JobMaster Pneumatics Technology Training

Intelitek's Pneumatics Technology training is a three part curriculum for learning air power to prepare students for careers in industry. The courseware is delivered in conjunction with the JobMaster Training Station (JMTS) and the LearnMate LMS. The hands-on, task-based skills training educates students on the fundamentals and advanced principles of Air Power and Pneumatic Systems. Students will learn to configure industrial pneumatic components in order to create a variety of pneumatic applications. Students can connect different elements, change physical parameters and observe system responses. The unique combination of software, simulation and real industrial equipment introduces students to the design, programming and control of pneumatically operated systems.

Course List

Pneumatics Technology 1: Fundamentals of Pneumatics

Introduces the principles of pneumatics and pneumatically controlled systems commonly used in automated manufacturing environments

Skills Covered

- Introduction to Pneumatics
- Atmospheric Pressure and Vacuum
- Atmospheric Pressure, Vacuum and Mechanical work
- The Double-Acting Cylinder
- 3/2 Valves
- Controlling a Piston with PBs
- 5/2 Air-Operated, Air-Returned Valve
- 5/2 Air-Air Valves
- Laws of Gases I
- Laws of Gases II
- 3/2 Air-Operated, Spring-Returned Valve
- Spot Welding System
- 3/2 Roller Valves
- Task - A Semi-Automatic System

Pneumatics Technology 2: Advanced Pneumatics

Covers advanced principles and components of pneumatics and pneumatically controlled system, including timing diagrams and the logic functions AND and OR.

Skills Covered

- The Logic Function AND
- Implementing AND in a Pneumatic Circuit
- The Toggle Valve
- Using AND to Build a Fully Automatic System
- The Logic Function OR
- Implementing OR in a Pneumatic Circuit
- Circuit with Two Double-Acting Cylinders
- Sequential Cycle
- A Delay
- Sequential Control with a Timed Delay
- Opposing Control Signals
- Timing Diagrams
- Using a Single Pilot Valve to Prevent Opposing Control Signals
- Using A Single Pilot Valve in a circuit

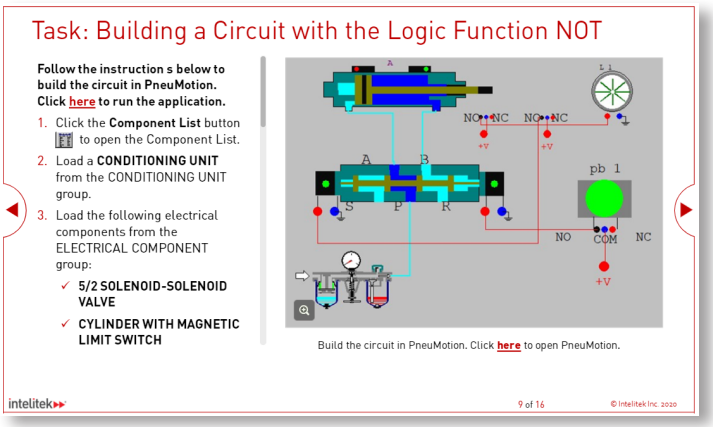
Pneumatics Technology 3: Fundamentals of Electro-Pneumatics

Enables students to grasp the fundamentals of pneumatic and electro-pneumatic controlled systems commonly used in modern automated manufacturing environments. In this module, students are exposed to the function and operation of electric/electro-pneumatic components such as switches, relays, timers, electrical push buttons, solenoid operated valves and proximity sensors.

Skills Covered

- Review Pneumatics Concepts
- Building a Basic Electrical Circuit
- The 5/2 Solenoid-Spring Valve
- The 5/2 Solenoid-Solenoid Valve
- Magnetic Switches
- Implementing the Logic Function AND
- Implementing the Logic Function OR
- Implementing the Logic Function NOT
- Sequential Operation
- The Relay
- Unlatching a Relay
- Building a Fully Automatic Circuit
- Adding a Delay Using an Electric Timer
- Unlatching a Fully Automatic Circuit
- Measuring Cylinder Speed

Example of a training task in the Pneumatics curriculum



JobMaster Pneumatic Technology Training (continued)

JMTS Pneumatics Training System

The JMTS pneumatics training system gives students complete hands-on experience in the design and construction of pneumatic circuits commonly used in industrial applications.

Standard Features

- JMTS is an educational panel for the assembly of pneumatics circuits and systems. Students can mount and configure industrial pneumatic components on the training panel to create a variety of applications. It can be used to teach the fundamentals of pneumatics at both basic and advanced levels,
- The components can easily be repositioned, coupled and uncoupled, to form a variety of pneumatics or electro- pneumatics circuits.

Hardware Kit P1 for Fundamentals of Pneumatics

- 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

Hardware Kit P2 for Advanced Pneumatics

- 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

Hardware Kit P3 for Electro-Pneumatics

- 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")

JMTS Electrical Modules Required:

(not included)

- Power Supply 24 VDC, 4A
- PLC unit

PneuMotion Software

PneuMotion is a computer-aided design tool and simulator that provides students a virtual workspace to learn how to design and operate pneumatic and electro-pneumatic circuits. PneuMotion can be used offline or for online operation and control of pneumatic circuits. The software's HMI animation provides an accurate working simulation of pneumatic circuits.

Pneumatic Component library

- A wide selection of components for creating pneumatic and electro-pneumatic systems
- Conditioning unit: provides pressurized air to the system
- Valves: 3/2 roller operated spring returned valve (used as pneumatic limit sensor and switch); 3/2 air operated air returned valve; 3/2 air operated spring returned valve; 3/2 manually operated spring returned valve (push button valve); 3/2 manually operated manually returned valve (toggle valve); 5/2 air operated spring returned valve; 5/2 air operated air returned valve
- Cylinders: Double acting cylinder. The cylinder's extension and retraction times are adjustable; spring return cylinder (2 types); double acting cylinder with two roller valves; diaphragm operated cylinder
- Miscellaneous: logic gate AND; logic gate OR; single pilot valve; pneumatic delay; pneumatic counter
- Connectors: T-connector; manifold
- Electrical components: 5/2 solenoid operated solenoid returned valve; 5/2 solenoid operated spring returned valve; cylinder with magnetic switches fitted as limit sensors; relay with four changeover contacts; V+ power supply; pushbutton; lamp; electronic delay unit; electronic counter
- Text component: symbolic and user defined text captions can be added to diagrams

Standard Features:

- Components can be connected in any combination, with no limitation on the number of components used
- Creates a technically accurate simulation of any pneumatic or electro-pneumatic circuit
- Circuit functioning can be simulated at a slow speed, thus enabling the students to follow the flow of air through the system
- Circuit components can be viewed in internal view, aiding the students in understanding how each component functions
- 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, reloaded or shared

Languages

- English
- Spanish
- Chinese (Simplified, China)

Computer Requirements

- Intel I5 or equivalent
- 4GB RAM
- 2 GB available disk space
- Win10 – 32 or 64 bit

Ordering Information

Curriculum

Pneumatics Technology 1: Fundamentals of Pneumatics	77-8070-0010
Pneumatics Technology 2: Advanced Pneumatics	77-8070-0020
Pneumatics Technology 3: Electro-Pneumatics	77-8070-0030

Hardware

JMTS P1 - Pneumatics Training kit for Pneumatics 1	00-1904-1000
JMTS P2 - Pneumatics Training kit for Pneumatics 2	00-1905-1000
JMTS P3 - Pneumatics Training kit for Pneumatics 3	00-1906-1000

Software

PneuMotion	63-9239-0000

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