

Axpertino

USER GUIDE

For SW version 1.01

by Jiří Jirutka, 2022

Hardware and software.....	2
Wiring diagram.....	3
Import software to arduino.....	4
First time using.....	5
MAIN PAGE.....	6
NETWORK SETUP.....	7
PREFERENCES SETUP.....	8
ENERGIES.....	9
COMMAND.....	11
LICENSE.....	12
Home Assistant.....	13
Operation via Nextion display.....	18
Warnings.....	20

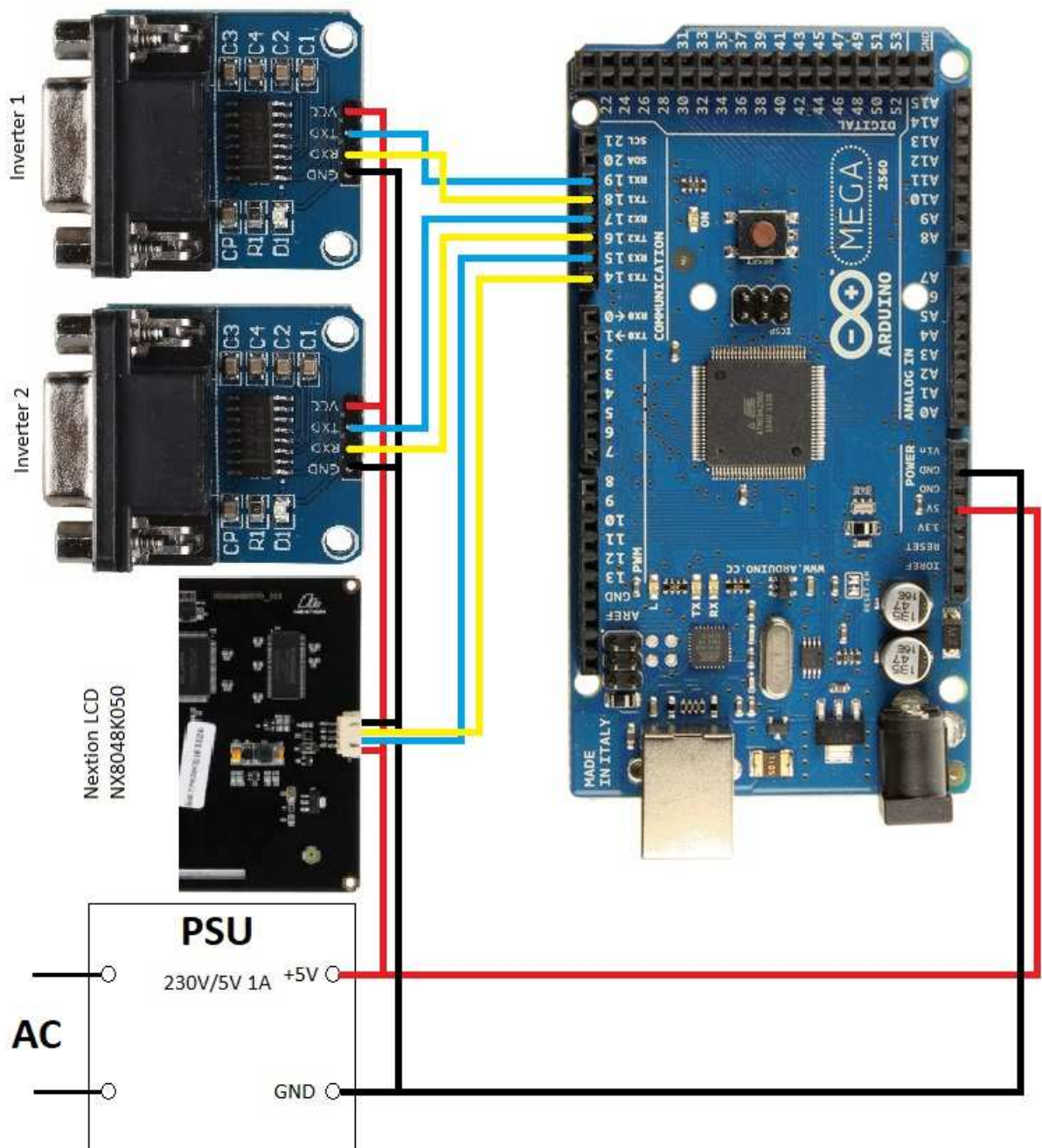
Hardware:

- 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

Axpertino Gateway for Home Assistant

[MAIN](#) [NETWORK SETUP](#) [PREFERENCES SETUP](#) [ENERGIES 1](#) [ENERGIES 2](#) [PASSWORDS](#) [COMMAND](#) [LICENSE](#) [INFO](#)

MQTT

MQTT Status: MQTT Connected_Online

Inverter 1 values

AC voltage: 235.30 V
Grid freq: 50.00 Hz
Active Power: 495 W
Batt. voltage: 29.30 V
Batt. charging current: 0 A
Batt. capacity: 100 %
PV Batt Current: 11 A
PV voltage: 77.80 V
SCC voltage: 28.82 V
Batt. discharge Current: 7 A
Mode: Battery mode

AC Energy: 690.41 kWh
Inverter Energy: 591.65 kWh
Batt. Charging Energy: 371.48 kWh
Batt. Discharging Energy: 748.56 kWh
PV Energy: 773.83 kWh

Inverter 2 values

AC voltage: 240.00 V
Grid freq: 50.00 Hz
Active Power: 0 W
Batt. voltage: 29.35 V
Batt. charging current: 4 A
Batt. capacity: 100 %
PV Batt Current: 4 A
PV voltage: 89.10 V
SCC voltage: 29.21 V
Batt. discharge Current: 0 A
Mode: Battery mode

AC Energy: 60.74 kWh
Inverter Energy: 66.22 kWh

Page is periodically 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

Axpertino Gateway for Home Assistant

[MAIN](#) [NETWORK SETUP](#) [PREFERENCES SETUP](#) [ENERGIES 1](#) [ENERGIES 2](#) [PASSWORDS](#) [COMMAND](#) [LICENSE](#) [INFO](#)

NETWORK SETTINGS

MAC address:

0

10

FA

6E

38

4A

IP address:

192

168

0

149

Subnet:

255

255

255

0

GW address:

192

168

0

254

DNS server:

192

168

0

254

Webserver port (1-65535):

80

Use DHCP:

☒ Off ☐ On

Renew interval for DHCP in minutes (1 - 255):

60

SET

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

Individually set MAC adress and all other settings.

PREFERENCES SETUP page description

The screenshot shows the 'Axpertino Gateway for Home Assistant' interface. At the top, there is a navigation bar with links: MAIN, NETWORK SETUP, PREFERENCES SETUP (highlighted), ENERGIES 1, ENERGIES 2, PASSWORDS, COMMAND, LICENSE, and INFO. Below the navigation bar, the section 'PREFERENCES SETTINGS' is visible. It contains the following fields and options:

- MQTT Broker IP: 192 168 0 249
- MQTT Username: user
- MQTT Password: psw
- Invertors: ☐ One ☒ Two
- SET button

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.

The screenshot shows the 'Mosquitto broker' configuration page. The title 'Mosquitto broker' is at the top. Below it, the section 'Možnosti' (Options) is visible. Under 'Logins', there is a list of users:

```
1 - username: user
2   password: psw
3
4
```

Below the list, there is a note: "A list of local users that will be created with username and password. You don't need to do this because you can use Home Assistant users too, without any configuration."

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

ENERGIES 1 and 2 page description

Axpertino Gateway for Home Assistant

[MAIN](#) [NETWORK SETUP](#) [PREFERENCES SETUP](#) [ENERGIES 1](#) [ENERGIES 2](#) [PASSWORDS](#) [COMMAND](#) [LICENSE](#) [INFO](#)

ENERGIES 1

AC Energy:	<input type="text" value="10.00"/>	kWh
Inv. Energy:	<input type="text" value="0.11"/>	kWh
PV Energy:	<input type="text" value="0.00"/>	kWh
Batt. Char. Energy:	<input type="text" value="0.04"/>	kWh
Batt. Disch: Energy	<input type="text" value="0.04"/>	kWh

SET

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

The screenshot shows the 'PASSWORDS SETTINGS' page of the 'Axpertino Gateway for Home Assistant'. At the top, there is a navigation bar with links: MAIN, NETWORK SETUP, PREFERENCES SETUP, ENERGIES 1, ENERGIES 2, PASSWORDS (highlighted), COMMAND, LICENSE, and INFO. Below the navigation bar, the page title 'PASSWORDS SETTINGS' is displayed. The page is divided into two sections: 'USER' and 'ADMIN'. Each section contains input fields for 'Username' and 'Password'. In the 'USER' section, both fields contain the text 'user'. In the 'ADMIN' section, both fields contain the text 'admin'. Below the 'ADMIN' section, there is a 'SET' button.

