FIRST OF ITS KIND ONLINE SHOP FOR

EDUCATIONAL TRAINING SYSTEMS

www.labelectronics.com

AVAILABLE FOR WORLDWIDE SHIPPING

LAB Electronics SINCE-1985

AN ISO 9001:2008 CERTIFIED COMPANY

LAB ELECTRONICS OFFERS THE FOLLOWING PRODUCTS
OVER 1000 TRAINERS

DC ELECTRONICS
AC ELECTRONICS
SEMI CONDUCTOR DEVICES
POWER ELECTRONICS
TRANSISTOR AMPLIFIER CIRCUITS
OPTO ELECTRONICS DEVICES
POWER SUPPLIES
OSCILLATORS
MULTIVIBRATORS & TIMER CIRCUITS
DATA COMMUNICATION & NETWORKS
OPTICAL COMMUNICATIONS
ELECTRONIC COMMUNICATIONS
TRANSDUCER CHAR. & APPLICATIONS
DIGITAL ELECTRONICS
WAVE FORM GENERATORS
OPERATIONAL AMPLIFIERS
ACTIVE FILTERS(OP-AMP BASED)
PHASE LOCK LOOPS
AC BRIDGES
FREQUENCY RESPONSE OF
- PASSIVE FILTER
DIGITAL LOGIC TRAINER
LINEAR IC TRAINER
BREAD BOARD SYSTEM TRAINER
ELECTRONIC DESIGN EXPERIMENTER
AUDIO FREQUENCY OSCILLATOR
R.F. SIGNAL GENERATOR
1MHz SINE/SQUARE. SIGNAL GENERATOR

AM TRANSMITTER/RECEIVER TRAINER
FM TRANSMITTER/RECEIVER TRAINER
ANTENNA SYSTEM TRAINER
ADVANCED RADAR TRAINING SYSTEM
COMPUTER INTERFACE ELECT. TRAINER
ANALOGUE TRAINERS
ANALOGUE & DIGITAL COMM. TRAINERS
FIBRE OPTICS TRAINERS
INSTRUMENTATON TRAINERS
LASER TRAINERS
SATELLITE COMMUNICATION TRAINERS
MICRO WAVE TRAINER
OPTO ELECTRONIC TRAINER
TELECOMMUNICATION TRAINER
TESTING & MEASURING INSTRUMENTS
WIRELESS COMMUNICATION TRAINERS
MOVING COIL VOLTMETERS
MOVING COIL CURRENT METERS
MOVING COIL CENTER ZERO GALVANOMETER
ISDN TRAINER
EMBEDDED TRAINER
LAN-WL TRAINER
GSM TRAINER
PROCESS CONTROL TRAINER
VLSI TRAINER
MECHATRONICS SENSOR TRAINER
SCADA TRAINER
CONVEYOR SYSTEM TRAINER

NEW PRODUCTS

INTRODUCING STATE OF ART TEST AND MEASURING INSTRUMENTS

DC POWER SUPPLIES
FUNCTION GENERATOR
SWEEP FUNCTION SIGNAL GENERATOR
DIGITAL STORAGE OSCILLOSCOPE
ANALOG OSCILLOSCOPE
SPECTRUM ANALYSER
FREQUENCY COUNTER

LEVEL CONTROL TRAINER
LEVEL MEASUREMENT TRAINER
TEMPERATURE CONTROL TRAINER
TEMPERATURE MEASUREMENT TRAINER
FLOW MEASUREMENT TRAINER
FLOW CHARACTERISTICS TRAINER
PLC TRAINER
DCS TRAINER
MULTI PROCESS TRAINER
UNIVERSAL PROCESS TRAINER
BASIC PNEUMATICS TRAINER
BASIC HYDURALICS TRAINER
ELECTRO HYDURALICS TRAINER
FLOW CONTROL TRAINER

AN ISO 9001:2008 CERTIFIED COMPANY

Company's Profile

INTRODUCTION:

Our Company was established in 1985 and is located in the heart of Chennai City, India.

Our Products are widely accepted in most of the Technical Institutions throughout India and we have also exported our products to countries like Singapore, Malaysia, Egypt, Israel, Bhutan, Middle East and Africa. We imbibe quality in every stage Design and Production to ensure Customers' Loyalty is enhanced.

OUR FACILITIES

We have qualified personnel to design and develop products with all in house facilities equipped with all modern computer systems and office automation

R & D FACILITIES

All our products are conceived, designed and developed in our Factory by qualified technical persons and circuits are designed with the help of modern Computer aided design tools and we are well equipped with sophisticated test and measuring instruments requried for production.

Certifications

NSIC ISO 9001 : 2008
राष्ट्रीय लघु उद्योग निगम लिमिटेड
THE NATIONAL SMALL INDUSTRIES CORPORATION LIMITED
(A Government of India Enterprise)   Sr. No. 16661

Branch Office : No.309, SIDCO-AIEMA Tower, 2nd Floor, 1st Main Road, Ambattur Industrial Estate, Ambattur, Chennai -600 058
Ph : 044-26243884   Fax : 044-26248826
Email : boambattur@nsic.co.in   Website : www.nsic.co.in

GOVERNMENT PURCHASE ENLISTMENT CERTIFICATE

(Valid From 21/09/2014 to 20/09/2016)

Ref.No. 303   Date: 02/09/2014

M/s. LAB ELECTRONICS
NO.5,2ND FLOOR 10TH AVENUE ASHOK NAGAR CHENNAI TAMILNADU- 600083

Factory Address:
1 NO.5 2ND FLOOR 10TH AVENUE ASHOK NAGAR CHENNAI, TAMILNADU -600083

Name of the Proprietor
Mr.K.UDAYASHANKAR

Certificate of Registration under Single Point Registration Scheme. Units registered under this scheme are considered to be at par with those registered directly with DGS & D.

Constitution of the firm- Proprietorship

GOVERNMENT PURCHASE REGISTRATION NO: NSIC/GP/AMB/2014/0007511
GOVERNMENT PURCHASE OLD REGISTRATION NO: NSIC/A/SPRL-00010
Monetary Limit: ₹ 25 Lakhs (Twenty Five Lakhs Only)
TURNOVER (Rupees in Lakhs)

Financial Year	Annual Turnover
2011-12	65.62
2012-13	69.97
2013-14	28.97
Monetary Limit	25

Your name has been registered as a SSI Unit eligible for participation in the Central Government Store Purchase Programme as per the Single Point Registration Scheme for the following Items/Stores/or Service no.

Name of the Stores/Service(s)	Specification(s)	Qualitative Capacity	Quantitative Capacity P.M.P.S.
		"As per List Attached" (12 item only)	

M/s. LAB ELECTRONICS   B. R/Authorised Signatory

http://www.nsicspronline.com/appAdministrator/Registration...   02-Sep-14

NSIC ISO 9001 : 2008
राष्ट्रीय लघु उद्योग निगम लिमिटेड
THE NATIONAL SMALL INDUSTRIES CORPORATION LIMITED
(A Government of India Enterprise)   Sr. No. 431

Branch Office : No.309, SIDCO-AIEMA Tower, 3rd Floor, 1st Main Road, Ambattur Industrial Estate, Ambattur, Chennai -600 058
Ph : 044-26243884   Fax : 044-26248826
Email : boambattur@nsic.co.in   Website : www.nsic.co.in

STORE DETAILS

(Valid From 21/09/2014 to 20/09/2016)

ANNEXURE TO GOVERNMENT PURCHASES ENLISTMENT CERTIFICATE
NO. NSIC/GP/AMB/2014/0007511 D.T. 02/09/2014
ISSUED TO M/s. LAB ELECTRONICS, TAMILNADU

