SIMULATION SOFTWARE FOR HVACR TRAINING
Simutech—the leader in “hands-on” HVAC/R service training software—offers a wide array of computer-based simulators for Heating, Ventilation, Air Conditioning, and Refrigeration. Simutech simulators use animated graphics and sophisticated computer-modeling to emulate faults in HVAC R systems. The simulators allow the trainee to measure various mechanical and electrical values to determine the cause of the fault, then perform repairs to return the system to normal operation.

Computer simulation has been proven to be the ideal method of training students and technicians in the servicing of HVACR equipment. A trainee can quickly learn operating characteristics, and proper troubleshooting and repair methods for faults commonly encountered during service calls. Simulators are also useful when studying for technician certification exams, including NATE and ICE.

All levels of users – from the entry-level student to the most seasoned technician – will greatly benefit by using Simutech “hands-on” simulators. That’s why our simulators are used extensively by vocational schools, colleges, trade unions, correctional institutions, contractors, and facilities, worldwide! The simulators are easy to use, even for novice computer users!

Instructors quickly discover that Simutech simulators are invaluable tools in teaching HVACR troubleshooting and theory-of-operation. Prior to their hands-on exposure to the real equipment, students learn proper troubleshooting and repair methods, refrigerant handling, safety practices, and use of test equipment. Plus, simulators provide training at a fraction of the cost of purchasing and maintaining mechanical HVACR equipment and facilities! Besides the cost factor, computer-based training has been proven to greatly enhance the retention level and interest of students! Simutech simulators meet the accreditation standards of PAHRA and HVAC Excellence.

Service technicians can use the simulators to improve their troubleshooting skills, or cross-train on different types of equipment. Training can be scheduled at any time, and with minimal supervision. Simulators are a great alternative to costly and time-consuming training seminars!

Employers find Simutech simulators to be useful in testing and evaluating technicians during the hiring process. Poorly skilled technicians or “part swappers” are easily identified, simply by reviewing the repair logs and other reports that are automatically generated by the software.

You’ll find Simutech simulators are easy to use, even for novice computer users! The software runs on any Windows based PC, tablet, iPad, or mobile device.
TABLE OF CONTENTS

General Information .......................... 3
Geothermal Heat Pump Simulator ............. 4
SIMUGEo™ for Windows ......................... 4
Air Conditioner Simulator ....................... 6
SIMUAIR™ for Windows ........................ 6
Heat Pump Simulator ............................ 8
SIMUPUMP™ for Windows ....................... 8
Gas Furnace Simulator ........................... 10
SIMUGAS™ for Windows ......................... 10
Oil Furnace Simulator ............................ 12
SIMUOIL™ for Windows ........................ 12
Hot Water Boiler Simulator ..................... 14
SIMUHYDRO™ for Windows ..................... 14
Commercial Refrigeration Simulator .......... 16
SIMUREFR™ for Windows ....................... 16
Supermarket Refrigeration Simulator ........ 18
SIMUMKT™ for Windows ....................... 18
Ordering Information ............................ 20
REALISTIC SIMULATION
Simutech training simulators are designed to represent generic HVAC systems that a service technician would commonly encounter in the field. Extremely accurate and realistic pressures, temperatures, and electrical values are maintained during the system’s operation, under both normal and fault conditions.

FAULT INSERTION
Up to 40 commonly encountered mechanical and electrical faults may be preselected by the instructor or randomly selected by the computer. Once a fault is inserted, the simulator will operate according to predetermined fault conditions.

INSTRUMENTATION
Realistic and accurate instrument readings can be taken at numerous locations throughout the simulated system. These readings correspond to the simulator’s current operating state and fault condition. They include pressure, temperature, voltage, current, resistance, and combustion components.

DIAGNOSTIC CHARTS
After taking readings with the test instruments, the trainee can refer to on-screen diagnostic charts to isolate the “faulty” component and repair the system. On-screen test procedures provide proper industry-standard methods to check a suspect component, and provide typical instrument readings.

INSTRUCTOR REPORTS
To monitor the performance of each trainee, Activity Reports, Fault Status Reports, Instrument Logs, and Repair Logs are generated for the instructor. Each user’s log-on time, troubleshooting time, fault insertions, instrument usage, and repair attempts are tracked and permanently stored in the database. The Repair Log lists all repairs and parts replacements made by a user during a fault insertion. This provides the instructor an excellent means of evaluating the users’ troubleshooting skills.

