



**PLC PROGRAMMING TRAINER KIT**

The applications and working modules of PLCs which are optionally hooked up with **PLC Programming Trainer Kit (PCST – 14)** gives an idea regarding the basics of Programmable Logic Controllers & its applications.

**Technical Specification: -**

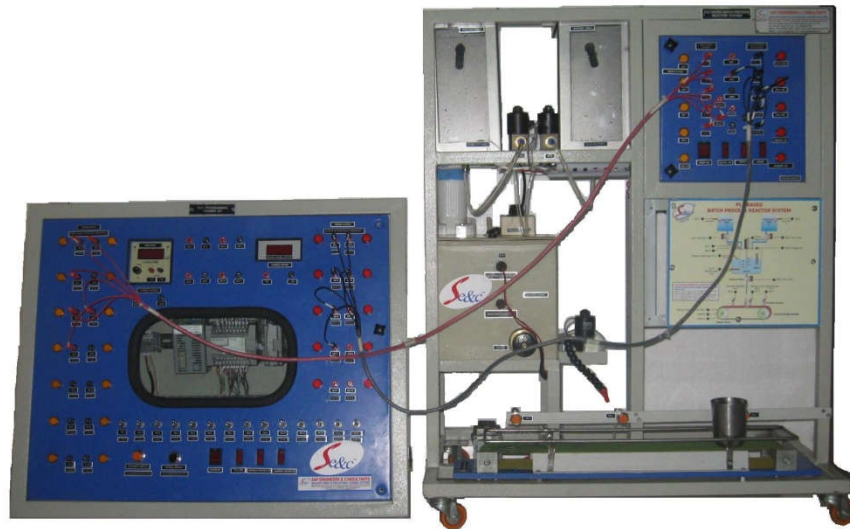
No.	Item Name	Technical Specifications
1	PLC -	Siemens S7 / A-B Micrologix 1400: 1762 – L24 BXB / Mitsubishi FX3GE / Eqv. Digital Inputs- 20, Digital Outputs- 12, Analogue input- 4, Analogue output- 2, Input /Output LED indication on front panel PC interface facility, PC-PLC interfacing cable.
2	Communication-	Communication Port RS 232 / RS 485 / Ethernet
3	Power Supply-	24VDC, 1.5A Power source. 4"X2"X2"
4	Ladder Programming Software-	RS LOGIX 500 MICRO STARTER 9324RLM0100ENE Step 7 – Basic TIA, Version- 13 for Siemens / Equivalent.
5	PLC panel dimensions-	1.5 Ft. X 1.5 Ft. X 1.5 Ft. with visible transparent front fascia
6	Optical sensor-	1no. for position.
7	Electrical control panel with Input / Output simulating devices-	For simulation of digital inputs (switches - 14 No.s & proximity sensors- 2 No., miniature level switch- 1 No.) Front panel for display of digital input/output status: Lamps (2 No.s), LED Indicators (4 No.s), small AC electric motor (Optional) (1 No.), solenoid valve (1No.)
8	Addition of HMI (Optional)-	Size: 7", Make: Mitsubishi / Equivalent.
9	Inductive/ proximity limit switches (digital inputs) MFPS_Q12 for Water level, position Sensing relay outputs (digital outputs) in lift simulator & bottle filling plant module. (Motor: ACM60, 10W, 230VAC.)	

10	<b>Output compatibility to Solenoid valves, Electric motors as actuating elements in respective assorted modules.</b>
11	<b>SCADA SOFTWARE connectivity for PLC (Optional).</b>
12	<b>High speed Frequency input</b> for optical encoder module J260-58-AN-R-HVLD-360-V3-10-1-S-EG. (Optional)
13	<b>High speed PWM output</b> for Stepper motor module 42SH33-4AM (Optional).
14	<b>Level measurement (CPT)</b> using PLC with water level control module. (Optional).

**Features: -**

- ❖ Compact Ergonomic Design.
- ❖ User Friendly, Self Explanatory Systems.
- ❖ Training Manuals & mimic charts for operation ease
- ❖ Robust Construction.
- ❖ Enhanced Electrical Safety Considerations.
- ❖ Self-explanatory instruction manuals, copy of S/W are provided.
- ❖ Inbuilt Safety Measures to avoid improper usage.
- ❖ Computer Interface (Optional).
- ❖ Computerized control system trainer (Optional).

