

SAP E & C PC-PLC BASED MULTI PROCESS CONTROL TRAINER
(PRODUCT CODE: PLCMT)



The **PLC Based Multi-Process Control Trainer (PLCMT)** outlines the basics of control of Flow, Level, Temperature, Pressure etc. and other aspects related to PLC Control.

Keywords:

- Feedback Control.
- Flow Control.
- Level Control.
- Cascade Control (Level + Flow, Pressure + Flow).
- Temperature Control
- Pressure Control.
- Ratio Control (Flow + Flow).
- Split Range Control.

Technical Specification:

No.	Item Name	Technical Specifications
1	PLC-	Allen-Bradley Micrologix 1400 L32BXBA / STD. Equivalent. Digital inputs: 20, Digital outputs: 12 (Micrologix 1400) Analog Inputs: 4, Analog Outputs: 2
2	Sump tank-	Material: Stainless Steel 1.5 mm thick/ P.P.5mm thick, Capacity: 30 litres, Dimension: 12" (L) × 24"(W) × 16" (H).
3	Level Tank-	Material: acrylic/ P.P. 5 mm thick, Dimension: 150(L) mm× 150(W) mm× 600(H) mm
4	Centrifugal Pump-	2 nos., ½" / ¼ H.P., 1ϕ 230 V AC supply, Surface mounting.
5	Temperature Cabinet Process Tank-	Process tank with thick insulation wall & Electric Heater, Thermostat, Heater: 3 KW. Dimension: 1.25ft (L) ×1.25ft (W) ×1.25 ft (H).
6	Pressure vessel-	Shape: Cylindrical, Material: CRCC /SS 304, Diameter: 150 mm, Length: 300 mm, Capacity: 15 Kg/cm ² , with 1/2" BSP connection for Pressure Gauge, Pressure Transmitter, Inlet & Drain facility.
7	Piping-	½"/ 1" Class B GI with ½ / 1" ball valves: 17 no.
8	Flow meter-	2 no. Size: ½"/ 1", Turbine type/ wfm type, Range: 0-1000/0-2000 LPH, Supply: 24 V DC, 100 mA. Output: 4-20 mA, Type: 3-wire type. Mounting: Horizontal, Connection: 1"
9	Level Transmitter-	Input: 0-400 /0-500 mm, Output: 4-20 mA, supply: 24 V DC, 100 mA. Type: 2-wire capacitance type, Mounting: Top 2" screwed connection.
10	Pressure Transmitter -	Input: 0-2.5 Kg/cm ² / 0-4 Kg/cm ² , Output: 4-20 mA, supply: 24 V DC, 50 mA. Type: 2-wire Piezo resistive type, Medium: Water Pressure, Mounting: Top ½" BSP connection.

