leXsolar-SmartGrid Professional
Order code: **5501.1607**

Cena bez DPH	3.613,00 Eur
Price with VAT	4.371,73 Eur

Parameters

Renewable resources and greenhouse effect	Renewable energy resources
Quantitative unit	ks

Understanding the complex interactions between renewable energies, energy stores and consumers in a smart grid is an important objective in vocational and technical education. leXsolar-SmartGrid Professional is the ideal basic training system to reach this goal. With setting-up smart grids on a laboratory scale and its measurement and control students will learn the electro-technical challenges of mains operations very demonstratively. Pre-set or user-created scenarios let the students gradually develop their knowledge with their own experiments. The influence of renewable energies on grid stability is one major issue of the product. The students at first experience the problem within an experiment to develop approaches for increasing grid stability on their own. At the end they will verify them in practical experiments. Even such complex concepts as demand-side-management or conductor rope monitoring can be addressed in experiments. The basis for most of the experiments is the innovative leXsolar-Smartmeter allowing measurement and control of the energy fluxes in the experiments.

The experiment components for renewable energies such as wind and photovoltaics as well as energy stores such as lithium-iron-phosphate batteries or fuel cells allow a large variety of fundamental experiments besides the smart grid experiments.

Smart Grid Experiments:

- Daily power fluctuations of a photovoltaic (PV) power plant
- Daily power fluctuations of a wind power plant
- Energy supply of a building by conventional power plants
- Energy supply of a building by conventional and PV power plants
- Energy supply of a building by conventional and PV power plants with storage
- Voltage behavior and grid stability in a radial distribution system
- Grid stability with PV power plants
- Grid stability with PV power plants depending on consumer load
- Grid stability with PV power plants depending on wire length
- Grid stability with PV power plants and smart transformer stations
- Grid stability with PV power plants and storages
- Grid integration of E-Mobility
- Conductor rope management

Fundamental experiments:

Photovoltaics

- IV-Characteristics of solar panels
- IV-Characteristics depending on illumination
- IV-Characteristics depending on temperature
- MPP-Tracking

Wind energy

- Turbine power dependent on blade shape and pitch angle
- Turbine power dependent on number of blades
- Turbine power dependent on wind direction

Fuel Cell and Electrolyzer

- Functionality of an electrolyzer
- IV-characteristics of an electrolyzer
- Functionality of a fuel cell
- IV-characteristics of a fuel cell

Storage technologies

- Charge and discharge characteristics of a capacitor
- Functionality and charge procedure of a LiFePo battery
- Operation of fuel cells and electrolyzers

Components:

- 2x 1400-13 leXsolar-Base unit Professional
- 2x 9100-04 SmartMeter

- 1x 1118-03 leXsolar-Wind turbine module Pro
- 1x 1100-04 Solar module 5.33 V, 370 mA
- 1x 1400-19 Wind machine
- 1x 1118-02 Motor module Pro
- 1x 1118-17 Base for solar panel
- 2x 9100-05 PowerModule
- 1x 1400-12 leXsolar-Wind rotor set
- 2x 1118-01 Light bulb module Pro
- 1x 1118-11 Capacitor module Pro
- 1x 9100-03 AV-Module
- 1x 1800-08 Battery module holder 1xAAA Pro
- 1x 1801-06 LiFePo-battery AAA
- 1x 1800-12 Fuel cell holder Pro
- 1x 1118-13 MPP-Tracker Pro
- 2x 1607-01 Grid module Pro
- 1x 1118-05 Diode module Pro
- 1x 1100-62 Potentiometer module 110 Ohm Pro
- 1x L2-04-116 Illuminant 120W, 12°
- 1x L2-04-080 Lamp housing
- 6x L2-05-068 Safety short-circuit plug, with mid socket
- 1x L3-01-137 Koffer SmartGrid Pro 1607
- 1x L3-01-138 Einlage SmartGrid Pro 1607
- 5x L2-04-066 Safety test lead, 25cm, red
- 4x L2-04-067 Safety test lead, 25cm, black
- 4x L2-04-059 Safety test lead, 50cm, red
- 4x L2-04-060 Safety test lead, 50cm, black
- 1x L2-02-017 Propeller
- 1x L2-06-067 Reversible Fuel cell
- 1x L3-03-176 Azimuth angle scale
- 1x L3-03-171 Einräumplan 1607 SmartGrid Professional
- 1x L3-01-199 Deckelschaum Zuschnitt 625x345x5mm
- 1x L3-03-258 Info sheet initial startup