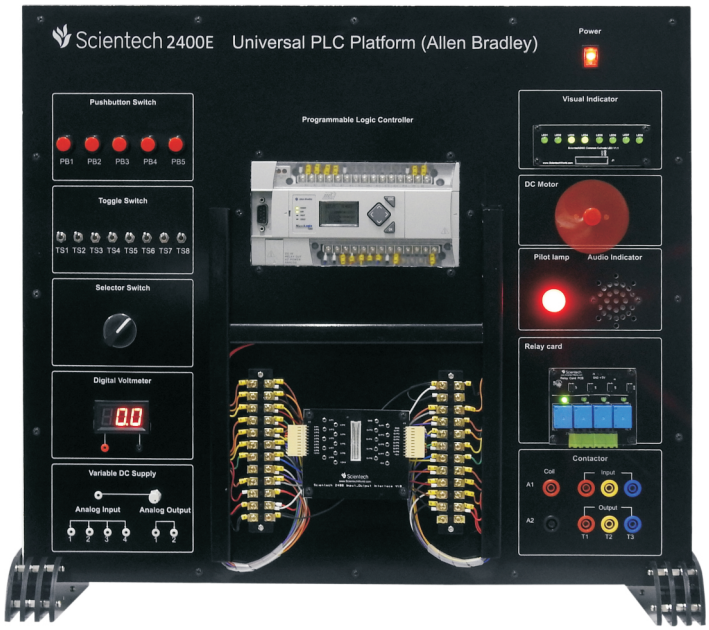
Scientech

Universal PLC Platform

Scientech 2400



Today, manufacturing processes have become a lot more efficient due to Internet of Things (IoT), intelligent automation, advance robotics and other smart factory initiatives. Despite rapid changes in technology, PLC continues to play a vital role in manufacturing and acts as a central processor for all real time decisions.

PLCs have adapted well to modern manufacturing and automation systems. With no competitor on horizon and solid fundamentals, PLCs and PLC programming will continue to play an integral role in the manufacturing processes.

Looking at career opportunities offered by Industry 4.0, Scientech has designed a Universal PLC platform. Scientech 2400 Universal PLC platform is an ideal setup to study the working of PLC's used for industrial applications. Scientech 2400 has been designed to learn and practice:

- Wiring of PLC with different inputs and outputs.
- Push to ON switch, toggle switch, proximity sensor, selector switch as an input to PLC.
- Realistic simulation that can drive visual indicators, audio indicators, and DC motor, relay and contactor.

Features

- Freedom to select a PLC from different makes.
- Open platform to explore wide PLC applications.
- Industrial look & feel.
- Toggle switches push to ON switch, proximity sensor, selector switch, visual indicator, audio indicator, DC motor, relay card, contactor and voltage display.
- Din rail mounting for PLC.
- Powerful instruction sets.
- Several sample ladder programs.
- High execution speed.
- PC based ladder programming.
- Extremely easy and student friendly software to develop different programs.
- Choice of PLC and expansion modules.
- Easy downloading of programs.
- Practice troubleshooting skills.
- Compact tabletop ergonomic design.
- Ready experimental details.
- Robust construction.

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Scope of Learning

- Exposure to technology of Programmable Logic Controller (PLC) and understanding the importance of automation in industries.
- Student will be familiarized with a variety of ladder logic instruction to create complete PLC program from scratch.
- Study the difference between digital and analog signals and how to bring them into a PLC, process them and send them back out.

PLC hardware

- PLC configuration.
- Source and sink concept.
- PLC history.
- Input/output configuration.
- Installation.
- Switches and sensor interfacing.
- Actuator interfacing.

PLC operation

- Sequence of operation.
- Program scans cycle.
- Addressing example.
- Upload/download/monitoring.

Installation

- Wiring and connection.
- Communication setup.
- Programming devices connection.

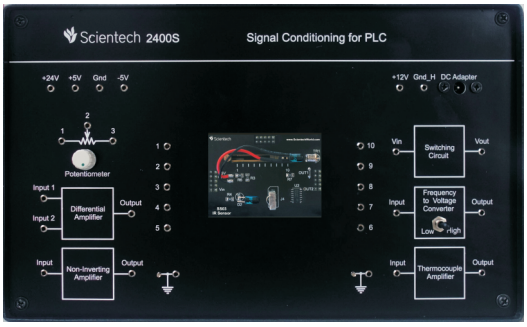
Program operation

- NO (normally open) and NC (normally closed) instruction.
- Types of logic gates.
- Set and reset bit.
- Types of timers.
- Types of counter.
- Types of compare instruction.
- Types of math function.
- Mov instruction.

