

# MULTI FUNCTION MEASURING INSTRUMENT SYSTEM

# New ED-2110

PART I  
ELECTRICALS/  
ELECTRONICS/  
EMBEDDED

The multi functional experiment trainer of ED providing the necessary measuring instruments for electrical and electronic training is suitable for digital, analog, LabVIEW experiment, electricity & electronics, medical electronics, communication, measuring control, smart-grid electric control, and renewable energy, etc.



## > EXPERIMENTS

- Diode/Zener Characteristic
- Transistor Characteristic
- FET Characteristic
- SCR Characteristic
- UJT Characteristic
- SCR/TRIAC/SBS Trigger
- LED/PHOTO Device
- Base/Emitter Ground Amp.
- DC Amplifier
- Complementary Amplifier
- Differential Amplifier
- Operational Amplifier
- Active Filter Circuit
- Unregulated Power Supply
- GUI program experiment using LabVIEW program.

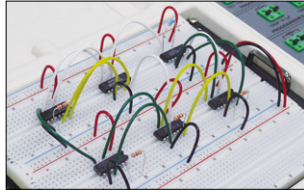
## > FEATURES



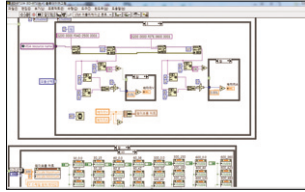
Experiment through the function generator, power supply, frequency counter, DMM and measuring resource, etc.



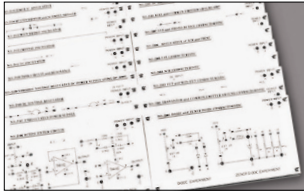
Provide the value of R&C element which user wants through programmable resistor & capacitor function.



Circuit assembly and experiment for various fields such as electricity & electronics, medical electronics, communication, measuring control, smart-grid electric control, renewable energy and logic, etc.



Measuring instrument control, DATA monitoring and GUI program experiment using LabVIEW program.



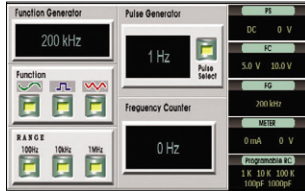
Various experiments using 24 experimental modules and 50 experimental circuits.



Provide various switch, relay, FND, buzzer and speaker to use easily the circuit experiment.



Possible to check measuring value from LCD screen and keep safely by screen panel with tilt device.

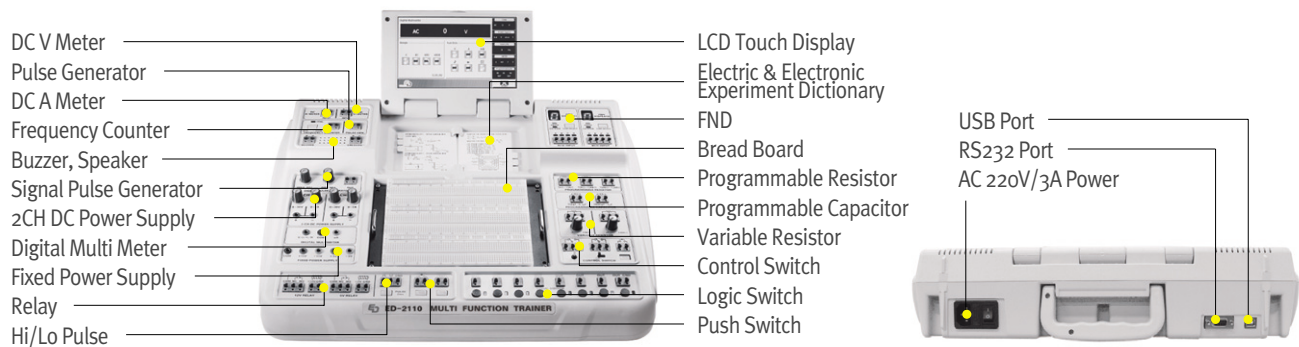


Possible to control the measuring instrument using TFT LCD, set up the port, select the value of element and watch the data in real time.