**MODULE I- BATCH PROCESS REACTOR (PCST – 14-I)**



**Technical Specification: -**

No.	Item Name	Technical Specifications
1	DC Geared Motor-	12 / 24VDC, Speed: 0- 60rpm, Torque: 10/20kgcm
2	Reactant Tank-	10" X 10"X10", MOC Plastic/PP5mm thick/SS304 (1.5mm thick) (1No.)
3	Miniature Heater-	1000W, 230VAC
4	Proximity Sensor -	Type- Inductive, 3 wire, Distance 7mm, 24 V DC
5	Process Tank-	6"X6"X12" (P.P. 5 mm thick) (Quantity: 2 nos.)
6	Stirrer-	230VAC, 2 Speed
7	Thermostat-	24V DC, Range 30-110°C
8	Level Switch-	Magnetic Type, Float operated, NO Contact,24VDC Operated
9	Solenoid Valve-	24VDC, 6mm Orifice, 1/4 "size
10	Power Supply-	I/P = 230 VAC, O/P = 24 V DC, 3A
11	Conveyor Belt-	70mm X 1225mm (Red)
12	Switches-	Mains, 6 Amp (Red)Rocker Switch, 16 Amp (Red)
13	Relay-	24V DC, 1C/O (2 nos.)
14	Electrical Control Panel-	MS Powder coated panel with switches, indicator, test Points, controller on front fascia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping. Wires & power cables are seated through 1"×1"PVC cable tray. Dimension: 2ft (L) ×1ft (W) ×2ft (H)

**Range of Experiments:-**

- ❖ Study of PLC programming (Optional).
- ❖ Demonstration of Batch Process Reactor.
- ❖ Study of Level Control.
- ❖ Study of Temperature Control.
- ❖ Study of application of solenoid valve, level switches, and proximity switches

## MODULE II- ROTARY BOTTLE FILL TRAINER (PCST – 14-II)



### Technical Specification:-

No.	Item Name	Technical Specifications
1	DC Geared Motor-	12 /24VDC, Speed: 0- 60rpm, Torque: 10/20kgcm
2	Sump Tank-	1'X1'X1', (P.P. 5mm thick)
3	Process Tank-	6"X6"X16" (P.P. 5 mm thick) (Quantity: 2 nos.)
4	FHP Pump-	230VAC (Submersible)
5	Level Switch-	Magnetic Type, Float operated, NO Contact, 24VDC Operated
6	Solenoid Valve-	24V DC single phase, ¼" size
7	Proximity Sensor-	Type: Capacitive, 3 Wire, Sensing Distance: 12mm, 24 VDC
8	Optical Sensor-	3 Wire, Sensing Distance: 10cm, 24 VDC
9	Relay-	24V DC Coil, 2 C/O
10	Coolant Pipe	Length 1', ¼" Size
11	Electrical Control Panel-	MS Powder coated panel with switches, indicator, test Points, controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping. Wires & power cables are seated through 1"×1" PVC cable tray. Dimension: 2ft (L) ×1ft (W) ×2.5ft (H)

### Range of Experiments:-

- ❖ Study of PLC programming (Optional).
- ❖ Demonstration of Rotary Bottle Fill Trainer.
- ❖ Study of Level Control.
- ❖ Study of application of solenoid valve, level switches, and proximity switches

## MODULE III- DC MOTOR SPEED CONTROL MODULE (PCST – 14-III)



The **DC Motor Speed Control Module** outlines the principal of Speed Control of DC Motor through PLC used in industrial applications. This setup is to be hooked up with PCST-14 (PLC Programming Trainer).

### Technical Specification:-

No.	Item Name	Technical Specifications
1	PMDC Motor-	12V DC, 1500 RPM, 1.5 Amp, Torque: ½ Kgcm, Mounting Horizontal
2	Optical Sensor / Proximity Sensor-	3 Wire, Sensing Distance: 07mm, 24 VDC
3	RPM Indicator/ Tachometer-	Retransmission O/P: 4-20mA as per 0-1500rpm, 3 ½ digital display Speed: 0-1500 RPM, Supply: 230V AC, Cut out size :92 X 92
4	DC Drive-	Power Supply: 230 V AC, Input: 4-20mA, Output Voltage. 0-12 V DC.
5	Electrical Control Panel-	MS Powder coated panel with switches, indicator, test Points, controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping. Wires & power cables are seated through 1''x1''PVC cable tray. Dimension: 1 ft (L) x 1 ft (W) x 1 ft (H)

### Range of Experiments:-

- ❖ Study of PLC programming (Optional).
- ❖ Demonstration of DC Motor Speed Control..
- ❖ Study of application of Optical / Proximity switches.

