



## SOLAR CENTRAL UNITS - 800WC - WITH DATAS ACQUISITION

NETWORK INJECTION + ISOLATED SITE		NETWORK INJECTION	
	SOL-4-EXP	ELECTRICAL CABINET	SOL-5-EXP
	1	1500W inverter for network synchronisation	1
	1	Interface + 4-20mA sensors	1
	1	Voltage converter 24VDC/230VAC. 200W	-
	1	Charging controller 12/24VDC-20A	-
	2	batteries 12V-12AH	-
	3	100Wh resolution meter	3
	1	lightning arrester	1
	1	2P-45A circuit breaker with residual current protection 500mA	1
	1	Residual current circuit breaker 30mA/16A	1
	2	Thermal magnetic circuit breaker 2A (controls)	2
	5	2-pole fuse holder and fuses	1
	2	Power switch	2
	2	Disconnecter	2
	1	Mushroom head emergency stop	1
1	Power socket 2P+E 230VAC	1	
			

ref. SOL-4-EXP

Electrical cabinet + 4 solar panels + link cable

Version without panel

Contact us



ref. SOL-5-EXP

Electrical cabinet + 4 solar panels + link cable

Version without panel

Contact us

### EDUCATIONAL OBJECTIVES

- Understanding the different elements of a photovoltaic system.
- Understanding the safety components in the system.
- Electrical measurements of different parameters.
- Analyzing and interpreting results.
- Studying the efficiency and impacts related to the positioning of the solar panels.
- Studying of the chain of solar energy (production, storage, consumption, resale, energetic behavior).
- Wiring of a photovoltaic system (coupling of panels).

### TEACHING RESOURCES STUDENT & TEACHER

#### 1. ELECTRICAL CABINET

See the table

#### 2. LINK CABLE

30-m cable for connecting the solar panels to any type of solar system.

#### 3. PHOTOVOLTAIC SOLAR PANEL 200WC ON TILTING FRAME (FOR EACH PANEL)

SOL-4-EXP and SOL-5-EXP are solar centrals with an electric power of 800Wp (+/- 10%) necessary to inject a significant current on the electrical network by the inverter and the other components of the housing part, to load the batteries and to allow equivalent measures as in a real housing installation. The system of data acquisition (temperature, radiation, wind speed and all the electrical parameters) allows making some practical works even in the absence of sun.

Supplied with  
1 pyranometer



## PARTIAL OR TOTAL RESALE OPERATION (SOL-4-EXP AND SOL-5-EXP)

In the cabinet a DC/AC inverter converts the DC from the photovoltaic panels to AC 220VAC 50Hz, and injects its power in synchronism into the network through an isolation transformer.

This inverter is protected against any polarity reversal and any overload on the DC or AC side.

When the panels are not lit, the inverter consumes no current.

### TECHNICAL CHARACTERISTIC FOR THE INVERTER COUPLED TO THE PUBLIC NETWORK.

INVERTER	Voltage	Max current	Power	Cos	Distorsion	Rendement
INPUT	150~450VDC	10,8A				
OUTPUT	230VAC-50Hz	6,5A	1,5kW	1	≤3,5%	91%

## OPERATION IN ISOLATED SITE WITH NO RESALE (SOL-4-EXP ONLY)

The photovoltaic current charges two 12V sealed batteries cabled in series through a charging controller.

This DC voltage is used directly by low energy consumption lamps 24VDC, and/or converted to 250VAC 50Hz by a 200W voltage converter.

### TECHNICAL CHARACTERISTICS FOR THE ISOLATED SITE CONVERTER

VOLTAGE CONVERTER	Voltage	Max current	Power
INPUT	20~32 VDC	11A	210W
OUTPUT	230VAC 50Hz	1A	200VA

## INTERFACE AND SENSORS DELIVERED WITH SOL-4-EXP AND SOL-5-EXP

Measure of the solar radiation

Temperature of the solar panels

Wind speed

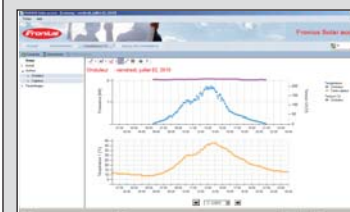
These physical parameters and also the electrical parameters (voltage and current AC/DC), the power and the energy are recorded (1 year of data maximum) by an interface placed in the electrical cabinet and monitored by a PC.

