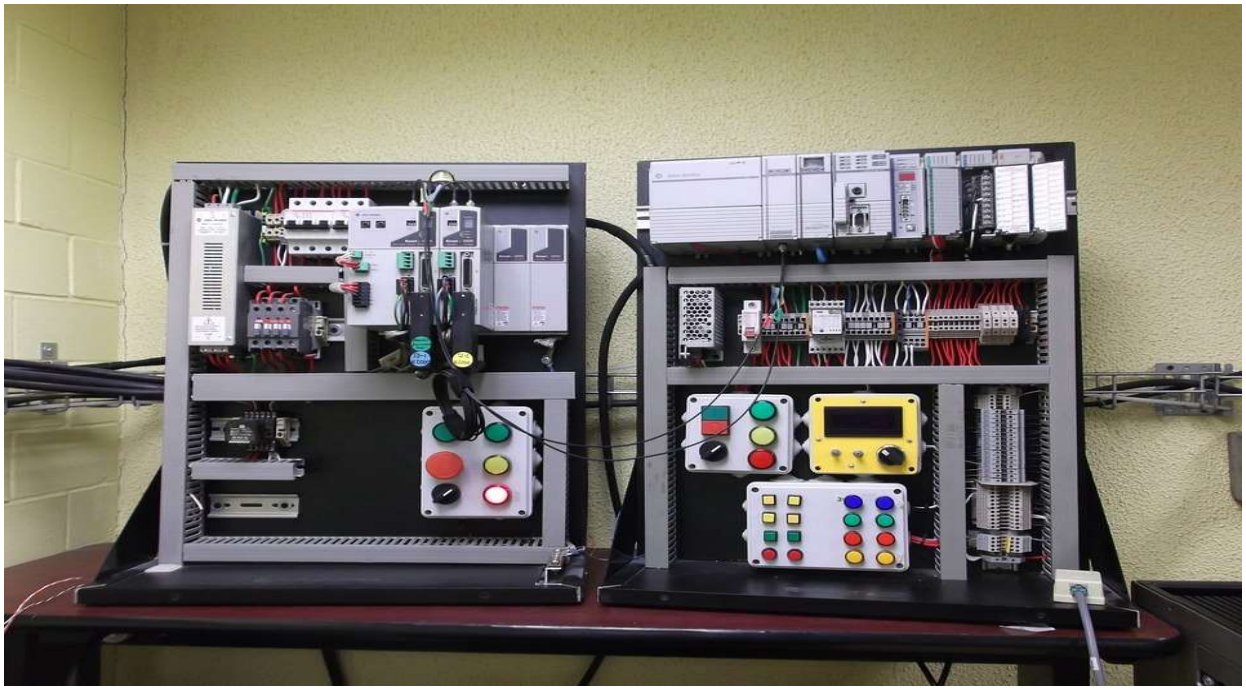
IASC
SECTOR SKILL COUNCIL
एक कदम आत्मनिर्भरता की ओर



FUNDAMENTAL OF PLC - PROGRAMMING

Model Curriculum: NM-5.5-AU-03305-2024-V1-IASC

Version: 1.0

NSQF Level: 5.5

Instrumentation, Automation, Surveillance & Communication Sector Skill Council
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Table of Contents

Training Parameters

Course	PLC Programmer & troubleshooter
Duration	30 Hours
Occupation	Installation and Commissioning
Country	India
Minimum Educational Qualification & Experience	**10+ 3-year diploma in relevant field*** **Plus** **3 Year Relevant Industry Experience** **Or** **3rd year of UG(B.E/B.Tech) in relevant field*** INSTRUMENTATION/ EEE /ECE /MECHANICAL /Electrical/Mechatronics
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Minimum Duration of the Course	30 Hours, 0 Minutes
Maximum Duration of the Course	30 Hours, 0 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Identify the role, responsibilities, and scope of work of a Programmable Logic Controller (PLC) Programmer and Troubleshooter
- Developing and testing PLC program using appropriate software
- Perform on site testing of PLC program
- Identify and resolve errors and issues in the machine and process plant
- Work effectively in a team
- Follow the safety procedures

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Recommended)	On-the-Job Training Duration (Mandatory)	Total Duration
Develop PLC program using related software	**05:00**	**05:00**	**00:00**	**05:00**	**15:00**
Module 1 - Developing PLC Program	05:00	05:00	00:00	05:00	15:00
Test the PLC program using simulators	**05:00**	**05:00**	**00:00**	**05:00**	**15:00**
Module 2 - Testing the PLC Program	05:00	05:00	00:00	05:00	15:00

Module Details

Module 1: Developing PLC Program

Terminal Outcomes:

- Develop and test PLC program using appropriate software

Duration: *05:00*	**Duration**: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Automation introduction, Present & future technologies in industries • Types of automation, Application & Advantages of automation • Identify the basic knowledge of computers, operating system and safety procedures • Follow standard operating procedures for developing programs • PLC introduction, PLC wiring (DC and AC PLC) • PLC family, Applications of PLCs, Types of IO's • Identify the basic knowledge of PLC programming software, its installation and debugging required • Identify piping and instrumentation diagram • Describe basic infrastructure processes in the industry • List IEC standards, technical information and relevant documents pertaining to PLC programming • Assimilate information pertaining to pre- requisites, communication protocol and program blocks, contacts in the field and different types of blocks • Prepare a list of requirements from the customer to be communicated to the control panel makers • Identify the type of PLC on the basis of operating supply, types of IO's, make and other parameters	• Identify the type of communication cable need for uploading and downloading logic. • Illustrate the various drivers for supported cables. • Illustrate using computers for basic software required for the role • Develop the control philosophy for control operation of the site/plant • Illustrate using PLC programming software, its installation and debugging • Prepare the dimensions and layout of the control panel • Illustrate mounting components and examine the drawings as per the layout • Demonstrate providing relevant instructions to the fabrication team • Develop the process logic using pre-defined software • Ensure customer satisfaction and prepare optimum plan for target visits
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Digital multimeter, PLC kit, SMPS, control panel enclosure and mounting accessories, relays, indicating lamp, different types of push button and selectors switch, analog input output expandable, communication cable, programming software, wires, screwdriver	

Module 2: Testing The PLC Program

Terminal Outcomes:

- Perform on site testing of PLC program

Duration: *05:00*	**Duration**: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Checking panel and PLC wiring according to drawing • Checking supply for all devices (AC/ DC accordingly) • Testing weather all components are proper functional or not • Ensure fault occurring due to several reason in PLC • Comply with the procedure for downloading program into PLC software • Identify requirements for testing • Explain the various testing procedures • Identify all hardware related errors • Ensure the completion of the factory acceptance test	• Perform activation of inputs to test the software • Demonstrate modification of the logic in case of any errors • Illustrate activating various connections for simulators • Perform testing of program using hardware simulators • Checking all IO's signal & assuring all sensors are working properly • Illustrate examining the hardware for errors • Develop programming logic to avoid non functionality of hardware
Classroom Aids:	
Laptop, white board marker, projector	
Tools, Equipment and Other Requirements	
Digital multimeter, PLC kit, SMPS, control panel enclosure and mounting accessories, relays, indicating lamp, different types of push button and selectors switch, analog input-output expandable, communication cable, programming software, wires, screwdriver	