Systèmes Didactiques s.a.r.l.
Equipement pour l'enseignement expérimental, scientifique et technique

Date d'édition : 12.09.2026

Ref : EWTHC2040

Energy Trainer Solar & Wind

Solar energy experiments
-The photovoltaic panel
-Open-circuit voltage measurement
-Short-circuit current measurement
-Current-voltage characteristic
-Daily trend in panel voltage without load
-Daily trend in panel voltage under load
-Seasonal trend of panel voltage without load
-Seasonal trend of panel voltage under load
-Series-connected photovoltaic panels
-Examination of photovoltaic panels connected in parallel
-Examination of the photovoltaic panel simulator
-Examination of the effect of shading on photovoltaic panels
-Examination of bypass diode operation
-Examination of the effect of asymmetry on photovoltaic panels
-Examination of the effect of the blocking diode on photovoltaic panels
-Examination of the photovoltaic panel emulator
-Experiments on photovoltaic systems
-Direct load connection of photovoltaic panels
-Off-grid inverter start-up (without load)
-Installation of a basic photovoltaic system (DC load)
-Installation of a basic photovoltaic system (AC load)
-Examination of the output signal of the off-grid inverter with the data acquisitionmodule
-Measurement of the output signal of the off-grid inverter with the energy analysismodule
-Measurement of energy absorbed by the off-grid inverter
-Measurement of power output and efficiency of the off-grid inverter
-SCADA application of the off-grid inverter
-Examination of on-grid inverter

Wind energy experiments
-Examination of the relationship between turbine speed and output voltage (no load)
-Examination of the relationship between turbine speed and output voltage (underload operation)
-Examination of the effect of the turbine controller on the relationship betweenturbine speed and output voltage (no load)
-Examination of the effect of the turbine controller on the relationship betweenturbine speed and output voltage (under load)
-Examination of turbine output voltage
-Examination of the turbine output voltage with the data acquisition module

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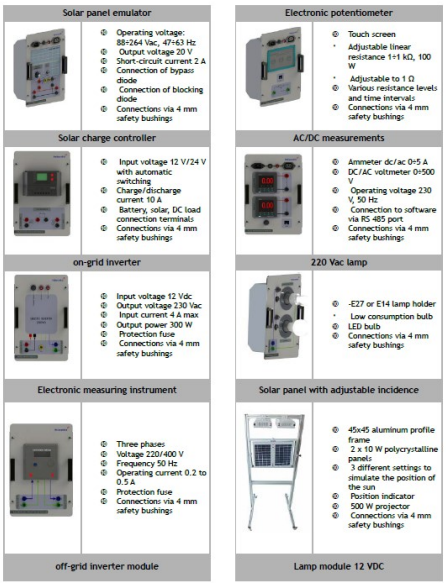
Description of modules Item2040solarwind
Main frame with shelf and monitor x1
Support structure with cable carrier x1
Solar panel module with light source(Photovoltaic panel-light source) x1
Wind turbine module x1
Monophase switching moduleEnergy Distribution Module x1
Energy Distribution Module x1
Accumulator module x1
Analogic measurement module x1
AC/DC measurement module x1
Potentiometer module x1
Lamp module 12 Vdc x1
Lamp module 220 Vac x1
AC energy analyzer module x1
Isolated measurement module x1
Data acquisition module x1
PC interface module x1
Wind Simulator module x1
Light source control module x1
Solar charge regulator module x1
Wind turbine charge control module x1
Off grid inverter module x1
On grid inverter module x1
Electronic potentiometer module x1
Solar panel simulator modul 2x x1
Diode Module x1
Electronic load module x1
Electronic electricity meter module 1x
Cable set 1x
Software (on USB stick) 1x



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Solar panel emulator

- Operating voltage: 88÷264 Vac, 47÷63 Hz
- Output voltage 20 V
- Short-circuit current 2 A
- Connection of bypass diode
- Connection of blocking diode
- Connections via 4 mm safety bushings

Electronic potentiometer

- Touch screen
- Adjustable linear resistance 1÷1 kΩ, 100 W
- Adjustable to 1 Ω
- Various resistance levels and time intervals
- Connections via 4 mm safety bushings

Solar charge controller

- Input voltage 12 V/24 V with automatic switching
- Charge/discharge current 10 A
- Battery, solar, DC load connection terminals
- Connections via 4 mm safety bushings

