REMOTE CONTROL OF STEPPER MOTOR POSITION USING RF

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ABSTRACT

This thesis describes the development of a Peripheral Interface Controller (PIC16F84A) with Radio Frequency (RF) remote control in controlling the position of the Hybrid Stepper Motor movement.

The project undertaken was a one semester project which is divided into two parts; hardware development and software development. For hardware development, it consists of stepper motor driver circuit and peripheral interface board circuit. While for the software development, it consists of PIC16F84A Microcontroller program.

The objective of this project is to interface Radio Frequency remote control with the PIC16F84A to control forward and reverse movement of the stepper motor. Besides that, the aim of this project is also to use the application of PIC16F84A interface with RF remote control to control the position of hybrid stepper motor.

The PIC will receive the signal from Radio Frequency receiver where this signal represents the position of the transmitter's joystick (this position indicate forward or reverse movement). Then, PIC will process this signal and transmit the output signal to the stepper motor driver circuit to run forward and reverse movement of the motor step by step.

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CHAPTER 1

INTRODUCTION

1.1 Background

The last few years has seen the increasing interest in Peripheral Interface Controller (PIC) application in controlling various dynamic systems including electric motor drivers. The PIC belongs to microcontroller family which offers a wide range of I/O, memory of development engineering. [1, 2]

It has also seen the increasing in interfacing PIC microcontroller with Radio Frequency (RF) remote control since this wireless system makes the controlling motors for some applications such as robotics, machineries, automotive equipments, etc becomes much easier. Radio Frequency is used rather than other wireless systems such as infra red and Bluetooth because of the cost for radio frequency is less expensive compared to the others. Furthermore, the radio frequency based remote control is the only available in the laboratory. To acquire other wireless remote control will be very costly. Besides that, radio frequency can transmit the signal over quite a long distance (in this project, it is about $100m^2$) compared to infra red and Bluetooth which only can transmit the signal in a short distance (in which the range is about below than $10m^2$).

In this project, PIC is used rather than other controllers such as Programmable Logic Controller (PLC), Fuzzy Logic Controller (FLC), etc. because the PIC is suitable for applications that require a simple controlling system. Since this