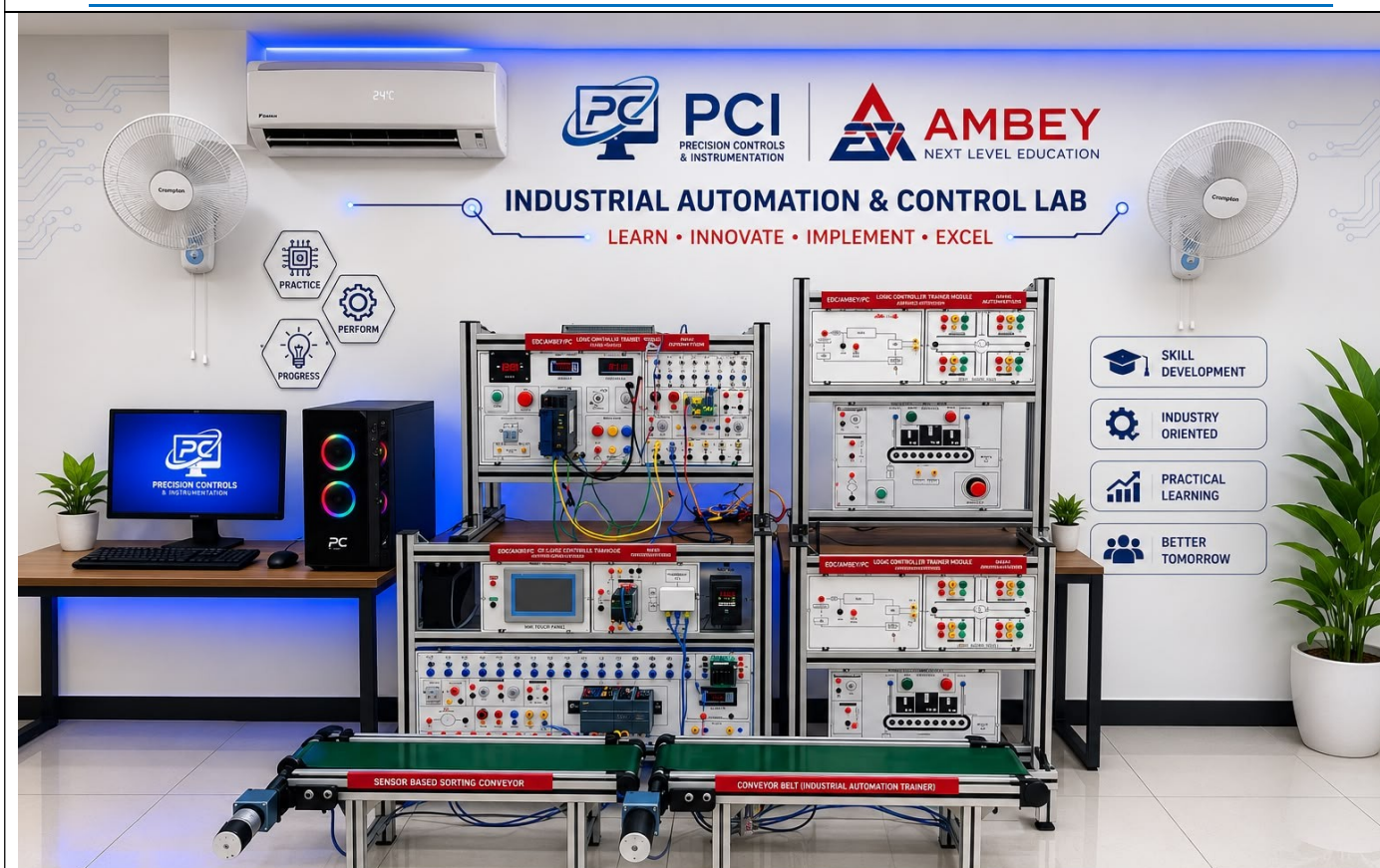


PLC TRAINERS

PRODUCT CODE: **AL-E491**

AL-E491 PLC AUTOMATION AND DRIVE CONTROL SYSTEM TRAINER



S.NO.	ITEM SPECIFICATION
1	The Training System Should have : PLC with HMI Interface & classroom Teaching Software Detailed Technical Specifications : PLC : CPU : 1212C (Siemens) Digital inputs : 8 nos.; Digital outputs : 6 nos. Expansion Module : 8 Digital Inputs and 8 Digital Outputs Analog inputs : 2 nos. ; Resolution : 10 bit Input ranges (rated values), voltages : (0 to +10 V) Memory : Work memory : 150 kbyte ; Load memory : 4 Mbyte Analog output : 1 nos.; Resolution : 12 bit ; Communication : Ethernet/ PROFINET Programming Software : TIA Portal (Licensed) HMI Panel (Touch screen) HMI Supply : +24V DC CPU : 32-bits 400MHz RISC ; Interface : Ethernet Display size : 7 inch ; Resolution : 800 × 480 TFT LCD 65, 536 colors Software : PI Studio General Specifications : Toggle switches : 4 nos.; Push to ON switches : 3 nos.; Proximity sensor : 1 no. Selector switch : 1 no.; Visual indicators : 4 nos.; Audio indicator : 1 no.; DC motor : 1 no.; Relay card : 1 no. (Contains 2 relays) ;Voltage display : 1 no.; DC Contactor : 1 no. The Training System Should be capable to perform the following Experiments : Experiments • Basic ladder logic programming using TIA Portal.

