FPS 3000 Troubleshooting Simulator

Bring Hands-on Troubleshooting into your lab or workplace with this Industrial Control System Simulator.

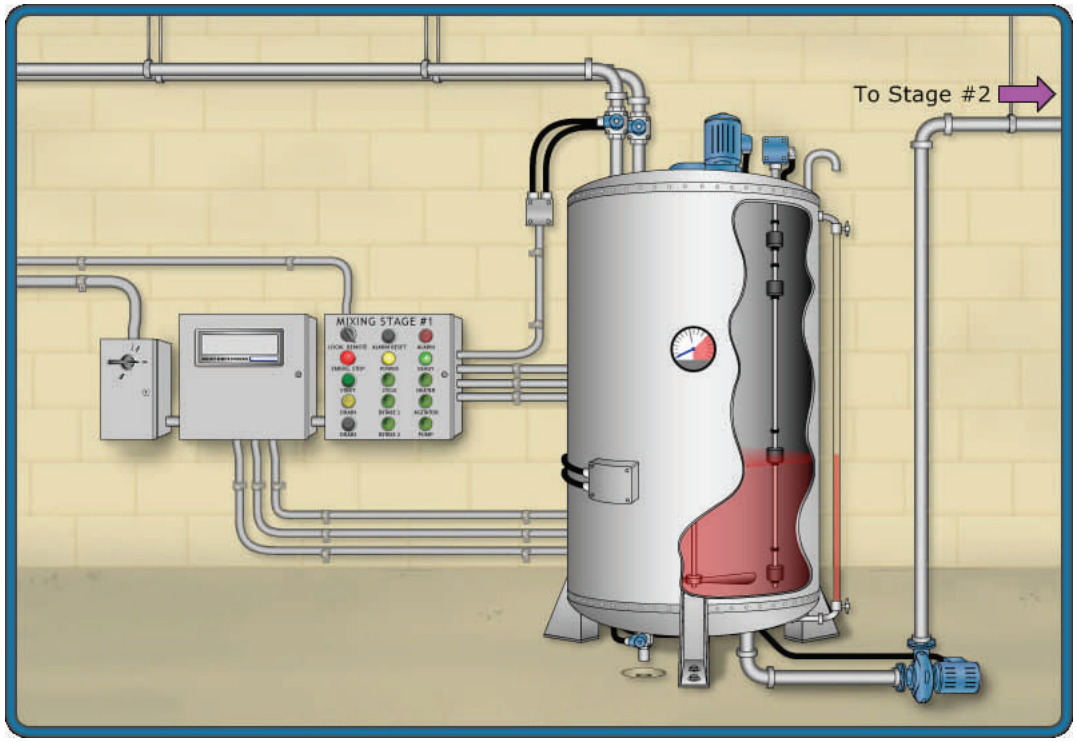
- Troubleshoot actual faults on this control system simulation
- Enforces safe work practices while Troubleshooting
- Shows new techniques and processes for solving faults
- Over 30 challenging faults to solve
- Evaluates troubleshooting skills
- Provides feedback on troubleshooting steps
- Instructor resources are available

Who is it for?

This advanced troubleshooting program is designed for students and electrical/ maintenance personnel who already have a good understanding of electrical systems. It is ideally suited for use:

- In organizations who wish to improve the troubleshooting skills of their electrical and maintenance personnel.
- In advanced electrical courses and programs providing experience with complex systems.

Industrial Control Simulation of a Fluid Processing System



Builds skills required to troubleshoot Industrial Control Systems

About this Simulation

This is a realistic simulation of an industrial process for mixing and processing liquids. The simulated system uses 480 volts AC 3 phase for its power portion consisting of:

