

Feature:

- **Magnetic Principles**
 - o The properties of a magnetic field and electro-magnetism
 - Construction and operation of a solenoid
 - o Applications of electro-magnets

- **Transformers**

- o Introduction to mutually coupled coils
- Transformer action and turns ratio
- Step-up and step-down configurations
- Factors that affect transformer efficiency
- Eddy currents and hysteresis
- o Impedance transformations using a transformer
- BH loops and their relevance

- **Magnetic Components**

- o Electro-magnetic relays, different types and configurations
- Principles of operation of a relay
- o Latching and non-latching modes
- Operation and applications of reed relays
- Principles of the Hall effect device

- **Motors and Generators**

- o Motor construction
- o Rotor, stator and the principle of commutation
- DC drive to a motor and directional control
- The principle of electrical generation
- Loading of electrical generator
- o Electrical efficiency of a generator

Model: MGT61

Basic Electronics Series — 12-303 Magnetic

Model: MGT61

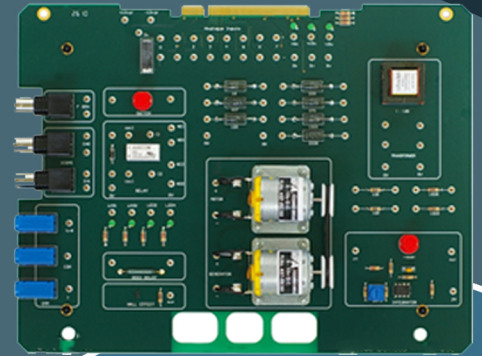
Introduction

With over 50 years of experience in the design, manufacture and supply of high quality educational products, Feedback's 12-300 series of innovative workboards and Discovery software set new standards in the teaching of basic electronics.

The 12-303 board teaches how electro-magnetic components work and what their applications are. This follows on from the fundamentals introduced in the electromagnetic induction section on board 12-301. The board enables students to learn by hands-on and using pre-constructed circuit elements that may be connected in different ways to perform a series of assignments.

Teaching material and pc based instrumentation are delivered by Feedback's own Discovery software, which teaches the student the necessary theory in order to complete the practical experiments. On-screen instructions guide the student through the set-up of the boards and the use of the on-screen instrumentation enables students to observe parameters in real time and to record their results. There is the potential to edit assignments or create completely new teaching material.

Discovery software provides a flexible and versatile learning environment where students can use the available resources in ways that are most suitable for them.



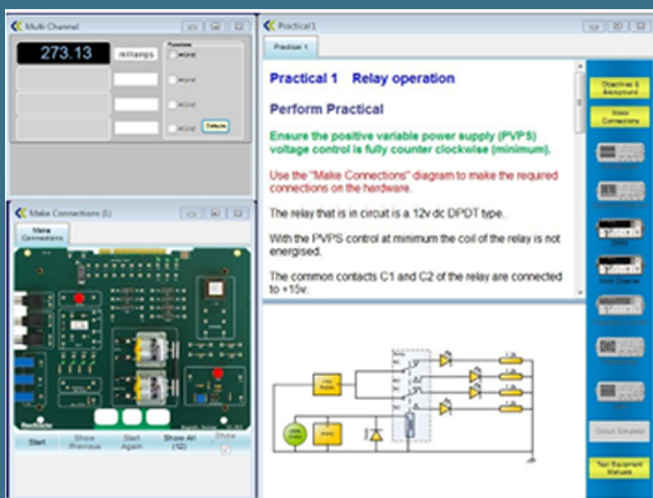
Magnetic Devices

The principles of operation of the most common electro-magnetic components are covered by taking a hands-on approach and the student is then able to perform practical tests using Discovery software.

Transformers are covered in detail, with practical experiments relating to the efficiency, phase shift and turns ratio. The use of the transformer to convert the impedance of a load is also demonstrated.

The concept of DC motors and generators are demonstrated by an experiment designed to see the effect on the generating motor has on the driving motor. The student also learns how to calculate the efficiency of a generator by measuring the power in and power out.

The student is able to refer to the "Concepts" section of the Discovery software to reinforce their understanding of the fundamentals of the subject before conducting the practical experiments.



Screen showing the Feedback interactive Discovery software, enabling the student to learn the principles of the subject and then implement practical experiments using on-screen instruments.

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