



**TII Technical
Education
Systems**

Teaching Technology for Tomorrow.

ADVANCED SYSTEMS



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ABOUT

TII Technical Education Systems (TII) is an internationally known leader in providing integrated, hands-on learning systems. Since our founding in 1964, we have excelled at producing innovative laboratory equipment and curricula geared toward technical training, workplace skills, and industrial certifications for schools, industry and government agencies worldwide.

We're incorporating the newest technology with an extensive curriculum for academic success, preparing students for today's modern employers.



Electro-Pneumatic Training System – EXP3

READ. SHOW. DO.

At TII, we believe a hands-on approach should be the cornerstone of every technical training program.

Statistics prove that hands-on training creates the highest learning retention rate for students.

We recall 25% of what we hear, 45% of what we see, and 70% of what we DO.

That's why all of our programs have a hands-on focus and are supported by a comprehensive instructional curriculum: Read. Show. Do.

All of TII's training programs follow this three-step training method. This in-depth combination of coursework, demonstrations, and hands-on exercises achieves the greatest retention rate and promotes productivity, integral to the development of a Technology Fundamentals skill set.



Advanced Electronic Sensors
EM600 Series

ADVANCED SYSTEMS

TII's Advanced Systems series provide the components and hands-on training required to effectively troubleshoot and repair systems used by today's employers in modern industry. These learning systems are broken into two learning categories: Fluid Power and Industrial Controls. Both programs emphasize career-focused, hands-on learning with industrial components for practical industry experience. Learning systems simulate real-life work conditions that assist in skill development for the workforce of tomorrow.

Featuring a flexible curriculum design, the Advanced Systems series can be used as an introduction, review, or in-depth study. Both the Industrial Fluid Power and Industrial Controls learning systems can be integrated with many other TII training programs for a customized experience of advanced topics. Our hands-on activities increase learning retention, allowing students to acquire industry-specific troubleshooting skills for STEM, industrial certifications, and technology-driven careers.

TII'S CURRICULA

Our technical training solutions are user-friendly and customizable for a clear and concise learning experience. TII's curricula have been designed and reviewed by a panel of experienced secondary and post-secondary educators. Each program has received input from industry experts and has been tested by industry and educational professionals.

Students will discover the functions of the individual technology components and combine them to mimic real world operating systems. They will then master the application of learned principles through mathematic and scientific concepts, the driving forces behind each of TII's learning systems.

Advanced Learning with TII

- Emphasizes industry-focused, hands-on learning with STEM applications
- Delivers a program consistent with a technology-driven world
- Professionally written programs increase instructor efficiency and student results
- Flexible curriculum design: Use as an introduction, review or in-depth study
- Easy to use instructor guide with student manuals
- Designed for individual or group study
- Stand-alone training systems
- Assessment testing included
- Can be integrated with other training programs for advanced topics

Visit our website for more information on TII's curriculum: www.tii-tech.com

OUR LEARNING SYSTEMS

Common features to most of the Advanced Systems learning series:

- Silk-screened panels for easy identification of learning system components and symbols
- Industrial components mimicking real world equipment, applications, and systems
- Fast and easy setup of experiments: Focus on experiment objectives, not a lengthy setup process
- All components, supplies, power system, quick connect hoses or cables, and curriculum are included: no extras needed
- Full sized, steel, ergonomically-designed table top workstation
 - o Explorer Series Workstation Dimensions: 33 in. W x 28 in. D x 30 in. H
- Durable, attractive Mobile Bench option: integrated fluid power supplies add to lab effectiveness and instructor efficiency
 - o Workstation and Mobile Bench Combined Dimensions: 34 in. W x 29 in. D x 64 in. H
- Fluid Power Systems are customizable with available supplemental non-standard components
- Industrial Controls Systems are customizable with additional I/O, varying communication platforms, or other leading brand PLC manufacturers



The Fluid Power Explorer Series offers an all-inclusive learning experience in industrial fluid power skills training for Pneumatics and Hydraulics.

