

model: **GT-Solar900**

Solar Energy Generation Training System

Features

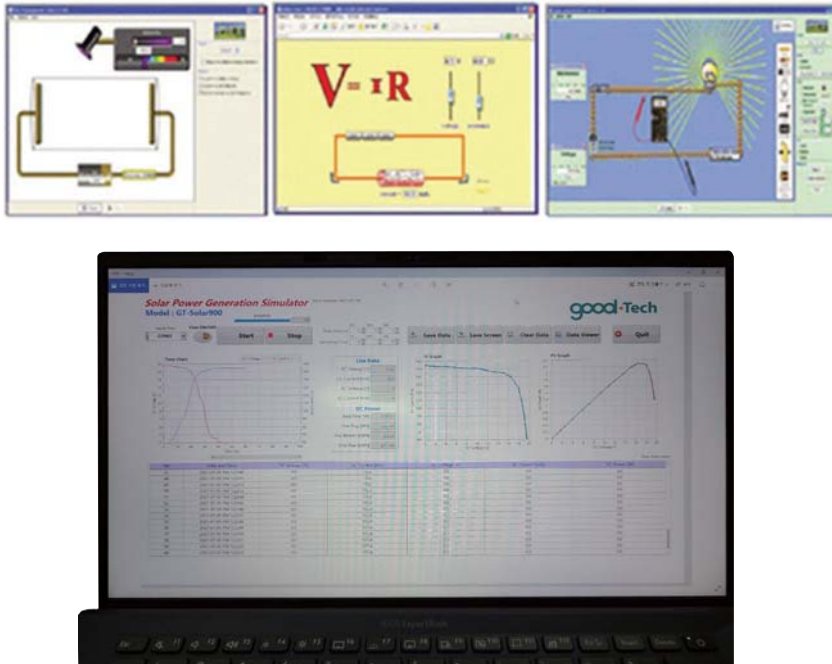
- 1) Integrated type of modules for energy generation & its processing.
- 2) IV, PV characteristic experiment & graph illustration
- 3) Built-in AC / DC voltmeter and ammeter. So, the value of energy conversion steps can be checked without separate measuring devices.
- 4) Driving load so that user can directly test the generated energy.
- 5) A separate output port is provided so that user can directly connect the load except for basic driving part.
- 6) Built-in rapid charging function to charge the consumed battery, Protection circuit works when the battery is short.
- 7) Transmit data to PC by USB type.
- 8) Provide basic Solar energy generation module.
- 9) Theory learning & real operation practice through hardware system

System configuration

1) Hardware platform & Photovoltaic Module



2) Screen shot for software menu



3) Illuminance Meter(1~100,000lux)



4) Infrared Thermometer(-32 ~ 300)



Components

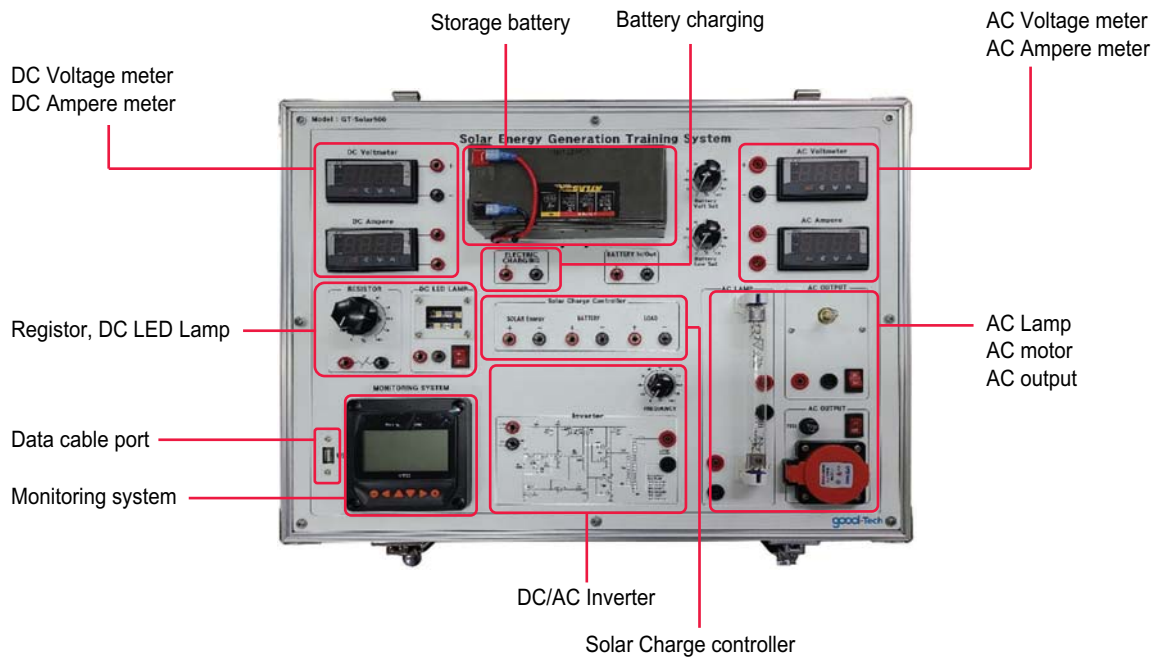
Hardware platform	1 set
Photovoltaic Module	1 set
Illuminance Meter (1~100,000lux)	1 ea
Infrared Thermometer (-32 ~ 300)	1 ea
Data Cable	1 ea
Banana plug jack cable	1 set
Power cable	1 ea
Program CD	1 ea
Textbook	1 book

