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ROBOTICS

Electrohydraulic

Hytech Electrohydraulic Training Kit

www.hytechdidactic.com

Hytech Electrohydraulic Training Kit – Structural Description

The Hytech Electrohydraulic Training Kit is a state-of-the-art, dual-sided training system designed to provide hands-on learning in electrohydraulics. 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 hydraulic operations, making it an ideal platform for technical institutions, vocational centers, and engineering colleges

Robust and Ergonomic Structure

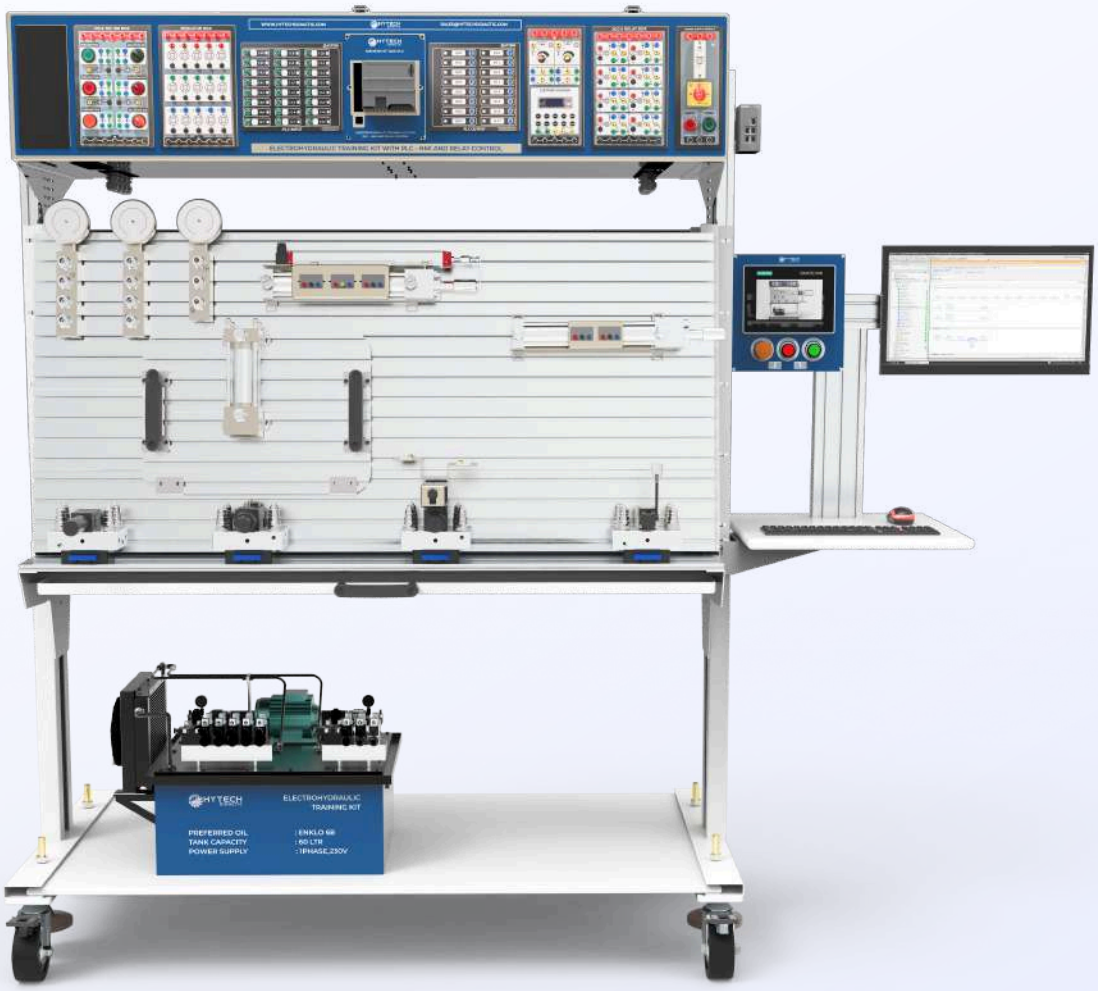
- The entire structure is fabricated using a combination of high-strength aluminium extrusions and durable powder-coated mild steel, ensuring longevity, structural integrity, and corrosion resistance.
- Designed as a mobile unit, the training kit is mounted on heavy-duty castor wheels with integrated 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 Electrohydraulic 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 hydraulic 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:

- Hydraulic 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 Electrohydraulic Components

Mounted at the top of the structure, the mild steel control panel serves as the electrical interface for electrohydraulic 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 electrohydraulic circuit building

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

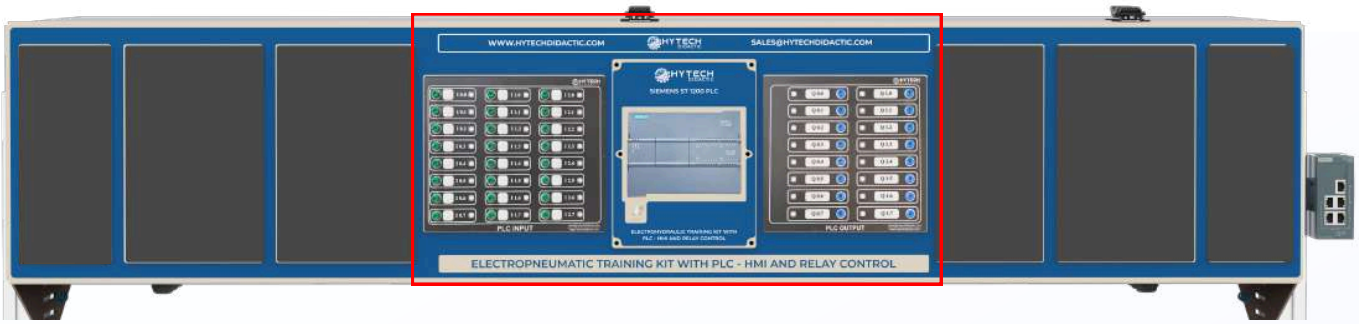
Moreover, the control panel can be removed entirely, transforming the unit into a conventional hydraulic training kit—ideal for foundational hydraulics training without electrical integration.

The Hytech Electrohydraulic 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 electrohydraulic 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 Electrohydraulic Training Applications

The PLC and HMI module is an advanced automation control unit designed to complement and enhance the capabilities of the Hytech Electrohydraulic 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 electrohydraulic 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 hydraulic 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 electrohydraulic 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 hydraulic 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 electrohydraulic 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 hydraulic 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 Electrohydraulic Training

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

- Automate hydraulic 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

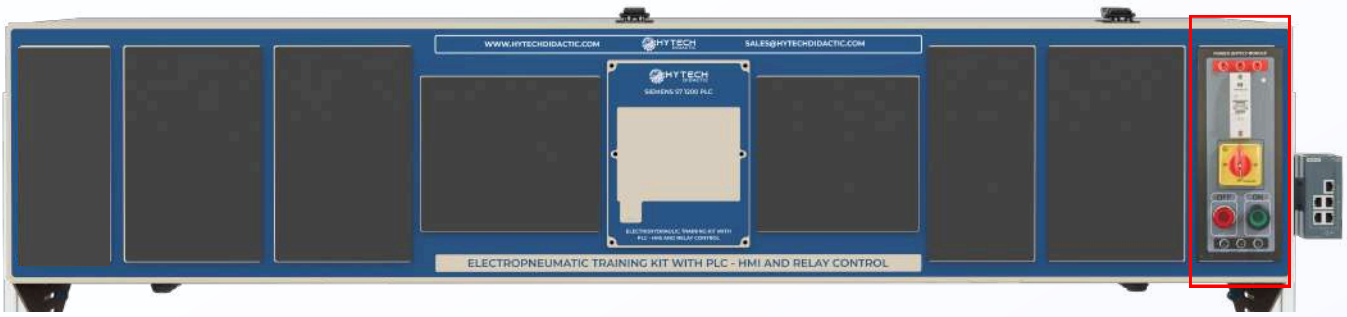
The PLC (Siemens S7-1200) and HMI (Siemens KTP-700) Module adds intelligent control, real-world automation experience, and programming flexibility to the Hytech Electrohydraulic Training Kit. By offering direct interaction with sensors, actuators, and user-defined logic, this module helps learners build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

- Electrohydraulic 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 Electrohydraulic Training



The Power Bank and Power ON Module is a key component of the Hytech Electrohydraulic 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 Electrohydraulic 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. **Hydraulic Power Pack Activation**
   - Includes a dedicated switch for the Hydraulic power pack, 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 Electrohydraulic Training:

This module provides:

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

2 Changeover – 8 Relay Module

— For Relay-Based Control in Electrohydraulic Training

The 2 Changeover – 8 Relay Module enhances the Hytech Electrohydraulic 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 hydraulic 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 Electrohydraulic Components

- Directly interfaces with hydraulic 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 Electrohydraulic Training

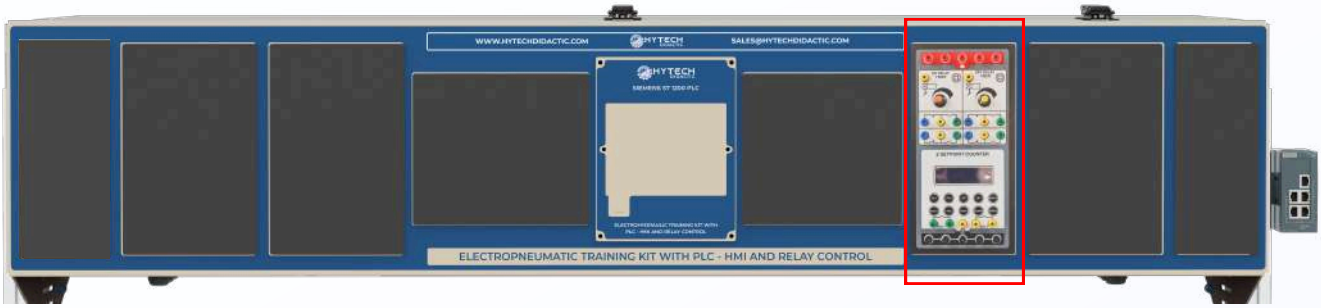
In the Hytech Electrohydraulic Training Kit, the 2 Changeover – 8 Relay Module enables learners to:

- Operate solenoid-actuated hydraulic 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 Electrohydraulic Systems



The Electronic Timer and Counter Module enhances relay-based operations in the Hytech Electrohydraulic 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 hydraulic 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 electrohydraulic system

Applications in Electrohydraulic Training

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

- Implement delayed response circuits for hydraulic 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 Electrohydraulic Operations

The Indicator Module enhances the Hytech Electrohydraulic 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 electrohydraulic 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 Electrohydraulic Training

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

- Confirming relay output activation
- Verifying correct signal routing to hydraulic 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 Electrohydraulic Control

The Push Button and Selector Switch Module serves as a key manual input interface for relay-based operations in the Hytech Electrohydraulic 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 hydraulic 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 Electrohydraulic Training:

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

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

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

The Hytech Electrohydraulic Training Kit introduces students to HMI-based system control, a key element of modern industrial automation. By interacting with Electrohydraulic 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 electrohydraulic 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 electrohydraulic 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 Electrohydraulic Training Kit

— Advancing Electrohydraulic Training with Smart Connectivity and Industrial Insight

The Hytech Electrohydraulic 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 Electrohydraulic 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 Electrohydraulic:

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 Electrohydraulic 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.

Electrohydraulic Training Cell with Hytech Learning Management System

Electrohydraulic 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 Electrohydraulic Training Cell comes integrated with a powerful Learning Management System (LMS) designed to elevate the training experience for both trainers and learners.

