

PLC & SCADA Automation Training (Beginner to Advanced)

Learn to program Siemens PLCs and build SCADA systems with TIA Portal and WinCC, from ladder logic to industrial networking and troubleshooting.

10

MODULES

35

TOPICS

COURSE OVERVIEW

This comprehensive hands-on training program takes participants from beginner to advanced levels in Industrial Automation. It provides in-depth practical knowledge of PLC programming, SCADA system development, industrial networking, and automation project execution. Using Siemens TIA Portal and WinCC, learners will design and implement real-time industrial monitoring and control applications. The course combines foundational theory with practical lab exercises to ensure participants gain the technical skills required for automation system design, programming, integration, and troubleshooting in modern industrial environments.

WHO THIS COURSE IS FOR

Automation, Electrical, Electronics, and Instrumentation Engineers

Diploma, BTech, and MTech Students

Maintenance, Service, and Commissioning Professionals

PREREQUISITES

- Basic understanding of electrical circuits and industrial systems
- Familiarity with computers and engineering software tools

LEARNING OBJECTIVES

Upon completion of this course, participants will be able to:

- Understand industrial automation principles and control architectures
- Configure and program Siemens PLCs using TIA Portal
- Design and develop SCADA systems using WinCC
- Integrate PLC and SCADA for real-time monitoring and control
- Apply industrial communication protocols (PROFINET, PROFIBUS, Modbus)
- Troubleshoot and maintain automation systems effectively
- Implement safety and diagnostic measures in automation environments

10 Modules, 35 Topics

01

Industrial Automation Fundamentals

TOPICS

Introduction to Industrial Automation · PLC, DCS & SCADA System Overview · Closed-loop Control and Process Flow · PLC vs Microcontroller vs Relay Logic

02

PLC Hardware & Architecture

TOPICS

- **Siemens PLC Models:** S7-1200 / S7-300 / S7-1500
- Digital & Analog I/O Modules
- Power Supply and Wiring Practices
- Industrial Electrical Safety

03

TIA Portal Engineering Environment

TOPICS

Project Creation & Hardware Setup · Configuring CPU & IO Modules · IP Addressing & PG/PC Interface · Program Load, Backup & Diagnostics

04

PLC Programming Basics

TOPICS

PLC Scan Cycle Explanation · Addressing Bits, Memory & Registers · **Ladder Logic:** AND, OR, Seal Logic · Motor Interlocking and Control Logic

05

Timers, Counters & Comparators

TOPICS

TON, TOF, TP Timer Applications · Up/Down Counters in Automation · Arithmetic & Comparison Instructions

06

Advanced PLC Programming

TOPICS

Functions (FC) and Function Blocks (FB) · Data Blocks (DB) – Global & Local Memory

07

Analog Signal Processing

TOPICS

0–10V and 4–20mA Sensors · Signal Scaling & Filtering

08

Industrial Communication Networks

TOPICS

PROFINET, PROFIBUS, Ethernet · Modbus TCP/RTU Communication · PLC ↔ SCADA Data Mapping · Real-Time Data Logging Concepts

09

SCADA Development

TOPICS

SCADA Project & Tag Database Setup · Screen Design, Animation & Object Linking · Alarm Management and Trend Logging · User Security & Runtime Deployment

10

Industrial Safety & Troubleshooting

TOPICS

Emergency Stop & Safety Relay Wiring · Fault Diagnostics & Monitoring Tools · I/O Forcing & Cross Reference Tracking · Error Memory and Diagnostic Buffer

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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