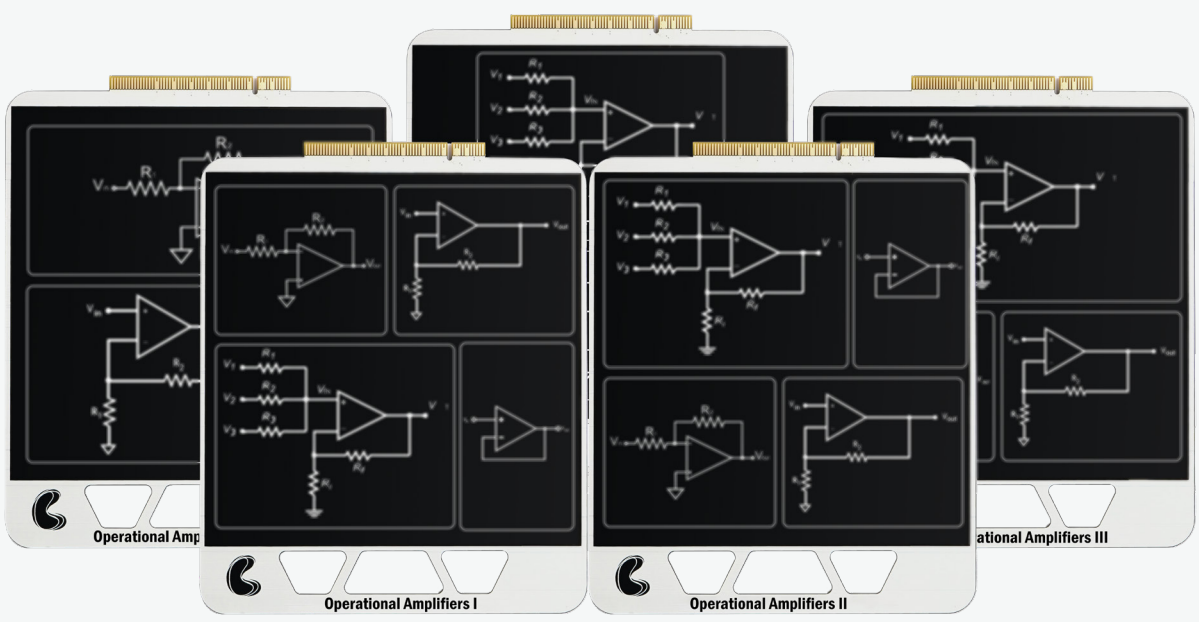
EC111

Operational-Amplifiers Experimental Cards

Overview

Explore the world of operational amplifiers with this set of 5 expertly crafted cards. Get the lowdown on key concepts like open-loop gain, input/output impedance, and bandwidth. Discover the secrets behind inverting, non-inverting, and differential configurations, while diving into real-world applications like amplifiers , filters and signal conditioning. Perfect for anyone eager to elevate their electronics game with op-amps mastery.



Specifications

- The experimental Cards include 5 different cards that are compatible with the Computer-Based Interface Unit.
- The cards contain a variety of opamp circuits that are used along AC/DC Signals
- Reinforce theory and techniques taught in the classroom through experiments and projects in the laboratory.
- Through the package ,the student can perform over 20 experiments using the package and verify the results of the experiments theoretically throughout the user manual.
- The cards are powered using a PCI socket directly from card holders for the convenience of powering up and to focus on learning about signals.

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Covered Topics

Operational Amplifiers I
Code:(EC111.01)

- Learning the operational amplifier's main characteristics: gain, input and output impedances, Slew rate, CMRR, offset, Bandwidth & frequency response.
- Constructing the classical linear configurations for the operational amplifiers such inverting , non-inverting amplifiers , voltage follower , summing and difference amplifier.
- Investigating of DC & AC response of inverting and non-inverting op-amp circuits.
- Analyzing and implementing cascaded opamps circuits and verifying the analyzed equations practically.

Operational Amplifiers II
Code:(EC111.02)

- Constructing an instrumentation amplifier based on the concept of cascaded opamps and understanding it's importance and its applications.
- Building a precision voltage source and current source using operational amplifiers.
- Set-up of a precision rectifier and examining rectified signals.

Operational Amplifiers III
Code:(EC111.03)

- Experimenting the classical non-linear operational amplifier circuits such as the opamp integrator and differentiator configurations.
- Discovering the opamp current to voltage converter, comparator & Schmitt trigger circuits.

Operational Amplifiers IV
Code:(EC111.04)

- Demonstrating two novel uses of op-amps: Negative Impedance Converters (NICs) and Generalized Impedance Converters (GICs).
- Experimenting how to convert a capacitor to inductor and vice versa, scale an impedance, and represent a negative resistance.

Operational Amplifiers V
Code:(EC111.05)

- Constructing Active First-order low pass, high pass active filters using operational amplifiers.
- Implementing band pass filters and band-stop through cascading LPF and HPF.
- Understanding how to display, analyze the frequency response of different filters and how to calculate every filter's cut off frequency.
- Comparing between the points of strength and weakness of the characteristics of active filters versus passive filters and therefore learning about the applications for which the active filters are designed.

Scope of Delivery

- Operational-Amplifiers Experimental Cards (EC111)
- Hard copy user manual

Options

- Digital content (BI01)

Required for Operation

- Card holder (MMS103) With Advanced Computer Interface Base Unit with Built-in Power Supply (MMS100)
- Card holder (MMS103) With Computer Interface Base Unit with Built-in Power Supply (MMS101)
- Bench Power Supply Unit (MMS102) (Customer to provide oscilloscope, function generator, multimeter)

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