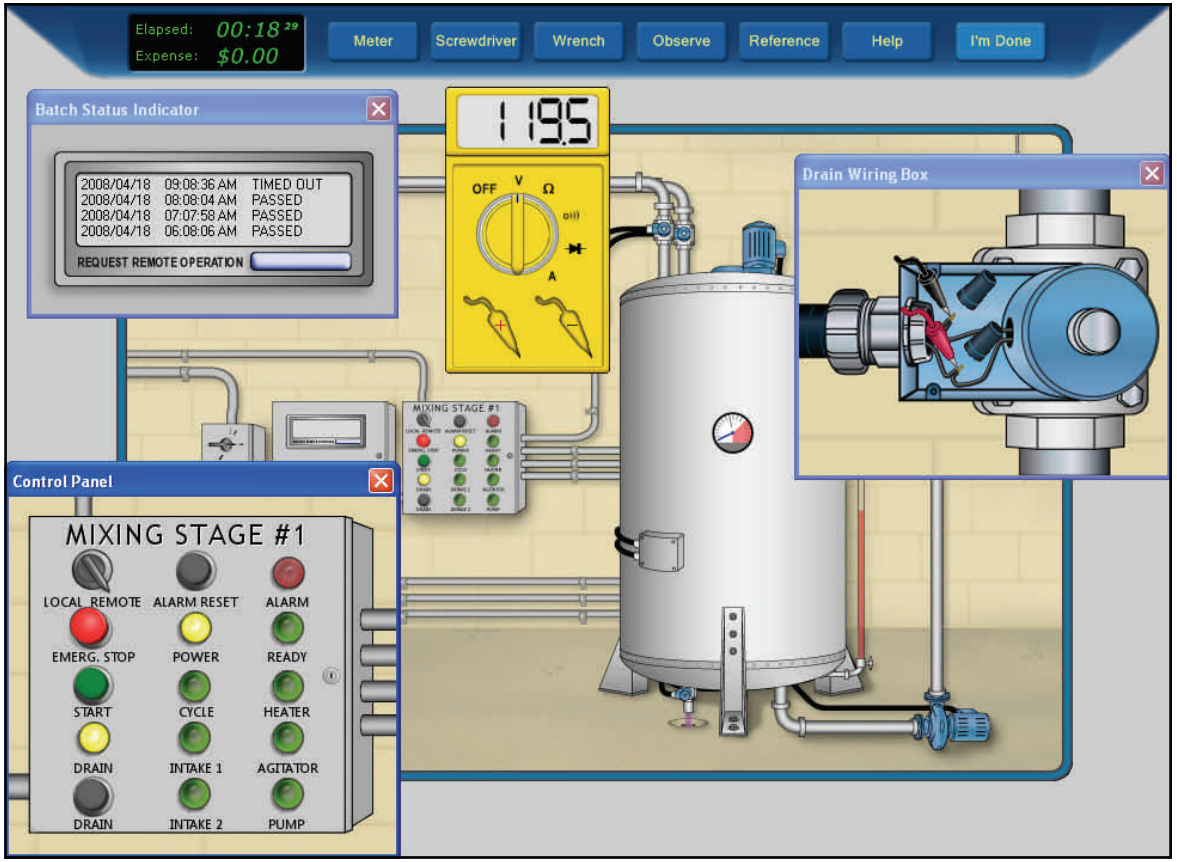
- Pump, Agitator, Heaters
- Motors, Transformers
- Contactors, Overloads

The control portion of the system consists of a variety of components typically found in industrial control systems such as:

- Temperature, Float, & Selector Switches
- Relays, Timers, Pushbuttons
- Solenoid Valves, Fuses, Indicators,
- Wiring, Terminal Blocks, Wire Connectors

This Troubleshooting simulator has over 30 built in faults to solve These faults simulate both electrical and mechanical failures. Users can interact with the simulation just like a real system. They can:

- Operate the system remotely or locally
- Take Voltage, Resistance and Current measurements with a multimeter
- Inspect, Repair and Replace components
- Disconnect and ring out wires.



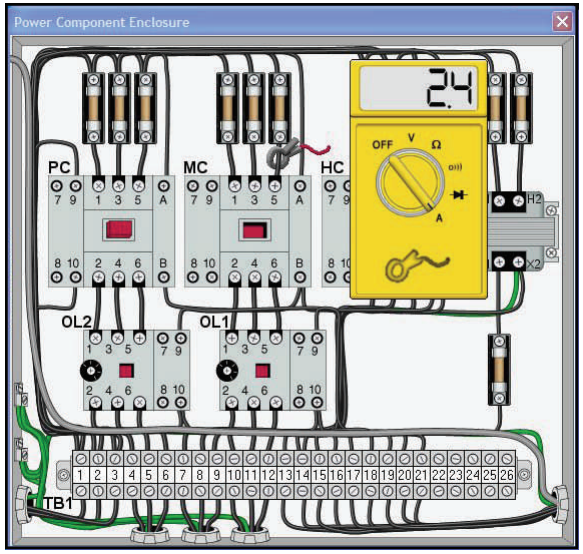
Main simulator window showing zoomed-in views of some of the system components

This simulator is built with a tracking system designed to monitor and evaluate all the activities performed by a user. This information is used to provide feedback to the user as they troubleshoot system faults. It is also used to evaluate their process and identify areas for improvement. Instructors can use this analysis to effectively focus the assistance required by the user.

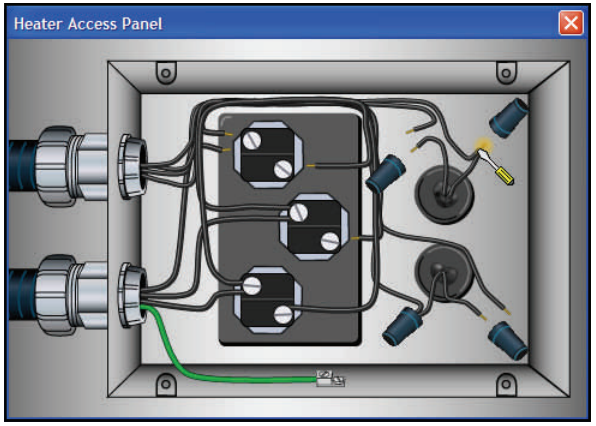
Simulation Features

This simulation is realistic and accurate. It has many features that make it an excellent tool for developing troubleshooting skills.

- This simulation is lifelike, having the tools normally used to troubleshoot equipment such as this. Taking meter readings, removing wires, inspecting and replacing components are all standard features.
- It is modeled on real equipment. The behavior of the system and components are accurate under normal and faulty conditions and even when wires are disconnected.
- Equipment models are accurate. The readings taken in the simulation are virtually the same as readings taken on real equipment.

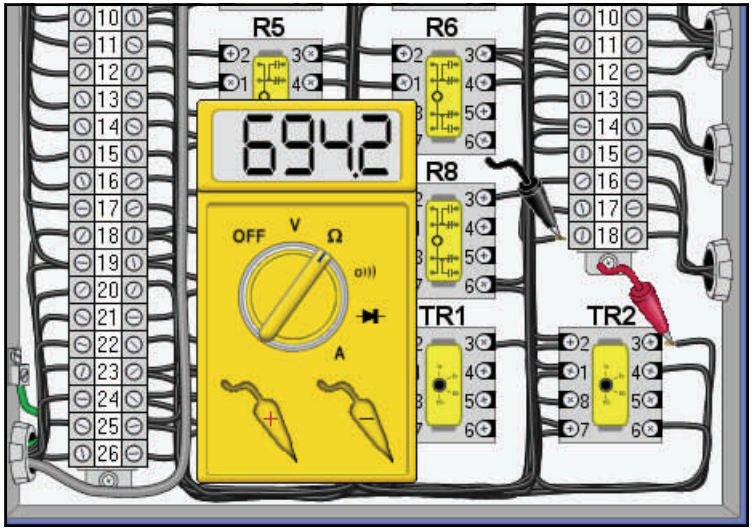


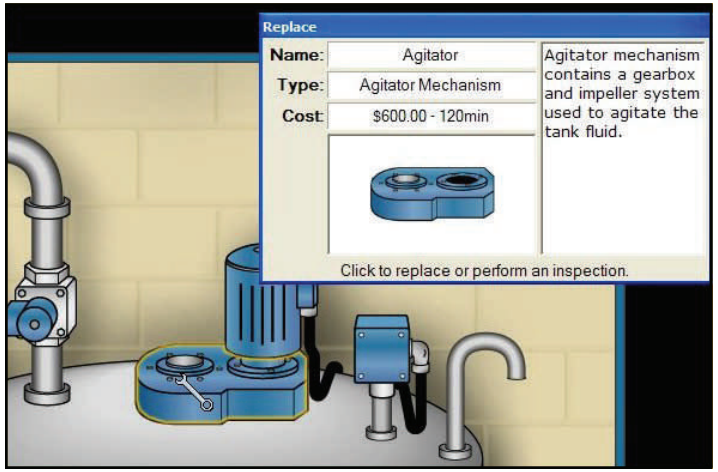
Taking current readings in the Power Circuit



Disconnecting multiple wires in the Heater Access Panel

Taking resistance readings in the Control Panel





Using the wrench tool to inspect, repair or replace components

Troubleshooting the System

This simulation contains many types of defects designed to give the user practice on a wide range of potential problems. Typical types of failures are:

- Opens in components or wiring
- Shorts in components or wiring
- Defects in component mechanisms
- Overloaded and defective 3 phase motors and protective equipment
- Opens and shorts in 3 phase circuits
- Defective mechanical components

Faults are organized by difficulty level (Basic, Intermediate and Advanced). Each level has three types of faults: Guided, Practice, and Skill Test.

