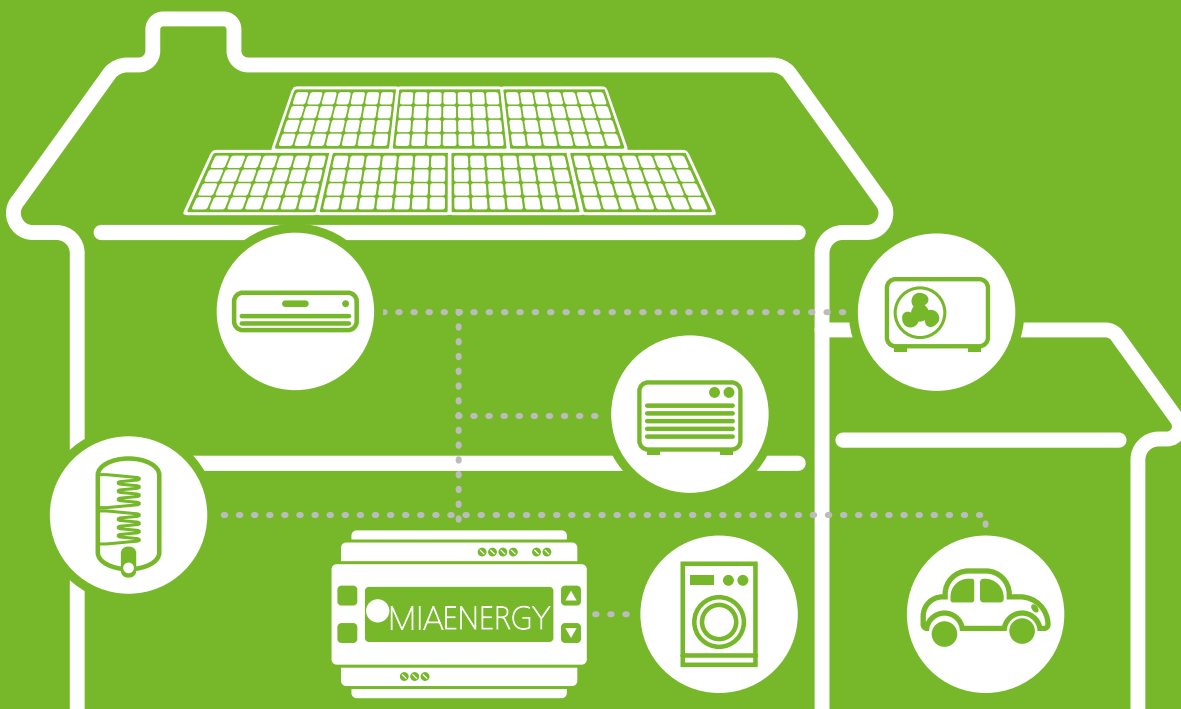# MIAENERGY
SELF CONSUMPTION

Maximum return from your PV system

100% Self-consumption with just one instrument

Management of up to 6 loads

Heat storage for the free production of domestic and technical hot water

SMART SELF CONSUMPTION

MIAENERGY

Self-consumption of the energy produced by a PV system: the most advantageous solution

The progressive **reduction of incentives** in the PV sector, based on feed-in tariffs, makes **self-consumption of the energy produced while it is being produced the best solution** for maximum return, **without the need for great investments in electricity storage systems**, which offer practical advantages but are not economically viable.

Electricity must therefore be consumed in the moment of maximum daily production, for this reason the loads must be managed in a smart and automatic way.

Mia Energy Autoconsumo
(Self-consumption)

is a complete professional instrument that features a set of **integrated functions**, available for the first time in **one single device**. These functions offer electricians and heating installers unbeatable **flexibility of use** for the design of new systems and the optimisation of existing ones.

Smart technology offers PV system owners up to 6 kW single-phase, with the aim of achieving a **sustainable eco-friendly house and almost 100%** self-consumption of the electricity produced.

All the functions in one single device without additional modules.
What can you do with Mia Energy?

