



# Green Energy Controller<sup>®</sup>

Product Information



Jan Ekiel  
IoT Oak CEO

# Green Energy Controller reduces costs of electricity consumption.

- Every energy consumer can control the cost of electricity consumption. Thanks to the Green Energy Controller, you can draw the energy at the moment, when it is the most advantageous for you.
- A prosumer (an owner of a PV system) can increase the economic efficiency of investments by controlling energy storage and receivers.

Green Energy Controller is on guard of electricity consumption. The Controller reads data in real-time from one or more electricity meters and connected inverters.

The Controller sends the collected data to the server. The user can display the visualized data in the Internet panel, analyze it and compare the consumption and production of electricity. The Green Energy Controller enables remote and automatic control by four receivers or electric power circuits.

**The analysis of energy enables users to select the best energy supply offer.**

To optimize costs, the Controller can turn on and turn off connected receivers and electrical circuits.

**The Controller will turn on the energy receivers exactly at the moment when the price for the energy will be more advantageous for the user. For example, water in electric boilers could be heated at night when energy is the cheapest.**

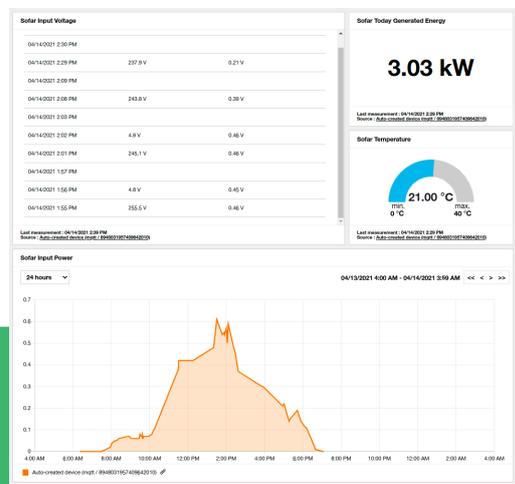
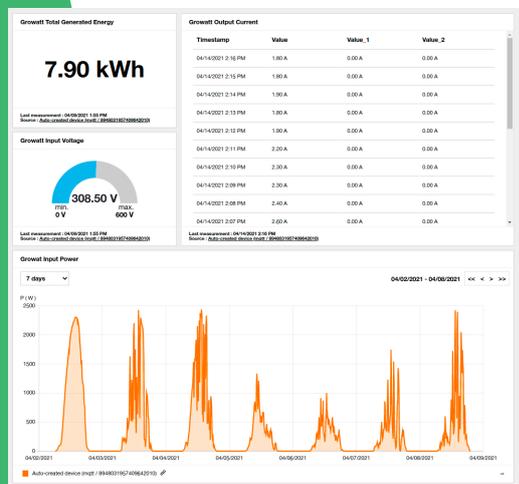


Fig. 1.2 The Controller reads all the data important for energy consumers directly from the inverters and energy meters. Data is sent to the IoT cloud where it can be analyzed and displayed.

Sofar Today Generated Energy

3.03 kW

Last measurement : 04/14/2021 2:29 PM  
Source : Auto-created device (mqtt / 8948031957409642010)

WE SUPPORT VARIOUS  
ENERGY METERS

Growatt Total Generated Energy

7.90 kWh

Last measurement : 04/09/2021 1:55 PM  
Source : Auto-created device (mqtt / 8948031957409642010)

The Controller could be also programmed to turn on and off automatically at the moment when it is needed. This functionality can help in different situations. For example, if all workers in your factory have a lunch break at 12:00, you can automatically turn off some of the machines which are not used at 12:05. Saved energy can be redirected and used at a cafeteria, where it is needed at this particular moment.

**The Controller is also useful for owners of photovoltaic farms. Storing and consuming energy on your own energy is more cost-effective than selling the produced energy to the operator for subsequent purchase. Receivers and energy stores will be turned on at the moment when the energy production of the PV system will exceed users' consumption.**

Green Energy Controller has multiple usage scenarios, especially in cases, when:

- it is important to analyze the consumed or produced energy in real-time;
- it is possible to reduce the cost of energy consumption by automatically controlling receivers and circuits;
- it is possible to optimize the usage of the produced energy in photovoltaic installations;
- it is important to minimize the risk of additional costs connected with exceeding the limits defined in contracts:
  - total energy consumption limit;
  - the maximum instantaneous power consumption;
  - generation of reactive power limits;
  - frequency containment reserves.
- Submetering allows monitoring energy consumption costs for charging purposes.