NO.5 2ND FLOOR 10TH AVENUE ASHOK NAGAR, CHENNAI, TAMILNADU-600083

Sl	Stores/ Service(s) Name	Specification(s)	Qualitative Capacity	Quantitative Capacity P.M.P.S.
1	ELECTRONIC TRAINING EQUIPMENTS AND SIMULATORS	AS PER CUSTOMERS SPECIFICATION		100 NOS
2	TEST AND MEASURING INSTRUMENTS	AS PER CUSTOMERS SPECIFICATION		100 NOS
3	MICROPROCESSOR BASED EQUIPMENTS	AS PER CUSTOMERS SPECIFICATION		100 NOS
4	MICROCONTROLLER BASED EQUIPMENTS	AS PER CUSTOMERS SPECIFICATION		100 NOS
5	EMBEDDED SYSTEMS	AS PER CUSTOMERS SPECIFICATION		100 NOS
6	COMMUNICATION SYSTEM	AS PER CUSTOMERS SPECIFICATION		100 NOS
7	ELECTRO OPTICAL TRACKING SYSTEM	AS PER CUSTOMERS SPECIFICATION		100 NOS
8	ANTENNA BASED TRACKING SYSTEM	AS PER CUSTOMERS SPECIFICATION		100 NOS
9	RADAR TRACKING SYSTEM	AS PER CUSTOMERS SPECIFICATION		100 NOS
10	VIDEO SURVEILLANCE / SECURITY SYSTEMS (MINI/MICRO UNMANNED AERIAL VEHICLE CLOSED CIRCUIT SURVEILLANCE SYSTEMS WITH DAY AND NIGHT CAMERAS)	AS PER CUSTOMERS SPECIFICATION		100 NOS
11	MODELING AND SIMULATION SOFTWARE	AS PER CUSTOMERS SPECIFICATION		100 NOS
12	PNEUMATIC/HYDRAULIC TRAINING EQUIPMENT (UNIVERSAL PROCESS CONTROL TRAINER LEVEL)	AS PER CUSTOMERS SPECIFICATION		100 NOS

M/s. LAB ELECTRONICS   B. R/Authorised Signatory

http://www.nsicspronline.com/appAdministrator/Registration...   02-Sep-14

D.Dis No. 1712/R4/2010
Additional Activity Incorporated
D.Dis No. 6094/B1/2012

FORM No. 18016

GOVERNMENT OF TAMILNADU
DEPARTMENT OF INDUSTRIES AND COMMERCE

ACKNOWLEDGEMENT - PART II

1 M/s. LAB ELECTRONICS has filed Memorandum for Manufacturing Enterprises at the address NO.5, 2ª FLOOR, 10th AVENUE, ASHOK NAGAR, CHENNAI-600 083 as per the terms indicated below as per the form stated in Form No. 18016 and allbsubs.

ENTREPRENEUR MEMORANDUM NUMBER as below:
2. DETAILS OF ITEMS MANUFACTURED / SERVICES RENDERED:

Sl. No.	Item & Manufacture / Type / Service rendered	Capacity (per annum)	
1	ELECTRONIC TRAINING EQUIPMENTS AND SIMULATORS TRACKING EQUIPMENTS AND SIMULATORS, TEST AND MEASURING INSTRUMENTS, MICROPROCESSOR BASED EQUIPMENTS, MICRO CONTROLLER BASED EQUIPMENTS, EMBEDDED SYSTEMS, COMMUNICATION SYSTEM, ELECTRO OPTICAL CATEGORY PRODUCTS BASED AS MARKING OPTICAL TRACKING SYSTEM, ANTENNA BASED TRACKING SYSTEMS, RADAR SYSTEMS, VIDEO SURVEILLANCE/ SECURITY SYSTEM, MODELLING AND SIMULATION ONLY, VIDEO SURVEILLANCE, PNEUMATIC/HYDRAULIC TRAINING EQUIPMENTS ONLY.	30.07.1985	

3. DETAILS OF PLANT & MACHINERY AS PER DATE WISE INVESTMENT:

			Date of Investment		
		Total	New / Existing	Expansion / Diversification
7	8	15	30.07.1985	01.04.2012

4. DATE OF CHANGE OF CATEGORY FROM : New Unit / No Change in Category

5. DATE OF ISSUE : 03.09.2010

5A. DATE OF ASSESSMENT : 21.04.2012

6. NATURE OF ACTIVITY (MANUFACTURING - 1 SERVICES-2)

7. CATEGORY OF THE UNIT (MICRO-1, SMALL-2, MEDIUM - 3)

ENTREPRENEUR MEMORANDUM NUMBER

3	3	0	0	2	1	1	15133	PART II	MICRO

RECHIVAL JOINT DIRECTOR OF INDUSTRIES & COMMERCE, Thirumangalam Industrial Estate,

CERTIFICATE OF REGISTRATION

The Management System of

LAB ELECTRONICS
Main Unit., Unit - 1: New No. 5, Old No. 27, Floor, 10th Avenue Ashok Nagar, Chennai – 600 083, Tamil Nadu, India
R & U Unit, Unit - 2: No: 1W/U, Amal Sathya Nagar Main Road, Ramapuram, Chennai – 600 083, Tamil Nadu, India

has been assessed and complying with

ISO 9001:2008

for the following activities

Design, Manufacture and Supply of Electronic Training Equipments and Simulators, Test and Measuring Instruments, Microprocessor / Micro Controller Based Equipments, Embedded Systems, Communication Systems / Trainers, Electro-Optical / Antenna Based Tracking Systems, Radar Tracking System, Video Surveillance / Security Systems (Mini / Micro Unmanned Aerial Vehicle, Closed Circuit Surveillance Systems With Day and Night Cameras), Simulation Software and Pneumatic / Hydraulic Training Equipments (Universal Process Control Trainer, Level Measurement Trainer, Flow Measurement Trainer, Level Control Trainer)

Date of Issue: 09 July 2013   Date of Expiry: 08 July 2016

Initial Certification: 09 July 2013

Certificate No. 600928

The validity of this certificate can be verified from the following website www.rqc.co.uk

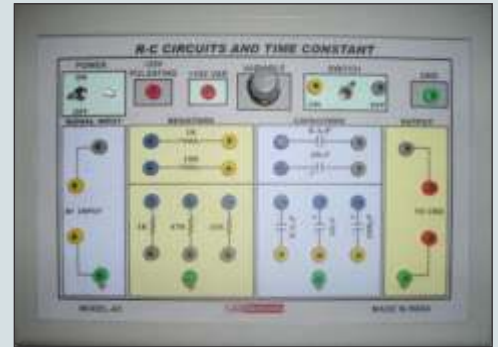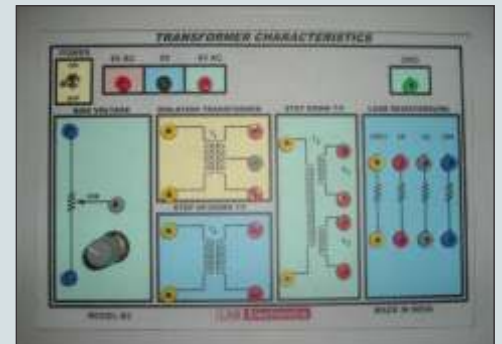# BASIC ELECTRONICS

