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ROBOTICS

Electropneumatic

Hytech Electropneumatic Training Kit

www.hytechdidactic.com

Hytech Electropneumatic Training Kit – Structural Description

The Hytech Electropneumatic Training Kit is a state-of-the-art, dual-sided training system designed to provide hands-on learning in Electropneumatics. Engineered for flexibility, ease of use, and real-world applicability, the structure of this training kit supports both modern PLC-HMI-based control and conventional pneumatic operations, making it an ideal platform for technical institutions, vocational centers, and engineering colleges

Robust and Ergonomic Structure

- The entire structure is fabricated using a combination of high-strength aluminium extrusions and durable powder-coated mild steel, ensuring longevity, structural integrity, and corrosion resistance.
- Designed as a mobile unit, the training kit is mounted on heavy-duty castor wheels with integrated brakes, allowing easy movement and stable operation during experiments.
- Dual-Faced Design: The unit is accessible from both sides, enabling simultaneous usage by multiple students or groups.

Worksurfaces – Designed for Practical Learning

Each face of the training kit includes two distinct worksurfaces:

1. Vertical Worksurface:

- Made from aluminium extrusions
- Dimensions: 720 mm (Height) × 1500 mm (Length)
- Mounted at a slanted angle to provide ergonomic comfort during valve mounting, connection, and operation

Hytech Electropneumatic Training Kit – Structural Description

2. Horizontal Worksurface

- Also made from aluminium extrusions
- Dimensions: 180 mm (Width) × 1500 mm (Length)
- Offers ample space for positioning actuators, cylinders, and other hydraulic components

The side profiles of the structure are also crafted using aluminium extrusions and feature channels/hooks for hanging patch cords or pneumatic hose pipes, maintaining a tidy and organized workspace.

Tool-Free Mounting System for Valves and Actuators

A key feature of the Hytech kit is its quick-mount valve and actuator system:

- Pneumatic valves are mounted using one-touch fittings that eliminate the need for external tools such as Allen keys.
- This makes the system highly modular and reconfigurable, allowing users to easily mount, reposition, or remove components as needed.
- The structure includes a dedicated storage unit for keeping valves and manifolds securely when not in use, ensuring longevity and easy access.

Optional Control Panel with Modular Electropneumatic Components

Mounted at the top of the structure, the mild steel control panel serves as the electrical interface for Electropneumatic control. It can be customized with the following plug-and-play modules:

- **PLC & HMI Module**
  - Siemens S7-1200 PLC
  - Siemens KTP-700 HMI
- **Power Management Module**
  - Power Bank
  - Power ON/OFF module
- **Relay and Control Modules**
  - 2 Changeover – 8 Relay Module
  - Electronic Timer and Counter
  - Indicator Module
  - Push Button and Selector Switch Module

These modules are interchangeable and optional, allowing institutions to tailor the system according to curriculum or training objectives.

Flexible Training Modes

The dual-faced design enables a dual-mode operational approach:

- One side can be configured for PLC-HMI or IIoT-based control
- The opposite side can be dedicated to relay-based Electropneumatic circuit building

This versatility empowers students to understand the transition from traditional control systems to modern automation technologies—all within a single integrated platform.

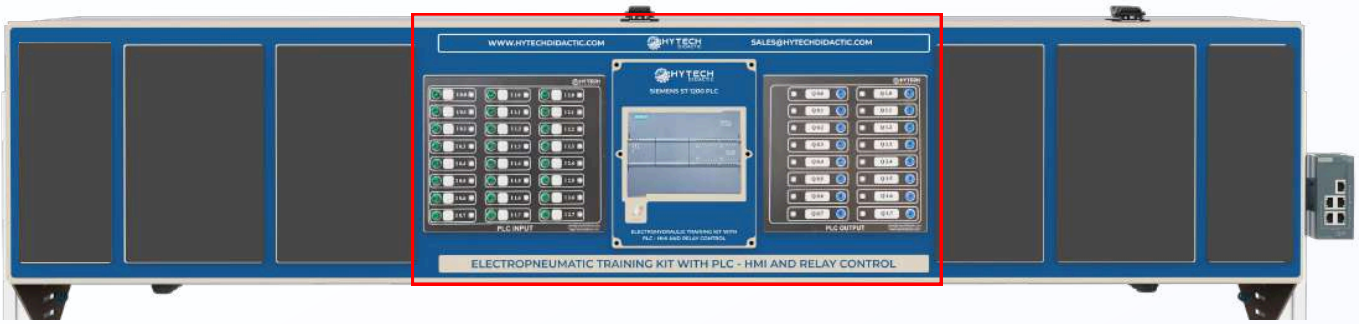
Moreover, the control panel can be removed entirely, transforming the unit into a conventional pneumatic training kit—ideal for foundational pneumatic training without electrical integration.

