

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



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

Key Words: -

- Feedback Control.
- Feedback Level Control.
- Feedback Pressure Control.
- Feedback Flow Control.
- Feedback Temperature Control.
- Cascade Control (Level + Flow, Pressure + Flow).
- Ratio Control (Flow + Flow).
- Split Range Control.
- ON-OFF Control.
- Feed forward control (optional)

Technical Specification:

No.	Item Name	Technical Specifications
1	PLC-	Allen-Bradley Micrologix 1400 /Siemens S7-1200/Equivalent. Digital Inputs- 20 (For M.L. 1400), 14 (For Siemens S7 1200) Digital Outputs- 12 (For ML 1400)/ 10 (For Siemens S7 1200), Analogue input- 4 (For ML 1400)/ 2 (For Siemens S7 1200), Analogue output- 2
2	Sump tank-	Material: Stainless Steel 1.5 mm thick/ P.P.5mm thick, Capacity: 30 litres, with top cover, 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" 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" Class B GI with ½" ball valves: 17 no.
8	Flow meter-	2 no. Size: ½", Turbine type/wfm type, Range: 0-1000 LPH, Supply: 24 V DC, 100 mA. Output: 4-20 mA, Type: 3-wire type. Mounting: Horizontal, Connection: ½"
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.

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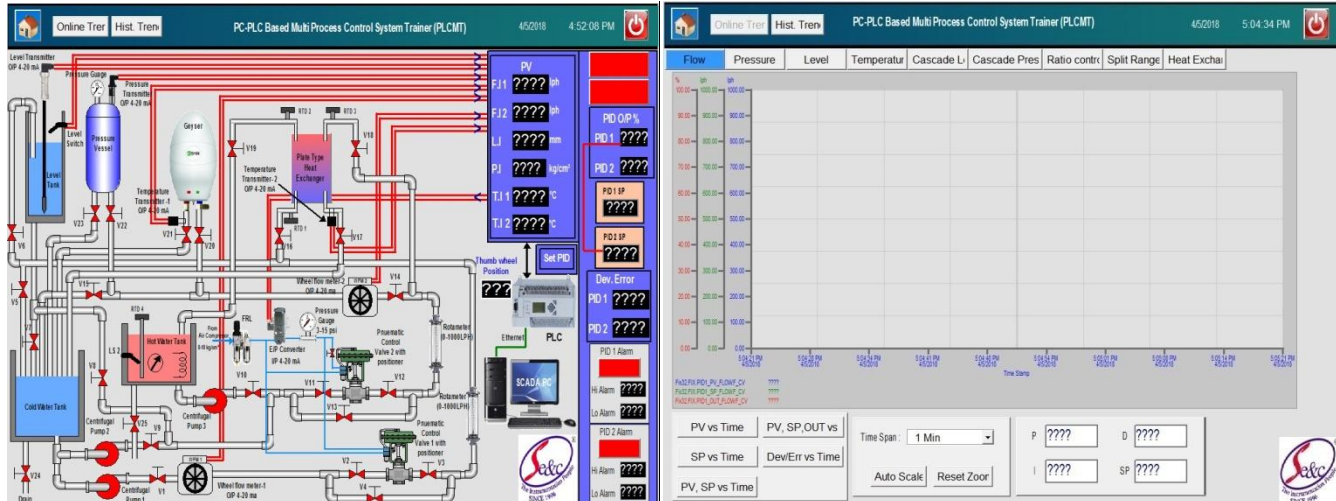


10	Pressure Transmitter -	Input: 0-2.5 Kg/cm ² or 0-4 Kg/cm ² , Output: 4-20 mA, supply: 24 V DC, 50 mA. Type: 2-wire Piezo-resistive type, Medium: Water Pressure, Mounting: Top ½" BSP connection.
11	Temperature Transmitter-	Input: RTD, Output: 4-20 mA, Type: 2-wire type, Sensor Length: 100 mm, DC Supply 24V, 50mA Range: 0-100°C / 0-200°C
12	Thyristerized Phase Angle Control Card-	Input: 4-20 mA, Output: 0-230 VAC variable, 10 A Max.
13	Pneumatic Control Valve-	2 no. Size: ½", 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 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", 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 0.5 sq 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	Human Machine Interface (HMI)-	Size: 7" Color Display Make: Mitsubishi/Siemens/Schneider/Eqvt.
25	SCADA Software (Optional)-	Make: Siemens WinCC Basic/G.E. Proficy I-fix /Eqvt. 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.
26	VFD (Optional)	Make: Siemens/Allen Bradley/ LS / DELTA/EQVT. Model Name: Sinamics V20 / EQVT. I/P: 1φ 230 VAC, O/P: 3φ 230 VAC
27	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
28	Computer (Optional)-	PC with color monitor: 18.5", Intel Core i3, 500 GB HDD, 4GB RAM, Keyboard & Mouse, DVD Writer, With supporting OS and Communication port.

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SCADA Screen (Optional):



Range of experiments-

- ❖ Study of PLC & HMI.
- ❖ Study of PLC based control of Multi Process systems.
- ❖ Study of data logging system.
- ❖ Study of feedback, cascade, Ratio and on-off, split Range, control schemes.
- ❖ Calibration of Various Sensors, Transmitters like Pressure, Level, Flow, Temperature, Control Valve, Rotameter, E/P, etc.
- ❖ Feedback control: Flow, Level, Pressure, Temperature
- ❖ Cascade Control: Flow-Level, Flow-Pressure.
- ❖ Ratio Control: Flow
- ❖ Split-Range Control: Level/pressure
- ❖ ON-OFF control: Level, Pressure, and Temperature.
- ❖ Study of SCADA Application Software/ Computerized Control of PC-PLC Based Multi-Process Control System.
- ❖ Study of implementation of Feed-forward Control using VFD based flow-level control (optional)

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).
- ❖ Caster wheel mounted movable frame

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

System Weight: Approx. 200 kg

For More Details Visit Our Website At: www.sapengineers.com, www.sapengineers.co.in E-mail:- sales@sapengineers.com
SAP Engineers & Consultants, Kothrud, Pune-411 038, India. Ph-(020)25384737

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Services Required:

- ❖ Electrical supply of 1 ϕ 230V 50Hz.
- ❖ Water supply and drainage arrangement.
- ❖ Clean, dry, compressed air supply at 2.1 kg/ cm².
- ❖ Laptop/Desktop computer (FOR SCADA)

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.

Manufactured/Marketed By

SAP ENGINEERS & CONSULTANTS

Regd. Off. : Shop No. 26-27, 'Srushti', Survey No.82, Near Guru Ganesh Nagar,
Eklavya College Road (D.P.Road), Kothrud, Pune - 411 038, India

Telephone : (020) 2538 4737

Mobile : +91 94220 88946, +91 9552475082

Fax : (020) 2538 3544

Email : sales@sapengineers.com

Website : www.sapengineers.com / www.sapengineers.co.in

