



**TII Technical
Education
Systems**

Teaching Technology for Tomorrow.



INTEGRATED AUTOMATION



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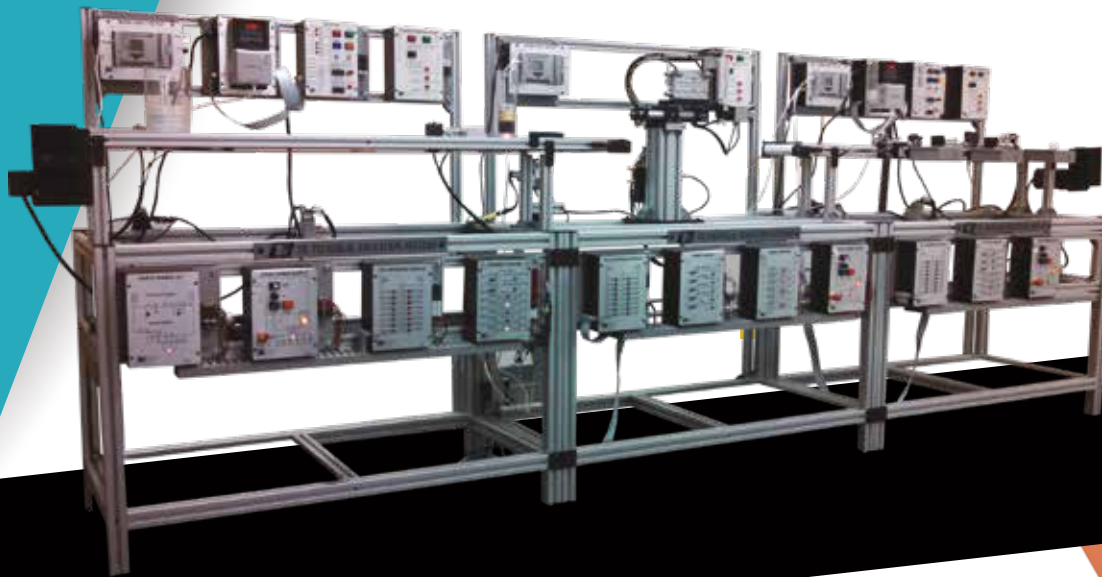


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ABOUT

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.



Mechatronics – FMS-800

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 an Integrated Automation skill set.

INTEGRATED AUTOMATION

TII's Integrated Automation series offers a complete, mobile Computer Integrated Manufacturing System (CIM, FMS, Mechatronics,) as well as smaller specific table top integrated automation systems for a wide range of automated training configurations. Trainees will gain authentic industrial automation knowledge and skills on real world hardware, designed for classroom and student use.

Our technical learning solutions focus on real world applications. Programs feature industrial control components for practical industry experience. Our programs simulate real-life work conditions that assist in the development of a skilled workforce. This series emphasizes career-focused, hands-on learning with a genuine integrated automation experience. Students will develop skills in troubleshooting, and fault identification, while furthering their competence in programming and operating industrial PLCs.

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.

