Axpertino

USER GUIDE

For SW version 1.01

by Jiří Jirutka, 2022

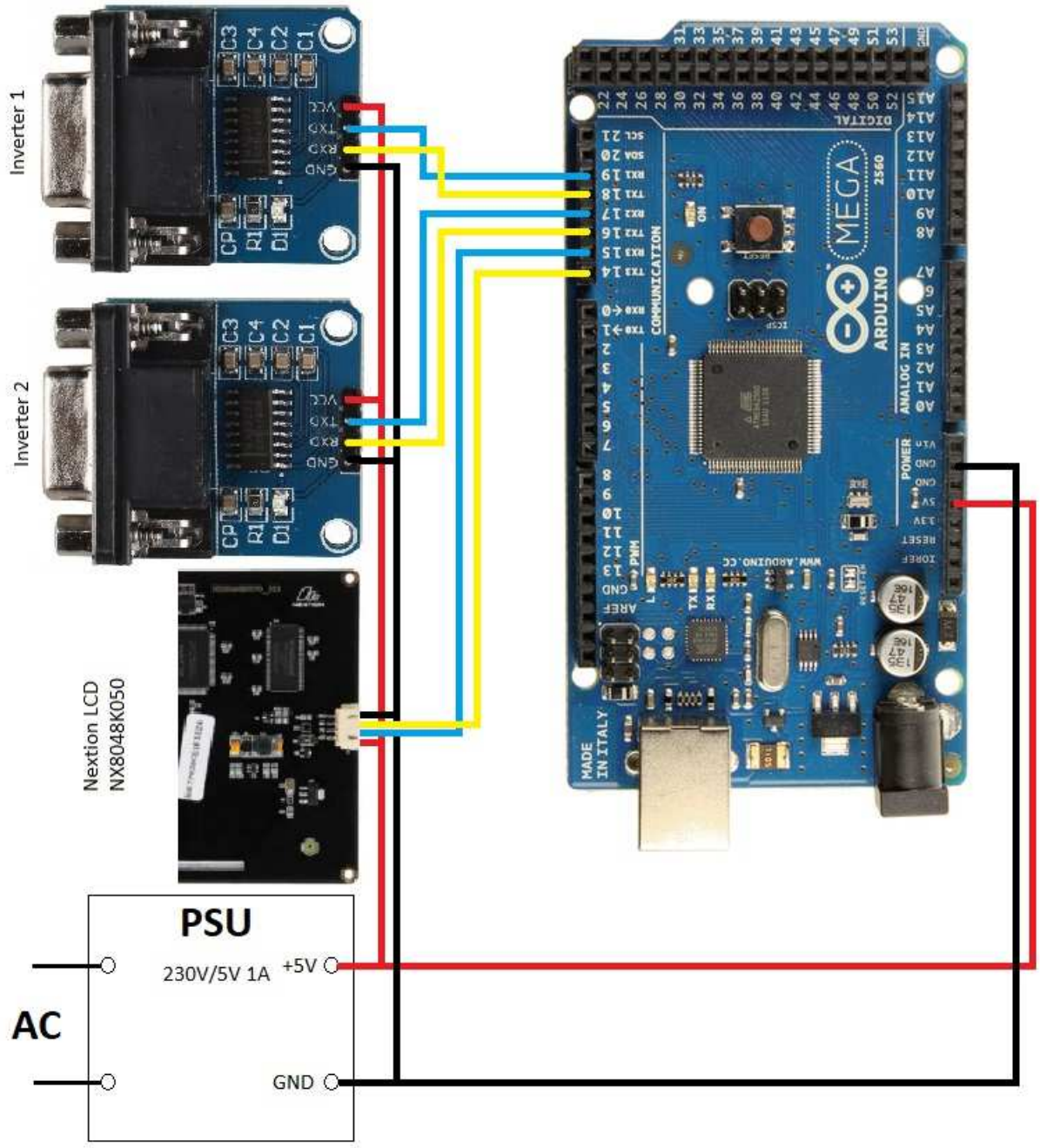
Hardware:

- Arduino Mega 2560 or clone 1pc
- Arduino Ethernet Shield Wiznet W5100 1pc
- Power supply, 5V/1A 1pc
- RS232-UART converter MAX2323 1pc
- For second inverter second converter 1pc
- Optional Nextion LCD NX8048K050 1pc
- For programming Nextion microSD card 1pc

Software:

- xLoader included in rar package
- Axpertino package .hex file

Wiring diagram:



As you see

Serial1 – Inverter 1

Serial2 – Inverter 2

Serial3 – optional Nextion display

Import software to Arduino

Use xLoader software for load to Arduino Mega

1. Open a path to hex file
2. Select Device to Mega (ATMEGA2560)
3. Select COM Port of Mega programmer
4. Baudrate = 115200
5. Click on Upload button
6. Wait for xxx bytes uploaded message on bottom side window

Load default settings

For first run, you need initialize Axpertino. Use short wire for connection GPIO 40 and GND. Connect this two pins on Arduino and press Reset button. Wait about 10 seconds and remove connected wire.

Then press Reset button again.

Hardware prepare

Wire all components as you see on schematics. Of course, you dont need Nextion Display, or for one inverter the second UART converter.

Connect Ethernet shield to Arduino.

Connect Solar Inverter, only RS232 connection, NOT USB !!!

Connect network cable between Axpertino and your router.

Its ready.

First time using

Open webbrowser on PC, connected in the same network.

