DC MOTOR DRIVES USING PERIPHERAL INTERFACE CONTROLLER (PIC)

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ABSTRACT

Direct current (DC) motor has already become an important drive configuration for many applications across a wide range of powers and speeds. The ease of control and excellent performance of the DC motors will ensure that the number of applications using them will continue grow for the foreseeable future. This project is mainly concerned on DC motor speed control system by using microcontroller PIC 16F877A. It is a closed-loop real time control system, and provides the feedback speed signal to controller. Pulse Width Modulation (PWM) technique is used where its signal is generated in microcontroller. Through the project, PI controller is implemented into PIC using C program language. In microcontroller, it will calculate the error between the desired speeds with the actual speed. The error will determine duty cycle of pulse-width-modulation (PWM) in microcontroller. Then, the duty cycle will send to DC motor driver either accelerate or decelerate DC motor to maintain it at desired speed.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1. INTRODUCTION

Direct current (DC) motors have variable characteristics and are used extensively in variable-speed drives. DC motor can provide a high starting torque and it is also possible to obtain speed control over wide range. The speed motor controller is important in running a machine effectively. For example, if the DC motor in a robot is applied with a constant supply of power, the robot will never be able to maintain a steady speed. It is thus, important to make a controller to control the speed of DC motor at desired speed.

DC motor plays a significant role in modern industrial. There are several types of applications where the load on the DC motor varies over a speed range. These applications may demand high-speed control accuracy and good dynamic responses, such as washers, dryers and compressors in home appliances, fuel pump control, electronic steering control, engine control and electric vehicle control in automotive and centrifuges, pumps, robotic arm controls, and gyroscope controls in aerospace.