Fiber Optic Sensor Demodulation Circuit



Overview

This paper presents a method that integrates neural networks with arrayed waveguide gratings (AWGs) for the demodulation of fiber-optic sensors based on the Vernier effect and a novel, to our knowledge, Fabry–Pérot (FP) strain sensor structure. Some embodiments of the disclosure provide a demodulation system for obtaining phase change parameters by a fiber-optic Fabry Perot sensor. In an embodiment, the demodulation system includes a transmitting module, a fiber-optic Fabry Perot sensor, a light splitting module, a filter module, a. Fiber optic Fabry-Perot sensors have attracted a lot of attention in many fields such as medical detection, underwater acoustic detection, and electric power monitoring due to their high sensitivity and strong anti-interference ability. The demodulation process is typically developed using analog circuits.

Article Content

Fiber optic sensing demodulation utilizing optical vector analysis ...

In this paper, we propose and experimentally demonstrate a high-resolution sensing demodulation technique using optical vector analysis based on microwave photonics (MWP).

Demodulation system and demodulation method of fiber-optic sensor

In an embodiment, the demodulation system includes a transmitting module, a fiber-optic Fabry Perot sensor, a light splitting module, a filter module, a receiving module, and a processing...

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Review on demodulation methods for optic fiber Fabry-Perot sensors

The parameters of the light source, the structure of the sensing head, and the demodulation methods are the main factors that restrict the detection ability of fiber optic Fabry-Perot sensors.

High Precision Decoupling and Demodulation for Temperature-Strain ...

To address the challenges of parameter decoupling and low demodulation accuracy in fibre-optic interferometric dual-parameter sensors, we proposes an innovative method co...

Optical Vernier effect-based demodulation system for

This paper presents a method that integrates neural networks with arrayed waveguide gratings (AWGs) for the demodulation of fiber-optic sensors based on

FPGA-Based Hardware Implementation of Homodyne

Homodyne demodulation is a convenient technique for signal detection in interferometric sensors. The demodulation process is typically

Development of a High-Precision Demodulation System for Fiber

Abstract: This paper presents the development of a high-precision demodulation system for fiber-optic current sensors (FOCS) based on magneto-optic crystals.

Research on Demodulation System and Algorithm of Distributed Fiber ...

In this paper, we proposed an approach of strain demodulation using a fiber-optic Fabry-Perot (FP) sensor based on Gramian Angle Field (GAF) algorithm and deep learning with sparse

Deep learning-based phase demodulation for distributed acoustic

Accurate demodulation is essential for a deeper understanding of the physical processes in fiber optic sensing systems, enhancing measurement accuracy, and optimizing system

Fiber Optic Sensor

Fiber optic sensors are defined as sensing devices that utilize optical fibers to convert lightwave properties into information about the state of structures, offering long-term durability, immunity to

Excelitas OTFI-0275 LED Fiber-Optic Illumination Module with

Overview The Excelitas OTFI-0275 is a medical-grade LED fiber-optic illumination module engineered for precision endo-illumination in clinical and laboratory environments.

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System and method for reducing fiber optic gyroscope color noise

Other rates at where possible output errors may occur depend upon the modulation/demodulation techniques used in processing the output of the fiber optic rotation sensor.

An improved device and demodulation method for fiber-optic

Abstract An improved fiber-optic distributed acoustic sensor (DAS) using a LiNbO 3 straight through waveguide electro-optic phase modulator and a novel phase demodulation method based on

Optical Fiber Sensing Technology for Sports Monitoring: A ...

The advancement of sports science has heightened demands for precise monitoring of athletes'' technical movements, physiological status, and performance. Optical fiber sensing (OFS)

Mechanism of the bias error for fiber optic gyroscopes induced by the ...

1. Introduction Fiber optic gyroscopes (FOGs) with different accuracy grades operate by detecting the phase difference induced by the Sagnac effect through interferometric measurement,

Systems and methods for resonator fiber optic gyroscope intensity ...

FIG. 1 is block diagram illustrating a feedback loop circuit 100 for a resonator fiber optic gyroscope (RFOG) of one embodiment of the present invention. Feedback loop circuit 100 comprises an

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