CHAPTER 1

INTRODUCTION

1.1   Background

This project is focusing on how to generate the signal of Pulse Width Modulation (PWM) as the input signal for 3-phase inverter. The 3-phase inverters are an electronic device used to convert a DC input voltage to symmetrical AC input voltage. Generally, the inverter output voltage is supplied by DC input voltage and controlled by the PWM voltage signal. The PWM signals may be generated either form a sinusoidal Pulse Width Modulation (SPWM), Dual Slope Pulse Width Modulation (DSPWM) or Sigma Pulse Width Modulation. DSPWM generated using a Personal Computer (PC) has been reported in the past however, generating the signal based on microprocessor or microcontroller has not yet reported. Therefore, in this project, the DSPWM generated by a microcontroller is proposed.

1.2   Project Objective

The aim of this project is obviously to develop a controlling system which can be used to drive the 3-phase inverter. The main objectives are as follow:

i.   To implement Delta Modulation PWM switching scheme for the 3-pahse inverter using microcontroller.
ii. To analyze the generated Delta Modulation PWM of its feasibility in controlling the 3-phase inverter.

1.3   Scope Of Project

There are several scopes that need to be accomplished for this project

i.   This project will design on how to generate delta modulated PWM signals using microcontroller PIC18F4431.
ii.   This project will generate the six signals of delta modulated PWM with 60 degree phase shift between the pulses sequence.

1.4   Project Contribution

The PWM signals have a wide range in electrical and electronics applications. It can be seen in industrial application, the PWM signals has been widely used in controlling the speed of the motor and also the output of the inverter. As we know, PWM is digitally controlling, hence, system cost and power consumption can be reduced. The same thing goes in communication system because the digital signals are more robust and less vulnerable to noise. Furthermore, most of today's microcontroller is built with PWM capability. Thus, by using this capability, the implementation for controller will be easier.

1.5   Report Organization

This project report is organized into five chapters. The content of each chapter is outlined as follows:

Chapter 1 explains the basic theory and advantages of PWM signal. The overview of project objectives, scope of project and the contributions has been discussed in this chapter.

Chapter 2 is discussing the literature review that related to this project. This chapter is review the conventional method to generate the signals and also the types of PWM that have been generated. Lastly, the overview of the microcontroller characteristics.

Chapter 3 is focusing the work flow of the project from beginning . This chapter also present all the circuit related to this project and method for the development of PWM signals including software and hardware.

Chapter 4 discusses about the type of PWM scheme that has been generated as the input signal for 3-phase inverter. This chapter also described the PWM signals when the value parameters of DPWM algorithm are changed.

Chapter 5 outlines the conclusions and the future work. This chapter concludes all the chapters covered in this report.