The Hytech Electropneumatic Training Kit is a complete, modular, and industry-aligned training system offering:

- Dual-sided usability
- Ergonomic and tool-free design
- Modern PLC, HMI, and relay control integration
- Compatibility with IIoT-based expansion
- Flexible configuration for evolving training needs

Its robust construction, mobility, and flexibility make it a preferred choice for institutions aiming to deliver comprehensive Electropneumatic training in both traditional and modern industrial environments.

PLC (Siemens S7-1200) and HMI (Siemens KTP-700) Module with PLC Input Module and PLC Output Module



- For Electropneumatic Training Applications

The PLC and HMI module is an advanced automation control unit designed to complement and enhance the capabilities of the Hytech Electropneumatic Training Kit. Built around the industry-grade Siemens S7-1200 PLC and KTP-700 HMI, this module allows students to understand the full cycle of Electropneumatic automation—from signal acquisition to real-time control—using both hardwired logic and modern interface programming.

Key Components and Functional Integration:

1. Siemens S7-1200 PLC

- Compact, scalable, and suitable for industrial applications, the S7-1200 serves as the core processing unit for controlling the pneumatic actuators, valves, sensors, and switches integrated within the training kit.
- The PLC enables logic programming, cycle execution, and real-time response based on field inputs, making it an ideal platform for Electropneumatic process control.

2. Siemens KTP-700 HMI

- A 7-inch color touch panel that provides graphical visualization, manual controls, and parameter adjustments for hydraulic circuits.
- Students can use the HMI to monitor status, initiate cycles, and control actuators like pneumatic cylinders and solenoid valves, making the learning process interactive and intuitive.

3. TIA Portal Software (Included)

- The training kit includes a TIA (Totally Integrated Automation) Portal License, enabling learners to design and simulate complex automation logic with seamless integration between PLC and HMI.
- The TIA platform supports user-friendly, drag-and-drop programming using Ladder Logic, FBD, or Structured Text languages.

I/O Interface and Connectivity

The module includes dedicated input and output interface units that bridge the PLC with the Electropneumatic components via 2mm banana sockets:

PLC Input Module

- Connected directly to the S7-1200 PLC through hardwired terminals
- Equipped with 2mm banana jacks allowing users to connect signals from field devices like limit switches, pressure sensors, or manual controls
- Each input point includes a built-in override push button, enabling learners to simulate input signals for troubleshooting or programming verification

PLC (Siemens S7-1200) and HMI (Siemens KTP-700) Module with PLC Input Module and PLC Output Module

- **PLC Output Module**
  - Outputs from the PLC are routed to this module via hardwired connections
  - Field outputs such as pneumatic solenoid valves, indicators, and relays can be triggered using banana plug connections
  - Provides a safe and modular interface to test different control scenarios

OPC-UA and Simulation Integration

In addition to physical control, the module supports OPC-UA protocol, allowing:

- Seamless connection with PC-based simulation software
- Virtual testing of logic sequences prior to hardware deployment
- Integration with Digital Twin platforms for hybrid training environments

This makes the module highly suitable for remote training, blended learning models, and virtual commissioning exercises.

Applications in Electropneumatic Training

When integrated with the Hytech Electropneumatic Training Kit, this PLC-HMI module enables learners to:

- Automate pneumatic cylinder movements based on sensor feedback
- Implement time-delay functions, counter-based logic, and safety interlocks
- Design start/stop control sequences for pumps or actuators
- Simulate sequential operations, such as clamping, pressing, or sorting in industrial settings
- Switch seamlessly between relay-based and PLC-based circuit designs using the same training platform

The PLC (Siemens S7-1200) and HMI (Siemens KTP-700) Module adds intelligent control, real-world automation experience, and programming flexibility to the Hytech Electropneumatic Training Kit. By offering direct interaction with sensors, actuators, and user-defined logic, this module helps learners build foundational and advanced skills in:

- Electropneumatic control systems
- PLC programming and HMI development
- Industrial communication and simulation
- Troubleshooting and real-time diagnostics

Its modularity and integration make it a powerful educational tool aligned with modern industrial automation standards.

