



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Programmable Logic Controller Fault Finding And Repair Training

Manufacturing, Engineering and Technology / Engineering and Related Design

Unit Standard 116056 · NQF Level 4 · 10 Credits · 7 Days

COURSE OVERVIEW

This course equips learners with the skills to diagnose and repair faults in programmable logic controllers (PLCs) used in industrial automation. Participants will gain hands-on experience in systematic fault finding, component testing, and repair techniques to minimize downtime and enhance system reliability.

Category	Manufacturing, Engineering and Technology
Subfield	Engineering and Related Design
Unit Standard	116056
Accreditation	SAQA Accredited · NQF Level 4 · 10 Credits
Duration	7 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply systematic fault-finding methodologies to identify PLC hardware and software failures.
- Analyze PLC system schematics and program logic to isolate root causes of malfunctions.
- Demonstrate safe isolation and testing of PLC input/output modules and power supplies.
- Implement repair procedures including component replacement and firmware restoration.
- Evaluate system performance post-repair using diagnostic tools and trend analysis.
- Document fault-finding processes and repair actions for compliance and future reference.

WHO SHOULD ATTEND

- This course is designed for electrical technicians, maintenance engineers, and automation specialists who are responsible for PLC systems in manufacturing, processing, or utility environments.

COURSE OUTLINE

Day 1: Introduction to PLCs and Safety

- Overview of PLCs: history, applications, and advantages
- Safety procedures: lockout/tagout, PPE, and safe working practices
- PLC hardware: CPU, power supply, I/O modules, and communication ports
- Wiring fundamentals: sourcing vs sinking, and signal types
- Introduction to PLC programming languages (Ladder Logic basics)

Day 2: PLC Programming Fundamentals

- PLC scan cycle: input scan, program scan, output scan
- Memory types: I, Q, M, T, C
- Ladder logic elements: normally open/closed contacts, output coils
- Timers: TON, TOF, TP and counters: CTU, CTD
- Hands-on: creating a simple motor start/stop program

Day 3: Advanced Programming and Troubleshooting Techniques

- Data handling: MOV, ADD, SUB, MUL, DIV, and comparison instructions
- Program control: JMP, LBL, subroutines (SBR, RET)
- Troubleshooting methodology: observe, isolate, test, correct
- Forcing I/O and monitoring in real-time
- Common programming errors: incorrect addressing, missing logic

Day 4: Input/Output Devices and Field Wiring

- Discrete input devices: switches, sensors (inductive, capacitive, optical)
- Discrete output devices: relays, contactors, indicator lights
- Analog I/O: 4-20 mA, 0-10 V, and signal conditioning
- Wiring techniques: shielded cable, grounding, and noise reduction
- Practical exercise: wiring and testing a sensor and actuator circuit

Day 5: Communication Networks and Remote I/O

- Industrial protocols: EtherNet/IP, Profibus, Modbus RTU/TCP
- Network configuration: IP addresses, baud rate, node IDs
- Remote I/O: advantages and wiring considerations
- Diagnostic tools: network scanners, LEDs, and software
- Hands-on: setting up a simple network with a PLC and remote I/O

Day 6: Fault Finding and Repair Strategies

- Fault-finding methodology: symptoms, analysis, isolation, correction
- Common PLC faults: power issues, I/O failures, communication drops
- Using diagnostic features: error logs, fault registers, and watchdog timers
- Component replacement: handling ESD, firmware compatibility
- Documentation: log sheets, as-built drawings, and change management

Day 7: Practical Integration and Assessment

- Simulated plant scenario: multiple faults across hardware, software, and network
- Team-based troubleshooting and repair
- Time management and prioritisation under pressure
- Review of key concepts and Q&A;

- Summative assessment: practical fault-finding test and written exam

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **10 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 28,200.00	R 28,200.00
1	In-House	R 36,700.00	R 36,700.00
1	On-Campus (Pretoria)	R 42,300.00	R 42,300.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	11 Aug 2026	On-Campus	Johannesburg, South Africa
04 Aug 2026	12 Aug 2026	On-Campus	Mauritius
05 Aug 2026	13 Aug 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	14 Aug 2026	On-Campus	Dubai, UAE
07 Aug 2026	17 Aug 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	17 Aug 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	18 Aug 2026	On-Campus	Durban, South Africa
10 Aug 2026	18 Aug 2026	On-Campus	Mauritius

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 116056) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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