INDUSTRIAL PNEUMATICS EXPI

The Industrial Pneumatics training system provides the hands-on experience required to effectively troubleshoot and repair pneumatics systems used by today's employers. This module familiarizes students with design, construction, and operation of pneumatic components. The EXPI acts as a building block to TII's other technology systems, designed to interface with our other mobile benches.

Our training system is accompanied by a comprehensive student manual with 40+ units of activities and instructional support. The curriculum begins with the fundamentals of pneumatics, which can be used as an introduction to the technology or as a review of key industrial pneumatic principles.

Additional sections focus on different types of valves, cylinders, and pneumatic devices like vacuum Venturi generators, air motors, and rotary actuators.

INDUSTRIAL PNEUMATICS EXPI

- Lockable storage area provides space for manuals and additional components
- Specialty components available to expand capabilities of the system
- Mounting hardware and quick connection hoses included
- Full sized A-frame table top workstation with T-slot experiment surface
- Easy electrical interfacing of external sensors and PLCs

INDUSTRIAL HYDRAULICS EXP II

The Explorer II is a comprehensive maintenance training system for Industrial Hydraulics. This system provides the components and hands-on training required to effectively troubleshoot and repair hydraulics systems used by today's employers. TII's curriculum covers hydraulic technology in its four areas of instruction: Fundamentals, Applications, Physical Properties and Maintenance. We begin with the fundamentals which can be used as either an introduction or a review of key principles. Additional sections focus on different types of valves, cylinders, devices, and hydraulic applications like hydraulic jacks and regenerative circuits.

Our training system is accompanied by a comprehensive student manual and instructor's guide with 40+ units of activities and instructional support. Each of the four necessary levels of instruction includes background study of the topic, observational and hands-on experiments, application exercises, and mathematical formulas for proving results.



- Lockable storage area provides space for manuals and additional components
- Specialty components available to expand capabilities of the system
- Mounting hardware and quick connection hoses included
- Full sized A-frame table top workstation with T-slot experiment surface
- Easy electrical interfacing of external sensors and PLCs

Industrial Hydraulics
EXPII

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INDUSTRIAL ELECTRO-PNEUMATICS EXP3

EXP3 is a comprehensive training system for Industrial Electro-Pneumatics. This system provides the hands-on training required to effectively study air and electrical logic circuitry used by today's employers. TII's curriculum covers air logic and electro-pneumatic control technology in its four areas of instruction: Physical Properties and Fundamentals, Applications, Air Logic, and Electro-Pneumatic Control.

The curriculum begins with a fundamental review of basic pneumatic principles as well as an introduction to programmable logic control (PLC). These sections are followed by air logic and electrical control circuits and schematics. Additional topics focus on typical air logic and electro-pneumatic applications found in industry.

- Lockable storage area provides space for manuals and additional components
- Specialty components available to expand capabilities of the system
- Mounting hardware and quick connection hoses included
- Full sized, A-frame, table top workstation with T-slot experiment surface
- Built-in PLC for electrical control
- Easy electrical interfacing of external sensors and secondary PLCs



Industrial Electro-Pneumatics
EXP3

INDUSTRIAL ELECTRO-HYDRAULICS EXP4

The EXP4 is a complete Industrial Electro-Hydraulics training system with proportional and joystick control. This trainer is designed to demonstrate electrical control of hydraulic systems in a user-friendly, application-oriented setting. Electrical sequence and logic control is done using switches, sensors, joystick (mimic mobile hydraulic operations), and control valves.

Our curriculum begins with a fundamental review of basic hydraulic principles followed by electrical graphic communication symbols. Additional topics focus on typical electro-hydraulic applications found in today's industry. This system covers electro-hydraulic Open Loop proportional control technology in its three areas of instruction: Physical Properties and Fundamentals, Applications, and Electro-Hydraulic Control.

INDUSTRIAL ELECTRO-HYDRAULICS

EXP4



- System components are mounted in a configuration to replicate Open Loop proportional speed and position control of electro-hydraulic manufacturing systems using a hydraulic motor and linear actuator
- Industrial grade electronic, electro-hydraulic, and hydraulic components
- Specialty components available to expand capabilities of the system
- Mounting hardware and quick connection hoses included
- Full sized, A-frame, table top workstation with T-slot experiment surface
- Easy electrical interfacing of external sensors and PLCs

Industrial Electro-Hydraulics
EXP4

ADVANCED INDUSTRIAL ELECTRO-HYDRAULICS EXP6

The EXP6 is a complete training system that provides comprehensive, hands-on study of Open and Closed Loop electrical control of hydraulic systems using a Proportional Valve, PLC and components used by today's employers. Students will focus on hydraulic technology in its three areas of instruction: Physical Properties and Fundamentals, Applications, and Electro-Hydraulic Control and Logic.

Our training system is accompanied by a student manual and instructor's guide. These focus on the background and applications of combining hydraulics and electrical control in industrially-relevant laboratory exercises. The curriculum begins with the fundamentals of pneumatics, which can be used as an introduction to the technology or as a review of key principles. Additional sections focus on different types of valves, cylinders, and pneumatic devices like vacuum Venturi generators, air motors, and rotary actuators.

ADVANCED INDUSTRIAL ELECTRO-HYDRAULICS EXP6

- Lockable storage area provides space for manuals and additional components
- Specialty components available to expand capabilities of the system
- Portable, rugged design
- Mounting hardware and quick connection hoses included
- Full sized, A-frame, table top workstation with T-slot experiment surface
- Easy electrical interfacing of external sensors and PLCs

