



Solutions, When the Conventional Ones Run Out of Breath



COMPOSITE SENSOR

FBG SENSORS & DETECTORS

Patch strain sensor for composite structures

The Composite Patch Strain Sensor (FBGS-01CP) is a fiber optic strain gauge sensor specially designed for long term monitoring of structures behavior. It uses the state of the art optical FBG approach based on a long-standing tradition of manufacturing composite, sandwich and bonded structures for the aerospace industry and terrestrial transport industry. This guarantees high performance, quality strength and durability of patches.

The sensor is a fiber optic equivalent of an electrical strain gauge. It can be mounted – embedded inside the structure and used for detection of delamination defects in composite material before it reaches the sensor's position. The strain changes are measured as a point inner deformation of structure. When used in high density, the composite sensors enable you to minimize the detectable damage size and keep the critical parts of the structure under constant supervision.

100% passive sensor

As the sensor doesn't need the power supply, it easily monitors places without electricity and hazardous or hard to reach areas.

Composite sensor

The sensor can be made from various types of commonly used composite materials, such as carbon/epoxy, glass/epoxy.

Universal platform

Together with the strain you can also use additional sensor types (temperature, inclination, vibration, displacement, etc.).

KEY PRODUCT FEATURES & BENEFITS

Protected as IP68 rated devices

The protection comparable to the international standard rating of IP68 guarantees complete dust-tightness and protection against the effects of long periods of immersion in water.

Connectivity

The sensor can be used as a standalone sensor or in series as a part of a larger sensing network regardless of sensor interconnections.

Stress analysis

The embedded composite patch sensors are very good tools for improving the stress analysis of composite structure and precise predictions.

Immune to EMI/RFI

The sensor enables operation even in harsh environments, as the technology is fully passive, explosion safe and immune to electro-magnetic/radio frequency interference.

Embedded monitoring

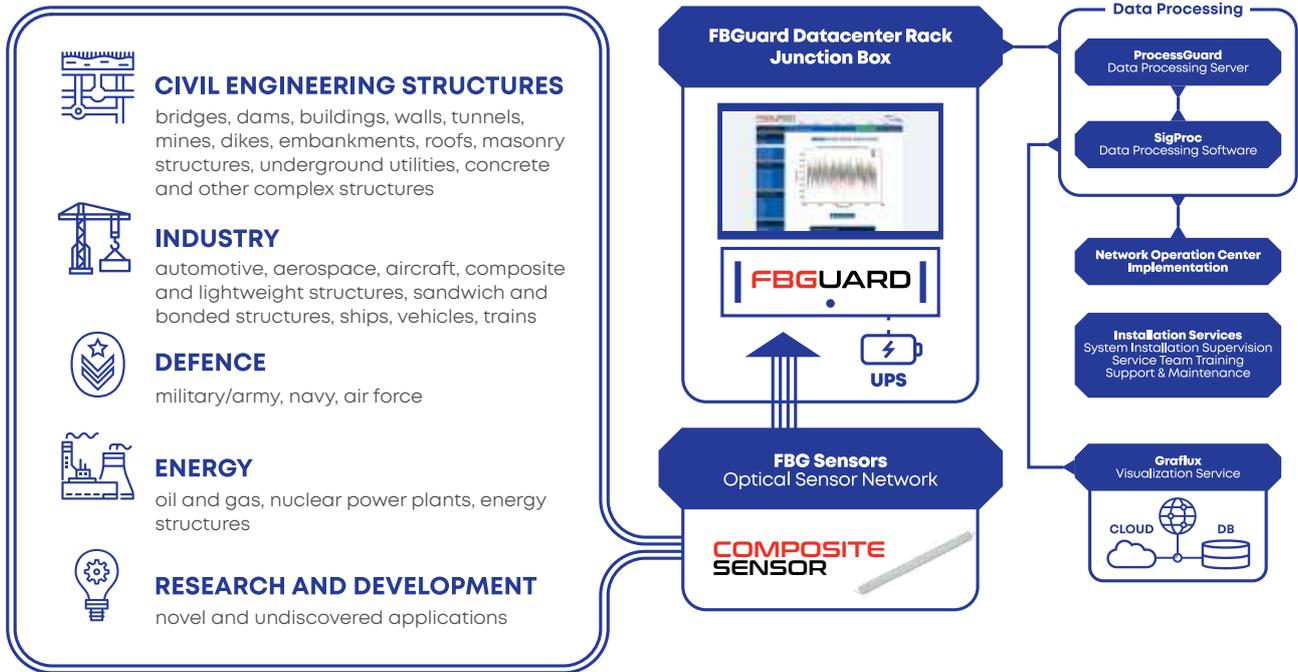
Optical sensor is designed to be embedded into the composite structure between the layers. The sensor enables to monitor bonded joints assembly, curing procedure and their behavior during the service.

Optional accessories

The strain sensor can be delivered with additional optional accessories, like fiber protection, customized size, connectors and many others.



PROJECT REQUIREMENTS



TECHNICAL PARAMETERS

Optical, Environmental and Mechanical

Sensor size	10 x 30 mm (minimal size) @ one FBG 15 x 50 mm (optimal size) @ one FBG 600 x 600 mm (common maximal) Custom solution up to the length of 7000 mm Various shapes possible
Sensor thickness	0,5 mm (Depends on composite material and chosen primary coating of the FBG sensor.)
Material	Carbon/epoxy, glass/epoxy, aramid/epoxy etc., both unidirectional and fabric materials are possible
Strain range	10 000 $\mu\epsilon$ ($\mu\text{m}/\text{m}$)
Strain sensitivity	1.2 $\text{pm}/\mu\epsilon$
FBG central wavelength	1505 to 1590 nm @ FBGuard system typ.
Temperature sensitivity	10 $\text{pm}/^\circ\text{C}$
Operational temperature range	-50 – +250 $^\circ\text{C}$
Waterproof design	IP68

Fiber Optic Cable

Fiber type	SMF G.652
Fiber input/output	Bare fiber with polyimide coating*
Lead in/out fiber length	1 m each side*
Fiber termination	Bare fiber (scissor cut for splicing) - default FC/APC - optional*

Mounting

Embedded or surface mounting	Standard adhesive for resistive strain gauges installation can be used.
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* These parameters can be customized upon request.

GET IN TOUCH WITH US
and we will recommend you the most suitable solution for your project.

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