The Controller allows you to connect:

- 128 Modbus RTU energy meters;
- 512 counters with pulse outputs (adapters required);
- 500 counters supporting the mBus standard;
- meter bus (adapters required).
- on-demand power supply with online and prepaid charges



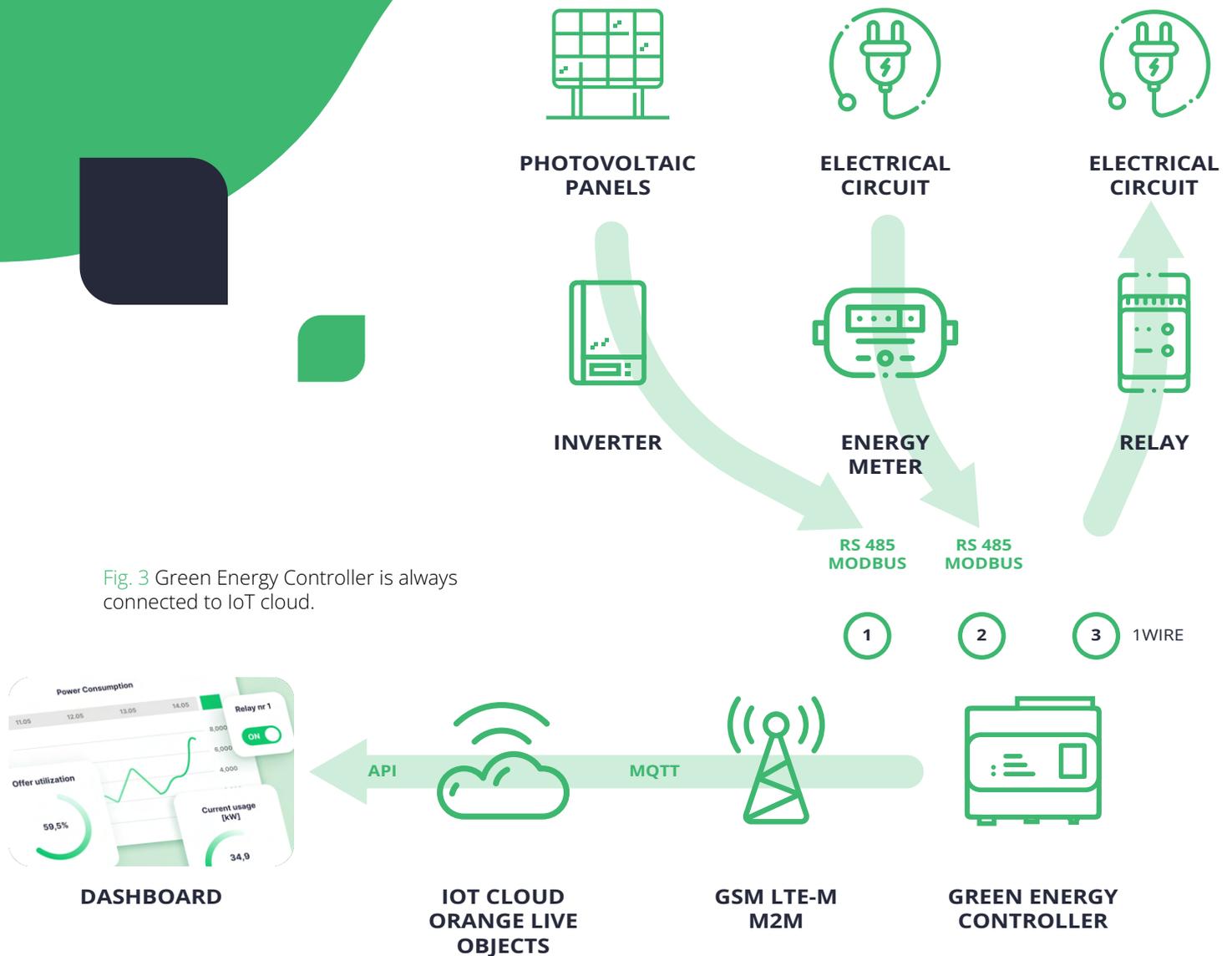


Fig. 3 Green Energy Controller is always connected to IoT cloud.

## Description

- The Controller installed in the electrical switchgear receives data from the power consumption counters and inverters via **RS485 Modbus interfaces, digital interface, and mBus**.
- The Controller manages **4 relays** which are used to control sub-networks and energy receivers such as electric boilers, heat pumps, air conditioning, heating, and energy storages.
- The Controller is connected to the Internet via **LTE Cat M1, Narrowband IoT or WiFi**.
- Data is collected in the IoT cloud and visualized in the **user's dashboard**.
- You can define **a relay control calendar** based on the time of day and the energy-efficient tariff by using the web and mobile applications.
- In web and mobile applications, it is also possible to **define relay control algorithms** using information about consumption and energy balance. This mechanism helps to improve the efficiency of the photovoltaic installation.