Integrated Learning with TII

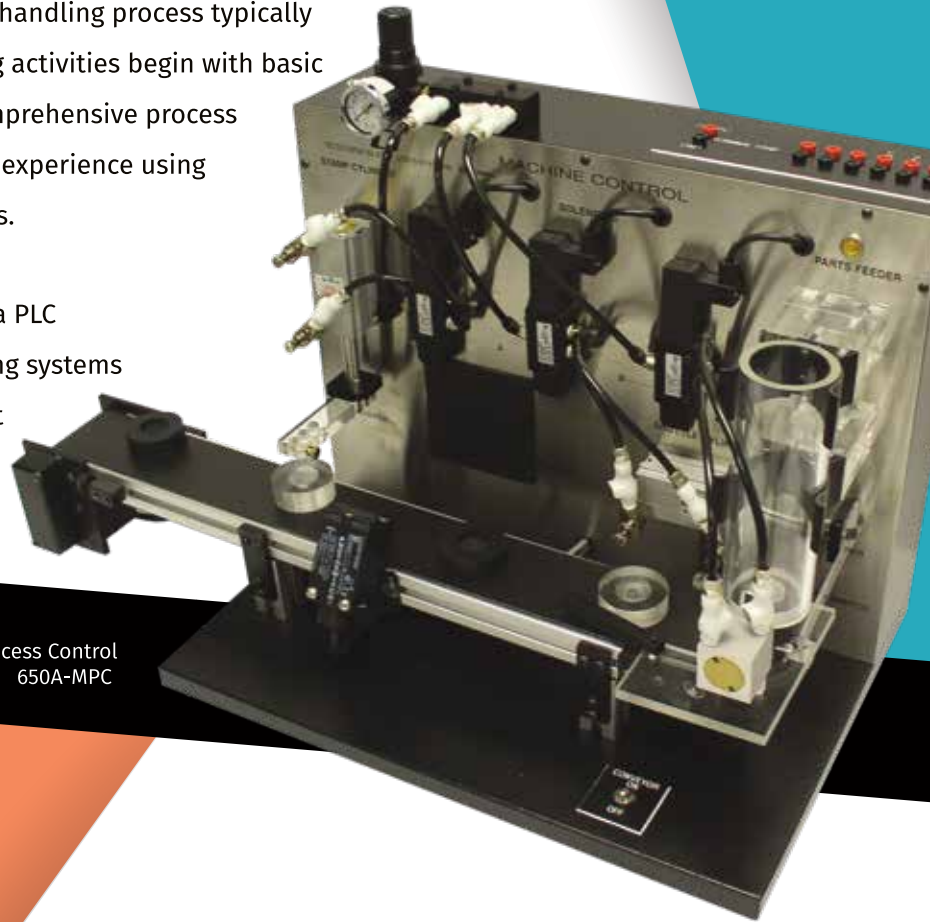
- Emphasizes industry-focused, hands-on learning with STEM applications
- Delivers a program consistent with a technology-driven world
- Professionally written programs increase instructor efficiency and student results
- Flexible curriculum design: Use as an introduction, review or in-depth study
- 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

MACHINE PROCESS CONTROL SYSTEM 650A-MPC

The 650A-MPC Machine Process Control System is an electro-pneumatic PLC application training system. This application replicates an automated material handling process typically found in manufacturing control situations. Training activities begin with basic control concepts and quickly progress to more comprehensive process sequencing activities. Students will gain hands-on experience using valves, actuators, industrial sensors, and conveyors.

- Application-oriented setting controllable by a PLC
- Can be controlled by TII's series of PLC training systems
- Designed for use on a table, bench, or as part of a desktop flexible manufacturing system



Machine Process Control
650A-MPC

ANCILLARY DEVICE CONTROL SYSTEM 650A-ADCS

The 650A-ADCS is an electro-mechanical PLC application training system which demonstrates electro-mechanical inputs and outputs typically found in an industrial environment. This desktop-sized application can be used in stand-alone mode or integrated with other PLC operation training systems. Student exercises begin with basic control concepts and progress to comprehensive process sequencing activities involving multiple devices and the entire training system.

- Can be controlled by TII's series of PLC training systems
- Design flexibility enables user to easily interface with other control devices
- All devices operate at a safe 24 VDC



Ancillary Device Control
System 650A-ADCS

ANALOG PROCESS CONTROL SYSTEM

CM184-APC

The CM184-APC provides a hands-on study of a typical closed loop process control system. Students will gain industrial experience using an assortment of temperature and pressure sensing components to control and monitor a water circulation application. This desktop-sized pumping system fills, drains, and circulates water through two water storage tanks. TII's curriculum is designed to explore control principles using the universal controllers and PLC.

Analog Process Control System
CM184-APC

- Two universal controllers included
- Can interface to a PLC with analog I/O control
- Control Modes: On/Off, Proportional, Integral, Derivative, and Composite

ELECTRO-PNEUMATICS EP250

The EP250 is a comprehensive training system for electronic control of pneumatic technology. This training system offers true electrical control and logic of pneumatic technology in a replicated manufacturing press/stamping and vise/clamping environment. The EP250's curriculum is designed to cover the background, use and application of electronic control of pneumatic components in an application-oriented setting.

- Flexible system design allows for interfacing to PLCs and other external devices
- Electronic control done through a Smart Relay PLC
- Smart Relay allows users to program and control up to eight inputs and four outputs simultaneously



Electro-Pneumatics
EP250

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OUR LEARNING SYSTEMS

The Integrated Automation learning systems use Windows-based software communications and interfacing, emphasizing real world inputs and outputs. Trainees will install, connect, operate, and control robots, valves, actuators, sensors, conveyors and other automation systems and components

The Integrated Automation offers an all-inclusive learning experience in industrial automation and hardware.

MECHATRONICS FMS-800

The FMS-800 Flexible Manufacturing System is part of TII's series of comprehensive manufacturing automation training systems that can be customized to customer requirements. As learning objectives change over time, so too can the FMS-800 System hardware, software, and configuration.

