4 July 2018
Hotel Casuarina @ Meru

Green Initiative Seminar

Addendum

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Export Sales & Trade Marketing Manager

EnergyTeam®

20 YEARS 1996 - 2016

Topic 3-2

"Energy Monitoring System" for Solar System

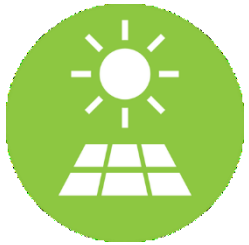
Products - Hardware

Photovoltaics

Irradiation and string control

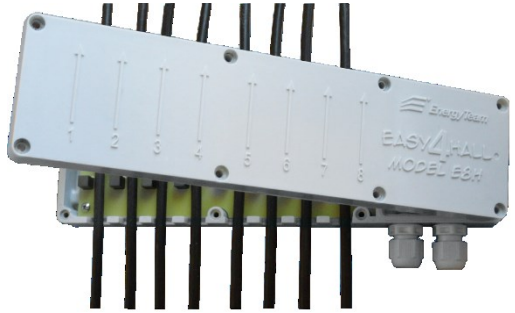
Solarimeter

Solar Irradiation and panel Temperature



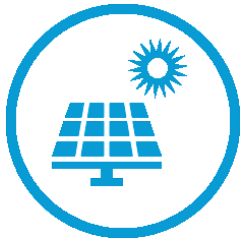
Solar irradiation sensor with PT100 Temperature probe

Digital and analog outputs (4-20 mA) and RTU GSL-IT-DA Modbus.



Easy4Hall

Split core multichannel device for string current measurement in photovoltaic systems



Split core multichannel device for string current measurement in photovoltaic systems

Precise and accurate data readings

BACK

PHOTOVOLTAICS PACKAGE COMPOSITION

ES WEB STANDARD PACKAGE ET

// ES WEB STANDARD PACKAGE

MENU II

REAL TIME

VIEW MEASUREMENTS
VIEW DEVICES PAGE
PIE CHART FUNCTION

// ES WEB STANDARD PACKAGE

MENU II

HISTORICAL DATA

HISTORICAL DATA
PERIODS COMPARISON
PILE GRAPH
BANDS CHARTS
PIE CHART
PERIODS SUMMARY
REPORT
SCATTER PLOT
CARPET PLOT
EVENTS LOG
HARMONICS
ALARMS LOG
EXPORT
MANAGEMENT PROFILES

+

PHOTOVOLTAICS PACKAGE ET

ESWEB

// PHOTOVOLTAICS PACKAGE

NEW FUNCTIONS IN ADDITION TO THE MENU

REAL TIME

PLANTS OVERVIEW

SOFTWARE

// PHOTOVOLTAICS PACKAGE

NEW FUNCTIONS IN ADDITION TO THE MENU

HISTORIC DATA

ENERGY ACCOUNT
DAY TO DAY
EFFICIENCY
PERFORMANCE RATIO
PROJECT ESTEEM
ENERGY
IRRADIATION,
TEMPERATURE,
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DISPLAY

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PERFORMANCE RATIO

ENERGY TEAM
ES WEB

Demo Photovoltaic plant kWp 380

PRODUCTION FROM 01/03/2017 TO 31/03/2017

Produced Energy kWh 55582 **CALCULATED PR 95,22%**

Accounted Energy kWh 43850

Inverter	Nominal AC Power (kW)	Nominal DC Power (kW)	Solarimeter	Irraggiamento kWh/mq	Temperature probe	Average Temperature	Ideal Energy kWh	Effective Energy kWh	Efficiency %
Inverter 1	150,0	144,0	Irradiation	132,1	Panels Temperature	33,8	18420,26	17800,68	96,64%
Inverter 2	220,0	216,0	Irradiation	132,1	Panels Temperature	33,8	27630,38	27185,72	98,39%
TOTALE	370	360,0		264,3		33,8	46050,64	44986,40	97,69%

// ESWEB

The performance ratio function allows the calculus to view a photovoltaic plant's efficiency.
Said elaboration can be done both on the whole plant and the single inverters.

