Activa Netcom & Energy Systems

Rotational speed detection based on fiber optic sensor

Overview

Abstract: In this paper, a fiber optic sensor system (FOSS) is proposed for the measurement of the rotational speed of a DC motor. It offers non-contact measurements. FODS is an intensity modulation based. Radiation absorption excites an orbital electron to a higher energy level. Heating the material enables the trapped states to interact with phonons and decay into lower-energy. A highly precise rotation sensor may be used tomeasure any changes inthe length ofthe day and to detect torsional oscillations inthe earth caused byearthquakes. Fina11y, ultraprecise sensors may find applications in relativity rela experiments ed such as the determination of the preferred frame. This work presents a dynamic rotational sensor using polymethyl methacrylate (PMMA) fiber for robot movement assessment. A birefringement optic fiber is connected to a light source, and passes through the magnetic field.

Article Content

Device for measuring rotational speed using an optical fiber sensor

A device for measuring the rotational speed of a shaft. A toothed wheel is connected to rotate with the shaft within a magnetic field. A birefringement optic fiber is connected to a light source, and passes

Design and Development of Fiber Optic Sensor System for Rotational ...

Abstract: In this paper, a fiber optic sensor system (FOSS) is proposed for the measurement of the rotational speed of a DC motor. It offers non-contact measurements. FOSS is designed using a fiber

Fiber Optic Sensors: Fundamentals, Principles & Applications

Radiation absorption creates electronic excited states that are trapped by localized defects for extended periods of time. Heating the material enables the trapped states to interact with phonons and decay

Rotation Active Sensors Based on Ultrafast Fibre Lasers

Nowadays, modern laser gyroscopes provide the most accurate rotation measurements and can detect precise rotational motions associated with seismic events , Chandler and Annual

Fiber-Optic Rotation Sensors. Tutorial Review

Allthe optical rotation sensors under development are based on the Sagnac effect which generates an optical path difference nL that is proportional to a rotation rate~.

Fiber-Optic Rotation Sensors. Tutorial Review

The measurement of rotation is of considerable interest in a number of areas. For example, inertial navigation systems as used in aircraft and spacecraft depend critically on accurate inertial rotation

Fiber-based broadband detection of a rotational object with

In this paper, we demonstrate a fiber-based configuration on rotational Doppler measurements for the detection of a rotational object using an ultra-broadband mode-selective

Fiber Optic Rotation Sensor (FORS) Signal Detection and Processing

The recent development of low-loss single-mode optical fiber waveguides for light has made possible a new class of inertial reference devices built on the principal of a closed loop interferometer. Light

Intensity-modulated rotation angle sensor based on multi-core fibers

Phase-modulation sensors are based on detecting phase variations in optical fibers caused by angular changes. Researchers have proposed the utilization of specialized fiber structures

Fiber optic sensor embedded in robotic systems for 3-D orientation ...

The study of a three-dimensional rotational sensor based on polymer optical fiber and its application in robotics is significant for several reasons, such as improved stability, cost

Dynamic Rotational Sensor Using Polymer Optical Fiber for Robot ...

A simple and straightforward polymer fiber-optic dynamic rotational sensor for robot movement assessment was proposed in this work, relying on the intensity variation.

Fiber-optic quantum gyroscope based on Hong-Ou-Mandel

The key to the optical quantum gyroscope based on HOM interferometry is the recognition that a HOM interference experiment is similar in configuration to a Sagnac interferometer. It is well

Rotation Rate Sensors and Their Applications

One prerequisite for accurate and reliable rotational motion observations is careful sensor performance characterization. For the majority of scientific domains discussed in this Special Issue, the application

Instantaneous rotational speed sensing method based on cam angle

The core principle of this method is to use an optical coherence system to detect the changes in optical path difference (OPD) caused by the continuous diameter variation of a rotating

Rotational speed sensors based on a fiber Bragg grating

All these fibre optic rotation sensing techniques suffer the problem of the ceiling of detectable rotating speed: The FBG and reflective FOS can detect the rotating speed no more than

Fiber optic sensor embedded in robotic systems for 3-D orientation ...

Moreover, optical fiber-based 3-D rotational sensors are still difficult to achieve as well as challenging to integrate into robotic systems for orientation measurement.

Dynamic Rotational Sensor Using Polymer Optical Fiber for Robot ...

Abstract: A complex signal processing technique is usually required to process the data in most sensor design structures, and integration into real applications is also challenging. This work presents a

Device for measuring rotational speed using an optical fiber sensor

To these ends, an object of the invention is a device designed to measure the rotational speed of a shaft of the type having a toothed wheel that is rotationally driven by the shaft, a magnet...

Novel rotational speed measuring method based on micro-indentation ...

This study proposes a novel rotational speed measurement method based on optical coherent displacement measurement. An optical coherence system is used to measure the relative

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