

# **Industrial Automation**

**SYNOPSIS  
OF MAJOR PROJECT  
BACHELOR OF TECHNOLOGY  
Electrical Engineering**

Submitted by:

SANDEEP SINGH

1605686

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**GURU GOBIND SINGH COLLEGE OF MODERN  
TECHNOLOGY, KHARAR  
I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY,  
JALANDHAR**

## **ABSTRACT**

- It is a great pleasure for me to present the following mid termreport on my industrial training otherwise one seldom gets the chance to go for the industrial training. It outlines the course of my job details during my training period of 6 Months at INFOWIZ.
- The training report consists of the various instructions used in the PLC programming, various examples on ladder logic, Scada system & my project details on **BOTTLE FILLING STATION** using PLC and SCADA.
- Adequate layouts & diagrams have been provided for more descriptive outlook & better clarity of understanding. All in I have tried to provide the best from me in presenting this volume on my training at INFOWIZ in a very precise manner.
- However any suggestions & comments on this volume will be gratefully accepted.

1.

## **INTRODUCTION**

The aim of this project is to design a PLC (Programming Logic Controller) Training kit that helps to study about the basic programming and wiring of PLC. It also includes programming logics like start stop, timer and logic gates.

- A **Programmable Logic Controller, PLC** or **Programmable Controller** is a digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines.
- The abbreviation "PLC" and the term "Programmable Logic Controller" are registered trademarks of the Allen-Bradley Company.
- Programmable logic controller (PLC) is a digital electronic device that uses a programmable memory to store instruction and to implement specific functions such as logic, sequence, timing, counting and arithmetic to control machines and process.
- PLCs are used in many industries and machines. Unlike general-purpose computers, the PLC is designed for multiple inputs and output arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact.
- A PLC is an example of a hard real time system since output results must be produced in response to input conditions within a limited time, otherwise unintended operation will result
- PLC began in the 1970s, and has become the most common choice for manufacturing controls.
- "MODICON" was the first company of PLC.
- Software used in PLC is RsLogix 500.

The project also include the basic study of ladder logic(Programming Language).

Commonly, the language or command for PLC designing base on the ladder

logic diagram. There have numerical of symbol that have been used to developed the ladder logic diagram which every symbols represent the different functions.

The formats for designing the ladder logic diagram are:

- Circuits are arranged as a series of horizontal lines containing inputs & outputs.
- Inputs must always go before outputs and are in the form of normally open and normally closed contacts.
- There must always be at least one output on each line. An output is for example, a PLC output relay. The ladder symbol for a PLC output is drawn either as two parentheses close together, i.e. or as a circle.
- The numerical assignment for the inputs and outputs form part of the ladder diagram.
- Other elements such as timers, counters and shift registers can be implemented in ladder diagrams.

## **Industrial automation**

Industrial automation is the use of control systems, such as PID controller based control system, PLC based control system for handling different processes and machineries in an industry to replace a human being. It is the second step beyond mechanization in the scope of industrialization.

### **Objectives:**

- An automated goals and objectives management system enables increased productivity.
- The better employee retention and optimizes compensation rewards to improve efficiency.
- Increasing safety in working conditions reducing manpower & cost.
- Better quality.

### **Description about Project Work**

Making products under the control of computer and programmable controller is known as industrial automation. Manufacturing assembly line as stand-alone machine tools (CNC machine) and robotic devices fall into this category. Automation is delegation of human control functions to technical equipment for increasing productivity.

In manual control an operator may periodically read the process temperature and adjust the heating or cooling input up or down in such a direction as to drive the temperature to its desired value. In automatic control measurement & adjustments

are made automatically on a continuous basis. Manual control may be used in non-critical application where major process upsets are unlikely to occur, where any process conditions occur slowly & in small increments and where a minimum of operator attention is required.

Industrial automation training includes:

- PLC programming and troubleshooting.
- PLC panel wiring/installation.
- SCADA designing and PLC interfacing.
- VFD panel configuration wiring.
- VFD PLC interfacing.
- Motors and drives.
- Panel designing and autocad.
- Industrial networking.

### **Components used in automation:**

The components of automation system includes

- Sensors
- Transmitters
- Control system which includes PLC, controllers
- Contactors
- Relays
- Output devices such as actuators, drives, control valves, coils etc.

### **External Advisor's Information**

**Name:** Mr. Amit Solanki

**Designation:** Automation Engineer.

**Business Name:** INFOWIZ

**Business Address:** SCO 118-120, Basement, Sector 34A, Chandigarh

**Business Email:** [info@infowiz.co.in](mailto:info@infowiz.co.in)

**Business Tel:** +91172-4567-88 +91 9888-500-888 +91 9888-600-888