EXTENSIVE HELP MENUS & MANUALS
Context-sensitive help menus guide the trainee and instructor at every step and command. Even a computer-novice can easily use Simutech simulators! In addition, both a comprehensive printed User’s Manual and Instructor’s Manual are included.

NETWORKABLE
The simulators may be installed on most local-area network (LAN) servers. Network licenses must be purchased for the maximum users that will be logged-on simultaneously.

MULTI-USER CAPABILITY
Up to 99 users can be assigned per stand-alone computer or network. Repair logs, fault selections, and other data is saved for each user on the hard drive of each workstation or server.

ONLINE USE
Network-licensed simulators can be accessed from a tablet, iPad, or compatible mobile device, using a server configured for a remote access environment and Windows Remote Desktop™. If this is not available, then Simutech can provide a cloud-based portal for these devices. Contact Simutech Technical Support for additional information.
SIMUGEOTM simulates a generic water-to-air geothermal heat pump (GHP) that uses R-410A refrigerant. Both closed-loop and open-loop ground-source installations can be simulated, including vertical and horizontal ground loops, and a water well system. SIMUGEOTM includes a desuperheater for domestic hot water and an electric auxiliary-heat unit. An ECM blower motor, 2-stage scroll compressor, and electronic modules are simulated. Environmental temperatures are adjustable, and heating and cooling capacities are continuously displayed. Set points for the thermostat, pressure controls, and TXV are also adjustable. With the capability of changing operating temperatures and other parameters, a geothermal heat pump may be observed operating under various environmental conditions; something very difficult to do with real mechanical systems.
Up to 40 commonly encountered mechanical and electrical faults may be selected, as shown in the Fault Lists above.

SIMUGEo provides troubleshooting of the devices listed below, which are commonly found in geothermal heat pumps. An animated mechanical diagram and three electrical schematic diagrams of the simulated geothermal heat pump are provided in “real-time”. The mechanical diagram shows refrigerant and water flow, as well as the liquid, liquid/vapor, and superheated vapor states of the refrigerant. In the four electrical ladder diagrams, the controls and switch contacts constantly change state as the system operates. Providing a means of visually tracing refrigerant, water, and current flow during operation, makes it much easier for the trainee to understand how a geothermal heat pump is supposed to work. Pressure-temperature charts, performance charts, specifications, and nomenclature are available on-screen. In addition, the trainee can “zoom” into the system to visually inspect various components, including the indoor coil, and a dirty air filter.

SIMUGEo provides easy-to-use “point-and-click” selection of meters and test points, and are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig) or metric (kPa/barg). The on-screen test instruments include:

- Gauge manifold set
- Voltmeter
- Thermometer
- Ohmmeter
- Pressure gauge
- Ammeter
- Leak detector
- Capacitance meter

SYSTEM REQUIREMENTS

SIMUGEo requires the following minimum IBM compatible computer:

- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, and 10
- Hard drive, 21MB available disk space

SIMUGEo network version is compatible with Novell and Windows Server 2003, Server 2008, and Server 2012

ORDERING INFORMATION

SIMUGEo™ Geothermal Heat Pump Simulator

<table>
<thead>
<tr>
<th>Standalone Licenses</th>
<th>1 computer license</th>
<th>$895.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG-500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MG-505</td>
<td>5 computer licenses</td>
<td>$1,595.00</td>
</tr>
<tr>
<td>MG-511</td>
<td>10 computer licenses</td>
<td>$1,995.00</td>
</tr>
<tr>
<td>MG-515</td>
<td>15 computer licenses</td>
<td>$2,295.00</td>
</tr>
<tr>
<td>MG-520</td>
<td>20 computer licenses</td>
<td>$2,595.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network Licenses</th>
<th>10 seats</th>
<th>$1,895.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG-540</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MG-560</td>
<td>25 seats</td>
<td>$2,095.00</td>
</tr>
<tr>
<td>MG-570</td>
<td>50 seats</td>
<td>$2,895.00</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
The trainee can “zoom” into the system to visually inspect various components, including dirt or ice on coils, and a dirty air filter. He can also “listen” to the compressor running.

