WAGO PLC Programming – Essentials

Course Duration

40 Hours

Course Description

This course provides a comprehensive introduction to WAGO PLC programming using CODESYS-based engineering platforms. Participants will learn industrial automation fundamentals, WAGO controller configuration, IEC 61131-3 programming languages, hardware integration, communication protocols, troubleshooting techniques, and basic visualization development. The program combines theory and hands-on exercises to enable participants to design, develop, test, and commission real-world automation applications using WAGO PLC systems.

Upon completion, participants will be able to independently develop PLC programs, configure WAGO hardware, establish industrial communications, and troubleshoot automation systems.

Target Audience

- Automation Engineers
- Electrical Engineers
- Instrumentation Engineers
- Maintenance Engineers
- Control System Technicians
- Engineering Students
- Fresh Graduates entering Industrial Automation

Pre-Requisites

Mandatory

- Basic knowledge of electrical circuits
- Familiarity with industrial equipment and sensors
- Basic computer operating skills

Recommended

- Understanding of relay logic
- Exposure to industrial automation concepts

Learning Outcomes

By the end of this course, participants will be able to:

- Understand WAGO PLC hardware architecture
- Configure controllers and I/O modules
- Develop programs using Ladder Diagram (LD)
- Develop programs using Function Block Diagram (FBD)
- Understand Structured Text (ST) fundamentals
- Configure digital and analog I/O
- Use timers, counters, and comparison instructions
- Implement basic industrial communication
- Develop simple HMI/Visualization screens
- Perform online monitoring and troubleshooting

Course Contents

Module 1 – Introduction to Industrial Automation

Topics

- Automation Fundamentals
- PLC Evolution and Applications
- WAGO Product Portfolio Overview
- PLC Scan Cycle
- Industrial Control System Architecture
- Applications of PLCs

Module 2 – WAGO Hardware Fundamentals

Topics

- WAGO Controllers Overview
- Power Supply Requirements
- I/O System Architecture
- Digital Inputs and Outputs
- Analog Inputs and Outputs
- Wiring Standards
- Hardware Diagnostics

Module 3 – Engineering Software Setup

Topics

- Introduction to CODESYS
- Software Installation
- Project Creation
- Device Configuration
- Downloading Applications
- Online vs Offline Operations

Module 4 – IEC 61131-3 Programming Fundamentals

Topics

- IEC 61131-3 Overview
- Ladder Diagram (LD)
- Function Block Diagram (FBD)
- Structured Text Introduction
- Data Types
- Variables and Constants

Module 5 – PLC Programming Essentials

Topics

- Contacts and Coils
- Set and Reset Logic
- Interlocks
- Timers
- Counters
- Comparators
- Arithmetic Operations

Module 6 – Program Organization

Topics

- Programs
- Functions
- Function Blocks
- Global Variables
- Local Variables
- Task Configuration

Module 7 – Industrial Communication Basics

Topics

- Ethernet Fundamentals
- IP Configuration
- Modbus TCP Overview
- PLC-HMI Communication
- Network Diagnostics

Module 8 – Visualization Fundamentals

Topics

- Visualization Concepts
- Screen Development
- Buttons and Indicators
- Trends and Alarms Basics

Module 9 – Diagnostics & Troubleshooting

Topics

- Online Monitoring
- Watch Lists
- Forcing Variables
- Error Diagnostics
- Troubleshooting Methodology

Module 10 – Final Project & Assessment (4 Hours)

Project

Tank Level Monitoring and Pump Control System

Assessment

- Practical Programming Test
- Theory Assessment
- Project Evaluation