Electronic Systems Troubleshooting and Repair Training Course

4 – 8 July 2027
Johannesburg

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Ref: 946_172253 **Date:** 4 – 8 July 2027 **Location:** Johannesburg **Fees:** 6000 Euro

Overview

Electronic Systems Troubleshooting and Repair Training Course is a 1-week course for electronics engineers, maintenance technicians, instrumentation specialists, service engineers, and technical support professionals who leave with an Electronic Fault Isolation and Repair Evidence Portfolio. Participants connect safe measurement, functional decomposition, power-rail checks, signal tracing, analog and digital diagnosis, component testing, controlled board repair, and post-repair verification. The course replaces trial-and-error substitution with evidence-led fault isolation. Agile Leaders Training Center provides this course on electronic systems troubleshooting and repair.

Who Should Attend

- Teams responsible for diagnosing electronic equipment and assemblies.
- Functions responsible for instrumentation and control electronics maintenance.
- Service groups responsible for board-level fault isolation and repair decisions.
- Technical support teams responsible for reproducing intermittent failures.
- Quality functions responsible for repair evidence and return-to-service checks.

The course assumes participants can read circuit diagrams and use basic electrical measurements, and leaves out electronic product design and introductory soldering instruction.

Departments and Industries

The course supports electronic maintenance decisions across industrial systems and equipment-service environments.

- Industrial automation and process instrumentation
- Manufacturing and electronic assembly services
- Facilities, transport, and energy equipment maintenance
- Medical and laboratory equipment support
- Field service and technical repair centers

Learning Objectives

By the end of this course, participants will be able to:

- Analyze electronic systems through functional blocks and signal paths.
- Apply safe measurement plans to power, analog, and digital circuits.
- Diagnose static, dynamic, intermittent, and interface faults.
- Evaluate components and printed circuit assemblies using evidence.
- Use controlled rework and repair decision criteria.
- Build post-repair verification and fault documentation records.

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Course Agenda

Day 1: Fault Isolation Foundations

- Electronic System Functional Block Map
- Symptom Reproduction and Boundary Definition
- Expected-versus-Measured Evidence Table
- Fault Hypothesis and Elimination Tree
- Measurement Safety and ESD Control Checklist

Day 2: Power and Analog Diagnosis

- Power-Rail Sequence and Loading Test Plan
- Continuity and Resistance Isolation Method
- Analog Signal-Path Tracing Map
- Oscilloscope Probe and Trigger Selection Matrix
- Noise, Distortion, and Instability Evidence Sheet

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Day 3: Digital and Embedded Faults

- Digital Logic State and Timing Assessment
- Clock, Reset, and Boot Sequence Checklist
- Serial Interface Signal Verification Plan
- Intermittent Event Capture Strategy
- Firmware-versus-Hardware Isolation Record

Day 4: Components, Boards, and Repair

- In-Circuit and Out-of-Circuit Component Test Matrix
- Thermal and Visual Inspection Evidence Map
- IPC-7711/21D Repair Procedure Selection
- Pad, Track, Connector, and Solder-Joint Assessment
- Repair Risk and Authorization Decision Log

Day 5: Verification and Integrated Practice

- Suggested Exercise: Power-Rail Fault Isolation
- Suggested Exercise: Analog and Digital Signal Diagnosis
- Suggested Exercise: Intermittent Failure Capture
- Suggested Exercise: Repair and Return-to-Service Verification
- Capstone Exercise: Electronic Fault Isolation and Repair Evidence Portfolio

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Practical Exercises

The course uses suggested activities to integrate electronic troubleshooting and repair decisions.

- Suggested activity: convert a reported symptom into functional boundaries, hypotheses, and measurement points.
- Suggested activity: trace power, analog, and digital evidence to isolate a faulty stage or interface.
- Suggested activity: compare component, thermal, waveform, and inspection evidence before authorizing repair.
- Suggested activity: verify repaired function and document residual risks and return-to-service evidence.

FAQs

Who suits electronic systems troubleshooting and repair and what does it assume?

Electronics engineers, technicians, instrumentation specialists, service engineers, and support professionals suit the course. It assumes participants can read circuit diagrams and use basic measurements and excludes product design and introductory soldering.

How does electronic systems troubleshooting differ from general electrical maintenance?

Electronic systems troubleshooting follows component-level power, analog, digital, embedded, and signal evidence rather than concentrating on cables, motors, switchgear, and other power equipment.

How is an electronic fault isolated without replacing parts at random?

An electronic fault is isolated by reproducing the symptom, defining functional boundaries, predicting expected values, selecting test points, comparing measurements, and eliminating hypotheses before component removal.

Which instruments support electronic systems troubleshooting?

Electronic troubleshooting commonly uses digital multimeters, oscilloscopes, logic and interface observations, current-limited supplies, thermal inspection, and purpose-specific component tests selected for the fault hypothesis.

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How is an electronic repair verified?

An electronic repair is verified through inspection, continuity and isolation checks, controlled energization, functional tests, signal and thermal observations, repeated operating conditions, and documented acceptance evidence.

Conclusion

Participants take back an Electronic Fault Isolation and Repair Evidence Portfolio linking symptoms, functional blocks, measurements, hypotheses, repair decisions, and verification. The portfolio creates traceable evidence for technical review and return-to-service approval. It reduces repeated substitutions and improves coordination among maintenance, engineering, service, quality, and operations functions.