BASIC ELECTRONICS

A1   ELECTROMAGNETISM

A2   MAGNETIC & ELECTRO MAGNETIC DEVICES

A3   NETWORK THEOREMS

A4   MAXIMUM POWER TRANSFER THEOREM

A5   RC CIRCUITS & TIME CONSTANT

A6   ADVANCED NETWORK THEOREMS
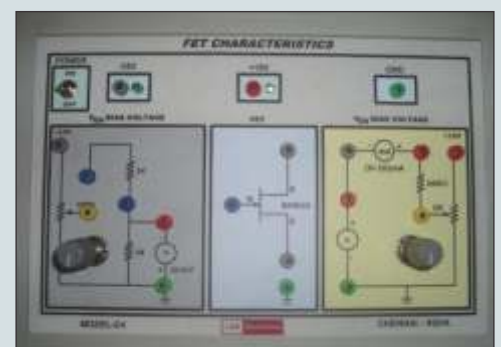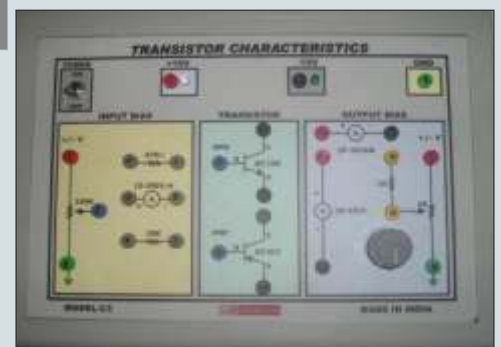
DC ELECTRONICS

B1   RC & LC CIRCUITS & THEIR APPLICATIONS

B2   TRANSFORMER CHARACTERISTICS

B3   SERIES RESONANCE

B4   PARALLEL RESONANCE

B5   B.H. CURVE AND HYSTERESIS LOOP

B6   TRANSIENT RESPONSE OF SECOND ORDER NETWORK

B7   TRANSFER FUNCTION OF SIMPLE NETWORK

B8   LEAD AND LAG NETWORK – FREQUENCY & PHASE

B9   LISSAJOUS MEASUREMENTS ON C.R.O.

SEMICONDUCTOR & POWER ELECTRONICS

C1   SEMICONDUCTOR DIODE CHARACTERISTICS

C2   ZENER DIODE CHARACTERISTICS

C3   TRANSISTOR CHARACTERISTICS

C4   FET CHARACTERISTICS

C5   MOSFET CHARACTERISTICS

C6   VARACTOR DIODE CHARACTERISTICS

C7   UNI JUNCTION TRANSISTOR (UJT) CHARACTERISTICS

C8   SCR CHARACTERISTICS

C9   PHASE CONTROL OF AN SCR

C10   SPEED CONTROL OF MOTOR USING SCR

C11   CONSTRUCTION OF SCR TRIGGERING CIRCUIT USING LDR

C12   CONSTRUCTION OF UJT FIRING CIRCUIT FOR SCR

BASIC ELECTRONICS

C13   UJT CONTROLLED SCR TIME-DELAY CIRCUIT

C14   SINGLE PHASE HALF & FULLY CONTROLLED
       BRIDGE RECTIFIER

C15   DIAC & TRIAC CHARACTERISTICS

C16   SPEED CONTROL OF MOTOR USING TRIAC

C17   CONSTRUCTION OF FAN REGULATOR
       USING DIAC & TRIAC

C18   LAMP CONTROL USING DIAC & TRIAC

C21   SERIES INVERTER

C29   PHOTO ELECTRIC RELAY USING SCR

C30   L-C COMMUTATION OF A THYRISTOR
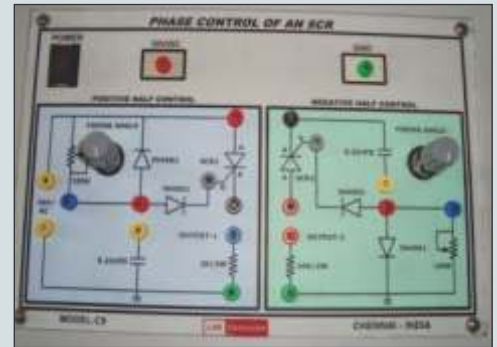
AMPLIFIERS

D1   TRANSISTOR AMPLIFIER TYPES

D2   THERMAL STABILITY OF TRANSISTORS

D3   TRANSISTOR DC AMPLIFIER

D4   TRANSISTOR PUSH PULL AMPLIFIER

D5   DIFFERENTIAL AMPLIFIER

D6   FET AMPLIFIER

D7   TUNED AMPLIFIER

D8   TRANSFORMER COUPLED AMPLIFIER

D9   VOLTAGE AND CURRENT FEEDBACK AMPLIFIER

D10   TWO STAGE RC COUPLED AMPLIFIER

D11   A.F.AMPLIFIER USING TBA 810

D12   AUDIO AMPLIFIER USING LM380

D14   THERMISTOR CHARACTERISTICS

D15   TRANSISTORISED COMPLEMENTARY
       SYMMETRY AMPLIFIERS

D16   CLASS 'A' AMPLIFIER

D17   CLASS 'B' AMPLIFIER

D18   CLASS 'C' AMPLIFIER

D19   BOOTSTRAP VOLTAGE SWEEP

D20   TRANSISTOR CURVE TRACER

D21   TRANSISTOR TIME DELAY RELAY CIRCUIT

D22   CLASS 'AB' AMPLIFIER

D23   DARLINGTON DIFFERENTIAL AMPLIFIER
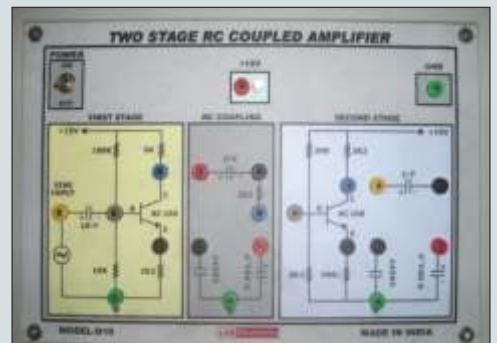
BASIC ELECTRONICS

## OPTO - ELECTRONIC DEVICES

E1 PHOTO CELLS CHARACTERISTICS & TESTING METHODS

E2 PHOTO DIODE CHARACTERISTICS AND TESTING METHODS

E3 PHOTO TRANSISTOR CHARACTERISTICS

E4 LIGHT EMITTING DIODE CHARACTERISTICS

E5 RELAY CIRCUITS USING PHOTO DEVICES

E6 TWILIGHT RELAY USING 555 & LDR

E7 SOLAR CELL CHARACTERISTICS

E19 OBJECT COUNTING USING INFRARED SENSOR

E21 LCD CHARACTERISTICS

E22 OPTO COUPLER
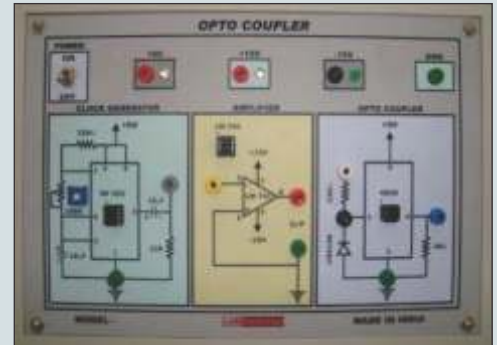
POWER SUPPLY TRAINERS

F1 HALFWAVE, FULLWAVE &BRIDGE,RECTIFIERS& FILTERS

F2 STABILISED POWER SUPPLY USING ZENER DIODE

F3 SERIES TYPE VOLTAGE REGULATOR

F4 SHUNT TYPE DC VOLTAGE REGULATOR

F5 VARIABLE VOLTAGE IC REGULATOR

F6 VARIABLE TRANSISTORIZED REGULATED POWER SUPPLY

F7 VARIABLE VOLTAGE CURRENT LIMITING IC REGULATOR

F8 SWITCH MODE POWER SUPPLY

F9 IC REGULATED POWER SUPPLIES (POSITIVE & NEGATIVE)

