Protean Knowledge Solutions
B-204, Satyam Industrial Estate
Erandwane, Pune 411038
Cell: 09422320468 / 08806132002
Email: b.gondhalekar@gmail.com

PLC – HMI – SCADA Training

Since its invention almost fifty years back, today, Programmable Logic Controllers (PLC) are the most widely used industrial process control, machine control technology. You will find PLCs being used in every known industry from Pharma, Mining, Steel making, Fertilizers, Cement, Foods and Beverages, Hospitality, Power Generation and Distribution…etc.
HMI (Human Machine Interface), SCADA (Supervisory Control and Data Acquisition) are the technologies which usually go with PLC, however they are not as widely spread as PLCs
But, as the prices go down, you will start finding more and more PLCs deployed with HMI and Scada especially in the process industry.

Our course is designed specifically for students and professionals working in the industry, we assume no previous knowledge and teach students from very basic. As the student gains knowledge and confidence - through extensive hands on training - more complex ideas are introduced.

This course is suitable for working engineers and degree/ diploma engineering students graduating in practically all streams - Mechanical, Electrical, Instrumentation, Electronics, Computing, and Production.

Participants in this course will not only gain good working knowledge of PLC- HMI- SCADA but more importantly, they will get the confidence to deal with these when they see one. In the job market, this course will provide students an edge over their competition. Every industry is interested in hiring logically thinking and hard working engineer.

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PLC

PLC: Basics

- Switch terminology is introduced.
- Understand switching elements e.g. momentary contact pushbutton, toggle, selector etc
- Construction of Gates like AND, OR, NAND, NOR and Truth Tables
- Understand different types of sensors (NPN and PNP) and actuators like relays, solenoids, contactors
- Latched relay contact.
- Understand discrete instruments like timers, counters, temperature controllers.
- Design of relay logic with different elements described above

- History of the evolution of the programmable logic controller - PLC.
- The reasons for changing from relay control systems to PLCs.
- PLC Architecture
- Different kinds of PLCs and their applications.

- The ladder logic language.
- WPL soft is introduced.
- Program Upload and Download (PC – PLC Communication)
- Understand how to simulate plc program, importance of comments in program. Trouble shooting / debugging using simulation.

- Bit devices in PLC like X, Y, and M. SET and RST instruction and data registers.
- Basic NO and NC contact in ladder program.

PLC: Timers and Counters, Increment and Decrement Instructions.

- On Delay Timer
- Off Delay Timer
- Various Timing Bases
- Timing Diagram for On Delay Timer and Off Delay Timer
- Retentive Timer
- Cascading Timers
- Up Counter
- Down Counter
- High speed Counters
- Cascading Counters

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PLC: Data Instructions and Arithmetic Instructions

- Data Transfer
- Data Compare
- Data Manipulation
- Arithmetic operations with integers and numbers with decimal point

PROJECT # 1: Gas Cylinder Bank Automation (Project deployed in industry)

PLC: Shift Register, PLSY instruction and Program Control

- Shift Register Instruction and application
- PLSY instruction to control stepper motor/ servo motor
- Program Control Instructions and application

PROJECT # 2: Cut to length line (Project deployed in industry)

PLC: A/D Modules, D/A Modules, DI/DO Modules

- Uses of Analog/Digital, Digital/Analog, Digital Input/Digital Output Modules
- Scaling
- Their connection with PLC

VFD

- Role played by VFD in AC motor speed control
- VFD parameter settings
- PLC – VFD communication
- VFD control via PLC

PROJECT # 3: Warehouse Temperature and RH Monitoring System

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HMI: Human Machine Interface

- Understand role that HMI plays in Automation
- Understand HMI types
- Understand HMI Programming Software for Delta HMI
- Creating Screens with various objects
- Macro Types
- Macro Editing
- Macro Operations
- USB Drive Data storage and retrieval
- Interfacing HMI with a PLC, Printer

PROJECT # 4: Gas Cylinder Bank Automation using Delta PLC and Delta HMI

SCADA: Supervisory Control and Data Acquisition

- Understand role that SCADA plays in Automation
- Different Scada Packages Available
- Features of SCADA software
- Application Development using Elipse Scada software
    - Application Organizer
    - Understand SCADA Tags
    - Create Screens using various objects
    - Creating Alarms
    - Data Storage and Retrieval (Historic and Database)
    - Reporting
    - Trending
    - Recipes
    - User Access management
    - Logic development using scripts
    - Communication with PLC
    - Troubleshooting Application

Capstone Project: Warehouse Temperature, RH Monitoring & Data Logging using Elipse SCADA, Delta HMI and Delta PLC (Project deployed in industry)

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Course Packages:

Certificate Course in PLC Basics: All content up to Project # 1

Duration: 30 Hrs

Fees: Rs.3000/-

Certificate Course in PLC (Basics + Advance): All content up to Project # 3

Duration: 45 Hours

Fees: Rs.4500/-

Certificate Course in PLC & HMI (PLC Basics + Advance + HMI): All content up to Project # 4

Duration: 54 Hrs

Fees: Rs.6000/-

Certificate Course in PLC, HMI, and SCADA (PLC Basics + Advance + HMI + SCADA): All content up to the Capstone Project

Duration: 63 Hours

Fees: Rs.8000/-

All necessary software will be loaded on student's laptops so they can practice at their leisure. **Apart from four projects and the capstone project, students will do close to fifty programming assignments.**