

Wind Power Training System

RE
01008



Hardware

- The advanced wind energy system trainer is a versatile educational trainer designed to provide practical experience in both types of wind energy regeneration systems, namely, stand-alone and grid-connected.
- The trainer includes all components of both stand-alone and grid-connected systems including:
 - Wind turbine
 - Battery
 - Battery Charge Controller (BCC) 20 A
 - 1-phase off-grid inverter
 - Real Small Wind turbine to be installed on the Roof of the School and connected to the wind Training System, 350 W
 - 1-phase tie-grid inverter
 - Motor controller
 - Synchronous generator 12 V
 - Halogen and LED Lamp Module (DC)
 - Load unit 1kOhm, 500W Module
 - Fan to simulate wind speed for experimenting in door
 - Light bulb, Energy saving lamp and LED bulb Module
 - Analogue/digital Test and Measurement System with USB Interface for measure voltage, current, Power and power factor Measurements.
 - Set of Safety Connection cables 4mm
 - All Necessary Accessories Required for Full Operation

Courseware

- Wind power plants in energy mix
- Regions of high and low pressure
- Effect of wind speed
- Generator speed as a function of wind speed
- Generator power at various wind speeds
- Determining the generator voltage at various wind speeds with a charge controller connected
- Measuring the battery voltage at various wind speeds
- How to measure the Mechanical and electrical parameters of the System
- Understand the design and operation of modern small wind power stations
- Measuring the generator's output power
- Measuring the resistor voltage at various wind speeds
- Measuring the load current at various wind speeds and loads
- Measuring the charging current at various wind speeds and loads
- Using the obtained values to determine the autonomy time at various loads
- Determining the waveform of the inverter's output current and voltage
- Determining the inverter's output voltage, current and power at various loads
- Determining the inverter's input voltage, current and power at various loads
- Explore hybrid systems for off-grid power supply using wind power and photovoltaic systems
- Operation with fluctuation wind force in offline operation
- Energy storage of the system
- Optimization of the system
- Design of an off-grid system for the generation of a 220V AC voltage