

AUTOMATIC CONTROLLER USING  
PROGRAMMABLE LOGIC CONTROLLER (PLC)  
FOR MARKER PEN ASSEMBLY MACHINE

Thesis is presented to fulfill the requirement  
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## Abstract

This project is to design and develop an Automatic Controller using Programmable Logic Controller (PLC) for Marker Pen Assembly Machine. The marker pen consists of five parts: barrel, ink pad, felt tip, rear cap and front cap. The assembly process is divided into four stages: sorting, feeding, indexing and insertion. The machine is expected to assemble 3,600 marker pens per hour. The PLC is used to transmit and process the electrical signals. A software routine known as ladder diagram is developed and used in the PLC to control the operation of the assembly machine automatically.

## CONTENTS

DEDICATION	i
ACKNOWLEDGEMENT	ii
APPROVAL	iii
ABSTRACT	iv
SYMBOLS	v
1.0 INTRODUCTION	
1.1 Introduction	1
1.2 Scope of Project	4
2.0 THEORY AND APPLICATION OF ELECTROPNEUMATIC	
2.1 Introduction	5
2.2 Programmable Logic Controller (PLC)	5
2.3 Pneumatic System	8
3.0 PROJECT PLANNING AND DEVELOPMENT	
3.1 Project Planning	14
3.2 Electrical System and Devices Selection	18
3.3 Pneumatic System and Equipment Selection	20
3.4 Ladder Diagram Design and Development	22
3.5 Marker Pen Assembly Machine	35
3.6 Electrical and Pneumatic Connection	37
3.7 Troubleshooting	37

## 1.0 INTRODUCTION

### 1.1 Introduction

Due to soaring labor costs, robotics and automation technology have recently become important in outside plant construction. In addition, it is expected that it will be difficult to obtain a highly skilled labor force in the near future. The route towards increased productivity is through increased automation of processes and machines. This automation may be required to directly increase output quantities, or to improve product quality and precision

For this reason, the automated marker pen assembly machine is proposed where Programmable Logic Controller was used to control the assembly process of the machine. The machine performs a repeating sequence of operations on a continuous flow of assembly process without operator input (except START, STOP, EMERGENCY STOP etc.). The major components of the marker pen as shown in Figure 1.1 are the barrel, ink pad, rear cap, felt tip and front cap.

The flow of assembly process as shown in Figure 1.2 are ink pad insertion into barrel, rear cap insertion to the barrel, ink injection into pad in the barrel, tip insertion to the barrel and front cap insertion to the barrel