

JobMaster Training Station

Career and Technology Training Platform



This double sided, portable, modular training bench is the base platform for Intelitek education programs that teach students hands on skills to prepare them for the real world.

Integrated with in-depth theoretical and hands-on workplace training, the courseware prepares students with actual equipment they will encounter on the job.

Intelitek offers curriculum that focus on industrial automation, hydraulics, pneumatics, electrical and electronics, process control, maintenance and more.

All powered by LearnMate, Intelitek's advanced learning management system that includes sophisticated 3-D simulation and allows students to build and test their projects in a virtual environment, before later building and showing the system on the hardware of the Training Station.

Learning Systems Designed for:

- Technical Schools
- Vocational Schools
- Colleges and Universities
- Training Institutes (government, NGO and private)

Supports Curriculum for:

- Hydraulics
- Pneumatics
- PLCs

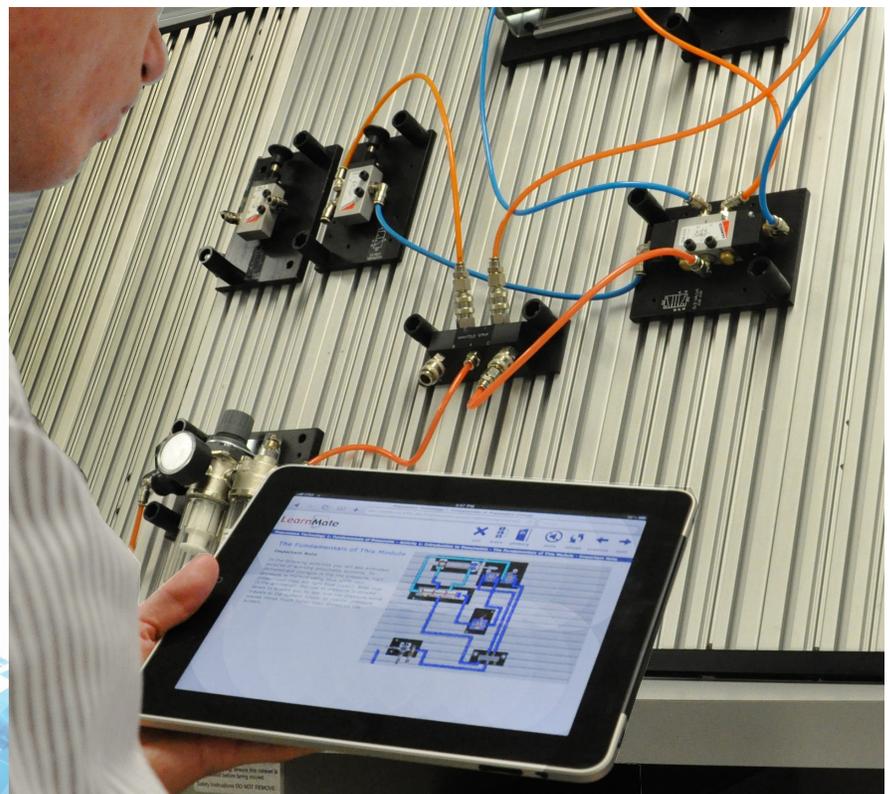
Flexible, Modular, Mobile Platform for Career and Technology Education

Hands on education has been the cornerstone of learning career skills for centuries and Intelitek's JobMaster Training Station is designed to enable educators to use real equipment to teach in-demand industry skills.

This modular training panel for the career tech classroom integrates all the components for teaching advanced industrial automation. The station is a double sided workbench that can be configured with a series of modular components to fit diverse training curriculum, classroom projects or competency tests.

The structured panels create a safe and scalable teaching platform that can be assembled on the fly, reconfigured between classes and expanded over time.

*Reconfigurable Platform Supports
Multiple Learning Configurations*



JobMaster Training Station

With the versatile JobMaster® training station, the electronics control panels and JobMaster technology training courses, you can be sure your educational programs are fully equipped for success!

1 Select Learning Station(s) to accommodate the number of students in your program.

The JobMaster Two-Sided Mobile Learning Station is the hardware foundation of various Intelitek career technology curriculum. This sturdy learning station provides the mounting points for the components used in the courses.

Each side of the learning station can hold multiple components and accommodates groups of students. Students can quickly and easily mount and remove panels to configure their work area for each individual skill.

