

The **DIGITAL-ANALOG LAB** is intended for elementary as well as advance training of Digital & Analog electronics. The trainer covers regular digital & analog circuits by solder-less interconnections on breadboard and as well as compatible with all optional modules, through use of 2mm brass terminals and patch cords. Various clock generators, logic level input/output indicators and DC regulated power supplies etc. are in-built. The unit housed in attractive enclosure is supplied with mains cord, patch cords, Instruction manual and **Component Set**.

Experimental Coverage:

Analog

001. Study of Diodes in DC circuits
002. Study of Light Emitting Diodes in DC Circuits
003. Study of Half wave rectifier
004. Study of Full wave rectifier
005. Study of Zener Diode as a voltage regulator
006. Study of transistor series voltage regulator
007. Study of transistor shunt voltage regulator
008. Study of Low pass filter
009. Study of High pass filter
010. Study of band pass filter
011. Study of CE configuration of NPN transistor
012. Study of CB configuration of NPN transistor
013. Study of CE amplifier
014. Study of Monostable multivibrator using transistor
015. Study of Bistable multivibrator using transistor
016. Study of Astable multivibrator using transistor

Digital

001. Logic gates operation
002. To verify De-morgan's theorem With boolean logic equations
003. Binary to Gray code conversion
004. Gray code to Binary conversion
005. Binary to Excess-3 code conversion
006. Binary Addition and Subtractor

Digital

007. Binary Multiplier
008. EX-OR gate implementation
009. Application of EX-OR gate
010. Johnson Counter
011. To verify the dual nature of Logic Gates
012. Study of Flip-Flops RS, JK, D&T
013. Multiplexer and Demultiplexer
014. 4 Bit Binary up and down counter
015. Study of 8 to 3 Line Encoder
016. Study of 3 to 8 Line Decoder
017. Study of Shift Register (SIPO)
018. CMOS-TTL Interfacing
019. Study of Crystal oscillator
020. Study of pulse stretcher circuit



FEATURES:

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|---------------------------|--|
| Bread Board | : Unique solder-less large size, spring loaded breadboard consisting of two Terminal Strips with 1280 tie points and 4 Distribution Strip with 100 tie points each, totaling to 1680 tie points. (Size:112mm x170mm) |
| Regulated DC Power Supply | : +5 V at 1 Amp, -5 V at 1Amp, +12 V/0 to 20V at 500mA, and -12 V/0 to -20 V at 500 mA |
| AC Supply | : 5-0-5V, 10-0-10V at 100mA. Can be used as 5V, 10V, 15V, 20V, and also as center tap |
| Function Generator | : Sine / Square / Traingular / Pulse waveform frequency 1 Hz to 110 Khz in 5 Steps. Variable in between steps. Sine / Square / Traingular waveform output 50mV ~ 10Vpp variable |
| Clock Generators | : 0.1Hz and 100 Hz, Independent fixed TTL 5V outputs |
| Variable Clock Generators | : low frequency variable clock 1 Hz to 10 Hz Fixed TTL 5V output |
| Pulser Switch | : 2 independent buffered bounce free manual pulser (useful for freezing the action of each stage of the counter after every clock pulse) |
| Data Switch | : 16 independent logic level inputs to select High / Low TTL levels, each with a LED to indicate high / low status and termination |
| Logic Indicators | : 16 independent buffered logic level indicators for High / Low status indication of digital outputs |
| Speaker | : 8 ohms miniature speaker with terminations |
| Digital meter (3½Digit) | : Dual range DC Voltmeter 0-20V / Ammeter 0-200mA |
| Continuity Tester | : For testing the continuity. Provided with Beeper Sound |
| Potentiometers | : 6 Potentiometers (1K, 22K, 47k, 100K, 100K and 1Meg) with terminals |
| BNC to banana adapter | : 2 Nos. BNC to 2 channel banana adapter |
| Computer interface | : Facilities connecting your trainer to either Rs232 communication port of PC ADAPTER using 25 pin (male) connector through 25 nos. of 2 mm banana sockets |
| On Board Switches | : 2 Switches singal pole double through |
| Connecting terminals | : 2 / 4 connecting terminals |
| Seven segment LED Display | : 2 Nos. BCD to Seven Segment Decoder/ Driver IC with terminals |
| LED Bar Graph | : With 10 LED Indicators and 20 termination |
| Logic Probe | : Logic level indicator for TTL/CMOS |
| Power | : 230 V ± 10%, 50 Hz |

