

SALIENT FEATURES



- Aesthetically designed injection moulded electronic desk (Master unit) with common experiment resources like Power supplies, Function Generator, switches, indicators, DPM etc. while the slot will carry replaceable expt panels.
- 4 mm sockets arranged on a grid of 19 X 19mm to receive plug in components useful foe students in non electronic streams of engineering.
- Computer assisted Training through use of Lab view based executables, optionally supported by variety of virtual instrumentation like toggle switches, leds, DMM, CRO etc. interface through USB IO module.
- Emphasis on troubleshooting skill through fault switches, locate hidden the experiment panels.
- Following Replaceable panels connect to Top Board resources / computer / I/Fon master unit through 64 pin Euro connector.
- Useful for Post Graduate projects and research purpose
- Set of Users Guide provided with each unit.

Technical Specification

Power Supply	DC Supply	5V / 1A, 12V / 500mA 0 to 18V DC (Variable) / 1A (Isolated) 2nos. With short ckt & overload protection. Both kept isolated to facilitate either 0 to 36V or ± 18V power supply etc.		
	AC Supply	12-0-12V AC, 150mA, Short circuit protected.		
Function Generator	Waveform	Sine, Triangle & Square wave, output for TTL/CMOS with variable amplitude pot.		
	Frequency	1 Hz to 1MHz in 6 ranges, with amplitude & frequency control pots.		
	Voltage & Current	15V p max (Sin/TRG) open ckt. (7.5Vpp into 50 ohm termination)		
	Optional I/ps (On Hind Plate)	AM	FM	FSK
		AM (std.)-I/P voltage ± 5V (100% modulation) 0V-No Modulation AM (DSBSC) I/Ptg. 0.9.8 Vpp., O/P Vtg. 0-2.7	I/P voltage ± 400mV (± 50%modulation)	I/P upto 500Hz, ± 4.5 squar wave
3 - phase voltage Generator		6Vrms/50Hz/120 degree phase shifted 3 O/ps, max 10mA loading		
Frequency Counter (Optional)		5 digit frequency display, Max I/P - 10Vpp, 300MV sensitivity, Range : 2MhZ, Max		
Logic input switches & status Indicators		Bi-colour buffered LED status indicators 8X2 nos for High/Low indication. Input data Switch (slide switches) X 8nos.		
Computer Interface	Digital I/O	Using switch selectable parallel port or optional USB port (through optional converter supplied) 8 I/P, 8 O/P 8 Bidirectional I/O Lines (TTL), opto isolated Adaptor to prevent damage to PC		
	Analog I/P	2nons. of ± 9V ADC channels, 2nons.of 0-2.5V ADC channels, Max BW - 1KHz		
	Analog O/P	O/P 0-10V max (optionally 0-2.5V), max load 10 mA		
Pulser switches (2nos.)		With four debounced outputs (TTL), A, A,B,B		
Logic probe		detect High/Low, level TTL pulses upto 1 MHz, with bi-colour LEDs to indicate sratus.		
7 segment display		2-digit red led 7 segment with built in BCD to 7 segment decoder (TTL)		
Onboard DPM)Ino.)		Provided with mode/range selection, DC volt-2V,20V & DC current-2mS/200mA		
Mic Pre Amplifier		ampilifier function block with DC gain = 1, AC gain = 50		
L/S Amplifier & Speaker (optional)		Amplifier gain 20, with volume control driving 8ohm, 0.5W- L/S, Mounted on hind plate		
Onboard POTS		1K, 1M (Optional in place of counter module)		
Fault Switches		14 nos. of gnd referred fault switches hidden under replaceable expt. Panel on pcb carrying 64 Pin Euro connector		
Accessories		1) Parallel port 25 pin cable 2) Virtual Lab CD 3) USB I/O module (optional) with type A to mini B cable 4) dynamic Mic or electret Mic with builtin bias (cell) (optional)		
Operating Voltage		220/240Vac Switch settable ± 10% 50Hz/80 VA		
Mechanical Dimensions		A) Master Unit: 460mm (W), 160mm (H), 350mm (D), Net weight : 7.5Kg. Gross Wt: 9.5Kg. B) PCB Panel : 439mm X 209mm		

Modular expt. panels offered (At least select one or more)

1) Digital Logic panel/TCAT1

[Provided with 227 banana sockets]

- Consist of DIP sockets : 14 pin (7 nos), 16 pin (5 nos), 24nos. of buffered leds using 3nos. LS245 as LED driver, 4 TTL clock outputs 1, 10, 100Hz, 1KHz.
- Generic ICs used : 7400 (NAND), 7408 (AND), 7432 (OP), 7495 (SHIFT REG), 7404 (NOT), 7486 (EX-OR), 7476 X 2Nos. (J-KFF), 7490 (DECADE COUNTER), 74138 (DECODER),74148 (ENCODER), CD4051 (MUX/DEMUX) ,1X3 extender (2nos).
- Experiment covered
 - i) Basic logic gates experiments-OR, AND INVERTER, NOR NAND, EX-OR, EX-NOR
 - II) Boolean Algebra theorems-25nos., Karnaugh Map

Note: Specifications are subject to change.

