ETEK
TOTAL AUTOMATION SOLUTIONS

INDUSTRIAL ELECTRICAL ENGINEERING

A: ETEK solution

ETEK solution

ETEK
TOTAL AUTOMATION SOLUTIONS

12 classrooms from basic to advanced

PH01. Basics Electricity trainning room	• Basic knowledge of electrical engineering
PH02. Basic electronic training room	• Knowledge of basic electronics, electronic components and applied circuits
PH03. Sensor training room	• Sensor types, working principles and industrial applications
PH04. Electric machine and power electronics training room	• Knowledge of Electric machine , power electronic components and power control circuits
PH05. Electrical equipment training room	• Knowledge of electrical tools and electrical equipment in industrial machines and equipment

ETEK solution

12 classrooms from basic to advanced

PH06. Electrical installation training room	• Practice installing electrical circuits in industry and civil use
PH07. Substation operation and power transmission training room	• Knowledge of practical power transmission and supply systems. Practice operating the system
PH08. Equipment Renewable Energy Training room	• Experiment on types of renewable energy, practice installation and operation, and identify errors in wind and solar power systems
PH09. Basic PLC training room	• Basic PLC programming using simulators: Logo, S7-1200, S7-1500, FX5U

ETEK solution

ETEK
TOTAL AUTOMATION SOLUTIONS

12 classrooms from basic to advanced

PH10. Advanced PLC training room	• PLC programming communicates through industrial communication standards: Profinet/Ethernet IP, Profibus, CC-Link, Device Net... Programming control systems
PH11. Automation training room	• Building a smart factory operation monitoring system via the Internet
PH12.Pneumatic - hydraulic training room	• Knowledge of pneumatic and hydraulic components and applied circuits

B: Details of practice rooms

ETEK
TOTAL AUTOMATION SOLUTIONS

ETEK
TOTAL AUTOMATION SOLUTIONS

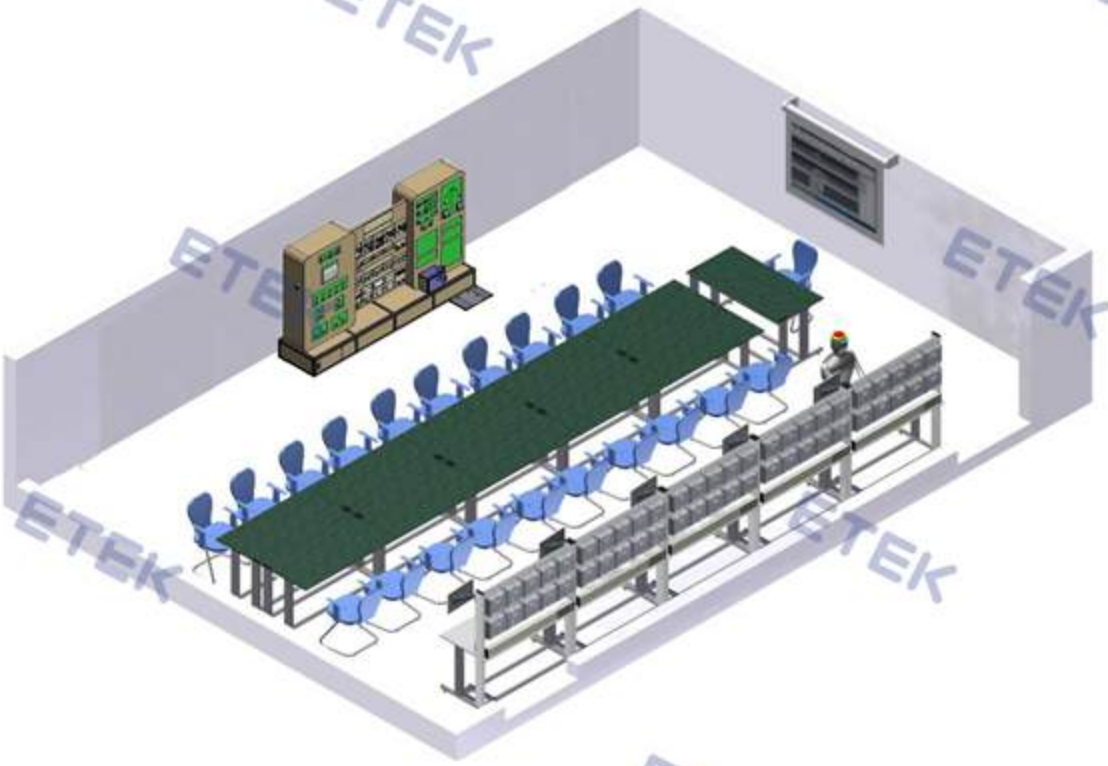
PH01
BASICS ELECTRICITY TRAINING ROOM

PH01. BASICS ELECTRICITY TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Practice measuring voltage and direct current
- Practice resistive circuits, parallel resistors, series resistors, voltage divider circuits
- Experiment on Ohm's law, Kirchooff 1 and 2 - Current characteristics electricity, voltage of alternating current
- Characteristics of purely resistive, purely inductive, and purely capacitive loads in AC circuits
- Practicing electrical safety



DC electric practice set

AC electricity practice set

Electrical safety practice model

Model of safe practices when working with vertical ladders

Table with Chair

Table with Chair

Magnetic White Board

Interactive Screen

PH01. BASICS ELECTRICITY TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Structure of practice module

Solution for mounting A4 modules during practice:

Thiết bị chính

Equipment

Table frame

Training set

PH02. BASIC ELECTRONIC TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

1. DC electric training set

Training content

- Practice measuring DC voltage
- Practice measuring direct current
- Practice resistive circuits
- Practice with resistor circuits connected in parallel
- Practice with resistor circuits connected in series
- Experiment on voltage divider circuit
- Experiment on Ohm's law
- Experiment on Kirchooff's 1st and 2nd laws

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

2. AC electricity training set

Training content

- Current and voltage characteristics of alternating current
- Characteristics of purely resistive, purely inductive, and purely capacitive loads in AC circuits
- Calculate the capacity of 1-phase and 3-phase AC circuits
- Inductance and RL circuit

Inductors connected in series and parallel

- Capacitance and RC circuit
- LC circuit and resonance phenomenon

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

3. Electrical measurement training set

Training content

- Practice measuring 1-way voltage
- Practice measuring DC current
- Practice measuring AC voltage
- Practice measuring alternating current
- Practice resistive circuits
- Practice with variable voltage circuits
- Practice single-phase power measurement circuit
- Practice three-phase power measurement circuit
- Practice frequency measurement circuit
- Practice power factor circuits
- Practice single-phase power consumption measurement circuit
- Practice 3-phase power consumption measurement circuit
- Practice using a Multimeter

PH01. BASICS ELECTRICITY TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Structure of practice model

Sample panel cluster

Indoor electrical safety practice cluster

Electric shock and leakage current simulation practice cluster

Electrical safety practice model

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

4. Equipment for training labor safety

4.1. Model of electrical safety training

Training content

- Analyze types of electrical safety incidents and train on how to prevent them depending on each type.
- Training on preventing electric shock accidents due to excessive current (excessive current practice)
  - Understand the effects of electric current according to each level of electricity that can impact the body
  - Experiment on overcurrent and overload incidents

General specifications

+ Dimensions: 3596 x 1042 x 1902 mm (LxWxH)+/- 10%
+ Mechanical structure made from welded box steel frame and powder-coated CT3 steel plate, ensuring durability and aesthetics

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

4.2. Model of training seat belts when working and moving

Training content:
Training on safety principles when working with steel frames and working at height
- Training on the dangers of falling when working with steel frames and working at height
- Training on the importance of using seat belts
- Training on examples of fall accidents due to not using seat belts and lifelines

4.3. Model of safe training with tools and hand tools

Training content:
Training on safety principles when working with hand tools
- Training on frequently occurring accidents
- Training on the structure and features of hand-held machine parts (hand cutters, high-speed cutters, circular saws

4.4. Practical model of seat belts to prevent falling accidents

Training content:
- Practice using seat belts and practice falling after using the belt

Training on the importance of using seat belts
- Training on how to properly use seat belts
- Training on the differences between types of seat belts: full body type, upper body type, hip type
- Training to prevent falls due to working at unsafe heights
- Training on incidents caused by not using seat belts

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

4.5. Model of safe training with mobile scaffolding

Training content:
Training on safety principles when working with steel frames and working at height
- Training on the dangers of falling when working with steel frames and working at height
- Training on the importance of using seat belts
- Training on examples of fall accidents due to not using seat belts and lifelines

4.6. Model of safe training when using protective shoes

Training content:
Training on safety principles when working with hand tools
- Training on frequently occurring accidents
- Training on the structure and features of hand-held machine parts (hand cutters, high-speed cutters, circular saws

4.7. Model for safe training in enclosed spaces

Training content:
- Practice using seat belts and practice falling after using the belt

Training on the importance of using seat belts
- Training on how to properly use seat belts
- Training on the differences between types of seat belts: full body type, upper body type, hip type
- Training to prevent falls due to working at unsafe heights
- Training on incidents caused by not using seat belts

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

4.8. Model of safe training when using protective helmets

Training content:
Training on safety principles when working with steel frames and working at height
- Training on the dangers of falling when working with steel frames and working at height
- Training on the importance of using seat belts
- Training on examples of fall accidents due to not using seat belts and lifelines

4.9. Model of safe training when working with A-shaped ladders

Training content:
Training on safety principles when working with hand tools
- Training on frequently occurring accidents
- Training on the structure and features of hand-held machine parts (hand cutters, high-speed cutters, circular saws

4.10. Model of safe training when working with vertical ladders

Training content:
- Practice using seat belts and practice falling after using the belt
Training on the importance of using seat belts
- Training on how to properly use seat belts
- Training on the differences between types of seat belts: full body type, upper body type, hip type
- Training to prevent falls due to working at unsafe heights
- Training on incidents caused by not using seat belts

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

5. Mechanical joint model

Purpose of use: to present to students an understanding of mechanical joints
- 01 aluminum suitcase
- 01 threaded joint model
- 01 key joint model
- 01 dowel joint model
- 01 riveted joint model
- 01 weld joint model
- 01 key joint model

6. Model of basic geometric blocks

Purpose of use: to present to students the understanding of basic geometric shapes in mechanics
* List of equipment
- 01 aluminum suitcase
- 01 Prism block
01 Sphere
- 01 Cylinder block
- 01 Cone block

7. Sample model of cable connections

- Dimensions: 1080x610x1515 mm
- Thick anodized aluminum frame ensures scratch resistance and aesthetics, specialized assembly structure.
- Specimens included in the model:
+ Multi-fiber cable connections: straight connections, branch connections, welded connections, screw connections...
+ 1-fiber cable connection: straight connection, branch connection, welded connection, screw connection...

ETEK
TOTAL AUTOMATION SOLUTIONS

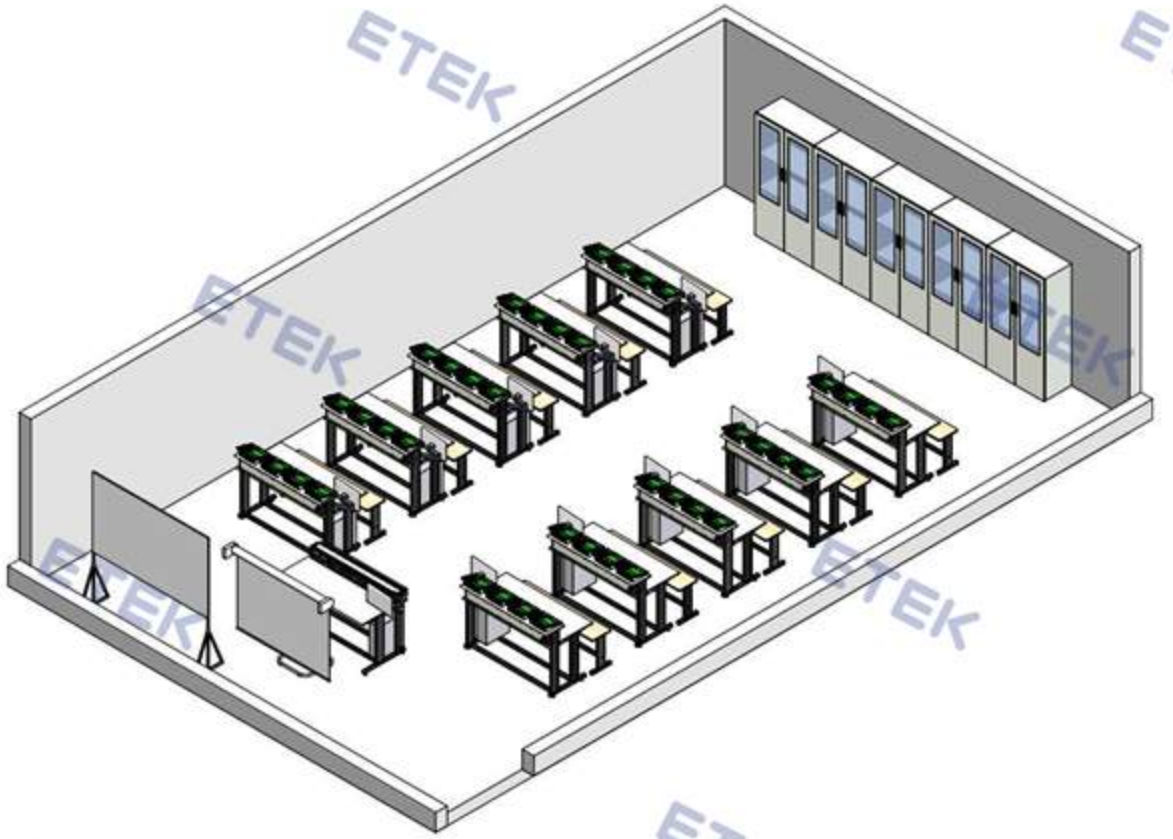
PH02.
BASIC ELECTRONIC TRAINING ROOM

PH02. BASIC ELECTRONIC TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Practice identifying types of electronic components
- Practice DC and AC circuits
- Practice applied circuits of semiconductor devices
- Practice applications of algorithmic amplification
- Practice pulse technique
- Digital practice