Accessories : Mains cord, Operating and Experimental manual, Red & Black patch cords (2mm with Pin) 10 each, Red & Black patch cord (Pin to Pin) 10 each & **Component Set**

Instruction manual : Strongly supported by detailed operating instructions

* Weight : 6 Kg. (Approx)

* Dimension : W 412 x H 150 x D 310

Note: Specifications are subject to change.

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Optional Modules:

Apart from above given experimental coverage of 16 + 20 experiments on breadboard, customers can purchase these optional modules. These are ready to use modules with wired components & circuit schematic drawn on top compatible to use with Digital-Analog Lab.

Analog

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36002	Study of Light Emitting Diodes in DC Circuits	38501	Logic gates operation
36003	Study of Half wave rectifier	38502	To verify De-morgan's theorem with boolean logic equations
36004	Study of Full wave rectifier	38503	Binary to Gray code conversion
36005	Study of Zener Diode as a voltage regulator	38504	Gray code to Binary conversion
36006	Study of transistor series voltage regulator	38505	Binary to Excess-3 code conversion
36007	Study of transistor shunt voltage regulator	38506	Binary Adder and Subtractor
36008	Study of Low pass filter	38507	Binary Multiplier
36009	Study of High pass filter	38508	EX-OR gate implementation
36010	Study of band pass filter	38509	Application of EX-OR gate
36011	Study of CE configuration of NPN transistor	38510	Johnson Counter
36012	Study of CB configuration of NPN transistor	38511	To verify the dual nature of Logic Gates
36013	Study of CE amplifier	38512	Study of Flip-Flops RS, JK, D&T
36014	Study of Monostable multivibrator using transistor	38513	Multiplexer and Demultiplexer
36015	Study of Bistable multivibrator using transistor	38514	4 Bit Binary up and down counter
36016	Study of Astable multivibrator using transistor	38515	Study of 8 to 3 Line Encoder
36017	Study CB amplifier (PNP)	38516	Study of 3 to 8 Line Decoder
36018	Study CC amplifier (PNP)	38517	Study of Shift Register (SIPO)
36019	Study of FET amplifier.	38518	CMOS-TTL Interfacing
36020	Study power supply having two zener diodes in series	38519	Study of Crystal oscillator
36021	Study dual polarity voltage regulated power supply	38520	Study of pulse stretcher circuit
36022	To study the characteristics of photo transistor	38521	4 Bit Ring Counter
36023	To practically understood the operation of a 7-segment LED display	38522	Modulo 12 Counter By Direct Clearing
36024	To Study CC configuration of NPN transistor	38523	Decade counter
36025	To study CE configuration of PNP transistor	38524	Shift Register SISO and PIPO
36026	To study CB configuration of PNP transistor	38525	Decimal to BCD Converter
36027	To study CC configuration of PNP transistor	38526	Astable Multivibrator using Digital IC
36028	Study full wave dual polarity supplies	38527	Bistable Multivibrator using Digital IC
36029	Study of FET characteristics	38528	Monostable Multivibrator using Digital IC
36030	Verify superposition theorem	38529	Octal to binary Encoder
36031	Verify thevenin's theorem	38530	4 Bit Magnitude Comparator
36032	Verify reciprocity theorem	38531	Interface of TTL-IC to CMOS-IC & CMOS IC to TTL-IC
36033	Study of Phase shift audio oscillator		
36034	Verify kirchoff's law (V&I)		
36035	Verify ohm's law		
36036	Ideal resistance characteristics		
36037	Verification of series law of resistance		
36038	Verification of parallel law of resistance		
36039	Verification of maximum power transfer theorem		
*	Weight : 0.7 Kg. (Approx)		
*	Dimension : W 176 x H 131 x D 37		

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