Install it on PV systems up to 6 kW single-phase

Control or automatically feed up to 6 loads: 2 resistive loads in a proportional way and 4 wireless On/Off loads and/or wired On/Off loads.

Create heat storage, by heating water for domestic/technical use, using a boiler or thermal storage (Puffer), whose elements (max. 6 kW) are fed proportionally to the energy available from the PV system. Using the comfort function of Mia Energy you can set and control the desired water temperature.

Control SG Ready domestic appliances: heat pumps, air conditioning, washing machines, dishwashers etc with the Smart Start function (remote activation).

Feed resistive loads with On/Off relay: radiators, electric stoves, appliances such as washing machines and dishwashers fitted with automatic start.

Feed inductive loads (max. 6 kW) such as: electric car chargers, pumps, motors, heat pumps to heat and cool rooms.

Feed resistive loads via Wireless connection , without the need for wiring. It is sufficient to insert the loads in the remote controlled sockets. They will be remotely activated by Mia Energy when PV energy is available.
It is suitable for radiators, electric stoves, appliances such as washing machines and dishwashers fitted with automatic start.

These functions are available in all the Mia Energy kits:

Monitoring and display of the energy produced, consumed and fed, through the on-board display or on your Smartphone, iPad and PC using the optional Mia-Wi-Fi module **WiFi**

PV system stop signal: it signals when the system is down or there is a fault in the inverter; it sends an alarm once the set waiting time has been exceeded. The alarm can be signalled externally with a buzzer or light signal which will be controlled by the relay code AF1.RELE12V16AZ, to be added to the selected kit.

Anti blackout due to overload. If the consumption from the grid is higher than the amount agreed, Mia Energy temporarily disconnects an "expendable" load for the time necessary to return within the allowed consumption. This operation avoids the triggering of the magneto-thermic switch and the consequent blackout.

Grid balance function to prevent inverter shutdown due to overvoltage. IIn areas of high PV density surges that disconnect the inverters from the grid are frequent. With this function, in the event of surges, Mia Energy will forcedly activate a load, for example the electric boiler, for the time necessary to lower the mains voltage to a safe value.

Universal. Each configuration can be expanded and integrated with the accessories found in the catalogue.

Our technical department is available to support customers in sizing the Mia Energy systems to meet specific needs.

Hot water from PV system kit

Heat storage

The Mia Energy Hot water from PV systems kit offers the possibility of independently feeding a boiler or puffer with an element up to 6.0 kW, for the heating and storage of domestic and technical water, self-consuming the energy produced by the PV system.
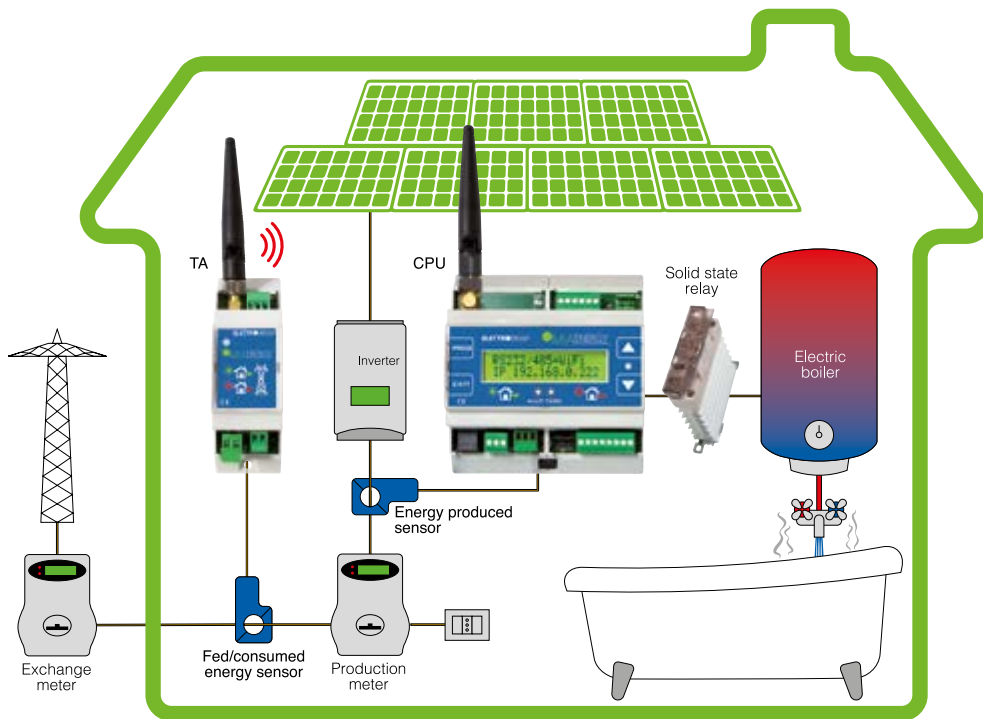
Hot water from PV system - Description

