DELTA ELECTRONICS

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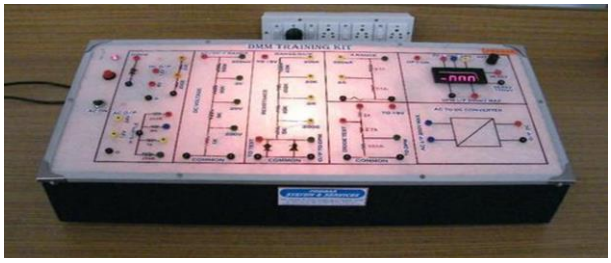
Total Lab Concept

PRODUCT GUIDE

Electronics And Electrical Lab Training Modules



DELTA ELECTRONICS

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TESTING MEASURING AND LABORATORY INSTRUMENTS

Analog oscilloscopes
Digital storage oscilloscopes
Spectrum analyzers
Logic analyser (pc based)
Function generator/frequency counter/
Soldering stations

DC regulated power supplies signal channel
Multimeter /clamp meter
Decade capacitance box
Decade inductance box
Decade resistance box

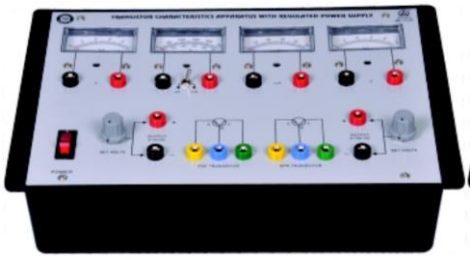
Fig. Cathod Ray Oscilloscope

fig. AF Function Generator

ELECTRONICS LAB TRAINING MODULES

DE - 001	PN Junction Diode Characteristics
DE - 002	Zener Diode Characteristics
DE - 003	Experimental Set-Up For Plotting CB Characteristics
DE - 004	Zener Diode As A Shunt Regulator
DE - 006	Voltage regulator using IC LM 317
DE-007	Characteristics of Diode & LED
DE-008	JFET Characteristics
DE - 046	MOSFET Characteristics
DE - 047	IGBT Characteristics
DE - 051	SCR Characteristics
DE -052	Diac Characteristics
DE - 053	Triac Characteristics
DE - 054	UJT Characteristics
DE - 055	Transistor as a switch
DE-056	Study of Half - Wave rectifier
DE-056	Center - Tapped Fullwave Rectifier
DE-075	Bridge Type Fullwave Rectifier
DE-076	Logic Gate Trainer using IC,s
DE-077	Binary To Gray Code Converter

Fig.pn junction diode chgaracteristics



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DE - 100	Basic Logic Gates using Diode & Transistors
DE - 101	Gray To Binary Code Converter
DE-102	Half Adder Using Logic Gates
DE - 103	Half Subractor Using Logic Gates
DE - 103	Half Subractor Using Logic Gates
DE - 104	Full Subtractor Using Logic Gates
DE - 105	Full Adder Using Logic Gates
DE - 106	Demorgan's Theorem
DE - 107	Boolean Expression using logic gates
DE - 108	BCD to 7 Segment Decoder using IC 7447
DE-109	BCD to Decimal Decoder using IC 7442
DE-110	Decimal to BCD Encode using IC 74147
DE-111	Bidirectional Buffer Using Ic 74245
DE-112	NAND & NOR As a Universal Gate
DE - 115	4:1 Multiplexer Using IC 74153
DE - 119	8:1 Mux Using IC 74151
DE - 121	16:1 Mux Using IC 74150
DE - 122	1:4 Demultiplexer Using IC 74139
DE - 123	1:8 Demultiplexer Using IC 74138
DE - 124	1:16 Demultiplexer Using IC 74154
DE - 125	RS Flip- Flop Using NAND & NOR Gate
DE - 126	D & T Flip – Flop
DE - 131	J-K Master Slave Flip-Flop
DE - 134	J-K Flip-Flop Using NAND Gate
DE - 137	Controlled Invertor using Ex-OR Gate
DE - 138	Decade Counter Using IC 7490
DE - 140	Up-Down Counter using IC 7476
DE - 155	Mod N (2 to 9) counter using IC 7490
DE-156	4 Bit Shift Register Using IC74194
DE-157	Arthmetic& logic unit using IC 74181
DE - 165	Study Of Kirchoff'sLaw(KCL & KVL)
DE - 200	Superposition Theorem
DE - 201	Norton’s Theorem
DE -202	Thevenin’s Theorem
DE -203	Maximum Power Transfer Theorem
DE -204	Reciprocity Theorem

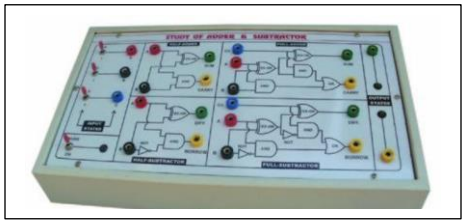


Fig. Adder/Subractor Trainer

fig. e/m by Thomson method

Fig. Network Theorem

DE -205	Tellegan's Theorem
DE -206	Millman's Theorem
DE -207	RLC Series Resonance Circuit
DE -208	RLC Parallel Resonance Circuit
DE-209	Two Port Network Parameter
DE-210	Charging &Discharing of Capacitor
DE-211	Bridge Circuits
DE 252	Wheatstone Bridge
DE-300	Non-Invering Op-Amp using IC 741
DE-301	Invering Op-Amp using IC 741
DE-302	Op-Amp Parameter & Application Trainer
DE-303	Inverting/Noninverting Op-Amp using 741
DE-306	Op-Amp as Adder using IC 741
DE - 307	Op - AMP Buffer Using IC 741
DE - 308	OP - AMP Subtractor Using IC 741
DE-309	Op - AMP Comparator Using IC 741
DE - 310	Integrator Using OP - AMP IC 741
DE - 311	Differniator Using OP - AMP IC 741
DE - 312	I to V & V to Converter
DE-313	Op - AMP Schmitt Trigger Using IC 741
DE - 314	Zero Crossing Detector
DE - 315	Active Peak Detector
DE - 316	IC 555 AsAstableMultibibrator
DE - 317	IC 555 AsBistable Multivibrator
DE - 318	IC 555 AsMonostanble Multivibrator
DE - 319	Second Order Low - Pass Butterworth Filter
DE - 320	Second Order High - Pass Butterworth Filter
DE - 321	Wide Band Pass Filter
DE-322	Op-Amp as Clipper
DE-323	Op-Amp as Clammper
DE-324	Square Wave Generator using Op-Amp 741
DE-325	Instrumentation Amplifier using Op-Amp 741
DE-326	Astable Multivibrator using Op-Amp 741
DE-327	Monostable Multivibrator using Op-Amp 741
DE-328	Bistable Multivibrator using Op-Amp 741
DE-329	Phase shift oscillator using Op-Amp 741

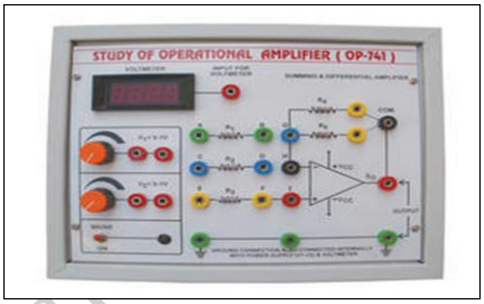


Fig.Study Of Operational OP-Amp

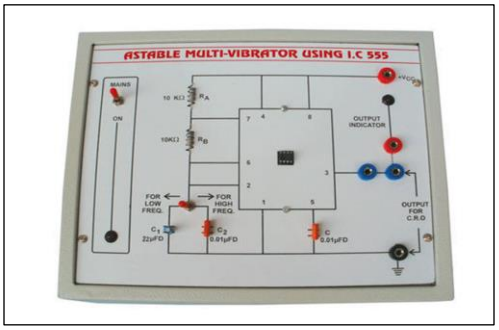


fig. Astable Multivibrator

DE-330	Trangular Generator using Op-Amp 741
DE -331	VCO using 565
DE-332	Sample & Hold Circuit
DE-400	Single Stage CE Amplifier
DE-401	Single Stage CB Amplifier
DE-402	Single Stage CC Amplifier
DE-403	Two Stage RC Coupled Amplifier
DE-404	FET Amplifier
DE -405	Single TunnedAmplifier
DE - 500	Analog To Digital To Analog Converter
DE - 500	AstableMultivibtator Using Transistor
DE - 500	Differntiator Using Op- Amp IC 741
DE - 501	Clipper& Clamper Circuit
DE - 502	Astable Multivibrator using Transistor
DE - 503	Monostable Multivibrator Using Transistor
DE - 504	Bistable Multivibrator Using Transistor
DE - 505	RC Integrator &Differentiotor
DE - 506	UJT As Relaxation Oscillator
DE - 507	Digital To Analog Converter
DE-508	RC Phase Shift Oscillator
DE-511	Colpitt Oscillator
DE -512	Hartley Oscillator using Transistor
DE -551	Study of RAM
DE -600	Solar Cell Characteristics Apparatus
DE -601	Energy Band Gap Apparatus
DE-602	Ohms Law Apparatus
DE-603	Thermister Charateristics Apparatus
RPS 501F	DC Power Supply 5V ,1A
RPS 1201F	DC Power Supply +- 12V, 1A
RPS 1501F	DC POWER SUPPLY +- 15V, 1A
RPS 1501R	DC REGULATED POWER SUPPLY 0-15V , 1A

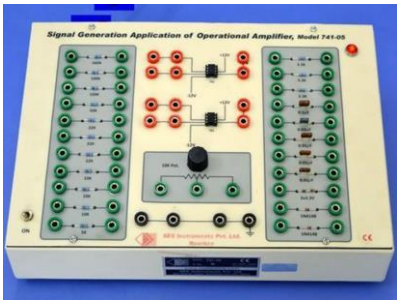
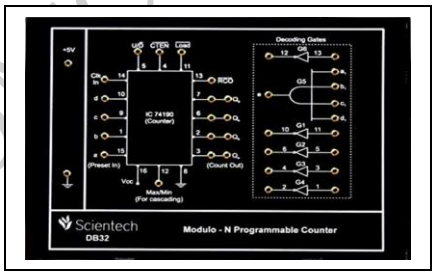


fig. Gate Trainer Kit

DIGITAL ELECTRONICS LAB TRAINING MODULES

- Logic Gates using Six TTL IC's (6 in 1)
- RTL Logic Gates (5 in 1)
- Basic Logic Gate using Discrete Components (7 in 1)
- Digital Logic Trainer (Logic Gates, Booleon Identities &Demorgan's Theorems)
- Verification of truth tables of Logic Gates using Universal Gates
- Pulse/ Clock Generator using NAND Gate
- 4 Bit Adder &Subtractor Circuits using IC 7483
- Digital Full Adders &Subtractors using NAND Gates
- Flip Flops using NAND Gates & TTL IC's
- Decade / Modulo-N Counter
- 4 Bit Counters (Synchronous & Asynchronous)



Modulo-N Counter

- 4 Bit Shift Registers
- Encoder & Decoder Circuits
- 16 to 1 line Multiplexer & 1 to 16 Line Demultiplexer
- Encoder/Multiplexer
- Decoder/ DeMultiplexer
- RAM Circuit using IC 7489
- Parity Generator/Checker with Bakelite Front Panel
- 4 Bit Digital Comparator
- 4/8 Bit Analog to Digital Converter
- 4 Bit A/D Converterfig.dsb/ssb transmitter &
- 4/8 Bit Digital to Analog Converter
- 4 Bit D/A Converter

4 bit D/A Converter

- Transfer Characteristics of TTL and TTL Schmit Trigger Inverter
- TTL-CMOS, CMOS-TTL Interfacing
- Arithmatic/Logic Unit (ALU)
- TTL IC Characteristics Apparatus
- CMOS IC Characteristics Apparatus
- Digital Lab Trainer (with Bread Board)

TTL CMOS Char.

