KCL - 13
DC POSITION CONTROL TRAINER

DC position control system is very use full in Controls System Laboratory . This system is easily understood and has a second order transfer function in the standard form, for which a well developed theoretical treatment is available.

This unit provides the students an opportunity to study and operate a practical electromechanical angular-position-control system. The system is built around a good quality permanent magnet armature-controlled DC motor, speed reduction gear-set, potentiometric error detector using special 360° revolution servo potentiometers, a tacho-generator for velocity feedback and associated electronic circuits.

A difficulty which is faced while working with many practical control systems is that their responses are rather slow (Note that in a simulated system the common practice is to scale-up the frequency to ensure a proper viewing on a CRO). The present unit has a built-in microprocessor based waveform capture/display system which stores the step response of the control system in a RAM and then displays it on a measuring CRO for further studies. This arrangement is extremely simple to operate and conforms to the accuracy needs of a class room experiment.

The motor unit is housed in a separate cabinet with transparent panels for easy viewing. Interconnection with the main unit is through a standard 9-pin D-type connector. All power supplies and step input signal are internally provided. In addition a 3½ digit DVM is available on the panel for the measurement of various signals. A good quality measuring CRO is the only accessory that would be required.

Features

- Position control of a 12V, 1A d.c. gear motor (50rpm)
- Provision for positive and negative tacho-generator feedback.
- Tacho constant: 2V/ 1000 rpm approximately.
- Calibrated dials for reference and output position: resolution 1°
- µP based waveform capture card.
- Literature and patch cords included.
- Built-in 3 ½ digit DVM for signal measurements.
- Built-in step signal and IC regulated power supplies for electronic circuit.
- Servo-potentiometer with full 360^{0} rotation.
- Separate unit for motor in a see-through cabinet.
- **Interconnections**
- - All interconnections are made using 2mm banana Patch cords.
- Test points are provided to analyze signals at various points.
- All ICS are mounted on IC Sockets.
- Bare board Tested Glass Epoxy SMOBC PCB is used.
- In-Built Power Supply with Power ON indication
- Attractive ABS Plastic enclosures.
- Set of 2mm Patch cords for interconnections
- User's Manual.

List of Experiments:

- Operation of the position control system for different value of the forward gain angular position commands.
- Step response studies for various value of forward gain.
- Study of the effect of velocity feedback on the transient and steady state performance of the system as well as its stability.

Note : Specifications can be altered without notice in our constant efforts for improvement.

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