The element inside the boiler/accumulator is managed by **Mia Energy** via the output from 0 to 100% and is powered through AF1.G3PE215B (3 kW) or AF1.G3PE225B (6 kW) solid state relays. This system controls the boiler/accumulator to heat the water in a proportional way according to the amount of electricity available from the PV system. **The water temperature is displayed and is set directly from Mia Energy.**

Forced heating function

To prevent the water not reaching the set temperature due to lack of sunshine and consequently lack of energy from the PV system, **the "Forced heating" function must be activated.** This ensures that when the NTC temperature probe detects a low water temperature (settable threshold), it activates the solid state relay and starts to consume electricity from the grid until the required temperature is reached; above the required temperature it shall once again give priority to the self-consumption of energy from the PV system when available.

Kit composition
1 Mia Energy CPU (code AF1.MIAENERGCPR)
1 Mia Energy TA (code AF1.MIAENERGYTR)
1 Solid state relay (code 011.G3PE215B for loads up to 3 kW) or (code 011.G3PE225B for loads up to 6 kW)
1 Temperature probe range -20% + 105° to control the water temperature in the boiler (AF1.103AT-11)

SG Ready control kit

Utilities that can be controlled remotely
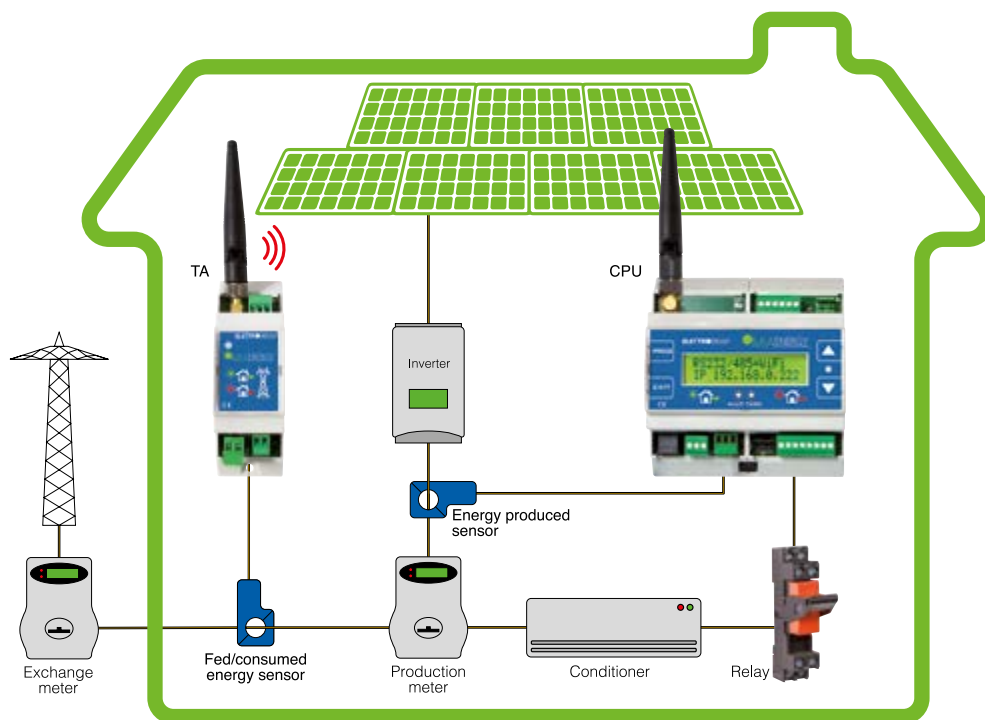
SG Ready load control - Description

