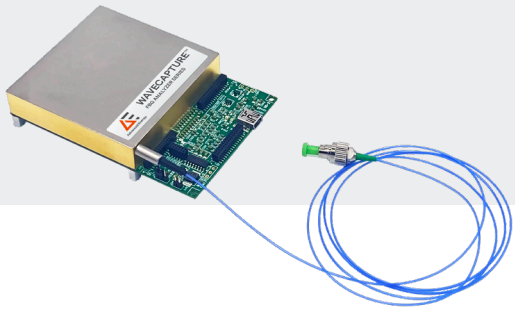
WAVECAPTURE FBG ANALYZER SERIES

Precise, reliable, and compact spectral analyzer for Fiber Bragg Grating (FBG) sensing



Advanced Energy's WaveCapture™ FBG spectral analyzer offers excellent performance in real-world applications. Its innovative, high efficiency optical design provides excellent wavelength accuracy, repeatability, resolution, long-term stability, ultra-low power consumption, small form factor, fast sub-ms response time, no moving parts, and lifetime calibration. This WaveCapture FBG Analyzer is field proven, with thousands of units serving as the heart of FBG sensing systems all over the world.

PRODUCT HIGHLIGHTS

- Wide wavelength range
- Ultra-fast response time (up to 5 kHz)
- Excellent wavelength repeatability and resolution
- High reliability with no moving parts
- Compact, low power, card-mountable design

APPLICATIONS

- Medical (e.g. RF ablation, robotics)
- Energy (e.g. battery, wind, and tidal)
- Aerospace
- Oil and gas
- Civil structures

AT A GLANCE

Standard Wavelength Ranges

40 nm Model: 1525 to 1565
80 nm Model: 1510 to 1590

Wavelength Repeatability

±5 pm

Wavelength Resolution

1 pm

Frequency Response Time (Typ.)

Standard: ~ 5 Hz (RS232)
Fast: ~ 5 kHz (USB 2.0/Ethernet)

Channel Input Power Range

~60 to -20 dBm

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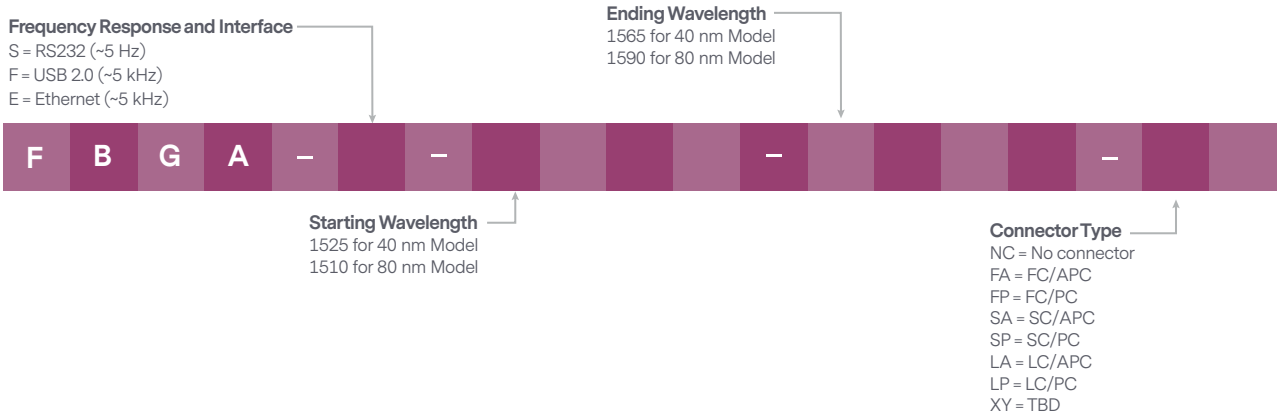
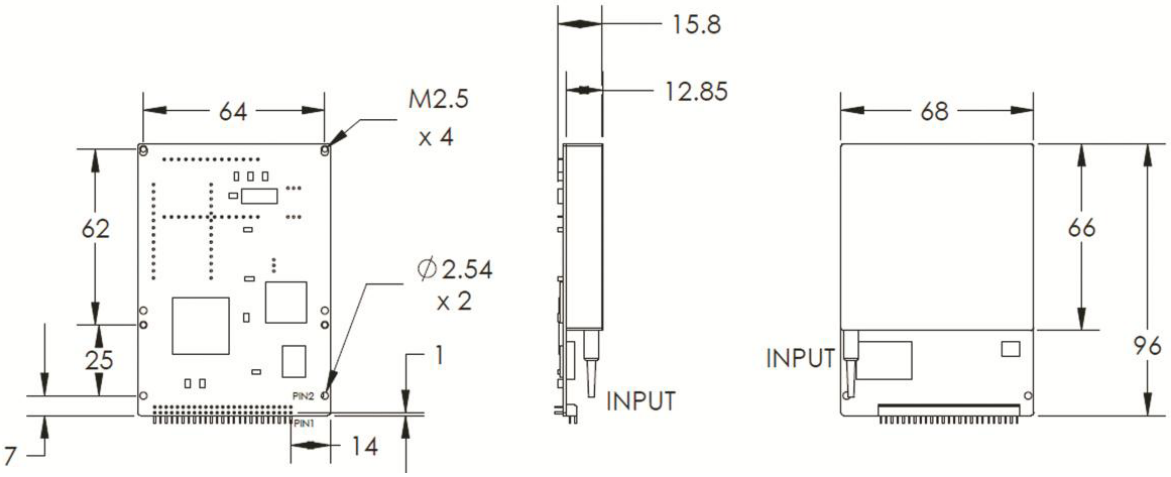
TECHNICAL DATA

Specifications		
	FGB Analyzer - USB 2.0 / RS232	FGB Analyzer - Ethernet
Wavelength Ranges[1]	40 nm Model: 1525 to 1565 nm	40 nm Model: 1525 to 1565 nm
	80 nm Model: 1510 to 1590 nm	80 nm Model: 1510 to 1590 nm
Wavelength Repeatability	±5 pm	±5 pm
Min Detectable Wavelength Change	±1 pm	±1 pm
Frequency Response Time (typ)	~5000 Hz (USB 2.0) /5 Hz (RS232)	~5000 Hz
Interface	USB 2.0 / RS232	Ethernet IEEE 802.3
Internal Reference Source for Field Calibration	No	No
Optical Interface	FC/APC connector (or specified)	FC/APC connector (or specified)
Channel Input Power Range	-60 to -20 dBm or specify	-60 to -20 dBm or specify
Power Resolution	0.1 dB	0.1 dB
Size	96 x 68 x 15.8 mm	130 x 75 x 25 mm
Operating Temperature	-5 to 75°C	-5 to 75°C
Storage Temperature	-20 to 85°C	-20 to 85°C
Software	WaveCapture Sense 20/20 software,	
	WaveCapture Sense 20/20 SDK for development (optional)	

ORDERING INFORMATION



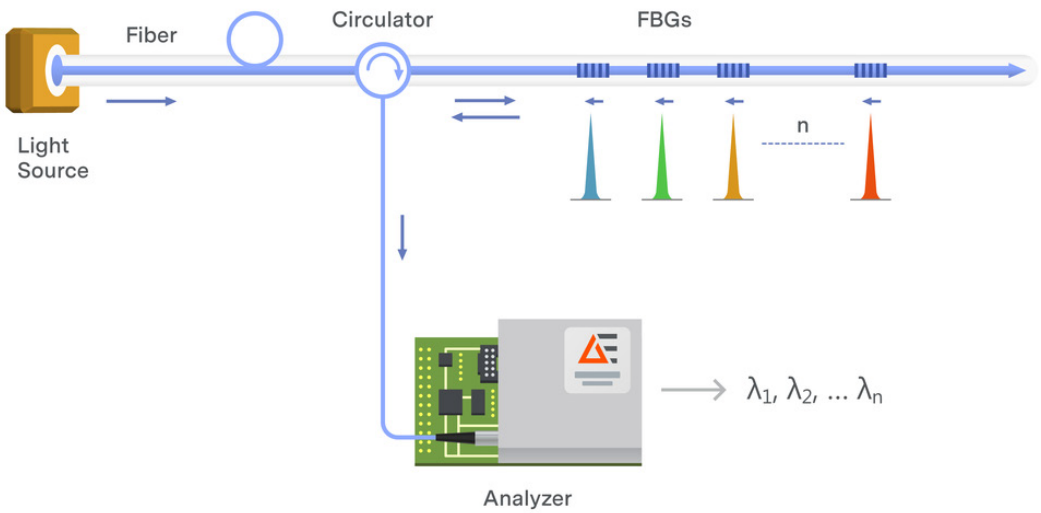
DIMENSIONS



Dimensions in mm
Drawing depicts the US 2.0 and RS232 version

WAVECAPTURE FBGA OVERVIEW

Advanced Energy's WaveCapture Fiber Bragg Grating Analyzer (FBGA) is an integrated spectral engine that serves as the heart of precise, fast, and reliable FBG interrogator systems. The FBG Analyzer employs a proprietary optical design that features high-efficiency dispersive optics, an ultrasensitive detector array, and innovative numerical algorithms to provide high speed, high-resolution spectral measurements in challenging environments. The figure below shows an FBG analyzer integrated into an FBG sensing system. A broadband light source illuminates an optical fiber which features an array of "N" fiber bragg grating sensors. The FBG array reflects "N" spectral bands of light back down the fiber, where an optical circulator directs the light to the FBG Analyzer. Inside the