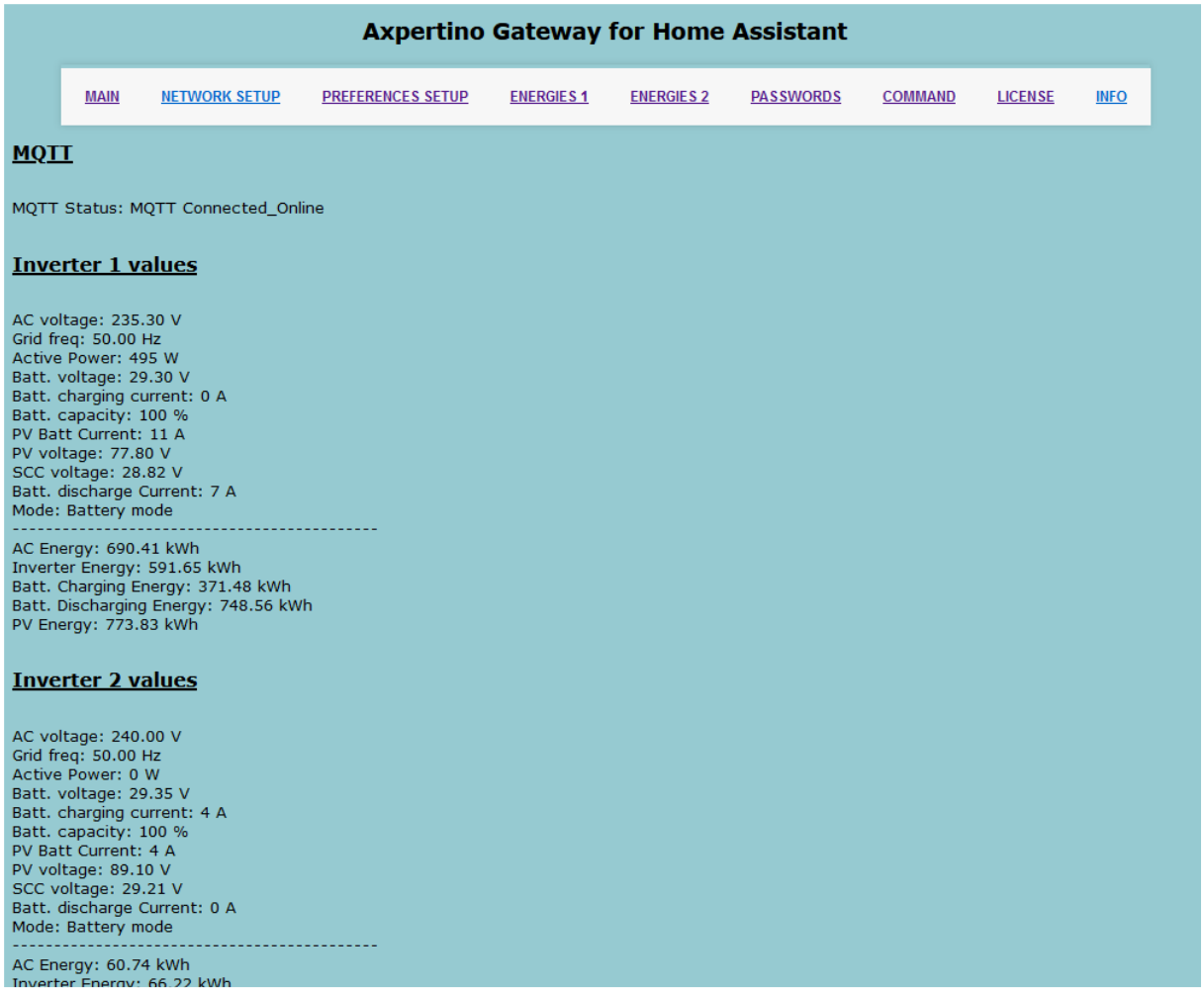
Type URL 192.168.0.122 (default static). You see login page

Default logins are user/user or admin/admin

User see only inverter values.

Admin see all.

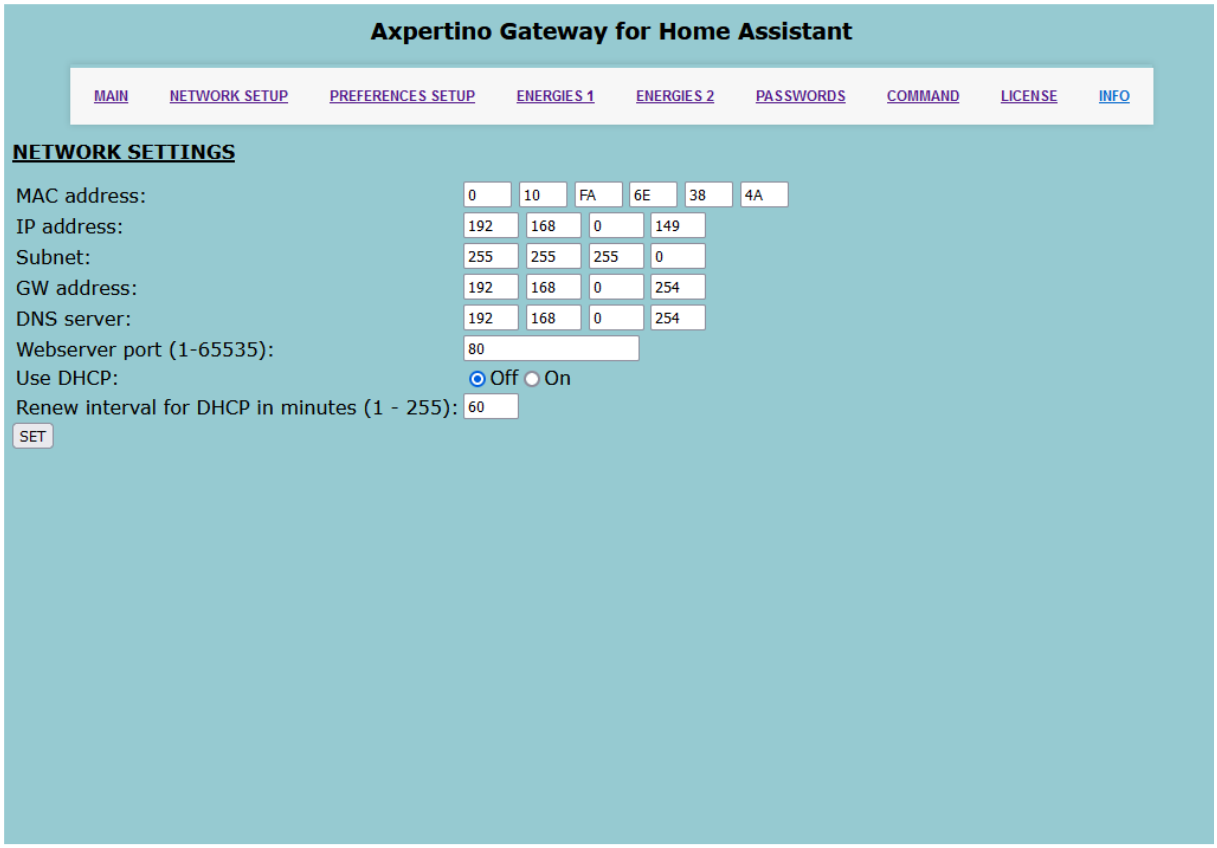
MAIN page description



Page is periodicaly refreshed each 10 seconds, for actual inverters values. If you have in PREFERENCES SETUP set two inverters, you will see on MAIN PAGE two inverters values.