Axpertino Gateway for Home Assistant

[MAIN](#) [NETWORK SETUP](#) [PREFERENCES SETUP](#) [ENERGIES 1](#) [ENERGIES 2](#) **[PASSWORDS](#)** [COMMAND](#) [LICENSE](#) [INFO](#)

PASSWORDS SETTINGS

USER

Username:

Password:

ADMIN

Username:

Password:

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

Axpertino Gateway for Home Assistant

[MAIN](#) [NETWORK SETUP](#) [PREFERENCES SETUP](#) [ENERGIES 1](#) [ENERGIES 2](#) [PASSWORDS](#) [COMMAND](#) [LICENSE](#) [INFO](#)

COMMAND

Select inverter:

Message:

CRC will be calculated automatically

Answer:
(229.3 49.9 229.3 49.9 0412 0371 013 355 25.34 004 100 0037 0004 081.0 24.97 00000 00110110 00 00 00104 010)

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

If inverter 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

The screenshot shows the 'LICENSE' page of the 'Axpertino Gateway for Home Assistant'. At the top, there is a navigation bar with links: MAIN, NETWORK SETUP, PREFERENCES SETUP, ENERGIES 1, ENERGIES 2, PASSWORDS, COMMAND, LICENSE (highlighted), and INFO. Below the navigation bar, the page title 'LICENSE' is underlined. The content area displays 'DEMO !!!' in red. It shows the 'CPU SN' as '1101.1711.107.1191.1108.1'. Under 'REMAIN HOURS OF FULL DEMO', it shows '603' and three input fields with '0' in each, separated by dashes. A 'SET' button is located below the input fields.

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.

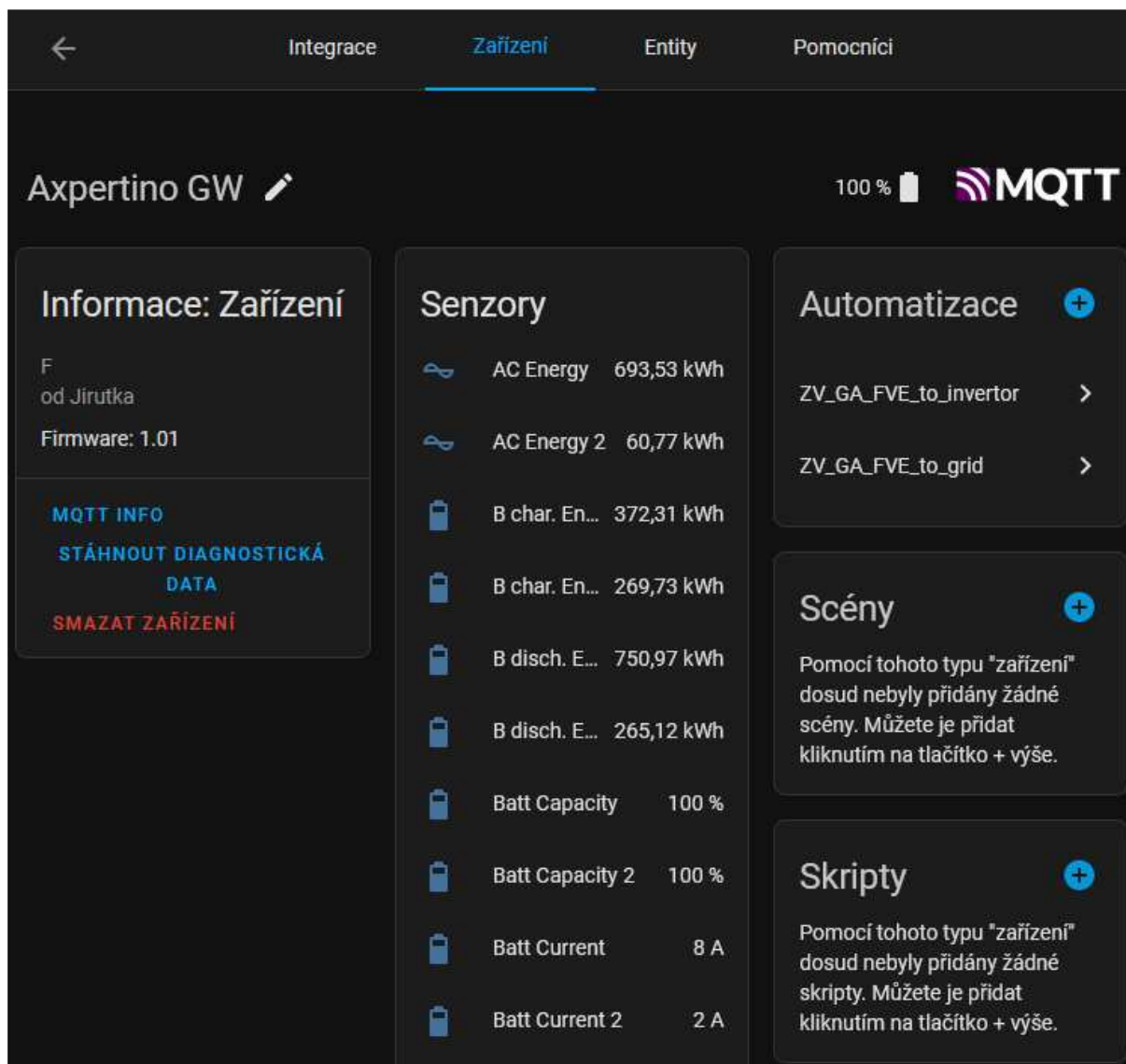
As soon as I receive the payment, I will send a product number to the given email, which will be entered in 3 fields and confirmed with the SET button. If the number is valid, Axpertino is licensed.