Advanced Industrial Electro-Hydraulics EXP6

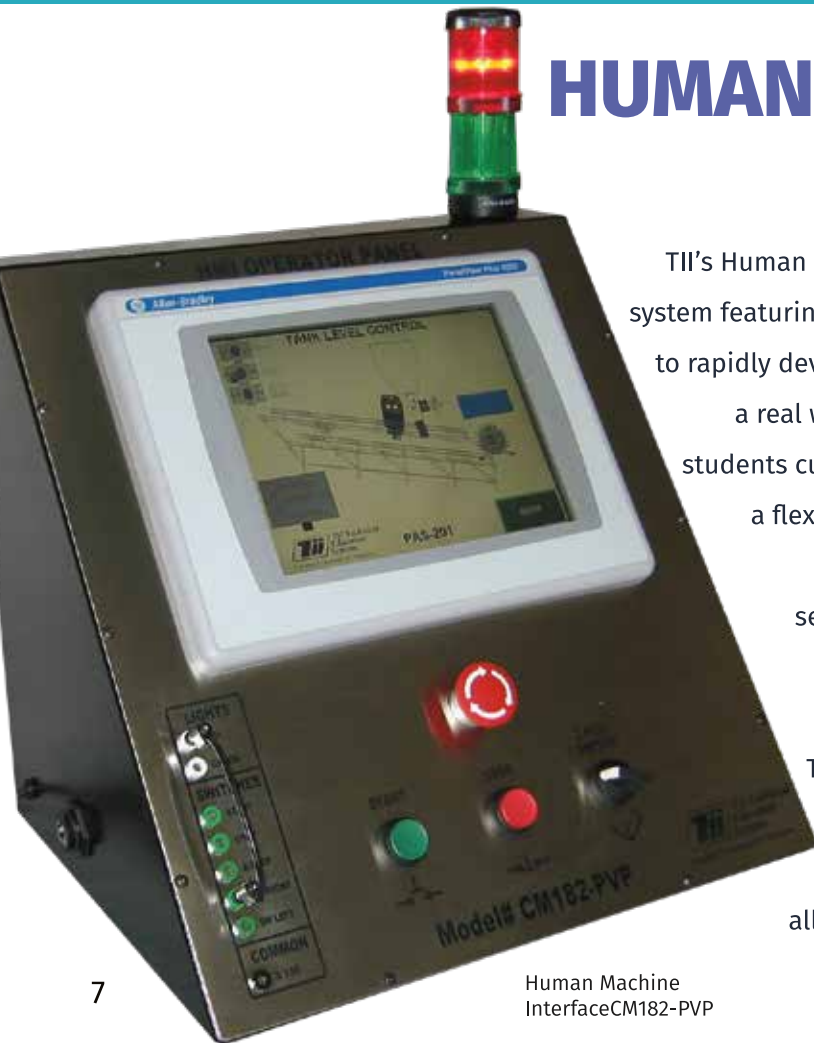


The Industrial Controls Series offers comprehensive instruction in PLC skills development and controls applications from leading manufacturers.

HUMAN MACHINE INTERFACE CM182-PVP

TII's Human Machine Interface training module is an industrial-based HMI system featuring Allen-Bradley's PanelView Plus. This trainer allows students to rapidly develop competence in operating, programming, and interfacing a real world industrial HMI system. The Allen-Bradley's software lets students customize system views specific to application needs, enabling a flexible learning experience that is relevant for today's industrial employers. Students create system simulation movements or select from a large variety of commonly used industrial control graphics from the system's library.

The curriculum begins with basic displays and object drawing, quickly moving to Ethernet communications, data collection, and industrial applications. Each lesson builds upon the last, allowing the student to work towards more complex instruction.



Human Machine
InterfaceCM182-PVP

HUMAN MACHINE INTERFACE

CM182-PVP

- 10 inch colored touchscreen display
- Built-in Ethernet connectivity
- Trending / Logging: Plot or log time-based data
- Expressions: modify data based on conditions using logic or mathematical expressions
- FactoryTalk programming software to communicate to PLCs, machines and other external devices
- Ergonomically-designed steel wedge-shaped frame workstation
- Easy interface to other TII systems and PLCs

COMPACT LOGIX CONTROLLER CM284-L1

Our training system is accompanied by an instructor's guide as well as a student manual. This manual is a comprehensive student resource, featuring detailed laboratory exercises which familiarize the trainee with PLC operation, automation connectivity via Ethernet communications, and industrial applications. The curriculum begins with basic wiring concepts and quickly moves through circuits, logic, and programming. Additional units focus on troubleshooting and special features of the Allen-Bradley Compact Logix.

- Easy access to the PLC digital and analog input / output terminals with banana jack connectors
- Rapid setup and testing of wiring changes
- Digital push-button switches and lights
- Analog potentiometers and panel meter displays
- User-identified external devices
- Built-in Ethernet communications with easy interface to other TII Systems
- Ergonomically-designed steel wedge-shaped frame workstation



