

FiSpec[®] FBG X150

Highresolution, fast and compact fully-integrated FBG-Interrogation system with embedded light source for mobile and industrial Applications.

Overview

With an outstanding precision and repetition rate within an unprecedented miniature size, the FiSpec FBG X150 integrates all necessary components for the analysis of fiber Bragg grating (FBG) sensor chains. Its rugged and lightweight design enables the integration of FBG-technology even in applications where space is limited.



Key Features

- Unique fully-integrated FBG-interrogation system
- High spectral resolution from 0.2nm
- Compact and robust
- 3pm FBG resolution @500Hz speed

Used for

- Interrogation of FBG sensor chains and fabry-perot sensors

Applications

- Strain Measurement
- Temperature Measurement
- Force Measurement
- Pressure Measurement
- Curvature and Displacement Detection

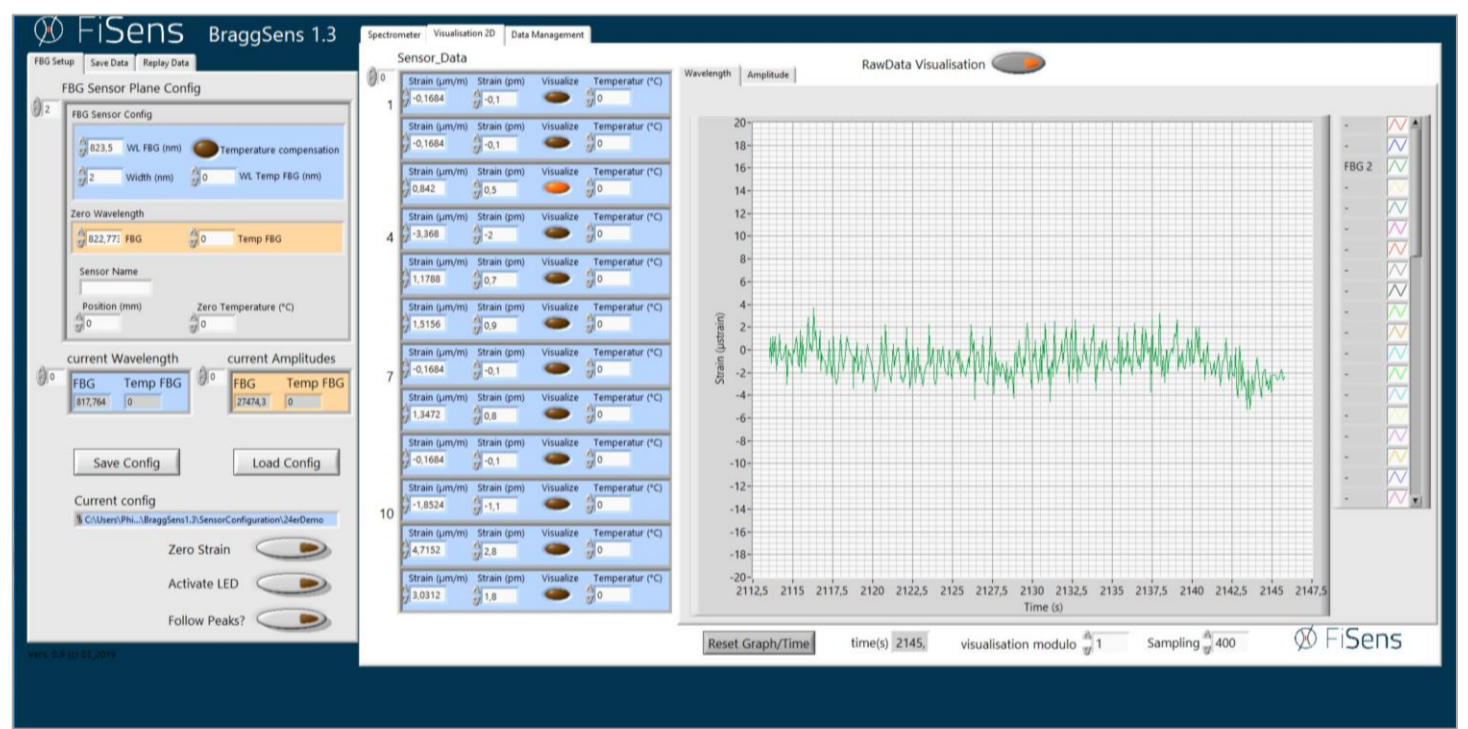
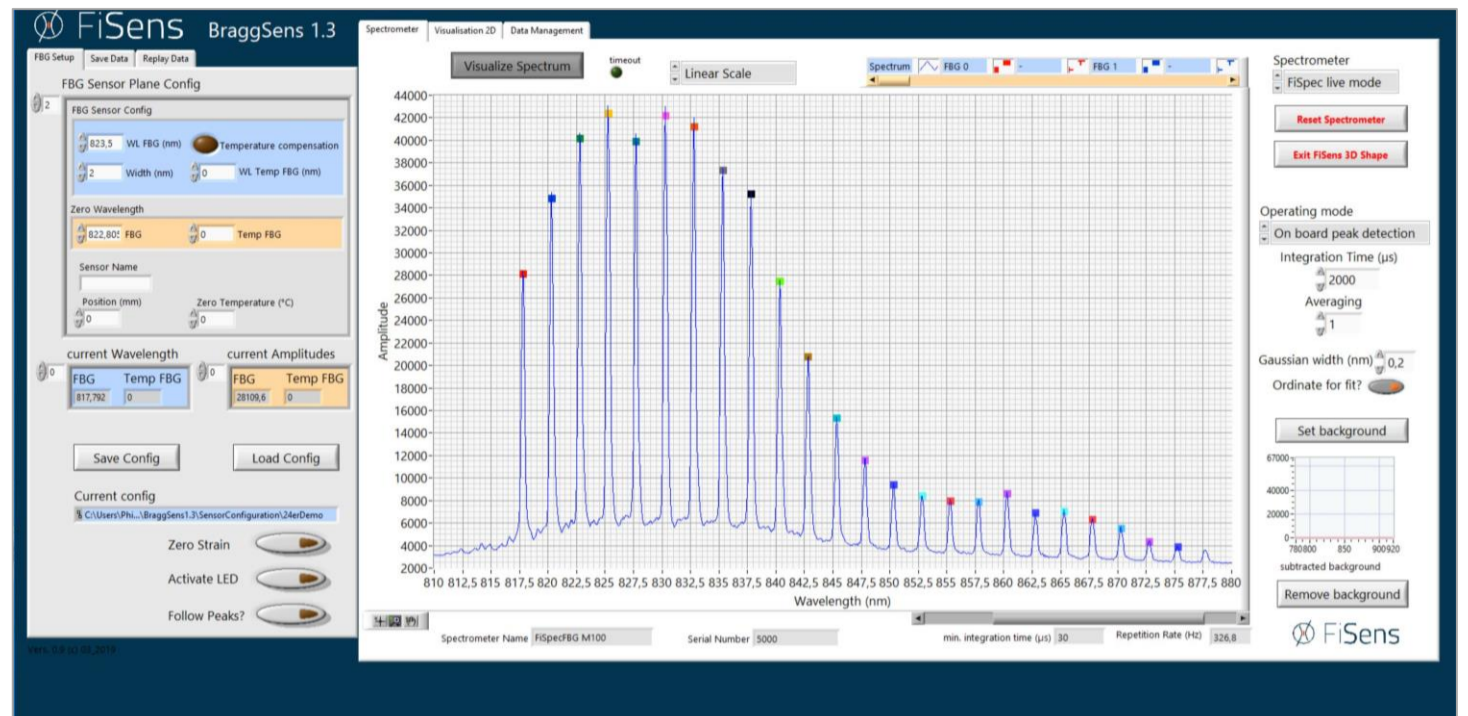
Specifications

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|-----------------------------|--|
| Focal length | 13 mm |
| Diffraction grating | Aspheric chirped Grating |
| Optical entrance slit | 5 μ m (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 | $\pm 3/2/0.6\text{pm}$ @ 500/250/50Hz |
| Strain/Temp. resolution | $\sim 5/3/1 \mu\epsilon$ // $\sim 0.5/0.3/0.1 \text{ K}$ |
| Dynamic range | 1200:1 |
| Exposure time range | 30 μ s to 65s |
| Repetition rate | up to 500Hz |
| Detector | Linear CMOS sensor |
| On-board processing | Signal averaging, FBG-analysis |
| Power consumption | $\sim 1\text{W}$ |
| Digital interface | USB 2.0 Full-Speed |
| Optical interface | FC/APC Connector |
| Dimensions | 100 x 68 x 15mm ($\sim 102\text{ccm}$) |
| Weight | 120g |
| Thermal stability | 0.02nm/K |
| Operating temperature | 0° - 50°C |

FBG Interrogation Software

Every FiSpec FBG X150 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 mosts ASCII-based file formats
- Real-Time streaming over UDP-Port



FBG X150 Schematic Drawing

