Higher Technical Institute

ELECTRICAL ENGENEERING DEPARTMENT

DIPLOMA PROJECT

PC CONTROL OF ROOM EQUIPMENT

By

GEORGE PARTASIDES

E/1115

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Project report submitted by

George Partasides (E/1115)

In part of award of

DIPLOMA PROJECT OF TECHNICIAN ENGINEERING

In Electrical Engineering of the Higher Technical Institute, Cyprus

Project Supervisor

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Lecturer in Electrical Engineering H.T.I.

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CONTENTS

Project number: E1115

Title: PC Control of Room Equipment

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OBJECTIVES

1. To design, construct and test an interface card using ISA slot.
2. To design, construct and test a sensor interface circuit for the above card.
3. To Find or develop a relevant software to control the developed circuits.

TERMS AND CONDITIONS

1. Input ports using 74LS245 ICS exist in the interface card
2. Output ports using 74LS573 ICS also exist in the interface card
3. Comparator 8-bit magnitude 74LS688 exist in the interface card
4. Octal Bus transceiver 74LS245 exist in the interface card.
5. Quad 2-Input Nor Gates 74LS02 exist in the interface card.
6. Decoder / Demultiplexeres 74LS138
7. Transistors BFY51
8. Relays for switching on and off the output devices
9. Diodes and Resistors
10. Adaptors for connecting the output devices

SUMMARY

The purpose of this project is to study the personal computer and the methods used for connecting an external electronic device to it. The final objective of the project is to design a computer-controlled system for different kind of devices.

The computer-controlled system must be capable at the first stage to control three or four devices, but the interface card should be capable to have sixteen outputs and eight inputs.

The inputs could be sensors for controlling the outputs automatically or any other kind of sensors (e.g. thermometer, infrared) . Using an appropriate software in one of the following languages, Pascal, Fortran, Basic, Visual Basic, could do all these.

In this project, after examining different techniques of interfacing, I selected the best method, which was the development of an interface card. The schematic designs for the interfacing card and the schematic of the external card were produced and tested to see if they operated properly. At the last stage, some other diagnostics tests were made to investigate the proper operation of the software.

The "PC control of room equipment " idea, has been conceived having in mind that computers day by day become more useful and soon will enter every house if they haven't already done! Automating almost everything, and making life more comfortable is one thing that I had in mind when I was decided to make this project. Furthermore, the possibility of using remote control to control all these, made the whole project more interesting.

INTRODUCTION

In recent years computers have evolved in a very fast way. Today they are a valuable part of the office and place of work and indispensable in everyday life, whether a man goes to the bank or to buy food from a supermarket. Everything is related to them making things faster and more convenient for the man of today.

But computers are still not playing a vital role in the house operation. Many people may have personal computers in their houses to deal with the taxes or play games, but up to now, no house is controlled by a computer. Computer can be the brain of the house, doing things that will help people live a more comfortable life. Computer can turn ON or OFF the lights, turn ON the oven and cook the food, or turn ON the heating system when its sensors notify it that the house is too cold.

Computer can be programmed to heat the water at a specific time of the day so that people coming back from their jobs have hot water to take their bath. Or even, a computer could control the television set, thus enabling parents to select what programs their children watch.

These are just a few examples of what could be done in a computer-controlled house. A11 these functions could be controlled from a small touch screen located in every room or even by voice commands. And, of course, the operation of the system would be so easy that anybody could control it, not just trained people or people with computing experience.

The above give a brief description of how the future house will be. Based on these, a simple system for controlling different devices in house will be constructed. This system will not necessarily be ready to be installed in a new house but will simply demonstrate one of the several ways it can be achieved.