



AT A GLANCE

Interrogator unit for fiber Bragg grating networks

Features

- Reduced size and mass
- Immunity to RF signals
- Tolerance of harsh environment
- Real-time analysis
- Compact and cost effective
- Up to 100 channels (@1550 nm)

Applications

- Renewable energy (wind load at turbines)
- Civil engineering (infrastructure, seismic events)
- Aerospace (integrity of composite constructions)
- Marine (hull stress / deck load monitoring)
- Oil & Gas (pipeline integrity, riser fatigue, subsea machinery)

Principle

- Change of wavelength response of Fiber Bragg Gratings by external mechanical or thermal stress
- Transformation of wavelength change to amplitude change via AWGs or edge filters
- Amplitude detection by standard PD arrays

References

- Innovative Regional Growth Core POLYPHOTONICS BERLIN (funded by BMBF)

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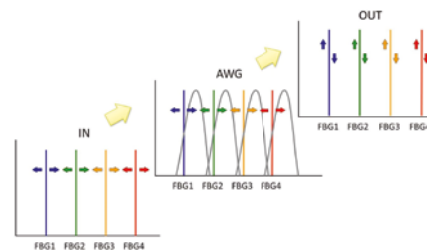
www.hhi.fraunhofer.de/pc

Structural Health Monitoring

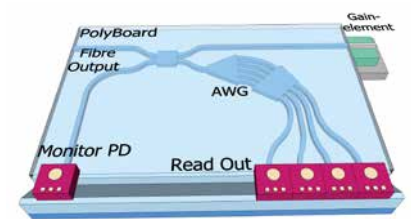
HHI's hybrid integration platform PolyBoard offers compact solutions for the readout of fiber Bragg grating networks. Featuring an on-chip broadband gain element as light source and an edge filter or AWG based readout unit leading to

higher sampling rates and smaller footprints than spectroscopy based solutions. Applications range from stress monitoring in wind foils and aircraft airfoils to multipoint temperature measurements.

Type-1: AWG based interrogator (with spatial resolution)

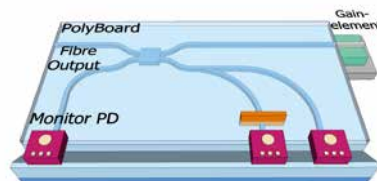


Working Principle

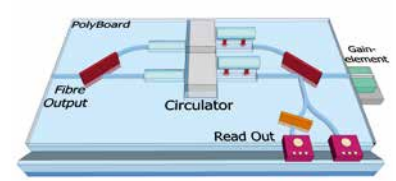


AWG Interrogator with 3 dB MMI coupler

Type-2: Edge filter based interrogator (threshold detector)



Edge filter interrogator with 3 dB MMI coupler



Edge filter interrogator with integrated circulator