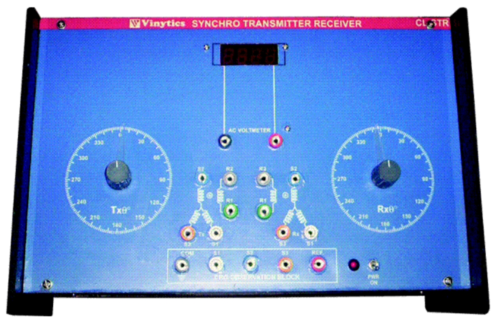
our complete Control System Laboratory Trainers as listed below:

CL-STR

SYNCHRO TRANSMITTER / RECEIVER TRAINER



DESCRIPTION

A synchro is an electromagnetic transducer commonly used to convert an angular position of a shaft into an electric signal.

The basic synchro is usually called a synchro transmitter. Its construction is similar to that of a three phase alternator. The stator (stationary member) is of laminated silicon steel and is slotted to accommodate a balanced three phase winding which is usually of concentric coil type (three identical coils are placed in the stator with their axis 120 degrees apart) and is Y connected. The rotor is a dumb bell construction and wound with a concentric coil.

The system set up is made up of synchro transmitter and synchro receiver on a single rigid base provided with suitable switches and anodised angular plates. The system also contains a step down transformer for providing excitation to the rotors. Suitable test points for rotor (R1 and R2) and stator (S1, S2 and S3) for both Tx and Rx are provided.

TECHNICAL SPECIFICATIONS

Study of input/output angular displacement.

- Pointers on transmitter and receiver.
- Rotor R1, R2 & R3 Stator S1, S2 & S3 on panel.
- Built in isolated power supply.
- 220V ±10%, 50Hz mains operated.
- Attenuated output for signal observation on CRO.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

Study of Starter voltage of the rotor angle, the space variations of the three voltages V12, V23 & V31 due to rotation of resultant magnetization in the starter for the error detection process.

- Plotting the error voltage as a function of the rotor angle with the receiver rotor for observing the 180° of phase reversal around the zero error.
- Error study of the transmitter and receiver pair as a simple open loop position control at a very low torque.

PRODUCT SELECTION GUIDE

Specifications are subject to change without notice due to our constant efforts for improvement.

CL-PID

PID CONTROLLER TRAINER

DESCRIPTION

This set up is designed to study performance of analog PID Controller with simulated process. The board has built in signal source, building blocks for simulated process and PID Controller with built in regulated dc supply to operate the system.

The PID Controller has three adjustable parameters, as P, I, D each has 10 turn potentiometers with dial knobs which are subdivided for .02 resolution. Three sockets are provided to add or out any of desired control P, I or D. at input of PID controller an adder is provided which sums the reference and feedback signals. The input and output of PID control has no phase shift.

TECHNICAL SPECIFICATIONS

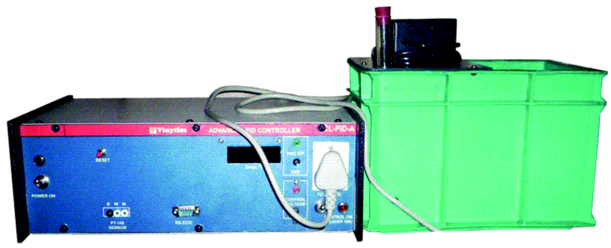
- Study of an simulated PID controller.
- PID Controller (configurable as P, PI, PD and PID).
- Proportional band : 1% to 50%.   Gain : 0-20.
- Integral time : 10 mS - 100 mS.
- Derivative time : 2-20 mS.
- Signal sources :
- Square wave : 0-2Vpp at 10-40 Hz variable (typical).
- Built in IC regulated power supplies.
- 3½ digit DVM.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of open loop response of various process.
- Study of close loop response.
- P, PI & PID design and performance evaluation in each case.

CL-PID-A

ADVANCED PID CONTROLLER TRAINER WITH µC



DESCRIPTION

The tank contains PT-100, a thermocouple whose resistance varies as the temperature varies and there by varying the output voltage. This analog variation is sensed by the thermocouple sensor and gives a corresponding, amplified output to the ADC. Tank also contains a stirrer, to keep the temperature of water uniform. Analog to Digital Converter converts the analog signal from thermocouple and displays the temperature Digitally on the display. Micro controller Circuit fetches the digital signal from the ADC, when capture code "#01M" is provided by the software (XTALK). The input format for acquiring the data from ADC to the micro controller is provided by the software from computer through serial cable "Rs232". DAC accepts the input data format as "#02XBBB". This "BBB" is the 12 bit data for controlling the DAC output voltage provided by the computer through micro controller. The DAC output voltage (DC) controls the output voltage (AC) of the TRIAC control circuit. The AC output voltage of the TRIAC controls the heating elements. This heating is sensed by the PT-100 & gives the analog signal to the thermocouple sensor and thus forms a close loop circuit.

