MERCURY

Electronics Troubleshooting and Repair Course

21 – 25 June 2027
Paris (France)



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Electronics Troubleshooting and Repair Course

Ref: 15310_256214 **Date:** 21 – 25 June 2027 **Location:** Paris (France) **Fees:** 6900 Euro

Introduction:

Electronic equipment can develop a wide variety of problems. Troubleshooting is making the problems disappear so that the equipment works as expected. This training provides an understanding of the electronics troubleshooting and repair process and demonstrates various electronic troubleshooting techniques. It addresses the calculation of fault currents in practical electrical power systems.

Short-circuit currents are associated with large amounts of very destructive energy. Therefore, calculations must be made to ensure that the short-circuit ratings of equipment are adequate to cater to these high currents. An accurate assessment of these currents is also essential for determining the settings of the system protection devices.

Understanding electronics troubleshooting and repair is essential for anyone involved in maintaining and repairing electronic devices. A comprehensive electronics troubleshooting and repair handbook is a vital resource, providing detailed instructions and practical advice. A basic electronics troubleshooting and repair guide for beginners offers an accessible entry point, covering fundamental concepts and joint issues.

Understanding Electronics Troubleshooting and Repair:

Electronics troubleshooting and repair involve a systematic approach to diagnosing and fixing electronic malfunctions. A training course equips individuals with the knowledge and skills to identify problems and implement solutions effectively. Practical electronics troubleshooting techniques are critical in resolving a wide range of issues, from simple to complex.

A structured electronics repair course is invaluable for those learning electronics repair. Such courses typically include hands-on training with essential electronics repair tools and equipment. Additionally, an electronics repair guide can be a helpful reference, providing step-by-step instructions for everyday repair tasks.

Basic electronics repair training lays the foundation for more advanced troubleshooting and repair work. Understanding how to use various electronic repair tools and equipment is crucial for effective repairs. By mastering the fundamentals of electronics troubleshooting and repair, individuals can confidently tackle various electronic issues, ensuring devices function optimally.

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Targeted Groups:

- Electricians.
- Design electrical engineers.
- Electrical supervisors.
- Plant electricians.
- Operations and maintenance engineers, supervisors, and technicians.
- Maintenance technicians.

Course Objectives:

At the end of this electronics troubleshooting and repair course, the participants will be able to:

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- Know the importance of safety precautions when dealing with AC and DC electronic circuits.
- An analog/digital multimeter is used to measure voltage, current, resistance, and continuity for troubleshooting purposes.
- Differentiate between AC and DC circuits.
- Remove and solder electronic components from and onto PCB boards.
- Protect PCB boards from moisture, water, and vibration.
- Use the proper chemical sprays to clean PCBs.
- Understand how electronic components work with the help of diagrammatic explanations.
- Calculate the code value of resistors, potentiometers, and capacitors.
- Identify and test most of the essential electronic components so that troubleshooting work can be performed on electronic equipment.
- Read semiconductor substitution manual books and find the best replacement parts from search engines.
- Understand Semiconductor Part Numbers and Datasheet specifications.
- Read basic electronic schematic diagrams of typical equipment.
- Enhance their testing and soldering skills.
- Know where to buy electronic parts locally and internationally.
- See the functions of specialized test equipment ESR and Ring Tester in checking different electronic components.
- Understand the importance of Pure Copper Grounding cables.
- Analyze a DC circuit board to determine how significantly a harmful component can impact the circuit's function.
- Troubleshoot a given circuit board with fundamentally destructive components.
- Understand ways to improve their electronics repair skills.
- Develop a technical mindset and know-how, think independently how to fix technical issues and find solutions, and handle technical work without much supervision.
- Read circuit Schematic Diagrams.
- Understand why a power supply will have decreasing/increasing unstable output voltage and power blink problems when you turn it on.
- Understand why the output measures are suitable, but the power supply immediately shuts down when the load is connected.
- Start troubleshooting a power supply with no blown parts.
- To isolate power supply problems, use a DC ammeter, light bulb, and Flickering method to speed up the repair process.
- Use a Digital/Analog Oscilloscope to perform critical waveform checking on mainboards with power on, if available.
- Use a simple EEPROM/Flash ROM Programmer Copier to copy EEPROM/Flash ROM data for troubleshooting.
- Use a Rework Station to extract and solder SMD/Spider ICs on the circuit board.
- Trace shorted components in the mainboard with the help of a DC Power Supply.
- Locate components that will burn or short circuit using a heat checker device.

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Targeted Competencies:

Upon the end of this electronics troubleshooting and repair training, the target competencies will:

- Identify causes of electrical faults.
- Recognition of unsymmetrical faults in transformers.
- Partial discharge phenomena and how to apply the required analysis.
- Representation of unsymmetrical faults in a power system.
- Simulation for protection relay configuration.

Course Content:

Unit 1: Introduction to Troubleshooting:

- Troubleshooting Basics.
- Common Troubleshooting Techniques.
- Gaining Circuit Familiarity.
- Getting Prepared for Troubleshooting.

Unit 2: Failure Analysis and Prevention in Electronic Circuits:

- Failure Symptoms.
- Failure Causes.
- Failure Types.
- Some Useful Terms in Failure.

Unit 3: Device Troubleshooting:

- Tools for Servicing.
- Test and measure instruments.
- Safety Issues to Test and Tagging of Portable Electrical Equipment.
- Testing of Passive Components.
- Testing of Semiconductor Devices.
- Learn how to test bipolar Transistors.
- Testing Other Active Components.
- Testing Diodes, Transistors, and In-circuit Semiconductors Using Oscilloscopes.
- Switches.
- Safety Issues for Plugs, Sockets, and Portable Appliances.

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Unit 4: Troubleshooting Digital Systems:

- Moving from Analog to Digital.
- Moving into the Digital Circuits.
- Typical Faults in Digital Systems.
- Digital Circuit Troubleshooters.
- Digital Integrated Circuits.
- Programmable Logic Device PLD and Memory Definitions.
- Precautions.

Unit 5: Power Supply and Subsystems Troubleshooting:

- Power Supply.
- Regulators.
- Switched Mode Power Supplies SMPS.
- Oscillators.
- Amplifiers.
- Troubleshooting Microprocessor-Based Systems.

Unit 6: Phenomenal Troubleshooting:

- Noise.
- Intermittent.
- Sources of Interference.
- Static Discharge.
- EMI/EMC and its Sources.

Unit 7: Maintenance and Safety Aspects:

- Aims of Maintenance.
- Advantages of Preventive Maintenance.
- Importance of Sound Maintenance Management.
- Know the Maintenance Policy.
- Maintenance Organization.
- Maintenance Manuals.
- Safety Aspects.