



**Scientech 2475 Multi Function Process WorkBench** is a complete setup to measure process through two point (ON/OFF) and three point (PID) controller. It is an Industrial Process plant with four processes Temperature, Liquid level, Pressure and Flow which we can measure through an Ethernet based Data Acquisition System which has 24 bit ADC and digital input/output. Scientech 2475 also gives us the exposure to the industrial components like Level Transmitter, Temperature Transmitter, Pressure Transmitter, Wheel Flow Transmitter, Rotameter, DAQ, PID controller and Temperature Sensor like RTD and Thermocouple. User can learn how to calibrate, install, operate and tune the instruments for controlling the process. All electrical components are connected to the control panel to allow students to measure signals and connect the devices in wide variety of control configuration including open loop (manual control) and close loop (PID control, ON/OFF control).

Scientech 2475 also has versatile software through which we can measure it from any PC which is in the local area network, software has features like logging of the process data, live and store Graph which can be printed when needed, alarm can be set for different points, animated real time view of complete process, easy IP configuration.

## Features

- Temperature, Flow, Level, and Pressure Measurement
- Use of Industrial Process Control elements like Capacitive Level Transmitter, Temperature Transmitter, Flow Transmitter, Pressure Transmitter, RTD and K Type Thermocouple Sensor, Rotameter and PID Controller, Solenoid Valve
- M.S Powder Coated Electrical Control Panel contain Start, Stop, Pump, Solenoid Valve, Stirrer button, Indicators for Pump, Heater, Stirrer, Solenoid Valve, Audio Indicator, Visual Indicator, Ammeter
- Real-time Ethernet based DAQ interface with ADC & Digital input/output
- Process Loop Tuning & Stable Process
- Process Control loops
- User Friendly Software
- Transducer/Transmitter Calibration
- Piping and instrumentation diagram
- Leak proof Safety measures, sturdy piping
- Enhanced Electrical Safety considerations
- Heat Transfer concepts
- Built-In Instrumentation
- SS Sump tank for inlet and outlet of water
- Robust construction
- Platform with Caster wheel arrangement for ease in movement

## Scope of Learning

### Study and use of :

- RTD characteristics
- Thermocouple characteristics
- Temperature Transmitter characteristics
- Level Transmitter characteristics
- Flow Transmitter characteristics
- Pressure Transmitter characteristics
- Open loop for Temperature
- Temperature on/off action using Software
- P-control action using the software for Temperature
- PI-control action using the software for Temperature
- PID-control action using the software for Temperature
- Industrial PID Controller as on/off Controller for Temperature
- Industrial PID Controller as Proportional (P) Controller for Temperature
- Industrial PID Controller as Proportional Integral (PI) Controller for Temperature
- Industrial PID Controller as Proportional Integral Derivative for Temperature
- Open loop for Level
- Level On/Off Controller using Software
- Level P Control action using Software
- Level PI Control action using Software
- Level PID Control action using Software
- Flow Measurement using Software
- Pressure Measurement using Software.

### Technical Specifications

#### Data Acquisition System (DAQ)

Analog input	: 8 nos.
Analog output	: 2 nos.
Digital input	: 8 nos.
Digital Output	: 8 nos.
ADC Resolution (In Bit)	: 24
Unity gain amplifier (Buffer)	: 2 (0-5V)
USB	: Yes
Ethernet	: Yes
Data Login (PC based)	: Yes
Software	: Yes

#### Wheel Flow Transmitter : 1 no.

Range	: 0-500 LPH
Supply Voltage	: 24V
Output	: 4-20mA
Level Transmitter	: 1 no.
Supply Voltage	: +24V DC
Output Voltage	: 4mA to 20mA
Cable Entry	: 2 X 1/2" BSP, SC gland brass
User Interface	: 4 digit display+4 Keys
Read out	: 0 - 100%, 4-20mA LED (red), Digital, 2-1/2
Outputs	: 4-20 mA PNP output ( 3 wire ) or galvanically isolated (4 wire loop) (User selectable) 4 - 20 mA output is over current safe and compatible with DAQ Measurement Range: 10-50000 pF.
Calibration	: Calibratable over measurement range.

Calibration method : Easy (Using DIP Switches)

Sensing rod material : Stainless steel (SS304)

Insulation : Full PTFE

Mains : +24V DC @25mA (reverse polarity safe)

Probe Length : 250mm

Pressure Transmitter : 1 no.

Measuring Range : 0-1 bar

Output Signal : 4-20mA

Supply Voltage : 24VDC

#### Temperature Transmitter : 1 no.

Supply : +24V DC

Output : 4 to 20mA

Temperature Range : 0 to 100C

**RTD Temperature Sensor** : 1 no. (PT100)

Wire : 3 Wire

Rod Length : 6"

Temperature Range : (-99 to 850°C)

**Thermocouple Sensor** : 1 no. (K Type)

Type : K Type

Wire : 2 Wire

Rod Length : 6"

Temperature Range : (-200 to 1250°C)

**Industrial PID Controller** : 1 no

Input : RTD (PT100), K type Thermocouple

Display : 7 segment LED, dual display

Control Action : PID & ON/OFF

Supply Voltage : 230V AC

Relay Action : Forward for cooling and reverse for heating

**Solenoid Valve** : 1 no.

Supply Voltage : +230V AC

Pressure range : 0 to 10kg/cm<sup>2</sup>

**Electrical Control panel** :-MS Powder coated panel with switches, indicator, Test Points, PID and DAQ , Ammeter on front face, DAQ Mounted on, multi strand wire with proper insulated ,lugs, ferruling & neat wire dressing & clamping

**Push to On Switch** : 6 nos.

**Toggle Switch** : 7 nos.

**Indicator Lamp** : 5 nos.

**Audio Indicator** : 1 no.

**Ammeter** : 1 no.

Range : 0 to 5A, 0.2% resolution

**Stirrer** : 1 no.

Supply : 12 V DC

**Rotameter** : 1 no.

Body : Acrylic Type

Range : 0-1000 LPH

**Submersibles Pump** : 1 no.

**Caster Wheel** : 4 nos.

**Heater** : 1 no.

Supply : 230 V AC (1000Watt)

**Process (Measuring) Tank** : 1 no.

**Supply (Sump) Tank** : 1 no.

**List of Accessories** : Mains Cord-1

Ethernet Cable-1

Flexible Pipe-1 meter