Under values, may be displayed actual Warnings or Faults of each inverter.

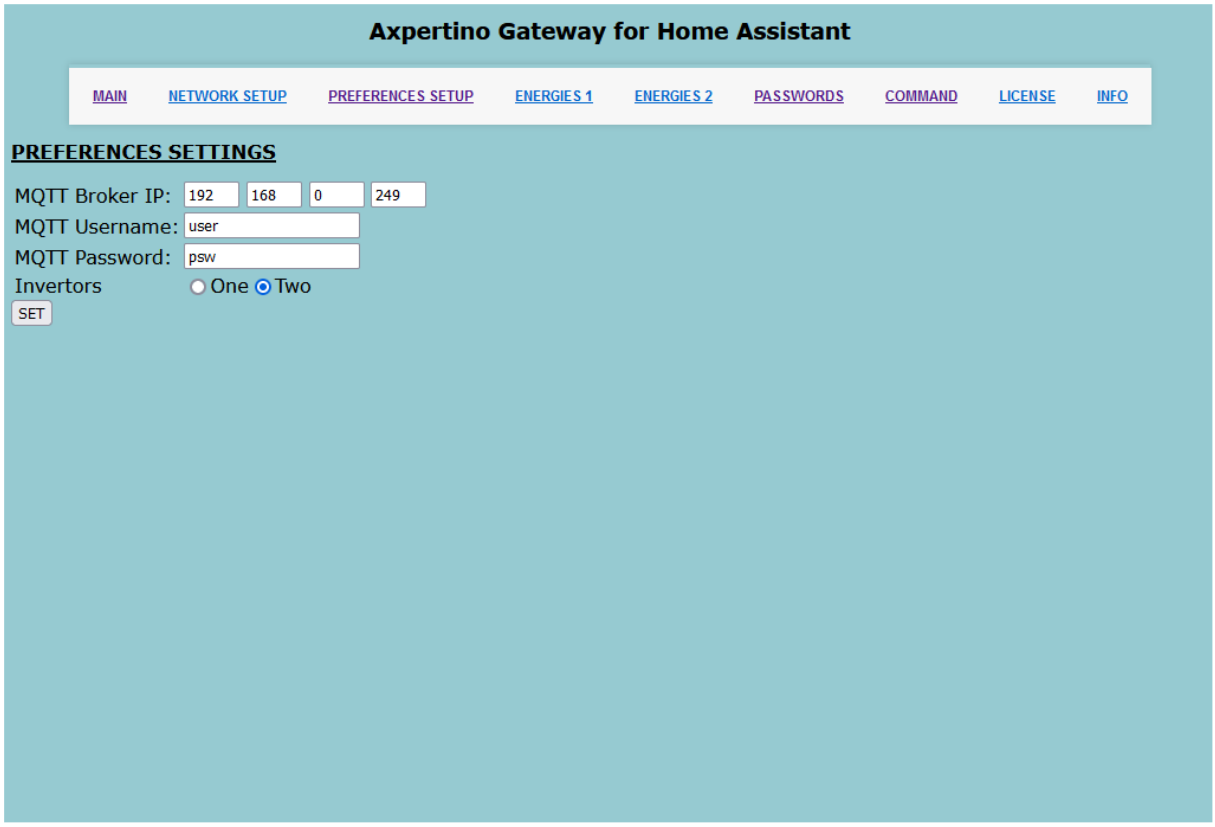
NETWORK SETUP page description



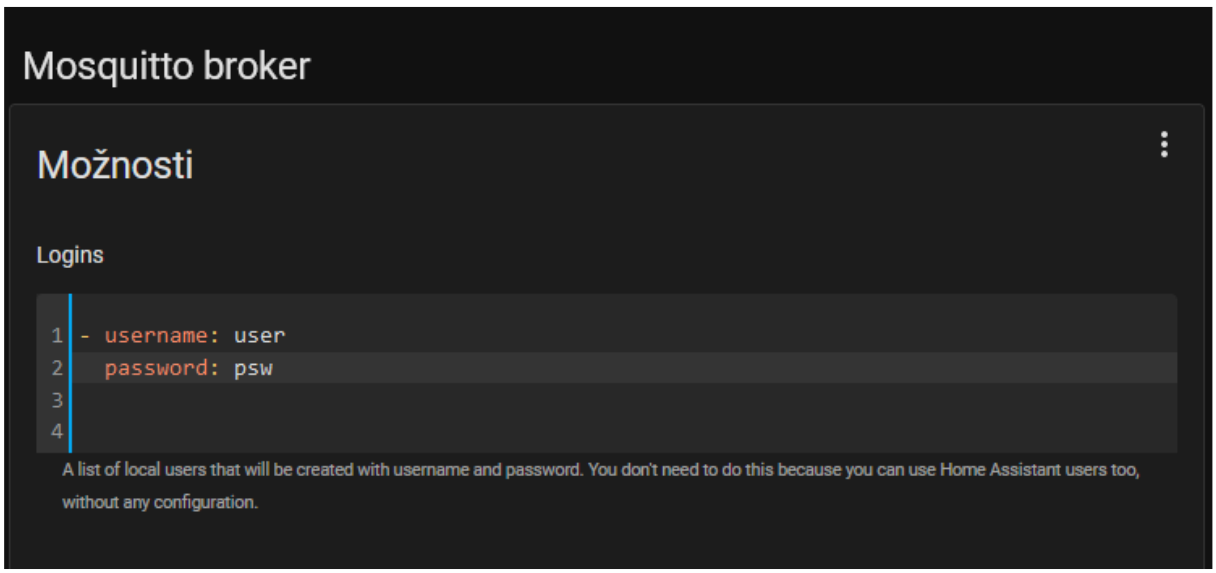
In this page, you can setup network parameters of Axpertino.

