

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

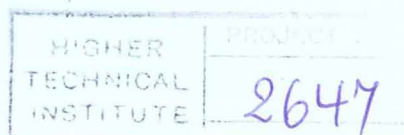
DIPLOMA PROJECT

DEVELOPMENT OF A SEQUENCE CONTROL
SCHEME OF A CHARCOAL MACHINE USING
PROGRAMMABLE LOGIC CONTROLLER

E.1056

CHADJIODYSSEOS CHRISTODOULOS

1997



SUMMARY

Title: Development of a Sequence Control Scheme of a charcoal machine using a PLC.

Author: Chadjiodyseos Christodoulos.

The purpose of this project is to provide information about the Programmable Logic Controllers through which someone can understand and become familiar with the capabilities of the PLC's.

In the various chapters of this book, a description of the PLC is given and also all the information about historical development; advantages and disadvantages of the use of PLC's, applications of these controllers and also comparison between PLC's and other control systems. Also a description of the "Ladder Language" used to program the PLC is given so that the programming capabilities of this language are investigated.

To understand better the functions, the characteristics and the capabilities of the PLC an application program is designed for a charcoal manufacturing machine. In the book you can find the "Ladder Diagram" for this as well as a program analysis and other useful information.

Finally costing for the PLC-based solution for the specific problem will be provided as well as a comparison between the costs of the particular system and other conventional methods.

CONTENTS

	Page No
Acknowledgements	4
Summary	5
Introduction	6
<u>Chapter 1: Introduction to PLC's</u>	
1.0 Introduction	8
1.1 Definition	8
1.2 Historical progress of PLC technology	9
1.3 Comparison of control systems	10
1.4 Advantages of Programmable Logic Controllers	13
1.5 Disadvantages of Programmable Logic Controllers	14
<u>Chapter 2: Programmable Controller System Description</u>	
2.0 Introduction	16
2.1 Major sections of PLC	16
2.2 The central processing unit or CPU	18
2.3 Input and output modules	21
2.4 Power Supplies	24
2.5 Programmer/Monitor (PM)	25
2.6 The printer	26
2.7 Recording devices (Tape or Disk)	27
<u>Chapter 3: PLC Programming, "Ladder Diagram Language"</u>	
3.0 Introduction	30
3.1 Ladder Diagram Programming	30
3.2 Logic Continuity	31
3.3 Operating cycle	31
3.4 Addressing	32
3.5 Programming instructions and functions	33

Chapter 4: An Application Scheme

4.0 Introduction	39
4.1 Program Requirements	39
4.2 Identification of inputs and outputs	43
4.3 Control panel	44
4.4 Addressing	45
4.5 PLC used for the application	48
4.6 Program explanation	50

Chapter 5: Another approach for the same application

5.0 Introduction	68
5.1 Additional requirements for safety	68
5.2 Addition of inputs/outputs and other functions	69

Chapter 6: Costing

6.0 Introduction	82
6.1 Calculations	82
6.2 Comments	83

References	84
-------------------	----

Appendices	85
-------------------	----