When there is energy available from the PV system, with this kit you can control, by closing the contact of a relay (up to 4), SG-Ready domestic appliances and devices with Smart Grid function, i.e. that can be switched on and off remotely. For example heat pumps for heating, cooling, conditioners and washing machines.
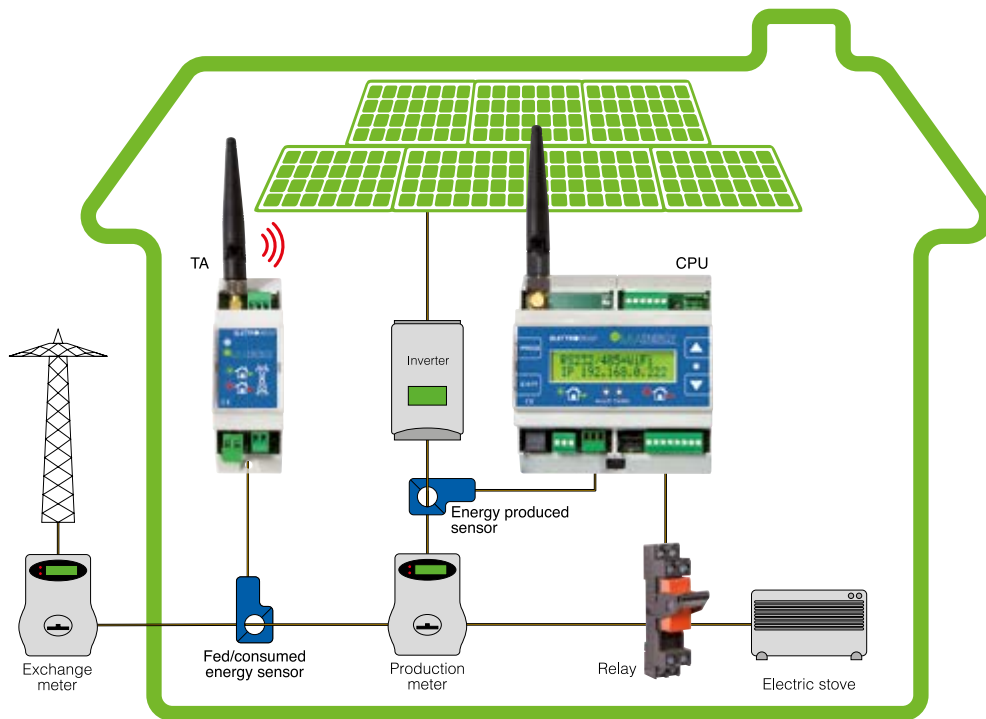
Composizione del Kit

1 Mia Energy CPU (code AF1.MIAENERGCPR)
1 Mia Energy TA (code AF1.MIAENERGYTR)
From 1 to 4 Relays 12V 16A (3.5 kW) on DIN socket (code AF1.RELE12V16AZ)