The FMS-800 System consists of three interconnected mobile tables and a fourth controls table (not shown). Each table can be used as a separate, standalone process or integrated into a dynamic three-table multi-stepped comprehensive process. Tables are connected physically and via Ethernet communications. System control is done with a single master PLC with remote I/O at each table for distributed control over Ethernet communications. Alternatively, a dedicated PLC at each table is used for local control with inter-communications among the three tables via Ethernet.

Table I



Note: Individual table PLCs would require Ethernet capability including teaching PLC control, robotic technology, and Ethernet communication skills.

Table I: Feeder Input

- Belt Conveyor
- Parts Feeder
- Assembly Station
- VFD Controls
- Remote I/O (PLC)

Table II: Robot Transfer

- Robot
- Sensors
- Assembly Interface
- Remote I/O (PLC)

Table III: Sorting Output

- Belt Conveyor
- Sorting Station
- Sensors
- VFD Controls
- Remote I/O (PLC)

Table IV: Controls

- Master PLC
- HMI
- Ethernet

Table II

Table III



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

TABLETOP MINI CIM

AMS-107

TII's Tabletop Mini CIM Cell is an automated manufacturing system for teaching the fundamentals of the automation process. The AMS-107 consists of five industrial-grade modules for a complete integrated manufacturing experience including our Milling Center, Pneumatic Robot Arm, Principles of Industrial Sensors, Principles of Programmable Logic Controllers, and Pneumatic Parts Feeder with Sensors.

Students will conduct an in-depth study of each individual component of the small work cell. They will then learn how to integrate these individual modules into a complete manufacturing process. Each module comes complete with a comprehensive curriculum. The curriculum begins with the basic concepts of each component and moves onto system integration and operation. Students will learn how pneumatic components work together in a pick-and-place robot application.

Major Learning Areas:

- Robotics
- Controls
- CNC
- Sensors
- System Integration

Key Items:

Additional optional accessories to expand the AMS107 learning experience include belt conveyor, inspection station, and customized applications.



Robot
B901

The Integrated Cell Consists of:

- A custom extruded aluminum framed mobile table allows for easy mounting and attachment of system components
- TII's B901 Pneumatic Robot with Teach Pendant and Software
- TII's MB665 Principles of Programmable Logic Controllers Trainer (featuring the Allen-Bradley MicroLogix PLC with software)
- A CNC Mill with a Pneumatic Vise
- A Pneumatically Operated Parts Feeder
- TII's MB600 Principles of Industrial Sensors Trainer



MB 600



MB 665

PLC APPLICATION SIMULATION MODULES

TII's series of PLC Application Simulation Modules (PAS-SIM) are designed for students to learn about PLC programming and control in an application-focused environment that simulates real world processes without the cost of purchasing real world hardware.

Instead of using computer simulations or expensive models to imitate real world processes, TII has created miniaturized hardware versions to replicate process control functions along with a graphical representation of the process. Each module is design to replicate a single process. This approach enables students to actually connect and control the PLC I/O and visually monitor the PLC process interaction.

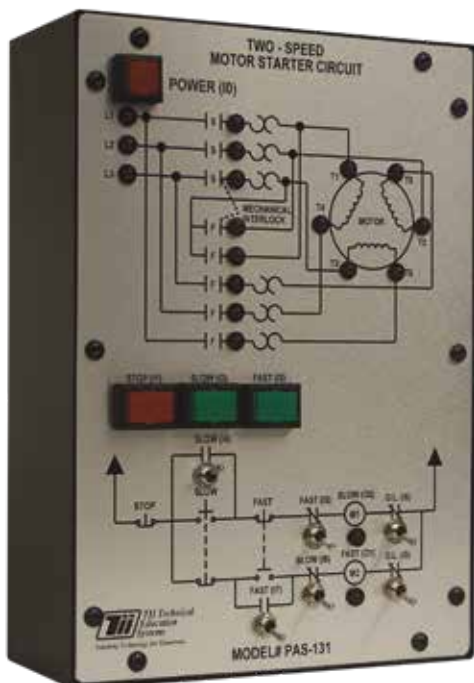
PAS-100 Motor Control Series

Basics

- PAS-101: Basic Start / Stop Control Motor Circuit
- PAS-102: Two-Wire Control Motor Circuit
- PAS-103: Overload Protection Motor Circuit
- PAS-104: Three-Wire Control Motor Circuit