analyzer, the light is dispersed and the diffracted spectrum is measured by a detector array. Numerical algorithms are used to extract each "Bragg wavelengths" from the raw data, which are sent to the host and converted to temperature, strain, acceleration, or other measured parameter. Both raw and processed data are available to the host.

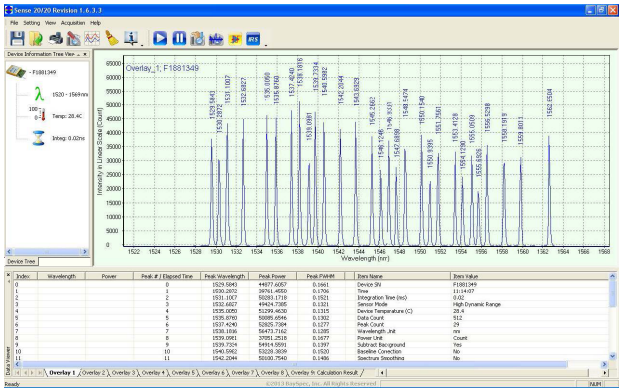


SOFTWARE

WaveCapture Sense 20/20

The WaveCapture™ Sense 20/20 software is a Windows-based program for interfacing with WaveCapture FBG analyzers and systems via USB, RS232, or Ethernet. The software is designed to run on Windows 7 and 10 operating systems. The software provides the following features:

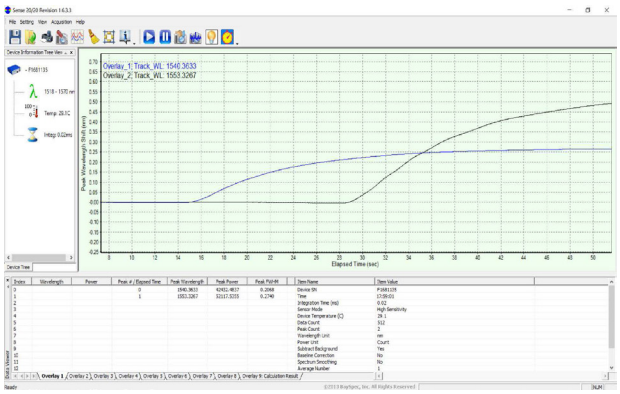
- Setup acquisition mode and parameters
- Acquire spectrum and display into multiple overlays
- Post-process spectrum data such as peak search, background subtraction, spectrum smooth and baseline correction, save and load spectrum data
- Record and replay spectrum data in the fast acquisition mode
- Track the wavelength shift of the selected peaks
- Control SLED light source
- Control optical switch and GPIO output



WaveCapture™ Sense 20/20 software

WaveCapture Sense 20/20 SDK

WaveCapture Sense 20/20 software development kit (SDK) provides the interface for software developers to access the WaveCapture FBG Analyzer spectrometers. The Dynamic Link Library (DLL) in the SDK can be used under different programming environments, including C, C++, Visual Basic, and LabVIEW. The SDK provides a set of fuctions that allow users to configure and control the FBG Anayzer spectrometer as well as acquire and post-process the spectrum data.



WaveCapture™ SDK

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PRECISION | POWER | PERFORMANCE

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