Power Bank And Power ON Module

— Centralized Power Management for Electropneumatic Training

The Power Bank and Power ON Module is a key component of the Hytech Electropneumatic Training Kit, providing centralized control and safe power distribution across the entire system. It simplifies operation, enhances safety, and ensures consistent performance of all training modules.

The Power Bank and Power ON Module offers a streamlined, safe, and structured way to manage power within the Hytech Electropneumatic Training Kit. It supports both modern control systems and conventional training needs, making it an essential part of any well-equipped automation training setup.

Key Features:

1. **Main Power Control:**
   - A single ON/OFF switch allows users to power up the entire training kit from one location, streamlining setup and ensuring safe operation.
2. **Pneumatic Compressor Activation**
   - Includes a dedicated switch for the Pneumatic Compressor, allowing users to control it independently without affecting other components.
3. **Integrated 24V DC Power Bank**
   - The built-in 24V power supply distributes power to all connected modules such as PLCs, HMIs, relays, and sensors, ensuring reliable and safe operation.
4. **Modular Connections**
   - Standardized connectors allow other modules to be easily powered through this unit, supporting quick setup, clean wiring, and easy module replacement.
5. **Safety and Indicators**
   - Equipped with overload protection and optional LED indicators to help users monitor system status and troubleshoot power-related issues efficiently.

Role in Electropneumatic Training:

This module provides:

- Centralized startup and shutdown of the entire kit
- Reliable 24V supply for all electropneumatic components
- Independent control of Pneumatic Compressor for flexible circuit execution
- Enhanced user safety and energy management

2 Changeover – 8 Relay Module

— For Relay-Based Control in Electropneumatic Training

The 2 Changeover – 8 Relay Module enhances the Hytech Electropneumatic Training Kit by enabling relay logic-based experiments. With 8 relays (each with 2 changeover contacts), it allows students to design, test, and troubleshoot control circuits, building core automation skills and preparing them for both traditional and PLC-based systems.

Key Features:

1. Relay Configuration

- The module includes 8 electromechanical relays, each with 2 changeover (DPDT) contacts, allowing for multiple circuit control configurations.
- These relays are capable of switching both low-voltage DC and standard field-level signals, making them ideal for controlling pneumatic solenoid valves, indicators, and interlocks.

2. Hands-On Relay Logic Implementation

- Enables users to design, wire, and troubleshoot real-world relay-based logic circuits such as: **Start/Stop controls, Sequential operations, Interlocks and safety loops, Timed actuation and signal switching**
- Promotes a deep understanding of fundamental control principles and the behavior of relay-driven circuits.

3. Easy Integration with Electropneumatic Components

- Directly interfaces with pneumatic actuators, directional control valves, and sensors mounted on the training kit.
- Supports 2mm banana jack connections, allowing quick and tool-free wiring between the relay module and field devices.

4. Educational Value

- This module allows students to visualize and trace signal flow, enhancing comprehension of electromechanical switching.
- Acts as a stepping stone between conventional relay logic and advanced PLC-HMI control systems, reinforcing the progression of automation learning.

Applications in Electropneumatic Training

In the Hytech Electropneumatic Training Kit, the 2 Changeover – 8 Relay Module enables learners to:

- Operate solenoid-actuated pneumatic valves without PLC intervention
- Understand the logic behind manual and automatic control circuits
- Develop troubleshooting skills for hardware-based automation systems
- Configure redundant or fail-safe control strategies for safety-critical circuits

This module is particularly useful for teaching basic automation, ladder logic principles, and relay-to-PLC transition understanding.

Electronic Timer And Counter Module

— For Time and Event-Based Control in Relay-Driven Electropneumatic Systems

The Electronic Timer and Counter Module enhances relay-based operations in the Hytech Electropneumatic Training Kit by adding time-delay and event-counting functions. It enables users to implement dynamic control logic such as delayed actuator movement and cycle counting.

This module acts as a learning bridge between basic relay circuits and advanced automation logic, helping students develop practical, industry-relevant skills in timing and sequence-based control.