Main kit for practicing basic electronics

Basic experiment set for DC circuits

Teacher's control desk

Electronic practice table

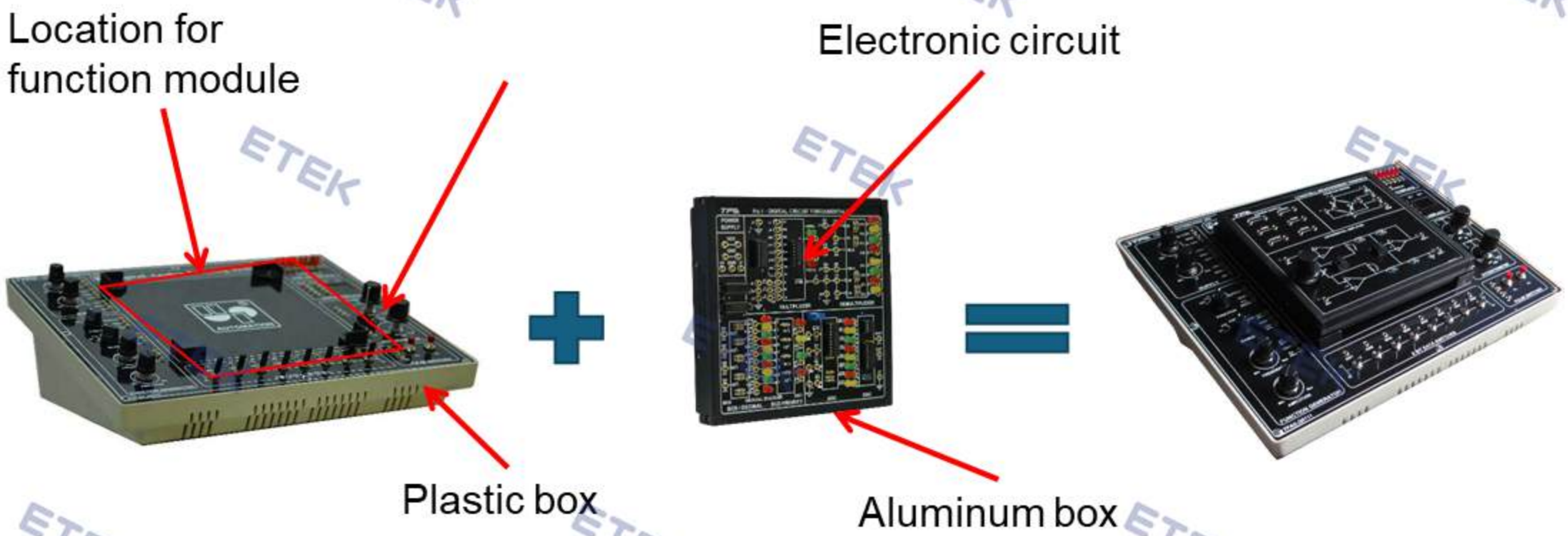
Standard practice equipment cabinet with A4 glass door module

Magnetic White Board

Interactive Screen

PH02. BASIC ELECTRONIC TRAINING ROOM

Solution for mounting modules during practice:



PH02. BASIC ELECTRONIC TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

1. Main kit for practicing basic electronics

Specifications:

- Input power supply for module: 220VAC/50Hz
- Output source block:
  + Adjustable power source: 0 ~ ± 15V/500mA adjustable by rheostat
  + Fixed source: ±5V/500mA, ±12V/500mA
- Fixed AC output: 12V/1A/50Hz
- Fixed AC output: 6V/1A/50Hz
- Pulse generator block

(A) Frequency range
+ 10 Hz ~ 100 Hz
+ 100 Hz ~ 1 kHz
+ 1 kHz ~ 10 kHz
+ 10 kHz ~ 100 kHz

(B) Output sine wave amplitude: 0 – 8 Vpp variable
+ Output triangle wave: 0 - 6 Vpp variable
+ Square wave output: 0 – 8 Vpp variable
+ TTL level: 0 - +5 V

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

2. Basic training set for DC circuits

Training contents:

- DC power source in series and parallel
- Dual DC source
- Determine the type of switching
- Concept of circuit reversal
- Ohm's Law: Resistance, current, circuit voltage
- Resistance, current, voltage in series resistor circuits
- Resistance, current, voltage in a parallel resistor circuit
- Resistance, current, voltage in mixed resistor circuits
- Power in series, parallel and mixed resistor circuits

3. Theorems of DC circuits training set

Training contents:

- Current in a 2-element branch circuit
- Nodal current in a 2-element branch circuit
- Voltage in a 3-element series circuit
- Add voltage in series circuit
- Circular equation
- Node equation
- Kirchhoff's voltage law for circuits with 2 sources
- Kirchhoff's current law with 2-source circuits
- Network method with 2-source circuit
- Stacking method with 2-source circuit
- Millman's theorem with 2-source circuit
- Thevenin method with one-source network
- Thevenin method with dual source network
- Thevenin bridge circuit resistor
- Thevenin bridge circuit voltage
- Convert Thevenin to Norton
- Convert Norton to Thevenin
- Tee, Wye, Pi and Delta networks
- Switch Delta and Wye Networks networks

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

4. AC - 1 Basic circuit training set

Training contents:

- AC waveform generator
- Measure AC amplification
- Measure AC voltage, current and impedance with an oscilloscope
- Measure and set frequency
- Inductance
- Phase angle
- Inductance in series and parallel Basics of resistance
- Inductance and impedance
- Serial RL circuit
- Parallel RL circuit
- Electromagnetic fields
- Transformer coil
- Symptoms
- Turns ratio and voltage of the transformer
- Secondary load of transformer
- Capacitor
- Capacitors in series and parallel circuits
- Basic effects of capacitors
- Series RC circuit
- Parallel RC circuit
- RC time coefficient
- RC/RL waveform
- Basics of troubleshooting

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

5. AC - 2 Basic circuit training set

Training contents:

- Serial RLC circuit
- Parallel RLC circuit
- Series resonant circuit
- Q and series RLC circuit frequency range
- Resonant frequency in parallel LC circuit
- Q and frequency range
- Power division
- Power factor
- Low pass filter
- High pass filter
- Band filter
- Stop band filter
- Basics of troubleshooting

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

6. Semiconductor training set

Training contents:

- Identify semiconductor devices
- Semiconductor switching control
- Diode and DC characteristics
- Half-cycle rectification
- Full cycle bridge rectifier using Diode
- Filter the power source
- Voltage doubler
- Waveform using Diode
- Zener diode
- Adjust Zener Diode voltage
- Check Transistor function
- Current control circuit uses PNP Transistor
- Emitter-Base bias voltage
- Collector upstream bias
- DC circuit voltage using Transistor
- Load line uses Transistor
- Optical isolation IC
- Optical resistance
- Basics of troubleshooting

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

7. Transistor amplifier circuit training set

Training contents:

- Recognize, become familiar with and locate components in the circuit
- Introducing multi-stage amplification
- DC/AC operation of common Base circuit
- DC/AC operation of common Emitter circuit
- DC/AC operation of common Collector circuit
- Temperature influence on fixed polarity circuits
- Temperature influence on voltage divider bias circuit
- Transistor parameter range
- Use the Transistor parameter table
- RC coupled amplifier DC operation
- RC coupling gain and phase angle relationship
- RC coupled amplifier frequency response
- DC/AC operation of transformer coupled amplifier
- Transformer coupled amplifier frequency response
- DC/DC operation of direct coupled amplifier
- Direct coupled amplifier frequency response
- Basics of handling and troubleshooting circuit problems

8. Transistor power amplifier training set

Training contents:

- Recognize, become familiar with and locate components in the circuit
- Introduction to Transistor power amplification
- DC single output power amplifier operation
- Single AC output voltage and power amplification
- Phase-separated DC operation
- Voltage amplification and input/output signal phase relationship
- DC operation symmetrical power amplifier
- AC symmetrical voltage and power amplification
- DC operation power compensation amplifier
- AC compensation voltage and power amplification
- Amplify push-pull power
- Darlington pair current amplification characteristics
- Darlington pair input and output impedance
- Basics of handling and troubleshooting circuit problems

9. Transistor feedback circuit training set

Training contents:

- Recognize, become familiar with and locate components in the circuit
- Series feedback amplification operation
- Effect of feedback on AC amplification
- Effect of negative series feedback on frequency range
- Effect of series feedback on input and output impedance
- Effect of parallel feedback on AC amplification
- Effect of parallel amplification on frequency range
- Effect of parallel amplification on input and output impedance
- Multi-stage current amplification in series and parallel
- Multi-stage output amplification in series - parallel
- Multi-stage voltage amplification in series - parallel
- Multi-stage output impedance connected in series - parallel
- Differential amplifier operation
- Differential and unipolar gain characteristics
- Differential gain coefficient
- Basic concepts of handling and troubleshooting feedback amplifier circuits.

ETEK
TOTAL AUTOMATION SOLUTIONS

10. Power source regulation circuit training set

Training contents:

- Recognize, become familiar with and locate components in the circuit
- Introducing power supply adjustment
- Parallel adjustment operation
- Line adjustment
- Adjust load
- Serial adjustment operation
- Pressure feedback adjustment operation
- Load regulation using voltage feedback
- Reverse current limit protection circuit
- Line adjustment operation
- Adjust the line using a line regulator
- Adjust load using current regulator
- 3-pin IC adjustment and voltage adjustment activities
- Adjust 3-pin IC current and performance
- DC to DC conversion characteristics
- Regulates DC to DC conversion voltage and performance
- Basic concepts of handling and troubleshooting power source regulation circuits.

11. Thyristor and power control training set

Training contents:

- Learn the principles and practice of half-wave SCR DC Gate circuits
- Learn the principles and practice of full-wave SCR DC Gate circuits
- Learn the principles and practice of AC power control circuits using Triac

Learn the principles and practice of controlled rectifier circuits

- Learn the principles and practice of half-wave SCR AC Gate circuits
- Learn the principles and practice of full-wave SCR AC Gate circuits

PH02. BASIC ELECTRONICS TRAINING ROOM

12. Basic experimental set of operational amplification

Training contents:

- Basic characteristics and parameters of operational amplifiers.
- Learn the principles and practice of inverting amplifier circuits
- Learn principles and practice with non-inverting amplifier circuits
- Learn principles and practice with inverter amplifier circuits Learn the principles and practice with non-inverting additive amplifier circuits.
- Learn principles and practice with voltage repeater circuits
- Learn the principles and practice with sine wave to square wave conversion circuit
- Learn principles and practice with differential amplifier circuits
- Learn principles and practice with open loop circuits
- Learn principles and practice with gate amplifier circuits
- Learn principles and practice with exponential amplifier circuits
- Learn principles and practice with subtractive amplifier circuits
- Basics of troubleshooting and troubleshooting in circuits.

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

13. Experimental set of applications of operational amplification

Training contents:

- Basic characteristics and parameters of operational amplifiers.
- Learn the principles and practice with full-wave bridge diode control circuits
- Learn principles and practice with integrator circuits
Learn principles and practice with differential circuits
- Learn the principles and practice with low-pass filter circuits
- Learn principles and practice with high-pass filter circuits
- Learn the principles and practice with bandpass filters
- Learn principles and practice with limited circuits
- Learn principles and practice with latching and sampling circuits
- Learn the principles and practice with window comparator circuits
- basics of troubleshooting and troubleshooting in circuits.

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

14. Basic training set for FET transistors

Training contents:

- Learn the principles and operating characteristics of JFET
- Learn principles and practice with JFET amplifier circuits
- Learn principles and practice with JFET CURRENT circuit

practice DC source current operation/load voltage variation with JFET

- Learn principles and practice with Colpitts oscillator circuit
- Learn the principles and practice the operation of the HARTLEY oscillator
- Learn principles and practice with thermistor circuits
- Learn the principles and practice of waveform generation and control characteristics using UJT
- Learn principles and practice with photoresistor circuits
- Learn principles and practice with fiber optic transceiver conversion circuits
- Learn the principles and practice of operating modes and dual gate MOSFET adder
- Basic troubleshooting and troubleshooting in circuits.

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

15. Set of digital practice modules

Training contents:

- Get acquainted, identify and locate components in the circuit.
- General circuit operations and basic IC sets
- AND/NAND Logic function
- OR/NOR Logic function
- Separate OR and NOR gates
- Dynamic response of XOR/XNOR Logic gate
- DC operation of a NOT and an OR
- Conversion characteristics of a Schmitt gate and an LS TTL gate
- Type D Flip-Flop
- SET/RESET Flip-Flop
- Static JK Flip-Flop operation
- Dynamic Flip-Flop JK operation
- Adjust the output of a 3-state gate
- Single port 3-state source and collector control
- Static trigger level of a TTL and CMOS
- Dynamic switching characteristics of TTL and CMOS
- Static control of a data bus
- Dynamic control of a data bus
- Learn circuit principles and practice with MULTIPLEXER multiplexing and DEMULTIPLEXER multiplexing circuits
- Learn principles and practice with BCD/DECIMAL, BCD PRIORITY circuits
- Learn principles and practice with ADC/DAC conversion circuits
- Learn the principles and practice with the 7 SEGMENT DRIVER/DISPLAY circuit
- Learn principles and practice with PARITY CHECKER circuit
- Learn the principles and practice with the ASYNCHRONOUS RIPPLE COUNTER circuit
- Learn the principles and understand the principles of ASYNCHRONOUS COUNTER circuits
- Learn the principles and practice with the 4 BIT SHIFT REGISTER shift register
- Learn the principles and practice with the 4 BIT ADDER circuit

PH02. BASIC ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

16. Pulse technique practice set

Training contents:

- Practice stable multivibrator circuits using transistors

Learn principles and practice with monostable oscillator circuits using OP-AMP

- Learn the principles and practice with unstable oscillator circuits using OP-AMP
- Learn principles and practice with bistable oscillator circuits using OP-AMP
- Learn principles and practice basic applications of IC555
- Learn principles and practice with IC555 - PWM circuit
- Practice creating pulses with the IC555 chip
- Learn principles and practice with Wien bridge circuits
- Learn principles and practice with IC555 linear circuits
- Learn principles and practice with trimmer circuits
- Learn principles and practice with pin circuits
- Learn principles and practice with differential circuits
- Learn principles and practice with integrator circuits
- Learn the principles and practice with frequency to voltage conversion circuits
- Learn the principles and practice with voltage to frequency conversion circuits
- Practice pulse generator circuit using UJT
- Practice pulse shortening circuit
- Practice pulse circuit using IC 74122
- Practice multivibrator circuits