- **Guided faults** have a series of screens that coaches the user through the process of solving the fault in an effective and efficient manner. This is a great place for learning tips and techniques for solving faults.
- **Practice faults** provide hints before starting the fault and feedback once the fault has been attempted (available only in Industrial Edition).
- **Skill Test faults** have no assistance. These faults are evaluated and affect the user's overall Skill Rating.

Safety Error Message

Monitoring and Feedback

As faults are attempted, the program monitors each step from a safety perspective. Unsafe steps that could cause personal injury, break a safety rule, or break safe work practices, cause feedback to be provided in the form of an error message.

The testing procedures used are also monitored, providing tips or warnings as necessary.

Fault Selection Screen (Industrial Edition)

Evaluating Skill

The program evaluates a user's troubleshooting skill on each fault attempt as well as provides an Overall Program Summary Evaluation.

Fault Evaluation

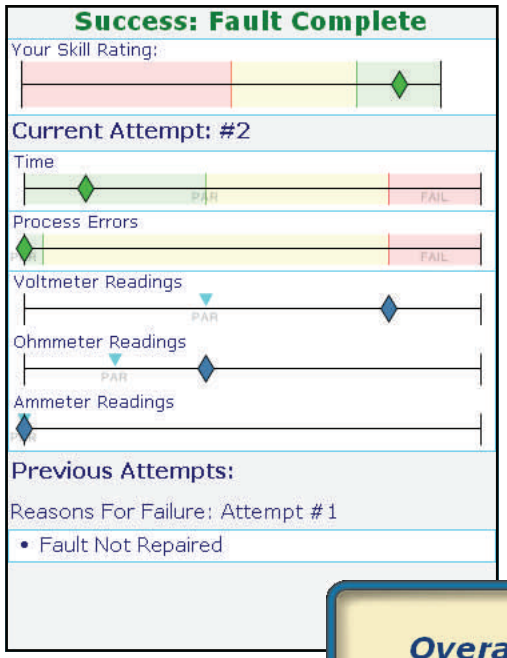
Each attempt to solve and repair a fault is evaluated based on standard set of criteria.

Successful Fault Completion Criteria:

- Fault must be correctly repaired
- No safety errors occurred
- No components unnecessarily replaced
- Fault repaired within time allowed
- Fault repaired within allowed troubleshooting process rating

If the criteria are not met, the fault is marked incomplete and the fault will have to be attempted again. The reasons for failure will be displayed.

If the criteria are met, the fault is marked complete and a rating is shown for the attempt. The Skill Rating takes into account the results of the current attempt plus the results of any previous attempt.

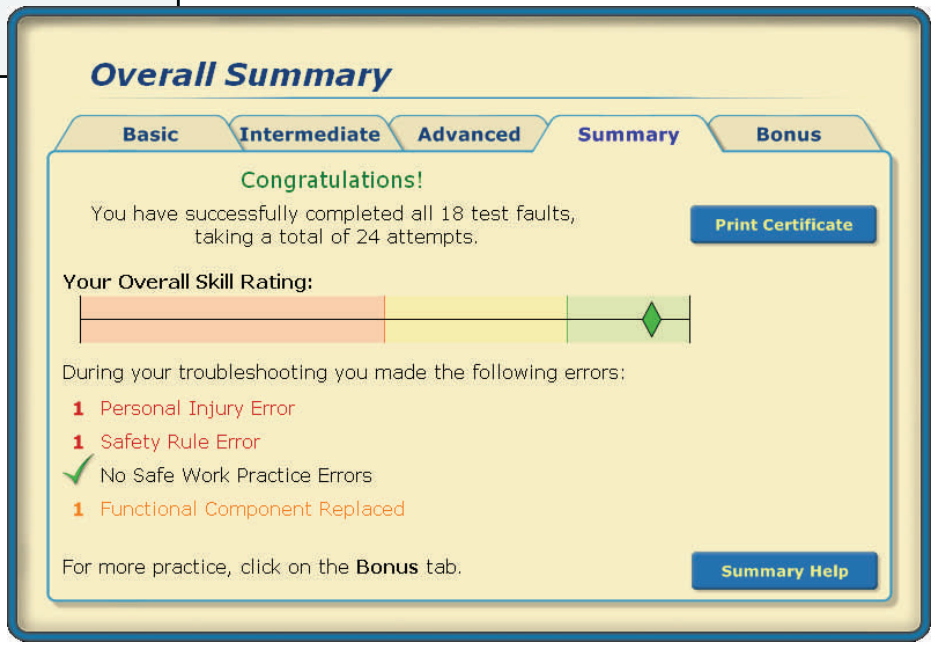


Overall Summary

When completed, the program summarizes all the user's results and provides an overall summary of their results.