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	• Program operation • NO (normally open) and NC (normally closed) instruction. • Types of logic gates. • Set and reset bit. • Types of timers. • Types of counter. • Types of compare instruction. • Types of math function. • Mov instruction. • NormX and SCALEX instructions.
	• Creating applications/screens in HMI.
	• Downloading and uploading programs.
	• Design screen for:
	• Switch and indicator in HMI for communication with PLC.
	• Timer in HMI for communication with PLC.
	• Counter in HMI for communication with PLC.
	• Trend in HMI for communication with PLC.
	• HMI screen development with buttons, displays, graphs.
	• Sensor input simulation and actuator output control.
	• Analog value scaling and display on HMI.
	Classroom / Laboratory Teaching & Learning Software Module on PLC and its Applications (Single User) : 1 No.
	• The trainer setup includes single user license classroom / laboratory teaching, learning software module on PLC. The content has easy explanation of various complex topics with animation and simulation for ease of student learning. It also supports learning through graphs, charts, along with mandatory rich content and theory to understand fundamental concepts, interactive learning objects.
	• The learning module covers following topics:
	• Industrial Automation and tools like PLC, SCADA, HMI, DCS.
	• Role of PLC in Automation
	• History of PLC
	• Types of PLC like Mini , Micro & Rack
	• Block diagram of PLC
	• Working of PLC
	• Sinking and Sourcing Concept
	• PLC Program Cycle
	• Input Devices:
	• Switches, Introduction, Switch State, Basic Switch Configuration, Toggle Switch, Slide Switch, Pushbutton, Rocker Switch, DIP Switch, Reed Switch, Limit Switch.
2	Application Modules to be interface with PLC
2.1	Application Module to study Temperature Control by PLC .
	Temperature Control Module should be able to perform the following Experiments
	• Study of temperature control.
	• Study and use of compare instruction.
	• Study and use of temperature sensors.
	• Study and use of controlling a heater and fan.
	• Temperature control by PLC through ladder program
2.2	Traffic Light Control Module
	• Traffic Light Control Module should be able to perform the following Experiments
	• Study of traffic light operation
	• Study and use of memory bit and timers.
	• Traffic light control by PLC through ladder program
2.3	Application Module to study Conveyor Belt control by PLC .
	Conveyor Belt Application Module should be able to perform the following Experiments
	Study and use of:
	• Memory bit, timers, counters, compare instruction
	• IR sensor, Proximity sensor, push to on switch DC motor
	• Conveyor control by PLC through ladder program

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	• How to count metallic container using a proximity switch? • How to run and control conveyor in manual and AUTO mode using a PLC.
3	AC Induction Motor Drive Training System Technical Specification AC Drive (VFD) : Single phase 230vac, 0.75 HP capacity , Supports IM / IPM /SPM motors and VF / SVC control, Built-in keypad- Display: 7-segment or LCD for frequency, current, voltage. Programmable motor parameters Overload & fault protection. Induction Motor :Single Induction motor- Power: 0.75HP, RPM: 2700, Class F insulation- B3/B5 mounting Enclosure : Epoxy-coated MS body with wiring diagram- Compact frame. Manual Control Panel : Push buttons (start/stop/Jog) and speed potentiometer. List of Experiment Should be performed • Speed control of induction motor using VFD. • Variable Frequency Drive (VFD) • Working principle of VFD. • Hardware connection of VFD. • Parameter setting of VFD. • Acceleration & deceleration time setting in VFD. • Jog mode operation in VFD. • Direction control operation of motor.
4	AC Servo Drive Training System Technical Specification AC Servo System : AC Servo Motor : 1 no.; Power : 400W ; Rated Voltage : 220V Rated Speed : 0 to 3000 r/min. ; Current : 1.0Ampere ; Control Type : PWM control using Drive Encoder: 2048 / 2500 / 10000 Pulse / Rev. (Incremental , Absolute) Servo Drive : 1 no. LED Display : 5 digit seven segment display Function Key : 5 nos. (Mode , Shift , UP, Down , Set) Power : 400W ;Supply : 230VAC PLC : Digital input : 8nos ; Digital output : 4nos Programming Software : ISP Soft ;Communication : USB Port Manual Control Panel : Switches (Start/Stop), Potentiometer , DC Voltage Display. Enclosure : Epoxy-coated MS body with wiring diagram- Compact frame. List of Experiment Should be performed Suggested Experiments • Study and use of AC Servo motor and drive • Study and use of AC Servo Drive Function • Servo speed control using analog voltage input using potentiometer . • Position control using pulse/direction signal from PLC. • Study and use of AC Servo motor in Jog mode. • Study and use of direction control of Servo motor using PLC. • Position Control of AC Servo using Drive and PLC

We are committed to the continuous development of our products, and therefore reserve the right to amend specifications without prior notice

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