

光子学报 2011, 40(11) 1671-1676 DOI: 10.3788/gzxb20114011.1671 ISSN: 1004-4213 CN: 61-1235/O4

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论文

一种新型光纤光栅围栏防火防入侵同步预警系统

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摘要:

利用布喇格光纤光栅传感器对应变和温度同时敏感的特性,根据应变和温度导致光栅中心波长变化趋势及规律的不同,在光纤光栅围栏入侵监测系统中,从信号时域、频域提取的多方位特征对周界入侵和火灾发生等威胁安全事件进行智能识别和报警.在光纤光栅围栏防入侵功能基础上,无需做任何硬件封装的改变,也无需另外增加温度敏感光缆和集成其他温度监测系统,即可同时达到火灾监测的目的,实现防火和防入侵的同步预警.处理结果验证了该方法的有效性.

关键词: 光纤光栅围栏 安防 火灾报警 布喇格光纤光栅

A Novel Method for Simultaneous Intrusion Detection and Fire Alarm in a Single FBG-based Fiber Fence Monitoring System Configuration

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Abstract:

The fiber Bragg grating is sensitive to both the temperature and the strain on sensors, while the trends of their wavelength drifts differ to each other a lot. A special fiber fence monitoring system based on the fiber Bragg grating sensing network is investigated, which can realize the perimeter intrusion detection and the area fire protection simultaneously in a single sensing system configuration. A signal processing method is proposed which can intelligently tell if there is any threat and which kind of event it is according to the extracted signal characteristics in the time and frequency domains. Thus a normal perimeter security system possesses a second function of fire prediction, without any additional temperature sensing cables or other fire alarm systems in parallel. The results show the effectiveness of the method.

Keywords: Fiber grating fence Security Fire alarm Fiber Bragg gratings

收稿日期 2011-05-27 修回日期 2011-07-29 网络版发布日期 2011-11-25

DOI: 10.3788/gzxb20114011.1671

基金项目:

国家自然科学基金(No.1234546)资助


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