AUTOMATION LAB

- This lab imparts skill and knowledge on Industrial automation with an exclusive training on hardware and software components to automate industrial and commercial applications.
- Candidates are trained on automation products like PLC, HMI and SCADA to control and monitor the plant and machine.
- Labs are equipped with Modular Controllers with Technology functions and advanced configurations.
- Programmes were developed to enhance the skill set of the participants on Hardware & Programming basics and servicing.

Basics of PLC

Course Description / Learning Objective

On completion of this course the participant will be able to:

- Identify the components and performance characteristics of the SIMATIC S7-1200 PLC, Signal and Communication Modules.
- Positioning of modular S7 Controllers.
- Install a PLC system, including the HMI and communication cabling.
- Use the various address types to edit, reload, structure and run a program.
- Document, test, and basically troubleshoot the control system and its program.
- Understand and create binary operations, timers, counters, mathematical functions etc.
- Interface an HMI with the PLC control system to control and monitor from a remote location.
- The components of the TIA Portal: SIMATIC STEP 7 Basic and WinCC Basic
- Program execution in automation systems
- Binary and digital operations in Ladder language
- Setup and assembly of the SIMATIC S7-1200 automation system
- Hardware and software commissioning of the SIMATIC S7-1200 with the TIA Portal
- SIMATIC S7-1200 hardware configuration and parameterization
- Introduction to the Touch Panel (HMI)
- Deeper understanding of contents through practical exercises on TIA system model
Basics of SCADA

Course Description / Learning Objective

On completion of this course the participant will be able to:

- Configuration and Parameterization of Simatic products for WINCC applications
- Installing communication between Stations.
- Screen creation for Monitoring and controlling Machine and Plants.
- Screen design with basic elements and control elements.
- Tag monitoring from a remote area with creative visualization for the process variable.
- Learning to assign the text and the graphic list for operator station
- Dynamizing screens for effective response and creating animations to monitor the field operations.
- Configuration for screen navigation.
- Working with layers.
- Use of tags and types of tags in Wincc.
- Data Logging and Trends to record process variable
- Configuration of Alarm and Events
- Security management using user Administration Tool
- Recipe management for process industries like Food processing and Beverage factories

LIST OF HARDWARE COMPONENTS

SIMATIC S7 Controllers – S7-1500 and S7-1200

- The Simatic S7-1200 Basic Controller for small to medium-sized applications.
- The Simatic S7-1500 Advanced Controller for medium-sized and complex applications.
- S7-1200 is designed with integrated input and outputs for standalone operations. Controller are enhanced with reliable diagnostics and safety integration

HMI- Touch panel and Key Touch Panel (KTP700 & TP700 Series)
SIMATIC HMI is engineered to support the increasingly complex processes and optimized to meet specific human machine interface needs using open and standardized interfaces in hardware and software.

**LIST OF SOFTWARE COMPONENTS**

**TIA portal software for integrated automation.**

- The Totally Integrated Automation Portal (TIA Portal) is a central framework for engineering SIMATIC products. It provides solutions to complete range of digitalized automation in discrete and analog.

**WIN-CC Professional for Visualization (SCADA)**

- An innovative software with scalable process-visualization system and numerous high-performance functions for monitoring automated processes.
- WinCC is the ideal choice for process visualization tasks of highest complexity and SCADA applications up to Plant Intelligence solutions.

**STEP-7 PROFESSIONAL software for engineering PLC CONTROLLERS**

- An engineering tool for configuration and programming for all SIMATIC controllers to solve your engineering tasks intuitively and efficiently.
- STEP 7 Professional comprises PLC programming with Device and Network configuration.

**Courses offered**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Domain</th>
<th>Course Name</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>1</td>
<td>Automation</td>
<td>Basics of PLC</td>
<td>50</td>
<td>Electrical, Electronics, Mechanical, Instrumentation engineers (4th Semester)</td>
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<tr>
<td>2</td>
<td>Automation</td>
<td>Basic of SCADA</td>
<td>50</td>
<td>Electrical, Electronics, Mechanical, Instrumentation engineers (6th Semester)</td>
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