

Basic Electronics Series — 12-301 D.C. & A.C. Basics

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 ESPIAL software set new standards in the teaching of basic electronics.

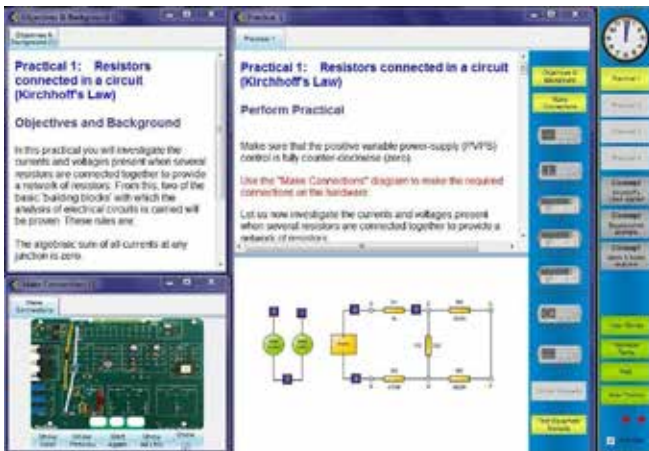
The 12-301 board provides an introduction to electronics and electrical principles using pre-constructed circuit elements that may be connected in different ways to perform a series of assignments. The board connects to the NI ELVIS II/II+ console which provides power and signal acquisition.

Teaching material and pc based instrumentation are delivered by Feedback's own ESPIAL 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 on-screen instrumentation enables students to record their results. There is the potential to edit assignments or create completely new teaching material.

ESPIAL software provides a flexible and versatile learning environment where students can use the available resources in ways that are most suitable for them. This makes the 12-300 series suitable for a wide range of courses including degree foundation and vocational learning.

D.C. & A.C. Basics

Using Feedback's ESPIAL software, students are able to interact with this comprehensive workboard and the extensive courseware and reference material. The 12-301 covers the basics of electricity and electronics such that the student covers what electricity is and how it is generated. The essential properties of passive electronic components are explained and how they are identified. Application covered along with Norton's and Thevenin's theorems.



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



Introduction to Electronics

- What is Electronics?
- Common Electronic terms and principles
- Conductors and insulators

Resistance and Ohm's Law

- Resistor types, values, colour code identification
- Relationship between resistance, current and voltage
- Ohm's Law

Resistor Networks

- Series and parallel connection of resistors
- Application of Kirchoff's Law applied to resistors in a circuit
- Multiple voltage sources in a network
- The Superposition Theorem Thevenin's Theorem
- Norton's Theorem
- Star-Delta transformation

Capacitors

- Capacitor types, values, ratings and identification
- Advantages and disadvantages of different capacitor types
- The behaviour of a capacitor under d.c. conditions
- Series and parallel connection of capacitors
- Time constants

Power

- Power dissipated in resistor networks

Electromagnetic Induction

- Electromagnetic Induction in a transformer

Inductance

- Inductor types, values, ratings and identification
- The behaviour of an inductor under d.c. conditions
- Series and parallel connection of inductors
- Time constants

A.C. Signals

- The properties of ac waveforms
- Power producing properties of ac waveforms and the relationship to d.c. signals
- The relationship between voltage and current in an a.c. circuit with R, L and C components