AC/DC measurements

- Ammeter dc/ac 0÷5 A
- DC/AC voltmeter 0÷500 V
- Operating voltage 230 V, 50 Hz
- Connection to software via RS 485 port
- Connections via 4 mm safety bushings

on-grid inverter

- Input voltage 12 Vdc
- Output voltage 230 Vac
- Input current 4 A max
- Output power 300 W
- Protection fuse
- Connections via 4 mm safety bushings

220 Vac lamp

- -E27 or E14 lamp holder
- Low consumption bulb
- LED bulb
- Connections via 4 mm safety bushings

Electronic measuring instrument

- Three phases
- Voltage 220/400 V
- Frequency 50 Hz
- Operating current 0.2 to 0.5 A
- Protection fuse
- Connections via 4 mm safety bushings

Solar panel with adjustable incidence

- 45x45 aluminum profile frame
- 2 x 10 W polycrystalline panels
- 3 different settings to simulate the position of the sun
- Position indicator
- 500 W projector
- Connections via 4 mm safety bushings

off-grid inverter module

Lamp module 12 VDC

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Wind turbine module

- Power 200 W
- Aluminum body
- Driven by DC 150W motor
- Connections via 4 mm safety bushings

Analogue measurement module

- Analogue ammeter 0÷5 A
- Analogue voltmeter 0÷20 V
- Connections via 4 mm safety bushings

Light source control module

- Manual or PC control
- Analogue input connector for manual control
- Output power 1000 W
- Connections via 4 mm safety bushings

Isolated measuring module

- Measuring voltage 0÷500 V
- Scales 0÷500 V, 0÷50 V, 0÷5 V
- Measuring current 0÷5 A
- 2 channels
- IEC socket with fuse and indicator light
- Connections via 4 mm safety bushings

Wind simulator module

- IEC socket, fuse and indicator light
- Switch for manual/pC-controlled mode
- Manual or PC-controlled DC motor rpm setting
- 200 W power
- Connections via 4 mm safety bushings

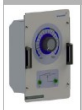
Diode module

- 6 high-current diodes
- Connections via 4 mm safety bushings

AC energy analyser module

- Operating voltage 100÷240 Vac, 110-250 Vdc
- Input current 5 A
- Accuracy ±1%.
- IEC connector with fuse and indicator light
- PC connector
- Connections via 4 mm safety bushings

Linear potentiometer module



- 0÷1 kΩ
- 0÷50 Ω max 6 A
- 51÷200 Ω max 2 A
- 201÷1000 Ω max 0.6 A
- Connections via 4 mm safety bushings

Fuel cell module

- Nominal cell power: 30 W
- 14 cells
- Rated performance: 8.4 V; 3.6 A
- Venting valve voltage: 6 V
- an voltage: 5 V
- Hydrogen pressure: 0.45÷0.55 bar
- Maximum gas flow: 0.42 L/min
- Hydrogen purity: 99.995%.
- Efficiency min. 39% at full speed
- Connections via 4 mm safety bushings

DC power supply module

- -Adjustable 0÷30 V power supply with short-circuit and overload protection
- Adjustable current 0÷5 A
- Colour LCD display shows instantaneous current, voltage and power values
- -Connections via 4 mm safety bushings

Solar panel emulator module

- -Operating voltage 88..264 Vac, 47÷63 Hz
- Output voltage 20 V
- Short-circuit current: 2 A
- Connection for bypass diode and blocking diode
- Connections via 4 mm safety bushings

Electronic load module

- Touch screen
- Power 100 W
- Voltage and current can be set via touch screen
- Controllable via PC
- Connections via 4 mm safety bushings

AC/DC measuring module

- Ammeter (0÷5 A ac/dc)
- Voltmeter (0÷500 V ac/dc)
- Supply voltage 230 Vac, 50 Hz
- Connection to software via RS 485
- LCD screen
- Connections via 4 mm safety bushings

Solar charge controller module

- Automatic 12/24 V input switching
- Charge and discharge current 10 A
- Terminals for solar/battery/DC charge connection
- Connections via 4 mm safety bushings