Compact Logix Controller
CM284-L1

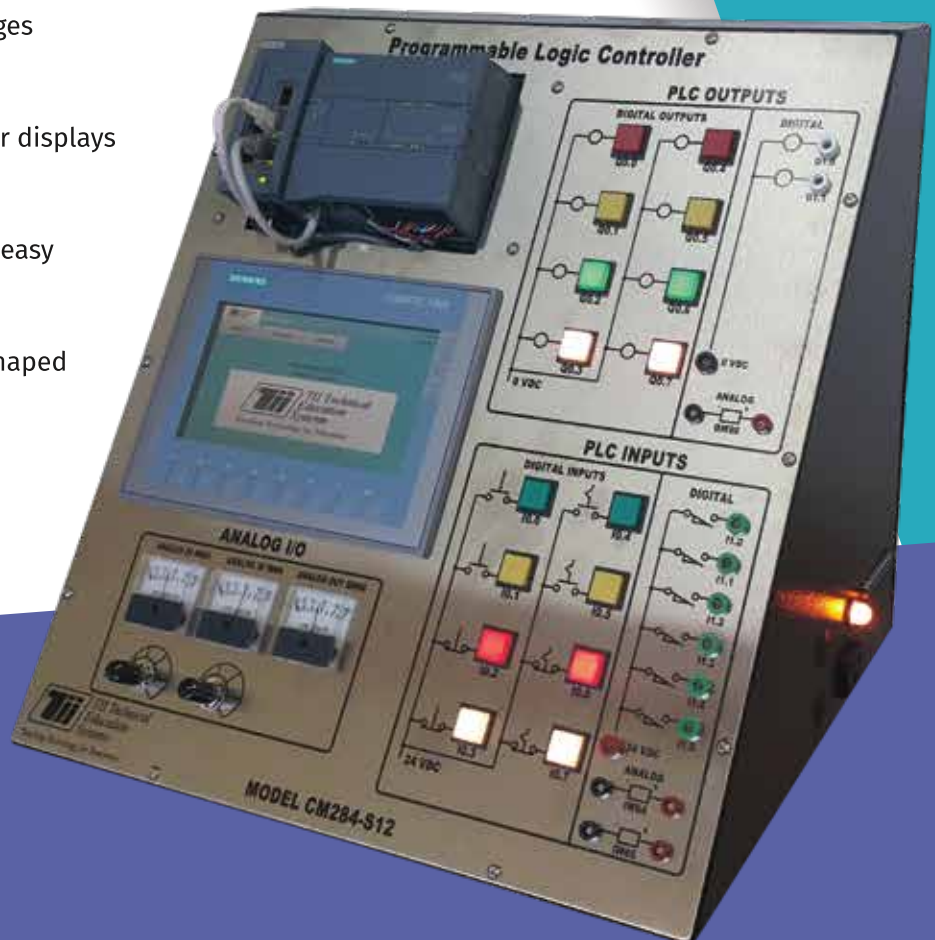
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SIEMENS INTEGRATED PLC AND HMI CM284-S12

The CM284-S12 training system is a complete industrial-based PLC with Human Machine Interface (HMI). This learning module features a state-of-the-art Siemens PLC and HMI. The Siemens PLC platform is a powerful series of programmable automation controllers featuring Windows-based Portal programming software. This trainer will allow students to develop competence in operating, programming, and troubleshooting a true industrial Programmable Automation Controller Portal software.

Our training system is accompanied by an instructor's guide as well as a student manual. This manual is a comprehensive student resource, featuring detailed laboratory exercises which familiarize the trainee with PLC operation, automation connectivity via Ethernet communications, and industrial applications. The curriculum begins with basic wiring concepts and moves onto circuits, logic, and programming.

- Easy access to the PLC digital and analog input / output terminals with banana jack connectors
- Rapid setup and testing of wiring changes
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- Analog potentiometers and panel meter displays
- User-identified external devices
- Built-in Ethernet communications with easy interface to other TII Systems
- Ergonomically-designed steel wedge-shaped frame workstation



Siemens Integrated PLC
and HMI CM284-S12

CONTROL LOGIX INDUSTRIAL COMMUNICATIONS LX755

This learning is a complete Industrial Communications Controls trainer featuring the powerful Allen-Bradley Control Logix Processor. The Control Logix architecture is a state-of-the-art control platform that integrates multiple control disciplines: sequential, motion, drive, and process. Because of this flexible architecture, multiple controllers, network communications, and I/O can be mixed in one chassis.

Our training system will allow students to gain hands-on experience using Control Logix. This includes digital, analog, and Flex I/O; Ethernet and DeviceNet networking communications in an application-oriented setting. Our training system is accompanied by an instructor's guide as well as a student manual. This manual is a comprehensive student resource, featuring detailed laboratory exercises which familiarize with real life industrial communications control platforms and situations.