The software provided with SOL-5 and SOL-4 allows to display one or several curves on the screen, diagrams, ...

All data can be exported to Excel®.

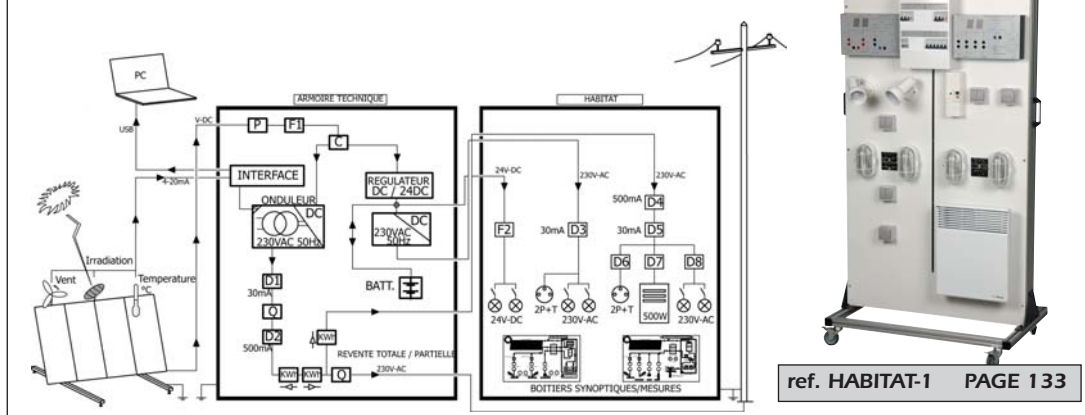


Screenshot of 3 recordings made during the day : Instant alternative power, temperature of panels, intensity of solar radiation.



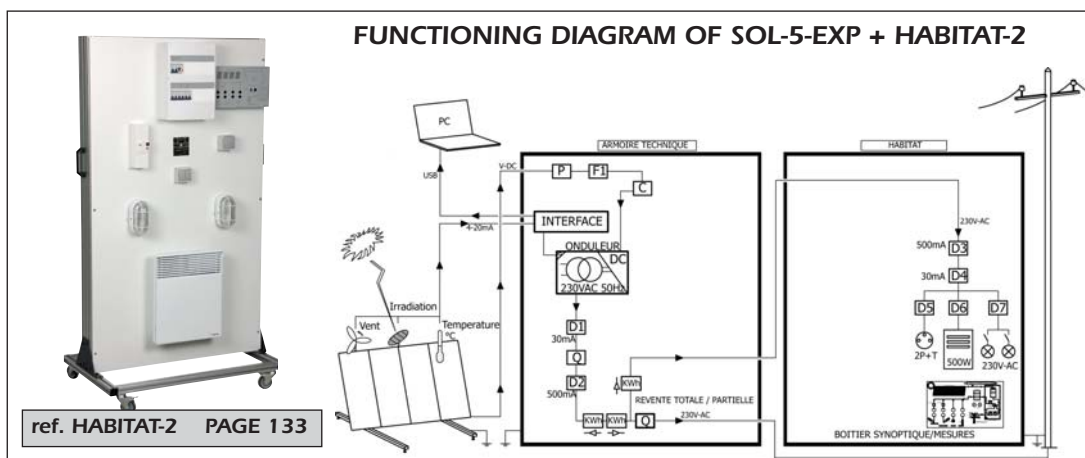
Screenshot showing the voltage and the power at the output of the inverter, the temperature of panels. Scales are specified with units.

### FUNCTIONING DIAGRAM OF SOL-4-EXP + HABITAT-1



ref. HABITAT-1 PAGE 133

### FUNCTIONING DIAGRAM OF SOL-5-EXP + HABITAT-2



ref. HABITAT-2 PAGE 133

### SUPPLIED ACCESSORIES

- A connection cable of 30 meters – 3x 6mm<sup>2</sup> panels/electrical cabinet
- A connection cable of 30 meter for the link sensors/interface for signal 4-20mA
- A CD-rom with all the practical works
- A software for the exploitation of data
- A pyranometer for measuring the solar radiation (200 and 2000 W/m<sup>2</sup> range)

### WARRANTY

Factory guarantee of the inverter: 5 years  
The website of Fronius offers the free update of the software, and answers the Frequently Asked Questions.