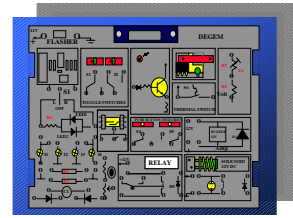


# EB-101 DC CIRCUITS I



The EB-101 is a single board, comprehensive instructional module designed to teach basic 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. The module contains experimental circuits with which the student performs a number of conceptual experiments at various levels of difficulty. 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-101 module is designed so that students will spend the maximum time on the experiments and practice drills for testing comprehension and troubleshooting. The module also ensures that students use their time more efficiently. The Printed Circuit Boards are pre-wired so that set-up time is minimal.

To facilitate the exercises, all the major signals are brought out on-board with 2mm jacks for tests and interconnections. The IC's and the transistors are mounted on sockets, enabling an easy replacement. The student has only to plug-in the appropriate patching cords and shorting plugs in order to perform the recommended experiments. The boards come 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

- Use the VOM as a voltmeter to measure voltages in operating circuits.
- Use the VOM as an ammeter to measure the current in an operating circuit.
- Use the VOM as an ohmmeter to measure resistor values.
- Predict the direction of the current from the voltage polarity obtained with the VOM
- Use the colour code to determine the value of resistors
- Use the ohmmeter to measure resistors
- Determine if the resistors measured are within the colour coded tolerances.
- Prove Ohm's law by experimental procedure
- Determine the value of resistors from measured values of current and voltage
- Determine the value of the current in a circuit from the resistor value obtained from the colour code and the measured voltage.
- Determine the voltage in a circuit from the resistor value obtained from the color code and the current measured with the ammeter in the VOM.
- Determine the power in a resistor from measured values of current and voltage
- Use the ohmmeter in the VOM to measure resistors connected in series.
- Measure voltage drops across resistors connected in series.
- Locate faults such as open and shorted resistors in series circuits.
- Use the VOM to measure the voltage drops in series circuits.
- Demonstrate that Kirchoff's voltage law is true for series circuits.
- Determine the voltages, currents and resistance of an operating circuit.
- Test the various voltages in a circuit and locate the faulty component.
- Calculate the equivalent resistance of series-parallel circuits.
- Use the ohmmeter in the VOM to measure the equivalent resistance of series-parallel circuits.
- Calculate the conductance in parallel circuits.
- Calculate the current using the current divider principle.
- Measure the current in parallel circuits and verify the current divider principle.
- Measure currents in parallel circuits.

- Use measured values of circuit in parallel circuit to verify Kirchoff's current law.
- Connect resistors in a number of parallel circuits
- Use the ohmmeter in your VOM to measure different parallel circuits.
- Calculate voltage values by voltage