- Experimentation station is protected with an internal fuse and circuit breaker
- Maximum voltage is limited to 12 VDC for student safety
- Component and circuit protection
- Banana jack and patch cords for easy wiring
- Rugged case mounting with stainless steel panel for table top use



Control Logix Industrial Communications LX755

Visit our website for more information on TII's curriculum: www.tii-tech.com

AC DRIVES ACD40

The ACD-40 is a complete AC Drive training system featuring the Allen-Bradley PowerFlex Variable Frequency Drive. This training system provides a hands-on study of a typical industrial AC variable frequency drive. This education system allows trainees to gain hands-on experience using an AC drive in an application-oriented setting.

The curriculum begins with basic AC motor and drive fundamentals. It quickly moves on to programming the PowerFlex 40 using parameter flow charts and the included Human Interface Module with keypad and display. This comprehensive study finishes by outlining various troubleshooting techniques, focusing specifically on fault troubleshooting with drive system fault simulation to demonstrate the process.

- Easy access to hardware and convenient interfacing to other TII training systems
- All control panel components, lights, and switches can be accessed through banana jacks and electrical patch cords
- Design flexibility enables user to easily interface the ACD-40 with other control devices
- Ergonomically-designed steel wedge shaped-frame workstation



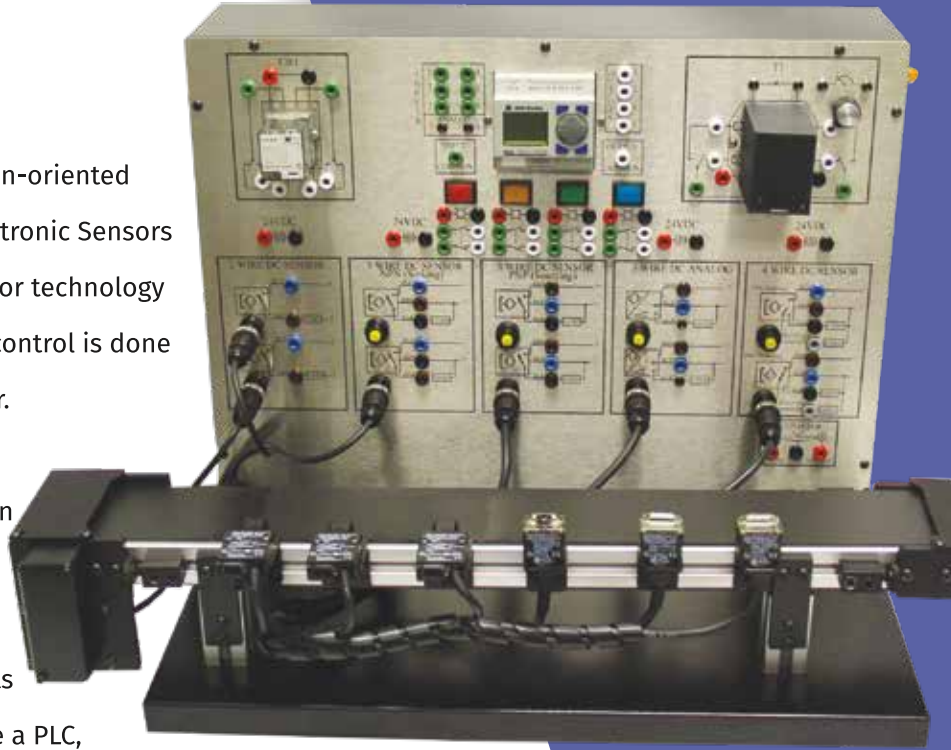
AC Drives ACD40

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ADVANCED ELECTRONIC SENSORS EM600

The EM-600 Series is a comprehensive, application-oriented industrial sensors training system. Advanced Electronic Sensors is designed for hands-on study of industrial sensor technology and control in a user-friendly setting. Electronic control is done through a Programmable “Smart Relay” Controller.

