

# X-Solar

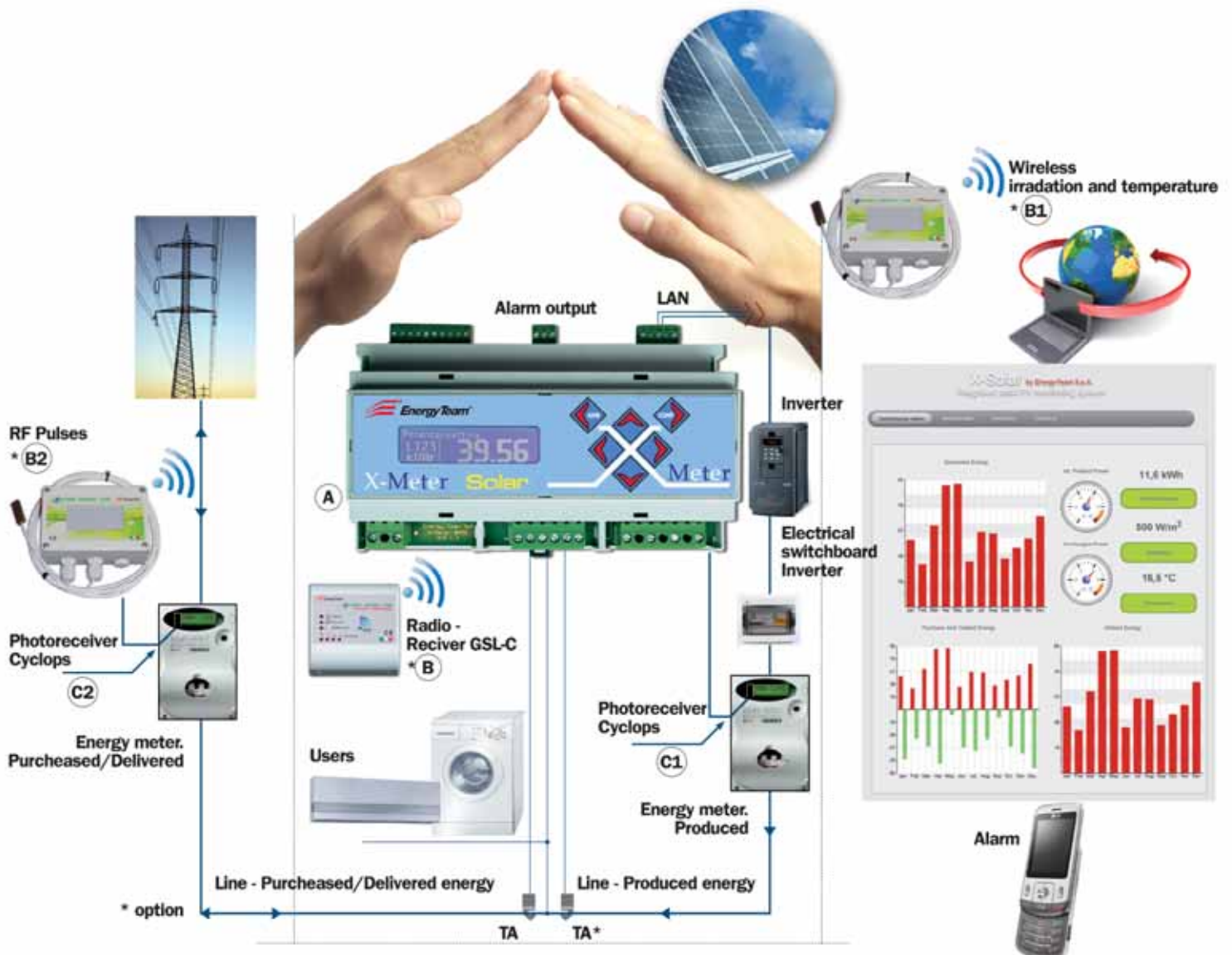
## Photovoltaic plants monitoring

Thanks to X-solar system it's possible to acquire and verify main parameters for a photovoltaic plant of small dimensions, showing clearly all the energetic and economic data for an easy management and verification of the plant even without a specific expertise.

In summary, you can:

- > Acquire energetic and economic data for an easy management.
- > Acquire data and consult them directly on the X-Solar instrument's display.
- > Apply to fiscal meters already present until 2 optical interfaces (Produced Energy and Purchased Energy/Delivered)
- > Detect the direction of energetic flows for an exact account of the same.
- > Insert into the system a combined sensor of irradiation and panel temperature, even equipped by the option for transmitting data via-radio.
- > Generate alarm state (lack of production in presence of Irradiation, Inverter anomaly, or when a QE Inverter's magneto-thermal switch is off).
- > Have an instrument equipped by an Ethernet interface.
- > Have the functionality of the system with a Web interface and a system able to send daily e-mail with production data.

