Scientech

PLC Controlled Multi Process Workbench

Scientech 2484

Patent Pending

Learn

HMI | Cloud SCADA | PLC | Sensors & Actuators | Automation | IIoT Gateway | VFD | Process Control | PID

The Scientech 2484 PLC Controlled Multi-Process Workbench is a comprehensive, self-contained, floor-standing training system that accurately replicates industrial process control systems used across various sectors such as chemical, oil, food, water, power, and other process-driven industries. Specifically designed for hands-on learning, this workbench offers students and technicians a practical, real-world experience in programming, automation, and process control, utilizing industry-standard components and tools.

This fully integrated workbench provides users the ability to control multiple processes, including temperature, pressure, flow, and level, using both two-point (On/Off) and three-point (PID) controllers. The Scientech 2484 workbench is designed to expose users to a wide array of industrial components, including PLCs, HMIs, IIoT Gateways, pressure transmitters, level transmitters, flow transmitters, temperature transmitters, control valves, variable frequency drives (VFDs), heaters, pumps, float switches, and more.

With its advanced IIoT capabilities, users gain hands-on experience in real-time data acquisition, remote monitoring, and process control through the IIoT Gateway. The system is tailored to help users understand the complexities of industrial automation, control systems, and IIoT applications, enabling them to develop valuable, practical skills that are essential for real-world industrial environments.

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Features

- Remote monitoring and control of the entire system is available through a cloud-based SCADA platform, allowing access and control via PC or mobile devices from anywhere in the world.
- This workbench is equipped with a PLC featuring 16 digital inputs, 12 digital outputs, 4 analog inputs, and 4 analog outputs for comprehensive process control and monitoring and communication facilities include USB, RS-485, and Ethernet, enabling seamless connectivity and integration with other devices and networks and comes with industry-standard PLC programming software, making configuration and control easy and efficient. Ladder programming is used for intuitive and simple process control setup.
- User-friendly 7" HMI touch screen for real-time process visualization and interaction. It also includes HMI programming software and programming cables for easy design of user interfaces and parameter configurations.
- Scientech 2484 includes essential process measurement devices such as a Pressure Transmitter, Level Transmitter, Flow Transmitter, Temperature Transmitter and Temperature Sensor for accurate monitoring of key process variables.
- Real-World process control components include Control Valve, Variable Frequency Drive (VFD), Heater, Pump, Float Switch, Start/Stop Switches, and Indicators, enabling full control over industrial processes and real-world applications.
- Supports both continuous controllers (P, I, PI, PID) for dynamic process regulation and discontinuous controllers (On/Off control) for simpler applications.
- Water pumps can be controlled via VFD to adjust speed, optimizing energy efficiency and improving pump operation.
- The workbench includes software for PC-based ladder and HMI programming, enabling users to easily develop and configure programs for process control.
- The workbench allows users to apply theoretical concepts in a practical setting, helping bridge the gap between classroom learning and real-world industrial practices.
- The workbench includes separate tanks for temperature, level, and pressure control, enabling hands-on experimentation under various conditions.
- Capable of both open-loop (manual) and closed-loop (feedback) control system configurations, enabling practical demonstrations of feedback control and set-point regulation.
- Experiments can be easily configurable through the patch board, allowing flexible and customized process setups for training purposes.
- Built with a heavy-duty M.S. Epoxy-coated frame, the workbench is durable enough to withstand the demands of industrial training environments. It is also equipped with caster wheels (with a locking mechanism) for easy movement, making it adaptable to various training setups and spaces.
- The workbench is designed with enhanced electrical safety features, including an MCB for AC supply protection, leak-proof safety measures, and sturdy piping for safe operation.

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Scope of Learning

- Provides a comprehensive learning experience on process control systems used in industries, helping users understand how automation and control are applied in various industrial processes.
- Learn the key differences between open-loop control systems (manual control) and closed-loop control systems (feedback control), exploring the advantages and applications of each in industrial environments.
- Gain hands-on experience with modern process control techniques used in industries, including advanced controllers and automation systems to optimize industrial operations.
- Explore the working of VFDs in detail, understanding how they control the speed and efficiency of motors, particularly for water pumps, to optimize energy consumption and improve operational efficiency.
- Develop practical skills in ladder programming and HMI (Human-Machine Interface) design. Learn how to create, modify, and troubleshoot programs to control industrial processes through PLCs and HMIs.
- Learn the role of PID (Proportional-Integral-Derivative) control in maintaining desired process variables (e.g., temperature, pressure, flow). Understand how PID controllers are used for precise regulation and stability in process control.
- Explore the significance of IIoT (Industrial Internet of Things) in modern industrial environments. Learn how IIoT enables real-time monitoring, remote control.
- Get hands-on experience with industrial instrumentation such as pressure transmitters, temperature transmitters, flow transmitters, and level transmitters. Understand how these sensors and instruments interact with valves to control and maintain critical process variables.
- Learn the characteristics, installation, and application of level transmitters, pressure transmitters, temperature transmitters, and electromagnetic flow transmitters, which are essential in maintaining safe and efficient process control systems.
- Temperature Control: Study On/Off and PID control of temperature processes using PLC, HMI, and Cloud SCADA for real-time monitoring and control.
- Level Control: Learn On/Off and PID control of level processes with the integration of PLC, HMI, and Cloud SCADA for precise control.
- Pressure Control: Implement On/Off and PID control for pressure processes using PLC, HMI, and Cloud SCADA, learning how to maintain stable pressure in industrial systems.
- Flow Control: Implement On/Off and PID control of flow processes using PLC, HMI, and Cloud SCADA, focusing on accurate flow measurement and regulation.
- Learn how to develop and utilize cloud-based SCADA systems for global access to process data and remote control. With Cloud SCADA, users can access live process data, control operations, and monitor systems from anywhere using mobile devices and applications.
- Gain experience in data logging, downloading data, and analyzing alarm histories through the Cloud SCADA system. Use tools to export data directly into Excel, helping track process performance, monitor trends, and optimize operations.
- The workbench provides real-world process control training with a complete set of components for process automation. Users will develop practical skills in automation, instrumentation, and process control that are directly applicable in industrial environments.

