

Product datasheet (en)

Version: 1406_18.10.2017

Photo:



Name:

leXsolar-Wind Professional

Item number:

1406

Youtube link:

<https://www.youtube.com/watch?v=dECoZkQT Bmo&list=PLKckcQZwZt5xmSkC9p1UhGTC64>

Area of application:

**Electrical Engineering
Renewable Energies**

Dimensions (cm x cm x cm)

64x37x16,5

Weight (kg):

6,00

User group:

**Basic Training
Industrial Customers**

Key facts:

Wind energy experiments for technical education
Understanding wind energy: from physics to application
Contains the innovative leXsolar-wind rotor set
Delivered in a stable aluminum case with all accessories

List of components:

1 x 1118-02 Motor module Pro

1 x 1118-03 leXsolar-Wind turbine module Pro
1 x 1118-04 Potentiometer module Pro
1 x 1118-14 Savonius rotor module Pro
1 x 1400-12 leXsolar-Wind rotor set
1 x 1400-13 leXsolar-base unit Professional
1 x 1400-19 Wind machine
1 x 1400-20 Anemometer Pro
2 x 1800-01 Resistor module (triple) Pro
3 x 1800-04 Resistor plug element 100 Ohm
2 x 1800-05 Resistor plug element 10 Ohm
1 x 1800-06 Resistor plug element 33 Ohm
1 x 9100-03 AV-Module
1 x 9100-05 PowerModule
1 x L2-02-017 Propeller
1 x L2-04-059 Safety test lead, 50cm, red
1 x L2-04-060 Safety test lead, 50cm, black
1 x L2-04-066 Safety test lead, 25cm, red
1 x L2-04-067 Safety test lead, 25cm, black
3 x L2-05-068 Safety short-circuit plug, with mid socket
1 x L2-06-062 Rotational-speed sensor
1 x L3-01-073 Aluminium case "Wind-Professional"
1 x L3-01-091 Insert "Wind-Professional"
1 x L3-03-180 Layout diagram 1406 leXsolar-Wind Professional
1 x L3-03-258 Info sheet initial startup

Extras needed:

No extras needed, all included.

Extras available:

L3-03-074 Anleitungsheft leXsolar-Wind Professional
L3-03-086 Experimentierhandbuch leXsolar-Wind Professional
L3-03-094 Instructions manual leXsolar-Wind Professional
L3-03-099 Experiment guide leXsolar-Wind Professional
L2-04-044 electric grid adapter set

Description:

Wind energy currently covers the highest proportion of renewable energy production. Especially, based on the really fast build-up of new wind power plants, the demand for highly qualified staff is at a very high level. leXsolar-Wind Professional offers you practical oriented experiments for technical training while including interesting basic experiments at the same time. The fields of applications are many and varied: from vocational school to college level.

Experiments:

2.1 Basic electronic experiments

B.1 Setup of a simple circuit

B.2 Ohm's law

B.3 Series connection of ohmic resistances

B.4 Parallel connection of ohmic resistances

B.5 Start-up and idling behavior of a motor

2.2 Basic wind experiments

2.2.1 Examine the wind speed behind the rotor

2.2.2 Energy balance sheet and efficiency of a wind turbine

2.2.3 Rotational speed and speed ratio of a wind turbine.

2.3.1 Change the turbine voltage by connecting a consumer

2.3 Influence of a consumer

2.3.2 Characteristic curves and rotational speed of a wind turbine

2.4 Influence of the wind speed

2.4.1 Voltage of a wind turbine dependent on the wind speed

2.4.2 Rotational speed and output dependent on the wind speed

2.5.1 Voltage dependent on the wind direction

2.5 Influence of the wind direction

2.5.2 Rotational speed and output dependent on the wind direction

2.6 Influence of the generator model

2.6.1 Voltage dependent on the rotor model

2.6.2 Rotational speed and output dependent on the rotor model

2.7 Influence of the rotor blade shape

2.7.1 Voltage dependent on the rotor blade shape

2.7.2 Rotational speed and output dependent on the rotor blade shape

2.8 Influence of the number of rotor blades

2.8.1 Voltage dependent on the number of blades

2.8.2 Rotational speed and output dependent on the number of blades

2.9.1 Voltage dependent on the rotor blade pitch

2.9 Influence of the rotor blade pitch dependent on the rotor blade pitch

2.9.2 Start-up speed of a wind turbine dependent on the rotor blade pitch

2.9.3 Rotational speed and output dependent on the rotor blade pitch

Specifications of components

1118-02 Motor module Pro:

1118-03 leXsolar-Wind turbine module Pro:

1118-04 Potentiometer module Pro:

1400-12 leXsolar-Wind rotor set:

Set of rotor blades and hubs to set up different wind turbines

4 rotor blades with optimized profile

4 rotor blades with flat rectangular profile

5 hubs for setting up 3-blade rotors with pitches 20°, 25°, 30°, 50° and 90°

1 hub for setting up 4-blade rotor with pitch of 25°

1 Cap for 3-blade rotor and 1 cap for 4-blade rotor

Allows setting up 24 different wind turbines

Easy assembling and disassembling without tools

1400-13 leXsolar-base unit Professional:

Main board for up to 4 plug-in modules

Grid-dimension of the plugs: 70 mm

Enables series and parallel connection of the modules

Changing between series and parallel connection by turning the Modules

Equipped with 12 additional 4mm security jacks for connecting security measuring lines

Each single plug-in module can be contacted externally

Enables current measurement between each module

1400-19 Wind machine:

1400-20 Anemometer Pro:

1800-01 Resistor module (triple) Pro:

1800-04 Resistor plug element 100 Ohm:

1800-05 Resistor plug element 10 Ohm:

1800-06 Resistor plug element 33 Ohm:

9100-03 AV-Module:

The IV-Module is able to measure current and voltage and therefore replaces conventional multimeters completely. With touch buttons three measurement modes can be selected: current, voltage and combined current-/voltage-measurement.

leXsolar AV-Module is intuitive and easy to use but yet allows precise and professional measurements. A high resolution graphics display shows the measurement values as well as visualizes the measurement modes.

Technical specifications:

Voltage measurement:

- Range: 0...12 V
- Accuracy: 1mV
- Overvoltage protection >12V

Current measurement

- Range: 0...2 A
- Accuracy: 0.1mA (0...199mA) and 1mA (200mA...1A)
- Automatic fuse protection >2A (reactivation with touch button)
- Internal resistance <0.5 Ohm (0...200mA); <0.2 Ohm (200mA...2A)

Electrical connection:

- compatible to leXsolar-basic unit
- 4mm-banana plugs

Display: Graphics display resolution 192x192

Power supply: 2 x AA battery or rechargeable

Interfaces:

- Display to read the measurement values
- leXsolar USB-Connect* for direct PC-connection
- leXsolar Wireless-Connect* for wireless data acquisition

***Please ask for availability**

9100-05 PowerModule:

The PowerModule is a compact, robust and easy-to-use power supply for experiments. The voltage can be varied incrementally in 0.5V steps from 0 to 12V. It supplies up to 24W output power!

With the acoustic feedback during operation and the voltage indicator by LEDs it is simple and intuitive for the user. With only 70g it is the most lightweight power supply of its power class. Due to the design as leXsolar plug-in module it is fully compatible with all leXsolar experiments. However, it can also be used in other setups with standard 4mm-connectors.

With software control* continuous variable voltages - even time-dependent - can be realized.

Technical data:

Output voltage 0-12V DC

Maximum current 2A

Maximum output power 24W

Automatic overcurrent detection

Voltage variation in 0.5V steps (manually) or continuous (with software* via USB-Connect* or Wireless-Connect*)

Accuracy: $\pm 0.15V$

Contacts: 4mm standard connectors and compatible to leXsolar main board

Input voltage 110-230V AC 50-60Hz

Adaptors for all common sockets included

Weight: 70g (+180g included wall power supply)

RiSU conform

***Please ask for availability**

L2-02-017 Propeller:

L2-04-059 Safety test lead, 50cm, red:

L2-04-060 Safety test lead, 50cm, black:

L2-04-066 Safety test lead, 25cm, red:

L2-04-067 Safety test lead, 25cm, black:

L2-05-068 Safety short-circuit plug, with mid socket:

L2-06-062 Rotational-speed sensor:

L3-01-073 Aluminium case "Wind-Professional":

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Specifications extras needed:

No extras needed, all inclusive.

Specifications extras available:

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L3-03-086 Experimentierhandbuch leXsolar-Wind Professional:

L3-03-094 Instructions manual leXsolar-Wind Professional:

The instruction manuals are available as PDF and Word versions in the online portal. A description of how to download the booklets is attached to every experiment set.

L3-03-099 Experiment guide leXsolar-Wind Professional:

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L2-04-044 electric grid adapter set: