



## ETS-3000

### Digital-Analog Training System



#### ● Feature

1. Suitable for basic electric circuits, linear circuits, combinational logic, sequential logic, microprocessor circuits, and FPGA.
2. User-friendly comprehensive power supply, function generator/counter, digital meter, analog meter and testing devices.
3. Universal breadboard(1440 tie points) for circuit design, faya-Nugget breakout boards NGT-series and prototyping.
4. Tie points fitting solid leads AWG#22~30 (0.3~0.8mm).
5. USB Interface for optional fayaduino Nano board, FPGA, MCU.
6. Peripheral hardware:
  - LED, JoyStick switch, Rotate switch, Potentiometer, Pulser switch, Rotary encoder, Data switches, Speaker, Power supply, Digital displays, Function generator/counter, DCV/DCA meter, Analog meter, etc.
7. Options: FPGA board (with USB Blaster), MCU board, faya-Nugget Combo Pack.

#### ● Specifications

1. Function Generator / Counter
  - (1) Universal counter
    - a. Frequency range :
      - 1Hz~99.99999MHz, 10Hz~100.00000MHz
    - b. Period range TH & TL :
      - 0.01 $\mu$ s~999999.99 $\mu$ s, 1 $\mu$ s~99999999 $\mu$ s
    - c. Input signal :
      - TTL or CMOS level or any level ( $V_{min} \geq +4.2V \pm 10\%$ )
    - d. Display : 8-digit 7-segment LED display
    - e. Mode switch : FG/FC
  - (2) Function generator
    - a. Output waveform :
      - sine, square, triangle, TTL (square only)
    - b. Frequency range : 1mHz~2MHz
    - c. Amplitude range : 100mVpp~18Vpp (open circuit)
    - d. DC offset : -10V~+10V
    - e. TTL mode output level : +5V $\pm$ 10%
2. Digital DCV/DCA Meter
  - (1) DC voltage range : 2V, 40V
  - (2) DC voltage accuracy :  $\pm 3\%$  of reading + 1 digit
  - (3) DC current range : 200 $\mu$ A, 2A
  - (4) DC current accuracy :  $\pm 3\%$  of reading + 1 digit
  - (5) Project fuse : 2A
3. Analog V/A Meter
  - (1) Voltmeter :
    - 0~30VDC full scale, class 2.5, impedance=320K $\Omega$
  - (2) Ampere meter : 0~100mA & 0~1A
4. Logic Indicators
  - 8 sets of independent LED indicates high/low logic state
5. JoyStick Switch
  - (1) X / Y- axis potentiometer : 5K $\Omega$
  - (2) Switch type : momentary
6. Potentiometer
  - (1) Variable resistor : 1K $\Omega$ (B) ,4-pin output
  - (2) Variable resistor : 100K $\Omega$ (B) ,4-pin output
7. Rotate Switch
  - 6 positions rotary switch, 2 set output
8. Pulser Switch
  - (1) Independent output, TTL level
  - (2) With A,  $\bar{A}$  output, pulse width > 5ms
9. Rotary Encoder
  - (1) PA, PB signal output
  - (2) TTL level
10. Data Switches
  - 8 sets independently control output high/low, TTL level
11. Speaker
  - 8 $\Omega$  /0.5W to be used for load
12. Adapter
  - For point tip / BNC socket exchange adapters, 2 sets



## 13. Adjustable Power Supply

- (1) Positive output voltage :  
0~ +15V±10%, continuously adjustable
- (2) Negative output voltage :  
0~-15V±10%, continuously adjustable
- (3) Maximum output current: 500mA

## 14. Fixed Power Supply

- (1) Fixed DC output : +5V±10%, 1A
- (2) Fixed DC output : +3.3V±10%, 1A
- (3) Fixed DC output : -5V±10%, 300mA

## 15. Digital Displays

- (1) 4 sets of independent 7-segment LED display
- (2) With BCD, 7-segment decoder/driver and DP input
- (3) Input with 8-4-2-1 code

## 16. Breadboards

- (1) Fitted on brick plate by brick posts
- (2) LA-60 x 4pcs: each 360 tie points, total 1440 tie points
- (3) Fitting solid leads AWG #22~30 (0.3~0.8mm)



## 17. USB Jack

Type A on front panel and Type B at the rear

## 18. Power Switch and Fuse

## ● Accessories

1. Power Cord
2. USB Cable (Type A to Type B)
3. User Manual

## ● General Characteristic

1. AC Power Input : AC 110V/220V, 50Hz/60Hz, ±10%, 1A
2. Weight : 4.5Kg
3. Operating Temperature : ambient temperature

## ● Options

### 1. FPGA Board (ETS-33051)



USB Blaster

- (1) Chip : Altera EPM 570T100C5
- (2) Operating voltage: +5V
- (3) Digital input pins : 20
- (4) Digital output pins : 16
- (5) Clock speed : 20MHz
- (6) Interface : JTAG
- (7) With USB blaster
- (8) User guide / sample code

### 2. MCU Board (ETS-33052)



USB ISP

- (1) Chip : Atmel AT89S52
- (2) Operating voltage : +5V
- (3) Digital I/O pins : 32
- (4) Clock speed : 8MHz
- (5) Interface : USB ISP
- (6) User guide / sample code

### 3. faya-Nugget Combo Pack (NGT-601)

Running Arduino experiments with fayalab Electronic Blocks



- Main Controller : fayduino NANO
- Modules :
 

1. Touch Slider	7. IR Distance Sensor
2. RGB LED	8. DC Motor
3. Color Sticker	9. Step Motor
4. Light Sensor	10. IR Receiver
5. Humidity & Temperature Sensor	11. IR Transmitter
6. IR Pulse Sensor	12. Basic Logic Gates
- Accessories :
  1. Brick Post Pack
  2. Brick Cap Pack
  3. Mini USB Cable
  4. Power Wire Pack
  5. Signal Wire Pack
  6. Tutorial CD