**SIMUAIR** provides easy-to-use “point-and-click” selection of meters and test points, and are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig) or metric.

**SIMUAIR** simulates two generic versions of residential and light-commercial air conditioning systems, using either R-22 or R-410A refrigerant. These systems include a packaged unit with a capillary tube and PSC motor circuit, and a split-system with a thermostatic expansion valve and CSR motor circuit.

Animated mechanical and electrical schematic diagrams of the simulated system are provided in “real-time”. The **mechanical diagram** shows refrigerant flow, as well as the liquid, vapor, liquid/vapor, and superheated vapor states of the refrigerant. In the **electrical ladder diagram**, the controls and switch contacts constantly change state as the system operates. Providing a means of visually tracing refrigerant and current flow during operation, makes it much easier for the trainee to understand how an air conditioner is supposed to work.

Indoor and ambient temperatures, and relative humidity are adjustable and continuously updated and displayed on the screen. Settings for thermostat setpoint, limit switches, TXV, circuit breakers, and other controls may be changed by the trainee. With the capability of changing operating temperatures and relative humidity, a system may be observed under various environmental conditions; something very difficult to do with real mechanical equipment.

Pressure-temperature charts, performance charts, specifications, and an electrical nomenclature, are available on-screen.
The on-screen test instruments include:

- Gauge manifold set
- Voltmeter
- Thermometers
- Ohmmeter
- Leak detector
- Clamp-on ammeter

Up to 20 commonly encountered mechanical and electrical faults may be selected, as shown in the Fault List above.

**SYSTEM REQUIREMENTS**

**SIMUAIR** requires the following minimum IBM compatible computer:

- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, or 8, 8.1, 10
- Hard drive, 18MB available disk space

**SIMUAIR** network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

**ORDERING INFORMATION**

**SIMUAIR™ Air Conditioner Simulator**

**Standalone Licenses**

<table>
<thead>
<tr>
<th>License Code</th>
<th>Quantity</th>
<th>License Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA-500</td>
<td>1</td>
<td>$595.00</td>
</tr>
<tr>
<td>MA-505</td>
<td>5</td>
<td>$1,195.00</td>
</tr>
<tr>
<td>MA-511</td>
<td>10</td>
<td>$1,595.00</td>
</tr>
<tr>
<td>MA-515</td>
<td>15</td>
<td>$1,895.00</td>
</tr>
<tr>
<td>MA-520</td>
<td>20</td>
<td>$2,195.00</td>
</tr>
</tbody>
</table>

**Network Licenses**

<table>
<thead>
<tr>
<th>License Code</th>
<th>Quantity</th>
<th>License Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA-540</td>
<td>10 seats</td>
<td>$1,495.00</td>
</tr>
<tr>
<td>MA-560</td>
<td>25 seats</td>
<td>$1,795.00</td>
</tr>
<tr>
<td>MA-570</td>
<td>50 seats</td>
<td>$2,595.00</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
**SIMUPUMP™** simulates a generic residential/light-commercial type air-to-air split-system heat pump, using either R-22 or R-410A refrigerant. The trainee may select heating, cooling, or emergency heat modes. Indoor and outdoor temperatures are adjustable, and continuously updated and displayed on the screen. Settings for thermostats, TXVs, defrost frequency, and building heatloss are also adjustable. With the capability of changing operating temperatures, a heat pump may be observed under various environmental conditions; something very difficult to do with real mechanical equipment.

Animated mechanical and electrical schematic diagrams of the simulated heat pump are provided in “real-time”. The mechanical diagram shows refrigerant flow, as well as the liquid, liquid/vapor, and superheated vapor states of the refrigerant. In the electrical ladder diagrams, the controls and switch contacts constantly change state as the system operates. Providing a means of visually tracing refrigerant and current flow during operation, makes it much easier for the trainee to understand how a heat pump is supposed to work.

Pressure-temperature charts, performance charts, specifications, and an electrical nomenclature are available on-screen. In addition, the trainee can “zoom” into the system to visually inspect various components, including dirt or ice on the coils, a dirty air filter, and a blocked outdoor unit.

**SIMUPUMP™** provides easy-to-use “point-and-click” selection of meters and test points, and are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig) or metric (kPa/barg). The on-screen test instruments include:

- Gauge manifold set
- Voltmeter
- Thermometers
- Ohmmeter
- Leak detector
- Clamp-on ammeter
Up to 40 commonly encountered mechanical and electrical faults may be selected, as shown in the Fault Lists above.

**SIMUPUMP** provides testing and troubleshooting of the devices shown below, which are commonly found in heat pumps.

**SYSTEM REQUIREMENTS**

**SIMUPUMP** requires the following minimum IBM compatible computer:
- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, 10
- Hard drive, 18MB available disk space

**SIMUPUMP** network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

**ORDERING INFORMATION**

**SIMUPUMP™ Heat Pump Simulator**

<table>
<thead>
<tr>
<th>Standalone Licenses</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP-500 1 computer license</td>
<td>$695.00</td>
</tr>
<tr>
<td>MP-505 5 computer licenses</td>
<td>$1,295.00</td>
</tr>
<tr>
<td>MP-511 10 computer licenses</td>
<td>$1,695.00</td>
</tr>
<tr>
<td>MP-515 15 computer licenses</td>
<td>$1,995.00</td>
</tr>
<tr>
<td>MP-520 20 computer licenses</td>
<td>$2,295.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network Licenses</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP-540 10 seats</td>
<td>$1,595.00</td>
</tr>
<tr>
<td>MP-560 25 seats</td>
<td>$1,895.00</td>
</tr>
<tr>
<td>MP-570 50 seats</td>
<td>$2,695.00</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
SIMUGAS™ simulates two generic versions of gas furnaces. These include a high-efficiency condensing furnace with hot-surface ignition (HSI), and a standard-efficiency furnace with standing pilot ignition. Either natural gas or liquid-petroleum (LP) gas may be selected for simulation. Room and ambient temperatures, room thermostat, burner air-shutters, fan limit, high limit, heat anticipator, and manifold pressure are all adjustable. The room and ambient temperatures, in either Fahrenheit or Celsius, are constantly updated and displayed.

Animated mechanical and electrical schematic diagrams of the simulated gas furnace are provided in “real-time”. The mechanical diagrams show the burner flames, gas flow, and blower rotation. In the electrical ladder diagrams, the controls and switch contacts constantly change state as the system operates. The trainee can “zoom” into the furnace to visually inspect various components, including checking for a dirty air filter or heat exchanger, and the position of the flame sensor. Typical types of burner flames are also shown. Up to 30 commonly
encountered mechanical and electrical faults may be selected, as shown in the Fault Lists above.

**SIMUGAS provides** easy-to-use “point-and-click” selection of meters and test points, which are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (in. w.c.) or metric (kPa). The on-screen test instruments include:

- Manometer
- Thermometers
- Combustion analyzer
- Ignition module tester
- Voltmeter
- Millivoltmeter
- Ohmmeter
- Clamp-on ammeter
- Microammeter

**SYSTEM REQUIREMENTS**

**SIMUGAS** requires the following minimum IBM compatible computer:

- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, 10
- Hard drive, 17MB available disk space

**SIMUGAS** network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

**ORDERING INFORMATION**

**SIMUGAS™** Gas Furnace Simulator

<table>
<thead>
<tr>
<th>Standalone Licenses</th>
<th>MF-500 1 computer license</th>
<th>$695.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MF-505 5 computer licenses</td>
<td>$1,295.00</td>
</tr>
<tr>
<td></td>
<td>MF-511 10 computer licenses</td>
<td>$1,695.00</td>
</tr>
<tr>
<td></td>
<td>MF-515 15 computer licenses</td>
<td>$1,995.00</td>
</tr>
<tr>
<td></td>
<td>MF-520 20 computer licenses</td>
<td>$2,295.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network Licenses</th>
<th>MF-540 10 seats</th>
<th>$1,595.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MF-560 25 seats</td>
<td>$1,895.00</td>
</tr>
<tr>
<td></td>
<td>MF-570 50 seats</td>
<td>$2,695.00</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
SIMUOIL™ simulates four common configurations of generic oil furnaces. These include two types of primary controls, cad cell and stack-mounted, as well as two types of oil supply systems, one-pipe gravity feed and 2-pipe buried tank.

Animated mechanical and electrical schematic diagrams of the simulated oil furnace are provided in “real-time”. The mechanical diagrams show the flame, fuel flow, and blower rotation. In the electrical ladder diagrams, the controls and switch contacts constantly change state as the furnace operates. The trainee can “zoom” into the furnace to visually inspect various components, including the electrodes, cad cell, and fan belt, and check for dirty filters, heat exchanger, and flue pipe. Room and ambient temperatures, room thermostat, limit switches, burner air shutter, draft regulator, fuel pump pressure, and electrodes are all adjustable. Room and ambient temperatures, in either Fahrenheit or Celsius, are constantly updated and displayed. Up to 30 commonly encountered
mechanical and electrical faults may be selected, as shown in the Fault Lists above.

**SIMUOIL** provides easy-to-use “point-and-click” selection of meters and test points, which are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig/in. w.c.) or metric (kPa). The on-screen instruments include:

- Draft gauge
- Fuel gauge
- Pressure gauge
- Vacuum gauge
- Thermometers
- Combustion analyzer
- Smoke tester
- Voltmeter
- Ohmmeter
- Clamp-on ammeter

**SYSTEM REQUIREMENTS**

**SIMUOIL** requires the following minimum IBM compatible computer:

- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, 10
- Hard drive, 18MB available disk space

**SIMUOIL** network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

**ORDERING INFORMATION**

**SIMUOIL™** Oil Furnace Simulator

<table>
<thead>
<tr>
<th>License</th>
<th>Computer Licenses</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO-500</td>
<td>1 computer license</td>
<td>$795.00</td>
</tr>
<tr>
<td>MO-505</td>
<td>5 computer licenses</td>
<td>$1,395.00</td>
</tr>
<tr>
<td>MO-511</td>
<td>10 computer licenses</td>
<td>$1,795.00</td>
</tr>
<tr>
<td>MO-515</td>
<td>15 computer licenses</td>
<td>$2,095.00</td>
</tr>
<tr>
<td>MO-520</td>
<td>20 computer licenses</td>
<td>$2,395.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>License</th>
<th>Seat Licenses</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO-540</td>
<td>10 seats</td>
<td>$1,695.00</td>
</tr>
<tr>
<td>MO-560</td>
<td>25 seats</td>
<td>$1,995.00</td>
</tr>
<tr>
<td>MO-570</td>
<td>50 seats</td>
<td>$2,795.00</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
**SIMUHYDRO™** simulates a generic gas-fired low-pressure hot water boiler. This residential/light commercial hydronic system uses a cast-iron boiler, a compression tank, and continuous circulation. Room and outdoor temperatures, thermostats, high-limit cut-out, circulator cut-in, gas manifold pressure, cold water pressure, and burner primary air are fully adjustable. The gas and water valves, and compression tank vent may be opened and closed by just a click of the mouse. Having the capability of changing operating temperatures, pressures, and water levels, allows the trainee to observe the boiler system under various conditions; something very difficult to do with real hydronic equipment.

**SIMUHYDRO** provides easy-to-use “point-and-click” selection of meters and test points, which are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig/in. w.c.) or metric (kPa). The on-screen instruments include:

- Pressure gauges
- Ohmmeter
- Manometer
- Microammeter
- Motor
- Clamp-on ammeter
- Voltmeter

Animated mechanical and electrical schematic diagrams of the simulated hot water boiler are provided in “real-time”. The **mechanical diagram** shows gas and water flow, water temperatures, boiler and compression tank water levels, and valve positions. In the **electrical ladder diagrams**, controls and switch contacts constantly change state as the system operates.

The trainee may “zoom” into the system to visually inspect various components, including checking for a dirty combustion chamber, clogged burner and pilot burner orifices, vent damper operation, and proper pilot ignitor position. The trainee can also drain and fill the boiler and compression tank, while observing water levels.
HOT WATER BOILER SIMULATOR  SIMUHYDRO™

Up to 30 commonly encountered mechanical and electrical faults may be selected, as shown in the Fault Lists above.

SIMUHYDRO™ provides testing and troubleshooting of the devices listed below, which are commonly found in hot water boilers.

