

# PLC & Automation

**Intermediate Course**

**Duration: 5 Days (6 hours Per Day)**

## Objective of the Course:

Understand the concept of a Programmable Logic Controller, and how it is implemented in industry, components, properties of automated systems, Engineering application of hydraulic and pneumatic using PLC systems and design Automated systems using Automation Studio Software.

## Course Outcome:

On completion of the course, the learner will be able to

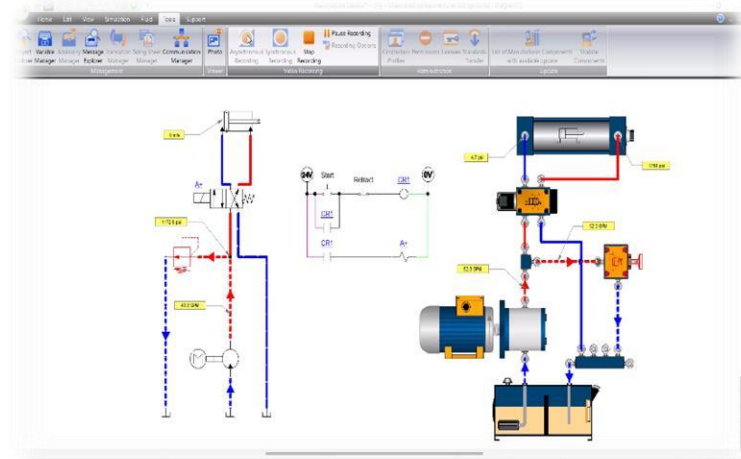
- Understand the purpose, working and applications of PLC systems and Automation System
- Explain functions, types, construction and working of different types of valves and actuators and other components used in PLC and Automation.
- Select an appropriate component required for hydraulic and pneumatic systems
- Understand the concepts of different electrical controls.
- Understand PLC and its application in automation
- Design Simulate & analyze various hydraulic and pneumatic systems for industrial/mobile applications controlled using PLC in Automation Studio.

## Course Duration:

### Module 1: Introduction to Automation Studio

Overview of Automation Studio and its Applications

- **User interface and workspace navigation**
- Toolbar and menus
- Project management
- **Creating and Editing Components**
- Inserting components (cylinders, valves, motors, sensors)
- Connecting components
- Editing properties



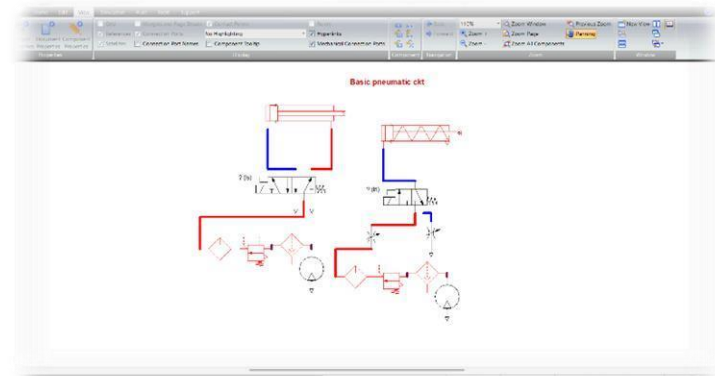
### Module 2: Hydraulic System Design

- **Introduction to Hydraulic Systems**
- Basics of hydraulics
- Hydraulic components and symbols
- Hydraulic circuit design principles

- **Designing Hydraulic Circuits**
- Building simple hydraulic circuits
- Designing advanced hydraulic systems
- Understanding flow control and pressure control
- **Simulating Hydraulic Systems**
- Analyzing hydraulic system behavior

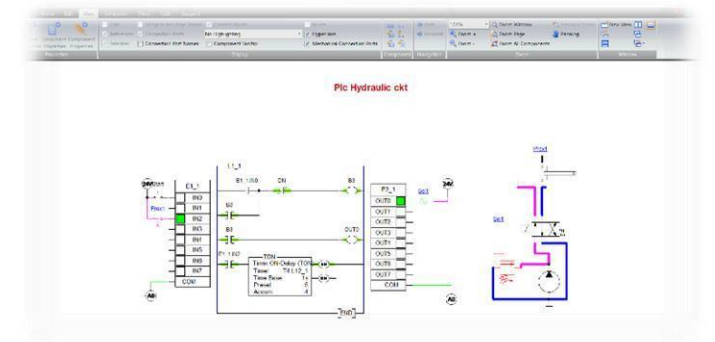
### Module 3: Pneumatic System Design

- **Introduction to Pneumatic Systems**
- Basics of pneumatics
- Pneumatic components and symbols
- Pneumatic circuit design principles
- **Designing Pneumatic Circuits**
- Building simple pneumatic circuits
- Designing advanced pneumatic systems
- Understanding speed control and direction control
- **Simulating Pneumatic Systems**
- Analyzing pneumatic system behavior



### Module 4: Automation and PLC Programming

- **Introduction to Automation**
- Basics of automation
- Sensors and actuators
- PLC programming fundamentals
- **PLC Programming in Automation Studio**
- Writing ladder logic programs
- Interfacing with virtual PLCs
- Testing and debugging PLC programs



### Module 5: Electro-Hydraulic, Electro-Pneumatic and PLC

- Integrating hydraulic, pneumatic, and electrical components
- Co-simulation of multi-system control
- Troubleshooting and debugging multi-system designs