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BASIC AND ADVANCE COMMUNICATION LAB TRAINING MODULES

- Amplitude Modulation & Demodulation
- Frequency Modulation and Demodulation
- Pulse Amplitude Modulation & Demodulation
- Pulse Width Modulation & Demodulation
- Pulse Position Modulation & Demodulation
- PAM/PPM/PWM Modulation & Demodulation
- Phase Modulation and Demodulation

fig Modulation & Demodulation kit

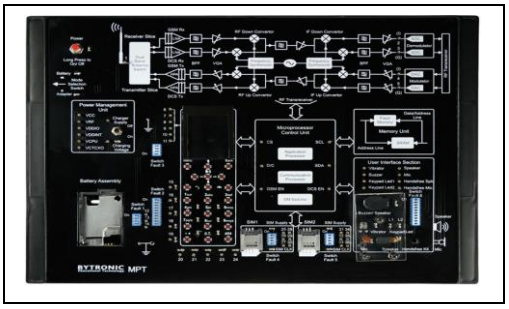
- Frequency Shift Keying Modulation & Demodulation
- Amplitude Shift Keying Modulation & Demodulation
- Phase Shift Keying Modulation & Demodulation
- Pulse Code Modulation and Demodulation
- Delta Modulation and Demodulation
- Adaptive Delta Modulation and Demodulation
- Single Side Band Modulation & Demodulation

Fig.Delta Modulation&Demodulation

- Sample & Hold Circuit using Op-Amp
- Detection of FM using Phase locked loop (PLL)
- Balanced Modulator/DSB-SC (DSB-SC Amplitude Modulation and Demodulation)
- Frequency Division Multiplexer &Demultiplexer
- QAM Modulation & Demodulation
- Frequency Modulation & Demodulation
- Delta, Adaptive Delta and Delta Sigma Modulation & Demodulation
- TDM Pulse Code Modulation Transmitter
- TDM Pulse Code Modulation Receiver
- Data Formatting and Carrier Modulation Transmitter
- Data Formatting and Carrier Demodulation Receiver
- Analog Signal Sampling & Reconstruction
- TDM Pulse Amplitude Modulation & Demodulation
- 8 Bit Variable Data Generator for Model
- DSB/SSB AM Transmitter
- DSB/SSB AM Receiver
- Transmission Line Trainer

fig.TDM

- Mobile Phone Trainer
- GSM Trainer
- CDMA Trainer
- CDMA TRAINER



Mobile Phone Trainer

POWER ELECTRONICS LAB TRAINING MODULES

- Light Intensity control using SCR & Triac
- SCR Firing Circuits
- SCR Commutation Techniques
- Phase control using Triac
- Switching Action of a BJT
- Switching Action of a FET
- 6 Thyristor Firing Circuit Kit (UJT Controlled SCR Time Delay)
- Zero Voltage Switching using SCR
- Step up Chopper
- SCR Single Phase Half Wave, Full Wave, Fully Controlled Bridge Rectifier/Converter
- DC Motor Control using SCR's (with tachometer)
- Three Phase Fully Controlled Converter
- Three Phase Induction Motor Speed Controller
- Single Phase Cycloconverter
- SMPS Trainer Kit
- Jone's Chopper
- Morgan's Chopper
- Series Inverter using SCR's
- Parallel Inverter using SCR's
- Single Phase Inverter (using power mosfet)
- Chopper Circuit (using power mosfet with Motor)
- DC Drive Trainer
- Single Phase Half Controlled DC Drive
- SCR Ring Counter

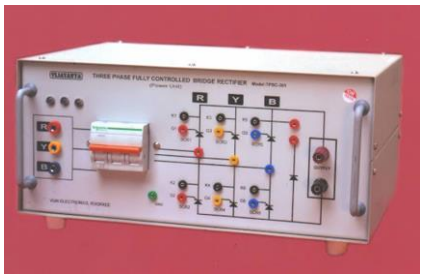


fig. 3 Phase Fully Controlled Bridge Converter

Fig. Speed Control of Single Phase Induction Motor

PHYSICS LAB EXPERIMENT SETUP

- Measurement of High Resistance using Substitution Method
- Lissajous Figure Apparatus
- Stefan Constant Apparatus
- Dielectric Constant Apparatus (Solid & Liquid)
- Hall Effect Experiment (Complete Setup)
- Fourier Analysis Kit
- Measurement of Susceptibility of Paramagnetic Solution by Quinck's Tube Method
- Heat Efficiency of an Electric Kattel
- Choke Charateristics Apparatus
- Inductance Measurement (using Impedance at Different Frequencies)
- Determine the Hight of Tower with the Help of Sextant
- GM Counter Experimental Setup
- Determine The Ballistic Constant of a Ballistic Galvanometer (Complete Setup)
- Determine The ECE of Copper using Tangent Galvanometer (Complete Setup)
- Determine the Wavelength of Sodium Light by Fresnel's Biprism Kit (Complete Setup)
- Determine the Focal Length of Two Lenses by Nodal Slide and Locate the Position of Cardinal Points (Complete Setup)
- Determine of the Specific Rotation of the Cane Sugar Solution with the Help of

