

**Omega Type ETB-251** An Operational Amplifier, usually referred to as an 'Op-Amp' for brevity, Op-Amps are among the most widely used electronic devices today, being utilized in a vast array of consumer, industrial and scientific devices. In present days electronics system a basic building block is the Operational Amplifier. The Operational Amplifier is a versatile device that can be used to amplify DC input signal as well as AC input signal and used for computing mathematical function such as addition, subtraction, multiplication, integration and differentiation, and due to the ability to perform these operations the name Operational amplifier stems.

ETB-251, Op-Amp Application Platform student can study the basic applications and will be able to perform the various application of operational amplifier. The Op-Amps were used to model the basic mathematical operations addition, Subtraction, Integration, Differentiation, Rectification, Oscillation, Filtering, Peak detection, comparison and so on. However, an ideal operational amplifier is an extremely versatile circuit element, with a great many applications beyond mathematical operations and to understand and perform those application it is necessary to achieve better understanding of its basic application.

ETB-251 has been divided into different independent blocks for the ease of user to understand the various application of operational amplifier. A function generator, generating Sine wave, Square wave and triangular wave, and variable DC supplies are provided on board.

#### OBJECTS

- 01 Study and observe Op-Amp as Voltage Comparator
- 02 Study and observe Op-Amp as Zero Crossing Detector
- 03 Study and observe Op-Amp as a Phase Shift Oscillator and its phase shift at every RC combination
- 04 Study and observe Op-Amp as a Function generator, generating Square and Triangle wave
- 05 Study and observe Op-Amp as a Half Wave Precision Rectifier
- 06 Study and observe Op-Amp as active second order High Pass Filter
- 07 Study and observe Op-Amp as a Wien Bridge Oscillator and its gain factor for a smooth sine wave
- 08 Examine the operation of colpits oscillator
- 09 Examine the operation of hartley oscillator



#### FEATURES

- 01 Self contained easy to operate platform
- 02 On board Function Generator
- 03 Variable power supply
- 04 Functional blocks indicated on board mimic
- 05 Built in power supply
- 06 Operating manual provided
- 07 Compact size

#### TECHNICAL SPECIFICATION

The Board consists of the following built in parts

- |                         |  |
|-------------------------|--|
| Function Generators     |  |
| 01 Sine Wave            | : 1Hz - 110 KHz (10VPP)  |
| 02 Square Wave          | : 1Hz - 110 KHz (10 VPP)   |
| 03 Triangle Wave        | : 1Hz - 110 KHz (8 VPP)  |
| 04 Pulse Wave           | : 1Hz - 110 KHz (8 VPP)  |
| 05 Power Supplies       | : 0-30V (variable)   |
| 06 Power Supplies       | : $\pm 5, 9, 12, 15V$ at 100mA   |
| 07 Decade capacitor Box | : 0.1 $\mu$ F and 1 $\mu$ F per step total step 20                                     |
| 08 Decade inductor Box  | : 0.1mH and 1mH per step total step 20   |
| 09 Experiments          | : Nine individual circuits having Op-Amp, resistance, capacitor, diodes, pot & etc.... |
| 10 Test Points          | : 28   |
| 11 Power Supply         | : 230 V $\pm 10\%$ , 50Hz  |
| 12 Power Consumption    | : 4 VA approximately   |
| 13 Operating Conditions | : 0-40 C, 85% RH   |
| 14 Learning material    | : Theory, procedure, reference results, etc.   |
| 15 Dimensions (mm)      | : W415 x H165 X D315   |
| 16 Weight               | : 4 Kg approximately   |

#### LIST OF ACCESSORIES:

- 01 Patch cord 4mm length 50cm Red & Black...06

We are committed to the continuous development of our products, and therefore reserve the right to amend specifications without prior notice.

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