



Advance Diploma In Automation

Duration: 3 Months | QP Code: IAS/Q5609 (L4)

Module 1: Environment, Health & Safety

120 hrs

Environmental health and safety managers inspect and evaluate the environment, equipment, and processes in working areas to ensure compliance with government safety regulations and industry standards. Their chief goal is to protect the employees, customers, and the environment.

Topics Covered:

- Understand Health and safety legislation, obligations, and documentation followed in Company
- Follow standard safety procedures while handling an equipment, hazardous material or tool. Follow the situations when personal protective equipment must be used
- Remove finger rings or any other metal objects which may interfere with the work before working on the unit.

Introduce related trades to support customer requirements

- Use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.
- Report about any breach of safety procedure in the company
- Ensure zero accidents at work
- Avoid damage of components due to negligence in ESD procedures
- Participate regularly in fire drills or other safety related workshops organised by the company
- Ensure no loss to the company occurs due to safety negligence
- Maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials
- Participate in company organized health sessions such as yoga, physiotherapy, or games
- Handle heavy and hazardous materials with care and appropriate tools and equipment such as trolleys, jacks, and ladders

Module 2: Basics Of Electrical Hardware & Their Installation

80 hrs

Before moving to Programmable Logic Controller (PLC), one must have a fundamental idea on Electrical hardware Components as well as some Field devices those are used in Process Industry that will help while Troubleshooting on any fault occur at field side.

Topics Covered:

- Study on all kind of Understanding the basics of Manual Actuating Devices
- Study on Semi-automatic Devices
- Study on all kind of sensor
- Study of One line Diagram

Module 3: Communication Skill

32 hrs

Good communication skills are essential to allow others and yourself to understand information more accurately and quickly. In contrast, poor communication skills lead to frequent misunderstandings and frustration. Understanding about basic principles of electricity.

Topics Covered:

- Time & Stress Management
- Body language & workplace readiness
- Business communication

Module 4: Develop PLC Programming Using Software

128 hrs

Following topics are covered under the course.

Topics Covered:

- Identify the required layout for mounting of components on the mounting plate inside the control panel
- Identify the PLC Modules first, then Understand Individual Modules and their specifications

- Select a Place where you can mount these PLC Panel
- Prepare the dimension of the control panel based on requirement
- Acquire and collect information of normally open (NO) and normally closed (NC) contacts in field
- Identify the requirement of special blocks like PID, high speed counters etc.
- Gather detailed information about bit instructions, mathematical instructions and conversion instructions and compare instructions to be used in the program
- Identify the timer and counter logics blocks, along with move data blocks, as required in process logics
- Have a detailed study on communication program blocks used especially for communication between different components in the panel
- Let's have some information related to pre-requisites for software installation on pc/laptops for programming
- Identify PLC modules used in the control panel

Module 5: Test PLC Programming Using Simulator

32 hrs

Following topics are covered under the course.

Topics Covered:

- Download the compilation error-free program and transfer it to the computer based internal software simulator for further checks
- Activate the respective inputs in software simulator to check the automation logic and thereby identify any error
- Connect hardware toggle switches to test program reaction via virtual field inputs
- Connect hardware LED/Lamps to check output generated from PLC program
- Connect actual DI, DO, AI and AO modules to check the hardware loading on PLC
- Connect hardware analog simulators to check analog behaviour of PLC program
- Identify and examine hardware related error which may occur during testing of PLC program
- Execute these error handling programs by physically creating faults like supply failure, communication break, IO channel error, module failure etc
- Generate outputs from error handling PLC program for error monitoring on HMI devices like Display Panels or SCADA systems
- Ensure completion of factory acceptance test (FAT) and send report to customer

Module 6: PLC Networking

24 hrs

Following topics are covered under the course.

Topics Covered:

- Communication Protocol (TCP/IP)
- Mod/CAN bus Communication
- Ethernet Communication (LAN, WAN, MAN)
- Profibus Communication
- Oral & Written Communication
- Problem solving & Decision making
- Basics of computer, Ms Word

Module 7: Electrical Motor & Drives

56 hrs

Electrical motor & Drives is one of the most Important part of Automation and Process industry. As electrical drive can operate in all four quadrant of Torque Speed plane so for any smooth angular rotation of an object control by PLC, the basic knowledge of motor & Drive are required.

Topics Covered:

- Configuring of VFD
- Briefly study on Drives & Types of Drive
- Activities On Motor Starters (DOL, Star Delta etc.)
- Motors are frequently used in Process Industry
- Basics of Electrical Motor
- Types of Electrical Motor
- Detail study on Variable Frequency Drive
- Check if the wiring between the terminal base of PLC panel and the field devices is completed
- Check the cable numbering and continuity test report
- List out all the components and Tools required to Commission PLC panel
- Detail study of Lay-out & circuit diagram
- Activate the field sensors and limit switches, etc. to verify them on input module
- Examine the power supply input to PLC panel and turn it on, activate the field sensors and limit switches, etc.
- Check the Programme by activating corresponding field inputs

- Activate the PLC outputs to check working of field outputs like actuators, contactors, relays etc
- Transfer the PLC program into the CPU at the user site
- Obtain the control drawing of the machine/plant connected with the PLC and the different module
- Find the fault in the PLC/plant
- Test the panel and modules for proper functioning as recommended
- Check earthing and power supply for proper functioning before troubleshooting
- Ensure that the software and program backup is available in the plant
- Prepare a flow chart for troubleshooting any machine/plant
- Check if the installation has been done as per installation guidelines
- Check if the connected field devices are in operation or have stopped at the time of troubleshooting
- Verify whether the communication cable is supporting the protocol or not
- Cross-check whether the PLC and its module is attached at right place
- Make changes in running project if it is required to rectify the faults
- Enter parameter of the connected load accurately in PLC & get the parameter reading according to schedule
- Replace the module/equipment if it is found faulty and provide the module replacement to the customer according to PLC
- Match the product according to the catalogue number with the drawing and material list
- Take a program backup before and after troubleshooting
- Prepare a site report after troubleshooting and mention the remedy
- Workplace Etiquettes
- Microsoft Excel & Power Point