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Technical Specifications

PLC		
Digital inputs	:	16 nos.
Digital outputs	:	12 nos.
Analog inputs	:	4 nos.
Analog output	:	4 nos.
Communication	:	Ethernet ,RS485
Human Machine Interface (HMI)		
HMI Supply	:	+24V DC
CPU	:	32-bits 400MHz RISC
Interface	:	Ethernet Storage
Flash	:	128MB
DDRAM	:	64MB
Display size	:	7 inch
Resolution	:	800 × 480 TFT LCD 65,536 colors
Touch screen	:	High precision four-wire resistive
Capacitive Level Transmitter : 1 no.		
Housing enclosure	:	Cast aluminum weather proof
Supply	:	+24V DC measurement
Span	:	15 to 50000pf above zero
Response time	:	0.5s to 5 sec
Output	:	4 to 20mA
Range	:	250mm
User interface	:	4 digit display with 4 keys and LED
Electromagnetic Flow Transmitter : 1 no.		
Output	:	4-20 mA
Flow	:	0 to 3000 LPH
Flow indication	:	3 ½ digital displays
Supply	:	230V AC
Pressure Transmitter with display : 1 no.		
Range	:	0 to 5 Bar
Supply	:	9 to 28 V DC
Output	:	4-20 mA
Protection class	:	IP-65
RTD Sensor : 2 nos.		
Type	:	RTD (PT100) Wire : 3 wire
Temperature range	:	(-99 to 850°C)

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RTD Temperature Transmitter : 1 no.		
Supply	:	24VDC
Output	:	4-20mA
Temperature range	:	0-100°C
4-20mA display : 1 no.		
Display	:	4 digit, 7 segment digital display
Keys	:	3 for digital setting
Input type	:	4-20mA
Resolution	:	1 or 0.1 degree
RTD Temperature display : 1 no.		
Display	:	4 digit, 7 segment digital display
Keys	:	3 for digital setting
Input type	:	RTD (PT100)
Resolution	:	1 or 0.1 degree
IIOT device (Gateway) with Cloud SCADA : 1 no.		
I/O ports		
USB host	:	USB 2.0 × 1
Serial port	:	RS232/RS485
Ethernet	:	3 ports
Wi-Fi module	:	Yes
Cloud SCADA Software	:	Yes
Variable Frequency Drive (VFD): 1 no.		
Horsepower rating	:	0.5 HP
Rated amps	:	2.5 A
Rated voltage	:	230 V
Input frequency	:	50 Hz
Control valve : 1 no.		
Input	:	4 to 20mA
Line size	:	25mm
Type	:	Servo type
Unmanned Ethernet Switch : 1 no.		
Ports	:	5 port
Water Pump: 1 no.		
Power	:	0.5HP (0.37 kW)
Rated voltage	:	220V
Rated frequency	:	50Hz
Voltage range	:	180V-260V (1PH)

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Air Compressor : 1 no.

Input	:	230VAC
Pressure	:	115 PSI
Power	:	1 HP
Tank Capacity	:	9 litres

Heater : 1 no.

Power	:	500W

Float Switch : 4 nos.

MCB : 1 no.

Current rating	:	16Ampere

Temperature Measuring Tank : 1 no.

Material	:	SS

Level Measuring Tank : 1 no.

Material	:	Acrylic

SS Pressure Measuring Tank : 1 no.

Material	:	SS

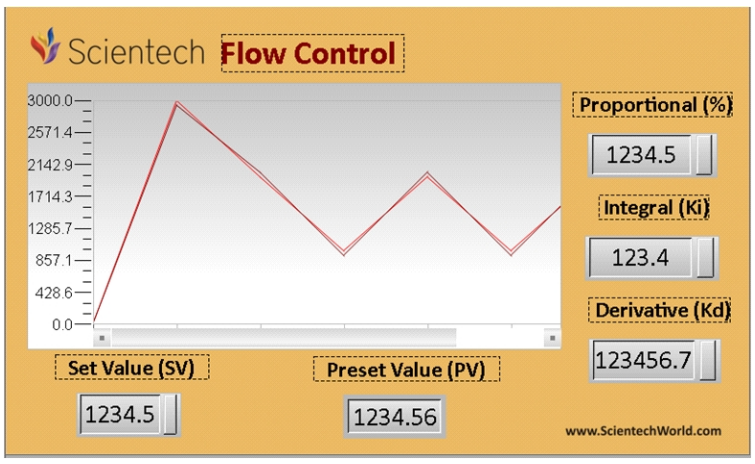
Manual valve : 6 nos.

Caster wheel : 4 nos. (2 with lock & 2 without lock)

Size	:	75mm

List of Accessories

Ethernet cable	:	3 nos.
PLC programming software	:	1 no.
HMI Programming software	:	1 no.
2mm patch cord red	:	4 nos.
2mm patch cord black	:	4 nos.



Subject to Change

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