Technical Specifications

Toggle switches	:	4 nos.
Push to ON switches	:	3 nos.
Proximity sensor	:	1 no.
Selector switch	:	1 no.
Visual indicators	:	4 nos.
Audio indicator	:	1 no.
DC motor	:	1 no.
Relay card	:	1 no. (Contains 2 relays)
Contactor	:	1 no.
Operating temperature	:	0-40°C, 80 % RH
Dimension (mm)	:	W 600 x H 390 x D 300
Weight	:	8 Kg (approximately)
Product tutorial	:	Online
Package contains		**Quantity**
Interfacing cable	:	1
Mains cord	:	1

Scientech 2400S Signal conditioning for PLC (optional)



Differential amplifier	:	2 gain
Thermocouple amplifier	:	10 gain
Non inverting amplifier	:	3 gain
Digital output logic	:	Logic 0 : 0V
		Logic 1 : 24V

Frequency to voltage converter

Input frequency range	:	0-400Hz
Output voltage range	:	0 to 4.5V
Input frequency range	:	0-5KHz
Output voltage range	:	0-4.5V

Note: Scientech 2400S signal conditioning module is required for SS04, SS13, SS57 and SS155.

Switches & Sensors (optional)

Digital Sensors:

Capacitive proximity Sensor (SS16)

Application

- Detecting flow of material
- Belt breakage detection
- Detection empty cartons

Scope of Learning

- Concept of capacitive proximity sensor.
- Interfacing with PLC.
- Ladder programming of proximity sensor for detection of metallic and non metallic objects.

PIR Sensor (SS155)

Application

- Alarm systems.
- Robotics.

Scope of Learning

- Concept of PIR sensor.
- Interfacing with PLC.
- Ladder programming of PIR sensor for human body detection.

Analog Sensors:

Pressure Sensor (SS04)

Application

- Pressure sensing
- Altitude sensing
- Leak testing

Scope of Learning

- Study of pressure transducer.
- Interfacing with PLC.
- Ladder programming for pressure sensor.

Temperature and humidity Sensor (SS150)

Application

- Food industries
- Steel industries

Scope of Learning

- Study of temperature and humidity sensor.
- Ladder program for temperature and humidity sensor.

Magnetic Sensor (Hall Sensor) (SS13)

Application

- Current sensing
- Power sensing
- Proximity detection
- Speed detection

Scope of Learning

- Concept of Hall Effect sensor
- Interfacing with PLC
- Ladder programming of Hall Effect sensor for magnet pole detection

Level Sensor (SS24)

Application

- Dairy industry
- Water & waste water

Scope of Learning

- Study of water level sensor.
- Interfacing with PLC.
- Ladder programming for water level sensor.

Air quality Sensor (SS151)

Application

- Air quality monitor
- Use to detect leakage/excess of gases

Scope of Learning

- Study of air quality.
- Interfacing with PLC.
- Ladder programming for air quality sensor.

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Soil moisture Sensor (SS152)

Application

- Soil moisture monitoring

Scope of Learning

- Study of soil moisture sensor.
- Interfacing with PLC.
- Ladder programming for soil moisture sensor.

Ambient light Sensor (SS153)

Application

- Street light
- Burglar alarm system

Scope of Learning

- Study of ambient sensor.
- Interfacing with PLC.
- Ladder programming for ambient light sensor.

Actuator (optional)

Seven segment display (SS57)

Application

- Digital clock
- Calculator

Scope of Learning

- Study of seven segment display.
- Interfacing with PLC.
- Ladder programming for seven segment display.

Note : This actuator requires a PLC of minimum 8 digital inputs.

Solenoid valve (SS70)

Application

- Used in air power pneumatic to control cylinder
- Used in refrigeration

Scope of Learning

- Study of solenoid valve.
- Interfacing with PLC.
- Ladder programming for solenoid valve.

Application modules (optional)

Scientech 2421 Water level control by PLC

Scope of Learning

- Study of water level.
- Study and use of timers and memory bit.
- Water level control by PLC through ladder program.

