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Industrial Maintenance Program

Solar/Wind
Process Control HVAC
Wiring Pumps Rigging Electric Power
Electronics Fluid Power Piping
Industrial Controls Mechanical

Career and Technical Education

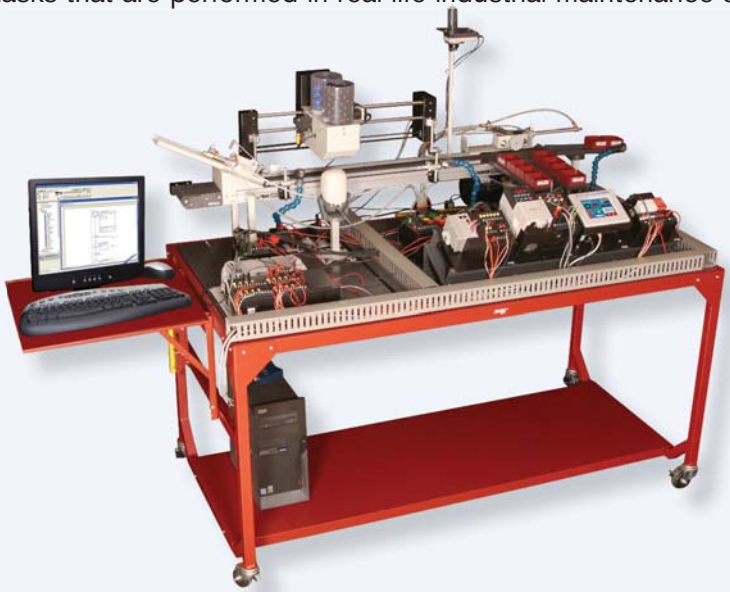
The transition from classroom to workplace is seamless with Lab-Volt's industry-relevant training.

Lab-Volt's Industrial Maintenance program provides trainees with all the knowledge, skills, and practical experiences needed for a rewarding career in industrial maintenance, whether they are college-bound or aim for employment after graduation.

Lab-Volt's Industrial Maintenance program provides quality training based on industry standards.

Competency- and Task-Based Courses

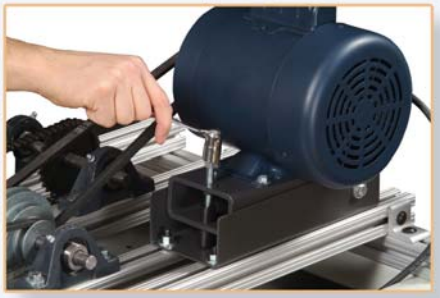
Industrial Maintenance courses use a series of comprehensive, instructional job sheets for theory and background. Job sheets are followed up by industry-standard work orders that direct students to carry out and complete specific tasks that are performed in real-life industrial maintenance situations.



Model 5901 prepares trainees to be efficient in advanced manufacturing

- **Workplace Topics**
  - » Health
  - » Electrical Safety
  - » Tool Safety
- **Flexible Career Options**
- **Employability Skills**
  - » Communication
  - » Troubleshooting
  - » Work Management
  - » Problem Solving
  - » Critical Thinking

- **Industrial-Grade Equipment**
- **Task-Based Learning**
  - » Job Sheets
  - » Work Orders
  - » Reference Material



Heavy-duty motor mounting base from Mechanical Training System

Major Training Topics

- Electric Power
- Electronics
- Fire Alarms – Conventional and Addressable
- Flexible Manufacturing
- HVAC
- Hydraulics
- Industrial Controls
- Industrial Wiring
- Instrumentation & Process Control
- Mechanical
- Piping
- PLCs
- Pneumatics
- Power Distribution
- Process Control
- Pumps
- Rigging
- Solar/Wind Energy

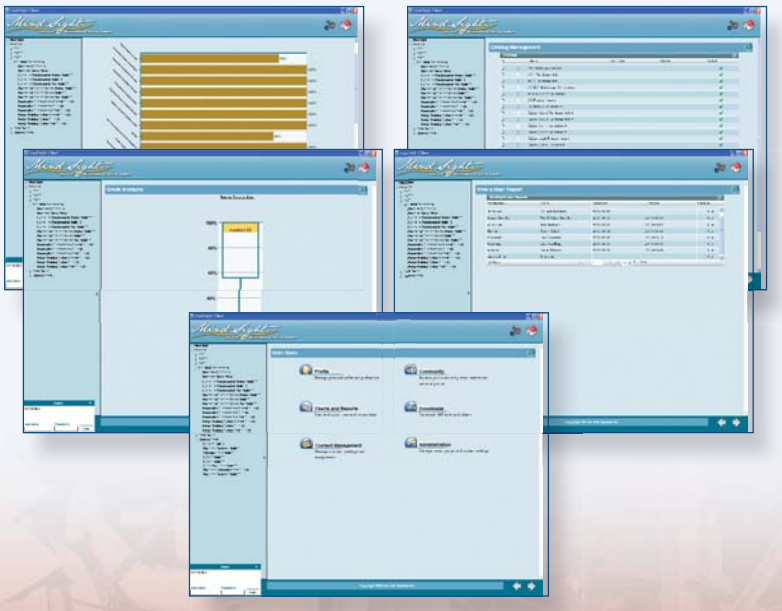
FOR TODAY'S COMPETITIVE INDUSTRY

Versatile systems allow for flexible classroom configurations.

- **Budget and Space**
  - » Optional workbenches
  - » Simulation software
- **Customization**
  - » Modular design
  - » Various lab configurations
- **Delivery Formats**
  - » Optimal multimedia format

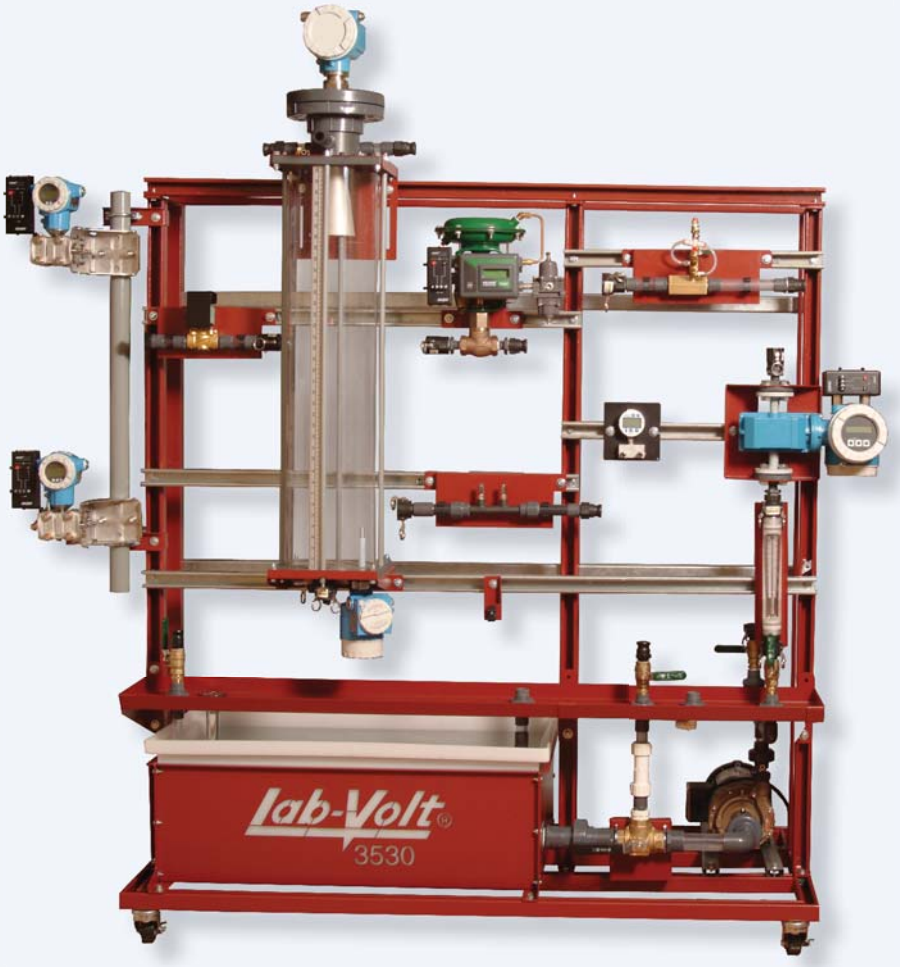
Optional A-frame bench for Hydraulics and Pneumatics

Powerful LCMS provides easy classroom management and assessment



- SCORM-Compliant Courseware
- Flexible Scheduling Options
- Easy Grade Viewing
- Real-Time Data Collection
- Simple Report Generation
- Competency Testing
- Manual Skill Assessment

Instrumentation and Process Control Training System – Model 3530



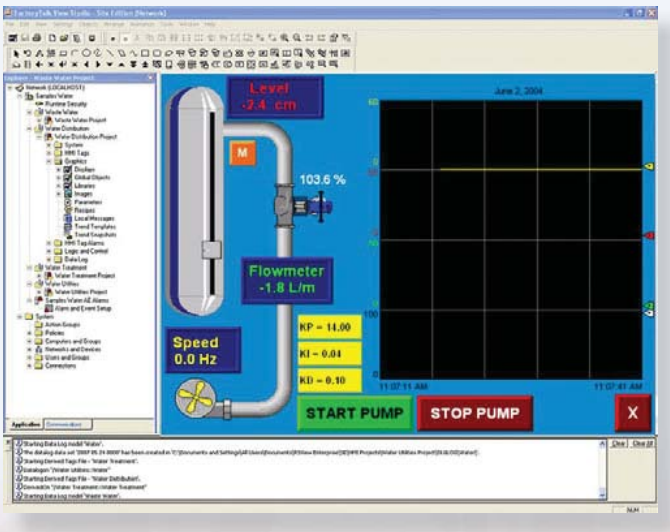
Process Workstation shown with optional equipment.

TOPIC COVERAGE:

- Introduction to Process Control
- Pressure Processes
- Flow Processes
- Level Processes
- PID Process Control
- Introduction to Temperature Process Control
- Temperature Measurement
- Characterization of Temperature Processes
- PID Control Temperature Processes
- Advanced Control (Feed Forward, Ratio, Split Range, 2nd Order Interacting and Non-Interacting Processes)

FEATURES:

- SCADA/DCS Software
- HART® and FOUNDATION™ Fieldbus
- Pressure and Flow of Compressed Air
- Safe Boiler Simulation using Water/Air
- Optional Valves
- Multiple Controllers
- Additional Pumping Unit



FactoryTalk View – optional HMI application development software

Instrumentation and Process Control

OTHER TOPICS AVAILABLE:

- Electromagnetic Flow Transmitter
- Ultrasonic Level Elements
- Radar Level Transmitter
- Guided-Radar Level Transmitter
- Vortex Flow Transmitter
- Coriolis Flow Transmitter
- Primary Flow Elements
- Paddlewheel Flow Transmitter
- Capacitive Level Transmitter
- Switches
- Control Valves
- Second Pump Add-on
- PLC ControlLogix
- PLC CompactLogix
- PLC MicroLogix 1100
- PID Controller Foxboro
- PID Controller Honeywell
- Hart Software Configurator
- Calibration Package Basic
- Calibration Package Advanced

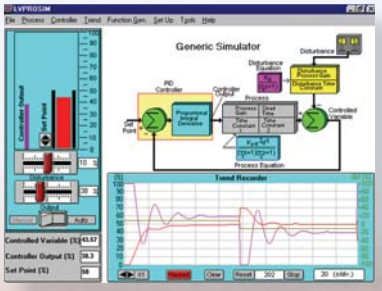
Instrumentation Workstation shown with optional equipment

Process Control Training System – Model 6090

System shown with optional equipment.

TOPIC COVERAGE:

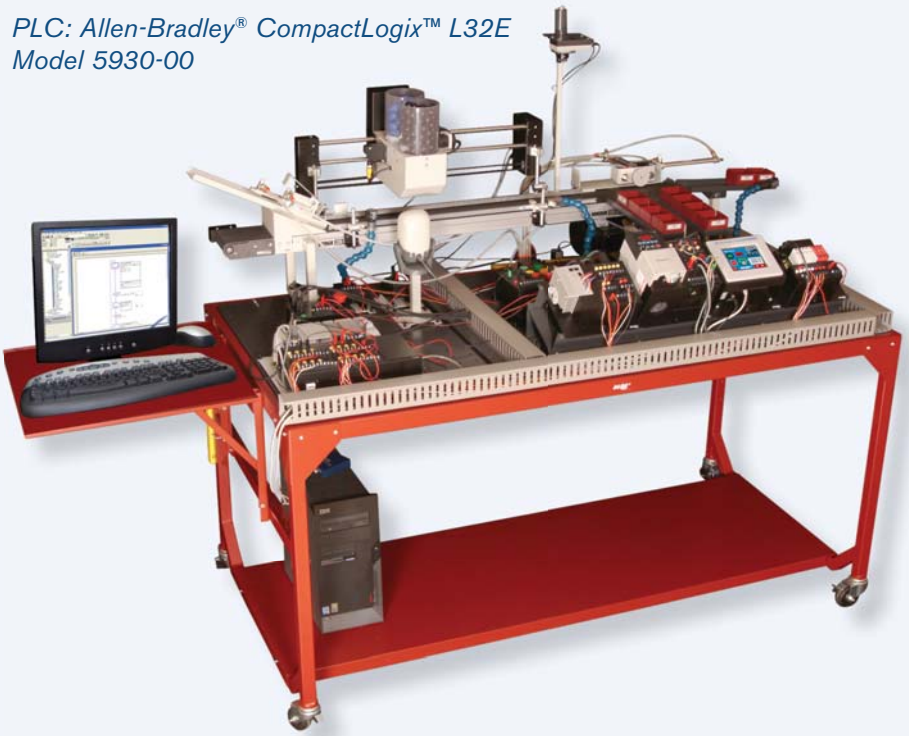
- Pressure Processes
- Flow Processes
- Level Processes
- PID Controller
- Temperature Measurement
- Temperature Processes
- pH Control and Measurement
- Process Dynamics
- Proportional Plus Integral Control Mode
- Proportional Plus Derivative Control Mode
- PID Controller
- PID Process Control



Optional simulation software

Flexible Manufacturing System
Models 5901-30 and 5901-40 (Advanced Applications)

PLC: Allen-Bradley® CompactLogix™ L32E
Model 5930-00



System shown with optional equipment.

TOPIC COVERAGE:

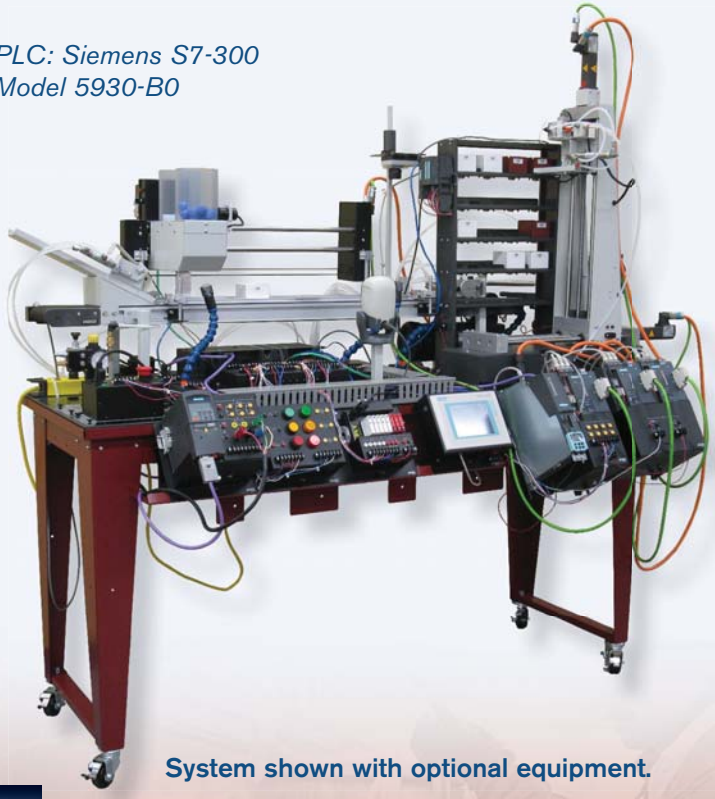
- DeviceNet AC Drives
- Ladder Diagrams
- PLC Controlled Conveyors and Sensors
- Structured Text and SFC Programming
- Automation
- Motor Control
- Pneumatics
- Sensors
- Troubleshooting
- Industrial Wiring
- Part Sorting
- Quality Control
- Product Inspection

Advanced Applications

- Human-Machine Interface (HMI)
- Machine Vision
- Servo Control
- FMS Production Line

Siemens Flexible Manufacturing System
Models 5901-50 and 5901-60 (Advanced Applications)

PLC: Siemens S7-300
Model 5930-B0



System shown with optional equipment.

TOPIC COVERAGE:

- ProfiNet AC Drives
- Ladder Diagrams
- PLC Controlled Conveyors and Sensors
- Structured Text and SFC Programming
- Automation
- Motor Control
- Pneumatics
- Sensors
- Troubleshooting
- Industrial Wiring
- Part Sorting
- Quality Control
- Product Inspection

Advanced Applications

- Human-Machine Interface (HMI)
- Machine Vision
- Servo Control
- FMS Production Line

Automated Storage and Retrieval System
Model 5940

FEATURES:

- Add-on component of both Siemens and Allen-Bradley Flexible Manufacturing Systems
- 37” x 26.4” x 16.5”
- 4” x 4” storage for system’s output products (boxes)
- Operates in three-dimensional space. X- and Y-axes use ball screw mechanism driven by servo motors. Z-axis pneumatically controlled
- Accepts boxes transferred by Pneumatic Sorting Device, Model 5913
- Limit switches allow PLC monitoring
- Network protocol monitors or controls all inputs and outputs
- Includes two supplementary Kinetix 2000 axis modules with cables and fiber optics

Hydraulics Training System
Model 6080

System shown with optional equipment.

TOPIC COVERAGE:

- Pressure and Force
- Flow Rate and Velocity
- Work and Power
- Cylinders
- Circuits and Valves
- Troubleshooting

Electric Control of Hydraulic Systems
Model 6080-2

TOPIC COVERAGE:

- Electrical Concepts
- Functional Systems
- Industrial Applications
- Troubleshooting
- Functional Circuits
- Servo Controls
- Sensors

Pneumatics Training System
Model 6081

System shown with optional equipment.

TOPIC COVERAGE:

- Basic Physical Concepts
- Basic Controls
- Electrical Concepts
- Functional Systems
- Industrial Applications
- Troubleshooting

Electric Control of Pneumatic Systems
Model 6081-2

TOPIC COVERAGE:

- Electrical Concepts
- Functional Systems
- Industrial Applications
- Troubleshooting
- Functional Circuits
- Servo Controls
- Sensors

Fluid Power Faulted Parts Kits
Troubleshooting Hydraulic Circuits, Model 6080-F0
Troubleshooting Pneumatic Circuits, Model 6081-F0

FEATURES

- Add-ons to basic or advanced systems
- Support multiple student groups
- Actual real-world components; not simulated faults
- Inexpensive troubleshooting solutions
- Kits include faulted parts and an instructor manual

FAULTED PARTS:

- Directional Valve, Lever-Operated, Model 6320-F0
- Pressure Reducing Valve, Model 6323-F0
- Double-Acting Cylinder, 2.54-cm Bore, Model 6340-F0
- Double-Acting Cylinder, 3.81-cm Bore, Model 6341-F0
- Bidirectional Motor and Flywheel, Model 6342-F0
- Vacuum Generator, Model 6413-F0
- Directional Valve, Push-Button Operated, Model 6420-F0
- Directional Valve, Double-Air Pilot Operated, Model 6422-F0
- Loading Device, Model 6480-F0
- Tees, Model 6490-F0
- Long Line, Model 64920-F0

Industrial Controls Training System
Model 8036

TOPIC COVERAGE:

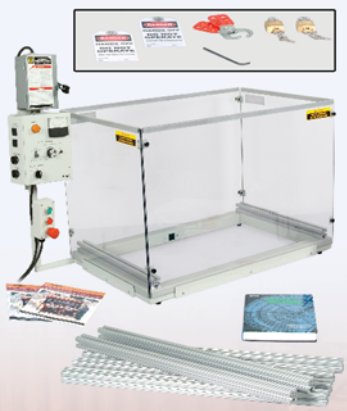
- Electric Motor Control
- Circuit Layout and Specifications
- Basic Control Circuit
- Jogging Control Circuits
- Reduced AC Voltage Starters
- Controls with Electronic Devices
- AC & DC Drive Controls
- Troubleshooting

Mechanical Training System
Model 46101

Shown with optional equipment.

TOPIC COVERAGE:

- Belt Drives
- Chain Drives
- Gear Drives
- Lubrication
- Couplings
- Shaft Alignment
- Bearings
- Linear Bearings
- Ball Screws
- Gaskets and Seals
- Clutches and Brakes
- Laser Alignment
- Vibration Analysis



Universal Base Assembly

Industrial Wiring Training System
Model 46102

System shown with optional equipment.

TOPIC COVERAGE:

- Cabinet Installation
- Conduit Installation
- Industrial Equipment Wiring
- Electrical Safety
- Electrical Diagrams
- National Electric Code® (NEC®)
- Electrical Power Distribution
- Three-Phase Motor Starters
- AC/DC Drives
- Industrial Applications

Fire Alarm Training Systems (Conventional and Addressable)
Models 46103-A and 46103-B

Conventional Fire Alarm System
Model 46103-A

TOPIC COVERAGE:

- Wiring and Schematics
- Component Location and Wiring
- EOLR
- Remote Zone Indicators
- Pull Stations/Connections
- Control Panels
- Horn Strobes
- Junction Boxes
- Layout Diagrams

Addressable Fire Alarm System
Model 46103-B

Both models shown with optional mobile workstation.

Piping Training System
Model 46105

System shown with optional equipment.

TOPIC COVERAGE:

- Motor Operators
- Pipes and Pipe Fittings
- Valve Types and Operation
- Safety Valves
- Steam Traps
- Valve Maintenance
- Fabrication, Assembly, and Installation
- Measurement and Layout
- System Testing
- Safety Rules and Procedures

Pumps Training System
Model 46106

System shown with optional equipment.

TOPIC COVERAGE:

- Pump Installation
- Lubrication
- Laser Alignment
- Pump Types and Operation
- Single-Pump Systems
- Multiple Pump Systems
- Inspection
- Component Replacement
- Valve Restriction
- Air Injection
- Pump Wiring
- Fluid Mechanics
- Pump Maintenance
- Vibration Analysis
- Vibration Metering

Rigging Training System
Model 46109

The Rigging Trainer offers storage for all necessary materials.
System shown with optional equipment.

TOPIC COVERAGE:

- Ropes and Slings
- Wedge Sockets
- Dollies and Roller Pipes
- Cranes and Hoists
- Machine Installation
- Machine Movement
- Lifting Objects and Unbalanced Loads

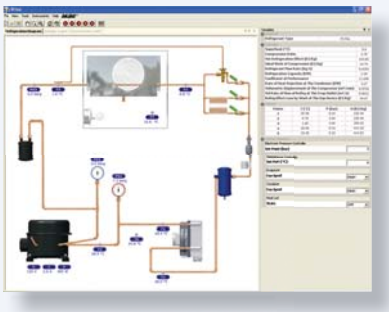
Solar/Wind Energy Training System
Model 46120

TOPIC COVERAGE:

- Energy Fundamentals
- Trainer Familiarization and Safety
- Solar Module
- Wind Turbine
- Solar/Wind Systems
- Going Green

System shown with AC Flood Lamp
(Sun Simulator)

Heating, Ventilation, Air Conditioning and Refrigeration



LVHVAC Simulation Software

TOPIC COVERAGE:

- Industrial Refrigeration Systems
- Air Handling and Energy Management
- Domestic Heat Pumps
- Domestic Freezers
- Beverage Coolers
- Dual-Temperature Refrigerator
- Walk-in Coolers
- Forced Air-Conditioning
- Universal Refrigeration

Pictured is Model 3431, Compact Refrigeration Training System. Other models are also available.

0.2 kW Electromechanical Training System

Model 8001

System shown with optional equipment.

TOPIC COVERAGE:

- Electric Power Technology
- Power Circuits
- Single- and Three-Phase Transformers
- AC/DC Motors
- AC/DC Generators

*Computer-Assisted Training System and simulation software also available.

Electricity and Electronics Training

Locktronics Basic Electrical and Electronics Engineering – Model LK7382

TOPIC COVERAGE:

- Conductors and insulators
- Series and parallel circuits
- Resistance and resistance in series and parallel
- Potential dividers
- Ohm's law
- Capacitance and capacitance in series and parallel
- Charging and discharging capacitors
- Diode behavior and characteristics
- Transistor as a switch and as an amplifier
- Transistor emitter follower circuit

FACET® Computer-Based Electronics Training – Series 91000

FACET®

TOPIC COVERAGE:

- Basic Principles
- Industrial Electronics
- Digital Electronics
- Microprocessor Electronics
- Communications Systems

Programmable Logic Controller and Applications
Series 3240

TOPIC COVERAGE:

- Familiarization with the PLC Trainer and with the RSLogix 500 PLC Programming Software
- Programming Basics
- Online Operations
- Latching Instructions
- Timer Instructions
- Counter Instructions
- Sequencer Instructions
- Comparison Instructions
- Shift Register Instructions/The Force Function

Model 3240-B0

PLC: Siemens ET200S

- 24 V built-in Power Supply
- 8x inputs (24 VDC only) and 12x outputs (24 VDC relay outputs)
- Eight fault switches
- PID Capability
- Easy expansion using rackless I/O modules (analog expansion module 3244-B0; two current/voltage inputs and two current/voltage outputs)
- Four push-buttons and four toggle switches
- Based on SIEMENS S7-300 technology
- Requires the STEP 7 programming software and an Ethernet crossover cable for programming
- Includes Siemens Resource Curriculum CD-ROM

Model 3240-30

PLC: Allen-Bradley: MicroLogix 1500

- 24 V built-in power supply
- 12x inputs (24 VDC only) and 12x outputs (24 VDC relay outputs)
- Eight fault switches
- PID Capability
- Easy expansion using rackless I/O modules (Expansion module 3244-30; four current/voltage inputs and four current/voltage outputs)
- Six push-buttons and six toggle switches
- Compatibility with MicroLogix and SLC instructions set
- Requires the RSLogix 500 programming software (Model 3245-A) and programming cable (3246-40)
- Includes curriculum

Other PLCs and PLC applications are also available. Please see our PLC Guide for more information.

Lab-Volt®

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Process Control Solar/Wind HVAC
Wiring Pumps Rigging Electric Power
Electronics Fluid Power Piping
Industrial Controls Mechanical

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