



TROUBLESHOOTING SKILLS  
FOR THE WORKPLACE

## TEACH ELECTRICAL TROUBLESHOOTING SKILLS THAT THE INDUSTRY DEMANDS

From apprentices and students to veteran trades professionals, Simutech's complete simulation-based training system provides the hands-on training and real-time evaluations necessary to develop effective troubleshooting skills.

**SIMUTECH**  
A TPC COMPANY  **MULTIMEDIA**

## BREAKINGDOWN TABLE CONTENT BY MODULE

| MODULE                                | LAB EXERCISES   | PRACTICE EXERCISES | GUIDED FAULTS | PRACTICE FAULTS | SKILL TEST FAULTS | EXTRA FAULTS | GENIUS FAULTS | ESTIMATED TIME |
|---------------------------------------|---|--------------------|---------------|-----------------|-------------------|--------------|---------------|----------------|
| Troubleshooting Electrical Circuits   | 6   | 4                  | 2             | 4               | 12                | 8            | 4             | 6-12 hrs       |
| Troubleshooting Control Circuits      | 2   | 6                  | 3             | 6               | 18                | 16           | 4             | 8-12 hrs       |
| Troubleshooting Motor Circuits        | 5   | 6                  | 3             | 6               | 18                | 16           | 4             | 10-15 hrs      |
| Troubleshooting PLC Circuits          | 13  | 6                  | 5             | 6               | 18                | 24           | 8             | 10-22 hrs      |
| Troubleshooting Industrial Controls   | N/A   | N/A                | 3             | 6               | 18                | 16           | 8             | 14-22 hrs      |
| Troubleshooting Industrial Controls 2 | N/A   | N/A                | 3             | 6               | 18                | 16           | 8             | 8-15 hrs       |
| Troubleshooting Industrial Sensors    | Explores Simutech's Advanced Green House Simulation utilizing analog sensors for temperature, humidity and light control. |                    |               |                 |                   |              |               | 5-8 hrs        |

## OVERVIEW

### TROUBLESHOOTING ELECTRICAL CIRCUITS

Students will receive hands-on training on several electrical circuit simulations. It will cover troubleshooting techniques, preparing them to diagnose a variety of problems on the main lighting circuit simulation. It contains common components including fuses, pushbuttons, switches, relays, and lights.

### TROUBLESHOOTING CONTROL CIRCUITS

Learners will encounter a range of malfunctions found in typical control circuits containing components including relays, transformers, switches, and solenoids. It contains two unique control circuit simulations, including an electric door lock simulation.

### TROUBLESHOOTING MOTOR CIRCUITS

The multiple motor lab simulations and the industrial garage door simulation included in this module contain components such as three-phase motors, transformers, contactors, overloads, fuses, and limit switches. Students will troubleshoot three-phase power circuits and the control portion of these motor circuits.

### TROUBLESHOOTING PLC CIRCUITS

This module allows students to learn the basics of Programmable Logic Controller operation and applications, it includes several circuit simulations containing generic PLCs with digital inputs and outputs. Provides a wide variety of faults specific to PLCs.

### TROUBLESHOOTING INDUSTRIAL CONTROLS

Students will troubleshoot complex malfunctions on this simulation of an industrial process for mixing and processing fluids. The system uses a three-phase, 480 volt supply and contains a variety of industrial components such as pumps, agitators, heaters, temperature and float switches, relays, and timers.

### TROUBLESHOOTING INDUSTRIAL CONTROLS 2

This simulation utilizes PLC controls on an industrial fluid processing system. Students will disconnect wires, take meter readings, and connect a virtual laptop computer to compare readings and settings against schematics for twenty different programs. Examining pumps, motors, transformers, overloads and contactors learners will build skills to troubleshoot complex industrial control system.

### TROUBLESHOOTING INDUSTRIAL SENSORS

This section will help students to develop problem-solving skills required in a wide variety of industrial applications. The focus of this module is on analog PLC inputs with 4-20 mA loop circuits. It also covers a number of sensors used in a variety of industrial processes for maintaining environmental factors such as temperature, light, and humidity.