ETEK
TOTAL AUTOMATION SOLUTIONS

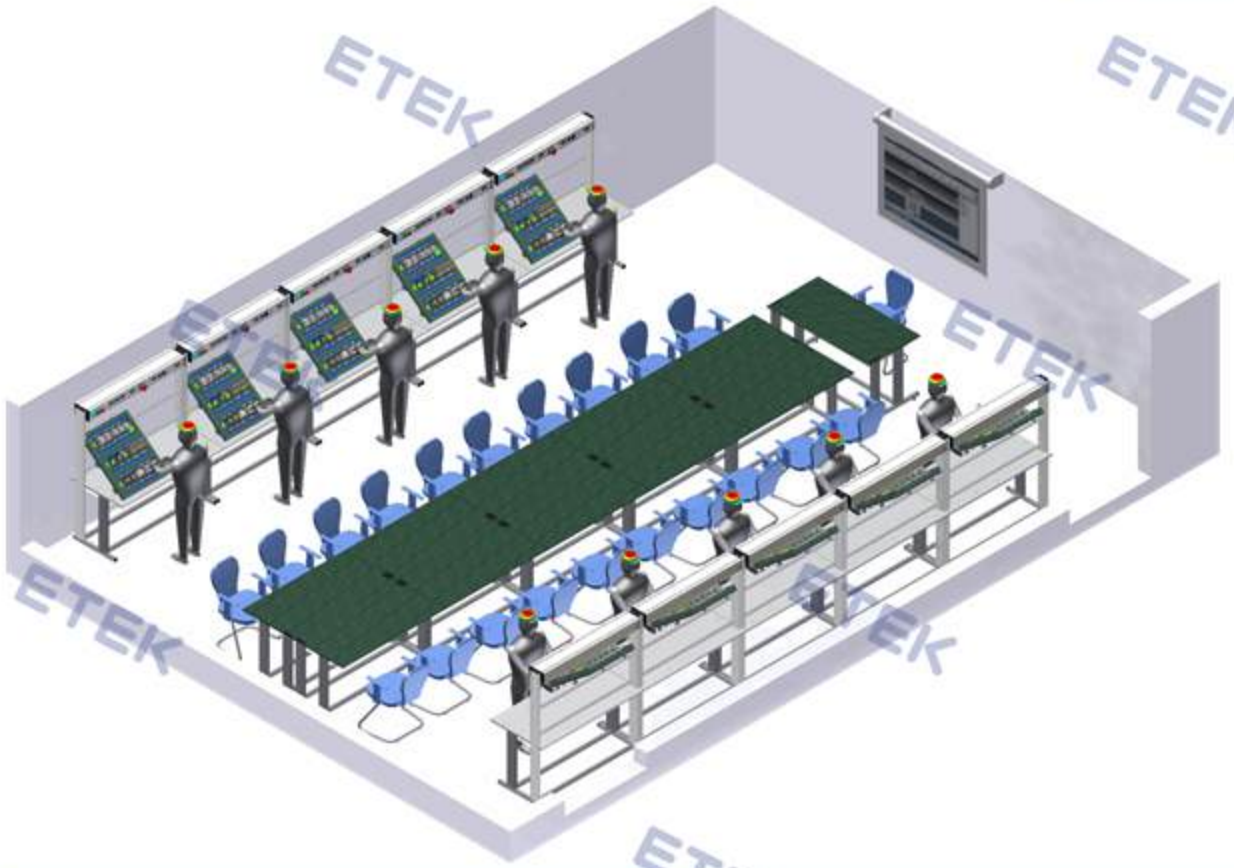
PH03
SENSOR TRAINING ROOM

PH03. SENSOR TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Phân loại các loại cảm biến công nghiệp
- Nguyên lý cấu tạo và nguyên lý đo của các loại cảm biến công nghiệp
- Thí nghiệm với phổ làm việc của các loại cảm biến
- Thí nghiệm cảm biến với đa dạng các đối tượng nhận
- Đấu nối các loại cảm biến
- Điều chỉnh độ nhạy của cảm biến
- Thí nghiệm với tần số đáp ứng cảm biến
- Hiểu được những lợi ích của cảm biến thông minh trong Công nghiệp 4.0
- Thiết lập giao tiếp IO-Link®



Bộ thực hành Cảm biến phát hiện vật

Bộ thực hành cấu tạo - nguyên lý của các loại cảm biến

Mô hình TH cảm biến lưu lượng,gia nhiệt, áp suất và điều khiển quá trình

Bàn điều khiển của giáo viên

Bộ thực hành camera công nghiệp

Table with Chair

Magnetic White Board

Interactive Screen

PH03. SENSOR TRAINING ROOM

Product structure

1. Quick fix mounting structure:

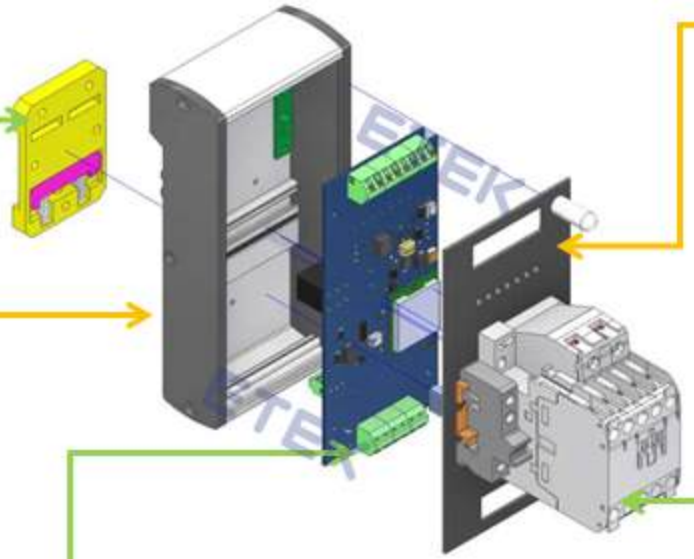
- Quickly mounts onto standard DIN rails
- High precision, sharp mold

2. Anode aluminum box + plastic lid:

- Hard anode, sandblasted,
- Does not leave fingerprints or stains

3. Push-in quick match:

- German equipment, industrial standards,
- Standard according to German program



4. Electronic circuit

- FR04 circuit, latest technology, fireproof
- Matte surface treatment to avoid dirt
- Quickly scan QRcode

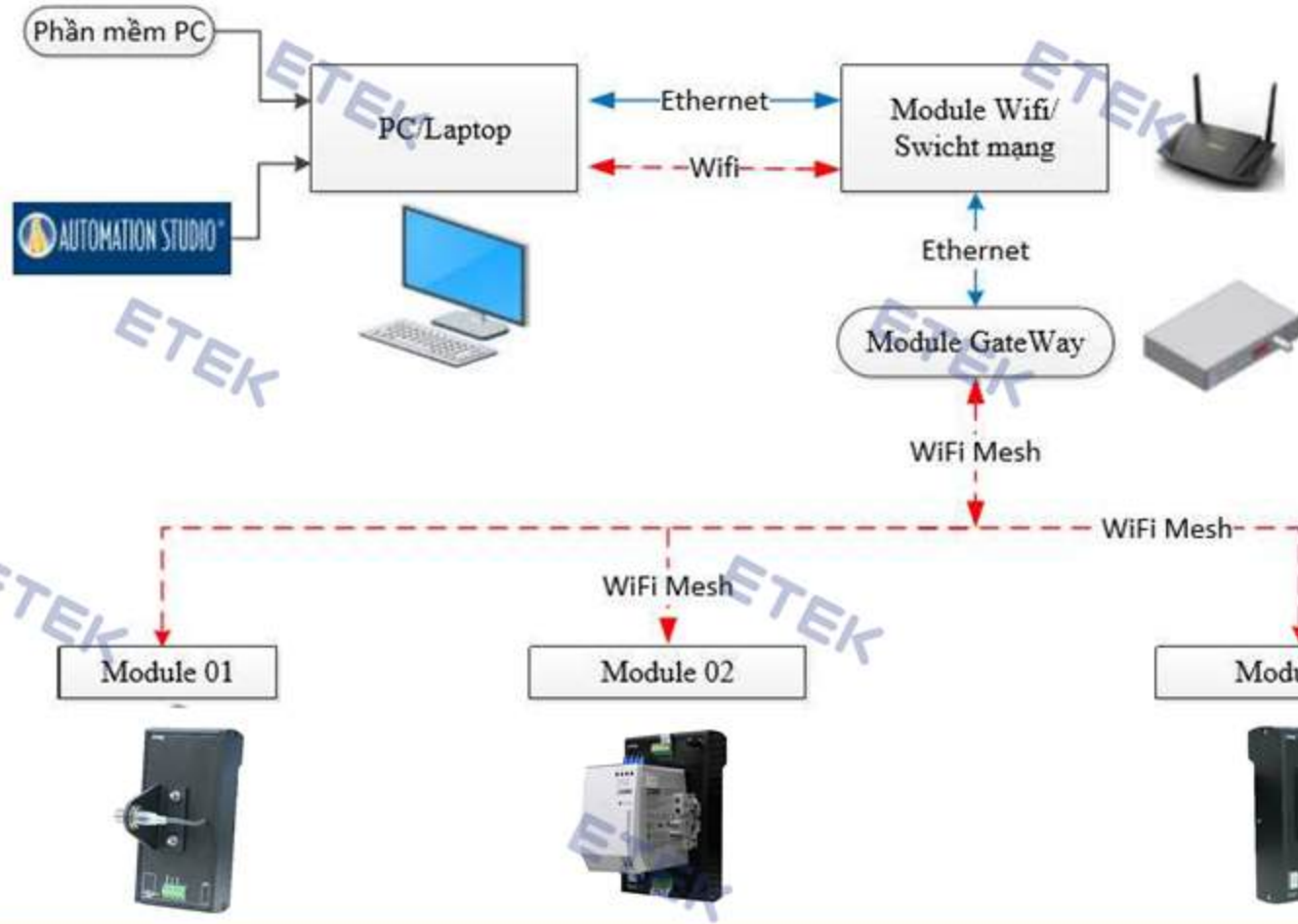
5. Main equipment:

- Easy to remove and replace.
- Mounting according to equipment standards

PH03. SENSOR TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

CONCEPT SYSTEM TECHNOLOGY DIAGRAM



CUSTOMER BENEFITS

- Reduce preparation and connection time
- Cần ít không gian lưu trữ và không gian thực hành
- Requires less storage space and practice space -Simulate the circuit before actual running -> Minimize errors
- Create errors, improve students' ability to analyze and test
- Easy to retrieve documents through software

PH03. SENSOR TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Electrical Student WorkBench Solutiong

Sensor module

Assembly panel

Table frame

PH03. SENSOR TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

1. Sensors principles training set

Training Contents:

- Operating principles of sensors in the training set
- Collect data from sensors through the control training and signal collection module

Draw a graph of the sensor's characteristic curves during practice and export it to an image file

- Store results after each experiment
- Export collected data to excel file

PH03. SENSOR TRAINING ROOM

2. Distance and displacement sensor training set

Training Contents:

- Learn the structure and operating principles of various types of sensors
- Practice measuring distance with ultrasonic sensors
- Practice measuring distance with sensors from analog output
- Practice measuring speed and displacement distance with encoder

PH03. SENSOR TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

3. Force and pressure sensor training set

Training Contents:

- Learn the structure and operating principles of sensors
- Practice measuring mass with loadcell
- Practice measuring compression pressure

PH03. SENSOR TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

4. Smart sensor training set for industry 4.0

Training Contents:

- Understand the benefits of smart sensors in Industry 4.0
- Selected, parameterized, monitored and adjusted sensors
- Establish IO-Link® communication
- Integrate sensors into different production communication layers
- Perform maintenance
- Automatic replacement of sensors and upload settings
- Troubleshooting sensor problems

ETEK
TOTAL AUTOMATION SOLUTIONS

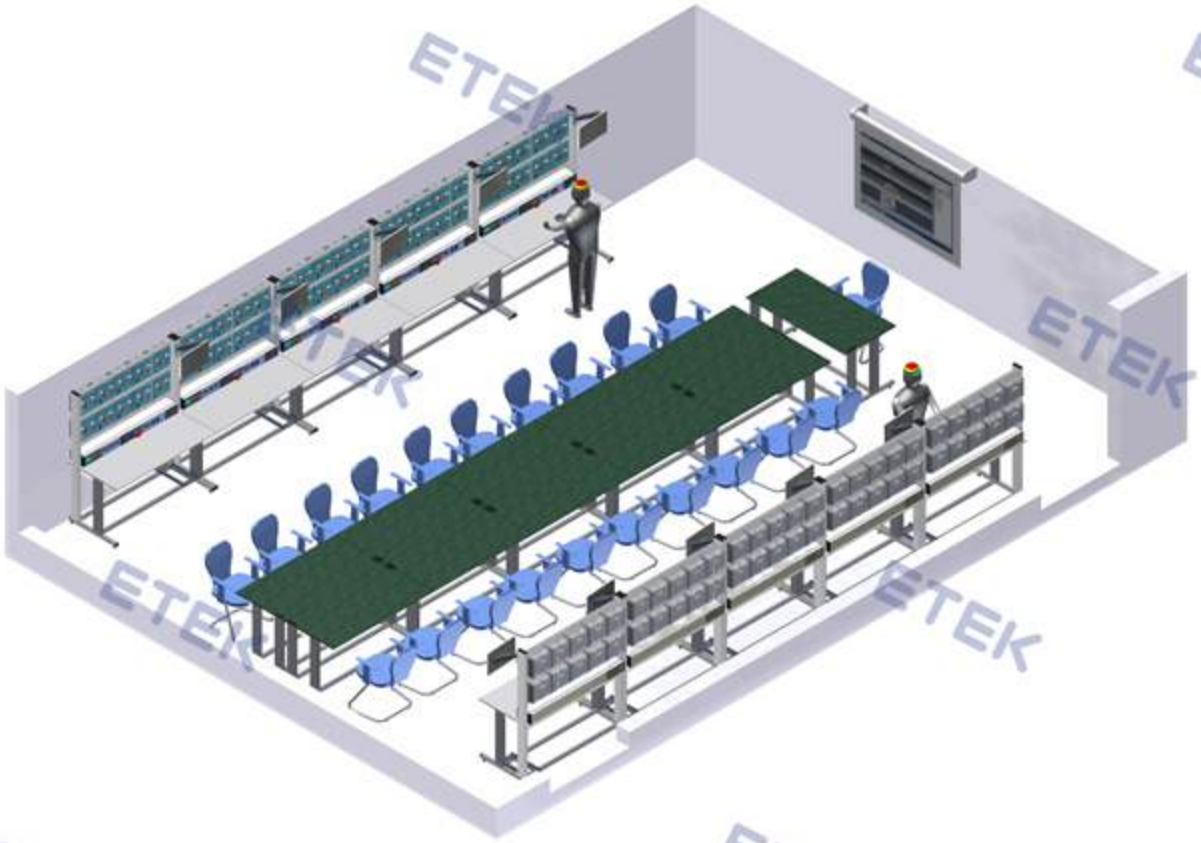
PH04
ELECTRIC MACHINE AND POWER ELECTRONICS TRAINING ROOM

PH04. ELECTRIC MACHINE AND POWER ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Bài thí nghiệm về UJT
- Bài thí nghiệm về SCR
- Bài thí nghiệm về DIAC và TRIAC
- Bài thí nghiệm về tự động điều chỉnh bóng đèn và điều chỉnh tốc độ động cơ AC bằng TRIAC
- Bài thí nghiệm về mạch điện chỉnh lưu dùng SCR
- Bài thí nghiệm về JFET và MOSFET
- Chỉnh lưu công suất một pha nửa chu kỳ,hai nửa chu kỳ
- Chỉnh lưu cầu một pha,chỉnh lưu hình tia 3 pha, chỉnh lưu cầu 3 pha
- Thực hành nghịch lưu
- Thực hành điều chỉnh điện áp xoay chiều
- Thực hành điều áp một chiều