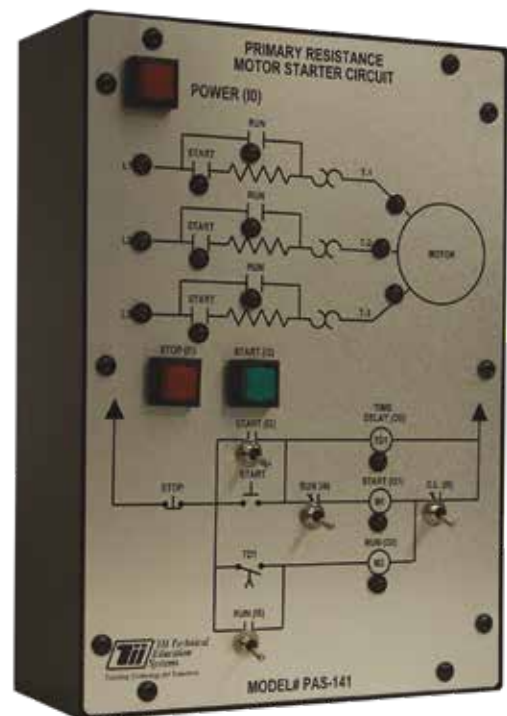
Motion

- PAS-111: Sequence Starting Motor Circuit
- PAS-121: Reversing Motion Motor Circuit
- PAS-122: Plug-Stop Reversing Motor Circuit
- PAS-123: Anti-Plug Stop Reversing Motor Circuit
- AS-131: Two Speed Control Motor Circuit



PAS 131
Two Speed Control
Motor Circuit

PAS 141
Primary Resistance Starting Motor Circuit



Starting

- PAS-141: Primary Resistance Starting Motor Circuit
- PAS-142: Autotransformer Starting Motor Circuit
- PAS-143: Part Winding Starting Motor Circuit
- PAS-144: Wye-Delta Starting Motor Circuit

PLC APPLICATION SIMULATION MODULES

PAS-200 Process Control Series

- PAS-201: Silo Station
- PAS-202: Tank Level Control
- PAS-203: Liquid Mixer
- PAS-204: Vessel Control

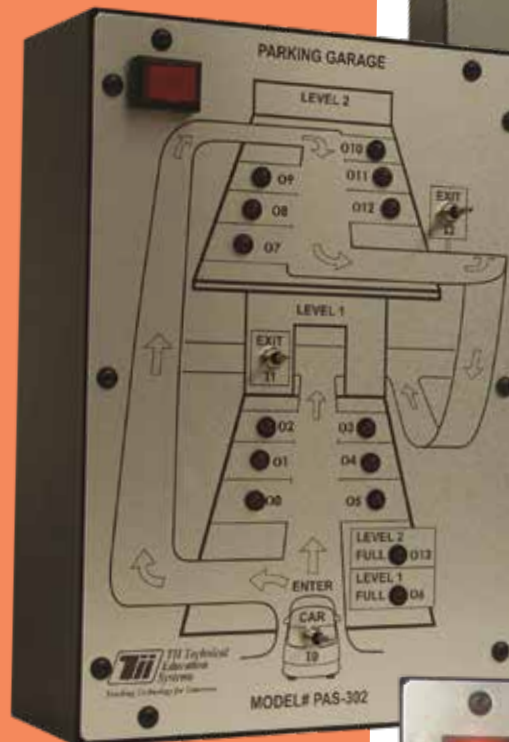
PAS 204
Vessel Control



PAS-300 Device Control Series

- PAS-301: Traffic Light
- PAS-302: Parking Ramp
- PAS-303: Light Sequencer
- PAS-304: Conveyor System

PAS 303
Parking Garage



PAS-400 Machine Control Series

- PAS-401: Elevator
- PAS-402: Car Wash
- PAS-403: Washing Machine
- PAS-404: Garage Door

PAS 403
Washing Machine



PAS-500 Basic Application Series

- PAS-501: Coolant Application
- PAS-502: Batch Processing Application
- PAS-511: Conveyor Application
- PAS-512: Test Station Application

PAS-600 Advanced Applications Series

- PAS-601: Palletizer Application
- PAS-611: Production Line Application
- PAS-621: Automated Paint Booth Application
- PAS-631: Pick-and-Place Robot Application

ABOUT TII'S OTHER SYSTEMS

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.

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 Advanced Systems 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 **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.

CONTACT **TII TECHNICAL EDUCATION SYSTEMS**
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