Polarimeter (Complete Setup)

- Determine the Wavelength of Spectral Lines using Plane Transmission Grating (Complete Setup)
- Determine the Viscosity of a Liquid by Stroke's Method (Complete Setup)
- Determine the Frequency of AC Mains by Electrical Vibrator
- Determine the Wave Length of Sodium Lamp by Newton Ring Method (Complete Setup)
- Determine Magnetic Field using Stewart and Gee's Apparatus (Complete Setup)
- Determine the Velocity of Ultrasonic Waves by using a Crystal (Complete Setup)
- Laser Experimental Setup with Diode Laser (Complete Setup)
- Laser Experimental Setup with He-Ne Laser (Complete Setup)
- He-Ne Laser with Power Supply (Complete Setup)
- High Resistance by Leakage Method (Complete Setup)
- Thermo electric e.m.f. with temperature for a copper iron thermo couple, by means of a potentiometer (Complete Setup)
- Calibration of Voltmeter using Potentiometer (Complete Setup)
- Determine Young's modulus's, modulus of rigidity and poisson's ratio of the material of a given wire by Searle's dynamical method (Complete Setup)
- Determine the Frequency of a Tunning Fork with the help of Sonometer
- Determine the Frequency of A.C. mains by means of a Sonometer (Complete Setup)
- Determine the Dispersive Power of the Material of the Prism for Violet & Yellow Colors of Mercury Light with the Help of Spectrometer (Complete Setup)
- Determine the Resolving Power of Telescope (Complete Setup)
- Determine the Wave Length of Sodium Lamp by Michelson Interferometer (Complete Setup)
- Determine the Refractive Index of Liquid using Diode Laser (Complete Setup)
- Determine the Malus Law using Diode Laser (Complete Setup)
- Determine the Brewster Angle using Diode Laser (Complete Setup)
- Determine the Refractive Index of Prism using white light & Spectrometer (Complete Setup)
- Carrey Foster Bridge with Four Gap (Complete Setup)
- Determine Thermal Conductivity using Lee's Disc Apparatus (Complete Setup)
- Sodium Vapour Lamp 35 Watt fitted in Box with Transformer
- Sodium Vapour Lamp 55 Watt fitted in Box with Transformer
- Mercury Vapour Lamp 80 Watt fitted in Box with choke

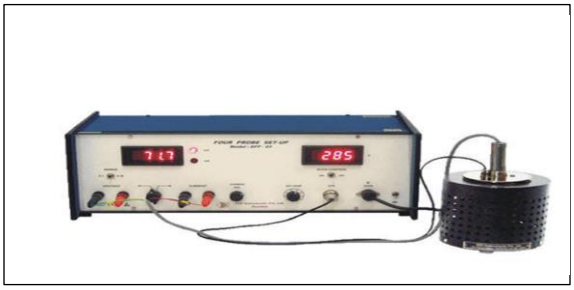


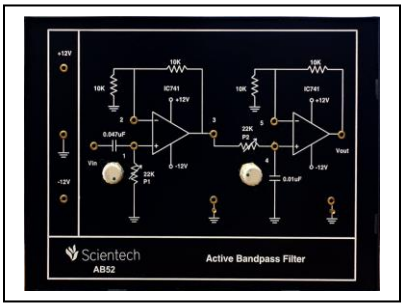
Fig. Energy band gap by four probe method with pc interface .

fig. Hall Effect apparatus

Carey Foster Bridge Full Experimental Setup

FILTER CIRCUITS

- T' type Passive Low Pass, High Pass, Band Pass & Band Stop filters
- M-Derived 'T' type Passive Low Pass & High Pass Filters
- "p" type Passive Low Pass High Pass, Band Pass & Band Stop filter
- Twin-T Active Notch Filter using Operational Amplifier
- Active filters using Operational Amplifier
- Transient Response of RLC Circuit with built-in Square Wave Oscillator
- Cascaded Two Port Network
- "T", "p" & "Bridge T" Type Attenuators
- RC, Low Pass, High Pass, Band Pass & Band Stop Filters



Active Low Pass Filter

Composite High Pass Filter

INSTRUMENTATION AND LAB TRAINING MODULES

Instrumentation Trainer Using Transducers (Complete with following Experimentalstudy)

Study ofLVDT

Study of RTD

Study of Thermocouple

Study of Thermistor

Study of Opto Devices (Photo Diode, Photo Transistor, LDR, Zener, Diode)

Study of Wheatstone Bridge & Instrumentation Amplifier

- Strain Gauge Trainer Kit (with Cantilever Beam)
- LVDT Trainer Kit
- RTD Trainer Kit
- Thermocouple Trainer Kit
- Speed Measurement Module using Photo Electric Sensor
- Speed Measurement Module using Magnetic Sensor
- Inductive Pick Up
- Capacitive Pick Up
- Piezo Electric Transducer
- Hall Effect Sensor
- Pressure Measurement using Strain Gauge
- Load Cell Trainer Kit
- Temperature Sensors Kitfig. Transducer Trainer
- Study of Linear Potentiometer instrument trainer
- Data Logger (Voltage,Current,Temperature&Pressur)