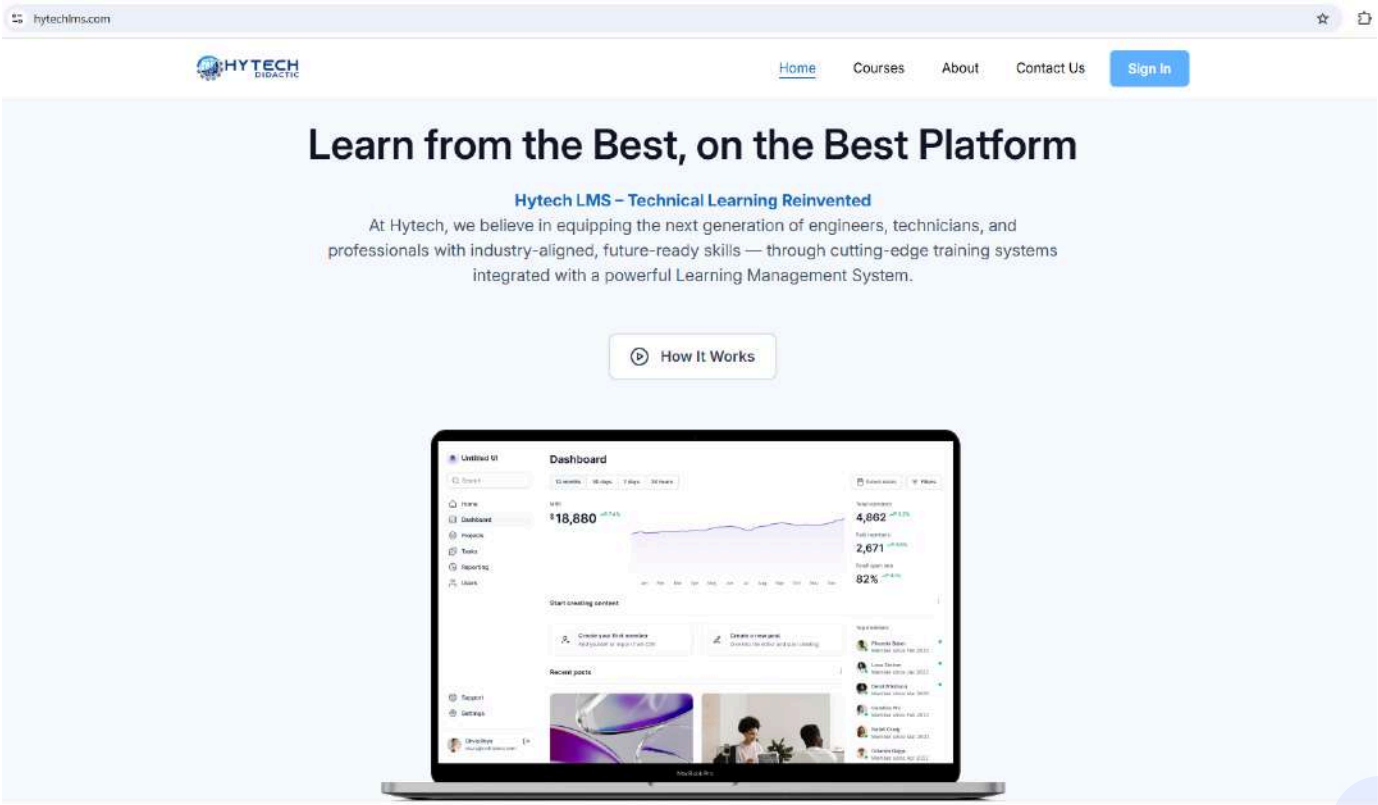
Key Features Of The Hytech LMS:

- **Step-By-Step Guidance:** Trainers receive structured, step-by-step instructions to master Electrohydraulic operation, programming, and safety protocols.
- **Up-To-Date Training Content:** LMS content is regularly updated to reflect the latest trends and technologies in Electrohydraulic.
- **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.

Electrohydraulic Courses In The LMS:

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

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



Electrohydraulic Courses in the LMS:

Day 1	**Module 1: Electrohydraulic Fundamentals**	2 Hours
	Hydraulic 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 Electrohydraulics**	2 Hours
	PLC wiring to hydraulic 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 + Hydraulic 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. Horizontal surface with minimum dimensions of 1500mm x 180mm is provided with aluminium extrusions which can be utilised for mounting of valves. Vertical surface made in aluminium extrusions with minimum dimensions of 1500mm x 720mm makes the kit dual faced training unit. Castor Wheels with brakes and Antivibration mounts for rigid mounting of the training kit.
Hydraulic Power Pack Module	Hydraulic tank with 64 Litre capacity, Oil cleanliness: Level 8
	Three Phase flange mounted electric motor 2 HP -1500 rpm
	Gear Pump (Flow Rate: 8 LPM, Max Pressure: 70 Bar)
	Pressure Gauge 0 to 100 Bar, Glycerin filled, 2 inch
	Pressure Relief Valve (Subplate Mounted) with Locking Arrangement
	Suction Line Filter
	Return Line Filter
	Pressure Line Manifold with 4 Ports (Hard piped / wire braided hose connected with powerpack and mounted on the front work surface)
	Pressure Line Manifold with 2 Ports (Hard piped / wire braided hose connected with powerpack and mounted on the front work surface)
	Return Line Manifold with 4 Ports (Hard piped / wire braided hose connected with powerpack and mounted on the front work surface)
	Return Line Manifold with 2 Ports (Hard piped / wire braided hose connected with powerpack and mounted on the front work surface)
	Test Line Manifold with 2 Ports (Hard piped / wire braided hose connected with powerpack and mounted on the front work surface)
	Pressure Gauge 0 to 100 Bar, Glycerin filled, 4 inch
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
	i5 processor, 256GB Hard Disk, 8GB RAM, Windows Professional License (Latest), 21-inch LED Monitor, Monitor mounting stand, Bluetooth keyboard and Mouse1
	LAN Cable (Ethernet Cable), minimum 3 meter
	Unmanaged Switch with minimum 5 Ports