- Cast-iron boiler
- Compression tank
- Air separator
- Compression tank vent
- Backflow preventer
- Pressure reducing valve
- Pressure relief valve
- Pressure gauge
- Temperature gauge
- Gas manifold
- Gas burners
- Burner orifices
- Pilot burner
- Gas shutoff valves
- Cold water shutoff valve
- Vent damper
- Vent pipe
- Draft hood
- Diverter fittings
- Transformer
- Gas control valve
- Circulator
- Heater units
- Ignition module
- Circulator motor
- Main valve solenoid
- Pilot valve solenoid
- Pilot ignitor/sensor
- Room thermostat
- Heat anticipator
- Low water switch (LWCO)
- High-limit aquastat
- Blocked vent switch
- Flame rollout switch
- Circulator control aquastat
- Main service switch
- Circuit breaker

SYSTEM REQUIREMENTS

SIMUHYDRO™ requires the following minimum IBM compatible computer:

- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, 10
- Hard drive, 17MB available disk space

SIMUHYDRO network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

ORDERING INFORMATION

SIMUHYDRO™ Hot Water Boiler Simulator

**Standalone Licenses**

- MB-500  1 computer license $795.00
- MB-505  5 computer licenses $1,395.00
- MB-511  10 computer licenses $1,795.00
- MB-515  15 computer licenses $2,095.00
- MB-520  20 computer licenses $2,395.00

**Network Licenses**

- MB-540  10 seats $1,695.00
- MB-560  25 seats $1,995.00
- MB-570  50 seats $2,795.00

For further prices and ordering information, please see Page 20
SIMUREFR™ simulates three generic versions of low-temperature and medium-temperature refrigeration systems. These include a reach-in case with random defrost, a reach-in freezer with electric defrost, and a walk-in freezer with hot-gas defrost. The trainee may select the type of refrigerant for the simulated system. Box and ambient temperatures are adjustable and continuously updated and displayed on the screen. The cut-in and differential settings for the pressurestat, thermostat, and low-pressure switch are also adjustable, as well as the defrost and TXV settings.

Animated mechanical and electrical schematic diagrams of the simulated refrigeration system are provided in “real-time”. The mechanical diagrams show refrigerant flow, as well as the liquid, vapor, liquid/vapor, and superheated vapor states of the refrigerant. Also, the liquid level in the receiver is shown. In the electrical ladder diagrams, the controls and switch contacts constantly change state as the system operates. Providing a means of visually tracing the refrigerant and current flow during system operation, makes it much easier for the trainee to understand how a refrigeration system is supposed to work.

Pressure-temperature charts, specifications, and an electrical nomenclature are available on-screen. In addition, the trainee can “zoom” into the system to visually inspect various components, including dirt or ice on coils, and bubbles in the liquid sight glass.

Eight common refrigerants may be selected for the simulated system. These include:

- R-12
- R-22
- R-134a
- R-402A
- R-404A
- R-409A
- R-502
- R-507

SIMUREFR provides easy-to-use “point-and-click” selection of meters and test points, and are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be
displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig) or metric (kPa/barg). The on-screen test instruments include:

- Gauge manifold set
- Voltmeter
- Thermometers
- Ohmmeter
- Leak detector
- Clamp-on ammeter

Up to 30 commonly encountered mechanical and electrical faults may be selected, as shown in the Fault Lists above.

**SIMUREFR** provides testing and troubleshooting of the devices listed below, commonly found in refrigeration systems.

<table>
<thead>
<tr>
<th>Device</th>
<th>Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Run capacitor</td>
</tr>
<tr>
<td>Condenser coil</td>
<td>Start capacitor</td>
</tr>
<tr>
<td>Evaporator coil</td>
<td>Defrost heater</td>
</tr>
<tr>
<td>Receiver</td>
<td>Defrost timer motor</td>
</tr>
<tr>
<td>TX valve (TXV/TEV)</td>
<td>Defrost timer solenoid</td>
</tr>
<tr>
<td>CPR valve</td>
<td>Defrost thermostat</td>
</tr>
<tr>
<td>Filter-drier</td>
<td>Box thermostat</td>
</tr>
<tr>
<td>Sight glass</td>
<td>Box pressurestat</td>
</tr>
<tr>
<td>Condenser fan motor</td>
<td>Low pressure switch</td>
</tr>
<tr>
<td>Evaporator fan motor</td>
<td>High pressure switch</td>
</tr>
<tr>
<td>Start relay</td>
<td>Heater limit switch</td>
</tr>
<tr>
<td>Liquid line solenoid</td>
<td>Condenser fan switch</td>
</tr>
<tr>
<td>Hot gas solenoid</td>
<td>Circuit breaker</td>
</tr>
</tbody>
</table>