F10 VOLTAGE MULTIPLIERS

F11 LOW VOLTAGE REGULATOR USING IC 723

F12 HIGH VOLTAGE REGULATED POWER SUPPLY USING IC 723

F13 DC - DC CONVERTER

F14 DC-AC INVERTER

F15 CONSTANT & VARIABLE CURRENT REGULATORS IC BASED
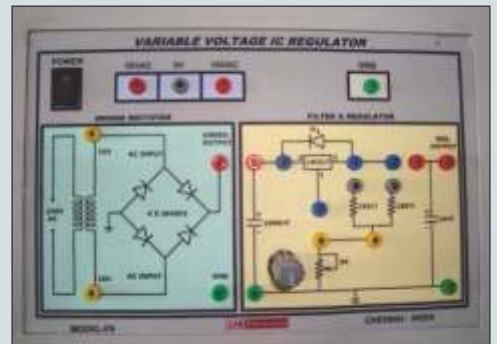
BASIC ELECTRONICS

OSCILLATORS

G-01   HARTLEY OSCILLATOR

G-02   COLPITT'S OSCILLATOR

G-03   CRYSTAL OSCILLATORS

G-04   PIERCE OSCILLATOR

G-05   RC PHASE SHIFT OSCILLATOR

G-06   WEIN BRIDGE OSCILLATOR

G-07   TRANSISTORISED WIEN BRIDGE OSCILLATOR

G-08   TWIN T OSCILLATOR

G-09   BEAT FREQUENCY OSCILLATOR

G-10   VOLTAGE-CONTROLLED OSCILLATOR USING 555

G-11   BLOCKING OSCILLATOR

G-12   CLAPP OSCILLATOR
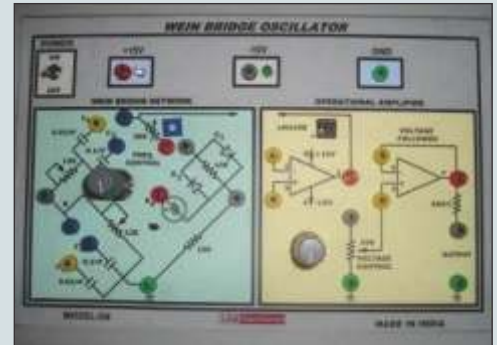
MULTIVIBRATORS

H1   MULTIVIBRATORS USING TRANSISTORS

H2   MULTIVIBRATORS USING OP-AMP

H3   MULTIVIBRATORS USING DIGITAL IC'S

H4   MULTIVIBRATORS USING IC-555 TIMER

H5   SCHMITT TRIGGER

H6   TIMER CIRCUIT EXCITING A TIME DELAY RELAY

H9   COUNTER USING 555 & LDR
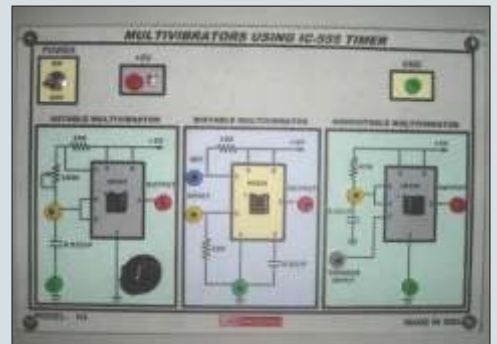
TRANSMISSION LINE

I-01   EFFECT OF LINE RESISTANCE & CAPACITANCE
ON SIMULATED TRANSMISSION LINES

I-02   DIGITAL CODING SYSTEM

I-03   CODING FOR SERIAL TRANSMISSION PART-1

I-04   CODING FOR SERIAL TRANSMISSION - PART II

I-05   PRINCIPLES OF MODULATION TO REAL SIGNAL

I-06   ANALOG SIGNAL SAMPLING

I-07   EFFECT OF NOISE & OTHER IMPAIRMENTS ON DATA
TRANSMISSION

AN ISO 9001:2008 CERTIFIED COMPANY

BASIC ELECTRONICS

ELECTRONICS AND DIGITAL COMMUNICATIONS

|	
K-01	AMPLITUDE MODULATION AND DEMODULATION
K-02	FREQUENCY MODULATION AND DEMODULATION
K-03	PHASE MODULATION
K-04	BALANCED MODULATOR
K-05	DIODE-BRIDGE BALANCED MODULATOR
K-06	PULSE AMPLITUDE MODULATION & DEMODULATION
K-07	PULSE POSITION & PULSE WIDTH MODULATION
K-08	PULSE POSITION AND PULSE WIDTH DEMODULATION
K-09	TIME DIVISION MULTIPLEXER
K-10	FSK TRANSMITTER
K-11	FSK RECEIVER
K-12	PULSE CODE MODULATION & DEMODULATION
K-13	AM-FM SIGNAL GENERATOR TRAINER
K-14	DEMODULATOR CIRCUITS
K-15	DELTA MODULATION & DEMODULATION
K-16	ADAPTIVE DELTA MODULATION/ DEMODULATION
K-18	PHASE SHIFT KEYING MODULATOR / DEMODULATOR
K-19	QPSK MODULATOR AND DEMODULATOR
K-20	FREQUENCY DIVISION MULTIPLEXING & DEMULTIPLEXING
K-21	BINARY PHASE-SHIFT-KEYING (BPSK)
K-22	ASK MODULATION AND DEMODULATION
K-23-1	DSB AM TRANSMITTER RECEIVER TRAINER
K-23-2	SSB AM TRANSMITTER RECEIVER TRAINER
K-24	DIFFERENTIAL PULSE CODE MODULATION& DEMODULATION
K-25	DPSK MODULATION AND DEMODULATION
K-26	SAMPLING AND RECONSTRUCTION TRAINER
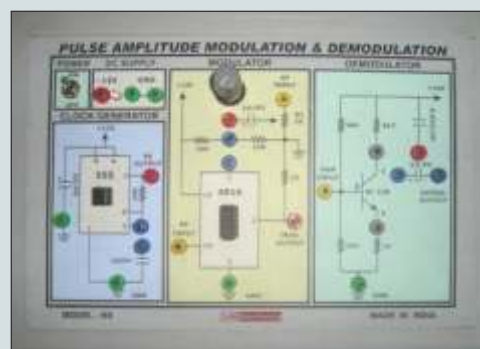
INSTRUMENTATION

|	
L-01	OPEN LOOP SPEED CONTROL OF DC MOTOR
L-02	CLOSED LOOP SPEED CONTROL OF DC MOTOR
L-03	2 WIRE R.T.D. IN A POTENTIOMETER CIRCUIT
L-04	3 WIRE R.T.D. USING DC WHEATSTONE BRIDGE CIRCUIT

BASIC ELECTRONICS

L-05   2-WIRE THERMISTOR IN A WHEATSTONE'S BRIDGE CIRCUIT

L-06   2-WIRE THERMISTOR IN AN OP-AMP CIRCUIT

L-07   TRANSISTOR AS TEMPERATURE SENSOR

L-08   LVDT CHARACTERISTICS

L-09   HALL EFFECT CHARACTERISTICS

L-10   LDR AS OPTICAL SENSOR

L-11   THERMOCOUPLE CHARACTERISTICS

L-12   TEMPERATURE TRANSDUCER TRAINER

L-13   PRESSURE MEASUREMENT TRAINER

L-14   STRAIN GAUGE TRAINER
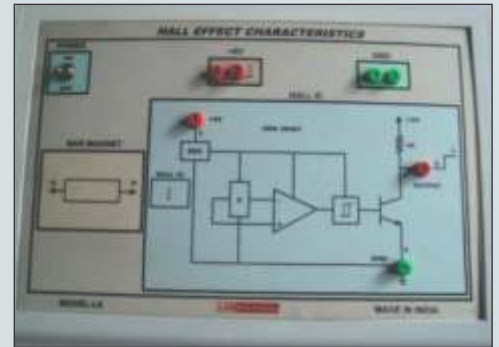
DIGITAL ELECTRONICS