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11	Temperature Transmitter-	Input: RTD, Output: 4-20 mA, Type: 2-wire type, Sensor Length: 100 mm, DC Supply 24V, 50mA Range: 0-100°C / 0-200°C
12	Thyristered Phase Angle Control Card-	Input: 4-20 mA, Output: 0-230 VAC variable, 10 A Max.
13	Pneumatic Control Valve-	2 no. Size: ½"/ 1", Characteristics: Equal percentage. Type: Two way Globe type with Valve Positioner (Air to Close) & Two way Globe type with Valve Positioner (Air to Open), Cv: 5 / 9 US GPM, with diaphragm actuator. Flange connection: PCD: 80 mm, ID: 26 mm, OD: 110 mm. Positioner Action: 0.2t01.0 Kg/cm ² (with Bypass), Action: Direct / Reverse Pneumatic Input Signal: 0.2 to 1.0 Kg/cm ² (Without Bypass)
14	Rotameter	2 no. Range: 0-1000 / 0-2000 LPH, Glass tube type/ Acrylic body. Connection: ½"/ 1", Mounting: Inlet- Bottom, Outlet- Top.
15	A.F.R. / F.R.L. Unit-	1 no. Air Filter, Regulator, Lubricator, ¼" connection. Range: 0-10Kg/cm ² with Pressure Gauge.
16	E/P Converter -	Input: 4-20 mA, Output: 3-15 psi, Connection ¼" NPT / BSP, Supply: 1.4 Kg/cm ² .
17	Level Switch-	Float operated, Float Material: SS304, Switching voltage: 240 VAC\200 VDC Switching Current: 0.5A, Switch Action: Reversible, Weight: 315 Gms.
18	Digital Panel Meters-	12 nos., A] Level Indicators - 2nos. Input Current- 4-20mA, Output Level- 0-500mm B] Pressure Indicators - 2nos., Input Current- 4-20mA, Output Pressure-0-2.5Kg/cm ² C] Flow Indicators - 4nos., Input Current- 4-20mA, Output Flow- 0-1000 LPH D] Temperature Indicators - 2 , Input Current- 4-20mA, Output Temp.- 0-100°C. E] Current Indicators - 2nos. Range- 4-20mA For PLC Input & Output respectively.
19	Thumbwheel Switch-	24 V DC operated, 10 positions
20	Isolator-	2 Nos, Signal Isolators, Input: 4-20 mA, Output: 4-20 mA, Supply: 230 V AC.
21	MCB-	16A, 1φ 230 VAC, L&T/ Standard Equivalent
22	Power Supply-	24 V DC, 5 A, Size: 48mm×126mm×68mm.
23	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 Multistrand wire with proper insulated Lugs, Ferruling & neat wire dressing & clamping wires & power cables are seated through 1"×1" PVC cable tray. Dimension: 1ft (L) ×1ft (W) ×1ft (H).
24	SCADA Application Software (Optional)-	G.E. Proficy I-fix / Ellipse / EQUIVALENT SCADA S/W, PID control setting (P, PI, PD and PID mode), Auto/Manual Tuning of PID, Data Storage, Off Line analysis, Online Data Acquisition, Simulation and Printing of data in Graphical and tabular form. Interactive Graphical User Interface (GUI) included.
25	Air Compressor (Optional)-	Tank capacity: 25 Liters, Discharge: 2 CFM, Motor: 2 H.P., 230 V AC Operated, Working Pressure: 5-6 Kg/cm ²
26	Computer (Optional)-	PC with color monitor: 15", PC Pentium Dual Core/i3, with serial communication ports, 250/500 GB HDD, 2GB RAM

Range of experiments-

- ❖ Study of PLC.
- ❖ Study of PLC based control of Multi Process systems.
- ❖ Study of data logging system.
- ❖ To study flow control loop.
- ❖ To study level control loop.
- ❖ To perform pressure control loop.
- ❖ To observe temperature control process.
- ❖ Study of feedback control, cascade control, Ratio and on-off, split Range, control schemes.
- ❖ Calibration of Various Sensors, Transmitters like Pressure, Level, Flow, Temperature, Control Valve, Rotameter, E/P, etc.
- ❖ ON-OFF control: Level, Pressure, and Temperature.
- ❖ Study of SCADA Application Software/ Computerized Control of PC-PLC Based Multi-Process Control System.

Features-

- ❖ Compact Ergonomic Design.
- ❖ User Friendly, Self Explanatory Systems.
- ❖ Leak proof Safety Measures, sturdy piping.
- ❖ Enhanced Electrical Safety Considerations.
- ❖ Training Manuals Mimic Charts for Operation Ease.
- ❖ System Frame with Caster Wheel Arrangement for ease in movement.
- ❖ M.S. powder coated cubical plant with standard Instrument Mountings.
- ❖ Inbuilt Safety Measures to avoid improper usage.
- ❖ Computer Interface (Optional).

System Dimension: 6 Ft. (L) X 2.5 Ft. (W) X 6.5 Ft. (H)

System Weight: Approx. 200 kg

Services Required:

- ❖ Electrical supply of 1 ϕ 230V 50Hz.
- ❖ Water supply and drainage arrangement.
- ❖ Clean, dry, compressed air supply at 2.1 kg/ cm².

Note:

All descriptive matter and illustrations are intended to give only a general idea of the equipment detailed specifications may be altered at the company's discretion without any notice.

