ETS-8000A
General Digitized Training System

*Notebook is excluded.

The ETS-8000A is a basic digital logic circuit training system. It includes combinational logic and sequential logic experiment circuit. The course content of experiment has hardware emulation and software simulation.

All necessary equipment for digital logic experiment such as power supply, signal generator, indicator, measurement are installed on the main unit.

● Features

1. Suitable for combinational logic, sequential logic experiments and designs
2. Ideal tool for learning the basics of digital logic circuits
3. Comprehensive power, signal supply and measurement devices for making experiments easily
4. Expandable and flexible experiments with universal breadboard
5. All supply units are equipped with overload protection for safety
6. Computer interaction includes software simulation & hardware emulation

● Specification
Main Unit (ETS-81001A)

1. Power Supply Units
    - a. Fixed DC power supply
        - Voltage range   : +5 V, -5 V
        - Maximum current output : 0.3 A
        - With overload protection
    - b. Dual adjustable DC power supply
        - Voltage range   : ±3 V ~ ±18 V, continuously adjustable
        - Maximum current output : 1 A
        - With overload protection

2. Signal Generator Units
    - a. Function generator
        - Output waveform   : sine, triangle, square, TTL level
        - Output frequency   : 1~100 KHz; 5 settings, continuously adjustable
        - Output impedance : 50 Ω
        - Output amplitude   : ≥ 18 Vpp (open loop); ≥ 9 Vpp (with 50Ω load)
        - Digital display   : 4 sets of 7-segment LED display With Hz, KHz, gate, OVFL LED With frequency counter
        - Minimum input voltage : 300mVpp
        - Counter range   : DC ~ 100 KHz

- b. Data switch
    - 8 sets of independent output
    - Output level   : TTL
    - Fan out   : 10 TTL load
- c. Pulse switch
    - 2 sets of independent control output
    - Each set with Q,$\overline{Q}$ output, pulse width > 5 ms
    - Output Level   : TTL
    - Each set of switch with Debounce circuit
    - Fan out   : 10 TTL load
- d. Potentiometer
    - 1 KΩ, 0.25W, variable resistor with 3 terminals (1,2,3) with overload protection
    - 100 KΩ, 0.25W, variable resistor with 3 terminals (1,2,3) with overload protection

3. Measurement Units
    - a. 3 1/2-digit digital volt/amp meter
        - DC voltage range   : 2 V, 20V
        - DC voltage accuracy   : ±0.3% of reading +1-digit
        - DC current range   : 2 mA, 2 A
        - DC current accuracy   : ±0.5% of reading +1-digit

4. Indicator Units
    - a. Logic indicators
        - Logic level   : TTL
        - Display   : Red LED for logic high, green LED for logic low; open status is none
   - 8 sets of independent input terminal
    - b. Digital display
        - Logic level   : TTL
        - 2 sets of independent 7-segment LED display
   - With BCD, 7-segment decode/driver input terminal
    - c. 8x8 LED dot matrix
        - Logic level   : TTL
        - With row input terminal   : R0~R7
        - With column input terminal: C0~C7

ETS-8000A

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5. USB Port
6. System requirement
    (1) PC : 1GHz or faster 32-bit (x86) or 64-bit (x64) processor
          128MB RAM, 100MB more free disk space
    (2) OS : Windows XP / Vista / 7
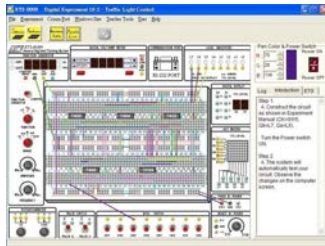
a. Software simulation
    • Simulate all the active status of digital logic circuits on the platform of ETS-8000A
    • With simulation software of breadboard
    • Simulate all digital experiments of user manual
    • Hint for experiment procedure
    • Automatically judge the line connection is true or false by computer
    • Record experiment result

b. Hardware emulation
    • Receive signal status of ETS-8000A platform through USB
    • Display the entity operation of ETS-8000A platform in screen
    • Display hint for how to connect & proceed from screen
    • Automatically judge the experiment result by software
   • Record experiment result