Individually set MAC adress and all other settings.

PREFERENCES SETUP page description

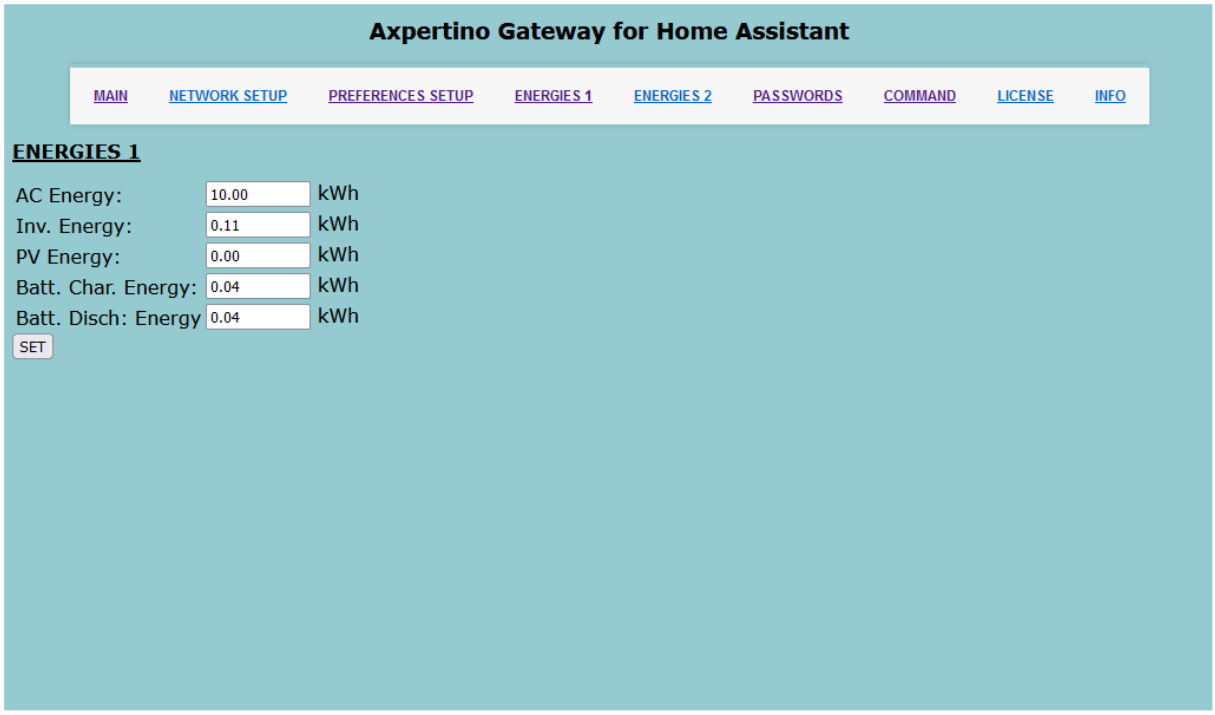


In this page, you will enter a MQTT broker connection. If you have broker as integration in Home Assistant, please, use IP adress of your HA systém. If you have secured connection, I recomend it, use Username and password as you see in the next picture from Mosquito broker addon settings.



If you want connect two invertors to Axpertino, please select Inverors as Two.

ENERGIES 1 and 2 page description



In this page, you can edit all values of energy meters. If you want reset it, fill zero to tab. For save values, press SET button.

PASSWORDS page description

In this page, you can edit logins to Axpertino, for User and Admin accounts. You see default logins.

For save, press SET button.

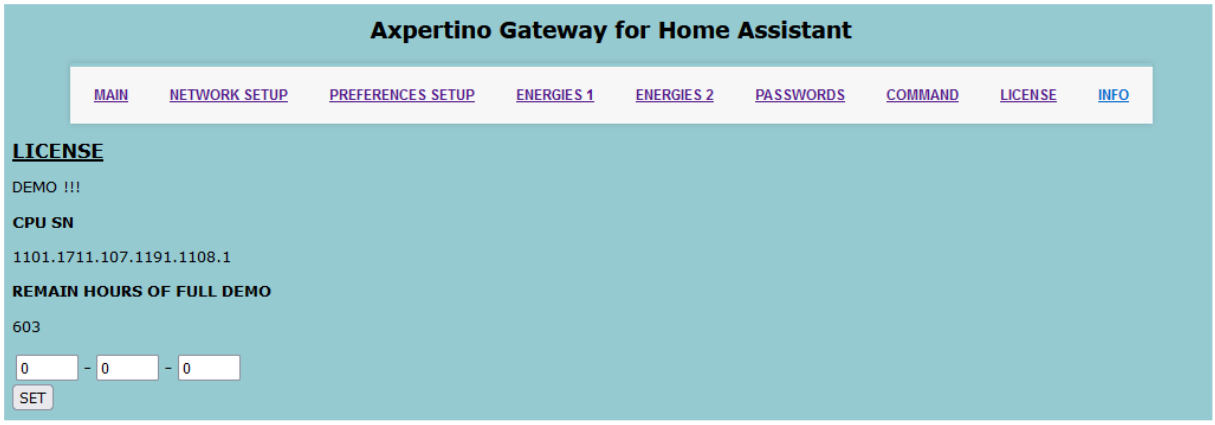
COMMAND page description

This is a very special page. You can send messages to 1 or 2 invertor and test commands, or set parameters in the invertor.

If invertor understand your message, you get answer, else you get NAK. ACK9 is received command.