# MULTI FUNCTION MEASURING INSTRUMENT SYSTEM

# ED-2110

## > COMPONENT LIST



## > SPECIFICATIONS

### CONTROL AND DISPLAY USING LCD

- **2Channel DC Power Supply**
  - » Output Channel : 2CH Output
  - » Variable Power Supply : 2 x 0~25V, 1A
  - » Internal Resistance : < 15m $\Omega$
  - » Stability : < 2.5mV
  - » Recovery Time : < 80 $\mu$ s
  - » Load Regulation : < 0.05
  - » Temperature Coefficient : 0.1%/ $^{\circ}$ C
  - » Ripple and Noise : < 5mV
  - » Output Current : Max. 1A
  - » Current Limit : 10mA to 1000mA
- **Signal Pulse Generator**
  - » Output Range : 1CH, 1Hz ~ 200kHz
  - » Output Voltage : 20Vp-p (10Vp-p at Load 50 $\Omega$ )
  - » Output Waveforms : Sine, Triangle, Square
- **Frequency Counter**
  - » Frequency Measurement Range : 0~1MHz
  - » Sensitivity : 100mV (1Hz~1MHz Sine wave)
  - » Input Noise : < 100 $\mu$ V
  - » Maximum Input Voltage : 250V(DC+AC peak) from 0~440Hz
- **Digital Multimeter**
  - » DC VOLTAGE
    - › Range : 4V, 40V, 400V, 1000V
    - › Resolution : 100 $\mu$ V, 1mV, 10mV, 100mV
    - › Accuracy : 4V~1000V :  $\pm$ 1%
    - › Maximum Input Voltage : 1000V for 40V, 400V Input
    - › Input Impedance : 10M $\Omega$  || 70pF
  - » AC VOLTAGE
    - › Range : 4V, 40V, 400V, 750V
    - › Resolution : 100 $\mu$ V, 1mV, 10mV
    - › Accuracy 400mV~40V :  $\pm$ 3% at 40Hz~10kHz
    - › 200V and 750V :  $\pm$ 3% at 40Hz~100Hz
    - › Input Impedance : 10M $\Omega$  || 70pF
  - » DC CURRENT
    - › Range : 40mA, 400mA, 4A
    - › Resolution : 10 $\mu$ A, 100 $\mu$ A, 1mA
    - › Accuracy : 400mA~4A :  $\pm$ 1%
  - » AC CURRENT
    - › Range : 40mA, 400mA, 4A
    - › Resolution : 10 $\mu$ A, 100 $\mu$ A, 1mA
    - › Accuracy (40Hz~100Hz) : 2~200mA :  $\pm$ 3%
  - » RESISTANCE
    - › Range : 4k $\Omega$ , 40k $\Omega$ , 400k $\Omega$ , 4M $\Omega$
    - › Resolution : 100m $\Omega$ , 1 $\Omega$ , 10 $\Omega$ , 100 $\Omega$ , 1k $\Omega$
    - › Accuracy :  $\pm$ 1%
    - › Diode Test, Short Test

# MULTI FUNCTION MEASURING INSTRUMENT SYSTEM

# ED-2110

## • Pulse Generator

- » Frequency Selection Range : 1Hz, 10Hz, 100kHz
- » Output Range : TTL Level

## • Analog Meter

- » Voltage, Current Measuring Function
- » LCD Displaying Analog Meter
- » Current Measurement Range : 100mA
- » Voltage Measurement Range : 10V
- » Voltage Meter Input Impedance : 1M $\Omega$
- » Current Meter Input Impedance : 1 $\Omega$

## • Programmable Resistor

- » Provide Digitally Variable Output
- » Output Value : 1k $\Omega$ ~15k $\Omega$ , 10k $\Omega$ ~150k $\Omega$ , 100k $\Omega$ ~1.5M $\Omega$
- » Output Error : 1%
- » Available Power : 0.25W
- » 3CH Output Providing

## • Programmable Capacitor

- » Provide Digitally Variable Output
- » Output Value : 100pF~0.1 $\mu$ F, 1000pF~1 $\mu$ F
- » Output Error : 10%
- » Available Voltage : 0~50V
- » 2CH Output Providing

## OTHER

### • FND

- » 1 digits (Hexadecimal Number Indicator)
- » Anode / Cathode Selectable Common Mode
- » BCD Data Input
- » BCD data display

### • Relay

- » DC 5V RELAY
  - › Nominal Operating Current 16.7mA
  - › Coil Resistance : 720 $\Omega$
  - › Nominal Operating Power 200mW
- » DC 12V RELAY
  - › Nominal Operating Current 40mA
  - › Coil Resistance : 125 $\Omega$
  - › Nominal Operating Power 200mW

### • Fixed Power Supply

- » Output Voltage : Providing Fixed 4CH (+5V, -5V, +15V, -15V)
- » Output Current : 500mA
- » DC Over Load Alarm & Indication

### • Speaker

- » Rated Input Power : 0.5W
- » Input Impedance : 8 $\Omega$
- » Frequency Range : fo~8kHz

