



PROCESS CONTROL TRAINING SYSTEM (4 IN 1) SMT-9200

Process Control technology has greatly expanded the variety of tasks performed by instrument technicians at industrial plants. They must calibrate, troubleshoot, and repair instruments ranging from pneumatic booster relays to microprocessor-based automatic controllers. To successfully perform these tasks without adversely affecting plant production and maintenance costs, effective training is essential.

The SMT-9200 Process Control system is designed for hands-on training in the measurement, control and troubleshooting of industrial processes. The trainers can operate independently, or be combined together in different configurations to simulate more-complex processes. The Flow, Level, Temperature and pressure use water as the process media. Student courseware starts with an introduction to the basic characteristics of main process variables, and proceeds progressively to the study of process fundamentals, calibration of sensing devices and transmitters, and the operation of microprocessor-based controllers. Closed-loop control of processes and troubleshooting exercises are an integral part of the training program, and computer-based training and simulation software provides flexibility when adding to or upgrading existing programs.

Process Control Trainer contains an educational board with a pressurized vessel and a set of sensors and actuators for level, pressure, temperature and flow. A control module, containing the interface circuits for the sensors and the actuators and the ON/OFF, proportional, integral and derivative control circuits (PID).



TECHNICAL SPECIFICATIONS

- **Fixed Supply DC:** +12V, +15V, -15V, +24V & +48V
- **Vessel:** 6 Liter approx.
- **Water Tank:** 20 liter approx
- **Heater Element:** 300W
- **Water Circulation Pump:** 10 l/min
- **Piping:** Plastic
- **Thermal Sensors:** PT100, Bi-metallic Direct Reading
- **Pressure Sensor:** Manometer Direct Reading, Strain Gauge
- **Level Sensor:** LVDT, Float Switch
- **Flow Sensor:** Direct Reading, Digital hall effect type
- **Valves:** Manual, Motor Driven & Safety set at 2.0 Bar
- **Level Sensor Interface:** Precision Rectifier with Offset
- **Flow Sensor Interface:** F/V Converter with Offset and Gain Control
- **Temperature Sensor Interface:** DC Amplifier with Offset and Gain Control
- **Pressure Sensor Interface:** Differential Amplifier with Offset and Gain Control
- **ON/OFF Control:** Comparator with Hysteresis Control
- **Analog Source:** 0 ~ +10V,
- **PID Controller:** Proportional, Integral & Differential Control with Feedback
- **Pump Driver:** DC to PWM Driver with DC Level Offset Control
- **Motor Valve Driver:** Proportional ON/OFF Control
- **Heater Driver:** DC to PWM Driver with DC Level Offset Control
- **Solenoid Valve Driver:** ON/OFF Control with Driver
- **Accessories:** Power Cord, 2mm Patch Cord, Experiment Manual.

- **Optional:** Data Acquisition Unit / Interface Software.

Features:

Flow Control:

User can control flow of liquid manually, through ON/OFF & PID control

Level Control:

User can maintain level of liquid manually, through ON/OFF through ON/OFF & PID control.

Temperature Control

User can control temperature level manually, through ON/OFF through ON/OFF & PID control

Pressure Control

User can control pressure of liquid manually through ON/OFF & PID control

Optional Features:

PID parameters are controllable and graph plotting is also available.

Control of parameter related to flow, level, and temperature and pressure process.

Experiments Included:

- Study of the Level Sensor
- Study of the Flow Sensor
- Study of the Pressure Sensor
- Study of the Temperature Sensor
- Study of the Characteristics of the Pump and of the Motorized valve
- Study of the characteristics of the static process and of the time constants.
- ON-OFF, P, PI, PD and PID Closed Loop Control of the Level
- P, PI, PD and PID Closed Loop Control of the Flow
- ON-OFF, P, PI, PD and PID Closed Loop Control of the Temperature
- ON-OFF Control of the Level with the Pressure Sensor.

SOFTWARE SPECIFICATIONS**Process Control Trainer 4 in 1 (SMT-9200)**

The Process Control Trainer provides user ability to control four processes of some liquid. These are: i) Flow Control, ii) Level Control, iii) Temperature Control, and iv) Pressure Control. Further details are as follow

Features:**Flow Control**

User can control flow of liquid manually, through ON/OFF control or through software PID control algorithm.

Level Control

User can maintain level of liquid manually, through ON/OFF control or through software PID control algorithm.

Temperature Control

User can control temperature level manually, through ON/OFF control or through software PID control algorithm.

Pressure Control

User can control pressure of liquid manually or through software PID control algorithm.

Others

PID parameters are controllable and graph plotting is also available.