Resistive load kit

On/Off feeding of resistive loads up to 3.5 kW with wired relay contact

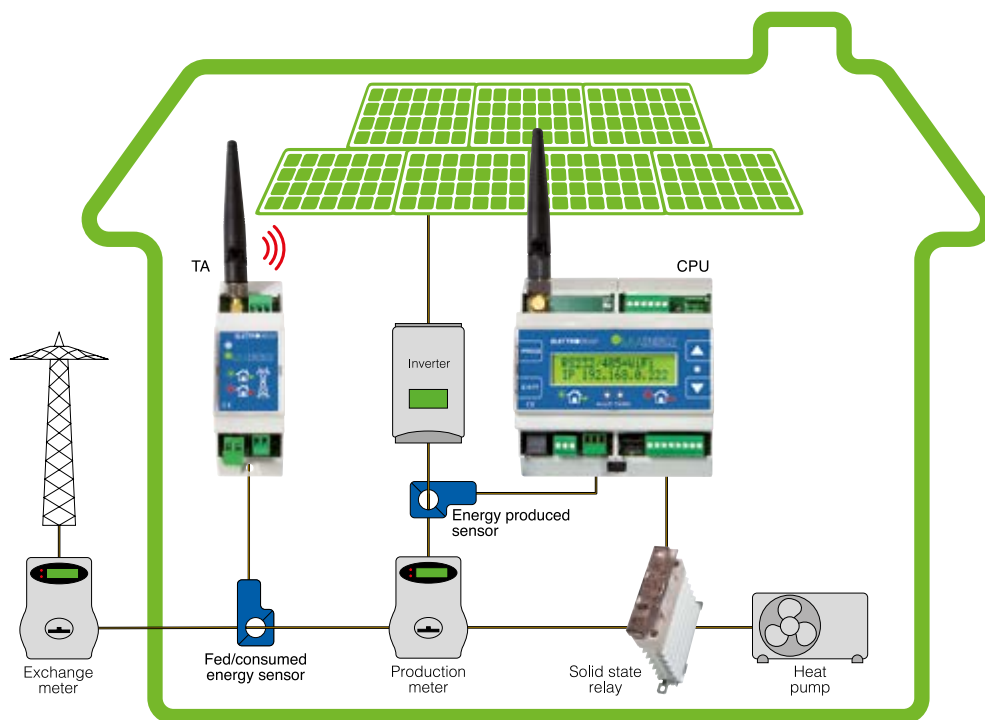## Feeding resistive loads - Description

With the same relay wired system of the previous SG Ready kit, it is possible to feed resistive loads in On/Off mode, i.e. providing power when PV energy is available and switching it off when it is no longer available.   It is suitable for radiators, electric stoves, appliances such as washing machines and dishwashers fitted with automatic start.

Kit composition

1 Mia Energy CPU (code AF1.MIAENERGCPR)
1 Mia Energy TA (code AF1.MIAENERGYTR)
From 1 to 4 relays 12V 16A (3.5 kW) on DIN socket (code AF1.RELE12V16AZ)

Inductive/Capacitive load kit

On/Off feeding of inductive-capacitive loads up to 6 kW with wired solid state relay.

TA
CPU
Inverter
Energy produced sensor
Exchange meter
Fed/consumed energy sensor
Production meter
Solid state relay
Heat pump

## Feeding inductive/capacitive loads - Description

This category of loads is characterised by a peak of current when switched on and off; for this reason they cannot be powered through a standard electromechanical relay as the contacts would be damaged. This category includes, for example: electric car chargers, motors, pumps and heat pumps.

Kit composition

1 Mia Energy CPU (code AF1.MIAENERGCPR)
1 Mia Energy TA (code AF1.MIAENERGYTR)
From 1 to 4 solid state relays AF1.G3PE215B (3 kW) or AF1.G3PE225B (6 kW).

Remote controlled load kit

On/Off wireless feeding of resistive loads up to 3.6 kW with smart sockets
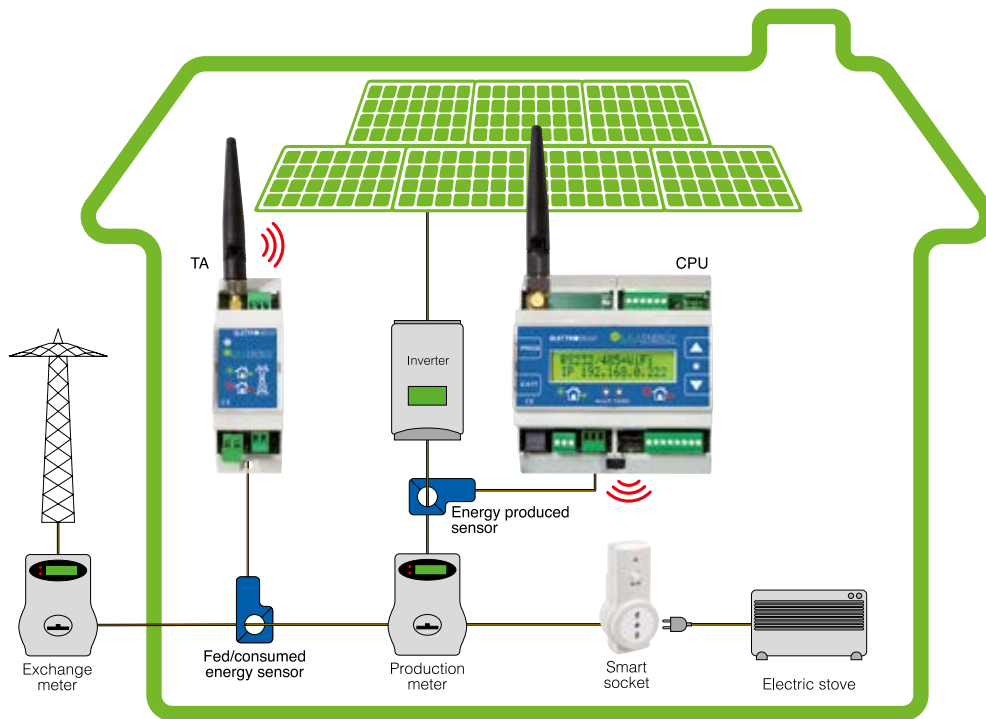
## Resistive loads wireless feeding - Description

This configuration allows you to manage self-consumption through the automatic control of maximum 4 wireless sockets (2 are included in the kit), which must be connected to the same number of preferential loads, to be switched on or off according to the programmable priorities and thresholds and to the availability of the energy from the PV system. It is suitable for radiators, electric stoves, appliances such as washing machines and dishwashers, etc., fitted with automatic start.

Kit composition

1 Mia Energy CPU (code AF1.MIAENERGCPR)
1 Mia Energy TA (code AF1.MIAENERGYTR)
From 1 to 4 Wireless sockets 3680 W Wireless 433.92 (code AF1.PR3680W)
1 Remote control 5CH Wireless 433.92 (code AF1.RC5C433.92)