You not need add a CRC characters. Axpertino calculate it automatically and give it to end of message. On the picture, you see main command QPIGS for get actual values. Its a long string of values, Axpertino decoding it. For list of command, use Protocol manual for Voltronics inverters.

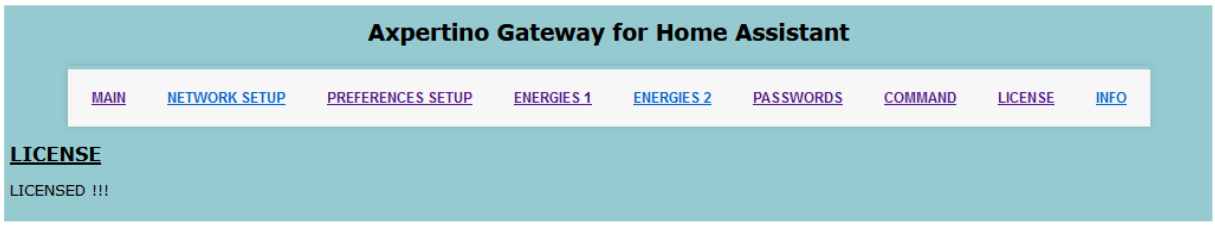
LICENSE page description



In this page, you see your License. If you have a new Axpertino, you have a full trial mode with all functions for 30 days. After 30 days, you can continue to use the Axperino, but with only one inverter and no energy meters, no commands. Your data will be preserved. Reset to defaults not change a license and remain time.

If you want to restore all functions, copy the CPU serial number, send it via the contact form on the axpertino.webnode.sk website and you will receive payment instructions. The current price is listed on the website in the DIY - License section.

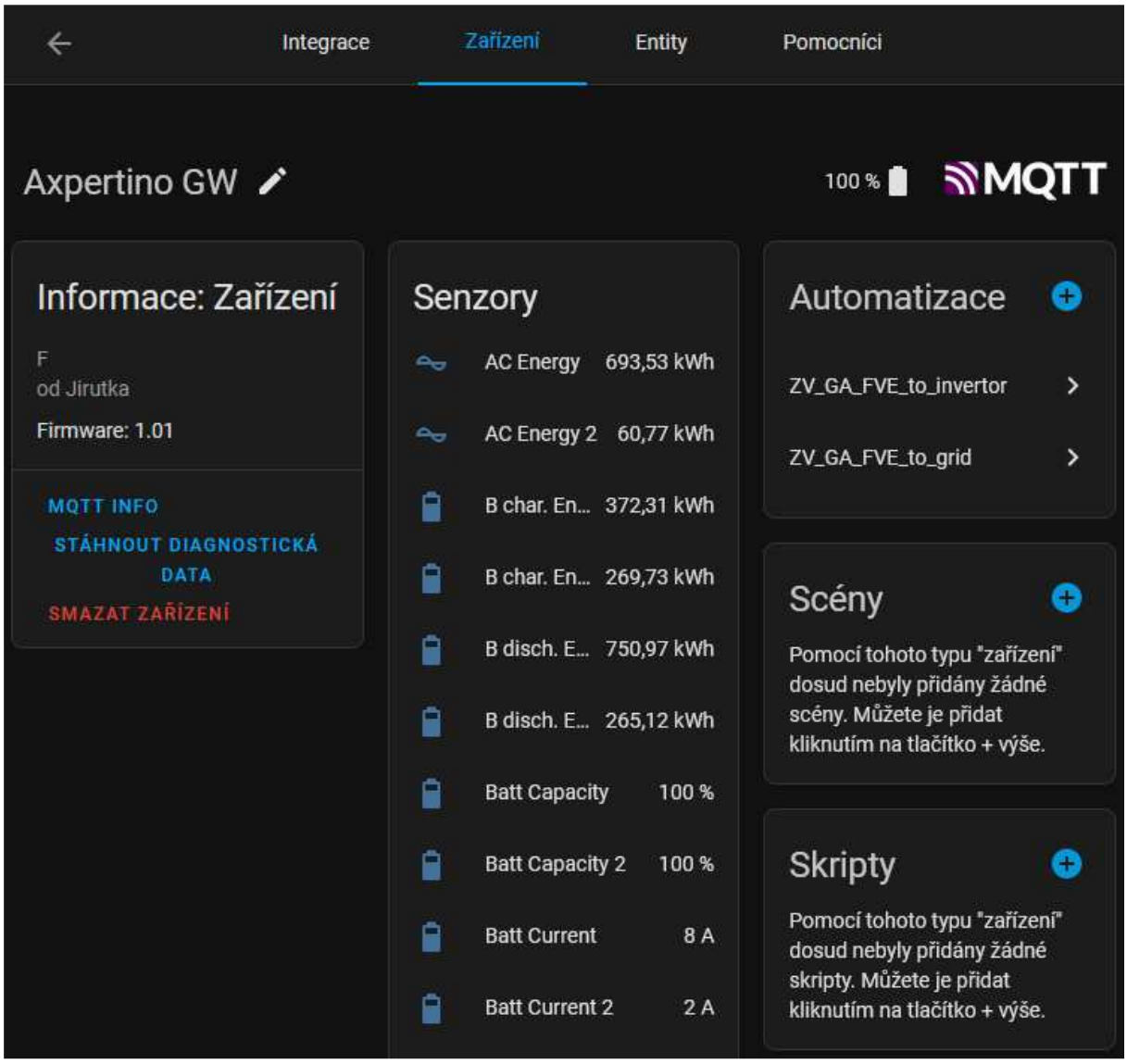
As soon as I receive the payment, I will send a product number to the given email, which will be entered in 3 fields and confirmed with the SET button. If the number is valid, Axpertino is licensed.