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// PHOTOVOLTAICS PACKAGE

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PROJECT ESTEEM

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Real time | Historical data | Manage

> Home > Historical data > Prevision

Select plant: Fair Demo System kWp 380 | Select year: 2014 | Chart | Save

Year	Month	Energy (kWh) Day					Irradiance (kWh/mq) Day				
		Project values		Measurement values		Difference (%)	Project values		Measurement values		Difference (%)
		Daily forecast	Monthly forecast	Daily production	Monthly production		Daily forecast	Monthly forecast	Daily production	Monthly production	
			Total: 697928.57		Total: 679933.97	Difference (%): -2.58		Total: 1852.51		Total: 1977.68	Difference (%): 6.76
2014	January	1833.87	56849.82	1936.84	60042.17	5.62	4.45	137.95	5.68	176.09	27.65
2014	February	1872.68	52434.96	1775.99	49727.72	-5.16	4.60	128.80	5.14	143.97	11.78
2014	March	1888.01	58528.24	1910.59	59228.42	1.20	4.89	151.59	5.57	172.59	13.85
2014	April	1930.90	57926.85	1852.42	55572.46	-4.06	5.03	150.90	5.36	160.86	6.60
2014	May	1939.31	60118.53	1884.07	58406.02	-2.85	5.50	170.50	5.42	168.11	-1.40
2014	June	1995.80	59873.95	1869.38	56081.28	-6.33	5.95	178.50	5.42	162.72	-8.84
2014	July	2036.66	63136.39	1789.62	55478.15	-12.13	6.00	186.00	5.23	162.12	-12.84
2014	August	2016.28	62504.72	1799.23	55776.06	-10.77	5.78	179.18	5.24	162.38	-9.38
2014	September	1921.19	57635.76	1966.68	59000.43	2.37	5.34	160.20	5.77	173.13	8.07

// ESWEB

"project esteem" is a very useful function for photovoltaic plants since it lets compare theoretical production and irradiation data forecast during the project phase (forecast values) with the actual ones (measured values). This way it is possible to calculate eventual discrepancies and check eventual errors in the project.

