



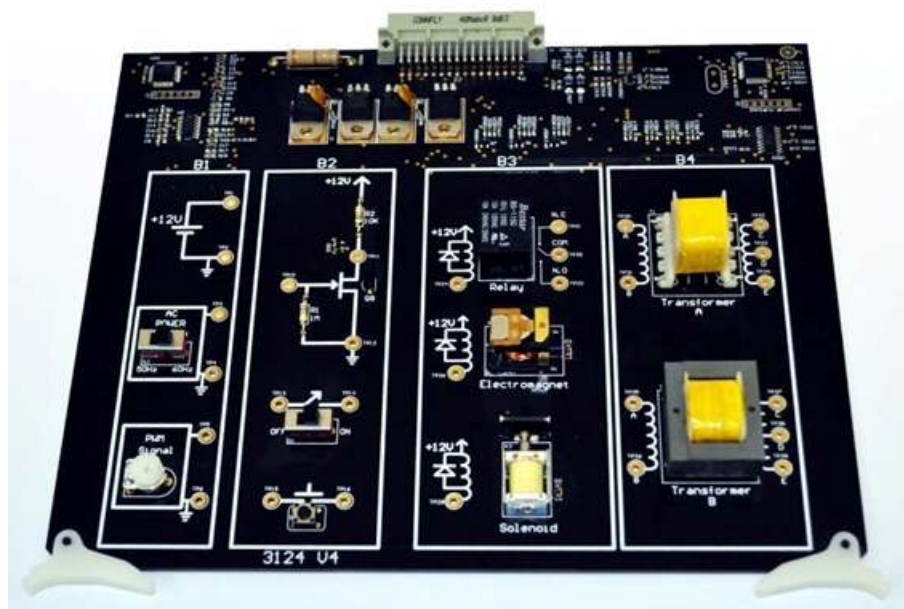
**DEGEM®  
SYSTEMS**

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# EB-3000

## EB-3124

### Magnetism and Induction



The EB-3124 Magnetism and Induction board is a comprehensive instructional module designed to teach the fundamental concepts of magnetism, electromagnets and transformers to students in high schools, technical schools and colleges.

The module contains various practical circuits with which the student can perform a number of meaningful experiments, which help reinforce the student's comprehension of the related concepts. The individual circuits and the required test equipment can be quickly wired by using the provided patch cords to connect the relevant 2-mm jacks. Students perform a minimal amount of wiring, thereby reducing the setup time and the possibility of a wiring error while increasing the time available for training. Manually inserted faults modify the circuits under test to provide valuable true-to-life troubleshooting exercises, which develop diagnostic skills.

A comprehensive student experiment manual provides essential theory and clearly details the experiment procedure. Optional courseware enhances the learning procedure testing the student's level of competence after reviewing the theory and then evaluates all answers to questions to test the student's level of achievement at the end of each experiment. The student may learn in the standalone mode or under CML (Computer Managed Laboratory), which allows the instructor to monitor student and class progress and records pertinent records in a database for future retrieval.

Base unit

DC circuits I

DC circuits II

AC circuits

Magnetism and induction

Diodes, zeners and transistors

Bipolar and FET transistor amplifiers

Industrial semiconductors

Optoelectronic semiconductors

Electrical control circuits

Operational amplifiers I

Operational amplifiers II

Power amplifiers

Power supplies

Oscillators & tuned amplifiers

Motor and generator control

Motor speed control

AC/DC and DC/AC conversion

3-phase motor control

Sensors & actuators

Automotive charging & ignition

Logic components

Demultiplexers, decoders & adders

Sequential logic

555, ADC & DAC circuits

Logic families

CAN-BUS systems

Introduction to microcontrollers

Programmable logic device

## Description

The EB-3124 printed circuit board is designed to minimize circuit wiring time when setting up experiments. The board dimensions are 220 x 180 mm is powered by the EB-3000 base unit. The board plugs into the EB-3000 base unit via a 48-pin industrial connector.

All components are mounted on the printed circuit board and the schematic diagrams of all circuits are silk-screened to help the student identify components and system operation. The printed circuit board is solder masked for long life. The components mounted on the board are protected with a plastic cover that is permanently mounted on the EB-3000 base unit.

All major signals can be accessed from the 2-mm jacks to simplify connections within the circuit and to test equipment. All integrated circuits and transistors are mounted on sockets. The printed circuit board can be stored in the supplied plastic binder for convenient storage.

## Experiments covered

### ▪ Essential theory:

- ✦ Magnet construction
- ✦ Magnetic fields
- ✦ Electricity and magnetism
- ✦ Self and mutual induction
- ✦ Magnetic penetrability
- ✦ Magnetic hysteresis
- ✦ Electromagnet
- ✦ Relay
- ✦ Solenoid
- ✦ Pulse width modulation

### ▪ Electromagnetic devices:

- ✦ Practical electromagnet
- ✦ Real solenoid
- ✦ Relay

### ▪ Transformer:

- ✦ Lenz's Law
- ✦ Transformer construction
- ✦ Turns ratio
- ✦ Center tap winding
- ✦ Determine voltage ratio
- ✦ High pass RL filter

### ▪ Troubleshooting:

- ✦ 8 different fault-finding exercises

## Required Accessories

- EB-3000 workstation with built-in digital multimeter, oscilloscope and patch cords

## Optional

- Personal computer with MS-Windows

## Instructional Materials

The experiment manual was written by pedagogical experts who train technicians in electronics technology. The student manual contains essential theory and a detailed procedure for each experiment and is available in hardcopy or electronic book formats.



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