This screenshot shows the 'LICENSE' page after successful licensing. The navigation bar is identical to the previous screenshot. The page title 'LICENSE' is underlined. The content area now displays 'LICENSED !!!' in red, indicating that the device is no longer in demo mode.

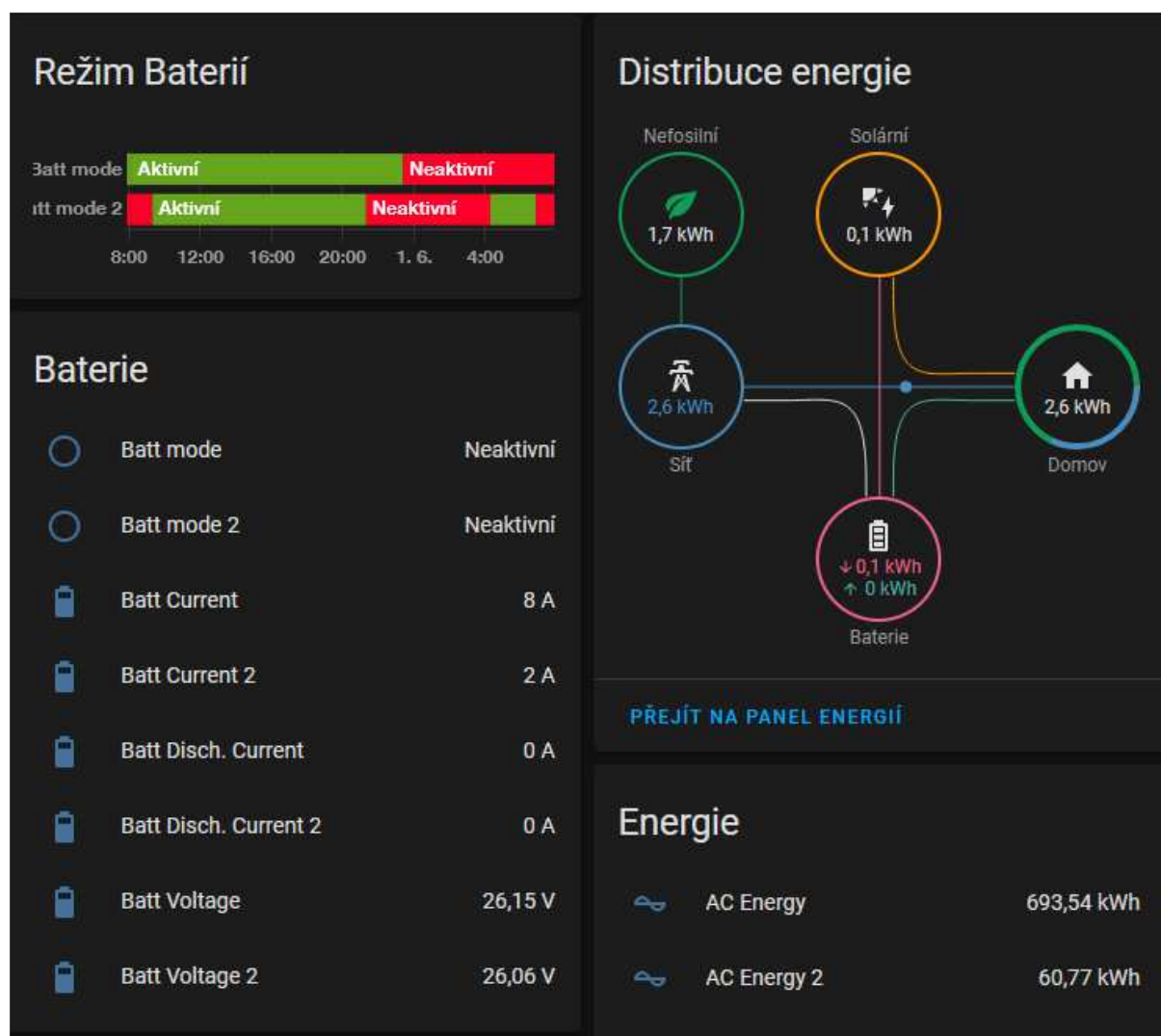
HOME ASSISTANT

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

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

1

climate.lms15_000a349:

2

friendly_name: BAXI

3

supported_features: 17

4

sensor.ac_energy:

5

state_class: total_increasing

6

sensor.pv_energy:

7

state_class: total_increasing

8

sensor.b_char_energy:

9

state_class: total_increasing

10

sensor.b_disch_energy:

11

state_class: total_increasing

12

sensor.ac_energy_2:

13

state_class: total_increasing

14

sensor.pv_energy_2:

15

state_class: total_increasing

16

sensor.b_char_energy_2:

17

state_class: total_increasing

18

sensor.b_disch_energy_2:

19

state_class: total_increasing

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

Energie

Rozvodná síť

Nastavte množství energie, kterou spotřebováváte z rozvodné sítě, a případně také množství energie, kterou do rozvodné sítě vracíte. Home Assistant tak bude moci sledovat spotřebu energie celé vaší domácnosti. [Více informací jak začít.](#)

Spotřeba ze sítě

AC Energy

AC Energy 2

PŘIDAT SPOTŘEBU

Vracení do sítě

PŘIDAT VRACENÍ

Uhlíková stopa sítě

CO2 Signal

Domácí bateriové úložiště

Pokud máte bateriový systém, můžete jej nastavit, aby sledoval, kolik energie bylo uloženo a kolik spotřebováno. [Více informací jak začít.](#)

Bateriové systémy

B char. Energy

B disch. Energy

Solární panely

Nechte Home Assistant sledovat vaše solární panely a získejte přehled o jejich výkonu. [Více informací jak začít.](#)

