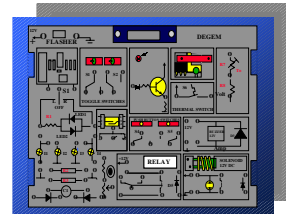


EB-102 DC CIRCUITS II



The EB-102 is a single board comprehensive instructional module designed to teach advanced concepts of DC CIRCUITS to technology students. The module can be operated as a stand-alone unit or integrated to the newly developed EB-2000 Computer Managed Laboratory. Manual or computer driver faultfinding exercises and testing are available when the module is interconnected to the EB-2000 system, providing valuable experience in the training and diagnosis of faults. Test equipment, when used, attaches to the board via 2mm jacks, placed at various points around the circuits. Students are required to do only a minimal amount of wiring so training time is maximised.

A comprehensive student manual is provided with each training module. The EB-102 module is designed so that students will spend the maximum time on the experiments and practice drills for testing comprehension and troubleshooting. The student has only to plug-in the appropriate patching cords, and shorting plugs in order to perform the recommended experiments. The boards comes also equipped with "black boxes" containing components used in the fault-finding and practice modes, components which should not be visually identified by the trainee.

OBJECTIVES

- Determine T (Thevenin) from measurements taken with a voltmeter.
- Determine Thevenin from measurements taken with an ohmmeter.
- Connect Thevenin's equivalent circuit.
- Test the original circuit and Thevenin if they provide the same current and voltage to various loads.
- Connect a potentiometer as a voltage divider.
- Measure the no-load and loaded output voltage of a potentiometer connected as a voltage divider.
- Plot a graph that shows the relationship between the rotation of the wiper arm and the output voltage.
- Calculate the output voltage applied to an electrical load by multiple voltage sources by Millman's theorem.
- Verify Millman's theorem by measurements in a circuit.
- Determine the internal resistance of voltage sources from measurements.
- Determine the voltage regulation of a voltage source.
- Compare voltage sources and determine the best quality by using the voltage regulation.
- Determine the power from measured values of voltage and current.
- Plot graphs of output voltage, current and power in the vertical axis and resistance on the horizontal axis.
- Determine the resistance relationship that produced maximum power from measurements and graphs.
- Using the colour code values of the resistors, convert the WYE circuit to DELTA circuit
- Using the code values of the resistors convert the DELTA circuit to WYE
- Measure the resistance of equivalent WYE and DELTA circuits.
- Identify components and test points in a complete circuit.
- Measure key voltages in an operating electrical circuit.
- Locate faulty components

RECOMMENDED EXPERIMENTS

1. Thevenin's Theorem
2. Potentiometer
3. Millman's Theorem
4. Superposition Theorem
5. Voltage Source
6. Maximum Power Transfer
7. WYS-DELTA and DELTA-WYE Conversions
8. Troubleshooting direct current circuits