ETS-81001A
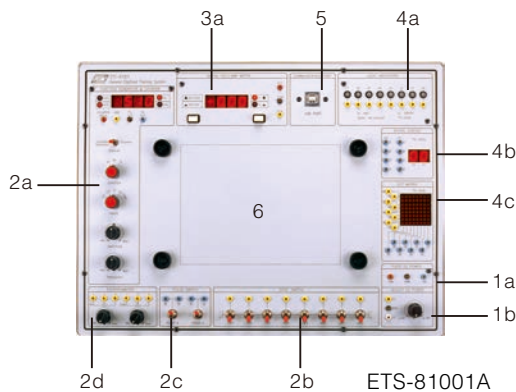
Experiment Modules

1. Each module is equipped with an 8-bit DIP switch for fault simulations. Students can practice trouble shooting by setting the DIP switch to different positions.
2. All terminals on the modules accept 2 mm plugs.
3. Comprehensive experiment manual
4. Module dimension : 255 x 165 x 30 mm
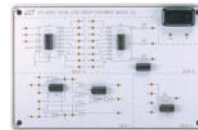5. Individual storage case for each module

List of Modules

ETS-83001 Digital Logic Circuit Experiment Module (1)
ETS-83002 Digital Logic Circuit Experiment Module (2)
ETS-83003 Digital Logic Circuit Experiment Module (3)
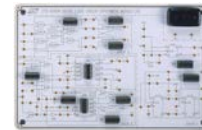ETS-83004 Digital Logic Circuit Experiment Module (4)
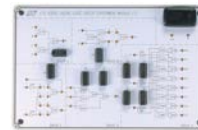
ETS-83001
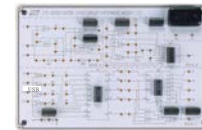
ETS-83003

ETS-83002

ETS-83004

List of Experiments

1. Basic Logic Gates
    (1) OR gate   (5) 2-input NAND gate
    (2) NOT gate   (6) 4-input NAND gate
    (3) NOT-OR gate   (7) AND-NOR gate
    (4) NOR gate   (8) Staircase light control
2. Combinational Logic Circuits
    (1) Verifying X+0=X and X+1=1
    (2) Verifying X•0=0 and X•1=X
    (3) Verifying X+X=X and X+X'=1
    (4) Verifying X•X=X and X•X'=0
    (5) Verifying (X•Y)'=X'+Y'
    (6) Verifying (X+Y)'=X'•Y'
    (7) 2-Bit magnitude comparator
    (8) Voting machine
    (9) Displaying patterns
3. Adders and Subtractors
    (1) Half adder   (5) 4-Bit adder
    (2) Full adder   (6) 4-Bit subtractor
    (3) Half subtractor   (7) BCD adder
    (4) Full subtractor
4. Decoders and Encoders
    (1) 8-to-3 Encoder
    (2) 3-to-8 Decoder
5. Multiplexers and Demultiplexers
    (1) Logic unit
    (2) Implementing logic function with multiplexer
6. Basic Flip-Flops
    (1) NAND gate RS Flip-Flop
    (2) NOR gate RS Flip-Flop
    (3) JK Flip-Flop
    (4) T Flip-Flop
    (5) D Flip-Flop
7. Flip-Flops Applications
    (1) Converting JK to D Flip-Flop
    (2) Converting JK to T Flip-Flop
    (3) Implementing Mod-8 ripple counter with JK Flip-Flops
8. Counters
    (1) Implementing Divide-by-8 counter with 7490
    (2) Implementing Divide-by-4 synchronous counter with JK Flip-Flops
9. Applications of Digital Circuits
    (1) Digital dice
    (2) Traffic light control

● Accessories

1. Experiment manual
2. Connection leads and plugs : 1 set
3. CD   : Software for data acquisition
4. USB cable   : 1 pce
5. Key   : 1 pce