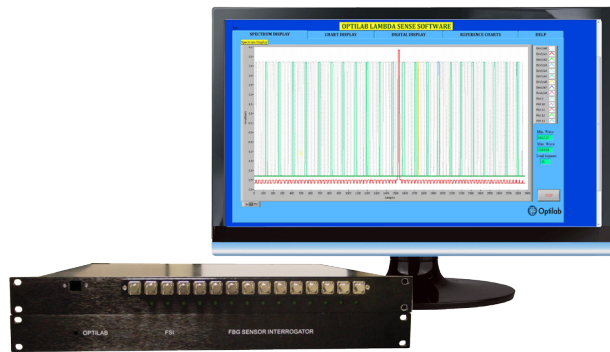


FBG Sensor Interrogator, Standard Series

The Fiber Sensor Interrogator (FSI) series is a measurement system for FBG based optical sensing applications. The FSI is ideal for continuous structure health monitoring (SHM).

FSI, FBG Sensor Interrogator, Standard Series



Product Description

The Fiber Sensor Interrogator (FSI) series is a fully-integrated, high-resolution, measurement system for Fiber Bragg Grating (FBG) based optical sensing applications. The FSI is ideal for continuous Structure Health Monitoring (SHM) of strain, temperature, pressure, inclination, and displacement on bridges, dams, buildings, ships, aircraft and more. The FSI can simultaneously have low speed sensing with 1 μm resolution and high speed sensing in a single chassis. The FSI system has 14 channels allowing the single system to monitor 320 individual FBG sensors. Optilab has developed two innovative softwares: a customizable LabView interface for OEM integration and a C-based interface for applications with cloud computing and mobile interface. Please go to Optilab.com/fsi for more information.

Features

- 14 independent fiber channels
- High resolution of $\pm 1 \mu\text{m}$
- Easily customizable LabView software for R&D OEM integration
- C-based software for applications with cloud computing and mobile interface
- Extremely reliable, ruggedized design
- Most cost-effective solution in market
- Designed, built in USA; Buy American

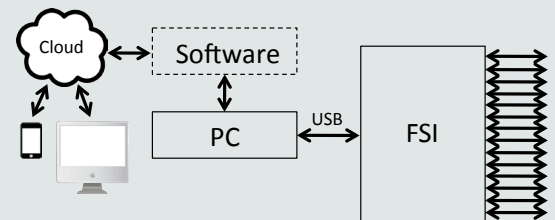
Applications

- Fiber Bragg grating (FBG), extrinsic Fabry-Perot, long period grating (LPG) measurements
- Structure Health Monitoring
- Fiber optic sensors and transducers
- Laboratory Testing and Measurement

PRODUCT DETAILS

General Specifications

Number of FBG Sensors in one Channel (3 nm spacing)	23 max.
Number of Optical Channels	14
FBG Sensors Monitored (3 nm spacing)	up to 320
Dynamic Range	30 dB
FBG Range	1525 nm to 1595 nm
Measurement Resolution	$\pm 1 \mu\text{m}$
Repeatability	$\pm 0.2 \mu\text{m}$
Control/Monitoring	USB 2.0 Interface



Software Diagram

Deployment

- ✓ Civil: bridges, dams, tunnels, mines, buildings
- ✓ Oil & gas: well reservoir, platform, pipeline
- ✓ Marine vessels: hull, mast, rudder, deck, containers
- ✓ Transportation: railways, trains, roadways, cranes
- ✓ Security: intrusion, heat detection, security gate
- ✓ Aerospace: structure integrity, vibration, strain