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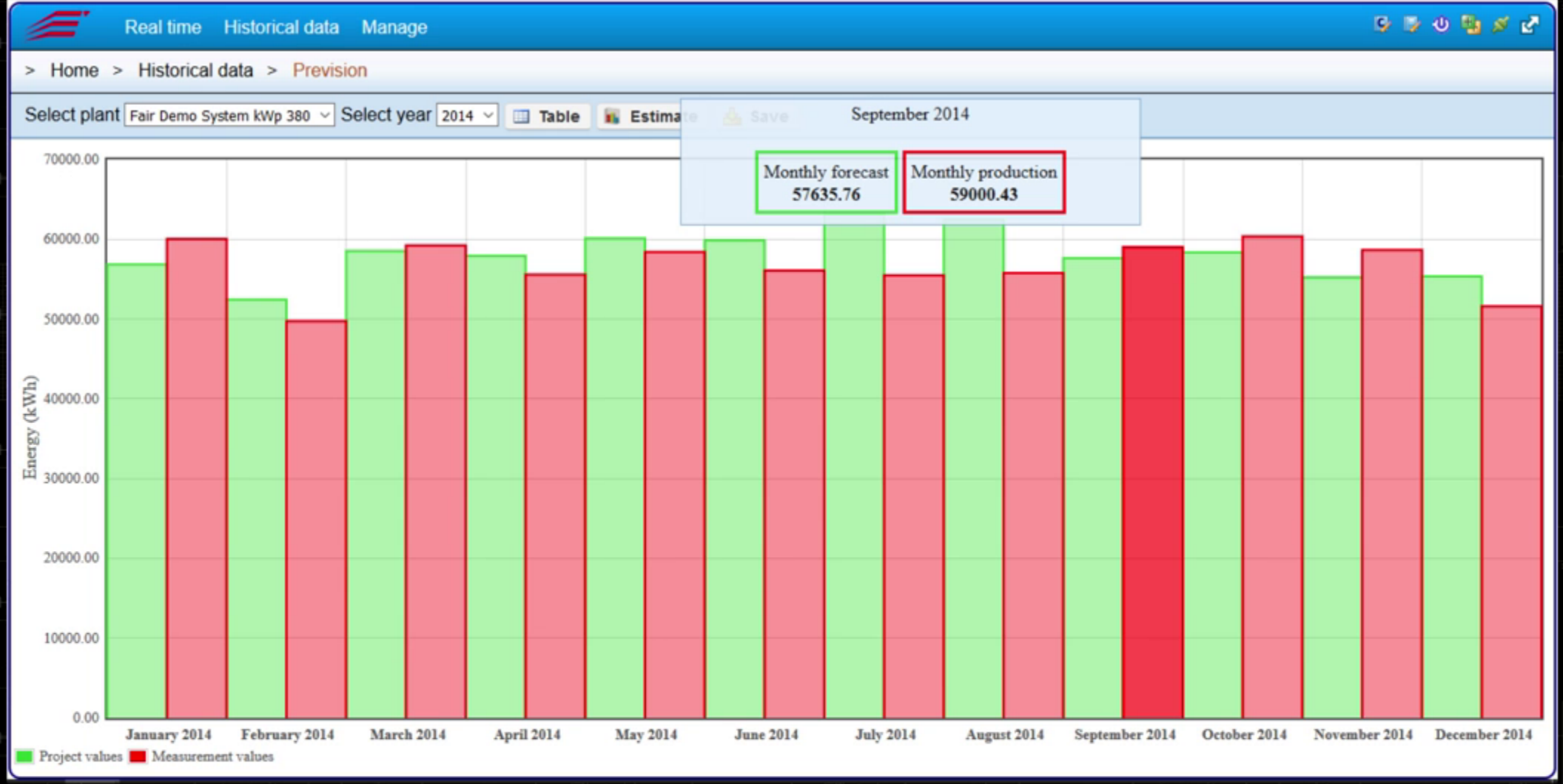