### • Buzzer

- » Sound Output : 80dB
- » Input Voltage : 3V~7V
- » Resonant Frequency : 300~2500Hz
- » Current Consumption : 20mA

## • Logic Switch

- » 8 Lock SW (Bounceless Output)
- » Bounceless Output Built-in Function
- » Hi/Lo Select LED Indicator
- » 8 Channel Output Terminal

## • Variable Resistor

- » Output Value : 10 $\Omega$ ~10k $\Omega$ , 10 $\Omega$ ~100k $\Omega$
- » Available Power : 5W

## • Control Switch

- » Slide Switch, Toggle Switch, Push Switch Providing

## • HI/LO Pulse

- » Hi/Lo Pulse Output
- » Pulse Cycle : 200mS
- » Output Voltage : TTL Level

## • Push Switch

- » Normal Open Push Switch
- » Normal Close Push Switch

## • Touch LCD

- » 7" TFT Touch LCD
- » 16bits Color

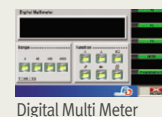
## GUI



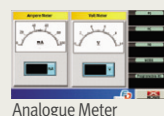
2 Channel Power Supply



FG, FC, Puls Generator



Digital Multi Meter



Analogue Meter



Programmable R&amp;C



## EXPERIMENTAL MODULE(24EA) OPTION

### • Basic/Characteristic : 7 Modules

01. Diode/Zener Characteristic
02. Transistor Characteristic
03. FET Characteristic
04. SCR Characteristic
05. UJT Characteristic
06. SCR/TRIAC/SBS Trigger
07. LED/PHOTO Device

### • Applied Circuit : 17 Modules

01. Base/Emitter Ground Amplifier
02. DC Amplifier
03. Complementary Amplifier
04. Differential Amplifier
05. Operational Amplifier
06. Active Filter Circuit
07. Unregulated Power Supply
08. DC Voltage Regulator
09. Variable Voltage Regulator

10. Tank Circuit/Resonance
11. Oscillator
12. Crystal Oscillator
13. Wien Bridge Oscillator
14. Multivibrator/Schmitt Trigger
15. Timer IC Application
16. Ramp Generator
17. Modulation/Demodulation

### EXPERIMENTAL CIRCUIT(50EA) OPTION

#### • DIGITAL & LOGIC CIRCUIT : 7 Modules

01. Logic Circuit
02. 7-Seg Display
03. BCD Counter
04. Decoder/Encoder
05. Flip Flop
06. Gate Function
07. Shift Register

#### • BASIC CIRCUIT : 15 Modules

01. DC Circuit
02. AC Circuit
03. Transformer
04. Semiconductor-1
05. Semiconductor-2
06. Transistor Amplifier
07. OP AMP.
08. Active Filter
09. Power Supply
10. Oscillator
11. Pulse Circuit
12. Fundamental Logic
13. Sequential Logic
14. Combination Logic
15. Signal Converter

#### • P-AMP. CIRCUIT : 28 Modules

01. Input Offset Voltage
02. Input Bias Current
03. Internal Input Impedance
04. Slew Rate

05. Common Mode Rejection Ratio(CMRR)
06. Closed Loop Response
07. Voltage Follower
08. Non-Inverting Amplifier
09. Inverting Amplifier
10. Summing Amplifier
11. Difference Amplifier
12. Differentiator
13. Integrator
14. Constant Current Source
15. Current-to-Voltage Converter
16. Voltage-to-Current Converter
17. Inverting Voltage-to-Current Converter
18. Non-Inverting Comparator
19. Sine Wave-Square Wave Converter
20. Window Comparator
21. Half-Wave Rectifier
22. Full-Wave Rectifier
23. Sine Wave-Cosine Wave Oscillator
24. Square Wave Oscillator
25. Square Wave-Triangle Wave Oscillator
26. Equal-Component VCVS(Voltage Controlled Voltage Source) Butter Worth
27. Low-Pass Filters
28. Band-Pass Filters

### GENERAL CHARACTERISTICS

- **Bread Board** : Socket Strip(630 Hole) 3ea, Bus Strip 4ea
- **Communication Port** : USB 1Port, RS232 1Port
- **Dimension** : 454(W) x 108(H) x 367(D)mm
- **Module Dimension** : 198(W) x 14(H) x 108(D)mm

### ACCESSORIES

- **AC Power Cord** : 1ea
- **Jumper Wire** : 1set
- **Test lead** : 1ea
- **Instruction Manual** : 1ea