

20000010850

FINAL YEAR PROJECT REPORT

DIPLOMA IN ELECTRICAL (INSTRUMENTATION) ENGINEERING

SCHOOL OF ENGINEERING

INSTITUT TEKNOLOGI MARA

SHAH ALAM, SELANGOR

PROJECT TITLE

TEMPERATURE CONTROL USING IBM/PC

BY

MOHD KHAIRUL NIZAM BIN MAT NOH

ITM IC : 87263441

AHMAD LUTPI BIN IBRAHIM

ITM IC : 87229662

HANIZAR BIN HASEIM

ITM IC : 86307747

PROJECT ADVISOR: MR. MUHAMMAD NADZRI B. MOHD NADZIR

MAY 1990

TABLE OF CONTENTS.

PAGE

Acknowledgements	i
Abstract	ii
<u>CHAPTER</u>	
1. INTRODUCTION	1
2. PROCESS TRAINER CHARACTERISTICS	2
2.1 Layout of front panel	3
2.2 Controller action	6
3. HARDWARE INSTALLATION	8
3.1 Block diagram for this project	8
3.2 The connection of the system	9
3.3 Drive circuit	12
4. 12 BIT ANALOG TO DIGITAL(A/D) AND DIGITAL TO ANALOG(D/A) CONVERSION.	13
4.1 D Type connector pin assignment	15
4.2 Hardware configuration in AD-DA card	16
5. SOFTWARE	17
5.1 The flowchart	17
5.3 Explanation of the flowchart and the programme	18
5.4 The graph	22
6. DISCUSSION AND CONCLUSION	25
7. APPENDIX	
-Appendix I - Process trainer layout	26
-Appendix II -The graph	27

## ACKNOWLEDGEMENT

In the name of ALLAH the Most Beneficial and the Most Merciful. All Praise be to ALLAH and HIS PROPHET for without HIS blessing we would not be able to complete our project successfully. We would like to express our highest sincere and gratitude to those who are involved in completing our project directly and indirectly especially to our project advisor, En. Muhammad Nadzri bin Mohd. Nadzir, En. Azhar, En. Hamdan and the lectures at the Instrumentation Department. Special thank to our parents, brothers and sisters for their encouragement.

Our greatest and ultimate debt is due to ALLAH the CREATOR OF THE HEAVEN AND EARTH. May He forgive our weaknesses, strengthen and enliven our faith in HIM.

## ABSTRACT

Control systems are used in a great range of applications in the modern world, from household appliances to the most sophisticated guided missile system. Computers, and particularly microprocessor based computers, are being applied in ever increasing numbers to all these areas of control. In this project a specialized type of control system will be studied for which all control inputs and outputs can be expressed in one of two conditions, ON or OFF. The use of an IBM/PC to provide control for this type of system will be studied. The two value nature of the variables in such systems makes interface to the computer particularly simple, but the control operations can still become quite complex.

## I.O INTRODUCTION

In this project, a process trainer in which its temperature can be controlled was used. The present control was provided by electronic circuits and this are to be replaced by a computer.

A thermistor was used to sense the temperature. This data is then converted from analogue to digital signal using an analogue to digital converter card and send to the computer. The computer then compares this value to the set point and makes a decision whether to switch ON or OFF a heating coil. A programme was then written to output the appropriate signal i.e ON or OFF heater in accordance with the set point.