## Put Yourself in safe hands



In order to get the maximum control in the performance of the plant, it's possible to insert into the system a combined sensor for Irradiation and panel Temperature, provided by the option for sending data via-radio, useful when the cable installation is difficult.

## Running on Ethernet Network

The instrument has an **Ethernet interface** which, when used, allows an high extension of the system functionalities, through a **Web interface** and a system for sending e-mail, by means of additional servers.

**Web interface makes available a consultation of the described data** by means of a normal Web browser (recommended Firefox, Opera, Chrome, Safari) and a Personal Computer, a tablet or a notebook, connected to the local network via-cable or wi-fi.

## Data available on the web: instantaneous values

- > Power Generated (production assignment) (kW)
- > Consumption power of the generation plant (production during absorption) (kW)
- > Power delivered to the electrical network (exchange sale) (kW)
- > Power absorbed by the electrical network (exchange during absorption) (kW)
- > Power used (production + exchange) (kW)
- > Irradiation (W/m<sup>2</sup>)
- > Panel temperature (°C)
- > Power expected with current Irradiation and Temperature (kW)
- > Status concerning the exchange on the network (absorption, delivery or null)
- > Status concerning the Inverter production (full production, degraded production or off)

## Data available on the web: historicized values

The values are available in the following periods:

- > Current day
- > Previous day
- > Current month
- > Previous month
- > Current year, previous years (until 10)
- > totate value from starting date

## Available values:

- > Energy Generated ( production assignment ) (kW)
- > Consumption energy of the generation plant (production during absorption) (kW)
- > Energy delivered to the electrical network (exchange sale) (kW)
- > Energy absorbed by the electrical network (exchange during absorption) (kW)
- > Energy used (production + exchange) (kW)
- > Remuneration energy produced (€)
- > Cost of Consumption energy in the generation plant (€)
- > Remuneration Energy delivered to the electrical network (€)
- > Cost of energy drawn form the electrical network (the calculation is made on the average cost KWh) (€)
- > Cost of used energy (production + exchange) (€)

## Option with combined sensor Irradiation-panel temperature:

- > Expected Energy (KWh)

## Graphics relative to: energy produced, energy delivered, energy purchased,energy used:

- > Graphic showing the daily production on a hourly basis within the current day and previous day.
- > Graphic showing the monthly production on a daily basis within the last 10 years.

## Working in stand-alone

In this modality the instrument isn't connected to Ethernet network, data acquired are available directly through X-Solar instrument's display.

## Alarms

When the system is coupled with the combined Irradiance and temperature sensor, it can generate alarm state corresponding to low performance of the plant (due, for example, to shadows of trees grown in this side after the plant was installed, or a dirt on the panels) or ab-

sence of production in presence of solar irradiance (due, for example, to a fault in the inverter or if the magneto-thermal switch is off); the first type of alarm is considered on daily basis on the data of the previous day, the second is evaluated in real-time, with a signal delayed by one hour for avoiding false alarms due to temporary shadings. The alarm is showed on the instrument's display and on two special contacts (digital outputs).

## Example of Web page



## Basic configuration for monitoring the Produced Energy meter

- > n.1 X-Solar
- > n.2 wired Photoreceivers for reading the LEDs on the Produced Energy meter and Exchanged Energy meter.
- > n.1 Openable Current transformer, internal diameter 24 mm, for discriminating the direction of the energy flow in the Exchanged Energy meter and for accounting separately the energy delivered and the energy purchased.

## Options

- > Sensor for Solar Irradiance and Temperature PT100 by GSL-IT-W Radio transmitter module.
- > Radio receiver GSL-C module for sensors of Solar Irradiance and Temperature (4 channels); range: 250 meters in open-field.
- > Radio-transmitter for 1 Photoreceiver Cyclops for detecting light pulses emitted by the LED on the Produced energy meter or on the Exchanged energy meter; range: 250 meters in open-field.
- > n.1 Openable Current transformer, internal diameter 24 mm, for discriminating the direction of the energy flow in the Produced energy meter. This installation was planned in order to eliminate the energy recording due to self consumption in the Inverters and in the insulating transformers.

## Additional services

By inserting into provision these additional services, it's possible to:

- > Send the alarms through e-mail service and, eventually, daily e-mail with production data.
- > Get a backup of the daily data: in this way, if a fault in X-solar occurs, the historical data aren't lost.
- > See and consult the Web page even outside the Customer's local network.
- > See and consult data coming from more plants (for installers and maintainers).