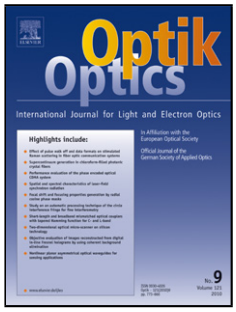
Accepted Manuscript



Title: FIBER OPTIC SENSOR FOR HEART RATE DETECTION

Authors: Y.G.Yhun Yhuwana, R. Apsari, M. Yasin

PII: S0030-4026(17)30046-3
DOI: http://dx.doi.org/doi:10.1016/j.ijleo.2017.01.035
Reference: IJLEO 58738

To appear in:

Received date: 17-12-2016
Revised date: 10-1-2017
Accepted date: 12-1-2017

Please cite this article as: Y.G.Yhun Yhuwana, R.Apsari, M.Yasin, FIBER OPTIC SENSOR FOR HEART RATE DETECTION, Optik - International Journal for Light and Electron Optics http://dx.doi.org/10.1016/j.ijleo.2017.01.035

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

FIBER OPTIC SENSOR FOR HEART RATE DETECTION

Y. G. Yhun Yhuwana[1], R. Apsari[1], M. Yasin[1*]

[1]*Department of Physics, Faculty of Science and Technology, Airlangga University, Surabaya (60115), Indonesia.*

**Corresponding author: yasin@fst.unair.ac.id*

Abstract:

The principle of operation, design aspects, experimentation and performance of an extrinsic fiber optic sensor using fiber optic displacement sensor for the measurement of amplitude and frequency of heart rate signal is presented and investigated. The displacement sensor consists of fiber optic transmitter, fiber optic bundled probe and photodiode detector and an artificial electrocardiogram (ECG) signal is used in the testing. The sensitivity of the sensor is found to be 0.002 mV/μm and thus it is capable of measuring heart rate from 50 bpm to 300 bpm with linearity more than 99%. The simplicity of the design, high degree of sensitivity, dynamic range and the low cost of the fabrication make it suitable for real field applications. Moreover, accuracy and reliability are the excellent pay-offs of this fiber optic sensor.

Keywords: *fiber optic, fiber optic bundle probe, heart rate detection.*

1. Introduction

Monitoring of heart rate is very important to determine the fitness level of the person. The low heart rate or pulse indicates that the person has a low intensity of work out. If a person is not working to their body's potential, there is no way they can burn enough calories to result in weight loss nor can they get up the endurance to build strength. On the other hand, vibration sensors is a very important devices which have many applications and thus a large number of

Download English Version:

https://daneshyari.com/en/article/5026224

Download Persian Version:

https://daneshyari.com/article/5026224

Daneshyari.com