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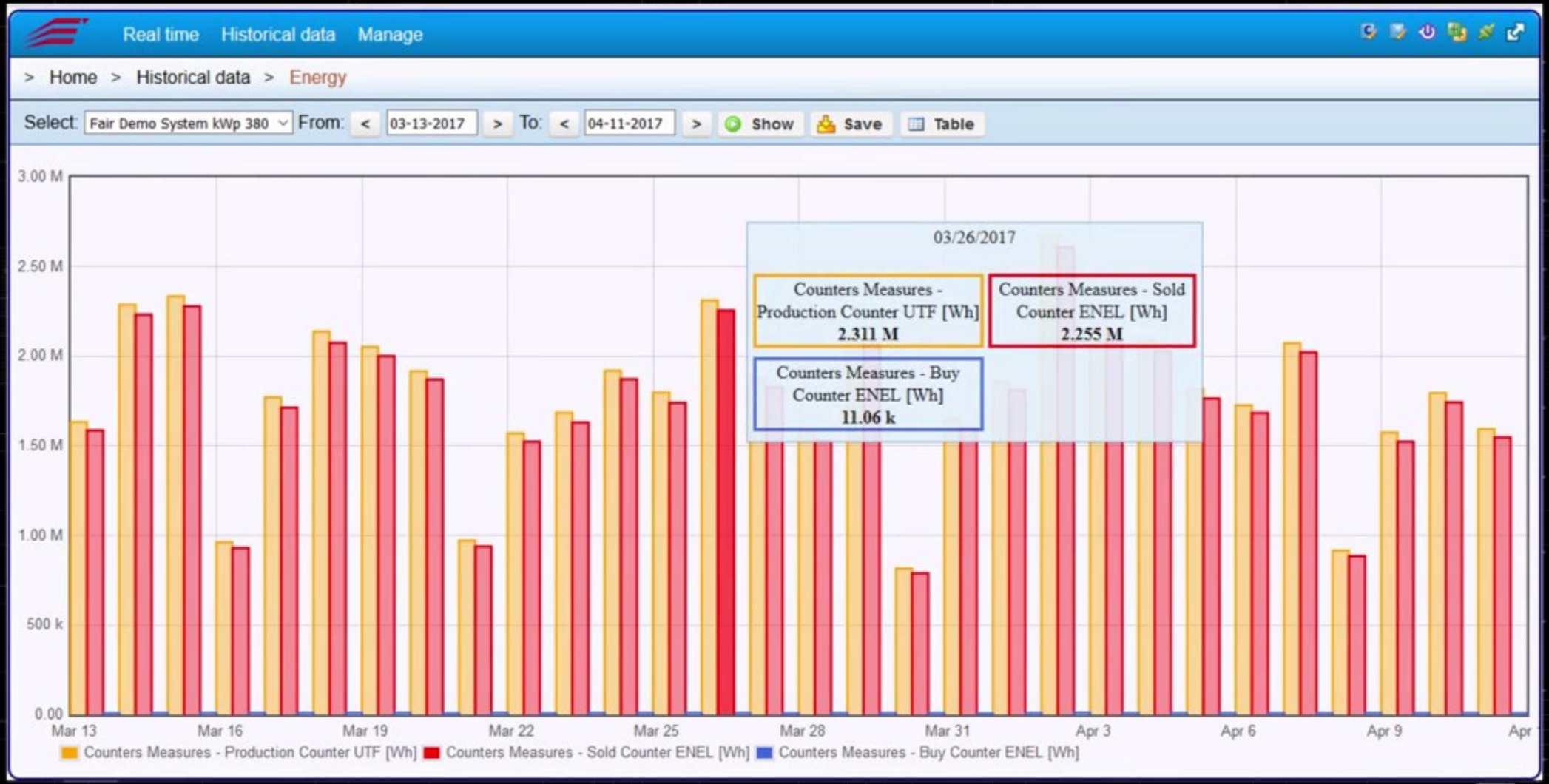