CONTROL LAB TRAINING MODULES

- PID Simulator
- 1 PID Controller Kit (Model Process)
- ON/OFF Temperature Controller (Indicator cum Controller)
- AC Servo Speed Torque Characteristics Trainer
- DC Servo Motor Speed Torque Characteristics Trainer
- AC Position Control System Trainer
- DC Position Servo Mechanism Trainer
- AC Servo Voltage Stabilizer as Servomechanism
- Stepper Motor Controller Trainer
- Stepper Motor Controller Trainer
- Potentiometer as Error Detector
- Synchro Transmitter Receiver Pair
- Study of Compensation Network
- Magnetic Amplifier

Stepper Motor Controller

- Variac 2 Amps Single Phase
- AC Ammeter (Rectifier Type) 0-1A (Internal shunt) (With current transformer)
- AC Ammeter (Rectifier Type) 0-5A (Internal shunt) (With current transformer)
- DC Voltmeter 0-300V (Internal shunt)
- AC Voltmeter (Rectifier Type) 0-150V (Internal shunt)
- DC Regulated Power Supply Dual Channel (With Four Digital Panel Meters) ±30VDC/2 Amps with Fixed 5V/3.3V output
- Rheostate 50 Ohms/ 5 Amps. (Double Tube)
- Rheostate 250 Ohms/ 3 Amps.
- Magnetic Amplifier (Series & Parallel Connection of Magnetic Amplifier)
- Accessories for ME 1115A
- AC Ammeter (Rectifier Type) 0-1A (Internal shunt) (With current transformer)
- AC Ammeter (Rectifier Type) 0-5A (Internal shunt) (With current transformer)
- DC Voltmeter 0-300V (Internal shunt)
- DC Regulated Power Supply Dual Channel (With Four Digital Panel Meters)
- ±30VDC/2 Amps with Fixed 5V/3.3V output
- Rheostate 50 Ohms/ 5 Amps. (Double Tube)

- Rheostate 250 Ohms/ 3 Amps.
- Magnetic Amplifier (Positive & Negative Feed Back)
- AC Ammeter (Rectifier Type) 0-1A (Internal shunt) (With current transformer)
- AC Ammeter (Rectifier Type) 0-5A (Internal shunt) (With current transformer)
- DC Voltmeter 0-300V (Internal shunt)
- DC Regulated Power Supply Dual Channel (With Four Digital Panel Meters)
- ±30VDC/2 Amps with Fixed 5V/3.3V output
- Rheostate 50 Ohms/ 5 Amps. (Double Tube)
- Rheostate 250 Ohms/ 3 Amps.
- DC Voltage Regulator as a Closed Loop System
- Relay Control System
- Mesurement of water level using strain guage
- Educational Analog Computer
- Light Intensity Control
- Digital Control System
- PLC Trainer Demonstration Unit
- Linear System Simulator (Open loop & Close loop System of First order & Second order system

fig. PID Controller Kit


PLC Training Modules

Relay Control System


DC Voltmeter

BREAD BOARD TRAINERS

- Bread Board Trainer with Power Supplies (General Purpose)
- Operational Amplifier Trainer (Bread Board Model)
- Digital Electronics Circuit Trainer (Bread Board Model)
- OP Set of 20 IC's & Instruction Manual for more then 60 Experiments
- Analog Lab Trainer (with Bread Board)
- Digital Lab Trainer (with Bread Board)
- Analog & Digital Lab Trainer (Bread Board Model)
- Amplifier Lab Trainer with Power Supply (with Bread Board)
- Amplifier Lab Trainer with Built in Power Supply, AC Millivoltmeter& Function Generator (with Bread Board)

Fig.Bread board trainer kit.

DYNAMIC DEMONSTRATORS & TRAINER

- Black & White Television Demonstrator (with 14" CRT)
- Color Television Demonstrator (with 20"CRT)
- Color Television Demonstrator (with 14"CRT)
- Video Compact Disc Player Demonstrator
- Digital Versatile Disc Player Demonstrator
- Stereo Tape Recorder Trainer
- Analog Multimeter Trainer
- Digital Multimeter Trainer
- Analog Fiber Optic Voice Transmission Demonstrator
- CRO Demonstrator (20MHz Dual Channel)

Stereo Tap Recorder

- Function Generator Demonstrator
- FM Radio Receiver Demonstrator
- Telephone Trainer
- AM Radio Receiver Demonstrator (Two Band)
- UPS Trainer 500 VA
- Video Cassette Recorder Demonstrator
- EPBAX Demonstrator
- Fax Demonstrator
- Walkie Talkie Demonstrator
- Battery Monitoring System
- Washing Machine Trainer (Automatic)
- Washing Machine Trainer (Semi Automatic)
- Microwave Oven Demonstrator
- Two in One Trainer
- AM / FM Radio Receiver Demonstrator
- Pattern Generator (For TV

Fig. LED TV Demonstrator

Colour Pattern Generator for tv

Semi automatic washing machine

MICROPROCESSOR & MICROCONTROLLER LAB

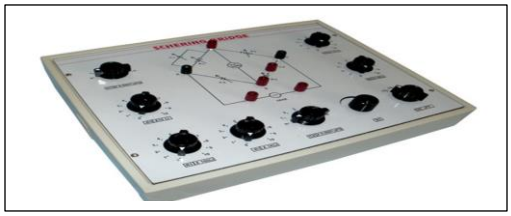
- 8031 Microcontroller Training Kit with Inbuilt Power Supply
- 8031 Microcontroller Training Kit with Inbuilt Power Supply (LCD Display,ASCII Keyboard)
- 8085 Microprocessor Training Kit with Inbuilt Power Supply
- 8085 Microprocessor Training Kit with Inbuilt Power Supply (LCD Display,ASCII
- Keyboard)
- 8086 Microprocessor Training Kit with Inbuilt Power Supply
- 8086 Microprocessor Training Kit with Inbuilt Power Supply (LCD Display,ASCII keyboard

Fig. Microprocessor Training Kit

ELECTRICAL LAB TRAINING MODULES

Electric bridges

- Anderson Bridge
- Schering Bridge
- Kelvin Bridge (Industrial))
- Kelvin Bridge (Student)
- Maxwell Inductance Bridge
- Weins Bridge (Capacity Measurement
- Weins Bridge (Frequency Measurement)
- Wheatstone Bridge (Portable)
- Desauty Bridge
- Hay's Bridge
- Owen's Bridge
- Callender and Griffith's Bridge
- Crompton Potentiometer (Complete Setup)



)fig. schering bridge

fig. Kelvin Bridge

Isolation Transformer.