The versatile learning station facilitates classroom organization. Lockable swiveling casters and the 32" (81 cm) depth enables easy mobility through standard facility doorways.

Simply choose the number of Learning Stations necessary for the scope and size of your program!



2 Install Electronic Control Panels based on individual course requirements.

An essential element of the JobMaster Training Station are the pre-configured electronic components common to many curriculum.

These modules provide the necessary power, electrical and electronic connections for the courseware assuring a safe environment in the classroom while exposing trainees to the same environment they will encounter in industrial settings.

Intelitek's LearnMate Learning Management System showing a part of the Pneumatics Curriculum

3 Select the course(s) you need.

Once you have equipped your program with the appropriate learning stations to accommodate your students, simply choose the courses that cover the skills and concepts needed in your training program.

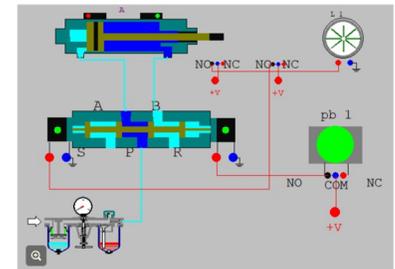
In addition to content, each course includes all the necessary components for use on the learning station, along with any additional tools and hardware used in the skill-based activities.

Learning kits are easily added and exchanged allowing the workspace to be re-configured as multiple students progress through the course. This flexible modular approach allows you to build a custom program for your needs.

Task: Building a Circuit with the Logic Function NOT

Follow the instructions below to build the circuit in PneuMotion. Click [here](#) to run the application.

1. Click the **Component List** button  to open the Component List.
2. Load a **CONDITIONING UNIT** from the **CONDITIONING UNIT** group.
3. Load the following electrical components from the **ELECTRICAL COMPONENT** group:
 - ✓ 5/2 SOLENOID-SOLENOID VALVE
 - ✓ CYLINDER WITH MAGNETIC LIMIT SWITCH



Build the circuit in PneuMotion. Click [here](#) to open PneuMotion.

Description of the Training Station

The JobMaster training station is a base platform for Intelitek education programs that teach high school, vocational school, college and university students hands on skills to prepare for careers in industry.

Integrated with Intelitek curriculum, the system offers in-depth theory and workplace training. The courses from Intelitek prepare students to work with actual equipment they will find in the field.

Using standard mountings and flexible modules, the training station can be configured, dismantled and reconfigured regularly. The station is designed for ease of mobility to allow easy moving to other classrooms or storage. The double sided panel can facilitate one large project or multiple smaller project simultaneously.

Features:

- Modular design
- Double sided
 - Independent groups on single panel
 - Supports identical or different setups
- Mobile with everything onboard for easy transportation between classrooms
 - Fold out side table
 - Rugged, industrial design
- Storage space and workspace built in
- Standard mounting hardware
- Large selection of hardware options

Specifications:

- Dimensions: (WxDxH)
53.4" x 31.5" x 68.9" (1330 mm x 800 mm x 1750 mm)
- Panel Working Area Dimensions: (WxH):
47.3" x 31.5" (1200 mm x 800 mm)
Aluminum panel with T-slots
- Weight : ±250-300 kg
- Optional add on storage cabinet available

Electronics Module Specifications

Power Supply Module:

- Input 110-220 VAC
- Output 24 VDC
- Supplies power to all the electrical modules via bananas plug connections
- ON-OFF Switch and illuminated lamp



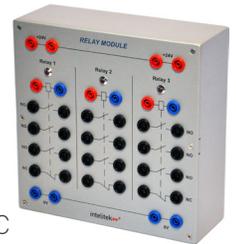
Operational Module:

- 2 buses for 24V DC
- 3 toggles switches
 - 3 way : OFF, momentary ON, ON
- 3 push button- red, yellow & green:
 - One NO contact
 - Red ON/OFF, yellow & green Momentary
- 3 Indicator Lamps
 - lamps & switches are combined
 - Red, yellow & green, 24 VDC
- One Buzzer: 24 VDC



Relay Module

- 2 buses for 24V DC
- 3 relays, 24VDC with led indicator
 - Each relay has 3 NO & 1 NC contacts



PLC Module

- Model: Siemens, Simatic S7-1200 CPU 1215C
 - DC, DC ,RELAY
 - Inputs/outputs:
 - 14 DI, 24DC
 - 10 DO Relay 2A
 - 2 analog input, 10VDC
 - 2 analog output, 0-20mA
- 2 buses for 24V DC



HMI module

- Simatic HMI
- 7" touch display
- LAN connector output
- 24 VDC Input



JobMaster Learning Plan: **Hydraulics Technology**

Hydraulics Curriculum

Intelitek Hydraulic Technology curriculum introduce students to the principles of hydraulics and hydraulically controlled systems commonly used in automated manufacturing environments. Using Hydraulic simulation software, trainees create, modify, operate and observe simulated industrial grade hydraulic and electro-hydraulic devices and circuits. Students will connect different components, change physical parameters and observe system responses.

Hydraulics Technology 1: Fundamentals of Hydraulics

The Hydraulics Technology 1 course introduces students to the principles of hydraulics and and the use of fluid power in automated manufacturing environments.

Hydraulics Technology 2: Fundamentals of Electro-Hydraulics

In the Hydraulics Technology 2 course students create, modify, operate and observe simulated hydraulic and electro-hydraulic devices and circuits. They also have the opportunity to configure and connect simulated components to create a variety of applications, changing physical parameters and observing system responses.

Hydraulics Technology 3: Advanced Hydraulics & Electro-Hydraulics

The Hydraulics Technology 3 course introduces students to advanced hydraulics and electro-hydraulics and the use of fluid power in automated manufacturing environments. Students use software to create, modify, operate and observe simulated hydraulic and electro-hydraulic devices and circuits.



HydraFlex components mounted on the training panel

HydraFlex Training Kits

HydraFlex are educational kits for the assembly of hydraulic circuits and systems. Kits are used to teach the fundamentals of hydraulics at both basic and advanced levels.

The HydraFlex hydraulics training kits give students complete hands-on experience in the design and construction of hydraulic circuits commonly used in industrial applications. Students can mount and configure components on the JobMaster Training Station to create a variety of hydraulic or electro-hydraulic circuits.

Fundamental Hydraulics (package H1)

- 1 Double-acting Cylinder 1-1/8"
- 1 4/3 selector valve, closed center
- 1 Two-way flow control valve
- 2 One-way flow control valves
- 1 Pressure relief valve
- 1 Flow meter
- 2 Pressure gauges
- 2 T-connectors
- 10 Hydraulic hoses, various sizes
- Hex wrench
- 1 Funnel
- 2 Gallons hydraulic oil

Advanced Hydraulics (package H2)

- Double-acting cylinder, diameter 3/4"
- 4/3 selector valve, open center (4/3 directional valve, open center)
- Pressure reducing valve
- Manifold (x2)
- Coiled hoses
- Temperature gauge
- Hoses: 80 cm (x2)

Electro-Hydraulics (package H3)

- 4/3 double solenoid valve (4/3 sol-sol valve, tandem center)
- 2/2 solenoid valve (2/2 sol-spring valve)
- Magnetic sensors (x3)
- Banana plug cables (14 total), assorted colors and lengths: red, black, gray; 610 mm (24"), 1220 mm (48")
- Electric distributor

Required Training Station components

- Electro-mechanical switching unit /PLC unit
- Power Supply - 24 VDC, 4A

HydraMotion CAD Software

HydraMotion is a computer-aided design tool that teaches students how to design and operate hydraulic and electro-hydraulic circuits. The software's HMI animation provides an accurate working simulation of hydraulic devices and circuits.

Hydraulic Component Library

- A wide selection of components for creating hydraulic and electro-hydraulic systems
- Includes: Power packs, Pumps, Valves, Cylinders, Hoses and connectors, Gauges, Accumulators, Filters, Electrical components, Text components

Functions and tools

- Component selection
- Component connections
- Cross-section (symbolic) display of components and circuits
- Schematic display of components and circuits, as they would appear in standard schematic drawings.
- Ladder diagrams
- Dynamic simulation of single component operation
- Timing diagram
- Software can control actual electro-hydraulic circuits.
- Software can perform on-line graphic tracking of hydraulic circuits in operation
- Parameter setting options for piston diameter, pump flow, valve setting, etc.
- Software monitors pressure and flow during circuit operation

JobMaster Learning Plan: Pneumatic Technology

Pneumatics Curriculum

Intelitek Pneumatic Technology curriculum introduce students to the principles of pneumatics and pneumatically controlled systems commonly used in automated manufacturing environments.