TECHNICAL SPECIFICATIONS

- 89C51/8031 based PID Demonstrator with sensor & PT-100.
- Heating source with PWM control.
- Water tank with stirrer.
- Temperature controller with facility to set Kp, Ki, Kd.
- 14 bit A/D for monitoring.
- 12 bit D/A for control.
- On line acquiring & display of graph.
- In-built Power Supply.
- RS-232C interface to be connected to computer.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Simulation of all process control through PC
- Study of Close loop response
- Study of P, PI & PID in different gain combination in each process.

PRODUCT SELECTION GUIDE

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CL-LSS

LINEAR SYSTEM SIMULATOR

DESCRIPTION

The set up has been designed to provide a convenient means of studying the transient response of linear systems. Special attention has been given at every stage to make the systems operationally simple an straightforward. Instead of bothering the students with system configuration, disturbance points etc. Block diagram approach has been employed as a standard technique depicting the features available to the user. A description of the various subsystems is presented next, an understanding of which is necessary for both conducting the routine and designing more advanced ones.

TECHNICAL SPECIFICATIONS

- To Study of simulated linear systems.
- Simulated blocks first, second and third order systems.
- Disturbance adding facility at input and output.
- Signal Sources :
- Square wave : 20-80 Hz, 0-2 V(p-p) continuously variable.
- Triangular wave : 20-80 Hz, 0-2 V(p-p) continuously variable.
- Integrated Triangular wave fixed amplitude.
- Built in IC regulated power supply.
- 220V ±10%, 50Hz mains operated.
- User's manual and patch cords.

LIST OF EXPERIMENTS

- Study state errors for close loop through triangular wave input.
- Response of the third order system.
- Open & close loop response of first order type - 0 for various gain.
- Open & close loop response of second order type - 0 type - 1 system.

CL-PED

POTENTIOMETRIC ERROR DETECTOR TRAINER

DESCRIPTION

Measurement of the output variable and its comparison with the command or reference input is a fundamental task to be performed in any feedback control system. In a position control system this is usually achieved by a pair of potentiometers (DC system) or a synchro transmitter-control transformer set (AC system). The present until allows students to study the performance of an angular position error detector using high quality servo-potentiometers. In addition, facilities have been provided for AC studies as well.

TECHNICAL SPECIFICATIONS

- To study of potentiometer as an error detector.
- Two Full 360° rotation servo-potentiometers with 1° degree resolution.
- IC regulated DC excitation for both potentiometers.
- AC excitation at 400 Hz approx.
- Built in demodulator circuit.
- 3½ digit DVM for carrying measurements.
- IC regulated power supply for rest of the circuitry.
- 220V ±10%, 50Hz mains operated.
- User's manual and patch cords.

LIST OF EXPERIMENTS

- Study of Error Detection linearity
- Use of AC supply for Error Detection.
- Error Detection Gain Measurement.

PRODUCT SELECTION GUIDE

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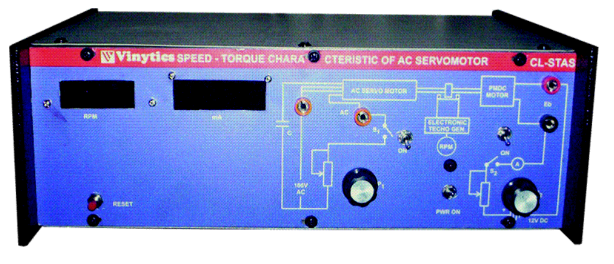
PRODUCT SELECTION GUIDE

CL-STAS

SPEED TORQUE CHARACTERISTICS OF AC SERVOMOTOR TRAINER



DESCRIPTION

The devices used in electrical control system are AC and DC servomotors AC servomotor has best suit for low power control applications. It is rugged light weighted and has no brush contacts as in case of DC servomotors. The important parameter of AC servomotor is its speed - torque characteristics. This set up is made to study of such AC servomotor characteristics.

TECHNICAL SPECIFICATIONS

- Two phase AC Servo Motor
- Electronic speed sensor with RPM display.
- Ammeter for load current.
- DC Motor for loading.
- Torque calculation from back emf.
- Speed controller for motor.
- Isolated supply for motor.
- IC regulated power supply for complete circuitry.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of Transfer Function.
- Study of Torque Characteristics.
- Time Constant of Servo Motor.

CL-STDC

SPEED TORQUE CHARACTERISTICS OF DC SERVOMOTOR TRAINER

DESCRIPTION

The devices used in electrical control system are AC and DC servomotors. DC servomotor has been the prime element most widely used in control applications. In position control the DC servomotor is of the highest choice to simple control circuitry. These motors suffers from wear and tear because of brush and commutator. The DC motor can be controlled by either field flux or by armature control. But variable flux motor suffer from costlier current source for armature and slightly poor control of field flux due to magnetization saturation for low speed application.

TECHNICAL SPECIFICATIONS

- Shunt wound DC Servomotor.
- Separate DC supplies for field and armature.
- 2 nos. o f Digital volt meter
- 2 nos. of Digital Current meter
- Digital RPM meter.
- Belt & pulley loading for torque measurement.
- Two spring balance.
- 220 V ac line operation.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of the torque characteristics
- Study of the loading effect
- Study of the balance measurement for torque.

CL-STAS-TC

STUDY OF AC SERVO MOTOR WITH TIME CONSTANT

TECHNICAL SPECIFICATIONS

- Two phase AC Servo Motor
- Small generator for loading
- Four Digit Speed Display
- 3 digit time constant display
- 3 ½ digit r.m.s. Voltmeter
- 3 ½ digit d.c. Panel meter
- Voltage regulated internal supplies
- IC regulated power supply for complete circuitry.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of Transfer Function.
- Study of Time Constant
- Inertia and friction parameters

CL-STDC-TC

STUDY OF DC SERVO MOTOR WITH TIME CONSTANT

TECHNICAL SPECIFICATIONS

- Study of a 12V, 8W DC motor
- Small generator (2W) for speed pick up and loading
- 4-digit speed display
- 3-digit time constant display
- 3 ½ digit voltmeter and current meter for DC measurement
- IC regulated power supply for complete circuitry.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of characteristics of torque speed
- Back e.m.f. Constant
- Mechanical time constant
- Transfer function of motor and the generator
- Evaluation of Inertia and friction parameter

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CL-DCM

DC MOTOR POSITION CONTROL SYSTEM TRAINER

DESCRIPTION

This set up is designed to study of dc motor position control system called servomechanism and comes first in automatic control systems. The prime advantage of this set up is near perfection to the simulated systems. The set up comprises two parts the Motor Unit and the Control Unit. The Motor Unit consists a permanent magnet armature controlled geared servo motor. A small DC motor is driven by the servo motor to generate the speed proportional voltage which are used as tacho output for velocity feedback. A miniature toggle switch is provided at rear side of the motor unit to change the polarity of these tacho voltages. The Control Unit has reference servo potentiometer, voltage source, error detector, amplifier, motor drive circuit, a RAM card and necessary regulated supplies for the circuits.

TECHNICAL SPECIFICATIONS

- Study of DC motor position.
- Position control of a 12 volt/1 Amp DC geared PM motor.
- RPM 50/60Hz
- Calibrated dials with 1 degree resolution for reference and output position.
- Two 360° Servo-potentiometers.
- Built in step signal.
- Built in waveform capture/display card for study dynamics.
- 3½ DVM.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of error variation with forward gain.
- Effect of error variation on the speed of motor.
- Determination of motor transfer function and tech meter characteristics.
- Study of Time Constant variation with forward gain.

CL-ACM

AC MOTOR POSITION CONTROL SYSTEM TRAINER

DESCRIPTION

This set up is designed to study of AC motor position control system. The set up comprises two parts :

A. The Motor Unit : It consists a two phase AC servomotor. It has Operating Voltage : 120V AC, maximum current 0.15Amp. Rated Shaft Speed : 2400rmp, Torque : 0.085×10^{-2}Kg/m. The motor drives a potentiometric load through gear train. The gear ratio is 1:40 and the load shaft rotation is 60rpm . The angular displacement is sensed by a 360° servo potentiometer. A graduated disc is mounted upon the potentiometer to indicates angular position with 1° resolution.

B. The Control Unit : It consists power supply, servo amplifier, error detector and command potentiometer. There is facility given to record the transient period of position control system under step signal.

