INTEGRATED CIRCUITS
ELECTROINC INDUSTRIES

PHOTOVOLTAIC SOLAR ENERGY TRAINER
IC-RW-PV-I10

2024

1.Overview

The IC-RW-PV-I10 – Photovoltaic Solar Energy Trainer provides a practical and interactive platform for exploring solar energy technology. It allows users to understand photovoltaic principles, system components, and real-world applications of solar power. Through hands-on experiments, learners gain valuable skills in harnessing and analyzing renewable energy, making the unit ideal for education, training, and introductory research in solar energy systems.

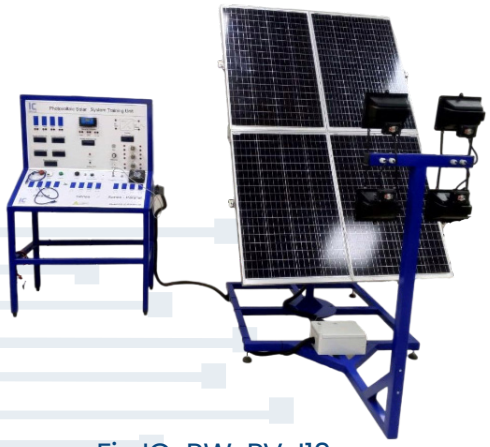

Fig:IC-RW-PV-I10

2.Advantages

A photovoltaic solar energy trainer is a comprehensive educational tool designed to provide hands-on training and practical experience in the field of photovoltaic solar energy. It consist of a compact system or kit that enables users to understand and explore the various aspects of solar energy conversion.

The trainer includes the following components:

- Solar Panels.
- Mounting Structure.
- Sun Simulator Unit.
- Energy Storage System.
- Load Bank.
- Computer software and hardware for control and monitoring.
- Safety Features.

3.Experiments will be done

1. Multiple Solar Cell Module Direction Towards the Sun Light and It's effect to Solar Cell Output.
2. Covered and Uncovered Multiple Solar Cells and its effect to the total Output Voltage.
3. Effect of Sun Light Blocking on Multiple Solar Cell to the total Output Current.
4. Understanding the Calculation of Actual Solar Cell Efficiency.
5. Regulating Solar-cell Output.
6. Configuration of Solar-cell from DC output to 220VAC.
7. Effect of Light Intensity to Solar Cell Power Output.
8. Applying Solar-cell System as Voltage Source for Lighting (Lamp) with Different Wattage.
9. Applying Solar-cell System as Voltage Source to Inductive Load.
10. Applying Solar-cell connection System: series and parallel.
11. Photovoltaic On grid system (grid tie).
12. Photovoltaic Off grid system.

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4.Specification

Fig:IC-RW-PV-I10

- Multiple Solar Cell Module (4 Cells).
  - Maximum Power (Pmax): approx. Not less than 100 W.
  - Maximum Power Voltage (Vmp): 0 - 3 %.
  - Maximum Power Current (Imp) : 5 to 10 A.
  - Open - Circuit Voltage (Voc): 20 to 24 V.
  - Short - Circuit Current (Isc) : 5 to 7 A.
  - Nominal Operating Cell Temperature: 45 ±2C.
  - Operating Temperature: - 40C to 85C.
- Battery Charger Regulator.
- Inverter 300 Watt - DC to AC Conversion.
- DC Outlet to Inverter - For connection between the regulator inverter.
- AC lamp 220 V/between 60-80 W- For Load application.
- SL Lamp 220V/between 60-80 W - For Load application.
- AC Electric Motor 220V/between 120W - 150W– Application Module.
- AC Fan 220V/ Ampere between (0.1 – 1A) – Application Module.
- AC Amperemeter 0-1A - Measurement Module.
- AC Voltmeter 0-250 V - Measurement Module.
- DC Amperemeter 1-10A - Measurement Module.
- DC Voltmeter 0-30 V - Measurement Modules.
- Frame for Solar Panel and application Modules.
- Rheostat Module.
- Solar Charge Controller Module with Modbus.
- AC Watt Meter Measurement Module.
- DC Watt Meter Measurement Module.
- Temperature Measurement Module.
- Solar Irradiation Measurement Module
- Accessories :Set of connecting cables Includes operation manual with theory and student experiments.