// ESWEB

Open the “energy” module to view the values of daily produced, sold and acquired energy.
This is a kind of a daily “energy balance” of the photovoltaic plant.

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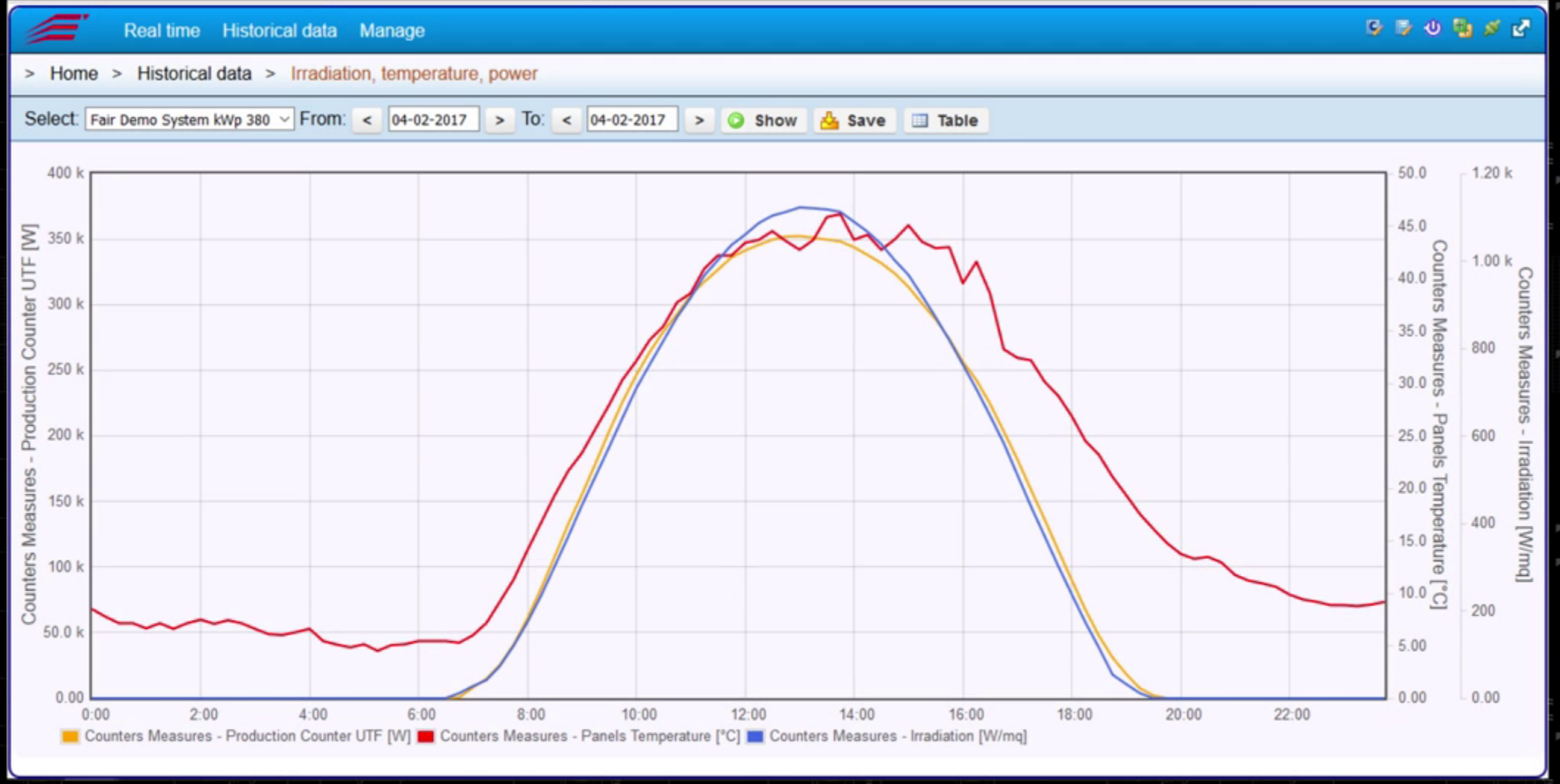