Bộ thực hành linh kiện điện tử công suất

Bộ thực hành chỉnh lưu không điều khiển

Bộ thực hành chỉnh lưu có điều khiển

Bộ thực hành nghịch lưu

Bộ thực hành điều chỉnh điện áp xoay chiều

Bộ thực hành điều áp một chiều

Bàn thực hành điện công nghiệp

PH04. ELECTRIC MACHINE AND POWER ELECTRONICS TRAINING ROOM

Structure of practice module

Solution for mounting A4 modules during practice:

Thiết bị chính

Equip ment

Table frame

Training set

II. POWER ELECTRONICS TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Solution for mounting A4 modules during practice:

Equipment

Table frame

Training set

1. Power electronic components training set

Training Contents:

- Laboratory test on UJT
- Experiment on SCR
- Laboratory test on DIAC and TRIAC
- Experiment on automatically adjusting light bulbs and adjusting AC motor speed using TRIAC
- Experiment on rectifier circuits using SCR
- Experiments on JFET and MOSFET

2. Uncontrolled rectifier training set

Training content:

- Basic measurements and characteristics of power electronic components
 + Operation of oscilloscope and differential amplifier
 + Measurement and characterization of SCR
 + TRIAC measurements and characteristics
 + Measurement and characteristics of IGBT
 + MOSFET measurements and characteristics.
- 1 phase/ 3 phase rectifier (AC-DC)
 + Operation of reference variable generator and 3-phase opening angle controller
 + Operation of current/voltage converter
 + Single-phase half-cycle uncontrolled rectifier (Half-wave rectifier)
 + Single-phase uncontrolled rectifier for the whole cycle (Full-wave rectifier)
 Rectifier with 1-phase half-cycle control (rectifier with half-cycle control)
 + The rectifier has single phase control for the entire cycle
 + Semi-controlled symmetrical rectifier, 1 phase, full cycle
 + 1-phase full-cycle asymmetric semi-controlled rectifier
 + 3-phase ray-shaped uncontrolled rectifier
 + The rectifier does not control 3 phases throughout the cycle
 + Rectifier with 3-phase beam control
 + Full-cycle 3-phase semi-controlled rectifier
 + The rectifier has 3-phase control for the entire cycle
- Phase control (AC-AC)
 + 1-phase semi-controlled AC regulator
 + AC regulator with 1-phase control
 + Full-cycle 3-phase semi-controlled AC regulator
 + AC regulator with full-cycle 3-phase control

1 phase/ 3 phase inverter (AC-DC-AC)

 + Basic characteristics of inverters and frequency conversion principles
 + 1-phase PWM control circuit
 + 3-phase PWM control circuit
- Converts 1-way voltage
 + Booster-type DC voltage change (Boost)
 + Converts DC voltage with pressure reduction (Buck) type
 + Push-pull DC voltage change (Buck - Boost)

ETEK
TOTAL AUTOMATION SOLUTIONS

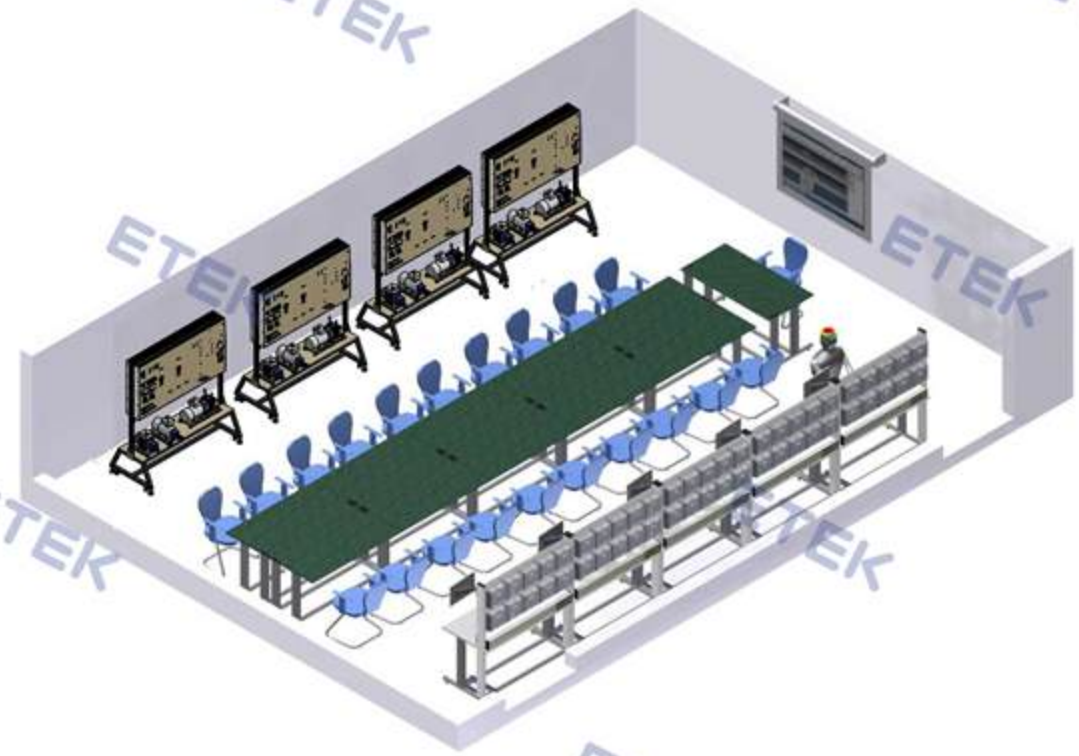
PH05
ELECTRICAL EQUIPMENT TRAINING ROOM

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Calculate the capacity of 1-phase and 3-phase AC circuits
- Learn the uses, configurations and operating principles of electric tools
- Calculate some common electrical tools according to specific technical requirements (breakers, fuses, circuit breakers, contactors, ...) in simple cases.
- Install and operate smart electric tools
- Learn and practice the skill of finding common errors in electrical tools in electrical circuits by creating electronic errors
- Learn the uses, configuration and operating principles of circuit tools
- Perform installation and identify errors on the machine's electrical circuit



Mô hình mô phỏng sự cố trên máy điện một chiều

Mô hình mô phỏng sự cố trên máy điện xoay chiều

Mô hình trang bị điện máy công cụ

Table with Chair

Magnetic White Board

Interactive Screen

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

Structure of practice module

Solution for mounting A4 modules during practice:

Thiết bị chính

Eqiuip ment

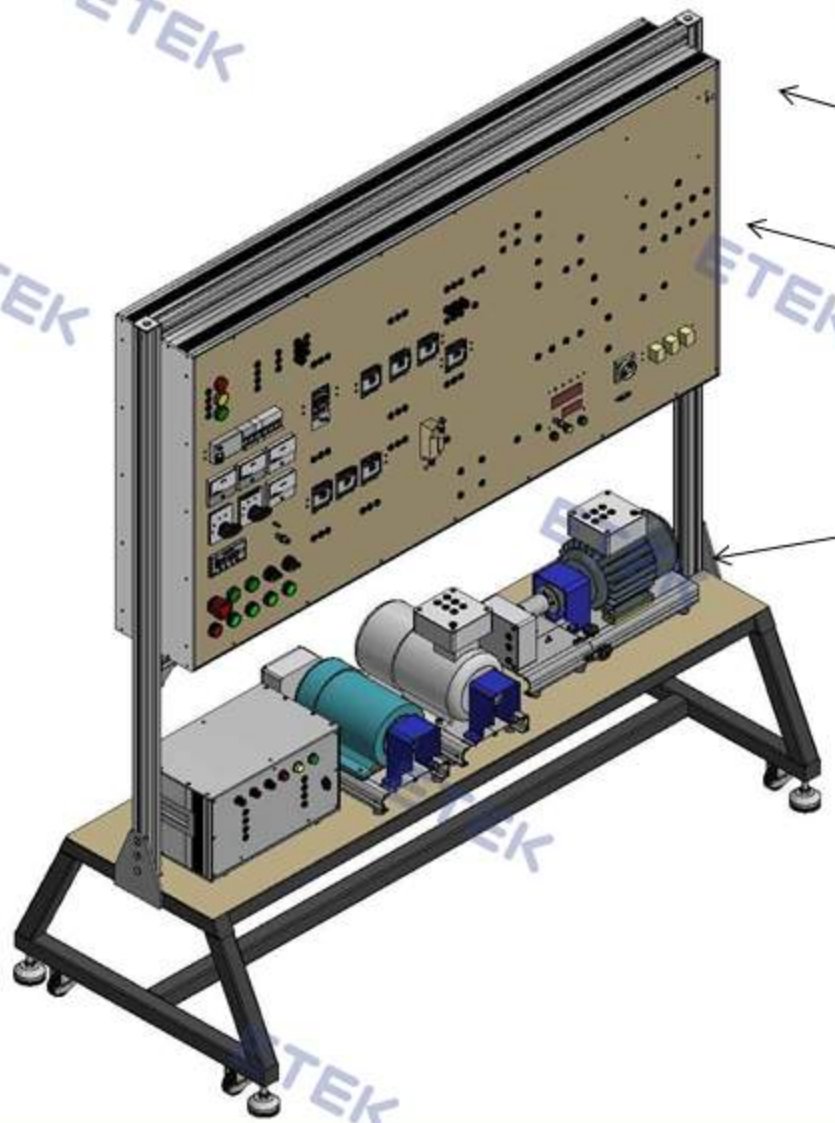
Table frame

Training set

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Model Structure electrical of machine tools



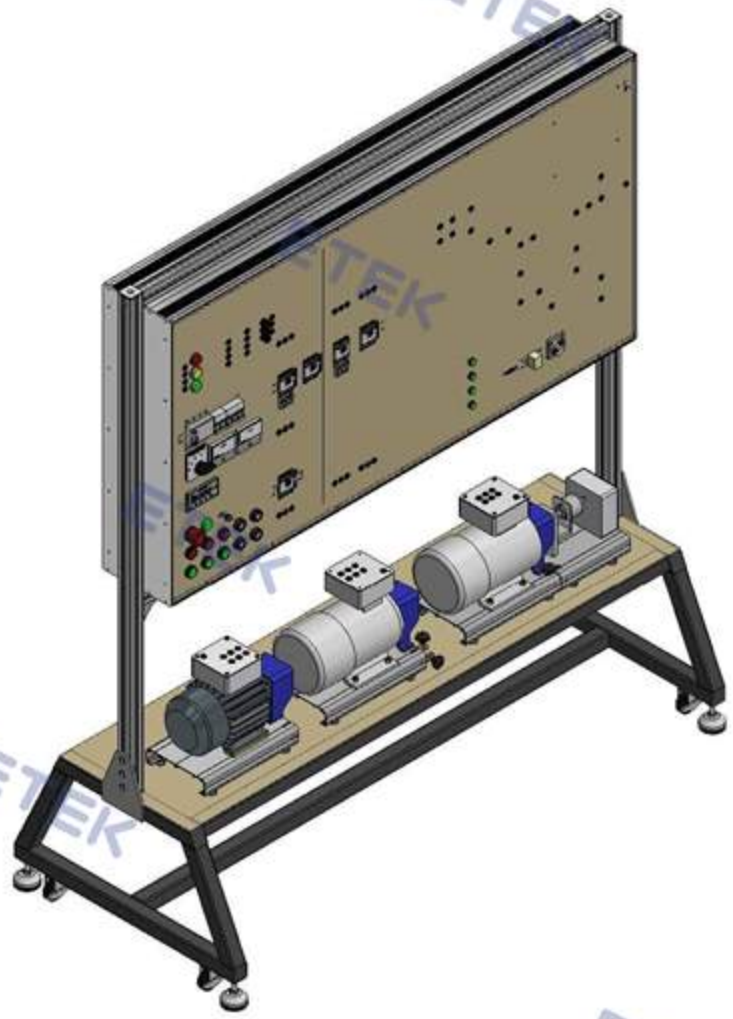
The panel shows the machine tool circuit

M4 safety jack

Simulate motors on machine tools

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

1. Model equipped with electric machine tools (Drilling machine)



Training content

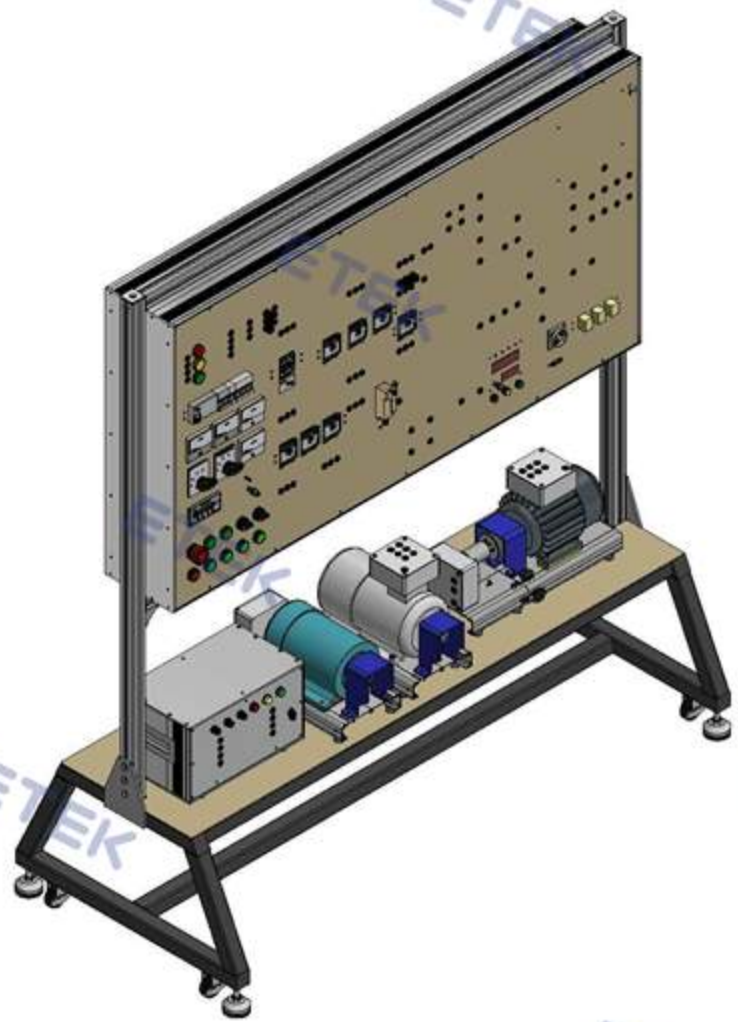
- Helps students learn about the structure and operating principles of the electrical equipment in the 2A55 drill
Learn the practical principles of controlling the 2A55 drilling machine and learn how to test, detect errors, and troubleshoot problems in the control circuit.

Skills acquired

1. Distinguish between types of electrical equipment such as atomat, fuse, contactor, magnetic starter, relay, push button
2. Understand the function of each electrical device in the circuit
3. Grasp knowledge of the structure and operating principles of electrical equipment
4. Understand measurement methods to detect errors and troubleshoot problems in control circuits.

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

2. Model equipped with electric machine tools (Breathing Machine)



Training content

- Helps students learn about the structure and operating principles of electrical equipment in the 2620 boring machine
- Learn the practical principles of controlling the 2620 boring machine and learn how to test, detect errors, and troubleshoot problems in the control circuit.

Skills acquired

1. Distinguish between types of electrical equipment such as atomat, fuse, contactor, magnetic starter, relay, push button
2. Understand the function of each electrical device in the circuit
3. Grasp knowledge of the structure and operating principles of electrical equipment
4. Understand measurement methods to detect errors and troubleshoot problems in control circuits.

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

3. Model equipped with electric machine tools (Lathe Machine)

Training content

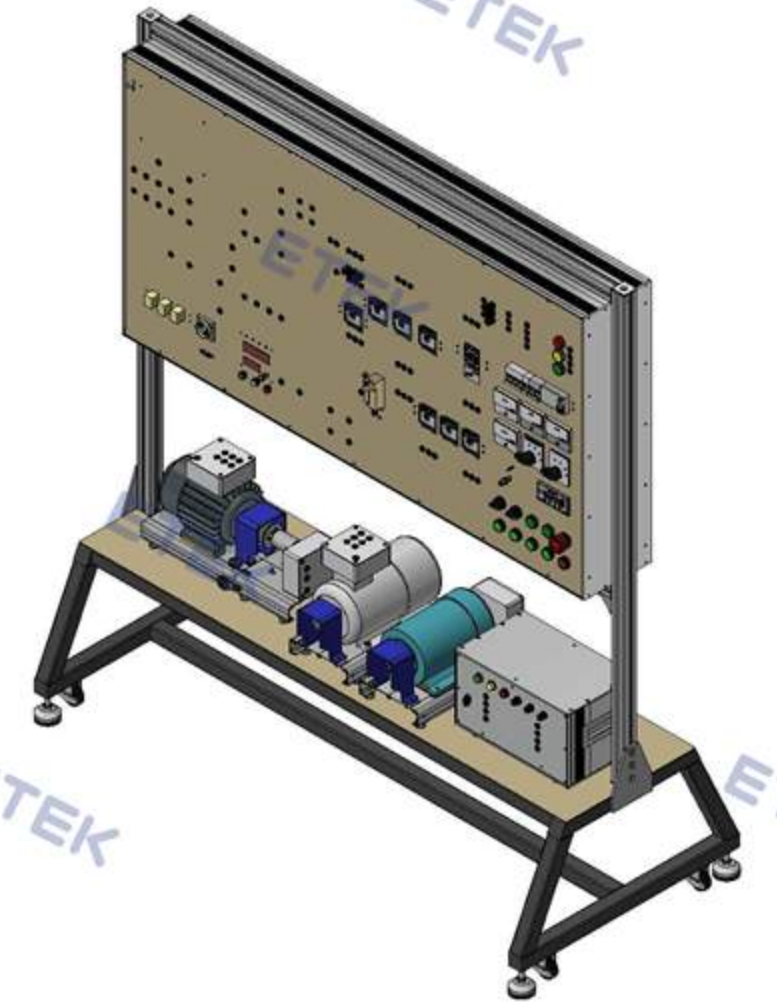
- Helps students learn about the structure and operating principles of electrical equipment in the 1A64 lathe
- Learn the practical principles of controlling the 1A64 lathe and learn how to test, detect errors, and troubleshoot problems in the control circuit.

Skills acquired

1. Distinguish between types of electrical equipment such as atomat, fuse, contactor, magnetic starter, relay, push button
2. Understand the function of each electrical device in the circuit
3. Grasp knowledge of the structure and operating principles of electrical equipment
4. Understand measurement methods to detect errors and troubleshoot problems in control circuits.

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

4. Electric machine tool equipment model (Milling machine)



Training content

- Helps students learn about the structure and operating principles of electrical equipment in the 6H81 milling machine
- Learn the practical principles of controlling the 6H81 milling machine and learn how to test, detect errors, and troubleshoot problems in the control circuit.

Skills acquired

1. Distinguish between types of electrical equipment such as atomat, fuse, contactor, magnetic starter, relay, push button
2. Understand the function of each electrical device in the circuit
3. Grasp knowledge of the structure and operating principles of electrical equipment
4. Understand measurement methods to detect errors and troubleshoot problems in control circuits.

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

5. Crane training model

Training content

- Practice understanding the structure of the crane system.
- Practice operating and controlling the crane manually.
- Practice surveying PLC S7-1200
- Practice surveying sensors (limit switches)
- Practice crane control with PLC S7-1200

Skills acquired

Operate crane equipment as in reality.

- Detect and resolve common damages and maintain the system.
- Know the hardware structure of the PLC programmer.
- Know how to connect the power supply, digital input and output, and analog input and output of the PLC.
- Know how to write programs for PLC with functions: logic, Timer, Counter, arithmetic calculations.

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

6. Electric instrument training equipment set

Training content

- Learn the uses, structures and operating principles of electrical tools
- Calculate and select some common electrical tools according to specific technical requirements (breakers, fuses, circuit breakers, contactors, ...) in simple cases.
- Install and operate common electrical tools
- Installation of civil and industrial electrical circuits
- Learn and practice the skill of finding common errors of electrical devices in electrical circuits by creating electronic errors for the devices through software installed on teachers' computers.

ETEK
TOTAL AUTOMATION SOLUTIONS

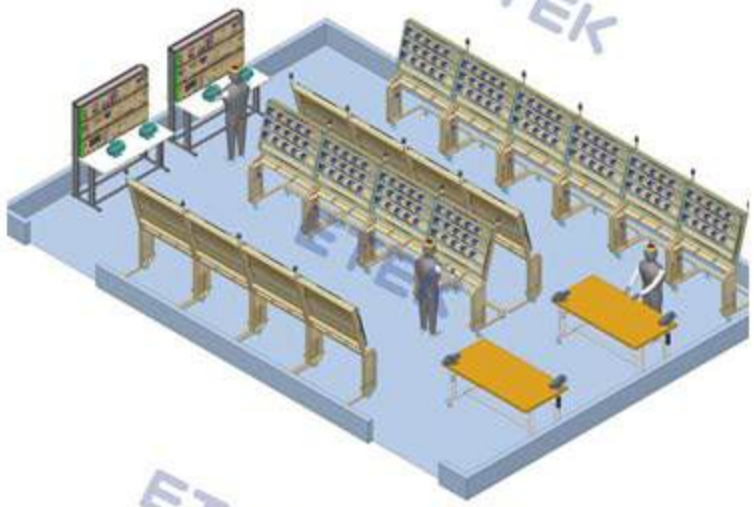
PH06
ELECTRICAL INSTALLATION TRAINING ROOM

PH06. ELECTRICAL INSTALLATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Install electrical equipment on specialized panels
- Wiring and electrical connection
- Testing without electricity
- Operate and test the equipment



Single assembly station

Practice set for installing basic industrial electrical circuits

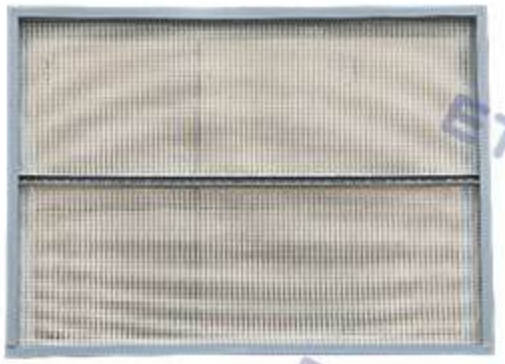
Practice set for installing advanced industrial electrical circuits

Practice set for installing civil electrical circuits

Practice set for installing home electricity Smart

Table with vice

Frame solution



Assembly panel

Single mounting frame

Single assembly station

PH06. ELECTRICAL INSTALLATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Wiring training solution

Electrical equipment

Single assembly station

PH05. ELECTRICAL EQUIPMENT TRAINING ROOM

1. Panel for practicing industrial and civil electrical installation

- Overall dimensions: 1180x740x1716±1% (mm) (LxWxH)
- Frame:
 + Use 40x40 mm box iron for bending and milky white powder coating.
 Edge panels made of powder-coated corrugated iron, size 690x285 mm (LxW), supplied R150
 + Each edge panel has 14 bean grooves measuring 80x20 mm
 + The installation panel frame is designed at a 100 degree angle for easy installation and connection
 + 04 moving wheels with height-adjustable feet when practicing
 + Base size: 1180x740 mm (LxW), R110 board

ETEK
TOTAL AUTOMATION SOLUTIONS

PH07
SUBSTATION OPERATION AND POWER TRANSMISSION TRAINING ROOM

PH07. SUBSTATION OPERATION AND POWER TRANSMISSION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

Training content:

-Practice understanding the operation of elements in the electrical system.
-Practice operating the electrical system locally - remotely
-Practice operating the electrical system on Scada software.
-Practice controlling generator voltage and frequency
-Practice synchronizing the generator with the grid manually and automatically on Scada software
-Practice controlling reactive power and active power of the generator.
-Practice controlling the ATS automatic power transfer system.
-Practice relay protection for distance, ground fault, differential, directional and scalar overcurrent
-Practice operating the system with LRC loads

Hệ thống đào tạo vận hành, bảo vệ và truyền tải điện năng

Mô hình hệ thống biến áp cung cấp và bảo vệ điện hạ thế

Mô hình mô phỏng hệ thống truyền tải, cung cấp điện sử dụng Scada giám sát

ETEK
TOTAL AUTOMATION SOLUTIONS

1. Training system for operation, protection and transmission of power

System equipment includes:

AC generator training module

Circuit breaker cabinet model (synchronous)

Power supply cabinet model

Circuit breaker cabinet model (input low voltage circuit breaker cabinet)

Step-up transformer model

Isolator cabinet model

Measurement cabinet model (medium voltage)

Circuit breaker cabinet model (Medium voltage circuit breaker cabinet)

Low voltage transformer model

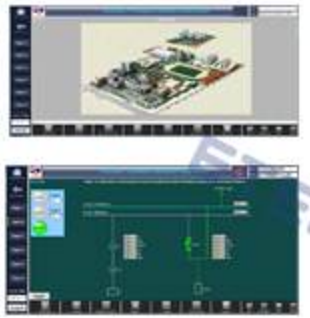
Low voltage distribution cabinet model

Cabinet model Low voltage capacitor

Training module for adjustable capacity loader (R - L - C)

Central control practice table for power supply system

Practice table for protective relay experiment



Control SCADA system and monitoring and measuring electricity

PH07. SUBSTATION OPERATION AND POWER TRANSMISSION TRAINING ROOM

2. Simulation model of power transmission and supply system using Scada Monitoring

Training content:

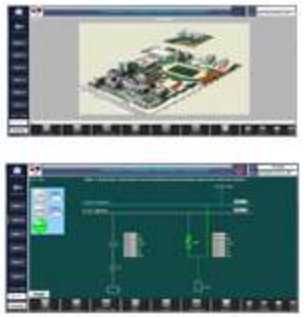
-Practice simulating power supply diagrams: Diagram of a busbar with segments using circuit breakers; diagram of 2 busbars; diagram of 2 busbars with ring busbar; quadrilateral diagram.
-Practice the functions of line protection relays
-Practice the features of transformer differential protection relays
-Practice automatic or manual low voltage power factor compensation
-SCADA system control, monitor and measure electricity