N-01   BASIC LOGIC GATES USING DIODES & TRANSISTORS

N-02   VERIFICATION OF BOOLEAN EXPRESSIONS

N-03   ADDER/SUBTRACTOR USING EX-OR GATES

N-04   R-S/D/T FLIP-FLOPS CHARACTERISTICS & COMPARISON

N-05   J-K FLIP FLOPS

N-06   MASTER SLAVE J-K FLIP-FLOP USING NAND GATES

N-07   DIODE MATRIX ENCODER

N-08   NAND GATE ENCODER

N-10   BCD TO 7-SEGMENT DISPLAY DECODER (COMMON ANODE & COMMON CATHODE TYPES)

N-12   DECADE COUNTER, DECODER DRIVERS AND 7 SEGMENT DISPLAY

N-13   16-LINE TO 1-LINE MULTIPLEXER

N-14   4-LINE TO 16-LINE DEMULTIPLEXER

N-16   ARITHMETIC LOGIC UNIT DEMONSTRATOR

N-19   4-BIT BINARY FULL ADDER/SUBTRACTOR

N-20   4 BIT SHIFT REGISTER

N-21   UP/DOWN COUNTER USING 74192

N-22   RANDOM ACCESS MEMORY

N-23   READ ONLY MEMORY

N-26   MODULO-N-COUNTERS

N-27   BINARY MULTIPLIER

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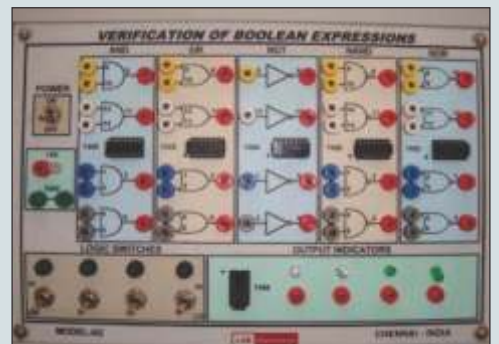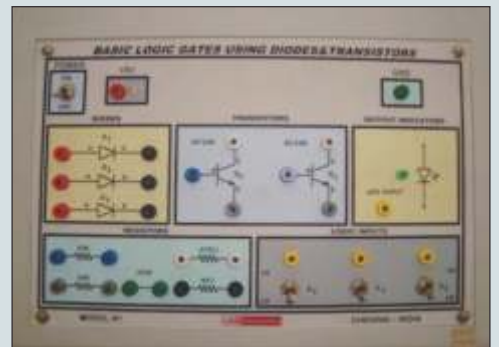
BASIC ELECTRONICS

N-32   ANALOG TO DIGITAL CONVERTER

N-33   DIGITAL TO ANALOG CONVERTER

N-33A R-2R LADDER (DAC)

N-34   555 TIMER CIRCUITS AND APPLICATIONS

N-42   LEFT/RIGHT SHIFT REGISTER

OP AMP AND ACTIVE FILTER TRAINERS

P-01   OPERATIONAL AMPLIFIER CHARACTERISTICS

P-02   VOLTAGE FOLLOWER

P-03   SUMMER /SUBTRACTOR /DIFFERENTIATOR AND
       INTEGRATOR USING OPERATIONAL AMPLIFIER

P-04   VOLTAGE TO FREQUENCY CONVERTER

P-05   FREQUENCY- TO-VOLTAGE CONVERTER

P-06   VOLTAGE TO CURRENT & CURRENT TO VOLTAGE
       CONVERTER

P-07   PRECISION HALF WAVE & FULL WAVE RECTIFIER

P-08   QUADRATURE (SINE & COSINE OSCILLATOR & PHASE SHIFT CIRCUIT)

P-09   LOG AND ANTILOG AMPLIFIER

P-10   SAMPLE AND HOLD CIRCUIT

P-11   ACTIVE LOW PASS FILTER

P-12   ACTIVE HIGH PASS FILTER

P-13   ACTIVE BAND PASS FILTER

P-14   UNIVERSAL ACTIVE FILTER

P-15   NOTCH FILTER

P-17   OP AMP AS CAPACITANCE MULTIPLIERS

P-18   NORTON AMPLIFIERS

P-19   CLIPPING CIRCUITS USING OP AMP

P-20   CLAMPING CIRCUITS USING OP AMP

P-21   INSTRUMENTATION AMPLIFIER
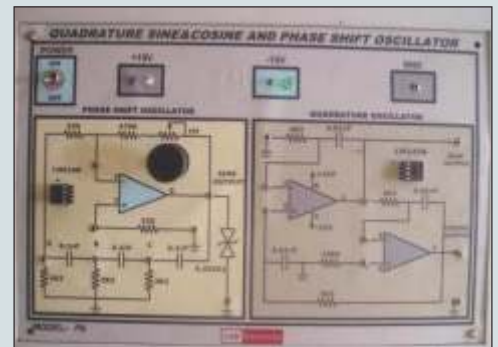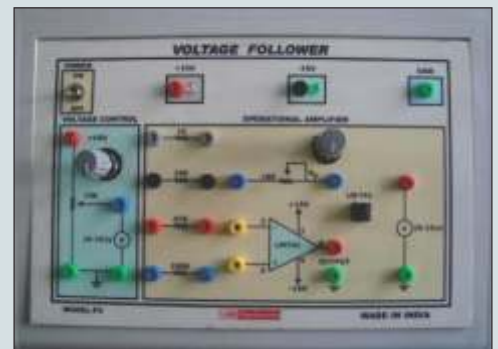
PHASE LOCKED LOOP
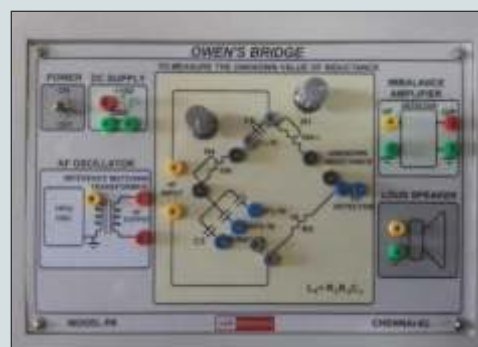
Q-01   PHASE DETECTION & MEASUREMENT USING PLL

Q-02   VOLTAGE CONTROLLED OSCILLATOR USING PLL

Q-03   PHASE LOCK LOOP FREQUENCY MULTIPLIER &
       SYNTHESIZER
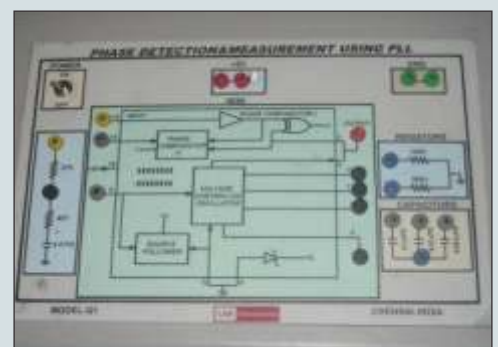
BASIC ELECTRONICS

BRIDGES

R-01   WHEATSTONE'S BRIDGE

R-02   DESAUTY'S BRIDGE

R-03   MAXWELL'S BRIDGE

R-04   HAY'S BRIDGE

R-05   SCHERING BRIDGE

R-06   ANDERSON BRIDGE

R-07   KELVIN'S DOUBLE BRIDGE

R-08   OWEN'S BRIDGE

RF & AUDIO

S-01   FREQUENCY MIXER (MIXER STAGE-ALIGNMENT & TESTING METHODS)

S-02   IF AMPLIFIERS-ALIGNMENT & TESTING METHODS

S-03   PRE-EMPHASIS AND DE-EMPHASIS

S-04   CROSS-OVER FREQUENCY NETWORK

S-08   RATIO DETECTOR

S-09   PHASE DISCRIMINATOR

PASSIVE FILTERS

T-01   CONSTANT K- TYPE LOW PASS FILTER

T-02   CONSTANT K- TYPE HIGH PASS FILTER

T-03   CONSTANT K BAND PASS FILTER

T-04   M-DERIVED LOW PASS FILTER

T-05   M-DERIVED HIGH PASS FILTER

T-06   M-DERIVED BAND PASS FILTER

T-07   EQUALISER

T-08   T- ATTENUATORS CHARACTERISTICS & TESTING METHODS

T-09   " PI " (¶) ATTENUATOR CHARACTERISTICS & TESTING METHODS

T-10   COMPOSITE LOW PASS FILTER (PASSIVE TYPE)

