Universal Lab Trainer

ULT-3000

EDU-LABS

BUATAN MALAYSIA
MADE IN MALAYSIA

OVERVIEW

A full functional Analog and Digital lab training station that meets the needs of most R&D labs and Analog & Digital training programs which include of Basic Electronics, Analog Circuit Experiments, Digital Circuit Experiments, Basic Logical Circuit Tracing and Circuit Trouble Shooting.

SPECIFICATIONS

1. **DC Power Supplies Module**
   Fixed Output: +5V/1A, -5V/1A, +12V/0.5A, -12V/0.5A
   Variable Output: +0V ~ +25V/1A, -0V ~ -25V/1A, and all power supplies are short circuit protected

2. **AC Power Supplies Module**
   Consists of 19V–15V–0V–15V-19V

3. **Function Generator (2 Channels) & Clock Generator (2 Channels) Modules**
   Sine, Triangle and Square waveform output
   Frequency range: 1Hz to 1MHz in 6 decades
   With fine adjust, Amplitude and DC offset control
   Clock output 1Hz to 1MHz in 6 decades
   Six frequency ranges:
   - 1Hz to 10Hz
   - 10Hz to 100Hz
   - 100Hz to 1KHz
   - 1KHz to 10KHz
   - 10KHz to 100KHz
   - 100KHz to 500KHz

   Sine wave output: 0 to 12V peak to peak variable
   Triangle wave output: 0 to 8V peak to peak variable
   Square wave output: 0 to 22V peak to peak variable

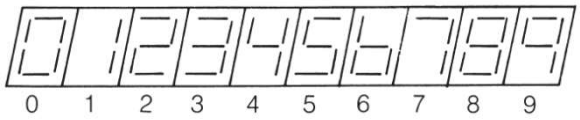
4. **Solderless Breadboard Module**
   Interconnected nickel plated with a total of 1860 tie points nickel plated contact, fitted all DIP sizes and all components with lead and solid wire in diameter of AWG #22-30 (0.3-0.8mm)

5. Two Pulse Switches Module

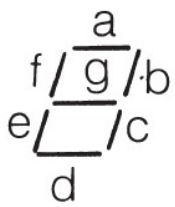
80uS Single Shot Pulse (Positive & Negative)
2 units push button switch contain switches debouncer for eliminating the bounce caused by switch from "open" to "close" or from "close" to "open" position.

6. Two digits 7-segment LED Display Module

Numerical designs and resultant display



Segment Identification



Truth Table

Decimal or Function	Inputs D	C	B	A	Outputs a	b	c	d	e	f	g
0	L	L	L	L	H	H	H	H	H	H	L
1	L	L	L	H	L	H	H	L	L	L	L
2	L	L	H	L	H	H	L	H	H	L	H
3	L	L	H	H	H	H	H	H	L	L	H
4	L	H	L	L	L	H	H	L	L	H	H
5	L	H	L	H	H	L	H	H	L	H	H
6	L	H	H	L	L	L	H	H	H	H	H
7	L	H	H	H	H	H	H	L	L	L	L
8	H	L	L	L	H	H	H	H	H	H	H
9	H	L	L	H	H	H	H	L	L	H	H
10	H	L	H	L	L	L	L	L	L	L	L
11	H	L	H	H	L	L	L	L	L	L	L
12	H	H	L	L	L	L	L	L	L	L	L
13	H	H	L	H	L	L	L	L	L	L	L
14	H	H	H	L	L	L	L	L	L	L	L
15	H	H	H	H	L	L	L	L	L	L	L

7. 16 Bits LED Indicators with buffer Module

16 units LED's separate input terminals in three colors. (RED, Yellow & Green). The LED will be lighted up when input is at "HI Level", and it will be turned off when it is at no input or at "LO Level". Capable for Traffic Light Experiments.

8. 16 Bits HI/LO Data Output Switches Module

16 units slide switches and corresponding output terminals. When switch is set at "down" position, the output is LO level; contrarily, it is to be HI level when setting at "up" position.

9. TTL/CMOS Selection Switch

Select TTL or CMOS Mode for data switches

10. 3-State Logic Probe Module

HI, LO, FLOAT 3 Logic Level Testing
CMOS / TTL Level Selection

11. Speaker Module

8Ω, 0.25W With Buffer

12. Digital DC Volt Meter Module

4 Digits LED display
Four voltage ranges:
- 0V to 199.9VDC
- 0V to 19.99VDC
- 0V to 1.999VDC
- 0V to 199.9mVDC

Input Impedance: 10Mohm for any range

13. Adaptors Module

5 Channels Banana to 2mm Adaptor Interface Socket and turn pins sockets

The ULT-3000 is shipped with a comprehensive CD Format Experiments Manual, Instruction Manual with Self Maintenance Guide and a power cord.

Power Supply: 240VAC, 50Hz (Fused Protected)
Dimensions: (W x D x H) 310 x 260 x 90mm
Weight: 3.5 kgs

EXPERIMENTS COVER

The ULT-3000 come with experiments manual (MANUAL ONLY NO COMPOENENTS) to cover the following experiments topics:

(A) Analog Electronics Experiments Lists Cover In the Lab Manual:

Experiments 1: The Superposition Theorem
Experiments 2: Capacitors in Voltage - Divider Networks
Experiments 3: Operational Amplifier - The Inverting Amplifier
Experiments 4: Operational Amplifier - The Non inverting Amplifier
Experiments 5: Operational Amplifier - The Comparator
Experiments 6: Operational Amplifier - The Summing Amplifier
Experiments 7: The Common - Base Amplifier Structure
Experiments 8: The Common - Emitter Amplifier Structure
Experiments 9: The Common - Collector Amplifier Structure
Experiments 10: The Op Amp Differentiator
Experiments 11: The Op Amp Integrator
Experiments 12: The RC Phase Shift Oscillator
Experiments 13: The As table Multivibrator
Experiments 14: The Schmitt Trigger
Experiments 15: The As table Multivibrator
Experiments 16: The D/A Converter
Experiments 17: The A/D Converter

(B) Digital Electronics Experiments Lists Cover In the Lab Manual:

Experiments 1: Fundamental Logic Gate - AND, OR, NOT
Experiments 2: Fundamental Logic Gate - NAND, NOR, XOR
Experiments 3: Applications of Boolean Algebra
Experiments 4: De Morgan's Law (I)
Experiments 5: De Morgan's Law (II)
Experiments 6: Diode Resistor Logic - AND
Experiments 7: Exclusive OR
Experiments 8: Exclusive NOR
Experiments 9: Demultiplexer
Experiments 10: Synchronous Up - Counter
Experiments 11: Synchronous Down - Counter
Experiments 12: The Schmitt Trigger
Experiments 13: Oscillator - Counter

Note: Due to products continuous development process, layout and specification may change without prior notices.