

01

New Renewable Energy &
Power Electronics

WS-SGIC

Solar Power Generation System (Module Type)

Introduction

- It is an equipment designed to study construction and principle of solar generation system from basic to application without extra devices.
- It allows users to carry out experiments for stand-alone and grid-connected system, the principle of street lamp and general energy conversion process. Grid-connected inverter is 200W and it converts DC voltage for 1 or 2 solar cells to 220V AC.
- Measuring terminals equipped on the modules help users to understand principle and characteristic easily.
- It contains intelligent digital multimeter module which enables users to measure and monitor by using PC.



Experimental List

- Solar Cell V-I Characteristic and Load Experiment
- Solar Cell Boost Experiment
- Stand-alone Inverter Experiment
- Emergency Power Control Experiment
- Overcharge, Overdischarge Control Experiment
- Analog MPPT Control Experiment
- Solar Street lamp Experiment
- Solar Grid Connected Inverter Experiment

Main Unit

■ 1-1 Working Table & Cabinet

- Type : HPM Wood
- Size : 1200(W) × 600(D) × 700(H)mm

■ 1-2 Frame

- Type : 2 Step Aluminium Profile
- Size : 30 × 60

- Cabinet for Module Storage

- Size : 30 × 60

Specification

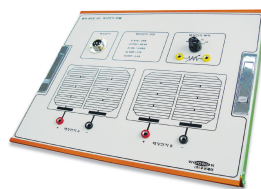
■ 1-3 Control Part

- Power : 1 Φ AC
- Internal Power Supply : 1 Φ AC
- **Solar Lighting Control**
 - Solar Lighting Auto Control Function by Embedded Controller
 - Lighting Mode : Manual/Auto
 - Solar Lighting Control : Run/Stop

■ 1-4 Solar Cell

- Type : Monocrystalline Silicon
- Short Circuit Current : 755mA
- Maximum Output : 12W
- Open Circuit Voltage : 20.8V
- Maximum Voltage & Current : 17.3V, 690mA

■ Basic Modules



| Solar Cell Module (Connection Module) |



| Multimeter Module |



| Load Module |

■ WS-SGIC-01

Solar Cell Module

- Output : 12W
- Variable Selection
- 24V, 1W Lamp
- 330(W)x280(H)mm

■ WS-SGIC-06

Digital Multimeter Module

- AC 500V : 1ea
- AC 5A DC 5A : Each 1ea
- DC 500V : 1ea
- 330(W)x280(H)mm

■ WS-SGIC-07

Load Module

- Induction Motor : 25W, 1ea
- Lamp Load : AC 220V, 10W
- Lamp Load : DC 12V, 30W
- 330(W)x280(H)mm

■ WS-SGIC-04

Multimeter Module

- Measure: V, A, W, V, F, cos ϕ
- Multi-drop Communications
- Accuracy : 0.5 ~ 1
- 330(W)x280(H)mm

■ WS-SGIC-05

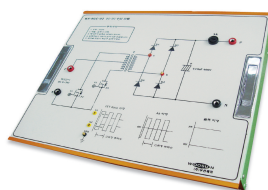
Virtual Solar Cell Module

- Output Capacity: 200W
- Output Voltage : DC 0~400W
- Built-in Current Limiter
- 330(W)x280(H)mm

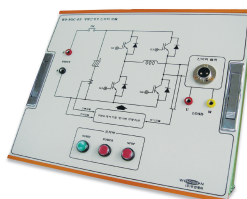
WS-SGIC

Specification

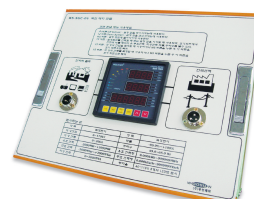
Grid System Modules



| Boost Chopper Module |



| Grid-connected Invert |



| Multimeter Module |

■ WS-SGIC-02

Boost Chopper Module

- Input : DC 0~34V(Max 40V)
- Capacity : 200W
- Waveform Check : 4 Points
- 330(W)×280(H)mm

■ WS-SGIC-03

Grid-connected Inverter Module

- Output : 220V AC, Sine-wave
- Capacity : 200W, 95% Efficiency

■ WS-SGIC-04

Multimeter Module

- Measure : V, A, W, V, F, $\cos\phi$
- Multi-drop Communications
- Accuracy : 0.5~1

■ WS-SGIC-05

Virtual Solar Cell Module

- Output Capacity : 200W
- Output Voltage : DC 0~400V
- Built-in Current Limiter
- 330(W)×280(H)mm

■ WS-SGIC-13

Analog MPPT Control Module

- Output Tracking Control for Change of Solar Cell
- Built-in Voltage & Current Sensor
- 330(W)×280(H)mm

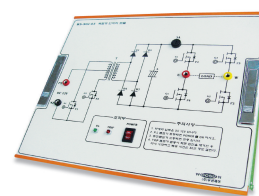
Stand-alone System Modules



| Overcharge Prevention Module |



| Battery Module |



| Stand-alone Inverter |

■ WS-SGIC-08

Overcharge Prevention Module

- Overcharge and Inverse Current Prevention
- Under Voltage Protection
- Voltage : DC 12V
- 170(W)×280(H)mm

■ WS-SGIC-09

Battery Module

- Voltage : DC 12V
- Capacity : 7Ah
- ϕ 4 Hole Terminal
- 170(W)×280(H)mm

■ WS-SGIC-10

Stand-alone Inverter

- Input : DC 12V
- Output : AC 220V, Sine-wave
- Voltage Change Rate : $\pm 3\%$
- 330(W)×280(H)mm

Specification

■ WS-SGIP-11

Lamp Control Module

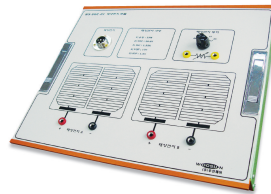
- Input : DC 12V
- Output : AC 220V
- Lamp Control PCB
- 170(W) × 280(H)mm

■ WS-SGIP-12

Emergency Power Control Module

- Input : AC 220V(Power Grid)
- Output : AC 220V(Inverter)
- Abnormal Voltage Detector
- 330(W) × 280(H)mm

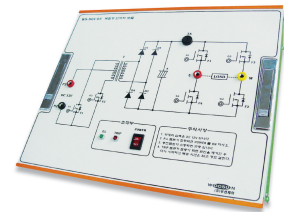
Application Modules



| Solar Cell Module(Connection Module) |



| Battery Module |



| Stand-alone Inverter Module |

■ WS-SGIC-08

Overcharge Prevention Module

- Overcharge and Inverse Current Prevention
- Under Voltage Protection
- Voltage : DC 12V
- 170(W) × 280(H)mm

■ WS-SGIC-09

Battery Module

- Voltage : DC 12V
- Capacity : 7Ah
- Φ 4 Hole Terminal
- 170(W) × 280(H)mm

■ WS-SGIC-10

Stand-alone Inverter Module

- Input : DC 12V
- Output : AC 220V, Sine-wave
- Voltage Change Rate : \pm 3%
- 330(W) × 280(H)mm

■ WS-SGIC-11

Lamp Control Module

- Input : DC 12V
- Output : AC 220V
- Lamp Control PCB
- 170(W) × 280(H)mm

Accessory

- ▶ Power Cable : 1EA
- ▶ Experimental Manual : 1Copy
- ▶ Software
- ▶ Connecting Cords : 1Unit
- ▶ Communication Cable : 1Unit