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The “irradiation, Temperature, power” function lets the user view, on a single page, the three quantities showing their trend in time in charts and graphs.

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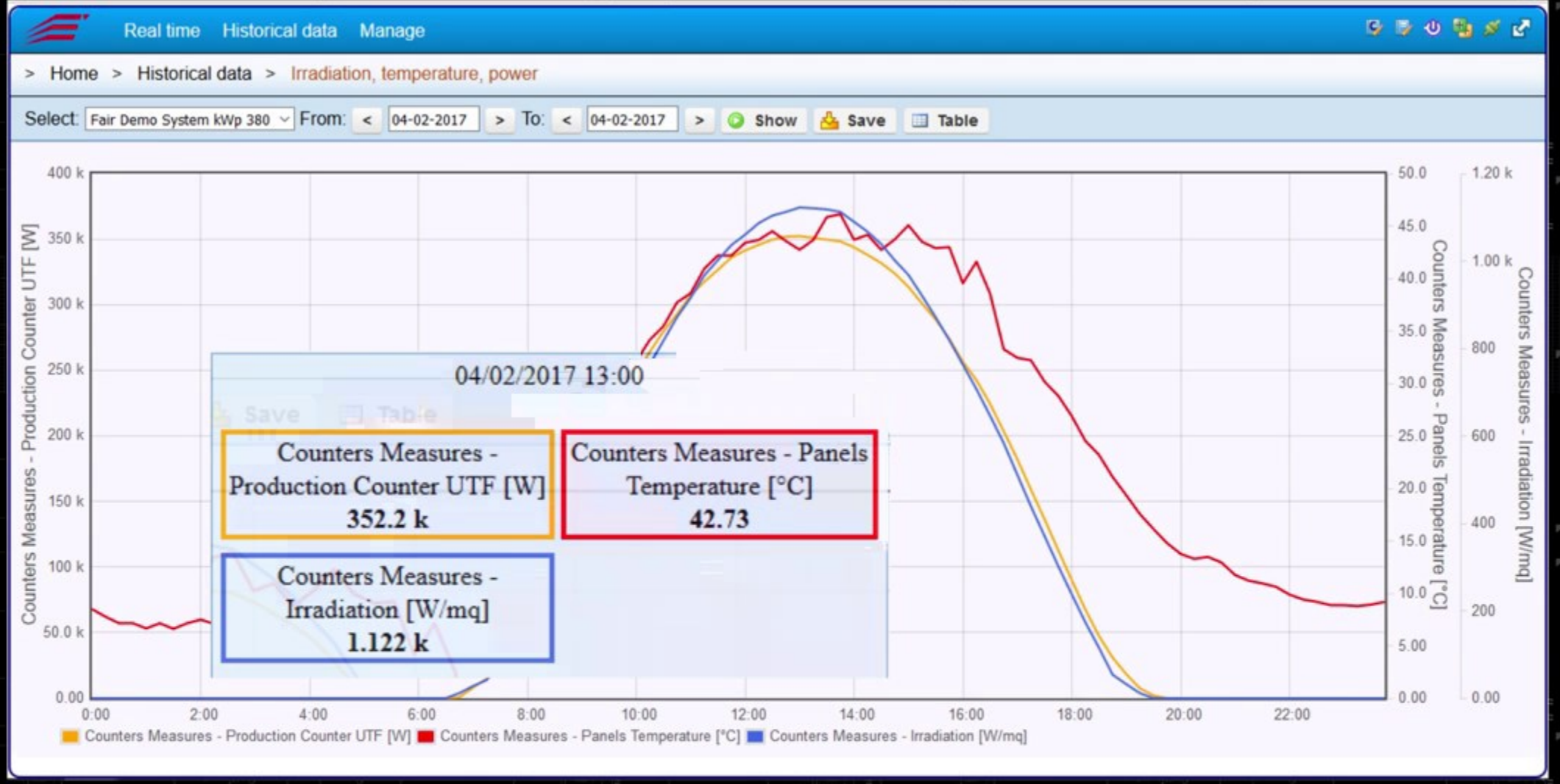

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good reasons to install an Energy monitoring system

Monitoring the photovoltaic system, small or large, is essential to ensure the success of the investment.

This is why it is essential to constantly monitor the "state of the art" and the productivity of your photovoltaic system to ensure that it constantly produces how and how much it is designed to produce.

Why the photovoltaics is not a cost, but a low risk investment.

How to constantly monitor the productivity of your photovoltaic system?

Obviously it is impossible, without the right tools, to constantly monitor the functioning of the photovoltaic system, 24 hours a day and 365 days a year.

In everyday life every person is taken by a thousand activities and for this reason it is humanly impossible to control counters, inverters, numbers and measures related to the operation of your solar system every day .

good reasons to install an Energy monitoring system

We need an automated technological system

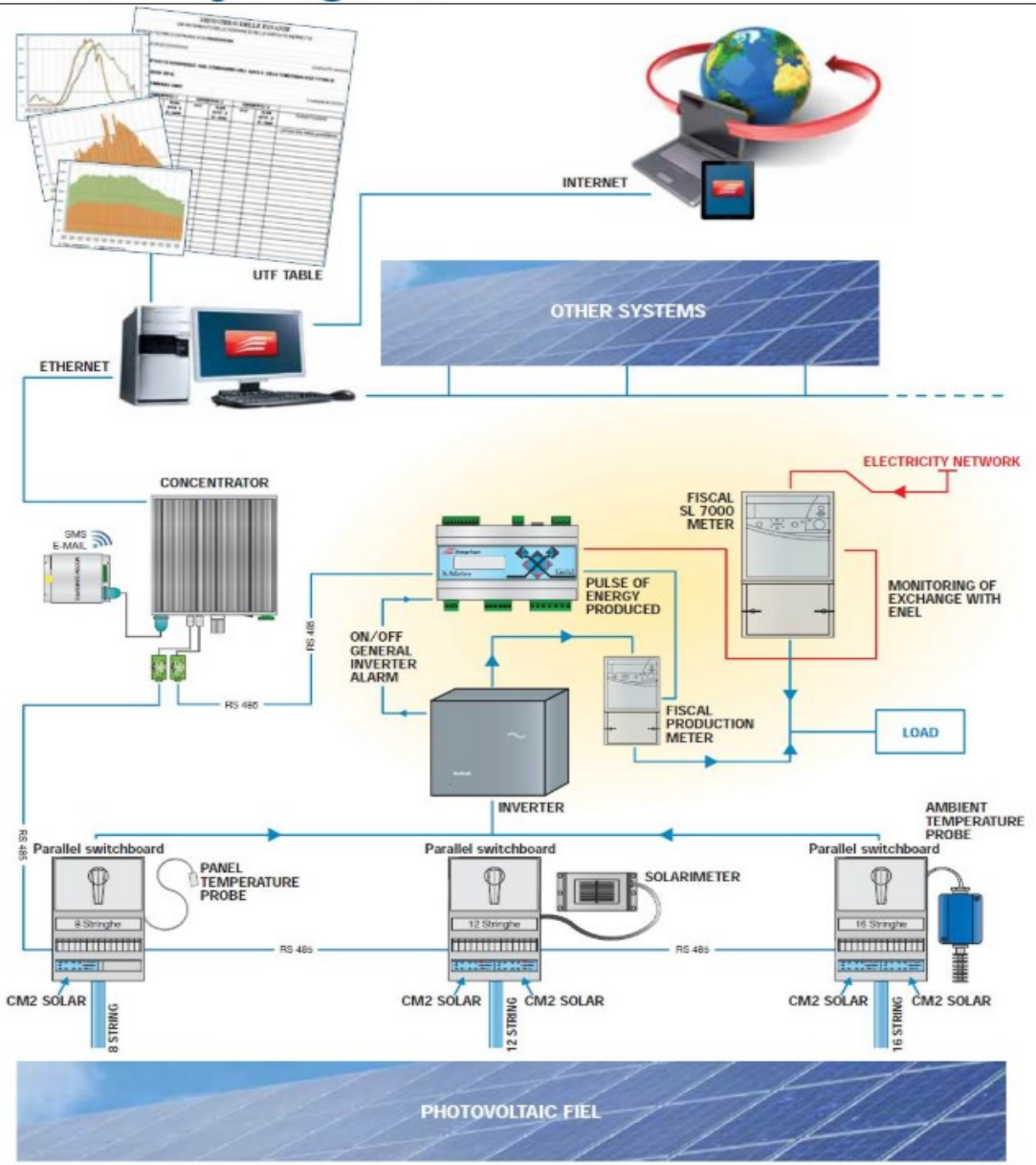
In case of breakdowns or malfunctions it is important, indeed fundamental, to **intervene in time**, without losing the precious kwh products that are, after all, the main responsible for the success of the investment.

In fact, the time of **return from the investment** will be respected if the plant produces over time what was planned.

If any form of malfunctioning of photovoltaic panels, inverters or any other component is not detected and corrected instantly, it risks causing considerable economic damage to the owner of the system, thus lengthening it in times of return from the investment.

For this reason it is essential to be able to intervene in a timely and effective manner.

Assembly diagram



10 good reasons to install an Energy monitoring system

1) Monitoring, Analysis and Remote Configuration of the Photovoltaic System

2) Visualization of all the main PV System Data stored through Data-Logger.

3) Instant detection of faults and malfunctions by Alarm

4) Automatic and simultaneous monitoring of multiple inverters

5) Possibility to visualize data in real time from every Web Browser

6) Possibility of formulating a periodic automatic report on the system's performance

