

**Training Title**

**PLC: Programming, Commissioning & Troubleshooting**

**Training Duration**

5 days

Will be held at any of the 5 star hotels (Exact venue will be informed soon)

**Training Fees**

- 3300 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultants Certificate of course completion will be issued to all attendees.

**TRAINING OVERVIEW**

**DESCRIPTION**

This course is designed to give engineers and technicians a good understanding of Programmable Logic Controllers (PLC's). The course places a heavy emphasis on the appropriate selection of PLC to meet specific design project as well as understanding the logic and operation of the PLC with real industrial applications. The course also covers the PLC hardware and software architectures, programming, networking, installation, commissioning and troubleshooting. Many hands-on examples and real-time case studies will be presented. At the end of the course, participants must design, develop, program, test, and document a complete project.

**COURSE OBJECTIVES**

After attending the course, participants will be able to:

- Select the right PLC systems and its hardware and software specifications to meet given system requirement.
- Specify PLC hardware and installation criteria
- Specify the inputs/outputs
- Use the PLC Instructions' set: logic, timers, counters instructions
- Utilize advanced PLC instructions' set: Data transfer instructions, Arithmetic, shift, and rotate instructions
- Understand the basic PLC's interrupt capabilities
- Write, implement and test PLC programs for real industrial systems
- Troubleshoot PLC systems

- **Develop, design and test real-time case studies using simulation and real stations.**

### **WHO SHOULD ATTEND**

- **Project, Electronic, Electrical, and Control Engineers.**
- **Technicians & Operators**
- **Managerial Staff**

### **OUTLINE**

#### *Day 1 :*

#### **Introduction to PLC's hardware and basic programming**

- PLC basic building blocks function modules: Small, Medium and Large Scale.
- Selecting the right PLC based on:
  - Power supplies: Output Current, Output Voltage and Operation Voltage.
  - CPU: Type, execution time, number of timers/counters, number of Analog Input/Output, maximum number of digital inputs/outputs, number of expansions modules, integrated functions, process-controlled and time-controlled interrupt capabilities.
  - Input/Output: DC and AC specifications.
  - Analog Input/Output: Number of channels, resolution, Current and voltage inputs
  - Special function units.
- PLC Operation Blocks
- Absolute and Symbolic Addressing
- Program scan cycle
- From discrete logic concept to ladder diagram concept
- Simple Examine ON and Examine OFF Instructions
- AND/OR programming
- Sealing bits / latch programming
- Practical case studies with hands on applications (using simulator)

#### *Day 2 :*

#### **Intermediate PLC programming**

- Programming counters:
- Programming timers
- Data Transfer
- Hands-on examples and practical case studies with hands on applications.

#### *Day 3 :*

### **Advanced PLC's Programming-I**

- Math operations
- Comparison statements
- Introduction to Interrupt and interrupt handling
- Hands-on examples and practical case studies with hands on applications.

#### *Day 4 :*

### **Advanced PLC's Programming-II**

- Analog Inputs and Outputs
- Function and functions blocks
- PLC installation, testing and commissioning
- Troubleshoot and maintaining a PLC system
- Course project: Part-1

#### *Day 5 :*

### **PLC Communications and Networking**

- PLC communication ports
- Serial communication and Protocol for communication
- Communication between several PLC's and Remote input/output and communications
- PLCs networks and Distributed Control Systems.
- System documentation
- Course project: Part-II.

### **The lectures will be supported by case studies and simulations**

*If participants can bring their laptop that is appreciated as during the training relevant software might be installed*

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