BST SENSOR APPLICATION: PROGRAMMABLE NIGHT LAMP WITH MORNING ALARM

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by

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Thank you.

APPROVAL AND DECLARATION SHEET

With the authority given to me, I Dr.Johari Bin Adnan approved that all statement written in this report are true and legal. This project report entitled "Automatic Night Lamp With Morning" was fully prepared and submitted by Khairunneesa Hanie Othman (Matrix Number: 031030154). All knowledge, data and engineering practices that stated in this report are gained throughout the project period. This project including the report is a satisfactory in terms of scope, the end product, quality and presentation as partial fulfillment of the requirement for Bachelor of Engineering (Honours)(Electronic Engineering) in Universiti Malaysia Perlis.

Checked and Approved by

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APLIKASI PENGESAN BST:
LAMPU MALAM DENGAN PENGGERA BOLEH ATURCARA

ABSTRAK

Pengesan BST berpotensi yang dihasilkan di Makmal Fabrikasi UniMAP terbiar daripada sebarang usaha pemajuan walaupun mempunyai percirian yang baik. Dengan itu, matlamat utama projek ini adalah untuk menghasilkan model sistem aplikasi bertajuk " Lampu Malam Dengan Penggera Boleh Aturcara" yang meggunakan pengesan BST tersebut bagi meninjau prestasi serta potensi komersial selain daripada mengkaji ciri-ciri utama pengesan dan perunsurannya. Secara umum, projek ini melibatkan pembangunan litar dan perkakasan berserta perisian berkonsepkan penggabungan lampu malam dan penggera. Sistem ini boleh diaturcara dan bersaiz kecil dengan kos yang berpatutan. "PIC16F876" sejenis alat pengawal-mikro digunakan untuk tujuan kawalan sistem operasi mempunyai persisian antara muka dan mempunyai banyak kelebihan selain penggunaan tenaga yang rendah. Pengesan berkenaan telah diuji bagi mendapatkan data dan maklumat berkaitan sifat dan cirinya. Data masukan bagi sistem ini adalah keamatan cahaya yang akan diproses dan dikawalselia oleh alat pengawal-mikro. Kekangan utama dalam menghasilkan projek ini adalah masalah kepekaan pengesan, julat optimum yang kecil dan kebolehulangan yang tidak tetap. Oleh itu, kajian lanjut berkenaan pengesan dan tindakan pembaikpulihan perlu dijalankan dan diteliti semula sebelum model sistem aplikasi boleh dilakukan dengan baik untuk tujuan pembangunan.

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ABSTRACT

A high potential BST Sensor fabricated at UniMAP's Clean Room was left unused from any further development even though it has good characteristics. The main aim for this project is to develop an application system prototype entitled "Programmable Night Lamp with Morning Alarm" utilizing this sensor to observe its performance and commercialization potential. Further aim is to investigate BST sensor parameters and its properties. Basically, this project involved development of software and hardware with a concept when combining night lamp and alarm to make a complete system. The system is programmable, small in size and low cost. To build the system, early research and bottom-to-up design approaches are taken. PIC16F876, a microcontroller from Microchip is used in this project because it has the processor, peripherals interface and other features in single chip with low power consumption. The sensor itself was tested to gain as many data and characteristics as possible. The input of the system will be the light intensity that determines the output derived by the controller. Sensitivity, optimum range and repeatability have been the major constraint during this project implementation. Therefore, further research and improvement of the sensor are crucial to further develop this system.

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LIST OF SYMBOLS, ABBREVIATIONS OR NOMENCLATURE

BST	Barium Strontium Titanate
DC	Direct Current
PWM	Pulse Width Modulation
CPU	Central Processing Unit
PIC	Peripheral Interfaces Communication
EEPROM	Electrical Erasable Programmable Read Only Memory
ADC	Analog-to-Digital Conversion
LED	Light Emitting Diode
LDR	Light Dependant Resistor