Key Features and Functions:

1. Integrated Timer Functions

- Supports ON-delay, OFF-delay, and cyclic timing operations
- Allows users to control pneumatic actuators based on time settings, such as:
  - Delayed extension or retraction of cylinders
  - Timed signal activation
  - Sequential actuation with set intervals

2. Counter Capabilities

- Enables event-based control by counting input pulses or trigger signals
- Ideal for applications like:
  - Cycle counting of repetitive operations
  - Limiting actuator strokes after a predefined number of events
  - Triggering outputs after reaching set counts

3. User-Friendly Interface

- Configurable settings for time (in seconds or milliseconds) and count thresholds
- Equipped with input and output terminals compatible with 2mm banana connectors for seamless integration with other relay and field modules

4. Educational Relevance

- Helps students understand the use of timers and counters in automation without the complexity of PLC programming
- Reinforces the logic of delay-based and event-triggered control in a real-world Electropneumatic system

Applications in Electropneumatic Training

When integrated into the Hytech Electropneumatic Training Kit, the Electronic Timer and Counter Module enables learners to:

- Implement delayed response circuits for pneumatic actuators
- Design time-based interlocks and sequential operations
- Conduct experiments involving cycle counting and operation limits
- Understand the role of timing and counting in process automation and safety logic

Indicator Module

— Visual Feedback for Relay-Based Electropneumatic Operations

The Indicator Module enhances the Hytech Electropneumatic Training Kit by providing real-time visual feedback during relay-based experiments. With 15 LED indicators, it allows users to monitor the status of signals and outputs within a control circuit.

This module improves functionality, supports faster troubleshooting, and helps students better understand circuit behavior—making it an essential tool for developing core automation skills.

Key Features and Functions:

1. **15 Individual Indicators**
   - Each indicator corresponds to a dedicated input or output point in the relay control circuit.
   - Useful for displaying the status of:
     - Relay activations
     - Solenoid valve triggers
     - Sensor responses
     - Output conditions in time-delay or counter-based applications
2. **Real-Time Visual Feedback**
   - LEDs illuminate instantly when signals are active, helping users trace logic flow, verify wiring, and debug circuits with ease.
   - Greatly improves understanding of how relay logic sequences affect Electropneumatic components.
3. **Plug-and-Play Interface**
   - Equipped with 2mm banana socket connectors for easy integration with relay outputs or field wiring.
   - No additional configuration is required, making it suitable even for beginner-level users.
4. **Educational Value**
   - Helps learners visualize circuit behavior without relying solely on physical movement of actuators or system pressure changes.
   - Reinforces understanding of input-output mapping, signal propagation, and fault detection in a relay-controlled system.

Applications in Electropneumatic Training

In relay-based Electropneumatic setups, the Indicator Module serves multiple purposes:

- Confirming relay output activation
- Verifying correct signal routing to pneumatic components
- Enhancing safety by providing pre-actuation feedback
- Supporting step-by-step logic testing and experimentation

Push Button And Selector Switch Module

— Manual Input Interface for Relay-Based Electropneumatic Control

The Push Button and Selector Switch Module serves as a key manual input interface for relay-based operations in the Hytech Electropneumatic Training Kit. It features industrial-grade push buttons and selector switches that let users manually initiate, interrupt, or toggle control signals during experiments.

This module adds hands-on interactivity, helping students understand operator inputs, relay logic, and interface control—bridging theory with real-world automation practice.

Key Features and Functions:

1. Multiple Push Buttons

- Includes momentary-type NO (normally open) and NC (normally closed) push buttons
- Used to simulate start, stop, reset, or emergency stop conditions in pneumatic circuits
- Ideal for testing manual actuation of relays and valve operations

2. Rotary Selector Switches

- Offers 2-position and 3-position selector switches to enable users to choose between different circuit modes or states
- Useful for applications like:
  - Manual/Auto selection
  - Direction control (extend/retract)
  - Mode switching in sequential operations

3. Field Connection Ready

- All push buttons and switches are connected via 2mm banana jacks, allowing easy wiring to relay inputs, indicator modules, or other field devices
- Modular design enables quick reconfiguration of input setups without tools

4. Educational Benefits

- Helps learners understand the role of manual input devices in industrial control systems
- Facilitates real-world practice of input signal mapping, circuit control, and operator interface design

Applications in Electropneumatic Training:

When used in relay-controlled setups, this module enables:

- Manual triggering of pneumatic actuators
- Testing of interlocks and safety logic
- Simulating operator-initiated actions
- Learning how field inputs interact with relays, indicators, and output devices in an Electropneumatic system

HMI Design And Integration In The Hytech Electropneumatic Training Kit: Enhancing Control And Operational Understanding

The Hytech Electropneumatic Training Kit introduces students to HMI-based system control, a key element of modern industrial automation. By interacting with Electropneumatic systems through graphical interfaces, learners gain real-world experience in monitoring and managing automated operations.

