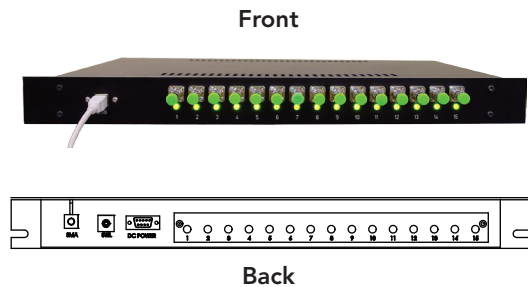


Sensor Interface Unit

The Sensor Interface Unit (SIU) is 15 channel fiber interface is designed for FBG sensing applications.



Product Description

The Sensor Interface Unit (SIU) provides a 15 channel fiber interface that connects FBG sensors. It comes complete with configurable hardware for structure health monitoring, local data storage, and remote configuration control/data transfer. The SIU can either be used in combination with the Optilab Swept Wavelength Source (SWL), or with user's own laser. The SIU has an optional National Instruments DAQ which converts the FBG waveforms into data for local storage.

Operational Principle

In FBG sensing, the SWL input signal is distributed through the SIU to 15 independent fiber channels, each able to measure multiple FBG sensors. The photodetectors in the SIU converts the reflected FBG signal from the FBG sensors of channel into an electrical waveform output at the rear panel or via the connector to the NI DAQ board.

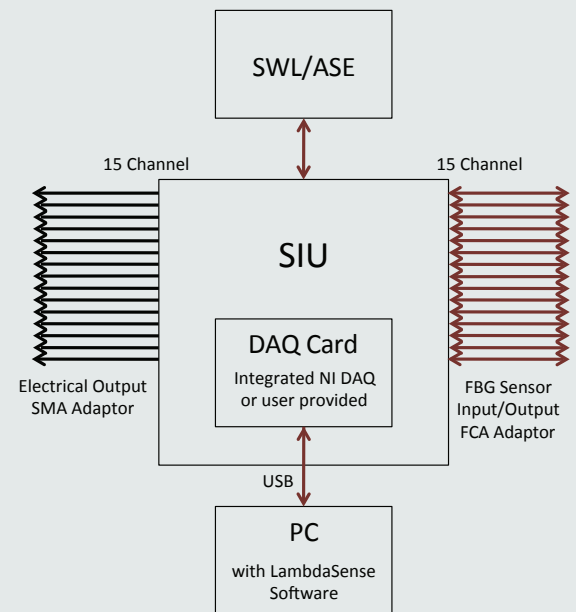
Features

- 15 optical FBG sensing channels
- 15 electrical output channels for external DAQ
- Optional built-in NI DAQ card that sends data to PC via USB
- High performance internal wavelength reference
- LED indicator for FBG installation
- Removable opticalconnector panel for easy cleaning

PRODUCT SPECIFICATIONS

Sensor Interface Unit Specifications

Number of Channels	15
Operating Wavelength Range	1500 nm to 1610 nm
Dynamic Range	50 dB
Resolution (-20 dBm input power)	± 1 pm
Wavelength Repeatability	± 5 pm
Reflected FBG Input Power Range	-50 to -10 dBm
Offset Adjustment	-5 to +5
Photodiode Amplifier	Dual Stage
Photodiode Type	PIN linear
Amplifier Filter Bandwidth	1 KHz