Technical Specifications:

Electro-Hydraulic 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
	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 connections2

Technical Specifications:

Electro-Hydraulic Training Module With Relay Based Operation	**Pressure Switch**
	Type 3 Valve Manifold for CETOP 3 valve with P port clearly engraved on the manifold
	Quick Connect Coupling for P Port
	3/8 Adapters for P port with dowty washer
	Four Way Three Position Double solenoid operated direction control valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Four Way Two Position Single solenoid operated direction control valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
Electro-Hydraulic 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 output1
	Perpetual License for PLC operation (Siemens / Mitsubishi)
	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)

Technical Specifications:

Electro-Hydraulic Training Module With PLC Based Operation	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 connections2
	Pressure Switch
	Type 3 Valve Manifold for CETOP 3 valve with P port clearly engraved on the manifold
	Quick Connect Coupling for P Port
	3/8 Adapters for P port with dowty washer
	Four Way Three Position Double solenoid operated direction control valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Four Way Two Position Single solenoid operated direction control valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers

Technical Specifications:

Basic Hydraulic Module 1	**Pressure Relief Valve (Direct operated relief valve)**
	Blocking Plate for PRV
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Flow Control Valve (Non Pressure Compensated) with Check Valve
	Flow Control Valve (Pressure Compensated) with Check Valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Four way Three position manually operated direction control valve - Tandem Center
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Four way Three position manually operated direction control valve - Closed Center
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Three way Two position manually operated direction control valve - Closed Center
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers

Technical Specifications:

Actuation Module	**Single Acting Cylinder (Stroke: 100mm, Dia: 25mm, Test Pressure: 70 Bar)**
	3/8 Adapters for DA Cylinder
	Quick Connect Coupling for DA Cylinder
	Double Acting Cylinder (Stroke: 200 mm minimum Test Pressure 130 Bar
	3/8 Adapters for DA Cylinder
	Quick Connect Coupling for DA Cylinder
	Hydraulic Motor Bidirectional .
	Mounting arrangement for hydraulic motor
	Attachment with engraving to indicate the rotation angle
Basic Hydraulic Module 2	**Needle Valve**
	Pressure Sequence Valve
	In Line check Valve mounted on the Vlave Manifold of Sequence Valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Pressure Reducing Valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Four way Two position manually operated direction control valve
	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
	Check Valve Direct Operated
	Single Pilot Operated Check Valve
	End Plate for Single Pilot Check Valve

Technical Specifications:

Basic Hydraulic Module 2	Type 1 Valve Manifold for CETOP 3 valve with P, T, A and B ports clearly engraved on the manifold
	Quick Connect Coupling for P, T , A and B Ports
	3/8 Adapters for P, T, A and B ports with dowty washers
Vertical Weight Loading Cylinder	**Hydraulic Cylinder with minimum stroke of 200mm (DA)**
	3/8 Adapters for DA Cylinder
	Quick Connect Coupling for DA Cylinder
	Spring attachment for weights
	Set of Weights
Simulation Software For Basic Hydraulics	This software is a perpetual software which can simulate basic hydraulics as well as hydraulics circuits. EXE files can be generated of the simulations which can be operated on systems without the software license. More than 2000 library components available for hydraulics as well as hydraulics
Simulation Software For Advance Electro Hydraulics	This software is a perpetual software which can simulate advance electrohydraulic as well as advance electrohydraulic circuits. Circuits in integration with Relay as well as PLC can be simulated on this software. EXE files can be generated of the simulations which can be operated on systems without the software license. More than 2000 library components available for hydraulics as well as hydraulics. Facility to update PLC ladder directly from software in integration with Electrohydraulic circuit.
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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