HMI integration helps bridge machine logic and human interaction, enhancing conceptual understanding and preparing students with practical skills for controlling, monitoring, and optimizing Electropneumatic systems in industrial settings.

Educational Relevance:

Through the HMI, users can:

- Monitor system parameters such as cylinder positions, pressure levels, and actuator status
- Initiate and control sequences using soft buttons and touch inputs
- Visualize process flow in real-time, which reinforces circuit logic understanding
- Implement features such as timing controls, counters, and manual overrides using user-friendly dashboards

This approach transforms passive circuit learning into interactive control system training, building confidence in handling industrial-grade HMIs.

Industrial Relevance

In actual manufacturing environments, HMIs are used for:

- Controlling Electropneumatic machines and processes
- Displaying real-time diagnostics, system alarms, and maintenance alerts
- Providing operators with customized workflows to manage automated operations efficiently
- Ensuring safe and intuitive control over complex systems

By learning to design, configure, and operate HMI panels using platforms like Siemens TIA Portal, students gain hands-on experience in skills that are directly transferable to roles in industrial automation, maintenance, and system integration.

IIoT Integration In Hytech Electropneumatic Training Kit

— Advancing Electropneumatic Training with Smart Connectivity and Industrial Insight

The Hytech Electropneumatic Training Kit integrates IIoT capabilities to bridge conventional fluid power systems with modern, connected automation. This enables students to explore how data, connectivity, and cloud-based monitoring are reshaping industrial Electropneumatic applications.

By learning to collect, interpret, and act on real-time data, students gain essential skills for Industry 4.0, making their training more industry-relevant and future-ready.

Educational Relevance of IIoT in Electropneumatic:

By enabling IIoT features within the training platform, students can:

- Collect real-time data from sensors and actuators (e.g., pressure, position, temperature)
- Visualize system performance through custom dashboards
- Analyze trends, identify anomalies, and predict failures
- Understand data communication protocols like OPC UA, MQTT, or REST APIs
- Explore concepts like remote monitoring, edge computing, and smart maintenance

This integration encourages data-driven learning, where students not only operate the system but also monitor and improve it based on live feedback—replicating what happens on a smart factory floor.

Industrial Relevance of IIoT Integration

In real-world industrial environments, IIoT is driving the next generation of Electropneumatic systems by enabling:

- Predictive maintenance using sensor-based alerts
- Cloud connectivity for remote diagnostics and performance monitoring
- Energy optimization and cycle time analysis
- Seamless integration into MES, SCADA, and ERP systems
- Enhanced machine-to-human and machine-to-machine communication

By learning IIoT-based control and monitoring through the Hytech training kit, students gain exposure to how intelligent automation systems are built, maintained, and scaled—skills that are highly valued across sectors like manufacturing, automotive, aerospace, and smart infrastructure.

Electropneumatic Training Cell with Hytech Learning Management System

Electropneumatic is an advanced and rapidly evolving field in industrial automation. Training of trainers is essential to ensure they are equipped to deliver effective and industry-relevant instruction. The Hytech Electropneumatic Training Cell comes integrated with a powerful Learning Management System (LMS) designed to elevate the training experience for both trainers and learners.