T-11   COMPOSITE BAND PASS FILTERS

T-12   COMPOSITE HIGH PASS FILTER (PASSIVE TYPE)
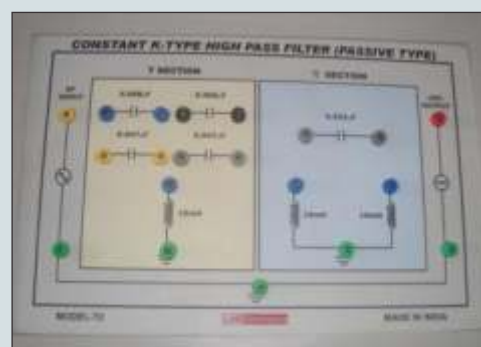
BASIC ELECTRONICS

AUTOMATIC GAIN CONTROL

AGC   AUTOMATIC GAIN CONTROL

TEST AND MEASURING INSTRUMENTS

DUAL REGULATED DC POWER SUPPLY 0-30V /2A

AUDIO FREQUENCY OSCILLATOR

DIGITAL STORAGE OSCILLOSCOPE

CATHODE RAY OSCILLOSCOPE

SPECTRUM ANALYSER

FREQUENCY COUNTER

ADVANCED ELECTRONICS

X1	DIGITAL LOGIC TRAINER
X2	LINEAR IC TRAINER
X3	ANALOGUE COMPUTER TRAINER
X6	BREAD BOARD SYSTEM TRAINER
X7	THYRISTOR APPLICATION TRAINER
X8	INSTRUMENTATION TRAINER USING TRANSDUCERS
X16	ELECTRONIC WORK STATION
X17	DIGITAL SYSTEM TRAINER
X22	TRANSMISSION LINE DEMONSTRATOR
X25	SPEED CONTROL OF DC MOTOR
X33	DC FUNDAMENTAL TRAINER
X34	OP AMP CIRCUIT TRAINER
X36	DIGITAL & ANALOG ELECTRONICS TRAINER
X37	SENSOR TRAINER
Z4	EPABX TRAINER

MICROCONTROLLER BASED TRAINERS

CONVEYOR CONTROL TRAINER

CST

FEATURES:

- CW / CCW Conveyor control
- Object counting for all rotation

PID CONTROL TRAINER

PID

FEATURES:

- Controls the temperature of water with PI & D modes combination
- Corrects the error between PV(process variable) and SP(set point)
- Microcontroller based
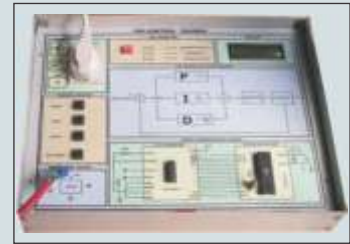
OPEN LOOP / CLOSED LOOP CONTROLLER

L17

FEATURES:

- To study the basic operation of an open loop/ closed loop system
- Driving the motor with open loop / closed loop system
- Speed indication and control

TRAFFIC LIGHT CONTROL TRAINER

TLK

FEATURES:

- Monitors and Controls the real time traffic light control system
- One way / two way control
- Four sequences and four delays

LIFT CONTROL TRAINER

MC6

FEATURES:

- Lift Control Trainer with Control Switches and LED
- Microcontroller based

MANCHESTER CODING AND DECODING

I10

FEATURES:

To study the Manchester Coding/Decoding techniques using microcontroller with different bit rates

MODEM TRAINER

X28

FEATURES:

To demonstrate the basic operation of an FSK(mod and demod)data modem with RS 232 interface

Two mode operation(Microcontroller/PC)

8 bit data output

DIGITAL COMMUNICATION TRAINER - II

X31

FEATURES:

To demonstrate
- I)   ASK Mod/Demod
- II) FSK Mod/Demod
- III) PSK Mod/Demod
- IV) QPSK Mod/Demod
- V)   NRZ,RZ,Manchester Code/Decode

FIBER OPTICS TRAINER

FO-1   FIBER OPTIC DESIGN TRAINER

FO-2   SIMPLEX ANALOGUE TRANSCEIVER TRAINER

FO-3   FIBER OPTICS FULL DUPLEX ANALOGUE TRANSCEIVER TRAINER

FO-4   FIBER OPTICS SIMPLEX CMOS DIGITAL TRANSCEIVER TRAINER

FO-5   FULL DUPLEX DIGITAL CMOS TRANSCEIVER TRAINER Model:FO-5

FO-6   FO VIDEO TRANSCEIVER TRAINER

FO-7   PROFESSIONAL FIBER OPTIC DESIGN TRAINER

FO-8   TRANSMISSION OF LASER BEAM THROUGH AN OPTICAL

FO-9   TDM-PCM TRANSMISSION TRAINER USING FIBER OPTIC CABLE

FO-11 OPTICAL FIBER TRAINER

FO-12 OPTICAL POWER METER

FOCR FIBER OPTICAL CABLE REPAIR KIT

FOTR FIBRE OPTIC VOICE TRANSMITTER AND RECEIVER
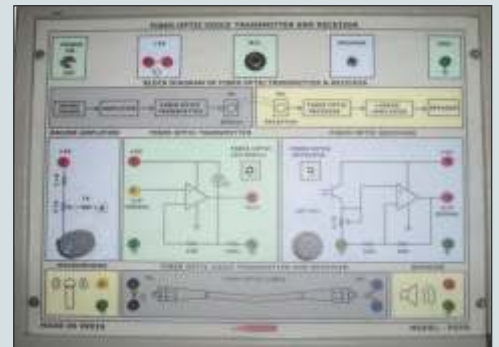
ADVANCED COMMUNICATION TRAINERS

LOCAL AREA NETWORK TRAINER

FEATURES:

- LAN using switches
- Wireless-G broadband router

DSP

DSP TRAINER

- Evaluation kit
- Starter version
- Advanced version

VLSI

VLSI TRAINER

FEATURES:

- Dual on-board 1.5A power regulators(2.5V and 3.3V)
- FPGA Evaluation kit and CPLD starter kit

GSM

GSM TRAINER

FEATURES:

- To study the GSM mobile communication trainer by dialling, receiving the calls and sending and receiving messages through GSM MODEM.

- To study the AT commands by connecting the PC with the GSM modem

ADVANCED RADAR TRAINING SYSTEM

Model:ARTS

(RANGE MEASUREMENT):
TRANSCEIVER:

- **RF Source** : 6.8GHz (max).
- **Band** : C – Band.
- **Signal output** : 4…20mA/HART(two phases)
- **Operating Voltage** : +24VDC.
- **Operating Current** : 200mA.
- **Measuring range** : 35 meters
- **Operating temperature** : -10 to 50 deg. C
- **Repeatability** : ± 3mm
- **Precision** : < 0.1%
- **Type** : conical Horn Antenna.

RADAR SIGNAL PROCESSING UNIT –USB BASED:

Radar signal processing unit will be supplied along with the trainer to log the reflected signal from the targets and will be processed on to the computer using USB port.

Range : 1 m to 35m.

RANGE MEASUREMENT:

LAB-Radar software provides you,

- Interfacing high velocity Data Acquisition Card to computer.
- Study of Radar Plotting (PPI Method)
- Target identification as blips.
- Realistic scanner with Grids.
- PPI
- A Scope
- Automatic Targer Clear for full rotation.(360 degree)
- Data logging in Table format (Distance Vs Angle).