TECHNICAL SPECIFICATIONS

- Study of AC motor position.
- Two precision servo-potentiometers at full 360° rotation.
- Calibrated dials with 1° resolution for command and output position.
- Thyristorized motor controller circuit.
- 110 volt two phase AC servo motor (60 RPM synchronous).
- Built in waveform capture/display card for study dynamics.
- Isolated supplies for motor, control circuit and capture/display card.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of AC Motor Position
- Study of error detection characteristics
- Step response study
- Amplifier gain measurement.

PRODUCT SELECTION GUIDE

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CL-CDS

COMPENSATION DESIGN SYSTEM TRAINER

DESCRIPTION

Compensation network are oftenly used to made appreciable improvement in transient response and small change in steady state accuracy. This set up has facilitate to study and design implementation of such networks. Three of such networks are given in the set up and performance of other designed networks can be implemented using few passive components.

The experimental work is divided in two parts :

1. (a - e) the open loop response and
2. (A - B) the close loop response.

In open loop response in first step the magnitude / frequency and phase / frequency plots are performed. A dual trace CRO is essential for experimental steps (optional phase angle meter).

TECHNICAL SPECIFICATIONS

- Study of lag, lead and lag-lead.
- Second order simulated systems.
- Study of All pass filter.
- Lag, lead and lag - lead compensating circuits.
- Gain compensating amplifier with calibrated dial.
- Signal sources :
- Sine wave : Variable in two decades 10 - 1000Hz.
- Square wave 40Hz 1V (p-p)
- Digital phase angle meter 0-180° (optional).
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of Lag function in the frequency domain.
- Study of Lead function in the frequency domain.
- Study of Lag - Lead in the s-plane.

CL-TSS

TEMPERATURE SYSTEM SIMULATOR

DESCRIPTION

This set up is designed to study performance of analog PID controller with model process as temperature control system. The set up has built in signal source as reference, digital voltmeter as temperature indicator, PID controller with separate controls and a model process with built in regulated DC supply to operate the system.

The controller parameters are controlled by PID controls in which I control can be out of circuit by mean 'I ON' control switch. The D control is made out by mean of keeping D control to minimum or fully counter - clockwise direction. The set point temperature is adjusted by 'SET POINT' control while the reference temperature is read by digital display keeping TEMP switch to set point direction. The heater may be cut-off regardless of any setting by mean of 'HEATER ON' switch. A fan is included in the oven which is used to bring temperature below when the heater is off. The similar one is used to add disturbance when the set up is running under PID control mode.

TECHNICAL SPECIFICATIONS

- Temperature controller with facilities for P,I,D and relay control blocks.
- Operating temperature : Ambient to 90°C.
- Separate control for P,I,D channel gains.
- Two settings for relay thysteresis.
- Fast 25W oven fitted with IC temperature sensor.
- Digital display of set and measured temperature on a 3½ DVM.
- Buffered output for recorder.
- IC regulated power supplies.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Identification of Oven Parameter
- Study of P, PI PID control
- Study of ON/OFF control

PRODUCT SELECTION GUIDE

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CL-DCS

DIGITAL CONTROL SYSTEM TRAINER

DESCRIPTION

Classical control theory dealing with analog compensation networks, PID controller and tachogenerator feedback invariably finds a place in engineering curriculum. These are also the most common systems in use today. On the other extreme, highly complex and sophisticated computer controlled systems employing optimum, adaptive and learning algorithms find application in guided missiles, space vehicles and the like. With the availability of low cost computing power in form of 8- and 16-bit microprocessors and Digital Signal Processor (DSP) chips, it has become possible to take advantage of digital control even for relatively simple application.

TECHNICAL SPECIFICATIONS

- Second order simulated process (analog process).
- Built-in D/A and A/D circuits (8-bit).
- 8085 based μp kit as digital controller with user software in 8K EPROM.
- 16-bit arithmetic for algorithmic calculations.
- 16 built-in levels of P, I and D gains each. Complete flexibility for the user to develop own software.
- Square wave test input (internal).
- Built in IC regulated power supplies.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of P, PI, PID Controller
- Study of Sampling Period variation.
- Identification of controlled process.

CL-DCSC

DC SPEED CONTROL SYSTEM TRAINER

DESCRIPTION

Speed control is a very common requirement in many industrial applications such as rolling mills, spinning mills, paper factories etc. The present unit is low power dc motor speed control system designed as a laboratory experiment. The various components and subsystems have been carefully integrated, and the experiments are designed to illustrate the important performance characteristics in a simple way.