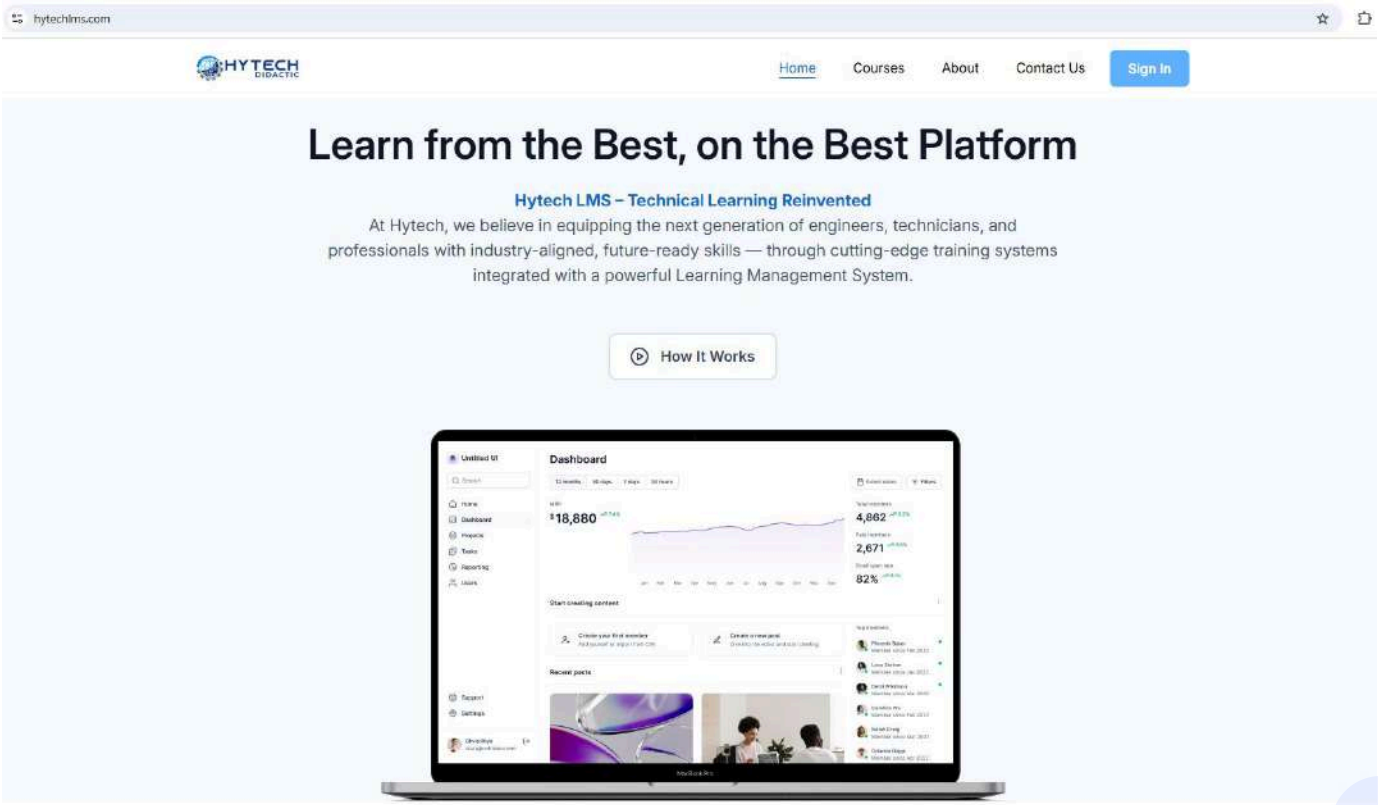
Key Features Of The Hytech LMS:

- **Step-By-Step Guidance:** Trainers receive structured, step-by-step instructions to master Electropneumatic operation, programming, and safety protocols.
- **Up-To-Date Training Content:** LMS content is regularly updated to reflect the latest trends and technologies in Electropneumatic.
- **Customizable Content:** Trainers can develop custom modules, conduct online assessments, and issue digital certifications directly through the LMS platform.
- **Support For Management:** The LMS helps institutions manage trainer transitions, maintain consistent teaching quality, and provide continuous support and knowledge handover.

Electropneumatic Courses In The LMS:

The Hytech LMS offers in-depth courses combining theoretical fundamentals with practical, hands-on training focused on Electropneumatic automation. These courses empower trainers and students with the skills needed for real-world applications in Electropneumatic.

Contact us today for a free demonstration of the Hytech LMS and see how it can revolutionize Electropneumatic Training at your institution.



Electropneumatic Courses in the LMS:

Day 1	**Module 1: Electropneumatic Fundamentals**	2 Hours
	Pneumatic components & symbols	
	Safety guidelines	
	Basic circuit layout	
	Module 2: Relay-Based Control	2 Hours
	NO/NC contacts, relay wiring	
	Manual control of hydraulic solenoids	
	Module 3: Hands-on Relay Control Experiments with Timers & Counters	4 Hours
	Extend/retract cylinder	
	Interlocking and sequence control	
Day 2	**Module 4: PLC Basics for Electropneumatics**	2 Hours
	PLC wiring to pneumatic valves & sensors	
	I/O addressing	
	Module 5: Programming with Timers & Counters	3 Hours
	ON/OFF delay timers	
	Count-based cycle control	
	Module 6: Hands-on with PLC	3 Hours
	Cylinder extend/retract with timer	
	3-cycle auto stop with counter	
Day 3	**Module 7: HMI Integration**	2 Hours
	Basic screen design	
	Command buttons, status indicators, counter display	
	Module 8: Mini Project – HMI + PLC + Pneumatic System	4 Hours
	Start/stop from HMI	
	Timer/counter control	
	Alarm indication	
	Module 9: Troubleshooting + Evaluation	2 Hours
	Common issues	
	Signal tracing	
	Viva or practical test	