SPEED MEASUREMENT:

TRANSCEIVER:

RF Source	10.525 GHz (max).
Type	Integrated Transmitter/ Receiver.
Band	X – Band.
Output Power	5 mW.
Mixer phasing Degrees	75-105.
Operating Voltage	+8 .5VDC.
Operating Current	200mA.
Nominal Sensitivity	-95dBc.
Type	Pyramidal Horn Antenna.
Gain(in dB)	12 nominal
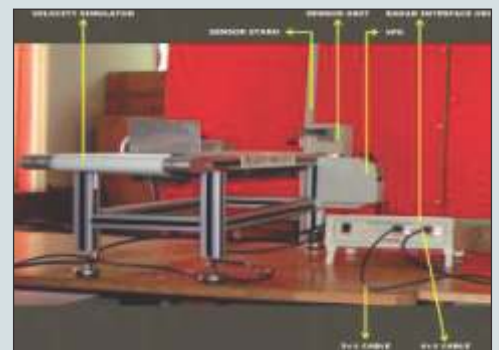
LAB-Doppler radar software provides you,

- Interfacing high velocity Data Acquisition Card to computer.
- Study of speed measurement in various units.
- Target identification.
- Dopper Shift Frequency.
- Data logging in Table.

ANTENNA SYSTEM TRAINER PC INTERFACE (MODEL-AST-PC)

FEATURES

- Supports 19 antennas
- Antenna Rotation control through Software.
- Auto Plotting of Radiation Pattern.
- Zoom-In and Zoom-Out.
- Radiation Pattern in Print Ready format .
- Theoretical Polar Plot is available.
- DB Table (Decibel) with Observed Values.
- Data logging in table format (Angle Vs Gain).
- Graphical User Interface.
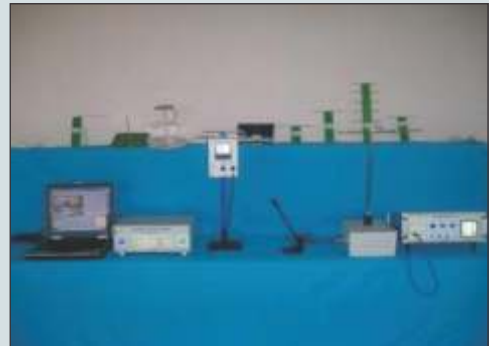
TYPES OF ANTENNAS

- Simple Dipole 1/4
- Folded Dipole Antenna
- Simple Dipole 1/2
- YagiAntenna : 5 Element - Folded Dipole.
- YagiAntenna : 5 Element - Simple Dipole.
- YagiAntenna : 3Element - Folded Dipole.
- YagiAntenna : 7 Element.
- Ground Plane Antenna
- Hertz Antenna
- Zeppline Antenna
- Slot antenna.
- Loop Antenna.
- Rhombus Antenna.
- Phase array l/4.
- Phase array l/2.
- Log Periodic Antenna
- Helical Antenna
- Parabolic Antenna
- Combined Collinear Array.
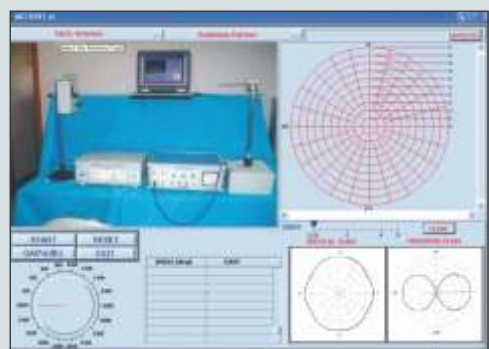
SOURCE AND CONTROLLER

RF Signal Generator	700MHz Range.
Power requirement	240V ac 50Hz.
Frequency range	700 MHz.
Output power	max 20 dBm.
Local oscillator	PLL frequency Synthesized.
AGC Dynamic range	40 dB.
Impedance	50 ohms.
IF	21.7 Mhz.
RF connection system	SMA and BNC connector.
Isotropic Radiator	2 Nos
Field strength Meter	1 No.
Control Method	AST software control.
Control Angle	360°, step : 1.8° / step
Calibration	auto
Motor rotation	Clockwise and anticlockwise in steps

MICROWAVE TRAINING SYSTEM (KLYSTRON TUBE)(MODEL-MWT)

KLYSTRON POWER SUPPLY

Beam Voltage	220 to 450mA
Beam Current	50mA
Operating Voltage	300 V (approx).
Reflector Supply	7 to 250 Volts
Modulation	Internal Square Wave 800 to 2000Hz with variable frequency & amplitude. Saw Tooth wave 15000-35000Hz variable
frequency &	amplitude.
Mains	230 VAC, 50Hz, 115 watts approx

VOLTAGE STANDING WAVE RATIO METER

Amplifier Type	High gain tuned at one frequency.
Frequency	1000 Hz.
Sensitivity	0.1 Micro volt at 200 ohms for full scale.
Band Width	25 to 30Hz
Range	60 db min. in 10 db scale.
Accuracy	0.15db on one range.
Meter Linearity	1% of full scale.
Scale- Selector	Normal, Expander.
Gain Control	Coarse & fine.
Input	BNC (F), 2000 ohms impedance.
Input Selector	Crystal, (4.5mA) and high (8.75mA).
Mains Power	230 VAC, 50Hz

MICROWAVE TRAINING SYSTEM (GUNN DIODE) (MODEL-MWT-1)

GUNN POWER SUPPLY

Gunn bias voltage	0.5 to 12V
Current	0 to 1.5 A (Max.)
Regulation	10% Mains 0.2% for
Ripple	2 mV (r ms)
Type of modulation	Internal as well as by using pin modulator
Modulation Frequency	900 to 1100 Hz Square wave
Modulation Amplitude	0 to 15V (Peak to Peak)
Output Connector	BNC (F) for both gunn bias and pin modulator
Mains	230VAC, 50Hz, 115 Watt approx.

VOLTAGE STANDING WAVE RATIO METER

Amplifier Type	High gain tuned at one frequency.
Frequency	1000 Hz.
Sensitivity	0.1 Micro volt at 200 ohms for full scale.
Band Width	25 to 30Hz
Range	60 db min. in 10 db scale.
Accuracy	0.15db on one range
Meter Linearity	1% of full scale
Scale- Selector	Normal, Expander
Gain Control	Coarse & fine
Input	BNC (F), 2000 ohms impedance
Input Selector	Crystal, (4.5mA) and high (8.75mA)
Mains Power	230 V AC, 50Hz

GLOBAL POSITIONING SYSTEM TRAINER (MODEL-X-40)

- Introduction to GPS

- Establishing Link between GPS Satellite & GPS Trainer

- Measurement of Latitude & Longitude

- To Study the Effect of DOP

- Study of HDOP & VDOP

- Analysis of Elevation Azimuth SNR

- Study of PRN code

- Study of Common NMEA Sentence Protocol
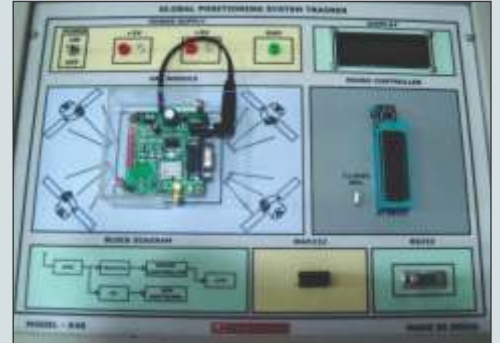
FEATURES

Channel	12
Frequency	L1 C/A
Position Accuracy	25 meters CEP without SA
Velocity Accuracy	0.1 meters/second, without SA Off
Time Accuracy	Synchronized to GPS time
Update rate	1/sec. (1 PPS) signal
Receiver Sensitivity	-175 dBW
Input Voltage	+5VDC
Current (Avg.)	180 mA
Serial Communication	4800 Baud
Maximum Altitude	18000 meters (60,000 Feet) max.
Maximum speed	515 meters/sec. (1000 knots) max.
PC Interface	RS 232 Port
Operating Temperature	-40 deg.C to +85 deg.C

INSTRUMENTATION / PROCESS CONTROL

LEVEL CONTROL TRAINER

FEATURES:
- System works on 230V AC.
- Honeywell' make PID is used.
- System controls ON-OFF through PID.
- Pre set levels can be Auto tuned.
- Interfacing Hardware and Software with USB to study SCADA operations.
- MODBUS communication.
- Multi drop and point to point Communication.
- Server-Client communication.
- Mono block pump of 0.5 HP is used.
- System is Floor mounted, on wheels.
- Dimensions: W: 800 mm, Ht: 1400 mm, D: 650 / 250 mm.