**SYSTEM REQUIREMENTS**

**SIMUREFR** requires the following minimum IBM compatible computer:

- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, 10
- Hard drive, 18MB available disk space

**SIMUREFR** network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

**ORDERING INFORMATION**

**SIMUREFR™ Commercial Refrigeration Simulator**

<table>
<thead>
<tr>
<th>License Type</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standalone Licenses</td>
<td>MR-500 1 computer license</td>
<td>$695.00</td>
</tr>
<tr>
<td></td>
<td>MR-505 5 computer licenses</td>
<td>$1,295.00</td>
</tr>
<tr>
<td></td>
<td>MR-511 10 computer licenses</td>
<td>$1,695.00</td>
</tr>
<tr>
<td></td>
<td>MR-515 15 computer licenses</td>
<td>$1,995.00</td>
</tr>
<tr>
<td></td>
<td>MR-520 20 computer licenses</td>
<td>$2,295.00</td>
</tr>
<tr>
<td>Network Licenses</td>
<td>MR-540 10 seats</td>
<td>$1,595.00</td>
</tr>
<tr>
<td></td>
<td>MR-560 25 seats</td>
<td>$1,895.00</td>
</tr>
<tr>
<td></td>
<td>MR-570 50 seats</td>
<td>$2,695.00</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
SUPERMARKET REFRIGERATION SIMULATOR  SIMUMKT™

SIMUMKT™ simulates a typical parallel-type multi-evaporator supermarket refrigeration system. Normally, a parallel system contains many display cases and walk-in coolers, but for simplicity, SIMUMKT contains three display cases. One case is low-temperature with electric defrost, the others are medium-temperature with off-cycle defrost. Two 3-phase semi-hermetic compressors, with capacity cycling, are included. A specific refrigerant may be selected for simulation, which includes R-22, R-402A, R-404A, R-422D, R-502, and R-507.

Animated mechanical and electrical schematic diagrams of the simulated refrigeration system are provided in “real-time”. The mechanical diagrams show refrigerant flow and the liquid, vapor, liquid/vapor, and superheated vapor states of the refrigerant. Also, the liquid level in the receiver is shown. In the electrical ladder diagrams, the controls and switch contacts constantly change state as the system operates. Providing a means of visually tracing the refrigerant and current flow during system operation, makes it much easier for the trainee.
to understand how the system is supposed to work. Up to 30 commonly encountered mechanical and electrical faults may be selected, as shown in the Fault Lists above.

Setpoints for the EPR valves and TXVs can be adjusted for each case, as well as the compressor-cycling control and defrost settings. Case and ambient temperatures are adjustable, and continuously updated and displayed on the screen. All temperature and pressure values can be set and displayed in either imperial or metric.

Pressure-temperature charts for the refrigerants, specifications, and an electrical nomenclature are available on-screen. In addition, the trainee can “zoom” into the system to visually inspect various components, including dirty or iced-up coils, and liquid and compressor oil level sight glasses.

SIMUMKT provides easy-to-use “point-and-click” selection of meters and test points, which are saved to an Instrument Log to monitor the users’ troubleshooting skill. Temperatures may be displayed in either Fahrenheit (°F) or Celsius (°C), and pressures may be displayed in either imperial (psig) or metric (kPa/barg). The on-screen test instruments include:

- Gauge manifold set
- Voltmeter
- Thermometers
- Ohmmeter
- Leak detector
- Clamp-on ammeter

SIMUMKT provides testing and troubleshooting of the devices listed above, commonly found in refrigeration systems.