TECHNICAL SPECIFICATIONS

- Study of speed control of DC motor in open and close loops.
- Speed control of 12V, 4W, permanent magnet DC motor.
- Speed range upto 3000 RPM (typical).
- Electronic techo-generator for feedback.
- Non-contact eddy current break for load.
- 4 digit RPM counter.
- 3½ digit DVM.
- Built in regulated power supply.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of loading effect on the speed of motor in open loop.
- Study of loading effect on the speed of motor in close loop.
- Study state error variation with forward gain.

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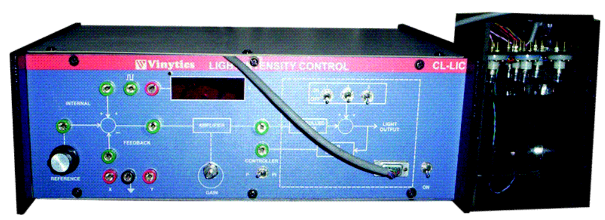
CL-LIC

LIGHT INTENSITY CONTROL SYSTEM TRAINER



DESCRIPTION

It is very common requirement in many industrial applications for the study of the control of the liquid level of a tank . This system works in closed loop process to keep the level of the liquid to constant. Since in open loop we have to operate manually, hence this system functions perfectly in closed loop without any manual help. The present unit is low power level control as a laboratory experiment. The various components and subsystems have been carefully integrated and experiments are designed to illustrate the important performance characteristics in a simple way.

TECHNICAL SPECIFICATIONS

- Performance improvement through P-I control.
- Evaluation of dynamic behaviour.
- Seven lamps 6V/300mA.
- 5 Hz square wave and triangular wave for dynamic response study.
- Switch selectable PI-Controller.
- Built-in 3½ DVM.
- IC regulated power supplies.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of Light Intensity Control.
- Characteristics of Light Panel and Light Sensor Block.
- Study of Single loop feedback control.
- Evaluation of dynamic behaviour.

CL-SM

STEPPER MOTOR CONTROLLER WITH µP INTERFACE

DESCRIPTION

This experimental set up is designed to study of a small stepper motor fitted with calibrated dial and servo potentiometer in see through cabinet. The main unit has a motor controller, pulse sequence generator, variable frequency square wave oscillator, single step mono pulsar and wobbling signal to observe dynamic response. The unit can be interface with µP kit.

TECHNICAL SPECIFICATIONS

- TTL circuit for single stepping & free running mode frequency 10-100Hz.
- Wobble mode.
- Direction selector.
- LED indicators for phase sequence.
- **µP interface.**
- Calibrated dial for position monitoring.
- Position pick up by servo potentiometer.
- IC regulated power supply for complete circuitry.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

STEPPER MOTOR

- Power : 12V/1A
- Torque : 2.0/3.0 kg/cm
- Step Angle : 1.8 degree

LIST OF EXPERIMENTS

- Study of Speed & Direction, the pulse sequence for clock wise & anti-clockwise
- Study of Resonance effect at various speeds.
- Study of manual Stepping through the push button for convenience.
- Study of Wobble mode enables to calculate single stepping.

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CL-SP

MAGNETIC AMPLIFIER TRAINER (SERIES & PARALLEL)

DESCRIPTION

Amplification is the control of a larger output quantity by the variation of a smaller input quantity. Such amplification can be performed by saturable reactors connected either in series or in parallel.. This set up consists two such reactors, AC and DC power supply, two meters for load and control currents and a fixed value RL.

The set up to study the characteristics of series - parallel connected magnetic amplifier, has two identical gate and control windings wound upon split deltamax cores, which are placed together to form two saturable reactors. A compensation winding is wound between the gate windings and connected with control windings for proper phase correction. Sockets are given to connect the amplifier gate windings in series parallel mode, while control windings are joined together with compensation windings internally. A control bias battery in form of regulated DC 0-3Volt supply with a DC mA meter to read IC, and current limit resistance is provided to study control and saturation characteristics.The polarity of DC current applied to control winding may be changed with polarity selector. Two fixed value (20 and 100 OHM) RL are given to study the effect upon transfer characteristics, with stepped down fixed AC supply with an AC ammeter to read load current IL.

TECHNICAL SPECIFICATIONS

To study input-output characteristic of a magnetic amplifier.

