

Green Energy Trainer Kit



SOLAR & WIND CIRCUITS TRAINERS

- ❖ 1- Solar Energy Kit
- ❖ 2- Wind Energy Kit
- ❖ 3- Boost and Buck Converters, Battery Charger Circuit
- ❖ 4- Basic Application Circuits for Solar Energy
- ❖ 5- Application Circuits for Solar Energy

IT.GE51SW

DESCRIPTION

Curriculum Outlines:

- Design and implementation of Rectifier Circuits .
- Understanding the theory and application of solar energy and related circuits
- Understanding the theory and application of wind energy and related circuits
- Suitable for electrical, electronic, and communication engineering students

Curriculum Objectives:

- To understand the solar panels characteristics and halogen light source
- To understand wind turbine generator and its applications
- To understand boost and buck converters, battery charger circuit
- To understand the applications circuits for solar energy



1 Solar Energy Kit



Solar Energy

Solar Panels Module and Halogen Bulb Fixture

- Light Source: 150 W Halogen Bulb
- Maximum Open Output Voltage: 5.5 V
- Maximum Short Output Current: Approx. 1 Ampere
- Normal Open Output Voltage: 4.5 V - 5.3 V
- Normal Short Output Current: 200 mA - 300 mA

Experiment 1.1:

Output Voltage at Different Loads

Experiment 1.2:

Output Voltage at Different Temperatures

Experiment 1.3:

Output Voltage at Different Incident Light Angles

2 Wind Energy Kit



Wind Energy

Wind Turbine Generator and Application Circuits

- Rated Power: Small Power
- Maximum Open Output Voltage: AC 46 V pp
- Built-in Voltmeter
- Wind Direction: 120° (-60° ÷ +60°)

Experiment 2.1:

Half-wave Rectifier and Filter Circuit

Experiment 2.2:

Bridge Rectifier and Filter Circuit

Experiment 2.3:

Half-wave Voltage Doubler

Experiment 2.4:

Full-wave Voltage Doubler

3 Boost and Buck Converters, Battery Charger Circuit

Experiment 3.1: Boost Circuit

Experiment 3.2: Buck Circuit

Experiment 3.3: Battery Charger Circuit

4 Basic Application Circuits for Solar Energy

Experiment 4.1:

Dancing LEDs Circuit

Experiment 4.2:

Pulsing Breathing LED Circuit.

Experiment 4.3:

MCU Controlled Two-color LED Circuit

5 Application Circuits for Solar Energy

Experiment 5.1:

MIC Voice Signal Processor Circuit

Experiment 5.2:

Audio Amplifier

Experiment 5.3:

Bluetooth Receiver and Audio Amplifier