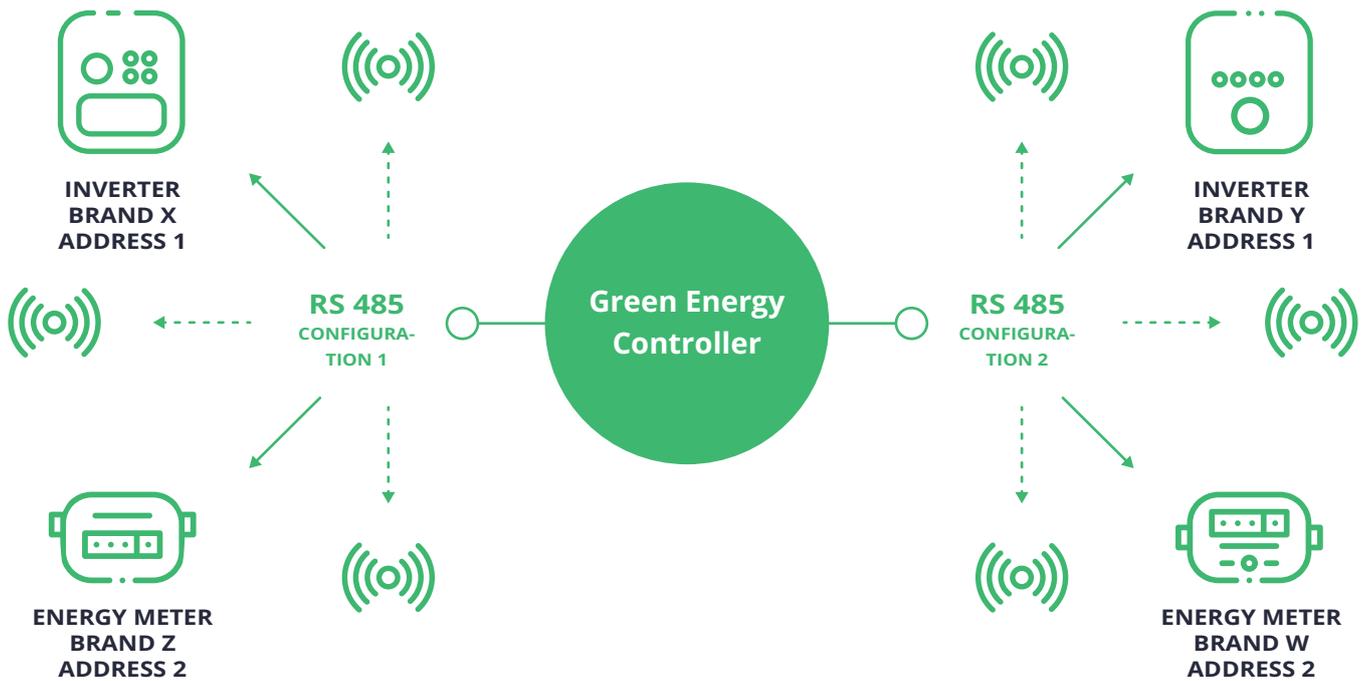


Fig. 4 Green Energy Controller collects data from many devices created by different manufactures at the same time.

## Specification Hardware

- Module ESP32 WROVER (8MB RAM, 16MB Flash)
- Wifi 802.11b/g/n
- Bluetooth v4.2 +EDR
- miniPCIe slot, supported modem Quectel BG95 i BG96 (GPRS/LTE-M/NB-IoT)
- SIM Card slot,
- 2 x port RS485
- 4 x digital output
- Power DC 9-40V
- Installation on DIN rail

## Specification Software

- The MQTT protocol enables quick integration with IoT clouds.
- ModBus protocol enables flexible implementation of communication with many devices at the same time in power engineering and industry.



## IoT Oak Team

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The skilled team of **IoT Oak** has a long experience in building integrated solutions. The team of designers and developers implements and maintains IoT systems using embedded devices, websites, utility, Internet and mobile applications.

Along with Smart Energy Controllers, the company offers **design, implementation, development and software services**. Our consultant team supports clients and partners in building requirements and designing systems. The team of developers takes care of the design of user interfaces, implementation of web applications and client applications as well as quality assurance and project control.

The IoT Oak team provides system **development services, maintenance and DevOps after implementation**.

We implement customer care applications and integrate Controller to CRM and BMS systems.