Wi-Fi Monitoring Kit

Monitoring and display on Smartphone, iPad and Pc of the energy produced, fed and consumed. Manual load control.
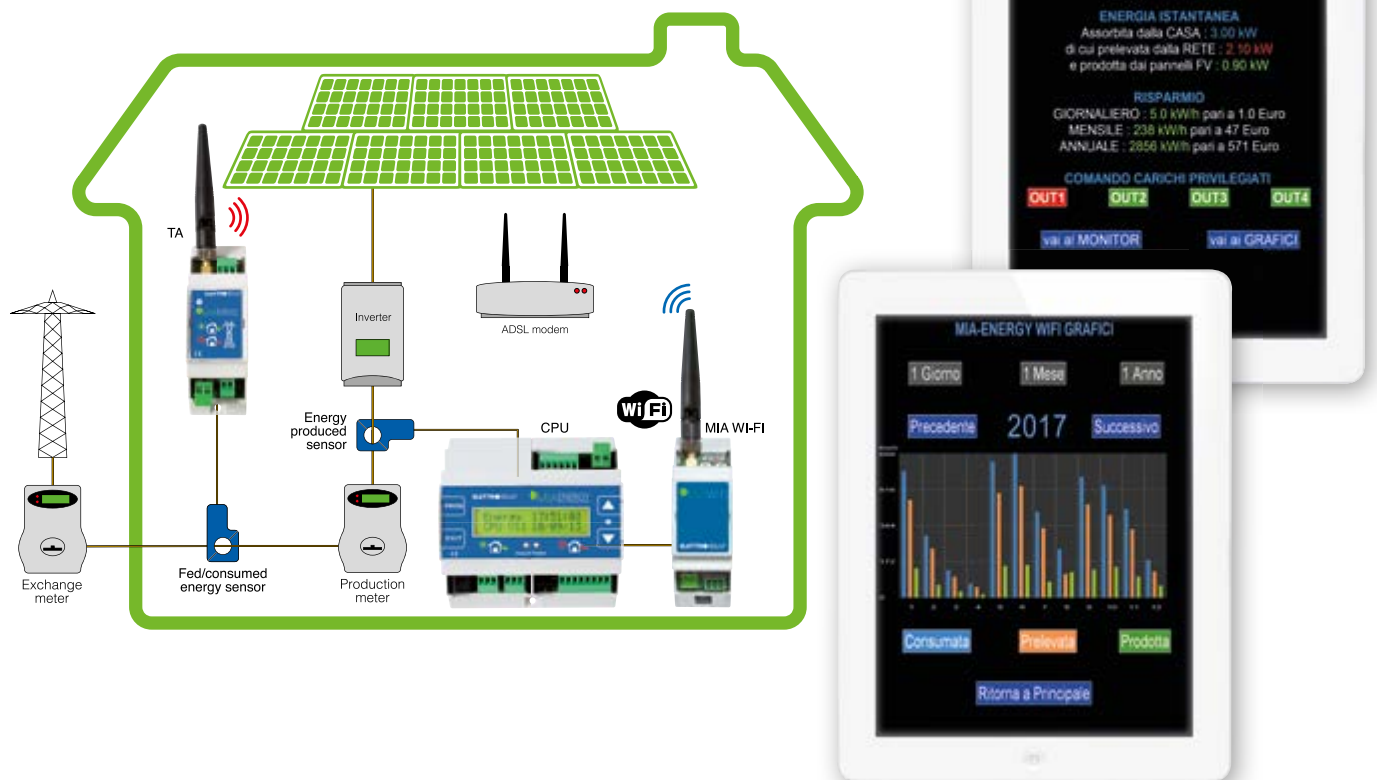
Wi-Fi Monitoring - Description

Mia Wi-Fi is an accessory that can be combined with any configuration of Mia Energy Autoconsumo. It acts as a Web Server and generates HTML pages that can be displayed on a Smartphone, iPad and PC just as if you were accessing an Internet page. In this way, the various parameters related to the energy consumed, fed and produced can be monitored.
To display the information remotely it is necessary to have a static IP or use a dynamic IP management service such as www.dyndns.it o www.noip.com.

Kit composition

1   Mia Wi-Fi (code AF1.MiaWi-Fi)

Mia Energy Autoconsumo components

Mia Energy CPU
(code AF1.MIAENERGCPR)
This is the main device of the **Mia Energy Autoconsumo** system, for each configuration. It collects data on the energy from the 2 TA (one is supplied with wired connection and measures the energy produced by the PV system,) and according to the priorities set it decides to switch on or off the loads, in wired and wireless mode. It manages communication with the Wi-Fi module, historical readings as well as all the functions of this system.

Nominal power	230+/- 20% (184..276V)
Absorption	1.5W Min 6 W Max
Secondary power supply with built-in battery charger	External backup battery 12V 1.2A Pb (not supplied)
Clock/calendar	Correct time is maintained for at least six months in case of lack of power supply
Internal memory	Historical data of energy consumed, produced and fed
Digital outputs	4 NPN outputs to control 4 external relays, total maximum consumption allowed for the 4 relays: 1.6 W
Analog outputs	2 analog outputs 0..12v, transformable into PWM outputs 1Hz/PWM 100Hz with variable Duty Cycle.
Analog inputs	2 analog inputs 0...60V 1 NTC temperature probe input 1 input 0..26A 7Kva via external TA
Possible settings	from 0 to 6 kW input and output
Port RS232/RS485	To communicate with a PC or other devices
Port RS485	To communicate, via wire, with Mia Energy-TA
Wireless module	434 Mhz to communicate with Mia Energy-TA
Remote controlled sockets	Possibility to manage up to 4
Radio transm. power	10mW
Radio transm. distance	150 m outdoors - 40 m indoors
Container	6 Modules, DIN rail or wall mount
Operating temperature	from -10 to +50°
Size	105 x 110 x 65 mm
Weight	310 g

