



The PC-PLC HMI Based Multi-Process Control Trainer 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

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
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).
Level Tank	Material: acrylic/ P.P. 5 mm thick, Dimension: 150(L) mm× 150(W) mm× 600(H) mm
Centrifugal Pump	2 nos., 1/2" H.P., 1φ 230 V AC supply, Surface mounting.
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).
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.
Piping	1/2" Class B GI with 1/2" ball valves: 17 no.
Flow meter-	2 no. Size: 1/2", 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: 1/2"
Level Transmitter	Input: 0-400/0-500 mm, Output: 4-20 mA, supply: 24 V DC DC, 100 mA. Type: 2- wire capacitance type, Mounting: Top 2" screwed connection.
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 1/2" BSP connection.
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
Thyresterized Phase	Input: 4-20 mA, Output: 0-230 VAC variable, 10 A Max. 13 Pneumatic Control Valve-Angle Control Card 2 no. Size: 1/2", 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: 0.2 to 1.0 Kg/cm ² (with Bypass), Action: Direct / Reverse Pneumatic Input Signal: 0.2 to 1.0 Kg/cm ² (Without Bypass)

Note: Specifications are subject to change.

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Rotameter	2 no., Range: 0-1000 / 0-2000 LPH, Glass tube type/ Acrylic body. Connection: ½", Mounting: Inlet- Bottom, Outlet- Top.
A.F.R. / F.R.L. Unit	1 no. Air Filter, Regulator, Lubricator, ¼" connection. Range: 0-10Kg/cm ² with Pressure Gauge.
E/P Converter	Input: 4-20 mA, Output: 3-15 psi, Connection ¼" NPT / BSP, Supply: 1.4 Kg/cm ² .
Level Switch	Float operated, Float Material: SS304, Switching voltage: 240 VAC/200 VDC Switching Current: 0.5A, Switch Action: Reversible, Weight: 315 Gms.
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.
Thumbwheel Switch	24 V DC operated, 10 positions
Isolator	2 Nos, Signal Isolators, Input: 4-20 mA, Output: 4-20 mA, Supply: 230 V AC.
MCB-	16A, 1f 230 VAC, L&T/ Standard Equivalent
Power Supply	24 V DC, 5 A, Size: 48mm×126mm×68mm.
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).
Human Machine Interface (HMI)	Size: 7" Color Display Make: Mitsubishi/Siemens/Schneider/Eqvt.
52202 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.
VFD (Optional)	Make: Siemens/Allen Bradley/ LS / DELTA/EQVT. Model Name: Sinamics V20 / EQVT. I/P: 1f 230 VAC, O/P: 3f 230 VAC
52203 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
52201 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.

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

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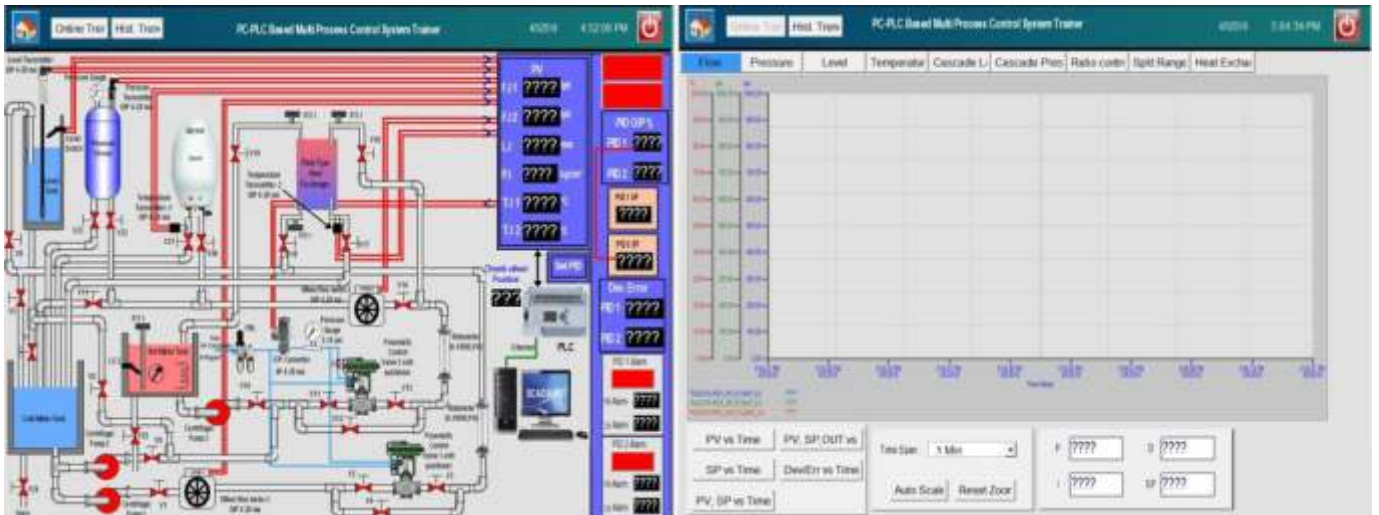
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- Split-Range Control: Level/pressure
- ON-OFF control: Level, Pressure, and Temperature.
- Study of SCADA Application Software/ Computerized Control of PC-PLC Based Multi-Process Control System.
- Study of implementation of Feed-forward Control using 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

52202 SCADA SCREEN (OPTIONAL)



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