Central control practice table for power supply system

Power grid simulation equipment set for relay protection practice

Transformer training module

Load module

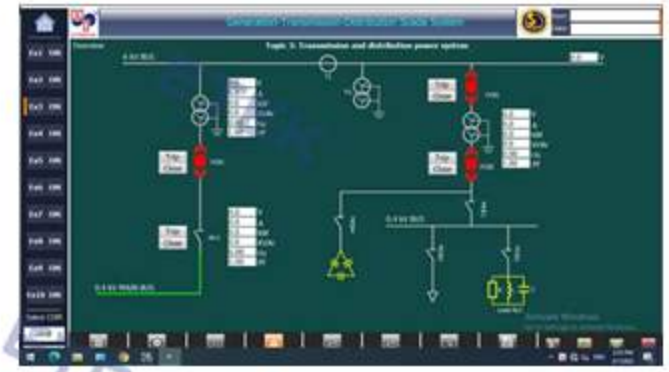


SCADA system for control and monitoring and measurement Electrical Power

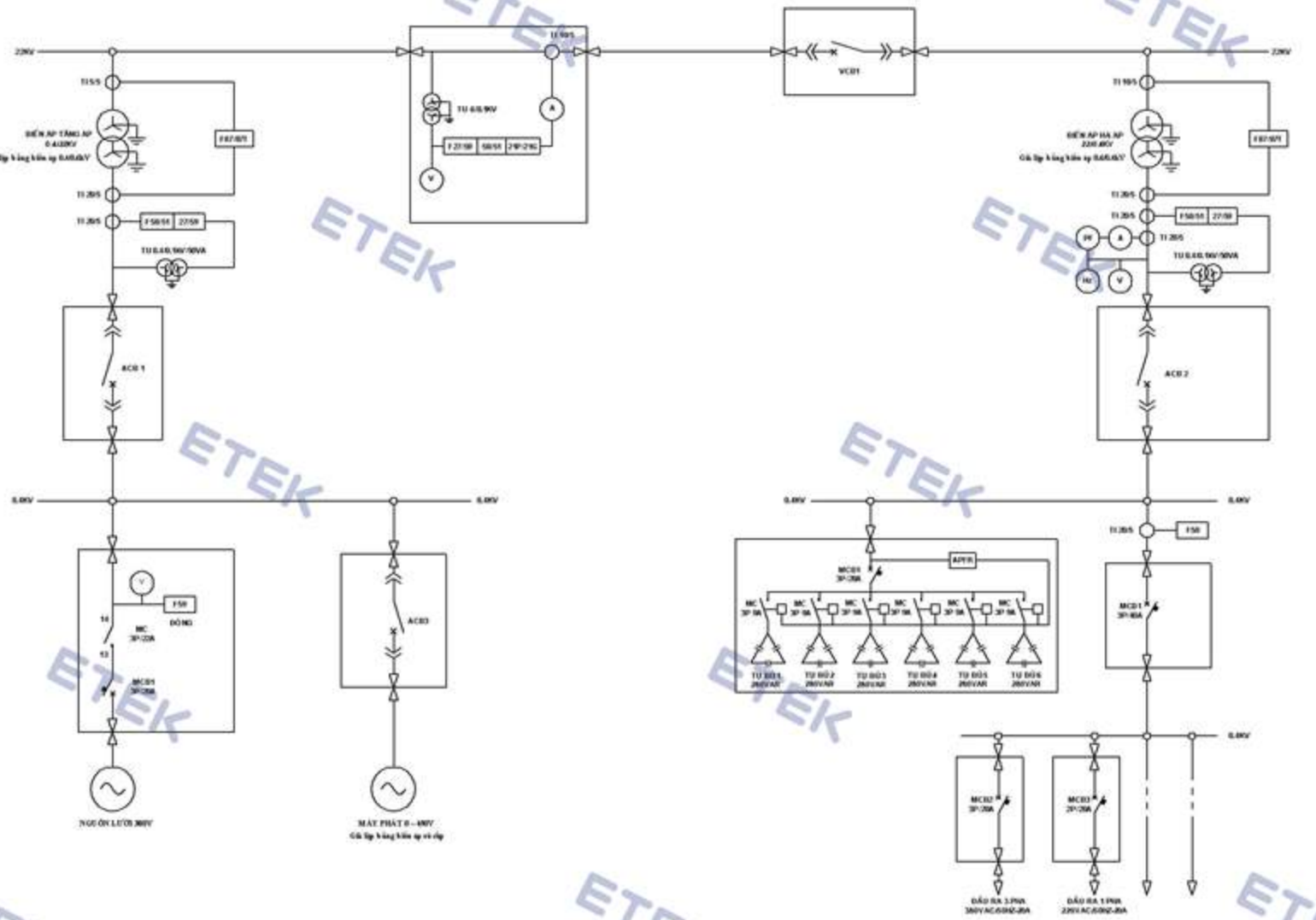
2. Simulation model of power transmission and supply system using Scada Monitoring

The system includes:

1. Input power supply system
2. Generator (simulated by stepless transformer)
3. ACB1: Input low voltage circuit breaker
4. 0.4/22kV step-up transformer (simulated)
5. Medium voltage measurement system
6. VCB1: Medium voltage circuit breaker
7. Low voltage transformer 22kV/0.4kV (simulated)
8. ACB2: Output low voltage circuit breaker
9. Low voltage distribution system
10. Reactive power compensation system
11. Load system: Including inductive load and resistive load



1. Scada interface controls and monitors the electrical system



3. Model of low voltage power supply and protection transformer system

Training content:

- Lesson 1: Practice simulating power supply diagrams: Diagram of a busbar with segments by circuit breakers; diagram of 2 busbars; diagram of 2 busbars with ring busbar; quadrilateral diagram.
- Lesson 2: Experiment to practice the functions of line protection relay
- Lesson 3: Practice the features of transformer differential protection relay
- Lesson 4: Practice low voltage power factor compensation automatically or manually

Model of low-voltage power supply system

Model of low-voltage power supply system

Model of low-voltage transformer station (hanging station)

Elevator system and dynamic electric cables

ETEK
TOTAL AUTOMATION SOLUTIONS

PH08.
EQUIPMENT
RENEWABLE ENERGY
TRAINING ROOM

PH08. EQUIPMENT RENEWABLE ENERGY TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Practice connecting and operating off-grid solar/wind energy circuits (Offline) / grid-connected (Online)
- Practice measuring, checking and calculating power consumption and power output to the grid.
- Practice installing a power switch circuit for the house when a grid failure occurs (offline power grid)
- Practice finding errors and repairing common damages.
- Practice periodic maintenance of equipment.

Wind power model

Solar power model

Electrical Student WorkBench with chair

Table with Chair

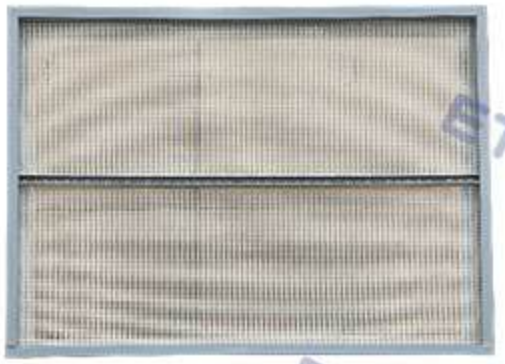
Magnetic White Board (Movable)

Interactive Screen

PH08. EQUIPMENT RENEWABLE ENERGY TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Frame solution



Assembly panel

Single mounting frame

Single assembly station

PH08. EQUIPMENT RENEWABLE ENERGY TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

Wiring training solution

Electrical equipment

Single assembly station

ETEK
TOTAL AUTOMATION SOLUTIONS

PH09
BASIC PLC TRAINING ROOM

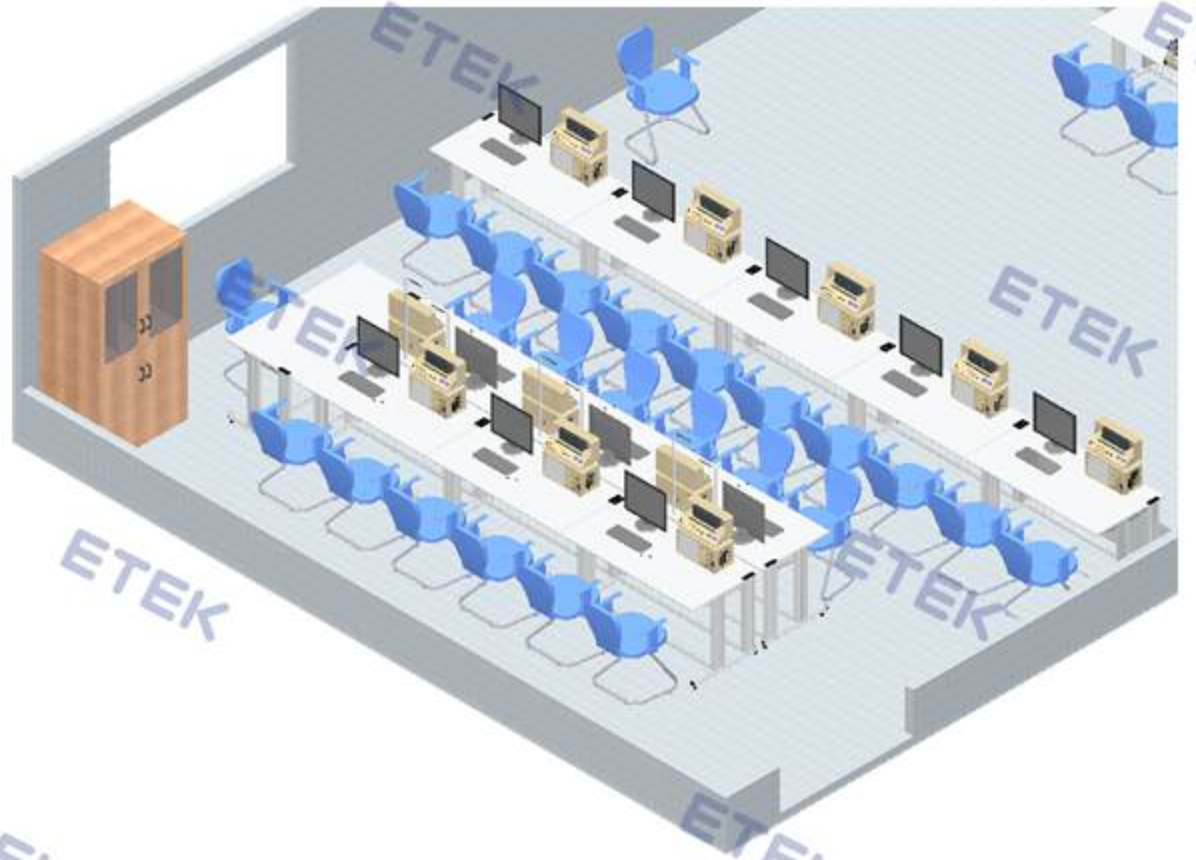
PH09. BASIC PLC TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

PLC programming training S7-1200, FX5U, Logo

- Learn the hardware structure
- Hardware declaration and PLC configurationprogramming basic logic commands
- Programming commands using Timer and Counter
- Programming comparison commands
- Programming basic mathematical commands
- Programming using subroutines
- Programming interrupt handler programmingreal-time programming
- Analog signal processing programming
- Analog signal processing programming



PLC FX5U Training set

PLC SIMATIC S7-1200 Training set

PLC Siemens LOGO Training set

Desktop Computer

Table with Chair

Magnetic White Board (Movable)

Interactive Screen

PH09. BASIC PLC TRAINING ROOM

PLC Training set Solution

ETEK
TOTAL AUTOMATION SOLUTIONS

PH10
ADVANCED PLC TRAINING ROOM

PH10. ADVANCED PLC TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

Install, wire and connect PLC:

- Install, wire and connect PLC circuits
- Programming PLC S7-1500, S7-1200 for specific applications:
  + Collect sensor data and control the process
  + Position control
  + Elevator control
  + Conveyor belt control and product classification
- Independent industrial communication network: Profinet, Profibus DP, Modbus RTU, IO-Link
- Mixed communication network: Profinet - Profibus DP, Profinet - Modbus RTU, Profinet - IO Link
- Practice combining multi-level communication networks
- Building a SCADA monitoring system

PLC wiring training set

PLC wiring training set combines industrial communication network

Conveyor control station for product sorting (actuator)

4-floor elevator

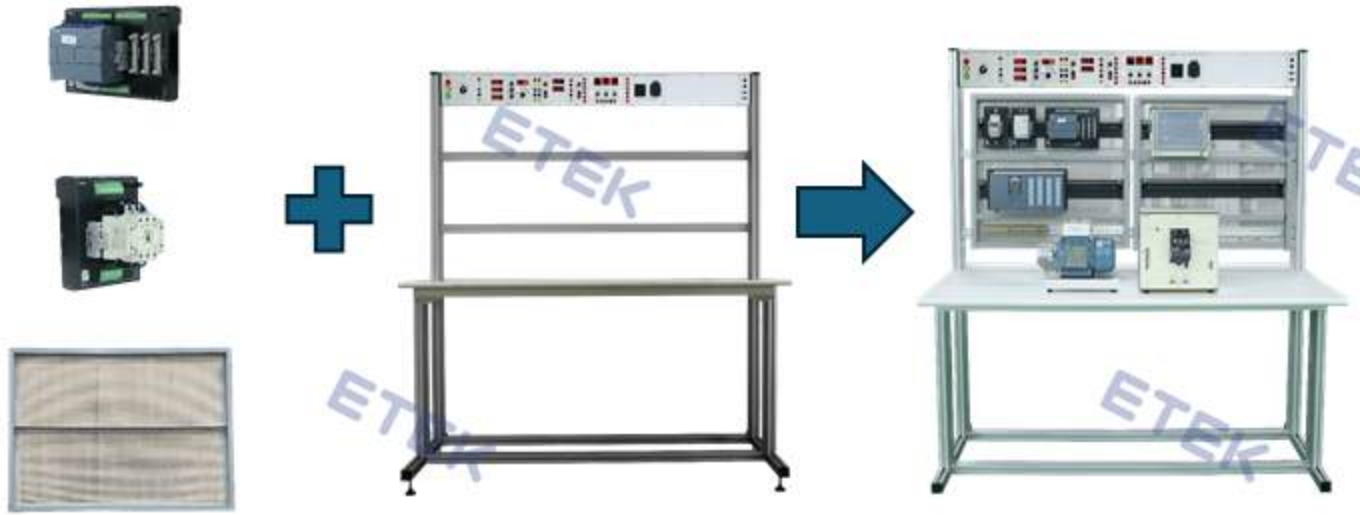
Process control station

1-axis position control station

Electrical Student WorkBench with chair

PH10. ADVANCED PLC TRAINING ROOM

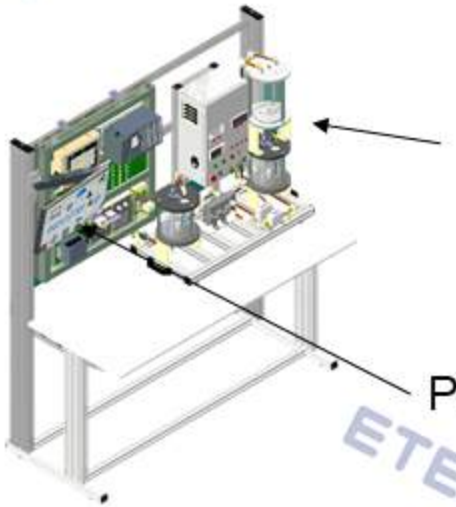
Electrical Student WorkBench Solutiong



Eqiuip ment + Assembly panel

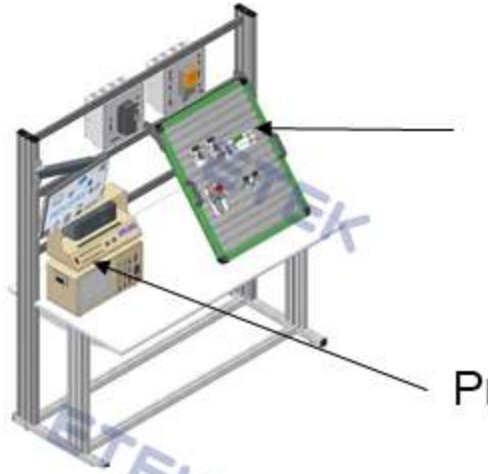
Table frame

The table is designed to be multi-functional and can add in a variety of practical equipment



