensors. Its compact and lightweight design enables the application of fiber Bragg grating sensor technology in applications where space is limited.



## Key Features

- Unique fully-integrated FBG-interrogation system
- High spectral resolution from 0.2nm
- Compact and robust
- Up to 100Hz speed

## Used for

- Interrogation of FBG sensor chains
- Interrogation of fabry-perot sensors

## Applications

- Strain measurement
- Temperature measurement
- Force measurement
- Pressure measurement
- Curvature and displacement detection

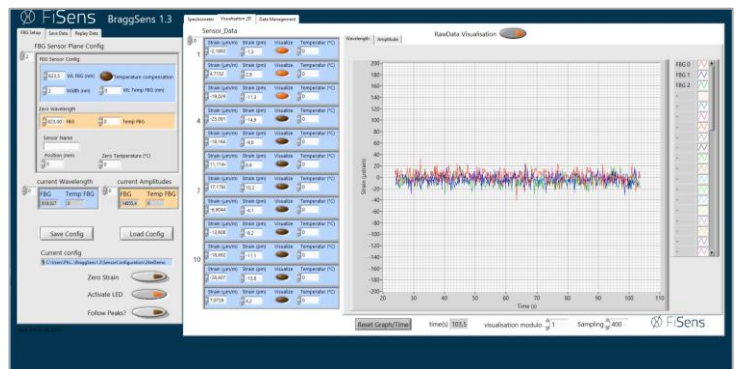
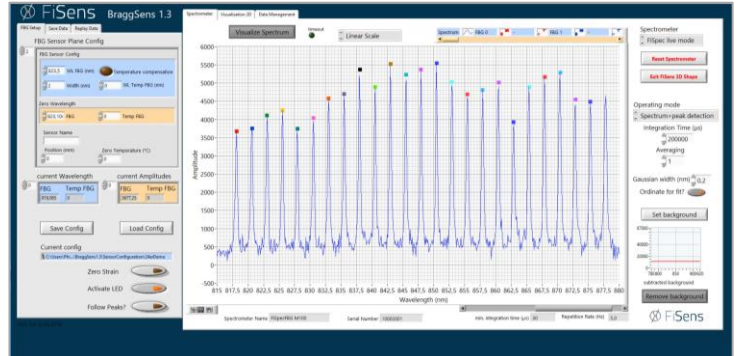
## Specifications

Focal length	13 mm
Diffraction grating	Aspheric chirped fiber grating
Optical entrance slit	5µm (SM800 fiber)
Spectral range	800-900nm
Mean spectral pixel pitch	$\Delta\lambda_{\text{Pixel}} \approx 0.2\text{nm}$
Physical resolution	$\Delta\lambda_{\text{FWHM}} \approx 0.6\text{nm}$
FBG-interrogation precision	$\pm 14/7/2\text{pm @ } 100/25/5\text{Hz}$
Strain/Temp. resolution	$\sim 20/10/3 \mu\epsilon // \sim 2/1/0,3 \text{ K}$
Dynamic range	1200:1
Exposure time range	30µs to 65s
Repetition rate	up to 100 Hz
Detector	Linear CMOS sensor
On-board processing	Signal averaging, FBG-analysis
Power consumption	$\sim 700\text{mW}$
Digital interface	USB 2.0 Full-Speed
Optical interface	FC/APC Connector
Dimensions	65 x 48.5 x 15.3mm ( $\sim 45\text{ccm}$ )
Weight	60g
Thermal stability	0.02nm/K
Operating temperature	0°-50°C

## FBG Interrogation Software

Every FiSpec FBG X100 includes FiSens BraggSens user software developed for both general-purpose spectrum acquisition and fiber Bragg Grating sensor evaluation. FiSens BraggSens comprises sophisticated algorithms for data acquisition and analysis, which provides the following features:

- Take and display series of spectra
- Dynamic peak detection of each FBG signal
- Data recording and playback
- Zooming in and out
- Automatic calculation of wavelength-dependent strain and temperature shift
- On-Chip Interrogation
- Dark spectrum removal
- Manual sensor configuration possible
- Import and export most ASCII-based file formats
- Real-Time streaming over UDP-Port



## FBG X100 Schematic Drawing

