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High-speed fiber optic grating demodulation module

Overview

It uses a scanning narrow-band semiconductor laser as light source to perform high-resolution fiber grating demodulation in the range of 40nm. A demodulation algorithm is vital for a fiber Bragg grating (FBG) sensing system. In this paper, a novel demodulation algorithm based on the variable-step-size method and cross-correlation algorithm is proposed to demodulate the wavelength of an FBG. Acting as the "brain" of the FBG sensing system, the device emits broadband laser light, demodulates reflected. High speed demodulation systems for fiber optic grating sensors Fiber optic grating sensor demodulation systems are described that offer high speed and multiplexing options for both single and multiple parameter fiber optic grating sensors. This content is available for download via your institution's subscription.

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Article Content

A novel method for the high-speed demodulation of FBG sensor arrays

As a novel sensor, fiber Bragg gratings (FBGs) havebroad applicability by virtue of their excellent characteristics such as compactness, large multiplexing capacity, and corrosion resistance.

Micro-nano fiber pressure sensor based on PDMS ...

Micro/nanometer fibers, as subwavelength-scale optical fiber structures, have become a crucial platform for high-sensitivity biosensing due to their low bending loss and strong evanescent

Demodulation Algorithm for Fiber Bragg Grating Sensors

A demodulation algorithm is vital for a fiber Bragg grating (FBG) sensing system. In this paper, a novel demodulation algorithm based on the variable-step-size method and cross-correlation algorithm is

A Tracking-Based High-Speed Demodulation Method for Fiber Bragg

In this article, a tracking-based high-speed demodulation method for FBG sensing systems based on the wavelength-tunable laser is proposed. The wavelength-tunable laser only

Fiber Bragg Grating Interrogator

The OFSCN® Fiber Bragg Grating Interrogator is an industrial-grade

High-speed and high-resolution demodulation system for hybrid

The demodulation system, which consists of two semiconductor optical amplifiers and one high-speed charge-coupled device module, was constructed to interrogate 2000 serial ultra-weak

Higher Speed Demodulation of Fiber Grating Sensors

For very -speed high events, such asurement ballistics speed testing, is not limited strain grating sensor, but rather the demodulation system used. used to support impact and ballistics explores testing the

Principle of Ultra-high-speed Parallel Acquisition and Demodulation of ...

In order to improve the demodulation speed of the fiber Bragg grating demodulation system, this article puts forward the principle of ultra-high-speed parallel acquisition and demodulation of fiber Bragg

A demodulation method of high-speed fiber Bragg grating based on ...

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A novel high-speed fiber Bragg grating demodulation method is proposed and demonstrated in this paper. Large dispersion will be generated when light going through the long

Demodulation Algorithm for Fiber Bragg Grating Sensors

Fiber optic sensors have advantages including anti-electromagnetic interference, corrosion resistance, strong multiplexing ability, high sensitivity, portability, and flexibility, and have been used to monitor

A Tracking-Based High-Speed Demodulation Method for Fiber Bragg Grating ...

The vibration measurement of spacecraft structures in space applications has raised higher requirements for the demodulation frequency of the fiber Bragg grating (FBG) demodulator. In this

High speed and high precision demodulation method of fiber grating ...

Therefore, this novel demodulation method has advantages of high speed and high precision, good stability and large dynamic range, and it is very applicable to quasi-distributed fiber

High-Speed Railway Perimeter Intrusion Detection Using CNN-LSTM

Abstract Ensuring reliable perimeter protection is essential for maintaining the operational safety of high-speed railways (HSRs). This paper presents a dual-cable intrusion detection framework that

High-speed demodulation system of fiber Bragg grating based on

A demodulation system built upon the F-P filter has a relatively slow demodulation frequency, leading to demodulation errors when measuring high-frequency changing physical

Low-cost high-speed fiber optic grating demodulation system for ...

A low-cost high-speed demodulation system based on a fiber grating spectral filter has been developed to support strain and temperature sensing in composite panels. This system has also been used to

Modular DAS demodulation system based on ultra-weak fibre Bragg grating ...

Aiming at the requirements of low power consumption, miniaturization, and massive data processing, a modular distributed optical fibre acoustic sensing (DAS) demodulation system based

Simulation and hardware implementation of demodulation for fiber optic ...

Abstract The demodulation system is a very critical component of the seismic exploration, which determines the response speed and accuracy of data acquisition of the detection system.

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NASA Technical Memorandum 0000

Implementation of a High-Speed FPGA and DSP Based FFT Processor for Improving Strain Demodulation Performance in a Fiber-Optic-Based Sensing System Douglas L. Farley Langley

A demodulation method of high-speed fiber Bragg grating based on ...

Fiber Bragg grating sensing is one of the most attractive researches in the field of optical fiber sensing. It has made considerable progress due to its advantages in high multiplexing, high precision, small

Research and Implementation of Super High-Speed Fiber Bragg Grating ...

A super high-speed fiber grating demodulator capable of simultaneously demodulating four grating channels is designed. The demodulator uses Fourier domain mode locked laser which consists of a

Higher-speed demodulation of fiber grating sensors

For very high-speed events, such as ballistics testing, strain measurement speed is not limited by the response of the fiber grating sensor, but rather the demodulation system used. This

(PDF) Higher speed demodulation of fiber grating sensors

This paper focuses on a current 10kHz fiber grating demodulator used to support impact and ballistics testing of a composite panel.

A three-points tracking-based high-speed fiber Bragg grating ...

A three-points tracking-based high-speed fiber Bragg grating (FBG) demodulation method based on wavelength-tunable laser is proposed. The wavelength-tunable laser scans just three

High-speed demodulation system of fiber Bragg grating based on

To address this issue, a demodulation system utilizing MEMS mirrors is proposed, involving constructing a demodulation system based on MEMS mirrors.

High speed demodulation systems for fiber optic grating sensors

Fiber optic grating sensor demodulation systems are described that offer high speed and multiplexing options for both single and multiple parameter fiber optic grating sensors.

Design of Fiber Grating Demodulation System Based on Tunable

Aiming at dynamic torque measurement system, fiber Bragg grating sensing principle is used to measure rotating shaft torque, and a fiber Bragg grating demodulation system based on

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High-speed spectrum demodulation of fiber-optic Fabry–Perot sensor ...

A high-speed spectrum demodulation method with a large dynamic range for fiber-optic Fabry–Perot sensor is presented. The demodulation system only consists of a near-infrared

Fiber X300/X500 series Fiber Bragg Grating Demodulator Module

Fiber X300/X500 series is a Fiber Bragg Grating demodulator by scanning spectrum. It uses a scanning narrow-band semiconductor laser as light source to perform high-resolution fiber grating

Fiber X300/X500 series Fiber Bragg Grating Demodulator Module

It uses a scanning narrow-band semiconductor laser as light source to perform high-resolution fiber grating demodulation in the range of 40nm. It is designed for static FBG measurement and can be

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