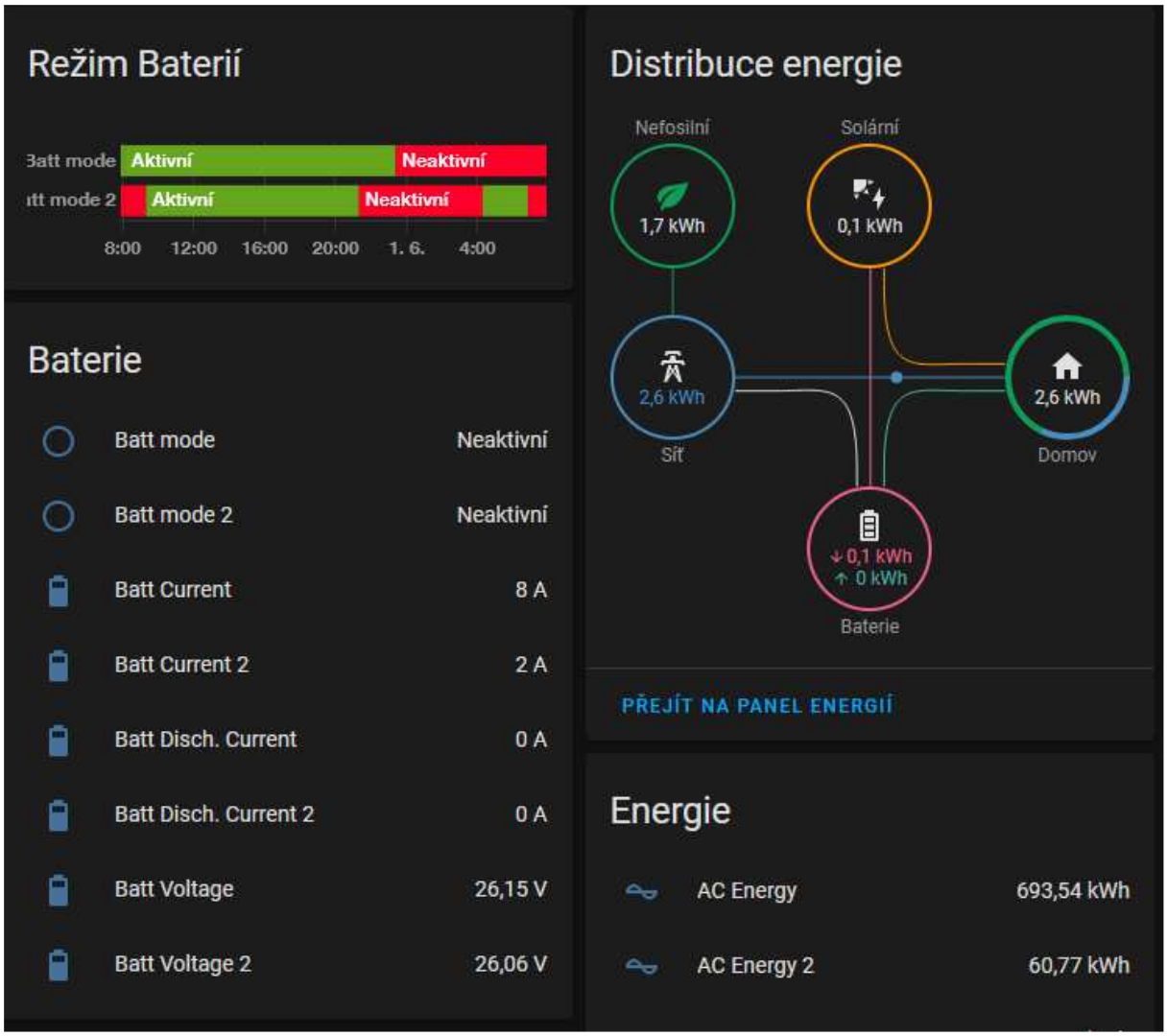
HOME ASSISTANT

After you set a MQTT connection to broker, all entities are filled automaticaly.

You will see Axpertino in HA Devices

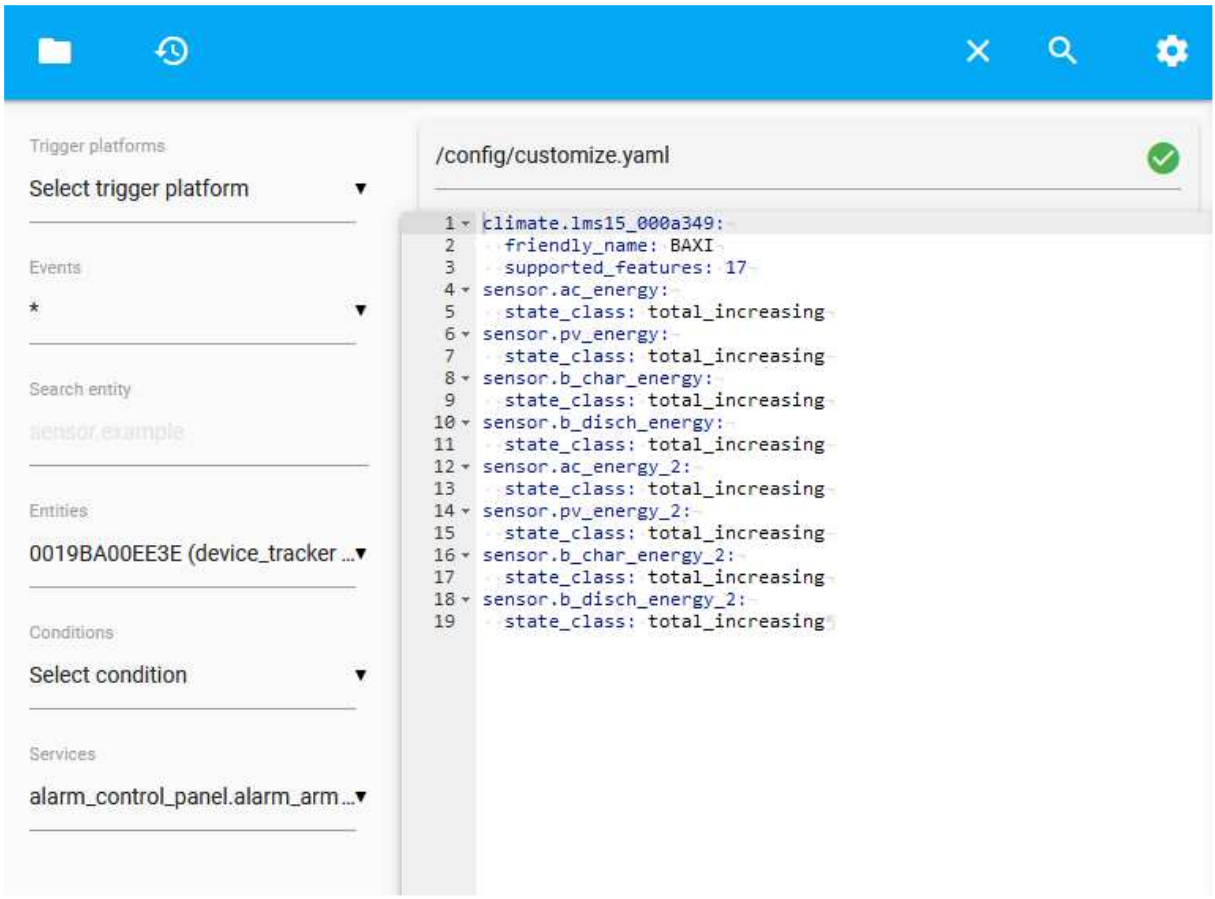


Now, you can create automations, lovelations with FVE parameters etc….

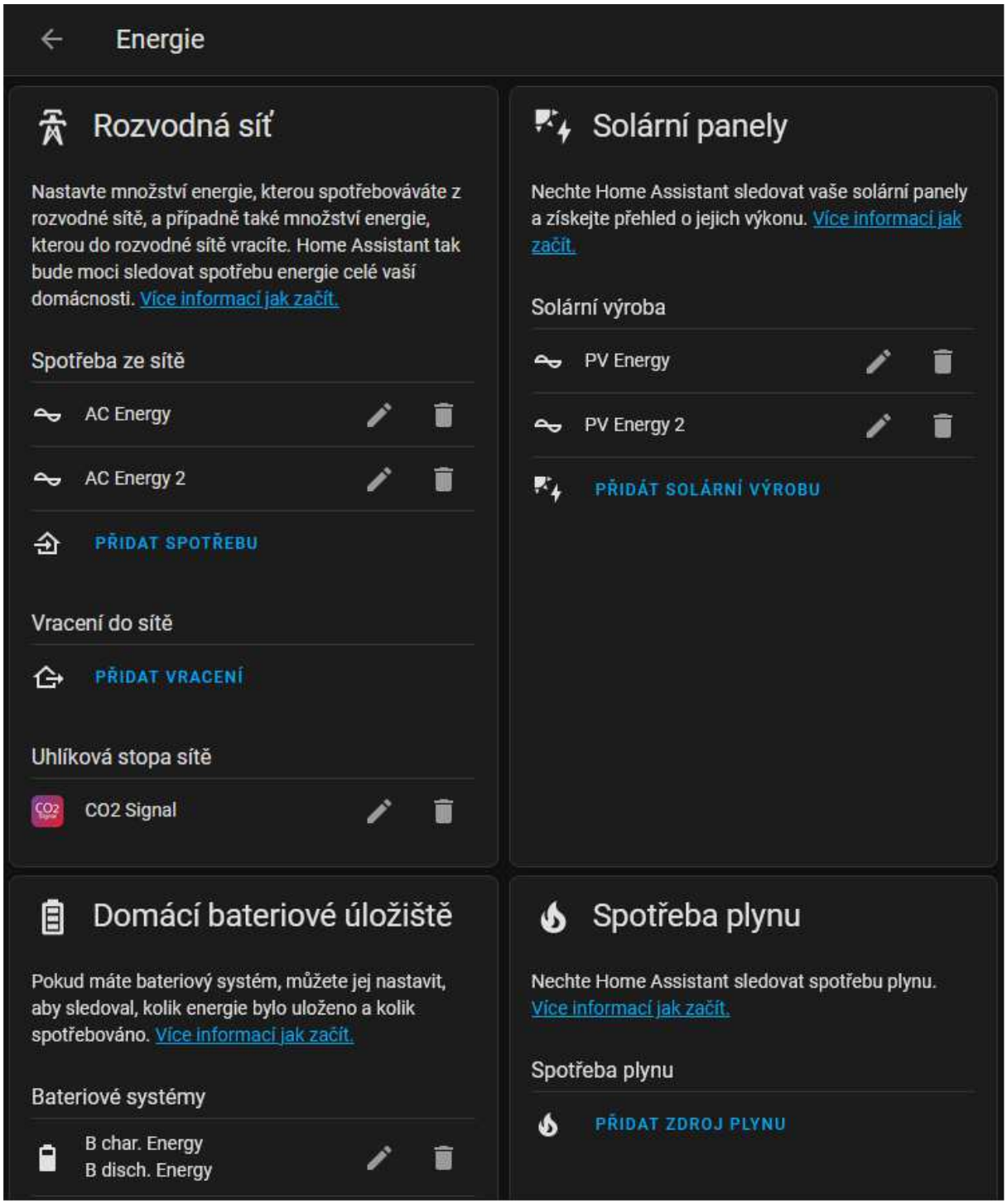


If you want use Energy function of Home Assistant, you must create customizations of energy entities. This is in customize.yaml file in Configuration Folder.