description of modules	Item 2010 solar	Item 2020 wind	Item 2040 solar wind	Item 2050 solar H2 fuel Cell	Item 2000 solar wind H2 fuel Cell
Main frame with shelf and monitor	•	•	•	•	•
Support structure with cable carrier	•	•	•	•	•
Solar panel module with light source (Photovoltaic panel - light source)	•	-	•	•	•
Wind turbine module	-	•	•	-	•
Monophase switching module	•	•	•	•	•
Energy Distribution module					
Energy Distribution Module	•	•	•	•	•
Accumulator module	•	•	•	•	•
Analogic measurement module	•	•	•	•	•
AC/DC measurement module	•	•	•	•	•
Potentiometer module	•	•	•	•	•
Lamp module 12 Vdc	•	•	•	•	•
(Lamp module 220 Vac	•	•	•	•	•
AC energy analyzer module	•	•	•	•	•
Isolated measurement module	•	•	•	•	•
Data acquisition module	•	•	•	•	•
PC interface module	•	•	•	•	•
Wind Simulator module	-	•	•	-	•
Light source control module	•	-	•	•	•
Solar charge regulator module	•	-	•	•	•
Wind turbine charge control module	-	•	•	-	•
Off grid inverter module	•	•	•	•	•
On grid inverter module	•	•	•	•	•
Electronic potentiometer module	•	•	•	•	•
Solar panel simulator modul 2x	•	-	•	•	•
Diode module	•	-	•	•	•
Electronic load module	•	•	•	•	•
Electronic electricity meter module	•	-	•	•	•
DC power supply					
Fuel cell module	-	-	-	•	•
Cable set	•	•	•	•	•
Software (on USB stick)	•	•	•	•	•

Produits alternatifs

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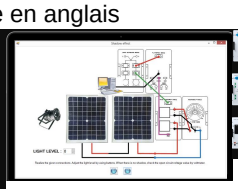
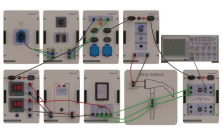
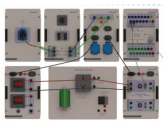
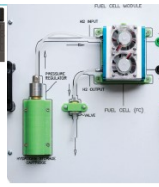
HRET Energy Trainer Solar 20 W ,Wind 200 W, Fuel Cell 30 W

Documentation technique et pédagogique en anglais





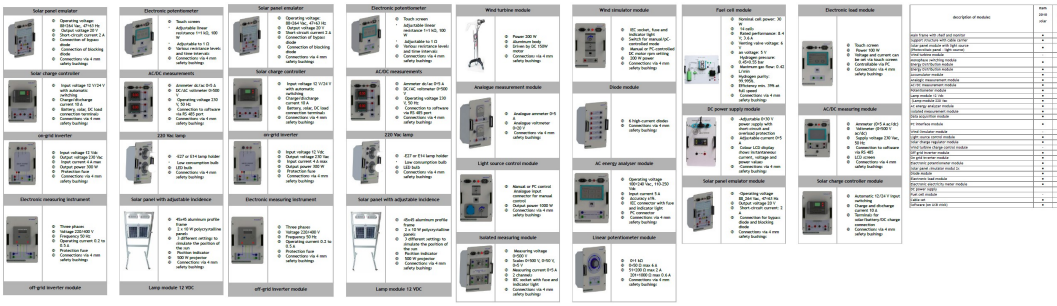
The Renewable Energy Training Set is prepared for the purpose of experimenting in solar based electricity production.
The experiment set is designed in accordance with the curricula of all institutions requiring technical education which can be listed as technical universities, technical high schools and any institution in need of technical education.
In the experiment set, user safety is prioritized in accordance with legal regulations.
Laser technology is used to draw the symbols and write the technical briefs on the modules.

The content of the training set is applicable for advanced technical training, including basic training as well.
The entire set of experiment unit consists of modules that can be easily attached to and removed from the main unit, depending on the experimental work to be carried out.
All of the components used in the modules are authentic products or their counterparts which are produced for industrial purposes.

Ref : EWTHC2010

Energy Trainer Solar





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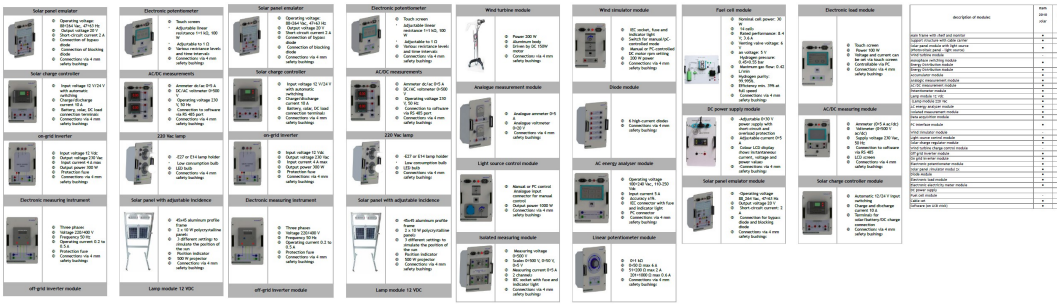
Energy Trainer Wind



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