Practice with Actuators

PLC Programming



Practice with Pneumatics Component

Practice with PLC Programming

PH10. ADVANCED PLC TRAINING ROOM

1. PLC wiring training set combines industrial communication network

Practice lessons

- Practice programming PLC S7-1500, S7-1200, writing interface for HMI screen
- Practice Profinet network communication using HMI, S7-1500 and S7-1200
- Practice Profibus DP communication network using S7-1500 and ET-200SP
- Practice Modbus RTU communication network using: S7-1200 to control the inverter
- Practice IO-Link communication network combining push buttons and contactors
- Practice sensor reading IO-Link communication network
- Practice mixed communication networks

  + Practice Profinet communication network - Profibus DP, Modbus RTU

  + Practice Profinet - AS-I communication network

  + Practice Profinet communication network - IO Link
- Practice combining multi-level communication networks

PH10. ADVANCED PLC TRAINING ROOM

2. Conveyor control station (Sorting Application)

Practice Lesson

- Control pneumatic mechanisms and classify products using sensors
- Control conveyor motor speed
- Sorting

ETEK
TOTAL AUTOMATION SOLUTIONS

3. 4-floor Elevator Control Model

Practice Lesson

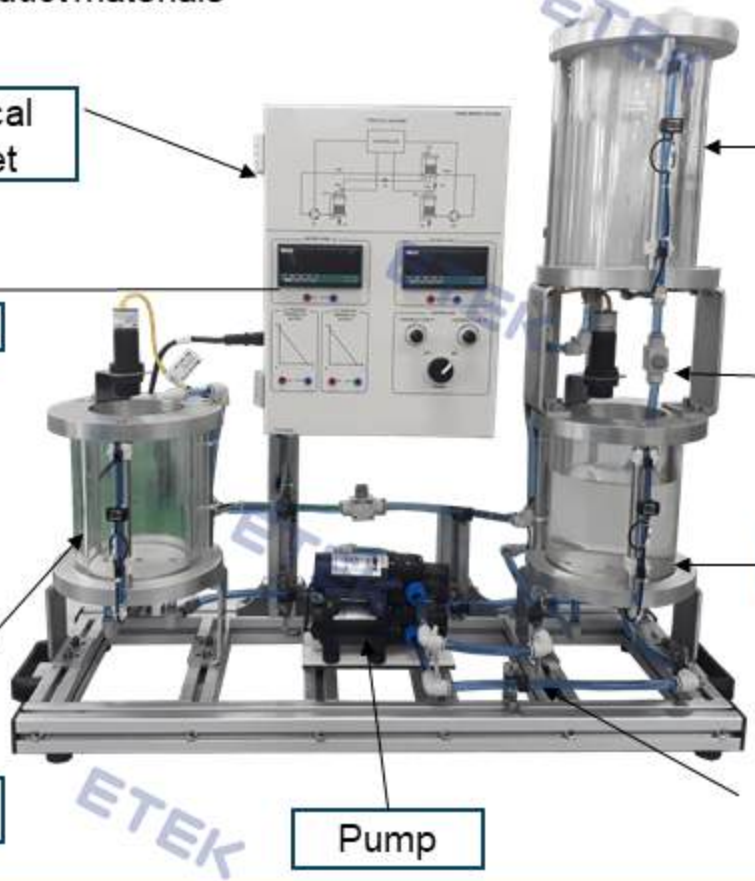
- Practice surveying elevator I/Os
- Practice connecting elevator I/O to the controller
- Practice writing elevator cabin control programs, opening and closing elevator doors, displaying elevator floor numbers, calling elevator cabins, and complete elevator control

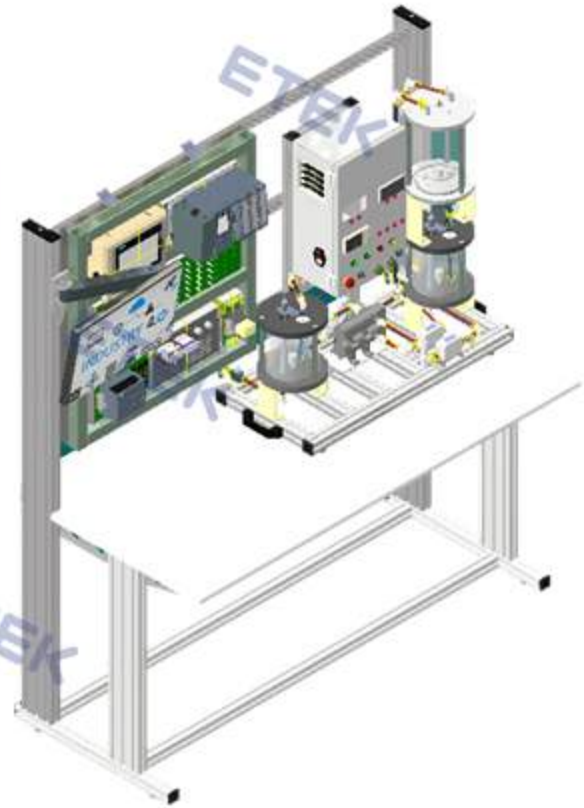
PH10. ADVANCED PLC TRAINING ROOM

4. Process control station

Practice Lesson

- Practice PLC programming (Timer, Counter, Analog, Real Time, HMI)
- Practice Level PID programming
- Practice PID Flow programming
- Practice programming and mixing product materials
- Heating control

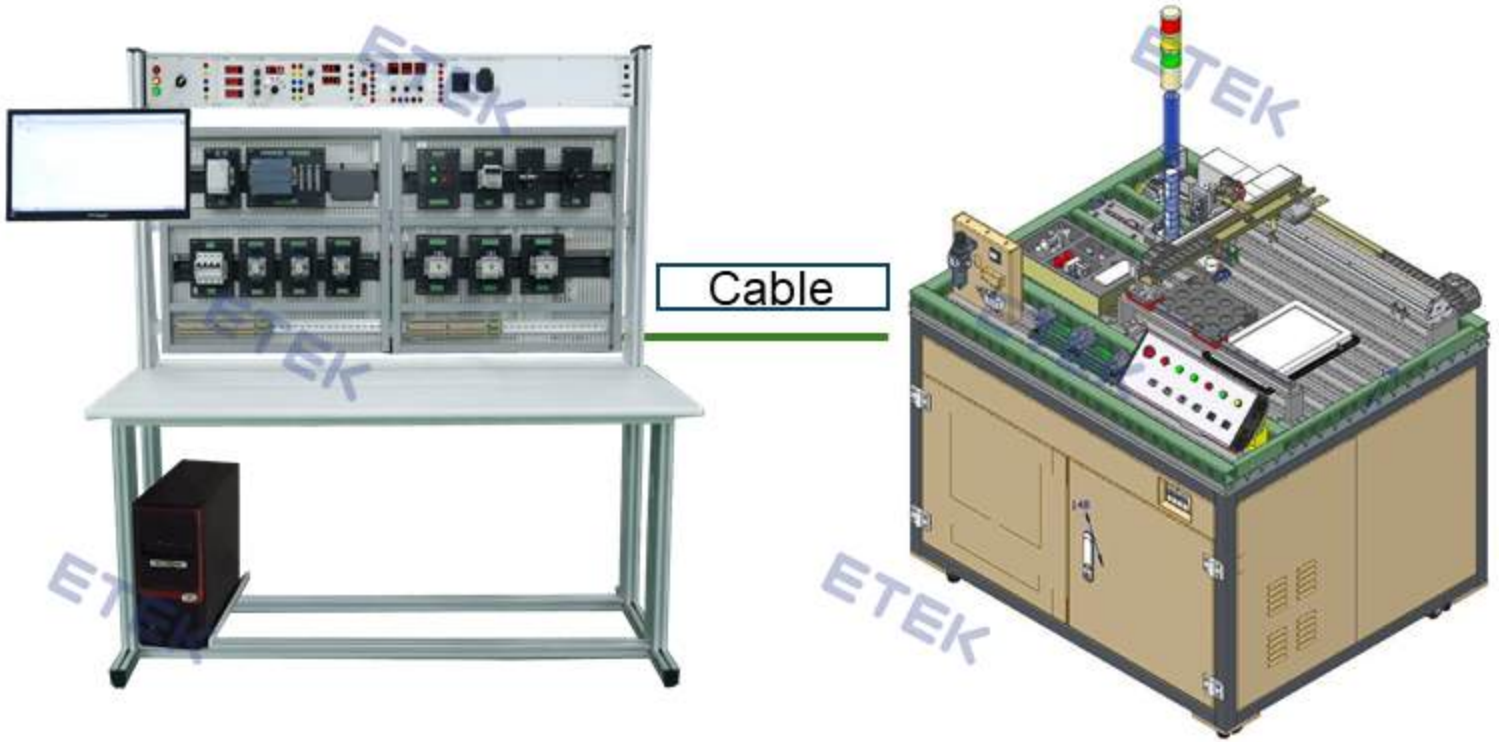




5. 1-axis position control station

Practice Lesson

- Install and mechanically align equipment clusters in the module
- Wiring, connecting and checking the electrical control system
- Operate and test the system
- Practice PLC programming to control stepper motors
- Practice PLC programming to control DC motors
- Practice PLC programming to control AC servo motors
- Practice PLC programming to control and coordinate different types of motors in the production line



ETEK
TOTAL AUTOMATION SOLUTIONS

PH11
AUTOMATION TRAINING ROOM

PH11. AUTOMATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Build hardware structure to collect production information in the field: Collect data from PLC, use Remote IO, Wireless IO, Smart Sensor
- System control programming
- Building software to monitor, manage and optimize the system
+ Configure IoT system, MQTT platform
+ Processing data on the Cloud
+ Build Dashboard to display data
+ Build graphs displaying data
+ Analyze and optimize machine performance with OEE tools
+ Analyze and optimize energy use with FMS tool
+ Warning and analysis of system errors with Andon tool
+ Build a maintenance schedule with the Maintenance tool
+ Predict machine status with PHM tool

Industrial IoT architecture training set

Digital factory simulation hardware suite

Digital factory simulation software suite

Theoretical desk

Teacher's desk

PH11. AUTOMATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

1. Desktop mechatronics 4.0 training system

Training content:

- Learn the structures of a flexible production line
- Practice surveying, installing, and aligning hardware devices
- Practice configuring devices and linking stations on software
- Practice PLC programming
- Practice programming SCADA monitoring interface

PH11. AUTOMATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

2. Mechatronic installation and maintenance practice system - MPS

Training content:

- Overall knowledge of mechatronics: Sensors, pneumatics, hydraulics, PLC, industrial communication networks, IOT.
- Disassembly, installation and connection of mechatronic modules (according to the national and international skills competition program)
- PLC programming to control independent stations
- Programming inter-station communication, complete system control
- Control and monitor the system via Cloud server

PH11. AUTOMATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

3. Mechatronics training system - Smart Factory

1. Digital factory simulation hardware suite

Training content

1. System control programming
- PLC programming to control the system
- HMI interface programming

2. Build software to monitor, manage and optimize the system
- IoT system configuration, MQTT platform
- Process data on the Cloud
- Build a Dashboard to display data
- Build graphs displaying data
- Analyze and optimize machine performance with OEE tools
- Analyze and optimize energy use with FMS tools
- Warning and analysis of system errors with Andon tool
- Build a maintenance schedule with the Maintenance tool
- Predict machine status with PHM tool

Kết hợp các trạm đơn lẻ thành dây truyền sản xuất

Mô phỏng 3D trạm và cả dây truyền

PH11. AUTOMATION TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

3. Mechatronics training system - Smart Factory

2. Digital factory simulation software suite

Visual Components simulation software

- Visual Compoments Premium 4.5: Simple, Intuitive, Powerful software. Verify automation solutions accurately
- Design: There are 3D design models available for use (available libraries) and you can also build your own 3D models according to CAD (import into
- Model and program: Visually define operating processes with easy-to-use tools or program robots with Teaching right in the software
- Simulation: Experience a simulation line and watch the simulated behavior of components and processes in action
- Evaluation: Perform simulation modeling studies to evaluate factors such as collisions, blockages, and design unknowns
- Optimization: When detecting abnormalities, you can quickly change the simulation design and repeat testing to optimize the production line.
- Share: Can export simulation activity and share results for multiple users to access
- The software connects to the Siemens S7 PLC to visualize the simulation model

ETEK
TOTAL AUTOMATION SOLUTIONS

3. Software toolkit to build smart factory functions

a. Manage and monitor OEE & Andon performance

1. OEE machine performance monitoring software

Calculated on the following indicators:

- Index A: Represents machine availability
- P index: Shows production efficiency
- Q index: Product quality indicator

Based on the indicators, users can evaluate and Flexible system optimization to meet requirements production demand