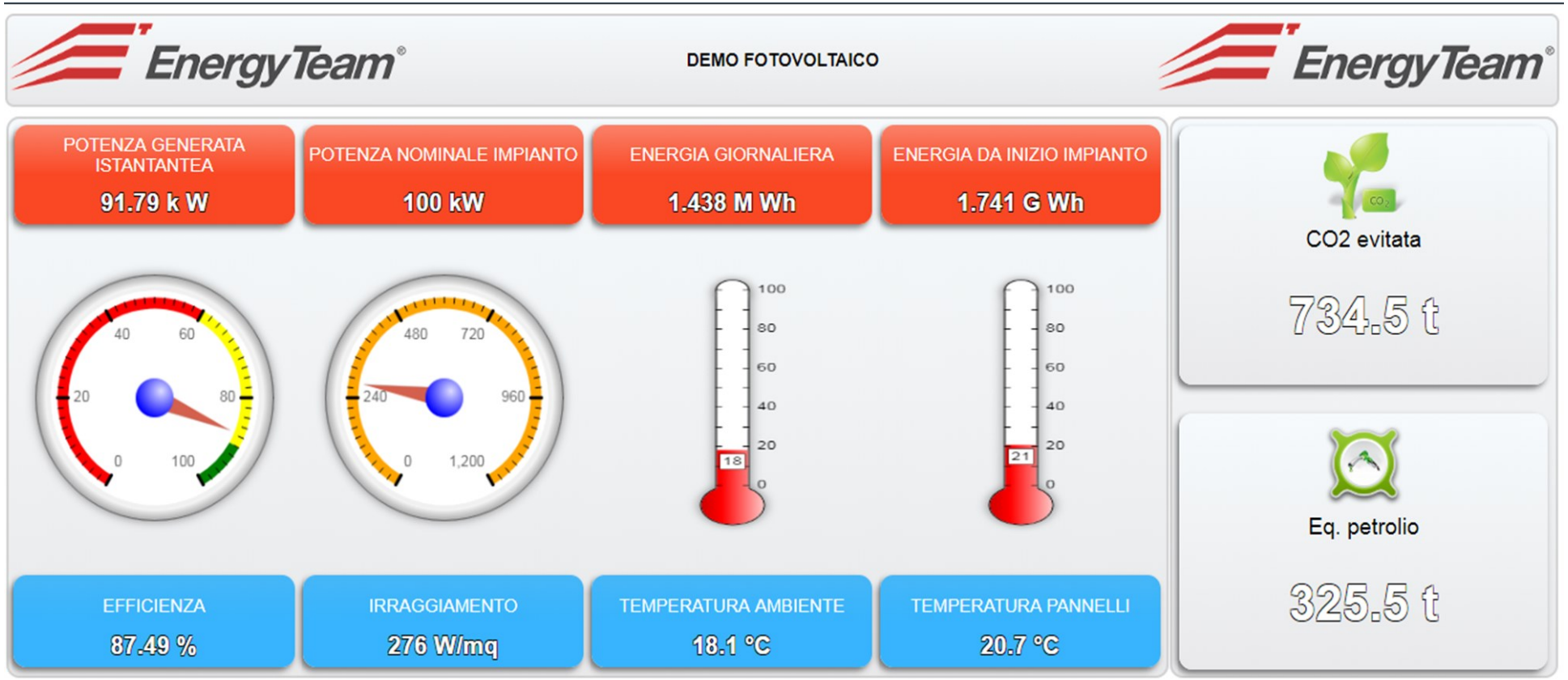
7) Possibility to have only one Monitoring Solution to view both:
   - Your company "Business" consumptions
   - Supervision the performances of your Photovoltaic

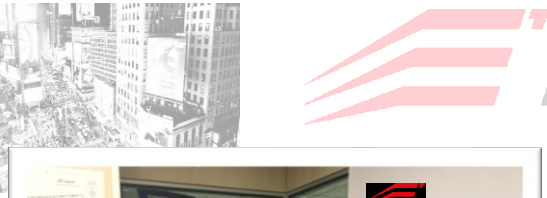
8) Possibility to view all your PV installation on the same platform, check the own investment in order to compare which is the most productive.

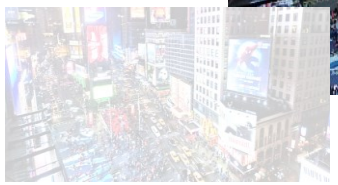
9) Possibility to forecast future production.

10 good reasons to install an Energy monitoring system

10) Possibility to set a Interactive Dashboard to see everyday activities of your Plant







Thank you for your time and attention

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