Scientech 2422 Elevator control by PLC

Scope of Learning

- Study of elevator.
- Study and use of latch switches and timers.
- Elevator control by PLC through ladder program.

Scientech 2423A Traffic light control by PLC

Scope of Learning

- Study of traffic light.
- Study and use of memory bit and timers.
- Traffic light control by PLC through ladder program.
- Study of signal indications for two direction.

Scientech 2423B Traffic light control by PLC

Scope of Learning

- Study of traffic light.
- Study and use of timers.
- Traffic light control by PLC through ladder program.
- Study of all three signals red, green and orange i.e. ready, go and stop. Signal indications for all direction at any square.

Scientech 2424 Temperature control by PLC

Scope of Learning

- Study of temperature control.
- Study and use of compare instruction.
- Study and use of temperature sensors and voltage to current convertor.
- Study and use of controlling a heater and fan.
- Temperature control by PLC through ladder program.

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Scientech 2425 Conveyor control by PLC

Scope of Learning

- Study of conveyor.
- Study and use of memory bit, timers, counters, compare instruction.
- Study and use of IR sensor, proximity sensor, push to on switch.
- Study and use of DC motor.
- Conveyor control by PLC through ladder program.
- Learn to count metallic container using a proximity switch.
- Learn to run and control conveyor in manual and auto mode using a PLC.
- Learn to control direction a of DC motor.

Scientech 2425B Sorting system control by PLC

Scope of Learning

- Study of conveyor.
- Study and use of memory bit, timers, counters, compare instruction.
- Study and use of input device like proximity sensor, push to on switches and output device like DC motor, 5/2 solenoid valve and double acting cylinder.
- Conveyor control by PLC through ladder program.
- Ladder program for count metallic container using a proximity switch.
- Ladder program for run and control conveyor in manual and auto mode using a PLC.
- Ladder program for control direction a of DC motor.
- Ladder program for sorting of metallic object using double acting cylinder and PLC.

Scientech 2426 Speed Control of DC motor by PLC

Scope of Learning

- Study of DC motor.
- DC motor control by PLC through ladder program.
- Study and use of PWM (pulse width modulation) and voltage to frequency convertor.
- Learn to run DC motor in clockwise and anticlockwise direction.
- Learn to change the speed of DC motor.

Scientech 2427 Motor & switches control by PLC

Scope of Learning

- Study of stepper motor, thumbwheel switch and limit switch.
- Stepper motor, thumbwheel switch and limit switch control by PLC through ladder program.
- Study of speed control of stepper motor using a thumbwheel switch.
- Learn to step (position) control of stepper motor using a limit switch.
- Learn to run stepper motor in clockwise and anticlockwise direction.
- Study and use of PWM (pulse width modulation).

Scientech 2429 Study of Star delta & direct on line (DOL) Starter by PLC

Scope of Learning

- Study of start delta motor starter.
- Study of direct online starter.
- Study and use of latching.
- Study and use of timer.
- Ladder program for star delta motor starter control by PLC.
- Ladder program for direct online starter control by PLC.

Ordering information

	Siemens PLC			Allen Bradley PLC		FATEK PLC		
Model	**Scientech 2400A**	**Scientech 2400B**	**Scientech 2400C**	**Scientech 2400E**	**Scientech 2400J**	**Scientech 2400F**	**Scientech 2400G**	**Scientech 2400GN**
CPU	1212C	1214C	1214C	1400	820	FB's-14mA	FB's-20mA	FB's-20mA
Digital input	8	12	30	20	8	8	12	12
Digital output	6	8	26	12	7	6	8	8
Analog input	2	2	2	4	4	NA	NA	4
Analog output	1	1	1	2	1	NA	NA	2
Program size (in words)	3200	4800	4800	3200	3200	4096	4096	4096
Communication	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	USB	USB	USB
Expansion	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
HMI compatibility (optional)	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
SCADA compatibility (optional)	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Application module compatibility								
Scientech 2421	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scientech 2422	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scientech 2423A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scientech 2423B	No	Yes	Yes	Yes	No	No	Yes	Yes
Scientech 2424	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Scientech 2425	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scientech 2425B	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scientech 2426	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Scientech 2427	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scientech 2429	No	Yes	Yes	Yes	No	No	Yes	Yes

Subject to change Version 1.0

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