

# DESIGN AND APPLICATION OF PIC 16F877 BASED AIR CONDITIONER

**İlhami Çolak**

**Ramazan Bayındır**

**Tolga Kahraman**

*Gazi University, Faculty of Technical Education, Department of Electric, Ankara, TURKEY*

*icolak@gazi.edu.tr*

*bayindir@gazi.edu.tr*

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## ABSTRACT

Nowadays, most people living in large cities have lived indoors. Especially in summer, high relative humidity, elevated air temperatures and bright sunshine can sometimes combine to produce an uncomfortable indoor environment. Therefore, people want to increase the quality of indoor environment. An air conditioning system can provide comfort for occupants by lowering both the air temperature and the humidity level in the closed area. The aim of the present study is to design and construct PIC controlled air conditioner system and compare them to other systems.

## I. INTRODUCTION

The quality and comfort of the indoor environment depends largely on temperature and fresh air indoors. Therefore, temperature of indoors must be independent than climate condition. The indoor condition such as heat, coldness and fresh air can change necessity. There are easy ways to reduce heat entering indoors and stay comfortably cool using air conditioner. A successful and speedy measurement for staying determined temperature needs air conditioning equipment containing requiring heater and cooler process [1].

Through the end of 1990, there has been tremendous development and innovation in semiconductor technology. Related to this development, microcontroller having skills in both circuit design and software programming to design and build a computer-controlled device has been started to be used instead of microprocessor that is not used for the reason of cost, capacity, programmable difficulty and so on. Using a microcontroller can reduce the number of components and thus the amount of design work and wiring required for a project [2]. The interfaces between the microcontroller and the outside world

vary with the application and may include equipments such as display, sensors, relays, motors, and so on. In this study, PIC 16F877 microcontroller has been used because using a microcontroller is easier and cheaper than microprocessor.

In this study, air conditioner was designed and constructed by using PIC 16F877, contrary to the one constructed in market by using different type microprocessor. Controlling of environment temperature, heat, coldness process, speed of electric fan is done PIC 16F877. When remote control unit of the air conditioner do not use, PIC is passed to sleep mode. All of the parameter such as temperature, electric fan control and so on was remote controlled. The test works showed that the PIC controlled and remote controlled air conditioner are operated successfully as a prototype. Upon analyzing the design concepts, a superior and more viable design has been developed than in market system.

## II. WORKING PRINCIPLE OF AIR CONDITIONER

An environment that is hot or cold will certainly not sustain to higher working efficiency and comfort [3].

Air conditioners use principles of heat transfer, and air movement by using electric fan, heater, and cooler. The amount of cooling or heating required by an air conditioner will vary depending on the outdoor temperature and the amount of heat indoors. When the power of air conditioner is on, the compressor operates at a high speed in order to cool or heat the room quickly. As the room temperature equal to the reference temperature, the compressor slow down, maintaining a constant temperature and saving energy.

*A. Working of air conditioner cooler mode*