LEVEL MEASUREMENT TRAINER

FEATURES:
- System works on 230VAC
- Compact and simple to operate
- Ultrasonic transmitter senses the level of the fluid for displaying in the Process indicator
- System is Table mounted
- Dimensions: W:600 mm, Ht:700 mm, D: 250 mm

TEMPERATURE CONTROL TRAINER

FEATURES:
- System works on 230VAC
- "Honeywell" make PID is used
- System controls ON-OFF through PID
- Pre set levels can be Auto tuned
- Interfacing Hardware and Software with USB to study SCADA operations
- MODBUS communication
- Multi drop and point to point Communication
- Server-Client communication
- System is Table mounted.
- Dimensions: W:530 mm, Ht:600 mm, D: 300 mm.

TEMPERATURE MEASUREMENT TRAINER

FEATURES:
- System works on 230VAC
- Inbuilt Digital Multi meter
- 4.1/2 digit Mili voltmeter
- Beeper for recording observations
- MS Excel sample calculation
- Compact and simple to operate
- System is Table mounted
- Dimension: W: 760 mm, Ht: 760 mm, D: 400 mm.

FLOW MEASUREMENT TRAINER

FEATURES:
- System works on 230VAC
- Closed loop water circulation
- Acrylic material used for Venturi meter and Pitot tube.
- SS material used for Orifice meter and sump tank.
- MS Excel sample calculation
- Mono block pump of 0.5 HP is used.
- System is Floor mounted, on wheels.
- Dimensions: W: 1000 mm, Ht: 1700 mm, D: 650 / 350 mm.

FLOW CHARACTERISTICS TRAINER

FEATURES:
- System works on 230VAC
- Closed loop water circulation
- MS Excel sample calculation
- Industrial control valves
- System is Floor mounted, on wheels.
- Sump and Process Tanks with SS material
- Dimensions: W: 1200 mm, Ht: 1950 mm, D: 950 /320 mm.

PLC TRAINER: MODEL PLC O

FEATURES:
- System works on 230VAC
- PLC study with different Inputs/Outputs
- Real process and simulation mode
- Sample Ladder Logics
- OMRAN make PLC is used
- System is Table mounted
  Dimension:W:600 mm, Ht:800 mm, D: 450 mm

DCS TRAINER

FEATURES:
- System works on 230VAC
- "Honeywell" make HC900-C30 controller is used
- Configuration using Function blocks
- Interfacing Hardware and Software with Ethernet to study SCADA operations
- Panel for input simulation.
- 4 Relays of 24VDC for Digital output.
- Inbuilt powering for all AI, DI & DO.
- System is Table mounted.
- Dimension: W: 760 mm, Ht: 760 mm, D: 350 mm.

MULTI PROCESS TRAINER

FEATURES:
- System works on 230VAC
- Flow, Level. Cascade, Feed forward and Ratio control
- System controls ON-OFF through PID
- Interfacing Hardware and Software with USB to study SCADA operations
- MODBUS communication
- Closed loop water circulation
- Mono block pumps of 0.5 HP are used.
- System is Floor mounted, on wheels.
- Dimensions: W: 800 mm, Ht: 1450 mm, D: 650 / 450 mm.

UNIVERSAL PROCESS TRAINER

FEATURES:
- System works on 230VAC
- DCS control
- MODBUS communication
- Interfacing Hardware and Software with Ethernet to study SCADA operations
- Manual tuning and Auto tuning
- Experiments configurable through Patch board
- Facility to introduce external controller
- Inbuilt Plunger pump with VFD
- Rotary Compressor to support Pneumatic lines.
- Study of I/P, DPT, control valve, valve positioner
- Study of Rota meter, Orifice meter,
- Temperature, Flow, Level and Pressure control
- On-off, P, PI, PID control
- System is Floor mounted, on wheels.
- Dimensions: W: 1050 mm, Ht: 2100 mm, D:860 /650 mm.

BASIC HYDURALICS TRAINER

ELECTRO HYDURALICS TRAINER

FEATURES FOR HYDRAULICS TRAINERS
- Hydraulic control of double acting cylinder by 4/3 DCV.
- Speed control of Hydraulic cylinder using FCV.
- Meter In & Meter Out circuit.
- Circuit design for automatic reciprocation of double acting cylinder.
- Systems are Floor mounted.
- Systems work with 3 Phase AC,440V AC.

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23

BASIC PNEUMATICS TRAINER Model – PT1

Front view

Side view

Compressor

FEATURES:

MANIFOLD: 6 Ports

- **AIR COMPRESSOR:** Max. Pressure : 8 - 10 bar. Power: 1 HP.

- Filter Regulator Lubricator

- **CYLINDERS:** Double Acting Cylinder (Magnetic)

- Single Acting Cylinder: Working Pressure -0.5-10 Bar Foot-mounted, fixed permanently on working panel.

- **VALVES:**
  5/2 solenoid valve (Double)
  5/2 Solenoid Valve (single)
  5/2 Push Pull Operated Valve with Detent
  5/2 Hand Lever Detent Valve
  3/2 Roller Lever/ Spring Return Valve
  3/2 Roller Lever Valve
  Single Solenoid Valve
  Operating Voltage

  FLOW CONTROL VALVE
  5/2 Single External Pilot Operated Valve
  5/2 Double External Pilot Operated Valve
  In-Line slide Valve:
  PU Tubes - (8mm ID X 10mm OD): Connectors

- Weight :100kg (Approx)

- Power Supply : 230 VAC

- Operating Voltage : 24 VDC

PLC TRAINER: MODEL PLC U

FEATURES :

Power supply	24VDC
Ladder code memory	24K OR 36 K
Bits/coils	256
Integers/Registers	256
Timers	64
Database	1024 Integers (Indirect access)
Serial communication port	RS232
Display Size	Two lines x 16 Characters
HMI Displays	Upto 80 user designed
Screen Type	STN, LCD Display
Screen Illumination	led Yellow green backlight
Keyboard	15 keys
I/O options	On-board I/Os (according to model)
I/O Expansion Modules.	
Dimension	82cms x 19cms x 48cms 230 VAC/50 Hz

OUTPUT DEVICES
Power
- 1 DC Motor of +12V Supply
- 1 No of DC Servo Motor
- AC BULB (10 WATT)

FLOW CONTROL TRAINER

FEATURES:
- System works on 230V AC.
- "Honeywell" make PID is used.
- System controls ON-OFF through PID.
- Pre set levels can be Auto tuned.
- Interfacing Hardware and Software with USB to study SCADA operations.
- MODBUS communication.
- Multi drop and point to point Communication.
- Server-Client communication.
- Centrifugal pump of 0.75 HP is used.
- System is Floor mounted, on wheels.
- Dimensions: W: 800 mm, Ht: 1400 mm, D: 650 / 350 mm.

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24

LAB Electronics

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PLEASE CONTACT US

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