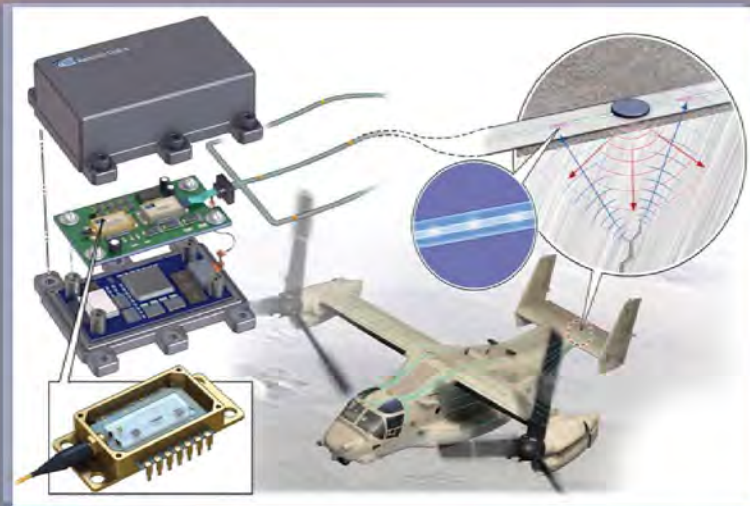




# FAULSense™ - PZT/FBG Sensor Interrogator

## Hybrid PZT/FBG Multi-Channel Fiber Interrogator System



The FAULSense™ SHM system is a highly integrated, ultra-sensitive, high-frequency-response (DC to 5-MHz), real time acousto-ultrasound structural health monitoring (SHM) system.

The system integrates a strip-patch network of piezo-electric actuators, covering a wide area, to input a controlled excitation of acoustic signals over the entire area or on discrete locations of an aircraft's structure (ie. the fuselage, wings, tails, rotor blades, etc.)

A high-density array (100s) of distributed fiber Bragg grating (FBG) acousto-ultrasound sensors are used to detect and measure the corresponding waveform structural response to the PZT excitation signals, which contain structural information representative of potential damage associated with load, fatigue, impacts, fractures, delamination, corrosion, radiation, and structural damage of large composite and metallic aircraft structures.



# FAULSense™ System Series

## Performance Specifications\*

Monitoring Mode	Distributed Hybrid PZT/FBG acoustic-ultrasound actuator/receivers
PZT Driver	DC to 5-MHz Digital Waveform Synthesizer with low noise 1000-V power amplifier
FBG Actuators	Piezoceramic Type PIC255* Flex circuit (-250 to 1000V); 0.64( $\mu\text{m}/\text{m}/\text{V}$ )
FBG Sensing Elements	100's FBG sensor AU sensor elements on a single fiber cable
Sensor Multiplexing	WDM/TDM with 1 x 12 MEMS optical switch
Multiplex Sensing Channels	12 independent electric/fiber sensor cable channels
FBG Sensor Demodulator	Resonant Cavity Adaptive Two-Wave Mixing (TWM) interferometry
Strain Accuracy	$\leq 10$ -femto-strains
Dynamic Range	5,000- $\mu$ strains
Frequency Sensitivity	0.1-microstrain/Hz
Sampling Rate	DC to 5-MHz
Signal Processor	Intel Compute Stick with Core M7 (3.2-GHz) processor; 256GB flash memory
Data Communication	Wireless – Wi-Fi 802.15.4, Bluetooth, USB
Power Consumption	$\leq 4$ -W @ 28-VDC
Operating Temperature	-60°F to 160°F
Weight & Size	~ 250-grams;
Package Dimensions	2-inch x 2-inch x 4-inch

\* Engineering prototypes specification subject to change without prior notice.

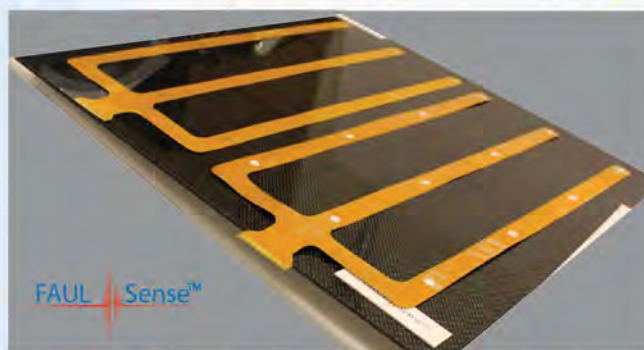
## Applications

- Structural health monitoring
- Nondestructive evaluation
- Smart structures
- Passive and dynamic sensing

Miniature Multi-Channel Hybrid PZT/FBG SHM Monitor System for Applications where Weight, Size, and Power are Critical for Operation

## Contact:

For further information on this or other products, please contact our sales department at (310) 406-1295 or e-mail [sales@redondooptics.com](mailto:sales@redondooptics.com).



Redondo Optics Inc.