System components and hardware are mounted in a configuration that replicates manufacturing operations. Like a PLC, the “Smart Relay” allows the user to program and control up to eight inputs and four outputs simultaneously. However, unlike a PLC, the simplified logic programming software requires no previous PLC programming knowledge. Users select from a variety of sensor categories and conveyor application, with or without the pneumatic sorting station, to configure the EM-600 Series Training System to their specific needs.



Advanced Electronic Sensors
EM600

- System consists of three parts: base station, sensor package, and conveyor application package
 - o User selects a sensor package with conveyor application complementary to use with the base unit
 - o Optional Conveyor Sorting Station (EM600-AIR): PLC controlled three-position pneumatically operated ejection/sorting station for pushing parts off conveyor
- Sensor Packages:
 - o Photoelectric: Retro-Reflective, Polarized Retro- Reflective, Fixed Focus, Standard Diffuse, Back- ground Suppression, and Transmitted Beam - light source and receivers
 - o Proximity: Inductive (2 sizes), Capacitive, Hall- Effect, Magnetic Reed Switch, and Ultrasonic.
 - o Combination: Three Photoelectric Sensors (Retro Reflective, Standard Diffused, and Transmitted Beam) and Three Proximity Sensors (Inductive - 12 mm, Capacitive, and Hall Effect)
 - o All Photo + All Prox: All six sensors from the Photoelectric Sensor Package and all six sensors from the Proximity Sensor Package
 - o Other: Customer Specified Sensors
- Dimensions: 29 in. L x 17 in. H x 15 in. D with Standard Conveyor without sorting station

MOTOR CONTROL TROUBLESHOOTING TRAINING CENTER KTS100

TII's Motor Control Troubleshooting Training Center is a complete troubleshooting program for industrial, commercial and vocational electrical training. This program includes hardware and instructional materials for learning how to troubleshoot modern motor and relay control systems. The hands-on application provides an in-depth explanation of how motor control circuits operate. Students will acquire practical experience of wiring, operating, and trouble-shooting these circuits.

The KTS-100 Training System offers a comprehensive study for novices and a refresher course for more experienced electricians. Troubleshooting concepts are developed quickly and advanced lessons are designed to challenge the skill of the most experienced electricians. Trainees wire circuits to improve retention of material covered and practice sessions are provided to develop proficient troubleshooters. In these sessions, the trainee will be working with 77 fault conditions or potentially hundreds of combinations.

- Identical to circuits actually used in industrial plants
- 40 single pole, double throw, three-position, flat handle toggle switches mounted on the rear panel
- Switches used to set "short circuit" or "open circuit" faults into panel circuits
- Size: 20" wide, 19" deep, and 15" high
- Training Center Weight: 40 pounds



Motor Control Troubleshooting
Training Center
KTS100

ABOUT TII'S OTHER SYSTEMS

The Advanced Systems series provide the components and hands-on training required to effectively troubleshoot and repair systems used by today's employers in modern industry. This Series offers comprehensive instruction in two major concentrations of advanced industrial skills training: Industrial Fluid Power and PLC-focused Industrial Controls.

From the entry-level student to the experienced professional looking to further their skills, our programs are designed to meet a wide variety of career-oriented needs.

Discover Technology Fundamentals and Integrated Automation with TII.

Technology Fundamentals serves as the building block for a career-focused education experience. Our uniquely designed training systems can function as stand-alone modules or integrated with other TII products to provide a more comprehensive training program.

The **Integrated Automation** series offers complete mobile Computer Integrated Manufacturing Systems (CIM, FMS, Mechatronics) for a wide range of integrated automated training configurations. Trainees will gain authentic industrial automation knowledge and skills on programming, system set up, HMI, system troubleshooting, and more on real world hardware. This series uses Windows-industrial based software communications and interfacing, real world inputs and outputs, creating industry-ready graduates.

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CONTACT **TII TECHNICAL EDUCATION SYSTEMS**
OR YOUR LOCAL REPRESENTATIVE FOR MORE INFORMATION



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