The Skill Rating takes into account the difficulty of each fault completed. The more difficult a fault the more it impacts the Skill Rating.

Also shown in this summary is a list of the major errors. This information is important in determining areas for improvement. (Industrial Edition only)

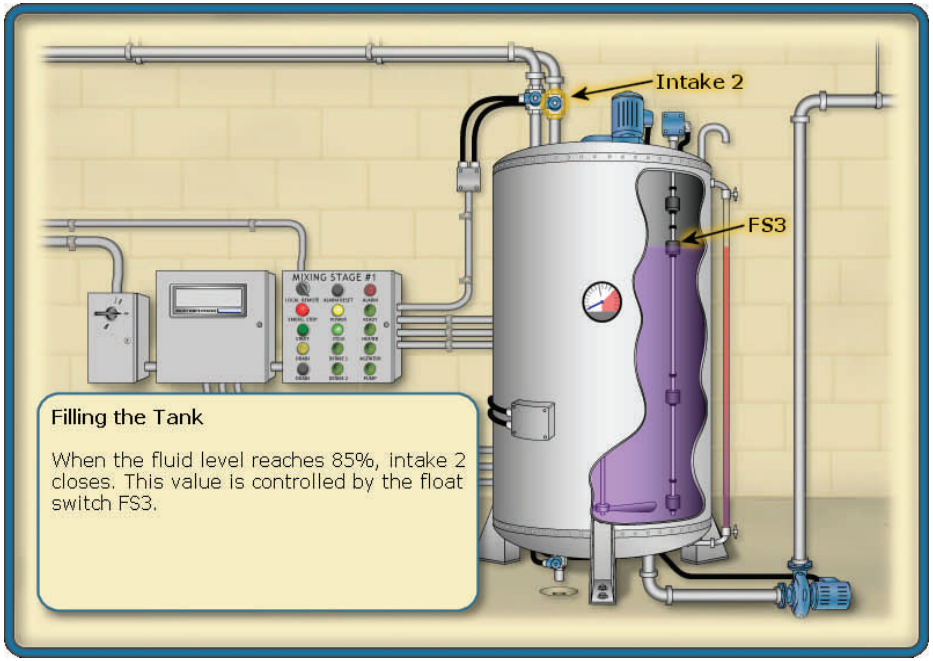


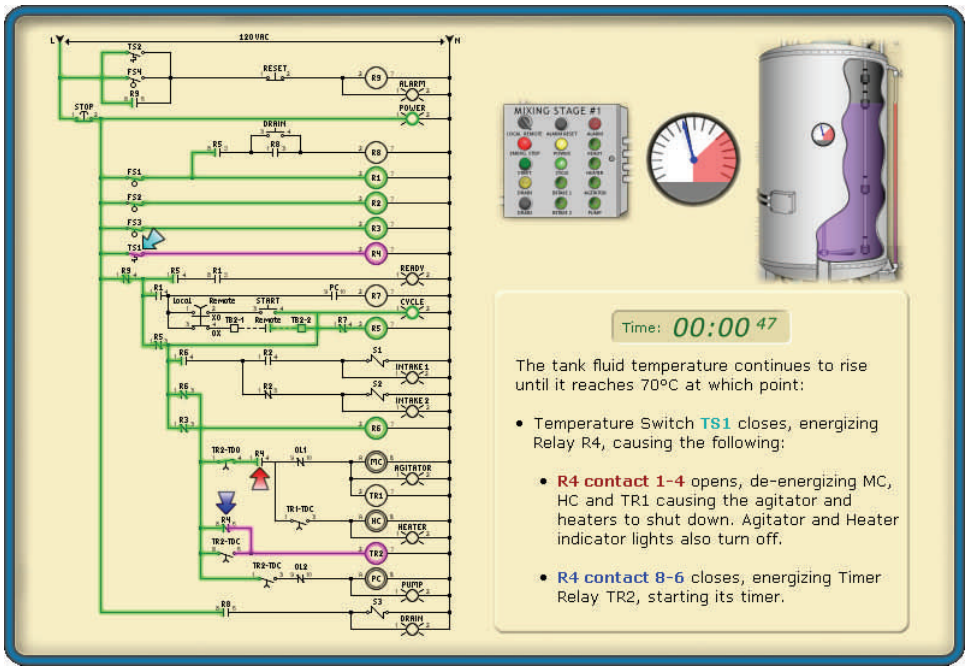
Overall Summary Screen from Industrial Edition

Learning How it Works

This program contains sections devoted to learning how the system works.