- Single Phase Transformer 0.5KVA/230VAC With Tappings at 50% & 86.6%
- Single Phase Transformer 1KVA/230VAC With Tappings at 50% & 86.6%
- Single Phase Transformer 2KVA/230VAC With Tappings at 50% & 86.6%
- Three Phase Transformer 3KVA/440VAC(Air Cooled)
- Three Phase Transformer 1KVA/440VAC(Air Cooled)
- Three Phase Transformer 3KVA/440VAC(Oil Cooled)
- Variable Auto Transformers (VARIAC), Loading Rheostats & Motors

Variac closed type and rheostat

- Variac 2 Amps Single Phase
- Variac 4 Amps Single Phase
- Variac 8 Amps Single Phase
- Variac 10 Amps Single Phase
- Variac 15 Amps Single Phase
- Variac 4 Amps Three Phase
- Variac 8 Amps Three Phase
- Variac 10 Amps Three Phase
- Variac 15 Amps Three Phase

fig. Varia

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- Rectifier Unit, I/P-440VAC ,O/P-0-250VDC/20A
- Rectifier Unit, I/P-440VAC ,O/P-0-250VDC/50A
- Loading Rheostat 1 KW Single Phase in 5 Steps of 200 Watt Each
- Loading Rheostat 2 KW Single Phase in 8 Steps of 250 Watt Each
- Loading Rheostat 3 KW Three Phase (Each Phase of 1 KW) in 8 Steps.
- Loading Rheostat 1.5 KW Three Phase (Each Phase of 0.5 KW) in 4 Steps.
- Resistive lamp Load 500W in 5 steps
- Resistive Lamp Load 1 KW in 10 steps
- Resistive lamp Load 1000W in 5 steps
- Capacitive Load 200mfd Single Phase in 20 Steps
- Inductive Load 5Amp. Single Phase in 5 Steps
- Resistive Lamp Load 3 KW
- Resistive Lamp Load 5 KW
- Current Transformer (CT 30/50v)
- Potential Transformer (PT 220/100V)
- Phase Shifting Arrangement
- Rheostat 10ohms/10Amps
- Rheostat 300ohms/2Amps
- Rheostat 100ohms/5Amps
- Rheostate 50 Ohms/ 5 Amps. (Double Tube)
- Rheostate 250 Ohms/ 3 Amps.
- Synchronous Motor 3HP
- DC Shunt Motor 1HP
- Study of Construction of a DC Motor 1HP
- Loading Arrangement for DC Shunt Motor 1HP
- AC Induction Motor 3HP Single Phase Coupled with 1KW DC Series Generator
- DC Series Motor 1HP
- Induction Motor 3 Phase 5 HP/ 415V.
- Induction Motor Single Phase 1 HP/ 230V Capacitor Type.
- Starter DC Motor 1HP (3 Point)
- Starter DC Motor 1HP (4 Point)

fig. Rheostat

Synchronous Motor 3 HP

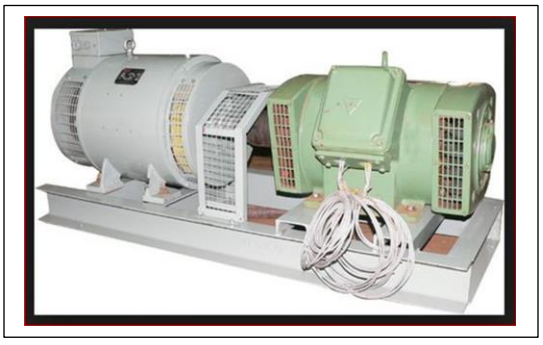
Resistive load bank

Experimental control panel for Electrical Lab.

- Measurement of Power in Three Phase Circuit by Three Wattmeter method.
- Measurement of Power in Three Phase Circuit by Two Wattmeter method.
- Measurement of efficiency of Single Phase Transformer (Direct Loading).
- Parameter and Losses in a Single Phase Transformer by OC.
- and SC Test and efficiency of Single Phase Transformer (Direct Loading)
- Parameter and Losses in a Single Phase Transformer by OC and SCtest
- Study of Single Phase Energy Meter
- Earth Resistance by Fall of Potential Method (Complete Setup)
- Calibration of Wattmeter by DC Potentiometer (Complete Setup)
- Calibration of Voltmeter & Ammeter by DC Potentiometer (Complete Setup)
- Single Phase Energy Meter with Phantom Loading
- Sumpner's Test (Back to Back) Test on Single Phase Transformer
- Sumpner's Test (Back to Back) Test on Single Phase Transformer
- Parallel Operation Single Phase Transformer
- Voltage Relationship of Three Phase Transformer in Various Connections
- Speed Control of D.C. Shunt Motor (By Armature and Field Current Control method)
- Efficiency by Swinburn's Speed Control by Armature & Field Control Method
- To Study Scott Connection of a Transformer
- Load Test of DC Shunt Motor
- To Plot Magnetizing Curve of a DC Series Generator
- Different Type of Contactor Control Circuit (4 Types)
- Angular Displacement Measurment of Synchronous Motor
- Speed Control of 3 Phase Induction Motor by Applying Voltage Variation
- To Plot OCC of a DC Shunt Generator
- Measurement of Power & Power Factor in Single Phase Circuit
- Measurement of Power in 3 Phase Circuit by CT, PT & 3 Phase Wattmeter
- Measurement of Power in Single Phase Circuit by CT, PT & Single Phase wattmeter
- Panel for Load Test of DC Series Motor
- To Obtain Efficiency of DC Shunt Motor by Swinburne's Test
- To Obtain Losses & Efficiency of DC Machine by Hopkinson's Test
- Panel For Study of Different Type of Fuses,MCBs& ELCBs
- To Connect, Start & Reverse the Direction of Rotation of a 3 Phase Induction motor
- To Proform the Block Rotar Test of 3 Phase Induction Motor
- Motor Generator Set to plot OCC and Load Charcteristics of DC Shunt generator