Mia Energy TA
(code AF1.MIAENERGYTR)
This is the TA reading device, which measures the energy fed and consumed to/from the grid.
It connects to **Mia Energy CPU** and transmits data in wired and wireless mode.
The last option is useful when, due to the configuration of the PV system, a wired connection is difficult.

Mia WiFi
(code AF1.MIAWIFI)
This device connects the local Wi-Fi network with devices such as: Smartphone, iPad and Pc.
It can be positioned in the ideal place to receive the strongest signal.
Through the HTML pages in the Mia Energy memory, you can display various energy production and consumption parameters, graphs, remotely switch on and off the related loads, access and modify the main parameters of the machine.

Nominal power supply	230+/- 20% (184..276V)
Absorption	0.5 W
Led	1 two-coloured led to signal energy being fed or consumed
Quantities measured	Voltage, current and power of the electrical grid
Detection system	TA without wire interruption
Maximum measurable instantaneous power	7 kW 25 A
Voltage reading resolution	1 Volt
Current resolution	0.1 Ampere
Power reading resolution	1W
Port RS485	For wired communication with Mia Energy-CPU
Wireless module	434 Mhz to communicate with Mia Energy-Cpu-R
Antenna	External, on SMA screw connector
Radio transm. power	10 mW
Radio transm. distance	150 m outdoors - 40 m indoors
Operating temperature	from -10 to +50°
Container	2 Modules, DIN rail fastening
Size	36 x 110 x 65 mm
Weight	180 g

Nominal power supply	230 VAC
Absorption	2W
Output power	12dBM
Frequency	2.4Ghz
Safety	WEP128-WPA PSK- WPA2 PSK
Setup	WPS
Supported protocols	802.11b – 802.11g
Based on	RN171 MicroChip
Communication port	RS232
Operating temperature	From -10° to +50°
Container	2 Modules, DIN rail fastening
Size	36 x 110 x 65 mm
Weight	175 g

Solid state relay
(code 011.G3PE215B)
loads up to 3 kW

(code G3PE225B)
loads up to 6 kW

This is used to control resistive loads from 3 kW to 6 k in a proportional way in relation to the energy available from the PV system.

Relay 12V 16A, Din socket
(code AF1.RELE12V16AZ)

This is used to control preferential wired loads when the wireless connection is not available.

Control voltage	12/24VDC
Load voltage	from 100 to 240V
Nominal current	15A/25A
Applicable resistive load	3 kW/6 kW
Installation	DIN rail
Size	H 100, L 100 ,D 23 mm
Model	with zero switch suitable only for the setting PWM 1Hz.
Compliant with	UL, CSA, EN standard (TUV certified)

Power supply	12VDC nominal
Maximum switching power CA	4kW
Socket	with DIN coupling and fastening clip

Temperature probe
(code AF1.103AT-11)

Temperature probe 10k +/-1% (range -20° + 105°) that detects and controls the temperature of the water in a boiler or accumulator. It is used together with the Solid state relay in the Hot water from PV system kit.

3680W Wireless socket 433.92
(code AF1.PR3680W)

Remote control 5CH Wireless 433.92
(code AF1.RC5C433.92)

This switches on and off the wireless loads (max 4 remote sockets).
Each kit requires a remote control.

Voltage	220Vac/50Hz
Power	3680 W
Reception frequency	433.92 Mhz
Reception distance	20 m (approx.)