SIU Block Diagram

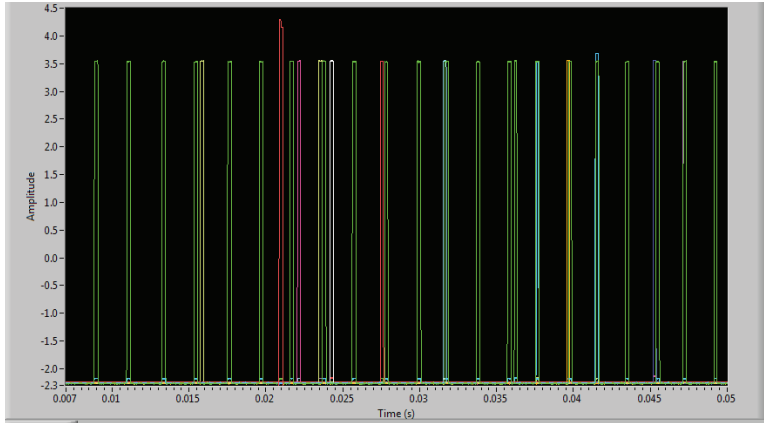
Ordering Information

SIU-x

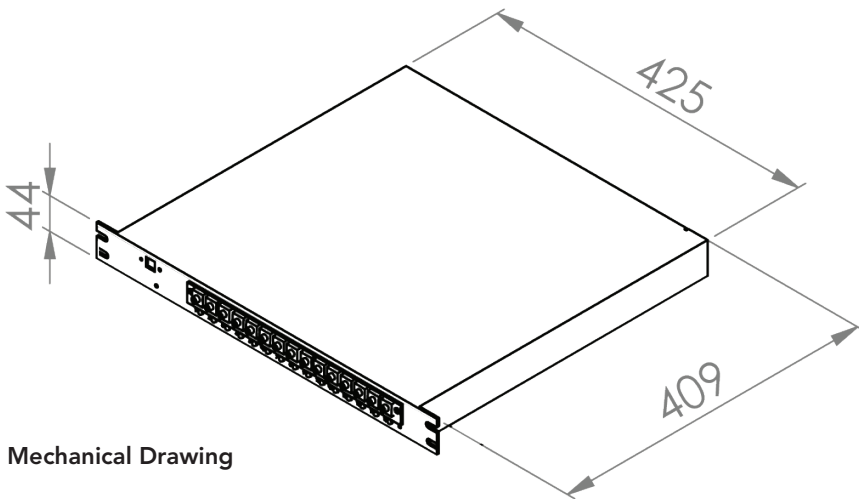
x: 1, NI DAQ board, 0, none

For more ordering information, see channel matrix on third page of this document.

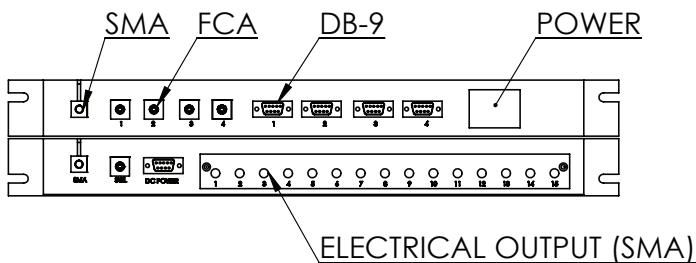
Sensor Interface Unit



Waveform Example



Mechanical Drawing



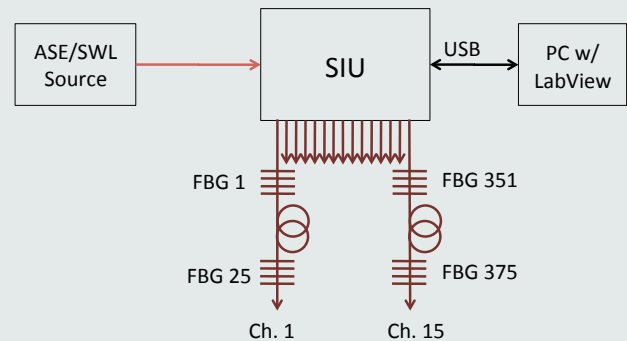
FSI Rear Connection Panel (SWL top, SIU bot-)

Mechanical Specifications

Temperature Range	10° C to +50° C (operating), -30° C to +85° C (storage)
Operating Humidity	0% to 85% Relative Humidity
Power Supply	Various voltages via DB-9 (ask for PIN-out diagram)
Power Consumption	50 W max.
Control/Monitoring	USB 2.0 Interface
Display	LED light for FBG indicator
Housing Dimensions	1U Rackmount: 19" x 16" x 1.75"
Optical Connectors	FC/APC
Optical Fiber Type	SMF-28 (Standard)
Housing	Steel Frame

Optional DAQ Card Specifications

Manufacture	National Instruments
Model	USB-6251 OEM Board
Sampling Rate	1.25 MS/s single channel 1.00 MS/s multi channel (aggregate)
Timing Accuracy	50 ppm of sample rate
Timing Resolution	50 ns
Input Coupling	DC
Input Range	±10 V
Crosstalk @ 100 kHz	-75 dB adjacent chan. -95 dB non-adjacent chan.



SIU Installation Diagram