- Motor Generator Set to plot Load Charcteristics of DC Series Generator
- Motor Generator Set to plot Load Charcteristics of DC Compound Generator
- Domestic Home Wiring Demonstration Panel
- Characteristics of DC Shunt & Series Motor
- To Perform Load Test of Single Phase Induction Motor & Plot Torque Speed characteristics
- DC Motor Drive Trainer
- Parallel Operation of Two 3 Phase Transformers
- To Plot V & Inverted V Curves of a Synchronous Motor
- Thyrister / IGBT Controlled AC Motor Drive with VVVF controls
- OC & SC Test on 3 Phase Synchronous Machine
- To Study the Speed Control of A DC Shunt Motor by Ward Leonard Method.
- OC & SC Test on A 3 Phase Transformer
- To Study the Controlling of Universal AC/DC Motor
- To Perform Load Test on a 3 Phase Induction Motor & To Plot Torque V/S speed charc.
- Speed Control of 3 Phase Slip-Ring Induction Motor By Rotor Resistance control
- To Study The Speed Control of 3 phase Induction Motor by Cascading of Two
- Induction Motor ,i.e by feeding the slip power of one motor into other motor.
- To Find Voltage Regulation of an Alternator by Zero Power Factor (z.p.z) method
- To Measure Negative Sequence & Zero Sequence Reactance of Synchronous machines
- Electrical Machine Trainer (Complete Setup)
- Electrical Machine Trainer

Fig. Electric Machine Trainer



Motor Generator Set

HIGH VOLTAGE ELECTRICAL LAB

- 100kV, testing transformer with control panel
- 50kV, testing transformer with control panel
- 100mm Sphere gap with water resistor (manual)
- 50mm Sphere gap with water resistor (manual)
- Rod-Gap apparatus with uniform and non-uniform field electrodes
- 0-60kV Oil test kit (manual)
- 30kV,30mA High voltage tester with jig for solid insulatingmaterials
- 150kV, 225J, 5 stage impulse generator with suitable oscilloscope
- 11kV Disc Insulator
- Electrolytic tank with electrodes
- Corona cage without transformer
- Horn gap apparatus
- 50KV Capacitance divider
- 100KV Capacitance divider
- 50KV resistance divider
- 100KV resistance divider

Fig. Horn Gap Apparatus

Fig. Sphere Gap Assembly

11KV Disc Insulator

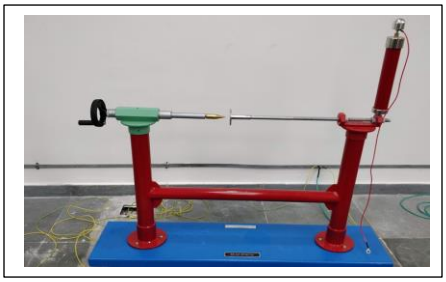


Fig. Rod Gap Apparatus

RF &MICROWAVE EXPERIMENTAL TRAINERS

- Experiments of Reflex Klystron
- Experiments on Gunn Diode
- Experiments to measure the Polar Pattern & gain characteristics of the antenna
- Experiment to measure dielectric constant of Solids & Liquid and to measure Phase
- Shift & 'Q' of a cavity.
- Study of Microwave components (Magic T, Directional Coupler, Isolator, Circulator)

Microwave power meters

- Microwave Power Meters 8.2GHz ~ 12.4GHz
- Microwave Power Meters 10MHz ~ 18GHz

Microwave component and power supplies

- Klystron power supply (Square & Saw Wave Digital readout)
- Gunn power supply (Digital)
- VSWR Meter Solid State
- BNC Cable
- Circulator
- Circular to Rectangular wave guide transition
- Coaxial to W/G Adopter
- Conical antenna
- Cooling fan
- Cross directional coupler
- Detector – IN-23
- Detector mount with detector
- Dielectric antenna
- E H Tuner
- E H Tuner precision with micrometer
- E Plane bend
- E Plane tee
- Fixed attenuator (3,6,10 db) Any One
- Frequency meter (Direct reading)
- Frequency meter (Micrometer type)

Cross Directional Coupler

E H Tuner

- Gunn oscillator
- H Plane bend
- H Plane tee
- Isolator
- Klystron mount
- Klystron tube
- Liquid Dielectric CellM H D Coupler (3,10,20 db) Any One
- Magic tee
- Matched termination
- Microwave Cavity
- Movable short
- Movable short precision with micrometer
- Parabolic disc (with dipole feed)
- Phase shifter
- Pick up horn
- Pin Modulator
- Pyramidal horn (Gain 16 db)
- Pyramidal horn (Gain 22 db)
- Radiation pattern turn table
- Sectoral horn – E plane
- Sectoral horn – H plane
- Dielectric Samples (Solid)
- Slide Screw Tuner
- Slide screw tuner precision with micrometer
- Sliding termination precision
- Slot antenna – Narrow wall
- Slot antenna- Broad wall
- Slotted section with probe carriage
- Solid Dielectric Cell
- Stand
- Tripod stand
- Tunable probe
- Variable attenuator
- Wave guide twist
- Fixed short