SYSTEM REQUIREMENTS
SIMUMKT requires the following minimum IBM compatible computer:
- Pentium, Core, or equivalent processor (32 or 64-bit)
- Windows XP, Vista, 7, 8, 8.1, 10
- Hard drive, 18MB available disk space

SIMUMKT network version is compatible with Novell and Windows Server 2003, Server 2008, Server 2012

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>SIMUMKT™ Supermarket Refrigeration Simulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standalone Licenses</td>
</tr>
<tr>
<td>MS-500</td>
</tr>
<tr>
<td>1 computer license</td>
</tr>
<tr>
<td>MS-505</td>
</tr>
<tr>
<td>5 computer licenses</td>
</tr>
<tr>
<td>MS-511</td>
</tr>
<tr>
<td>10 computer licenses</td>
</tr>
<tr>
<td>MS-515</td>
</tr>
<tr>
<td>15 computer licenses</td>
</tr>
<tr>
<td>MS-520</td>
</tr>
<tr>
<td>20 computer licenses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network Licenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-540</td>
</tr>
<tr>
<td>10 seats</td>
</tr>
<tr>
<td>MS-560</td>
</tr>
<tr>
<td>25 seats</td>
</tr>
<tr>
<td>MS-570</td>
</tr>
<tr>
<td>50 seats</td>
</tr>
</tbody>
</table>

For further prices and ordering information, please see Page 20
ORDERING INFORMATION

METHODS OF ORDERING

MAIL
Simutech Systems, Inc.
PO Box 7212
Beaverton OR 97007 (U.S.A.)

PHONE
(800) 648-6209 (USA & Canada)
(503) 649-9076
Hours: 8:00 am to 5:00 pm Pacific Time

FAX
(503) 649-8972

ON-LINE STORE / E-MAIL
www.simutechsystems.com
sales@simutechsystems.com

METHODS OF PAYMENT

U.S. CUSTOMERS
• Purchase Order from government agency, school, or corporation (OAC), Net 30-days
• Visa, MasterCard, or American Express
• Prepaid by check

CANADA & INTERNATIONAL CUSTOMERS
• Purchase Order from government agency or school,
  Net 30-days, payable in U.S. funds
• Visa, MasterCard, or American Express
• Prepaid by International Bank Check, payable in U.S. funds

SHIPPING
All orders are shipped FOB shipping point and a shipping charge is added to invoice. Shipment is normally via UPS ground in USA and UPS Air to Canada and international. Next-day or second-day air is available upon request. For Canada and international orders, GST, local taxes, and duty are not included in our prices.

Orders are normally shipped within 24-hours

SYSTEM CONTENTS
Each simulator system includes the following:
• CD-ROM
• User’s Manual
• Instructor’s Manual
• Technical Support, unlimited, with toll-free number (USA and Canada)

(1) Additional licenses are required if simulators are installed and used on more than one standalone computer at same campus or training facility
(2) Network versions are valid for installation on a LAN server at one campus or training facility, for concurrent use by maximum licensed users
(3) Network versions for more than 50 users are also available
(4) May be used on tablets and iPads when a remote access server is used

Prices are subject to change without notice
Note: Simutech reserves the right to refuse any order, including shipment to countries where prohibited by U.S. export laws or lacking proper international copyright protection. Export, reshipment, or resale is prohibited without prior written permission, subject to U.S. export laws.

INSTRUCTOR INTERFACE MODULES
These optional programs are installed on the instructor’s computer to preselect faults for all users at one time. Using a CD or flash drive, the faults are then uploaded to each workstation. In addition, when a printer isn’t available at each workstation, these interfaces can be used to download reports, for display and printout at the instructor’s computer. These are recommended when six or more workstations are utilized without a network. Prices are shown below:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>UNIT PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACINST™ Version 5.1</td>
<td>TA-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>HIPINST™ Version 5.1</td>
<td>TP-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>REFRINST™ Version 5.1</td>
<td>TR-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>MKTINST™ Version 5.1</td>
<td>TS-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>GASINST™ Version 5.1</td>
<td>TF-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>OILINST™ Version 5.1</td>
<td>TO-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>HYDROINST™ Version 1.1</td>
<td>TB-500</td>
<td>$195.00</td>
</tr>
<tr>
<td>GEOINST™ Version 1.0</td>
<td>TG-500</td>
<td>$195.00</td>
</tr>
</tbody>
</table>

© 2016 Simutech Systems, Inc
Printed in U.S.A.

IBM PC is a registered trademark of IBM Corp.
Pentium and Core are registered trademarks of Intel Corp.
Windows XP, Vista, 7, 8, 8.1, 10, Server 2003, Server 2008, and Server 2012 are registered trademarks of Microsoft Corp.
iPad is a registered trademark of Apple Inc.