Using Pneumatic simulation software, trainees create, modify, operate and observe simulated industrial grade pneumatic and electro-pneumatic devices and circuits. Students will connect different components, change physical parameters and observe system responses.

Pneumatics Technology 1: Fundamentals of Pneumatics

Pneumatics 1 enables students to design basic pneumatic circuits. Applied science experiments are used to demonstrate the physical principles of fluid power.

Pneumatics Technology 2: Advanced Pneumatics

Pneumatics 2 covers a range of advanced pneumatics topics, including timing diagrams and the logic functions AND and OR

Pneumatics Technology 3: Fundamentals of Electro-Pneumatics

Pneumatics 3 enables students to mount and configure components on the panel in order to create a variety of applications. Students connect different components, change physical parameters and observe system responses. The combination of software and industrial equipment allows students to test and troubleshoot simulated circuits before hardware connections are made

PneuFlex Training Kits

PneuFlex is an educational kit for the assembly of pneumatics circuits and systems. It can be used to teach the fundamentals of pneumatics at both basic and advanced levels

The PneuFlex pneumatics training system gives students a complete hands-on experience in the design and construction of pneumatic circuits commonly used in industrial applications. Students can mount and configure components on the JobMaster Training Station to create a variety of pneumatics or electro-pneumatics circuits.

Fundamental Pneumatics (package P1)

Conditioning unit: pressure regulator, pressure gauge, water trap, air filter, lubrication unit; max. inlet pressure: 16 bar; pressure range: 0-8 bar

- 5/2 double air pilot valve (5/2 air-air control Valve)
- 3/2 mushroom push button (3/2 push button valve) (x2)
- 3/2 lever valve (3/2 manually operated valve, toggle valve)
- 3/2 double roller lever valve (3/2 roller valve)
- 3/2 pneumatic valve (3/2 air-spring control valve)
- AND gate
- OR gate
- NOT gate
- Double-acting cylinder
- Manifold
- T-connector (x4)
- Connector (x4)
- Quick-coupler
- Tubing

Advanced Pneumatics (package P2)

- Double-acting cylinder
- 5/2 double air pilot valve (5/2 air-air control valve)
- Single air pilot valve (x2)
- 3/2 double roller lever valve (3/2 roller valve)
- Pneumatic time delay valve
- Manifold

Electro-Pneumatics (package P3)

- 5/2 double solenoid valve (5/2 sol-sol control valve) (x2)
- Inductive proximity sensor (x2)
- Magnetic sensors (pair)
- Banana plug cables (14 total), assorted colors and lengths: red, black, gray; 610 mm (24"), 1220 mm (48")

Required Training Station components

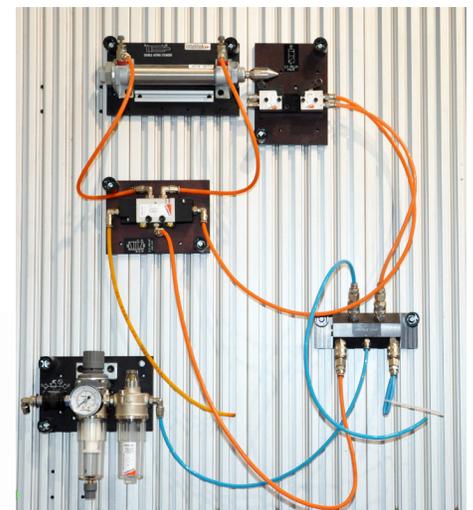
- Electro-mechanical switching unit /PLC unit
- Power Supply - 24 VDC, 4A

PneuMotion CAD Software

PneuMotion is a computer-aided design tool that teaches students how to design and operate pneumatic and electro-pneumatic circuits. The software's HMI animation provides an accurate working simulation of pneumatic devices and circuits.

The PneuMotion Pneumatic Simulator provides a virtual workspace where the students can build and simulate pneumatic and electro-pneumatic circuits using any combination of the components provided. Access to actual hardware is not required.

