

PC CONTROLLER SWITCHES

This Project Report is presented in partial fulfillment for award of the
Bachelor of Electrical Engineering (Hons)

UNIVERSITI TEKNOLOGI MARA



NORSUHAILA BT MOHAMED SUTAN
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR

ACKNOWLEDGEMENTS

In the name of Allah S.W.T, the Beneficent and Merciful. It is with the deepest sense of gratitude to Allah who has given the strength and ability to complete this project and the thesis as it is today.

I would like to take this opportunity to express my special gratitude to my project advisor P.M Rosnani bt. Yahya for the consistent consultation and invaluable advice throughout the preparation and completion of this project.

Secondly, I would like to express my sincere gratitude and heartfelt thanks to my beloved parent, Mohamed Sutan b. Ibrahim and for their guidance and love in nurturing me to be who I am today. Also to my brothers and sisters through their caring, motivations and understanding, they have taught me to have the courage to believe in myself even more.

Last but not least, I also would like to express my thanks to all my friends who had given ideas, support and encouragement throughout the study. THANK YOU.

ABSTRACT

This thesis describes the developed hardware and software for PC Controller Switches. PC Controller Switches is the new approach in system control nowadays. By using the personal computer (PC), users can control the switch states of the devices in a room. In hardware implementation, a transmitter and a receiver are created to form a link between the computer and devices. The link is wireless and radio frequency is used as the technology to convey the control signal from PC to destination. In short words, the hardware is established in five states: Frequency Shift Keying (FSK) Modulator, Frequency Modulation (FM) Transmitter, FM Receiver, FSK Demodulator and Devices Interfacing. All the states are combined together to operate as PC Control System. For software design, Visual Basic is used to develop the program that will control the devices. So the PC able to integrated with the hardware for control purpose. The written program must be able to send the control signal through serial port to integrated hardware.

TABLE OF CONTENTS

CHAPTER		PAGE
1	INTRODUCTION	
1.1	Introduction	1
1.2	Project Overview	2
1.3	Project Objectives	3
1.4	Scope of Report Project	3
2	LITERATURE REVIEW	
2.1	Introduction	4
2.2	Serial Communication	4
2.3	RS-232C Definitions	5
2.4	Frequency Shift Keying (FSK)	7
2.5	Phase-Locked Loop	8
2.6	Direct FM Transmitter	9
2.7	Direct Conversion FM Receiver	10
3	HARDWARE DEVELOPMENT	
3.1	Introduction	11
3.2	RS-232 Level Converter	14
3.3	FSK Generator	15
3.4	Direct FM Transmitter	17
3.5	FM Receiver	20
	3.5.1 Mixer Section	20
	3.5.2 Tapped-C Network of SA605N in Antenna Design	21
	3.5.3 Local Oscillator	24
	3.5.4 IF Section	26
	3.5.5 Demodulation Section	27
3.6	PLL FSK Demodulator	27
	3.6.1 Calculation for RC2211N	29

CHAPTER 1

INTRODUCTION

1.1 Introduction

The PC Controller Switches concept consists of computer as a terminal, which allows people to easily use the computer to control electrical/electronic home appliances.

Traditionally, electrical devices such as fan and lamp are controlled manually by switching the power socket on and off. This situation is pretty much improved after years of development and invention of wireless controlling system.

After the evolution of computer in this decade, tasks that were once complicated can be made easy through computerization. The computers may be divided into personal computer (PC) and embedded controllers. A PC may be a laptop or a desktop machine. In addition, an embedded controller is a computer that is dedicated to performing a single task. Embedded controllers tend to be smaller and less complex than PCs. The computers may control relays, displays or other outputs, and the result is an integrated control system.

An example of a system involved equally with monitoring and controlling is a PC home control system, which may control temperature, humidity, motion, switch state and other condition throughout a house. The system may also control audio, video system, automatic door and windows and outdoor lighting.

This integrated system became even more sophisticated when the communication link between computer and devices are fully wireless link transmission. At its most basic, PC Controller Switches simply switched any electrical devices such as lights, lamps and appliances on and off automatically. It performs many tasks automatically to reduce the stress of