Ordering Information

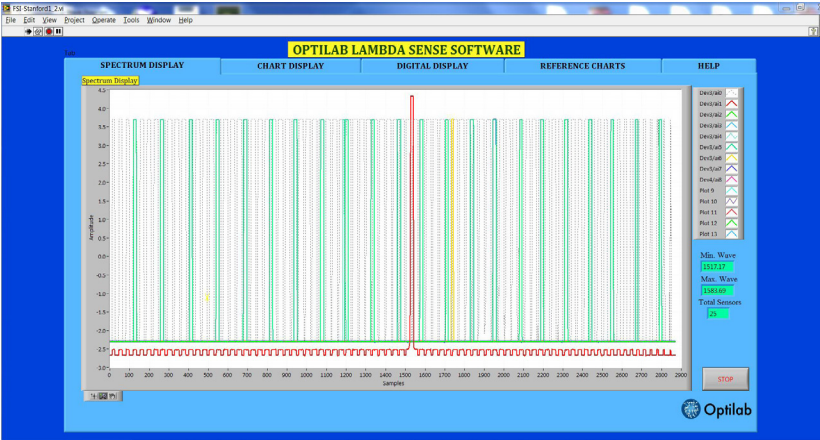
FSI-S

Software

LambdaSense; LabView software for OEM



LambdaSense® is an easily customizable LabView-based environment that provides wavelength monitoring and control on a PC. LambdaSense is designed for Research & Development OEM intergration. Please visit optilab.com/lambda for more detail.

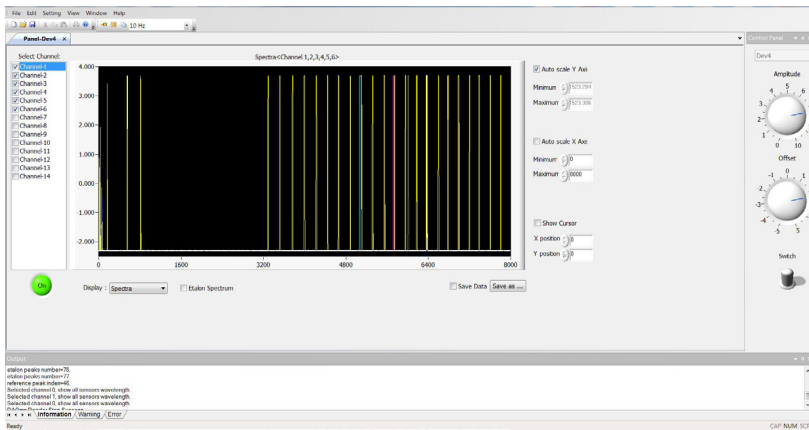


LabView-based software for OEM integration

C-Based software with cloud computing



Optilab has also developed a C-based software for large scale applications with cloud computing. This sensing data can be streamed to computers and mobile devices in a numerical, graphical 2D, or 3D model visual interface. Optilab has also developed iOS software for iPad and iPhone for mobile access. Please visit optilab.com/cloud for more detail.



C-based software for applications

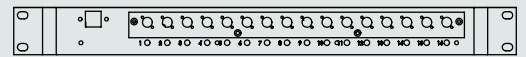
Hardware

Swept Wavelength Laser (SWL)



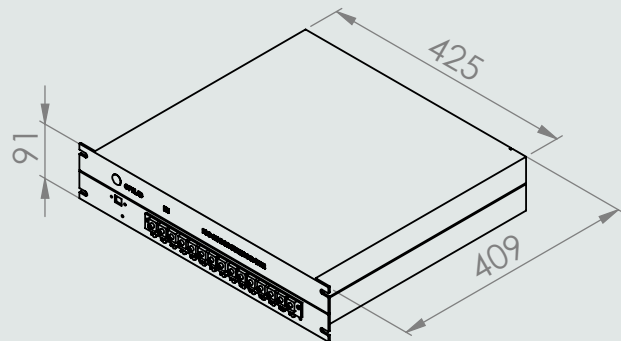
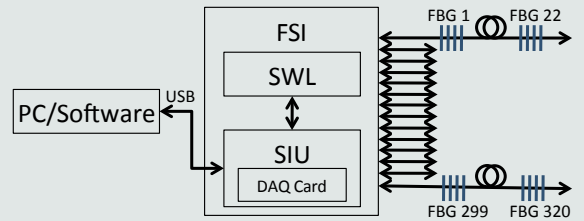
The SWL serves as an interrogating laser source for the FSI. There are different variations ranging from high power to wide band. Please visit optilab.com/swl for more information.

Sensor Interface Unit (SIU)



The laser signal is distributed through SIU to 14 fiber channels, each containing multiple FBG sensors. The SIU converts the reflected optical signal from the FBG sensors into electrical waveform with its DAQ card. Please visit optilab.com/siu for more detail.

FSI Hardware Block Diagram



Mechanical Drawing¹

¹ Measured in millimeters