- Components can be connected in any combination, with no limitation on the number of components used.
- The program creates a technically accurate simulation of any pneumatic or electro-pneumatic circuit.
- The circuit functioning can be simulated at a slow speed, thus enabling the students to follow the flow of air through the system
- The circuit components can be viewed in internal view, aiding the students in understanding how each component functions.
- The circuit components can be viewed in symbolic view, thereby training students to interpret pneumatic diagrams.
- Timing and ladder diagrams are automatically generated.
- Easily understandable design error messages are displayed.
- Circuits can be saved and reloaded or shared with others



PneuFlex components mounted on the training panel

JobMaster Learning Plan: Programmable Logic Controllers (PLC)

PLC Curriculum

Intelitek's Programmable Logic Controller courseware gives students a solid grasp of industrial PLCs, ladder logic programming, inputs and output devices and electrical control. PLC hardware that is part of the JobMaster Training Station and is integrated with PLC software that lets students observe and understand the control logic behind the operation of industrial PLCs. The Programmable Logic Controllers courses emphasize PLC theory and basic programming. Students learn to program a PLC and simulate industrial applications that require electrical control.

PLC Technology 1: Fundamentals of Ladder Logic

PLC Technology 1 emphasizes the fundamentals of PLC theory and basic programming. In this module, students learn how to program and use PLCs in industrial applications that require electrical control.

The module includes the testing of input and output responses to ladder diagrams students program.

PLC Technology 2: Advanced Ladder Logic

PLC Technology 2 focuses on advanced PLC programming and ladder logic. In this module, students learn how to use advanced functions of PLC programming implementing projects that use the advanced functions.

PLC Technology 3: PLC-Controlled Pneumatic Systems

In PLC Technology 3 students learn how to control pneumatic systems using a PLC. Basic pneumatic terminology is introduced and explained, and the students simulate the operation of pneumatic components

PLC Technology 4: PLC-Controlled Hydraulic Systems

In PLC Technology 4 students learn how to control hydraulic systems using a PLC. Basic hydraulic terminology is introduced and explained, and the students simulate the operation of hydraulic components.

PLC Training Kits

PLC Options:

The JobMaster Training Panel is designed to work flexibly with industry equipment and supports a variety of PLC modules including:

- Siemens SIMATIC S7-1200
 - 14 digital inputs, 10 relay outputs
 - 2 analog inputs, 2 analog outputs
 - Communications: PROFINET
 - Power supply: 24 VDC
 - Work memory: 125 kbyte
 - Load memory: 4 Mbyte
 - Programming language: STEP 7
- MicroLogix 1000
 - 10 inputs, 24 VDC sink/source
 - 6 relay outputs
 - RS232 and DH485 communication
 - Power supply 20.4-26.5 VDC
 - 1K EEPROM Memory

PLC Kit Contents:

DC servo motor

- 4 VDC servo motor

Optical encoder unit

- One-slot rotating disk with photoelectric sensor
- Supply voltage: 5 to 24 VDC \pm 10% Ripple P•P 10% or less
- Current: 100mA
- NPN, Normally Open (sink)

Lead screw

- Lead screw with a nut is connected to the motor output shaft by means of a coupling
- Nut detection: mechanical limit switch, inductive proximity sensor

Limit switch, small

- Normally open

Limit switch, large

- Normally open

Inductive proximity Sensor

- Supply Voltage: 10-30 VDC
- Maximum Consumption: 200mA
- NPN, Normally Open (sink)
- M12 thread
- Length: 50 mm
- Normal Operating distance: 6 mm

The PLC training uses components from the JobMaster Training Panel modules like:

- Output lamps
- Buzzer
- Pushbutton and toggle switches

PLC Software

PLC curriculum use computer-aided design tools that teaches students how to program and use PLCs. Where available, the courseware uses the software from the PLC vendor or Intelitek's PLCMotion software.

Standard Features

PLC editing module

- A fully operational editor for creating PLC ladder diagrams that incorporates all the basic functions of PLC programming.
- Run, debug and print ladder diagrams from within the PLC editor, making programming easier.
- Create logic control applications by selecting PLC programming functions (inputs, outputs, timers, counters and flags) and linking these instructions to variable addresses.

PLC simulation module

- Enables online and offline activation of the application in the HMI alone, or together with actual equipment.
- PLC simulator runs the ladder logic control program while the HMI responds accordingly.

Ladder diagrams

- Export and display ladder diagrams as IEC 1131-3 Instruction List.

PLC training panel simulator module

- Activates the PLC simulator with the panel HMI interface.
- Allows students to run a previously programmed ladder logic and observe it in the simulation.

HMI graphic editor module

- An interactive graphic module for creating any PLC-controlled system.
- Develop original HMI (human machine interface) applications and visualize production lines and other industrial processes.

Functions

- Simulations of sample HMI applications

