Level 1: Fundamentals
PLC—Allen Bradley

FESTO

To work efficiently with a PLC, it's essential to be well-versed in the specific programming environment and languages. This certification is designed to meet that need. Students will gain hands-on experience with high-end products from Rockwell Automation/Allen Bradley, allowing them to work directly with industrial control equipment. Realistic examples are used to motivate students and help them develop the skills necessary to operate PLC-controlled systems, which are prevalent in our daily lives. As a Rockwell Encompass Partner, Festo provides training that is perfectly suited to this environment. This certification is derived from extensive industry based content to reflect the key topics and competencies building a foundation of PLC understanding.

Industry Recognized Certification Topics

- Control relays
- Communication protocols
- Programming techniques
- HMI integration
- Networks
- Basic design and operation
- PLC sections: input, logic and output
- Input types: discrete, analog and digital
- Memory types: ROM and RAM
- Logic processing: addressing and scanning
- Output types: discrete, analog and digital
- Numbering systems: decimal, binary, octal, hex and ASCII
- Boolean functions: identity, AND/OR/NOT circuits
- Basic troubleshooting: using a PLC as a troubleshooting tool

Industry Recognized Certification Competencies

- Explain the operation and design of various relays
- State/explain the three PLC sections
- State/explain the three types of input devices
- State/explain the types of memory in a PLC
- Explain different types of PLC addressing
- State/explain the three types of output devices
- Convert different numbering systems used in a PLC
- Explain various boolean gates/truth tables
- Demonstrate how to use a PLC for troubleshooting to resolve problems quicker
- Understand and apply communication protocols
- Integrate and configure HMI's
- Understand PLC networks

Units - 6 / Labs - 5 / Projects - 1

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Level 1: Fundamentals
PLC — Siemens

FESTO

To work efficiently with a PLC, it's essential to be well-versed in the specific programming environment and languages. This certification is designed to meet that need. Students will gain hands-on experience with high-end products from Siemens, allowing them to work directly with industrial control equipment. Realistic examples are used to motivate students and help them develop the skills necessary to operate PLC-controlled systems, which are prevalent in our daily lives. This certification is derived from extensive industry based content to reflect the key topics and competencies building a foundation of PLC understanding.

Industry Recognized Certification Topics	Industry Recognized Certification Competencies

Industry Recognized Certification Topics

– Control relays
– Communication Protocols
– Programming techniques
– HMI Integration
– Networks
– Basic design and operation
– PLC sections: input, logic and output
– Input types: discrete, analog and digital
– Memory types: ROM and RAM
– Logic processing: addressing and scanning
– Output types: discrete, analog and digital
– Numbering systems: decimal, binary, octal, hex and ASCII
– Boolean functions: identity, AND/OR/NOT circuits
– Basic troubleshooting: using a PLC as a troubleshooting tool

Industry Recognized Certification Competencies

– Explain the operation and design of various relays
– State/explain the three PLC sections
– State/explain the three types of input devices
– State/explain the types of memory in a PLC
– Explain different types of PLC addressing
– State/explain the three types of output devices
– Convert different numbering systems used in a PLC
– Explain various Boolean gates/truth tables
– Demonstrate how to use a PLC for troubleshooting to resolve problems quicker
– Understand and apply communication protocols
– Integrate and configure HMI's
– Understand PLC Networks

Units - 6 / Labs - 5 / Projects - 1

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Level 2: Advanced Mechatronics
PLC Technology II: Allen Bradley or Siemens

FESTO

Estimated Duration: 16 hours

PLC II expands on the topics covered in PLC I and utilizes the same equipment. Students will go deeper into programming PLCs, incorporate HMI (Human Machine Interface) programming and modifying programs to include changes in the applications. This is a highly sought after skill in modern industry.

Industry Recognized Certification Topics

– Ladder Logic Programming
– Basic functions: operation and programming
– Program modifications
– Uploading and downloading programs to a PLC

– HMI (Human Machine Interface)
– Basic Networking
– Troubleshooting

Core Competencies

– Program a PLC using ladder logic
– Upload and download programs to/from a PLC
– Understand and program basic PLC functions
– Modify a current PLC program
– Program HMI Applications

– Understand and explain basic networking fundamentals

Equipment

Advanced PLC Training System

– Alen Bradley or Siemens PLC
– Siemens or Alen Bradley HMI
– Stratix 2000 industrial Ethernet switch
– 16 digital inputs
– 16 digital outputs
– 4 universal analog inputs
– 2 configurable analog outputs
– 3 high-speed counters
– 2 high-speed counter output points
– 2 NO push-buttons
– 2 NC push-buttons
– 4 toggle switches
– 2 potentiometers
– 8 indicator lamps
– Eight electric fault switches

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