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- iii) Combinational circuit adder, subtractor, code converter Like Gray code, 7 seg BCD, Hex Excess-3, Parity checker, Encoder/ Decoder, Multiplexer / Demultiplexer
- iv) Sequential Logic like Flip-Flops- R-S, J-K, T,D. Counters- Async/Sync, decade, ring/twisted, Divide by N (modulo N)
- v) Multivibrator circuit (Mono/Bistable/Astable).
- vi) Applications- Traffic signal control, Staircase Lamp etc.

2) Plug-in components panel / TCAT2

[Provided with 205 banana sockets]

- Consists of 19 grid of 4 mm sockets, All plug in discrete components are housed in Acrylic transparent top module of size 50.5mm X 32.5mm with 4 (optional) plugs to facilitate easy viewing & handling w/o fear of damage. Useful for students w/o electronic background.
- Plug in components (TTM) diode (4nos), resistor (8nos), Potentiometers (2nos), led (2nos), transistor (4nos), Relay (1no) etc. Qty = 25nos.assorted

3) Bread board panel / TCAT3

[Connectivity through 64 X 2 tie points]

- Consists of 3360 tie points bread board and 64 X 2 connectivity tie points offering top board resources like Function Generator, status switches, logics indicators, power supply, 8;/O lines, pulser outputs, 4 TTL clock output 1,10,100Hz. 1khz etc. for easy connectivity using 22/24 SWG single wires, 28 pin ZIF Socket, Input data switches - 8 Nos, pulser Switch-1No., RC Circuits-4nos., On board pot 100-K -1No., Bicolour buffered LED status indicators 8 X 2 for high low indication BS5 to Bread Board converters - 8Nos., BNC to banana converter- 2Nos.

4) Digital panel II / TCAT4

[Provided with 269 banana sockets]

- Consists of DIP sockets : 14 pin (7nos), 16 pin (5nos),28pin ZIF sockets (1no.) 4TTL clock outputs-1, 10, 100Hz, 1KHZ Bi-colour buffered LED status indication 8X2 for high/low indication, Input data Switches 8 nos., NO_NC pulser switch -1no./ On board pot 100K-1no., RC ckts for Mono stable M.V. RC ckts for ADV.BNC to banana converter-2nos.
- Generic ICs Used : TTL, COMS ICs like 74280 (Parity Generator), 7407 (buffer), 74CHT14 (Schmitt Inverter), CD4011(NAND), 7485 (Comparator), 74191 (Counter), 74123 (Multi-vibrator),CD4013 (D/F/F), CD4052(MUX/DEMUX),CD4001(NOR), Cd4093 (Schmitt NAND), CD4007 (CMOS Inverter).
- Experiments Covered : Study of TTL, CMOS characteristics, schmitt gate circuit , Circuits using NAND gate, Multiplexer circuits, Opencollector gate circuits, Parity generating circuits High speed monostable circuits, Comparator circuits, Counter circuits, CMOS device characteristics, 12bit ADC DAC optional using ZIF sockets.

5) Analog computer /TCAT5

[Provided with 128 banana sockets]

- Function blocks: Analog multipliers (3nos), op-amp inverting (2nos), Op-amp Basic (2nos), op-amp full (2nos), bread board for general purpose circuits Digital to analog converters (2nos.), diodes, transistors trimmers, voltage regulators
- Experiments covered: Study the characteristics of negative feedback amplifiers and design of an instrumentation amplifier, Study the characteristics of regenerative feedback, Study the characteristics of integrators and differentiator circuit, Design of Analog Filters Design of a self-tuned filter, Design uncton generator and convert it to voltage-Controlled Oscillator / FM generator Design of a phase Lock loop (PLL), automatic Gain control (AGC) automatic volume Control (AVC), DC_DC converter, Design low dropout (LDO) regulator, To study the parameters of LDO integrated circuit, To study the parameters of DC-DC converter sing Stage Amplifier, Design of a Digitally programmable square and Triangular wave generator/oscillator.

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