2. Andon software

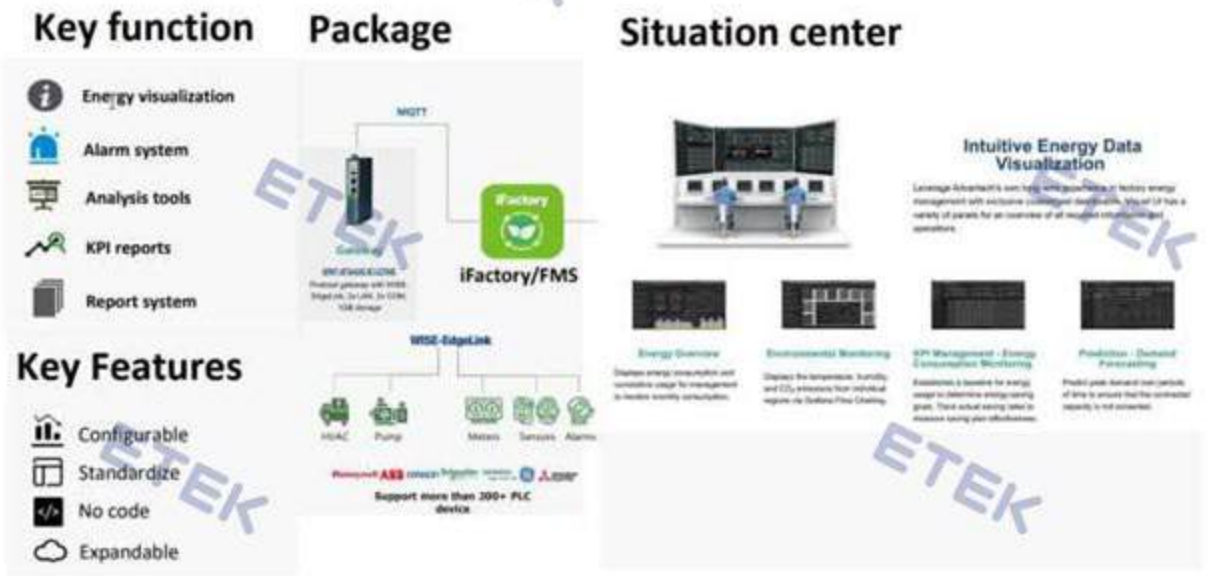
- Visually display the error and the machine location where the error occurred
- Statistics on error frequency
- Calculate losses based on time and frequency
- Provide events and notifications about the machine
- Document service requests and monitor the process

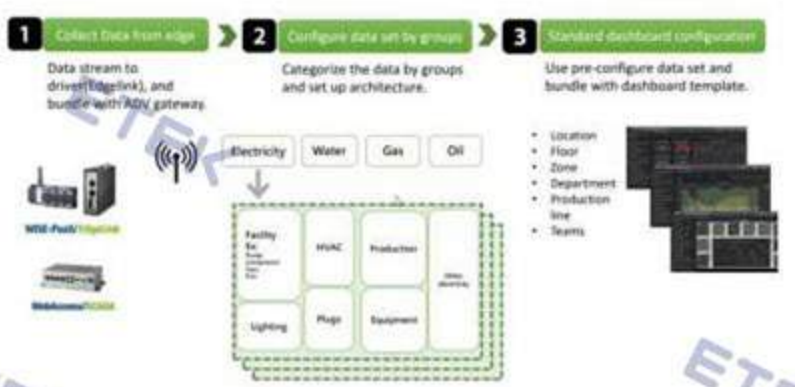
ETEK
TOTAL AUTOMATION SOLUTIONS

3. Software toolkit to build smart factory functions

b. FMS energy monitoring management

- Real-time display of energy used in machines, lines, and areas: Electricity, compressed air
- Energy usage chart during periods of time: Peak, off-peak
- Manage total energy usage
- Energy distribution assessment
- Optimize system costs
- Detect signs of abnormal energy usage, early warnings of possible errors
- Monitor the energy area in the factory





ETEK
TOTAL AUTOMATION SOLUTIONS

3. Software toolkit to build smart factory functions

c. Maintenance and prediction

- Real-time display of machine information: Temperature, vibration, energy consumption
- Visualize abnormal signs and mutation states that can cause errors
- Assess the current health of the machine
- Predict machine condition in the future
- Root cause analysis
- Develop a detailed maintenance plan and schedule system maintenance

Machine status overview

ETEK
TOTAL AUTOMATION SOLUTIONS

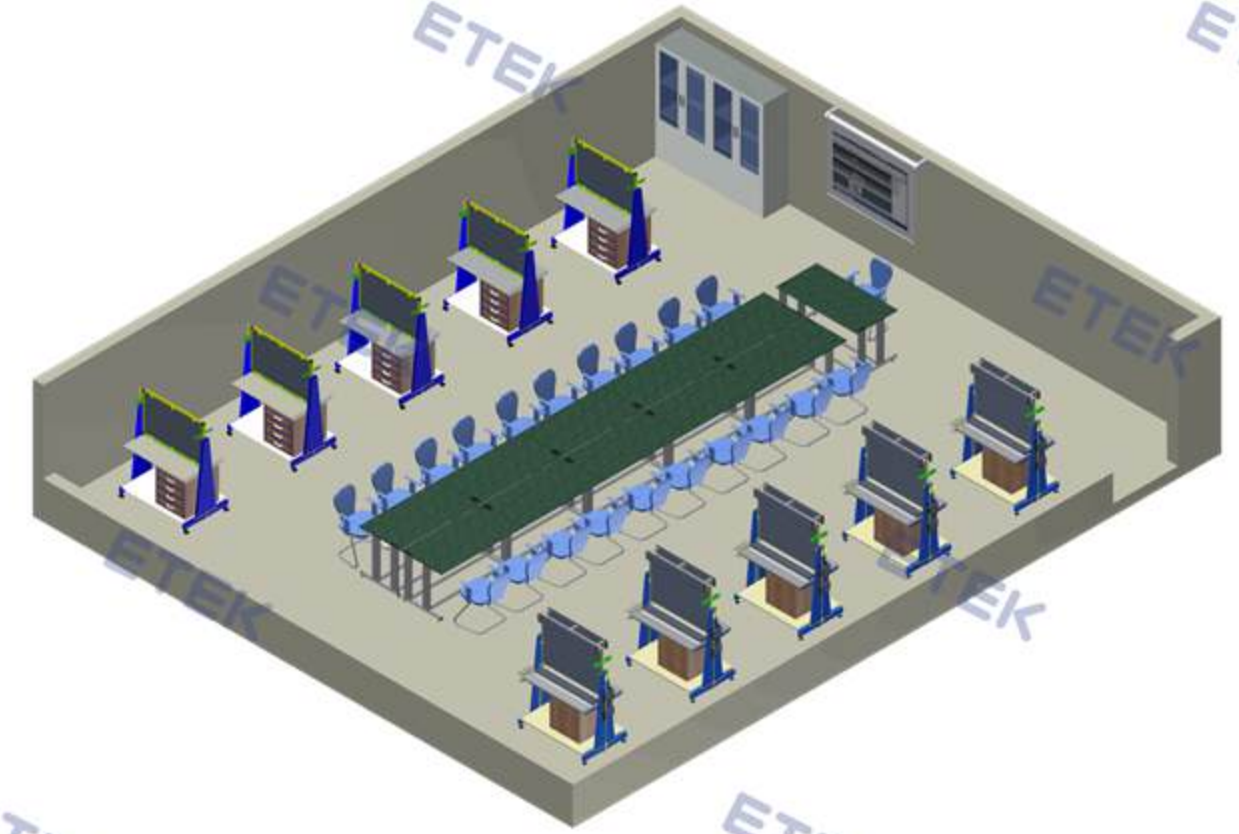
PH12
PNEUMATIC - HYDRAULIC TRAINING ROOM

VI. PNEUMATIC - HYDRAULIC TRAINING ROOM

ETEK
TOTAL AUTOMATION SOLUTIONS

FUNCTION

- Identify pneumatic and hydraulic elements in practice
- Learn the operating principles and control principles of pneumatic and hydraulic elements
- Practice connecting and operating pneumatic and hydraulic control circuits



Basic /Advanced Hydraulic training set

Basic /Advanced Electro-hydraulic training set

Basic /Advanced level pneumatics training set

Basic /Advanced electro-pneumatics training set

On/off hydraulics – Manual / Electrical operation

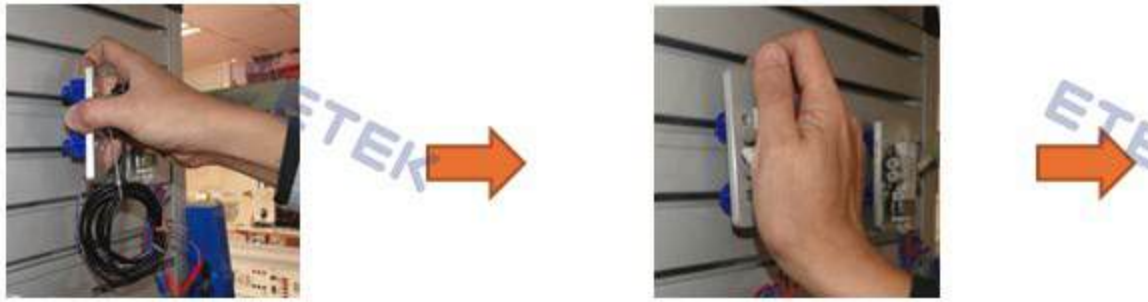
Table with Chair

Magnetic White Board

Interactive Screen

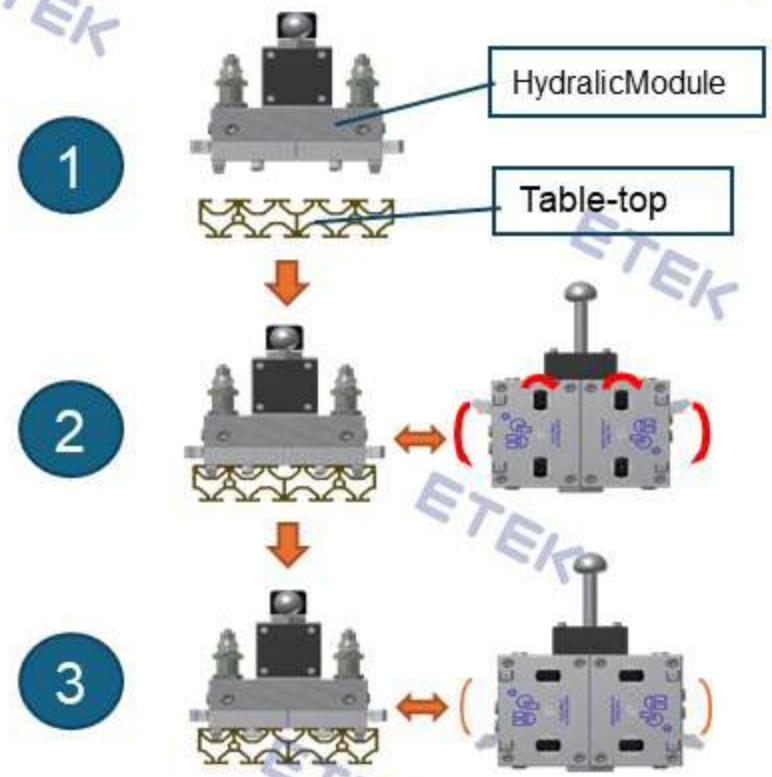
PH12. PNEUMATIC - HYDRAULIC TRAINING ROOM

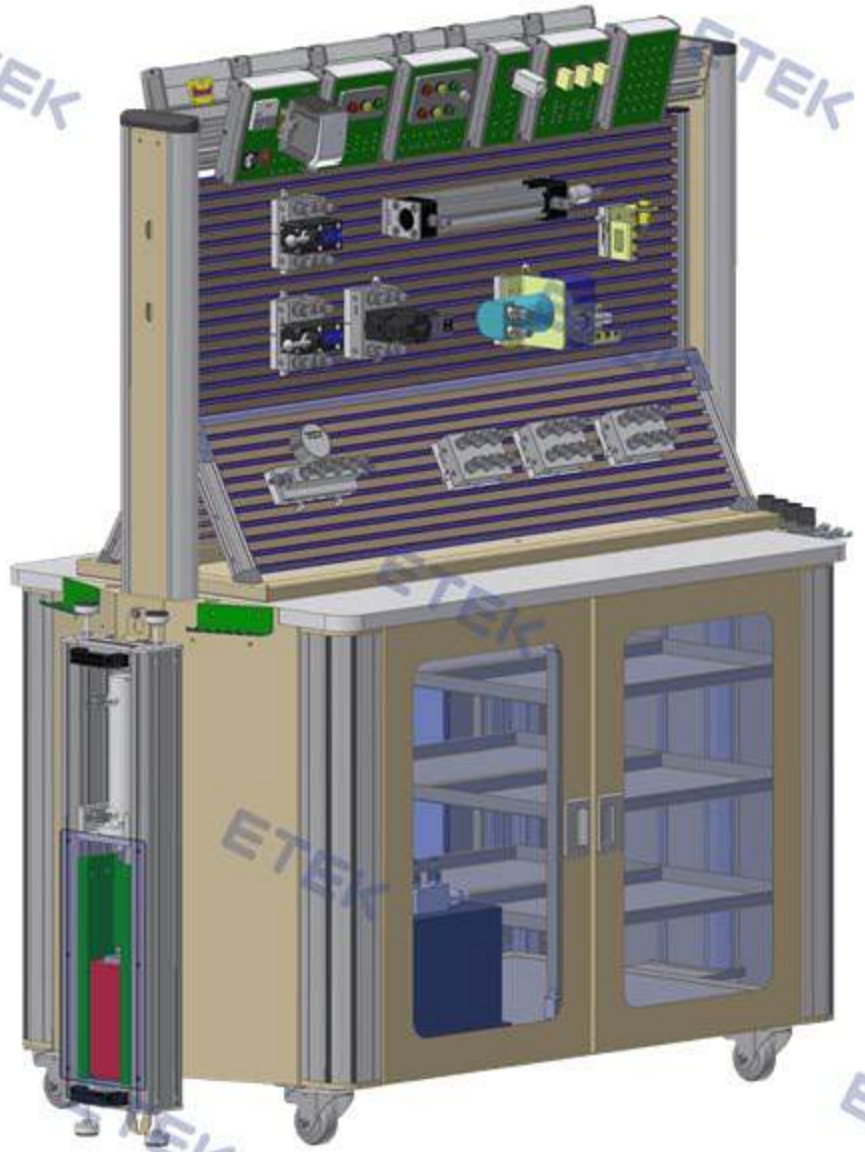
Solution for mounting pneumatic modules in practice:



PH12. PNEUMATIC - HYDRAULIC TRAINING ROOM

Solution for mounting hydraulic modules in practice:





ETEK
TOTAL AUTOMATION SOLUTIONS

ETEK AUTOMATION SOLUTIONS JSC

Headquater
189 Phan Trong Tue Road, Thanh Liet Ward, Thanh Tri Dist, Hanoi, Vietnam

Ho Chi Minh Branch
No 1 Le Duc Tho Road, Tan Thoi Hiep Ward, 12 District, Ho Chi Minh, Vietnam

info@etek.com.vn www.etek.com.vn