Technical Specifications:

Structure	Training kit structure made in mild steel and Aluminium extrusions. Wooden surface made in MDF with minimum area of 1500 x 180 mm as a horizontal surface. Vertical work surface made in aluminium extrusions with operation provision from both sides of the training kit and minimum size of 1500mm x 720 mm. Castor Wheels with brakes and Antivibration mounts for rigid mounting of the training kit.
Compressor Unit	Compressor with minimum capacity of 45 Litre and power requirement of 1 Hp.
Pneumatic Supply Module	Compressed Air Service unit (FRL unit) complete with hand slide, Shut-off pneumatic valve
	Pneumatic Manifold Unit with 1 inlet and 8 outlets with self-locking push-in pneumatic connectors
	Quick Latch mechanism for Pneumatic Manifold
	Pneumatic Tee Joint with 4mm PU Tube connections
	Pneumatic Y Joint with 4mm PU Tube connections
	Plastic Tubing with 4mm Outer Diameter
Electro-Pneumatic Training Module With Relay Based Operation	Signal input box, electrical, consisting of three illuminated momentary contact pushbutton switches (each 1 NO + 1 NC) and one illuminated maintained-contact switch (1 NO + 1 NC), power supply rail, and earth contact rail. Contact load 2A
	Relay unit, three-fold, with 3 electro-magnetic relays each with 4 change-over contacts, suitable for 24 V DC, 5 A
	Relay unit, three-fold, with 3 electro-magnetic relays each with 2 change-over contacts, suitable for 24 V DC, 5 A
	Power supply unit, Input voltage: 85 – 265 V AC, Output voltage: 24 V DC, Output current: approx. 4.5 A, short-circuit-proof
	Timer box with an on-delay timer and an off-delay timer, each with 2NO+2NC contact sets, delay time adjustable from 0.5 – 10 sec. (or more), Current rating - 5 A
	Predetermining counter (Electrical Counter)
	Illuminated Emergency Push Button with illuminated maintained-contact switch (1 NO + 1 NC)
	Proximity sensor, inductive with protection against polarity reversal, overload and short circuit, 10 – 30 V DC, sourcing (PNP) type, sensing distance of 0 – 4 mm Quick latch mechanism for Proximity sensor with Electrical contacts for connections

Technical Specifications:

Electro-Pneumatic Training Module With Relay Based Operation	Proximity sensor, Capacitive with protection against polarity reversal, overload and short circuit, 10 – 30 V DC, sourcing (PNP) type, sensing distance of 0 – 4 mm Quick latch mechanism for Capacitive sensor with Electrical contacts for connections
	Proximity sensor, Optical, with protection against polarity reversal, overload and short circuit, 10 – 30 V DC, sourcing (PNP) type, sensing distance of 10 – 100 mm (adjustable) Quick latch mechanism for Optical sensor with Electrical contacts for connections
	Proximity switch, Reed contact, for mounting on a cylinder, operating voltage 0 – 30 V, with attachment and connecting cable
	Mounting Mechanism for Reed sensor on DA / SA Cylinders with Electrical contacts for connections
	Electrical limit switch with a change-over contact, Left / Right actuated Quick latch mechanism for Electrical Limit Switch with Electrical contacts for connections
	3/2-way solenoid valve with LED, spring return, 24 V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	5/2-way single solenoid valve with manual override and LED, 24V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	5/2-way double solenoid valve with manual override and LED, 24 V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	5/3-way double solenoid valve (Centre Closed) with manual override and LED, 24 V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	Set of laboratory cables (2 mm) with banana connections and safety plugs at both ends Red colour cables: 1500 mm (02 No), 1000 mm (10 Nos) Black colour cables: 1500 mm (02 No), 1000 mm (10 Nos) Blue colour cables: 1500 mm (02 No), 1000 mm (10 Nos), 500 mm (10 Nos) Green colour cables: 1500 mm (02 No), 1000 mm (10 Nos), 500 mm (10 Nos)
Electro-Pneumatic Training Module With PLC Based Operation	Programmable Logic Controller
	Siemens (S7 1200 / S7 200 Smart) / Mitsubishi (FX 5) with minimum 24 digital inputs, 16 digital outputs, 2 analogue inputs and 1 analogue output
	Perpetual License for PLC operation (Siemens / Mitsubishi)
	Illuminated Emergency Push Button with illuminated maintained-contact switch (1 NO + 1 NC)