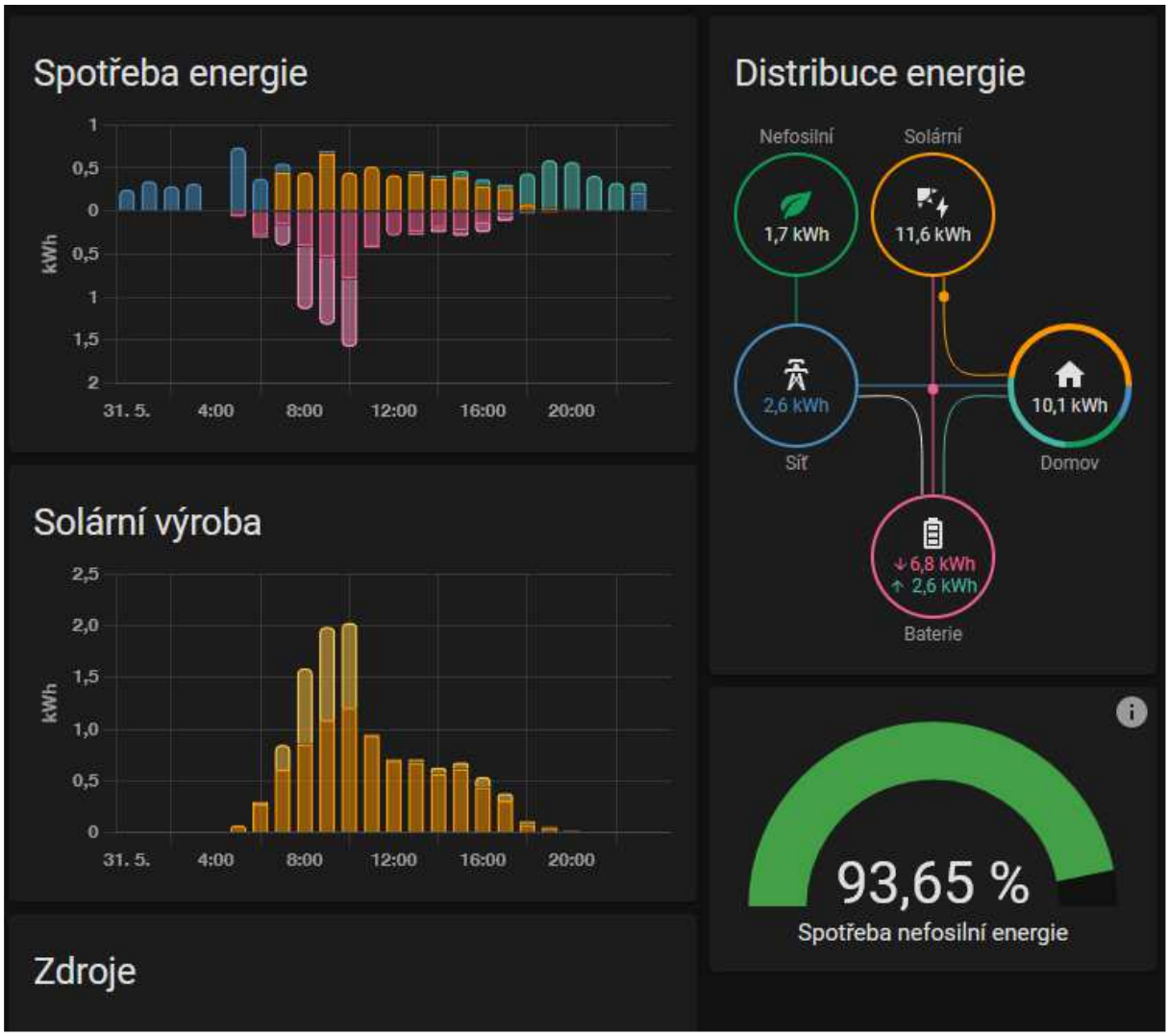
You add this:


Trigger platforms
Select trigger platform
Events
*
Search entity
sensor.example
Entities
0019BA00EE3E (device_tracker ...
Conditions
Select condition
Services
alarm_control_panel.alarm_arm...
/config/customize.yaml
climate.lms15_000a349:
friendly_name: BAXI
supported_features: 17
sensor.ac_energy:
state_class: total_increasing
sensor.pv_energy:
state_class: total_increasing
sensor.b_char_energy:
state_class: total_increasing
sensor.b_disch_energy:
state_class: total_increasing
sensor.ac_energy_2:
state_class: total_increasing
sensor.pv_energy_2:
state_class: total_increasing
sensor.b_char_energy_2:
state_class: total_increasing
sensor.b_disch_energy_2:
state_class: total_increasing

And next step is add this sensors to the energy configurations…



After some time, you will see a graphs of your energies…



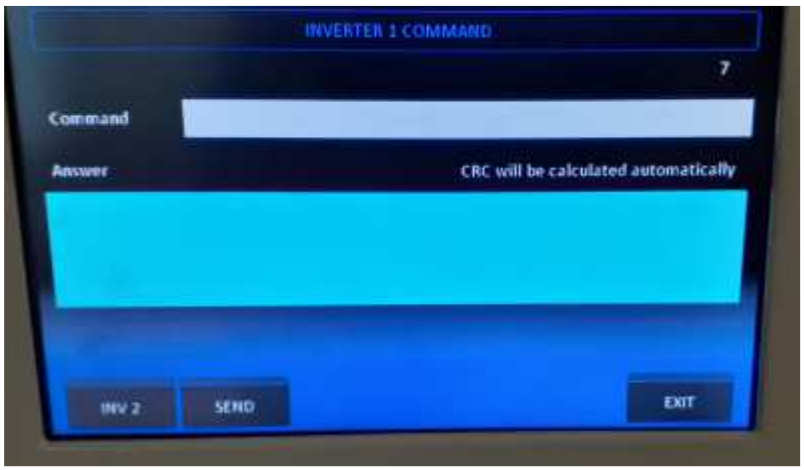
OPERATION VIA NEXTION DISPLAY

As is descripted on the top of this manual, you can use optional Nextion 5“ display.

For install software to the new display, you need copy tft file to FAT 32 microSD card. On the card must be only one tft file!!! Safe remove card from a PC, insert it to slot on not powered display, connect +5V power to display. You will see a white page with red message, % of loads. After complette loading, remove a card from slot and restart display, restart Axpertino. Its ready for use.

On the display, you see ALL parameters, values and you can configure 1 or 2 invertors. This options is not on web config.


CHARGING VOLTAGE INV 1
13
Batt. Under voltage
21.00 V
Batt. Bulk Voltage
31.30 V
Batt. Float Voltage
31.00 V
Batt. Type
USE
WRITE
WRITE
WRITE
WRITE
EXIT


INVERTER 1 COMMAND
7
Command
Answer
CRC will be calculated automatically
INV 2
SEND
EXIT

Warning !!!

Both the document and the software are subject to change without notice