The image below is a screen shot of a page from the System Overview section. This and 13 other screens show how the process works and points out components that affect the operation of the system at key points in the process.





A detailed step by step sequence shows the operation of all electrical components in the system.

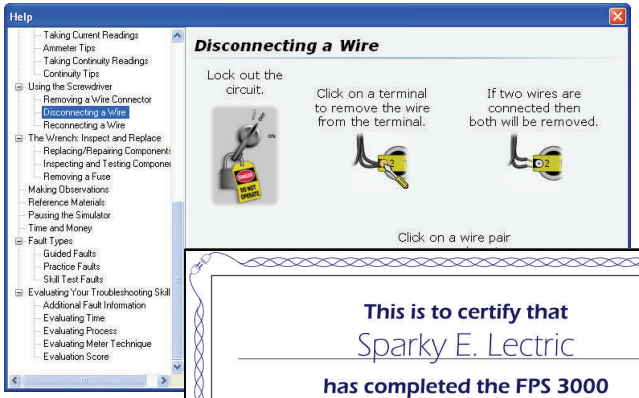
The image shown above is one of a series of 17 screens that explains step by step the system function from the moment the system receives a start signal to the end of the cycle. This is done through the use of the main schematic diagram and images of the key system indicators.

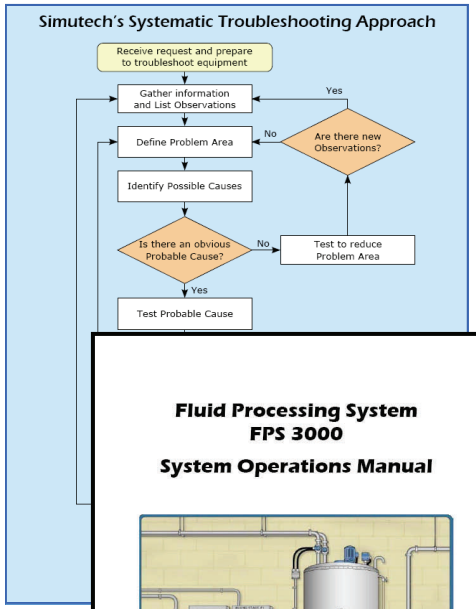
For each step of the process, live portions of the circuit are highlighted with newly energized sections shown in a different color. As relays become energized, they, and their corresponding contacts, are also highlighted.

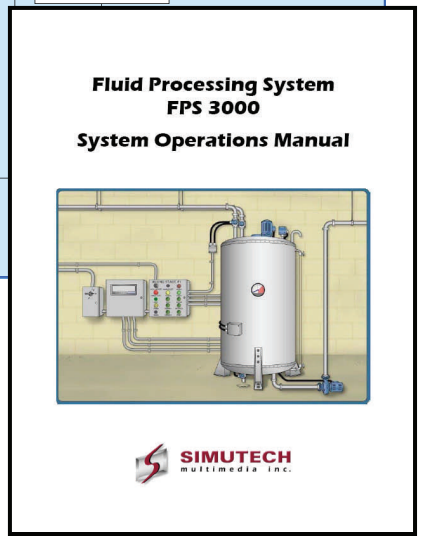
Resources

The program contains several resources to help understand the troubleshooting process and troubleshoot the system including:

- System Operations Manual
- Schematics and diagrams of system
- Help System
- Troubleshooting Flow Chart & Worksheets
- Instructor Resources consisting of Admin program, Instructor notes for using program, Reports, and Certificates of Completion (available with Industrial Edition only)







e

Available Editions

The **Personal Edition** is licensed for personal use. It allows the program to be installed on one computer and may only be used by the individual for whom the license has been purchased. This edition is typically purchased by students, apprentices, tradespersons, etc. wishing to learn or upgrade their troubleshooting skills.

The **Workbench Edition** provides evaluation and feedback for each fault attempt. It is suitable for situations where developing troubleshooting skills and providing practice is more important than the documentation of results. This edition does not include reporting or other instructor resources.

The **Industrial Edition** includes all the features of the workbench edition plus an additional 20 faults, instructor resources and a more detailed evaluation system. Documentation of results, individual and group reporting, and certificates for successful completion make this edition suitable for use in formal training programs.