Technical Specifications:

Electro-Pneumatic Training Module With PLC Based Operation	PCB Based PLC Input Module with 24 input connections (Compatible for 2mm Banan Connections) hardwired to PLC inputs. This module can be used for connecting field inputs from training kit (For example reed switch / sensor inputs) with PLC inputs by banana connections.
	PCB Based PLC Output Module with 24 input connections (Compatible for 2mm Banan Connections) hardwired to PLC outputs. This module can be used for connecting field outputs from training kit (For example Solenoid Valve output) with PLC outputs by banana connections.
	PCB Based Analog Input and Output module with minimum 2 analogue input connections and 2 analogue output connections (Compatible for 2mm Banan Connections) hardwired to PLC inputs / outputs.
	Signal input box, electrical, consisting of three illuminated momentary contact pushbutton switches (each 1 NO + 1 NC) and one illuminated maintained-contact switch (1 NO + 1 NC), power supply rail, and earth contact rail. Contact load 2A
	Illuminated Emergency Push Button with illuminated maintained-contact switch (1 NO + 1 NC)
	Proximity sensor, inductive with protection against polarity reversal, overload and short circuit, 10 – 30 V DC, sourcing (PNP) type, sensing distance of 0 – 4 mm Quick latch mechanism for Proximity sensor with Electrical contacts for connections
	Proximity sensor, Capacitive with protection against polarity reversal, overload and short circuit, 10 – 30 V DC, sourcing (PNP) type, sensing distance of 0 – 4 mm Quick latch mechanism for Capacitive sensor with Electrical contacts for connections
	Proximity sensor, Optical, with protection against polarity reversal, overload and short circuit, 10 – 30 V DC, sourcing (PNP) type, sensing distance of 10 – 100 mm (adjustable) Quick latch mechanism for Optical sensor with Electrical contacts for connections
	Proximity switch, Reed contact, for mounting on a cylinder, operating voltage 0 – 30 V, with attachment and connecting cable
	Mounting Mechanism for Reed sensor on DA / SA Cylinders with Electrical contacts for connections
	Electrical limit switch with a change-over contact, Left / Right actuated Quick latch mechanism for Electrical Limit Switch with Electrical contacts for connections
	3/2-way solenoid valve with LED, spring return, 24 V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections

Technical Specifications:

Electro-Pneumatic Training Module With PLC Based Operation	5/2-way single solenoid valve with manual override and LED, 24V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	5/2-way double solenoid valve with manual override and LED, 24 V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	5/3-way double solenoid valve (Centre Closed) with manual override and LED, 24 V DC Quick latch mechanism for Solenoid Valves with Electrical contacts for connections
	Set of laboratory cables (2 mm) with banana connections and safety plugs at both ends Red colour cables: 1500 mm (02 No), 1000 mm (10 Nos) Black colour cables: 1500 mm (02 No), 1000 mm (10 Nos) Blue colour cables: 1500 mm (02 No), 1000 mm (10 Nos), 500 mm (10 Nos) Green colour cables: 1500 mm (02 No), 1000 mm (10 Nos), 500 mm (10 Nos)
Computer Workstation Module	Worksurface made in MDF with minimum dimensions of 500mm x 500mm for Workstation (Monitor and Keyboard) mounting on the side of the training structure.
	Computer with minimum specifications of: i5 processor, 256GB Hard Disk, 8GB RAM, Windows Professional License (Latest), 21-inch LED Monitor, Monitor mounting stand, Bluetooth keyboard and Mouse
	LAN Cable (Ethernet Cable), minimum 3 meter
	Unmanaged Switch with minimum 5 Ports
IIOT And Remote Operation Module	IIOT Based 7-inch HMI with remote operations facility IIOT / Remote operation module provides user with a facility to record the data points on the cloud (Up to 20,000 data points at a time with perpetual cloud space) as well as to operate the HMI remotely from any device such as mobile, tab as well as web server.
	Mounting Stand for IIOT HMI with Push buttons and indicators
Accessories	Magnetic Graphical Symbol set for all components used in the training kit
	Operation Manuals

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