- Two saturable reactors in one frame.
- Two Rectifiers.
- Fixed Resistive load.
- DC bias voltage.
- One potentiometer.
- Two digital meters.
- IC regulated power supply for complete circuitry.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of Feed back control characteristics.
- Study of Series feedback of amplifier
- Effect of Parallel feedback of amplifier.

CL-MAF

MAGNETIC AMPLIFIER TRAINER (POSITIVE & NEGATIVE)

DESCRIPTION

Amplification is the control of a larger output quantity by the variation of a smaller input quantity. Such amplification can be performed by a magnetic device called Magnetic Amplifier or Magamp. This set up is designed to study the basic characteristics of such amplifier with +Ve & –Ve feedback. The set up consists magnetic amplifier, AC and DC power supply, two meters for load and control currents and a fixed value RL.

The set up to study the characteristics of magnetic amplifier, has two identical gate windings wound upon split deltamax cores, which are joined together to form a common central limb. The DC control winding is wound upon this central limb with the amplifier feedback winding in / out mode. A control bias battery in form or regulated DC 0-3 volt supply with a DC mA meter to read IC, and current limit resistance is provided to study control winding may be changed with polarity selector. A fixed value (50 ohm) RL with stepped down fixed AC supply, with a dc ammeter to read load current IL, is provided with gate winding.

TECHNICAL SPECIFICATIONS

To study input-output characteristic of a magnetic amplifier.

- Two saturable reactors in one frame.
- Two Rectifiers.
- Fixed Resistive load.
- DC bias voltage.
- One potentiometer.
- Two digital meters.
- IC regulated power supply for complete circuitry.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

Study of Feed back control characteristics.

- Study of Positive feedback of amplifier
- Effect of Negative feedback of amplifier.

PRODUCT SELECTION GUIDE

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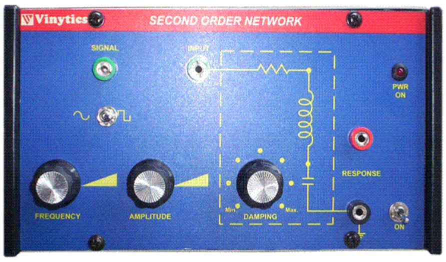
PRODUCT SELECTION GUIDE

CL-SONT

STUDY OF SECOND ORDER NETWORK



DESCRIPTION

A second order network is a network that I defined by a second order differential equation. A network comprising of a resistance, R, an inductance, L, and a capacitance, C, all in series is the simplest second order network. Other configurations of the above three elements may also lead to second order differential equations, however the present experiment is designed to study the series RLC network

TECHNICAL SPECIFICATIONS

- Active RLC network using OPAMPS
- Damping 1.1-0.1 (approx)
- Inbuilt Square wave 35-700Hz, 0-1V (typical)
- Inbuilt Sine wave 35-700Hz, 0-1V (typical)
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Compute approximate values of equivalent network parameters
- Observe and trace from the CRO screen the step response for different values of ζ
- Plot the frequency response for various of ζ and observe resonance

CL-RCS

RELAY CONTROL SYSTEM TRAINER

DESCRIPTION

The relay is basically an electromechanical device which comprises one or more set of contacts, open or closed by an electromagnet. The basic structure of relay is in form of coil.

The relays is an important primary control element in a control system which is being controlled by an electrical signal gives advantage of cost reduction. These system deliberately introduced as on –off control. This set up is designed to study of such relay control system characteristics. The set up has simulated relay with simulated process. There are three continuously variable controls. One is AMPLITUDE, meant to control the reference single amplitude. Another two controls are related with relay controller.

TECHNICAL SPECIFICATIONS

- Simulated electronic relay using high speed IC's.
- Simulated 2nd order linear plant.
- Facility for displaying x and x signals.
- Dead zone variable from 0-600mV app.
- Hysteresis variable from 0-500mV app.
- Built in signal sources :
- Sine wave : 0-1V (min.) variable amplitude.
- Square wave : 0-1V (min.) variable amplitude.
- IC regulated internal power supplies.
- 220V ±10%, 50Hz mains operated.
- User's Manual with patch cords.

LIST OF EXPERIMENTS

- Study of the relay characteristics and display of the same on CRO for different values of hysteresis and dead zones.
- Study of the effect of hysteresis on system stability.
- Phase plane analysis of relay control system for various values of Hysterisis and Dead Zones.

Specifications are subject to change without notice due to our constant efforts for improvement.

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