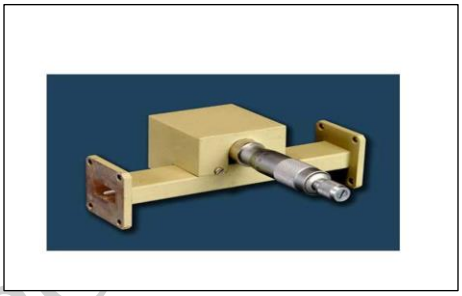


fig. Phase Shifter

fig. Pyramidal Horn

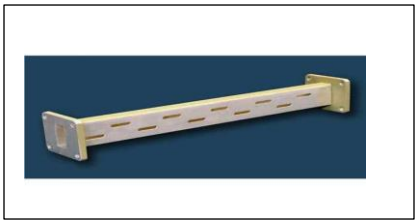


fig. Slotted Antenna

- Wave guide bend 90 Degree
- Wave guide cavity
- Smith Charts (Set of 100 Sheets)
- N-N Coaxil cable

POWER SUPPLIES

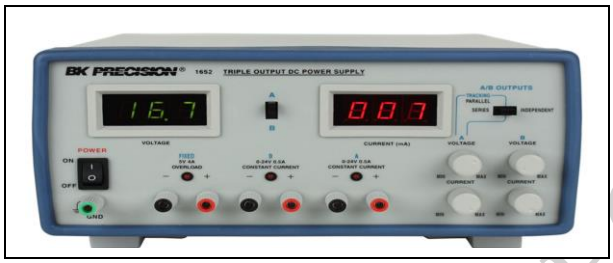
DC Regulated Power Supplies Single Channel / Dual Channel

- Single Output 0 - 30VDC/2 Amps with fixed 5V/3.3V output
- Single Output 0 - 30VDC/5 Amps with fixed 5V/3.3V output
- Single Output 0 - 30VDC/10 Amps
- Single Output 0 - 60VDC/5 Amps
- Single Output 0 - 60VDC/10 Amps (Dual Supply used in series mode)
- Dual Output 0 - +30VDC/2 Amps with fixed 5V/3.3V output
- Dual Output 0 - +30VDC/5 Amps with fixed 5V/3.3V output
- Multiple DC Regulated Power Supply (CH 1: 0-6VDC / 100mA-2Amps, CH 2: 0-32VDC / 100mA-2Amps, CH 3: 0-+15VDC / 100mA-1Amps)

Dual DC Regulated Power Supply

Special Purpose Power Supplies

- DC Power supply 0 - 16Volts / 2Amps with One Digital Voltmeter
- Electronic Standard Cell 1.018 VDC
- Fixed Output DC Regulated Power Supply +5VDC/1Amp
- Fixed Output DC Regulated Power Supply +12VDC/1Amp
- Fixed Output DC Regulated Power Supply +12VDC/2Amp
- Fixed DC power Supply 2V/1A, +6V/1A
- Fixed DC Power Supply 2V/1A , 1.018VDC



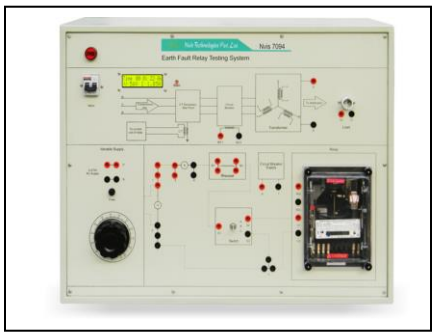
Triple Output DC Power Supply

POWER SYSTEM / RELAY LAB TRAINERS

- Transmission line trainer (ABCD, T & Pi parametrs, Ferranti effect load test
- IDMT over current relay testing kit (electromechanical type)
- Earth fault relay testing kit (electromechanical type)
- Percentage bias differential relay testing kit (electromechanical type with rehostat)
- Transformer protection using percentage biased differential relay (static type)
- Transformer protection using percentage biased differential relay (microprocessor type)
- Thermal overload relay testing kit
- Bucholz relay test setup (with compressor & oil)
- CT test set (with reference CT &CT under test)
- Resistive lamp load 1000w in 5 step without lamo
- Under voltage / over voltage relay testing kit (static type)
- Instantaneous earth fault relay testing kit (electromechanical type)
- Under / over frequency relay testing kit for frequency variation
- Over voltage relay testing kit (electromechanical type)
- Under voltage relay testing kit (electromechanical type)
- Over current &earth fault relay testing kit (three phase static type)
- Over currentrelay (directional type) testing kit(electromechanical type with rehostat)


Relay

- Over current relaytesting kit(static type)
- Negative sequence relay testing kit (with 3 phase 3 HP induction motor)
- Reverse power relay testing kit (static type)
- Oil testing kit



Earth fault relay testing kit

Distance Protection Relay

Current injector

ELECTRICAL WORK BENCH

- Work bench for dc motor shunt type
- Work bench for dc series motor
- Work bench for dc motor compound type
- Work bench for dc generator shunt type
- Work bench for dc generator compound type
- Work bench for ac squirrel cage induction motor
- Work bench for motor generator set (AC to DC) And (DC to AC)
- Electrical machine trainer
- Advanced Electrical machine trainer set of 5 panels
- Electrical machine trainer set of 2 panels for 15 experiments
- Test bench for single and three phase energy meters
- Work bench for transformers (single phase & three phase) experiments