Solární výroba

PV Energy

PV Energy 2

PŘIDÁT SOLÁRNÍ VÝROBU

Spotřeba plynu

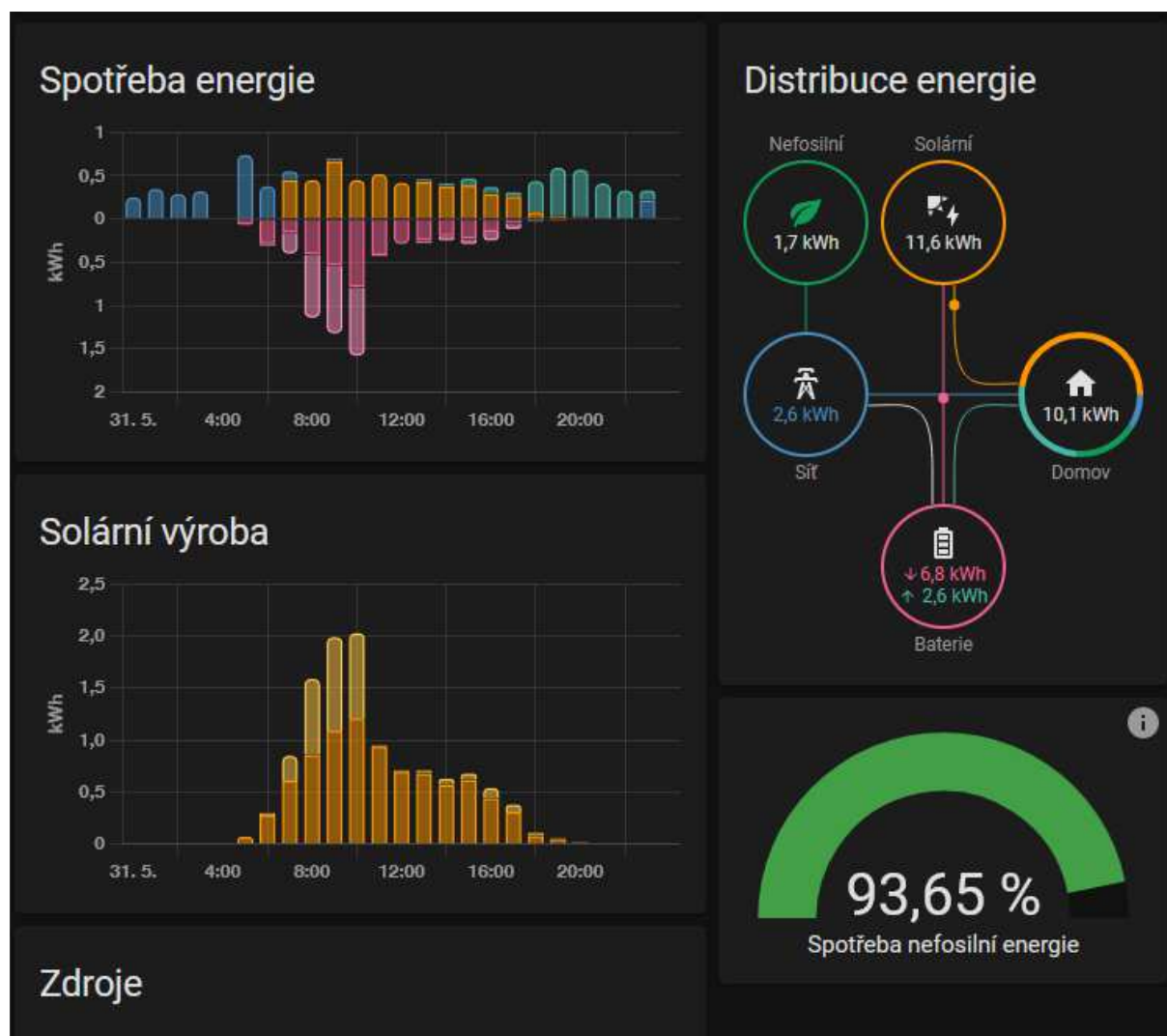
Nechte Home Assistant sledovat spotřebu plynu. [Více informací jak začít.](#)

Spotřeba plynu

PŘIDÁT ZDROJ PLYNU

16

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



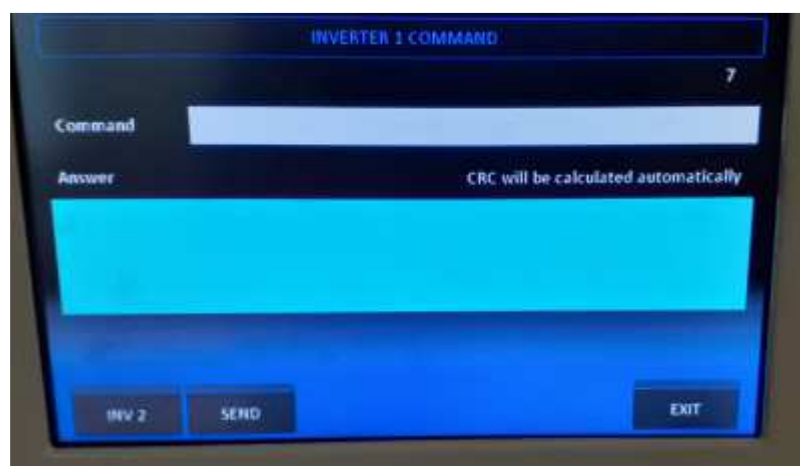
OPERATION VIA NEXTION DISPLAY

As is described 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 complete 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.





Warning !!!

This document is written by Jiří Jirutka, 2022. All right reserved!

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

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