



Programmable Logic Controllers I (OMRON)

Duration 50 hours

SECTION 1 INTRODUCTORY CONCEPTS

Introduction to Programmable Controllers

- ✓ Definition
- ✓ A Historical Background
- ✓ Principles of Operation
- ✓ PLCs Versus Other Types of Controls
- ✓ PLC Product Application Ranges
- ✓ Ladder Diagrams and the PLC
- ✓ Advantages of PLCs

Number Systems and Codes

- ✓ Number Systems
- ✓ Number Conversions
- ✓ One's and Two's Complement
- ✓ Binary Codes
- ✓ Register Word Formats

Logic Concepts

- ✓ The Binary Concept
- ✓ Logic Functions
- ✓ Principles of Boolean algebra and Logic
- ✓ PLC Circuits and Logic Contact Symbol

OMRON Tools

- ✓ Introduction to software tools by OMRON
- ✓ CX-One installation
- ✓ Introduction to CX-One
- ✓ Quick Project

SECTION 2 COMPONENTS AND SYSTEMS

Processors, the Power Supply, and Programming Devices

- ✓ Introduction
- ✓ Processors
- ✓ Processor Scan
- ✓ Error Checking and Diagnostics
- ✓ The System Power Supply
- ✓ Programming Devices

- ✓ What OMRON offers

The Memory System and I/O Interaction

- ✓ Memory Overview
- ✓ Memory Types
- ✓ Memory Structure and Capacity
- ✓ Memory Organization and I/O Interaction
- ✓ Configuring the PLC Memory—I/O Addressing
- ✓ Summary of Memory, Scanning, and I/O Interaction
- ✓ Memory Considerations

The Discrete Input/Output System

- ✓ Introduction to Discrete I/O Systems
- ✓ I/O Rack Enclosures and Table Mapping
- ✓ Remote I/O Systems
- ✓ PLC Instructions for Discrete Inputs
- ✓ Types of Discrete Inputs
- ✓ PLC Instructions for Discrete Outputs
- ✓ Discrete Outputs
- ✓ Discrete Bypass/Control Stations.
- ✓ Interpreting I/O Specifications
- ✓ Summary of Discrete I/O
- ✓ What OMRON offers

The Analog Input/Output System

- ✓ Overview of Analog Input Signals
- ✓ Instructions for Analog Input Modules
- ✓ Analog Input Data Representation
- ✓ Analog Input Data Handling
- ✓ Analog Input Connections
- ✓ Overview of Analog Output Signals
- ✓ Instructions for Analog Output Modules
- ✓ Analog Output Data Representation
- ✓ Analog Output Data Handling
- ✓ Analog Output Connections
- ✓ Analog Output Bypass/Control Stations
- ✓ What OMRON offers

Special Function I/O and Serial Communication Interfacing

- ✓ Introduction to Special I/O Modules
- ✓ Special Discrete Interfaces
- ✓ Special Analog, Temperature
- ✓ ASCII, Computer, and Network Interfaces
- ✓ Peripheral Interfacing
- ✓ What OMRON offers

SECTION 3 PLC PROGRAMMING-A

The IEC 1131 Standard and Programming Language

- ✓ Introduction to the IEC 1131
- ✓ IEC 1131-3 Programming Languages
- ✓ Sequential Function Chart Programming
- ✓ Types of Step Actions
- ✓ IEC 1131-3 Software Systems
- ✓ Summary

Programming Languages

- ✓ Introduction to Programming Languages
- ✓ Types of PLC Languages
- ✓ Ladder Diagram Format
- ✓ Ladder Relay Instructions
- ✓ Ladder Relay Programming
- ✓ Timers and Counters
- ✓ Timer Instructions
- ✓ Counter Instructions
- ✓ Program/Flow Control Instructions
- ✓ Arithmetic Instructions
- ✓ Data Manipulation Instructions
- ✓ Data Transfer Instructions
- ✓ Special Function Instructions
- ✓ Boolean Mnemonics

PLC PROGRAMMING-B

Short Programming Examples

- Filling and draining control
- Parts sorting

PLC System Documentation

- ✓ Introduction to Documentation
- ✓ Steps for Documentation
- ✓ PLC Documentation Systems
- ✓ Conclusion

SECTION 4 INSTALLATION AND START-UP

PLC Start-Up and Maintenance

- ✓ PLC System Layout
- ✓ Power Requirements and Safety Circuitry
- ✓ Noise, Heat, and Voltage Considerations

- ✓ I/O Installation, Wiring, and Precautions
- ✓ PLC Start-Up and Checking Procedures
- ✓ PLC System Maintenance
- ✓ Troubleshooting the PLC System

System Selection Guidelines

- ✓ Introduction to PLC System Selection
- ✓ PLC Sizes and Scopes of Applications
- ✓ Process Control System Definition
- ✓ Other Considerations
- ✓ Summary

Available software/hardware tools during training session

- ✓ Cx-One
- ✓ Cx-Simulator
- ✓ OMRON PLC
- ✓ Simulator based Factory Setups
- ✓ Technical Manuals
- ✓ Theoretical booklet covering/explaining all the topics covered in training session

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