



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, Tesca has designed a Universal PLC platform. Tesca Universal PLC platform is an ideal setup to study the working of PLC's used for industrial applications. Tesca 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.

Experiments

- 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)
Contactors	: 1 no.
Operating temperature	: 0-40°C, 80 % RH
Dimension (mm)	: W 600 x H 390 x D 300
Weight	: 8 Kg (approximately)

Note: Specifications are subject to change.

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Package contains	Quantity
Interfacing cable	: 1
Mains cord	: 1

Water level control by PLC - PLC-01

Scope of Learning

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

Elevator control by PLC- PLC-02

Scope of Learning

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

Traffic light control by PLC- PLC-03A

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.

Traffic light control by PLC- PLC-03B

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.

Temperature control by PLC- PLC-04

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.

Conveyor control by PLC - PLC-05

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.

Sorting system control by PLC- PLC-05B

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.

Speed Control of DC motor by PLC - PLC-06

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.

Motor & switches control by PLC - PLC-07

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).

Study of Star delta & direct on line (DOL) Starter by PLC - PLC-09

Scope of Learning

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

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Order Code - 52014A-52016A, 52018F, 52019G-52019GNH,
52020E-52020J & PLC-01 to PLC-09
Universal PLC Platform

Ordering Details

PLC Type	Siemens PLC			Allen Bradley PLC		FATEK PLC		
Order Code	52014A	52015A	52016A	52020E	52020J	52018F	52019G	52019GN
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

PLC-01	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLC-02	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLC-03A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLC-03B	No	Yes	Yes	Yes	No	No	Yes	Yes
PLC-05	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLC-05B	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLC-06	Yes	Yes	Yes	Yes	Yes	No	No	Yes
PLC-07	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PLC-09	No	Yes	Yes	Yes	No	No	Yes	Yes

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