WIRELEES VIBRATION MONITORING SYSTEM (WVMS)

By

WONG YOON KHANG

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APPROVAL AND DECLARATION SHEET

This project report titled Wireless Vibration Monitoring System (WVMS) was prepared and submitted by Wong Yoon Khang (Matrix Number: 031080526) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Communication Engineering) in Universiti Malaysia Perlis (UniMAP).

Checked and Approved by

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(SABARINA BINTI ISMAIL)
Project Supervisor

School of Computer and Communication Engineering
Universiti Malaysia Perlis(UniMAP)

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SISTEM PENGAWASAN GEGARAN TANPA KABEL

ABSTRAK

Tujuan projek ini dibangunkan adalah untuk mengawasi gegaran semula jadi secara tanpa kabel. Idea projek ini ialah melibatkan pemindahan data tanpa kabel di antara ’sensor’ dengan komputer dilakukan berdasarkan pada teknologi radio frekuensi (RF). Secara amnya, rekabentuk sistem ini melibatkan 3 bahagian utama iaitu, meliputi sistem penghantar dan penerima iaitu pemindahan data tanpa kabel ’RF’, ‘sensor’ untuk mengesan gegaran atau getaran yang ada di sekeliling dalam jarak yang tertentu dan pengurusan pengawasan untuk capaian data isyarat. Teknologi ’RF’ dipilih kerana kosnya yang murah, keperluan kuasa minima, dan kebolehannya untuk bergabung dengan litar kawalan yg lain. Selain itu, komputer juga merupakan satu alat yang penting dan berguna untuk pengumpulan data dan kawalan dan juga membenarkan kawalan pada sistem. Sejenis ‘sensor’ digunakan untuk mengesan gegaran dalam lingkungan jarak tertentu dan sistem penghantar digunakan untuk penghantaran isyarat gegaran. Komputer akan menerima isyarat digital dari ’ADC’ melalui sistem penerima dan akan menyusun semua isyarat tersebut. Di peringkat antara muka perisian, ’Visual Basic’ dipilih untuk tujuan pengawasan dalam mempamerkan data-data kritikal dalam bentuk digit sama ada graf atau nombors untuk setiap kadar sampel sesaat bergantung pada litar. Isyarat dari sistem ini adalah sensitif terhadap gangguan pada kawasan terbuka. Masalah ini diatasi menggunakan konsep mikropengawal untuk membolehkan komunikasi di antara 2 bahagian berlaku dengan lebih effisien.

WIRELESS VIBRATION MONITORING SYSTEM

ABSTRACT

The purpose of developing this project is to monitor the vibration naturally through wireless. The idea of this project is to make the data transfer wireless between sensor and PC, based on the RF technology. Generally a set of system design requirements are developed that cover 3 main parts, which consists of the hardware module transmitter and receiver which is the RF wireless data transfer, the design of the vibration sensor circuit to detect vibration surroundings within certain ranges, and software for the monitoring capabilities for vibroseis data access and management. RF wireless technology was chosen to implement the wireless module for its low cost, low power and its ability to be incorporated into small control board. Besides that, Personal Computer (PC) can be an extremely useful tool for data acquisition and control because it enables the collection of sensory information as well as the control of systems. A practical vibration detector using typical vibration sensor is used to trace the vibration signal that is within the operation range and the transmitter is used for the transmission. PC will receive the digital signal from Analogue Digital Converter (ADC) through the receiver that will receive the entire signal. At the software interface, Visual Basic software is used for monitoring system purpose which can display all the critical vibroseis data in binary digit in line graph and numeric views of data at sample rates per second. The vibration signal detected from the sensor is very sensitive to the disturbance surroundings. The problem can be solved by using Microcontroller to realize the transmission of the vibroseis signal more effectively.