Heliocentris

Solar Outdoor Trainer

Mobile Unit with Solar

With Solar tracking system

The Solar Outdoor Trainer generates electric energy from solar power. A software program helps users to learn about energy flux and system efficiency, making it possible to implement interesting projects dealing with autarkic energy supply.

Product Features

- PV systems for DC loads up to 700 W
- 12V DC Output with 24W
- PC software for system control and data acquisition is included
- Extensive instruction and experimentation material
- Mobile system components with rollers
- Remote monitoring via LAN network is possible

System Design

Solar Outdoor Trainer

The Solar Outdoor Trainer is a modular system. Connecting cables and quick-release couplings allow easy set-up and take-down.

Solar Module Unit

» 2 x > 400 Wp Polycrystalline / Monocrystalline solar module
» Adjustable angle of inclination

Optional: PV Sensor Kit

» Temperature sensors
» Irradiation sensors

System Technology Unit

» Suitable for loads up to 700 W
» Ethernet port for PC control and network connection
» Includes power electronics, measuring technology and batteries
» Optimized for the supply of the electro-lyzer

Functional Principle

Solar Module

Load Regulator

Battery

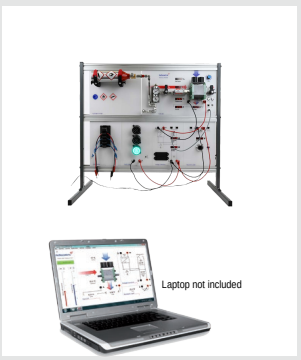
Power Electronics with AC-Output

The direct current generated by the solar modules charges the system batteries by means of a load regulator. The power elec-tronics, including an inverter and a DC converter, provide the user with 12 V DC and 230 V AC.

Optional:
The system control provides for optimal operation of the hy-drogen generator. It does not start operating until the battery has reached a minimum charge. This ensures uninterrupted operation of the system in case of inconsistent sunshine.

The hydrogen is stored in metal hydride canisters, which are also used in training and fuel cell systems from Heliocentris.

Possible Combinations

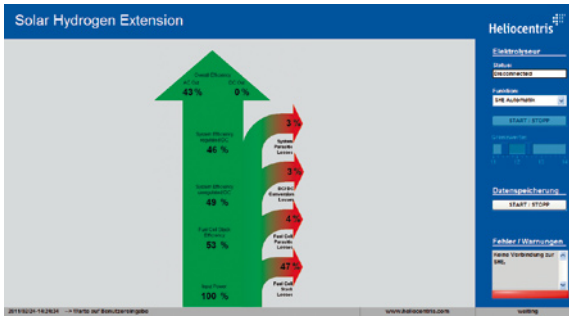


The solar Hydrogen Extension can be combined with the following products: (FCT) Fuel Cell Trainer; (HEL) Hybrid Energy Lab System; (NIS) NEXA Integration System.

Software

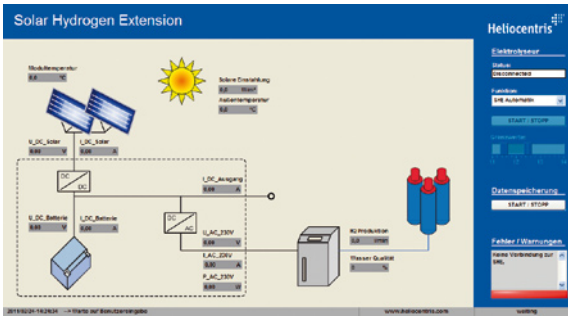
Solar Outdoor Trainer

The software is used to visualize data and control the system. Measurements at the system and component level are displayed and can easily be retrieved and exported for further processing. Also, the limit values for the battery regulation can be defined.



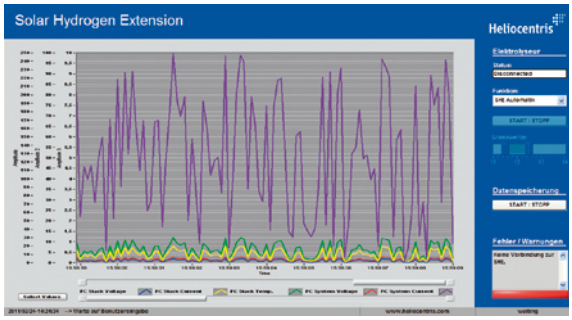
Efficiency Analysis

» Overall system output balancing
» System efficiency chain (Sankey diagram)



System Overview

» Flow chart view
» Voltage and current display for individual components



Time Curve

» Graphic visualization of the measurements
» Freely configurable measurements

Supplementary Material

The supplementary material facilitates use of the system.

» Detailed operating manual
» Science book on hydrogen
» Experiment Guide with:
  - Graphic display of experiment set-ups
  - Worksheets with questions and tasks
    Solutions

» Flash drive with printable experiment sheets (PDF files)

Sample Experiments

» Optimal alignment of solar modules
» Behavior of solar modules

Product Overview

Solar Outdoor Trainer

Solar Outdoor Trainer

» System technology unit
» 2 mobile solar module units
» Monitoring and control software
» Cable set

Item No. 810

Accessories

PV Sensor Kit

» Irradiation sensor
» Temperature sensors

Item No. 821

Technical Data

System Technology Unit	
Max. input current, photovoltaics	30 A
System voltage, photovoltaics	24 V DC
Max. output current 12 V DC	2 A
Max. continuous output 230 V AC	700 W
Momentary peak load	1050 W (for 10 sec)
Output voltage frequency	230 V, 50/60 Hz, True Sinus

Solar Module*	
Type	Polycrystalline / Monocrystalline
Dimensions	Approx. 1762 mm x 1134 mm x 30 mm
Weight	Approx. 25 Kg
MPP output	> 400 Wp
Efficiency	Approx. 22,52 %
Short circuit current	Approx. 15,5 A
MPP voltage	> 30 V

*Please note: Details are subject to change. These are conventional market standards.

Battery	
Type	2 lead-acid batteries (12 V), maintenance-free
System voltage	24 V DC
Capacity	55 Ah

Heliocentris

Heliocentris Academia International GmbH
Rudower Chaussee 30
12489 Berlin, Germany

Tel. + 49 (0) 30 340 601 600
sales@heliocentrisacademia.com
www.heliocentrisacademia.com

Optional to the Mobile Solar Modul,
Solar Tracking System: