

- New & Renewable Energy

NEW & RENEWABLE ENERGY TRAINER

New
ED-9710

- Conversion processing experiments on the produced energy(power production / processing)
- Energy efficiency experiments followed by energy production and conversion
- Voltage and current characteristics curve
- Standalone or integrated operation of the energy experimental module
- Enriched teaching aids such as simulation software for power production



> EXPERIMENTS

- Understanding of the solar cell energy
- Photo electricity simulation
- Ohm's Law and voltmeter/ammeter
- Characteristics of solar cell(Isc, Voc, Im, Vm, Fill Factor)
- Light source's intensity and shadow
- Basic circuits for charge and Inverter
- Charge using the solar cell
- AC/DC Inverter(sine wave / pseudo sine wave)
- Standalone 12V solar cell system
- Optional hybrid experiments(Option: ED-9731 or ED-9732 model)

> CONFIGURATION

- Basic Module
 - » ED-9710-01 Charging Controller Module- I
 - » ED-9710-02 DC/AC Inverter Module- I
 - » ED-9710-03 Energy Storage Module
 - » ED-9710-04 Central Communication Module
 - » ED-9710-05 AC Load Module
 - » ED-9710-06 DC Load Module
 - » ED-9710-07 DC/DC Converter Module- I
 - » ED-9710-10 Photovoltaic Module- I
 - » ED-9710-71 RS-485 Communication Board(8ea)
 - » ED-9710-73 Multi RS-485 Converter(1ea)
- Integrated System(Option)
 - » 300W Wind Generator Ki(ED-9732)

> SPECIFICATIONS

ACCESSORIES

- Experimental Rack : 1490(W) x 918(H) x 320(D)mm
- Cable(Power, Serial, Circuit Connection) : 1set
- Monitoring Software CD : 1ea
- User Manual : 1ea

OPTION

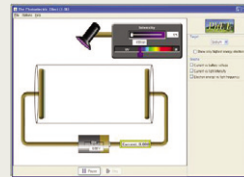
- Work Table
 - » Dimension : 1490(W) x 846(H) x 800(D)mm
 - » Material : MDF, wheel type with drawers

SOFTWARE

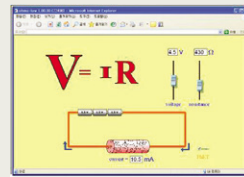


PC : LabVIEW Monitoring Program

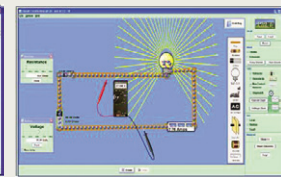
- Checks the voltage/current data per module(text and graph)
- Graph and data storage function
- I-V characteristics curve graph output for PV module



JAVA photo electricity simulation



JAVA Ohm's Law simulation



JAVA basic circuits simulation

- Photo electricity simulation
- Basic circuits and voltmeter/ammeter practices
- Ohm's Law simulation

Experiments Module

ED-9710-01
Charging Controller
Module - I

- **Charge Controller**
 - » System Voltage : 12V
 - » Self Power Consumption : 6~9mA
 - » Charge Voltage : Floa-13.8V, Absorption-14.4V/14.4V
 - » Discharge Blocking Voltage : 11.4V
 - » Load Reconnecting Voltage : 12.4V
 - » Temperature Compensation : 20mV
- **Buzzer for Input Polarity**
 - » Operating Voltage : 5~12V

ED-9710-02
DC/AC Inverter
Module - I

- **Pseudo Sine Wave Inverter**
 - » Rated Continuous Output : 350W
 - » Max. Instant Output : 700W
 - » Input Voltage : 10~15VDC
 - » Output Voltage : 220VAC
 - » Low Voltage Alarm : 10.5V ± 0.5V
- **Sine Wave Inverter**
 - » Rated Continuous Output : 200W
 - » Max. Instant Output : 400W
 - » Input Voltage : 10~16VDC
 - » Output Voltage : 220VAC
 - » Low Voltage Alarm : 11.0V ± 0.5V,
 - » High Voltage Isolation : 16.0V ± 0.5V
- **Buzzer for Input Polarity**
 - » Operating Voltage : 5~12V

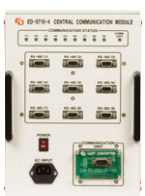
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ED-9710



ED-9710-03 Energy Storage Module

- **MF Battery**
 - » Voltage : 12V
 - » Capacity : 2.0AH
- **Battery Charger**
 - » Rated Input Voltage : 220V/60Hz/170mA
 - » Rated Output Voltage : DC 12V
 - » Rated Output Current : 1.6A
- **Buzzer for Input Polarity**
 - » Operating Voltage : 5~12V



ED-9710-04 Central Communication Module

- **LED(10ea)**
 - » Operating Voltage : 5V
 - » Size : $\varnothing 5$
 - » Color : Blue
- **COM Port(9ea)**
 - » I/O Type : RS-485



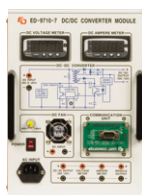
ED-9710-05 Load Module

- **Fluorescent Lamp**
 - » Operating Voltage : AC 220V
 - » Rated Input Current : 0.09A
 - » Lighting Frequency : 42KHz
 - » AC Motor
 - » Operating Voltage : AC 110/220V
 - » Power Consumption : 3.5W
 - » Speed : 36rpm
- **220V Power Outlet**
 - » Allowable Voltage : 220V/15A



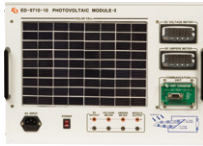
ED-9710-06 DC Load Module

- **DC Lamp**
 - » Operating Voltage : 3~12VDC
- **DC Motor**
 - » Operating Voltage : 12V
 - » Power Consumption : 0.63W
 - » Speed : 6,100rpm
- **Buzzer for Input Polarity**
 - » Operating Voltage : 5~12V



ED-9710-07 DC/DC Converter Module - I

- **DC/DC Converter**
 - » DC/DC Converter Input Voltage : 10~36V
 - » Output Voltage : 12V
 - » Output Current : 1.25A
 - » Output method : single
- **DC FAN**
 - » Operating Voltage : DC 12V
 - » Power Consumption : 0.7W
 - » Type : Ball Bearing
 - » Variable Resistance : 1K Ω
- **Buzzer for Input Polarity**
 - » Operating Voltage : 5~12V



ED-9710-10 Photovoltaic Module - I

- Max. Operating Power : 5W
- Open Voltage : 20.5V
- Short Circuit : 0.3A
- Operating Voltage : 17.64V
- Operating Current : 0.284A
- General Characteristics
- **DC(AC) Voltage Meter, DC(AC) Ampere Meter**
 - » Voltage : AC 100-240V 50/60Hz
 - » Power Consumption : 5VA
 - » Max. Indication Range : -1999 ~ 9999(4 lines)
 - » RS-485 Communication Output : 1200/2400/4800/9600bps
 - » Protocol : Modbus
- **Communication Port**
 - » No. of Pin: 32pin x 2



ED-9710-71 RS-485 Connector Module

- Communication Speed : 9600bps
- General Characteristics
 - » Input Voltage : AC 220V 60Hz



ED-9710-73 Multi RS-485 Converter Module

- Processor : Atmega128, 8bit RISC
- Memory : 128k Program Flash, 64k SRAM
- Program Downloader : ISP
- Interface : RS-485, RS-232, USB
- 485 Driver Chip : ADM1485