STEPPER MOTOR CONTROL USING PIC MICROCONTROLLER BASED ON LIGHT INTENSITY

LAU AIK LENG

SCHOOL OF ELECTRICAL SYSTEM ENGINEERING

UNIVERSITY MALAYSIA PERLIS

2011

STEPPER MOTOR CONTROL USING PIC MICROCONTROLLER BASED ON LIGHT INTENSITY

by

LAU AIK LENG

FINAL YEAR PROJECT REPORT
Bachelor of Engineering (Honours)
in
Electrical System Engineering for

SCHOOL OF ELECTRICAL SYSTEM ENGINEERING
UNIVERSITI MALAYSIA PERLIS

April 2011

ACKNOWLEDGEMENTS

First of all, I would like to thank, first and foremost, School of Electrical System Engineering, UniMAP to give me a chance to do my final year project. Secondly, I would like to express my endless gratitude to my supervisor, Mr. Engku Ahmad Rafiqi Bin Engku Ariff for his invaluable guidances, support and helps me a lot by providing me useful information for which all of these merits lead to significant improvement to this report.

DECLARATION SHEET

I hereby declare that my Final Year Project Thesis is the result of my research work under supervision of Mr. Engku Ahmad Rafiqi bin Engku Ariff. All literature sources used for the writing of this thesis have been adequately referenced.

Name (in capitals) : **LAU AIK LENG**
Candidate number : **071090294**
Supervisor : **Mr. ENGKU AHMAD RAFIQI BIN ENGKU ARIFF**
Title of thesis (in capitals) : **STEPPER MOTOR CONTROL USING PIC MICROCONTROLLER BASED ON LIGHT INTENSITY**

Candidate's signature: …… Supervisor signature: ……...
Date: …….. Date: …..……

APPROVAL AND DECLARATION SHEET

This project report titled Stepper Motor Control Using PIC Microcontroller Based On Light Intensity was prepared and submitted by LAU AIK LENG (Matrix Number: 071090294) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Electrical System Engineering) in University Malaysia Perlis (UniMAP).

Checked and Approved by

_____

(En. Engku Ahmad Rafiqi Bin Engku Ariff)
Project Supervisor

School of Electrical System Engineering
University Malaysia Perlis

April 2011

Stepper Motor Control Using PIC Microcontroller
Based On Light Intensity

ABSTRAK

Pada masa kini, sistem kejuruteraan adalah bahagian yang amat penting bagi tempat pembangunan atau mesin untuk menjimatkan tenaga manusia. Pelbagai jenis mechine telah aplikasikan untuk menjimatkan masa, kos dan tenaga manusia. Salah satu daripadanya ialah system mesin automatik yang amat membantu manusia untuk mengangkat atau mengambil barang-barang berat. Stepper Motor Control Using PIC Microcontroller Based On Light Intensity ialah satu komponen yang sangat sesuai untuk projek ini. Projek ini direka dan dibina sistemnya ialah memusingkan stepper motor dengannya. Sistem ini menggunakan penyesuai AC kepada DC yang dapat menghidupkan dan mematikan litar elektrik. Idea utama projek ini adalah untuk mencipta satu sistem yang boleh memberi kesenangan kepada manusia untuk membuat kerja yang berat. Pengawal mikro PIC 16F628A digunakan sabagai otak di dalam sistem ini yang akan mengawal system melalui satu kod C (kod sumber) yang dibina menggunakan pekakas lembut PIC C Compiler atau nama lain ialah PIC kits. Di dalam projek ini ia boleh mengawal secara manual oleh manusia sendiri. Oleh itu, ini adalah selamat untuk menggunakan system stepper motor kepada industri berat dan industri kecil-sederhana.

Stepper Motor Control Using PIC Microcontroller
Based On Light Intensity

ABSTRACT

These days the engineering system is an important part for a construction site and machinery to save the energy such as man-power. A lot of machinery types have been applies to saving times, money and power energy. One of the system is automatic machinery system which really helpful for human being especially to carrying the heavy things. Stepper Motor Control Using PIC Microcontroller Based on Light Intensity is a device that suitable for this project. The output is the performance of rotating of the stepper motor to carry the object. The system is powered by using AC to DC adapter. The main idea in this project is to create a system which that can provide a machinery for the human daily works. At the heart of project is a PIC 16F876A microcontroller which will be used as a brain of the system and control the system through a source code (C code) build using PIC C Compiler software or called PIC kits. In this project, it can control manually by human. So, it is really safety to use the stepper motor system for any industries.

TABLE OF CONTENTS

List of abbreviations

MAC	multiply-accumulate
ICSP	In Circuit Serial Programming
LVP	Low Voltage Programming

List of symbols

E_λ	The emissive power per unit area of a blackbody (W/m2 μm)
T	absolute temperature of the body (K)
λ	is the wavelength (μm)
ψ_M	Maximum flux linking each winding
e_A	rate of change of flux linkages
P	rotor teeth
T_{pk}	$Peak\ static\ torque$
R	Resistance
V_{dc}	$Direct\ Current\ Voltage(DC\ voltage)$
ψ_M	$Phase\ winding$
V	Voltage
ω	$angular\ frequency$
f	$frequency$
L	inductance

List of Figures **Page**