## MODULE IV- STAR-DELTA STARTER (PCST – 14-IV)



The **Star-Delta Starter** outlines the principal of Star & Delta Mode of 3 $\phi$  AC Induction Motor used in industrial applications. It explains the different different application of PLC; this setup is to be hooked up with PCST-14.

### Technical Specification:-

No.	Item Name	Technical Specifications
1	Voltmeter with Voltage Transformer-	Power Supply:230VAC, Range: 0-1100V, with 3½ Digit Display
2	Ammeter with Current Transformer-	Power Supply:230VAC, Range :0-5 A
3	Motor-	Star-Delta type, (415V-Y/415V- $\Delta$ ),3 $\phi$ , ½ HP Induction Type, 2 A
4	Relay-	Power Supply: 230VAC, 10 Amp, (2 c/o & 3 c/o)
5	Power supply-	I/P: 230VAC, Output: 24VDC, 3A
6	Contacto-	24 V DC Operated, 3 C/O, 10 Amp, Siemens/L&T/Equivalent
7	Electrical Control Panel-	MS Powder coated panel with switches, indicator, test Points, controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping. Wires & power cables are seated through 1''x1''PVC cable tray. Dimension: 1 ft (L) x 1 ft (W) x 1 ft (H)

### Range of Experiments:-

- ❖ Study of PLC programming (Optional).
- ❖ Demonstration of Star-Delta Starter.

## MODULE V- DISCRETE APPLICATION TRAINER (PCST – 14-V)



The **Discrete Application Trainer** outlines the principal of discrete application Through PLC used in industrial applications. It explains the different application of PLC; this setup is to be hooked up with PCST-14.

### Technical Specification:-

No.	Item Name	Technical Specifications
1	PMDC Motor-	12V DC , 1500 RPM, 1.5 Amp, Torque: ½ Kgcm, Wall Horizontal
2	Alarm Annunciator-	230 V AC, 4 Window, Reset; Accept Function
3	Optical Encoder-	Shaft Encoder with Pointer Channels= R=ABZ/ Q=AB/ A=A, PPR:360, Shaft Ø: 10mm, Connection Location: EG=End Gland.
4	Stepper Motor-	24VDC, 30rpm, 2.6 kgcm
5	Proximity Sensor-	Type: Inductive, 3 Wire, Sensing Distance: 5 mm, 24 VDC
6	Indicating Lamp-	24 V DC, LED type, 16mm cut out (Red, Green & Amber)
7	MCB-	230 V AC, 10 Amp, Single Pole
8	Limit Switch-	Lever Type, Single C/O, AC/DC operated
9	Toggle Switch-	SPST, SPDT, 6 Amp AC/DC Operated
10	Power Supply-	I/P = 230V AC, O/P = 24V DC, 3A
11	Voltage Regulator-	Supply Voltage 230 VAC, O/P: 0-12 V DC
12	Electrical Control Panel-	MS Powder coated panel with switches, indicator, test Points, controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping. Wires & power cables are seated through 1"×1"PVC cable tray. Dimension: 1.5 ft (L) × 0.5 ft (W) × 1.5 ft (H)

### Range of Experiments:-

- ❖ Study of PLC programming (Optional).
- ❖ Demonstration of Discrete Application Trainer.
- ❖ Study of traffic light control.
- ❖ Study of application of Alarm Annunciator, DC Motor, and proximity switches.

## MODULE VI- DENSITY BASED TRAFFIC LIGHT CONTROL (PCST – 14-VI)



The **Density Based Traffic Light Control** outlines the principal of absorbing the light density through Opto-Coupler Sensor used in industrial applications. It explains the different application of PLC; this setup is to be hooked up with PCST-14.

### Technical Specification:-

No.	Item Name	Technical Specifications
1	<b>Opto-coupler sensor with power supply-</b>	24VDC Operated, M18, PNP, NO-DS, 100mm light sensor with power supply Unit, 2 C/O, 230 VAC.
2	<b>Bulb with Holder-</b>	230 V AC, 60 watt
3	<b>Indicating Lamp-</b>	24 V DC, LED type, 16mm cut out (Red, Amber & Green)
4	<b>Electrical Control Panel-</b>	MS Powder coated panel with switches, indicator, test Points, controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, Use of 1sq mm multi-strand wire with proper insulated Lugs, Feruling & neat wire dressing & clamping. Wires & power cables are seated through 1''x1''PVC cable tray. Dimension: 1.5 ft (L) x 0.5 ft (W) x 1.5 ft (H)

### Range of Experiments:-

- ❖ Study of PLC programming (Optional).
- ❖ Demonstration of Traffic Light Control.
- ❖ Study of application of Opto-coupler Sensor.