Training Contents

- Chapter 1. Classification of energy types
- Chapter 2. About technology that directly converts sunlight into electrical energy
- Chapter 3. Description of solar power generation training equipment
- Chapter 4. Learn the theory and measuring practice for the effect of sunlight (photoelectric effect) using simulation software
- Chapter 5. Learn the theory of Ohm's Law & Ammeter/Voltage Meter and measuring practice Using Simulation Software
- Chapter 6. Learn the theory and measuring practice for the brightness of light [illumination intensity]
- Chapter 7. Learn the theory and measuring practice for the Efficiency of Solar Panels
- Chapter 8. Learn the theory and measuring practice for solar module characteristics according to distance
- Chapter 9. Learn the theory and measuring practice for Solar module characteristics according to amount of light
- Chapter 10. Learn the theory and measuring practice for Solar module characteristics according to temperature changes
- Chapter 11. Learn the theory and measuring practice for Solar module Electrical characteristic according to incident angle
- Chapter 12. Learn the theory and Characteristics test for series/parallel connection of solar panel
- Chapter 13. Learn the theory and Solar power generation experiment according to shadow area
- Chapter 14. Learn the theory and Exposure defect protection test & hot spot
- Chapter 15. Learn the theory and experiment for Charging controller
- Chapter 16. Learn the theory and experiment for Battery characteristic
- Chapter 17. Learn the theory and experiment for DC-AC Inverter
- Chapter 18. Learn the theory and experiment for DC-AC Inverter load
- Chapter 19. How to use Hardware measuring & PC program

Spec

1) Hardware platform



(1) Communication port : USB port

(2) AC/DC Voltage/Ampere digital meter

- * Electric Source Voltage : 100-240VAC 50/60Hz
- * Power Consumption : 5VA
- * RS-485 : 9600bps

(3) DC Load

- * Variable resistor (1K[Ohm], 50[W]) to test DC Load and DC LED lamp
- * DC INPUT : 4Pi Terminal x2EA
- * LED Lamp : DC 12V

(4) AC LOAD 1 (AC Motor Module)

AC Power S.W : 1EA

* Rating : AC 250V/8A, AC 125V/15A

AC Synchro Motor : 1EA

* Voltage : AC 220V

* Frequency : 50/60Hz

* Output : 2.5 ~ 3W

* Speed : 3RPM

* Double Protection Terminal x 2EA

- (5) AC LOAD 2 (AC Lamp Module)
 - AC Power S.W : 1EA
 - * Rating : AC 250V / 8A, AC 125V / 15A
 - Fluorescent Light : 1EA
 - * Rating : CA 220V / 50/60Hz
 - * Power Consumption : 4W
 - * Lamp Size : 136(W)X16()mm
 - * Double Protection Terminal x 2EA
- (6) Battery
 - * Battery : DC 12V, 7A
- (7) BATTERY CHARGER SMPS
 - * Input Voltage : AC85~264V
 - * Output Voltage : 15~18V (Variation through VR)
 - * Output Current : 1A
- (8) Charging Controller
 - * Input Voltage : DC 15V~30V
 - * Block Overdischarge: 11.1V
 - * Block Overcharge : 13.8V
 - * Variation of over-discharged/overcharged voltage levels
 - * Charging Circuit T.P : 4Point
- * Input Terminal: 4PI 2EA
- * BATTERY Terminal : 4PI 2EA
- * LOAD OUTPUT : 4PI 2EA
- (9) DC/AC Inverter
 - DC INPUT
 - * 4Pi Terminal 2EA
 - INVERTER
 - * Input Voltage : 10~12V
 - * Output Voltage : AC220V, 50/60Hz
 - * Maximum Output : 200W
 - * Reverse Voltage Protection Diode : 1N5404
 - * Double Protection Terminal x 2EA
 - Inverter Circuit T.P : 5EA
- (10) Monitoring system
 - * Power generation status
 - * Voltage in battery
 - * Output Voltage

2) Photovoltaic Module spec



- 1) Solar Cell : 5W, 18.5V, 0.3A x 2 EA
(Upward/downward 90° angle control, Attachment of attachable/detachable profile levers)
- (2) Output Terminal : 4 EA
- (3) Lamp : Halogen Lamp 220V / 500W
- (4) Brightness Control : Dimmer VR (Angle Control)
- (5) AC Input : 220V
- (6) Base : AL Profile (Cursor Control 0~270 cm)

3) Software spec

- (1) Simulator for theory learning of IV & PV curve graph of Solar module
- (2) Solar Power Generation System, GUI Software & Serial Driver
 - * Real-time data is implemented as a graph and can be saved at the same time
 - * Serial port setting menu
 - * Progress menu
 - * Live ON/OFF menu
 - * Stop & Start menu
 - * Data Interval menu
 - * Sampling Time menu
 - * Time Chart
 - * IV graph, PV graph
 - * Raw data table (date & time, DC voltage, DC Current, AC voltage, AC current, DC power)
 - * Data can be saved as a CSV file and can be used in Excel
 - * Graph review function by recalling saved data
 - * Live Data menu (DC voltage[V], DC current[mA], AC voltage[V], AC current[mA])
 - * DC Power menu (Real time[W], one day[Wh], one month[kWh], one year[kWh])