

ATKGWH.01 - On-Grid Water Heater

User Manual



1 Description

The most efficient way to utilise photovoltaics is to consume as much of the generated energy as possible directly in the home. However, consumption in most households occurs in the morning and evening, whilst peak generation takes place during the day, which naturally results in surpluses being fed into the electricity grid. A physical battery is a solution for storing generated energy for later use, but it is expensive and has a long payback period. It is therefore optimal to use the energy during the day to heat domestic hot water.

The Antik AC Water Heater allows you to direct the output from the photovoltaic inverter to heat water in an electric boiler or storage tank, without the need for complex installation.

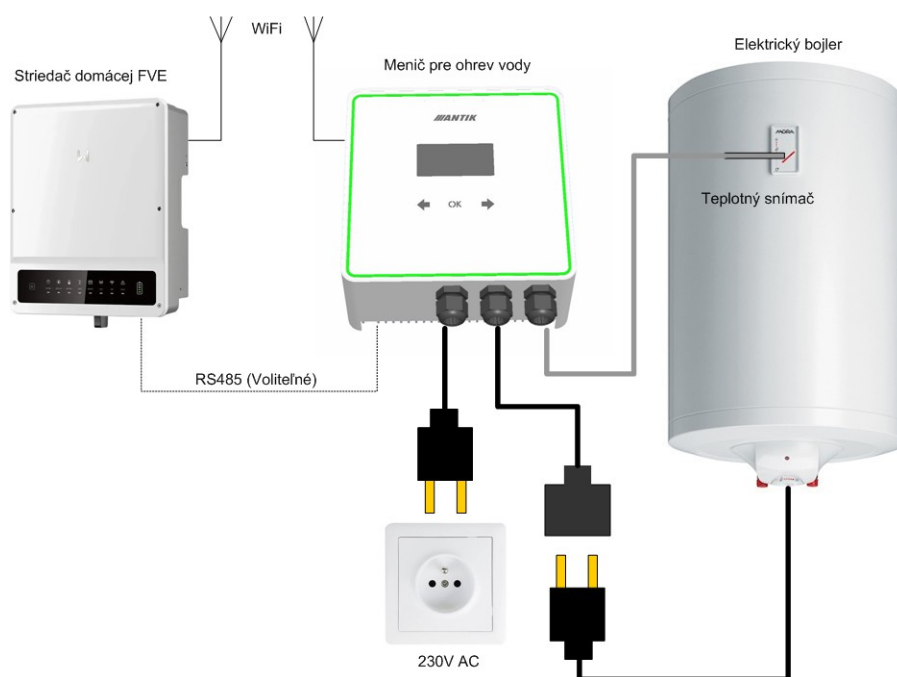
Features:

- Redirects surplus power from the home inverter to an electric heating element (0–3 kW)
- Simple installation, just plug into a 230V socket and connect to the boiler
- Real-time communication with the photovoltaic power plant

inverter In addition to these basic advantages, the device has the following

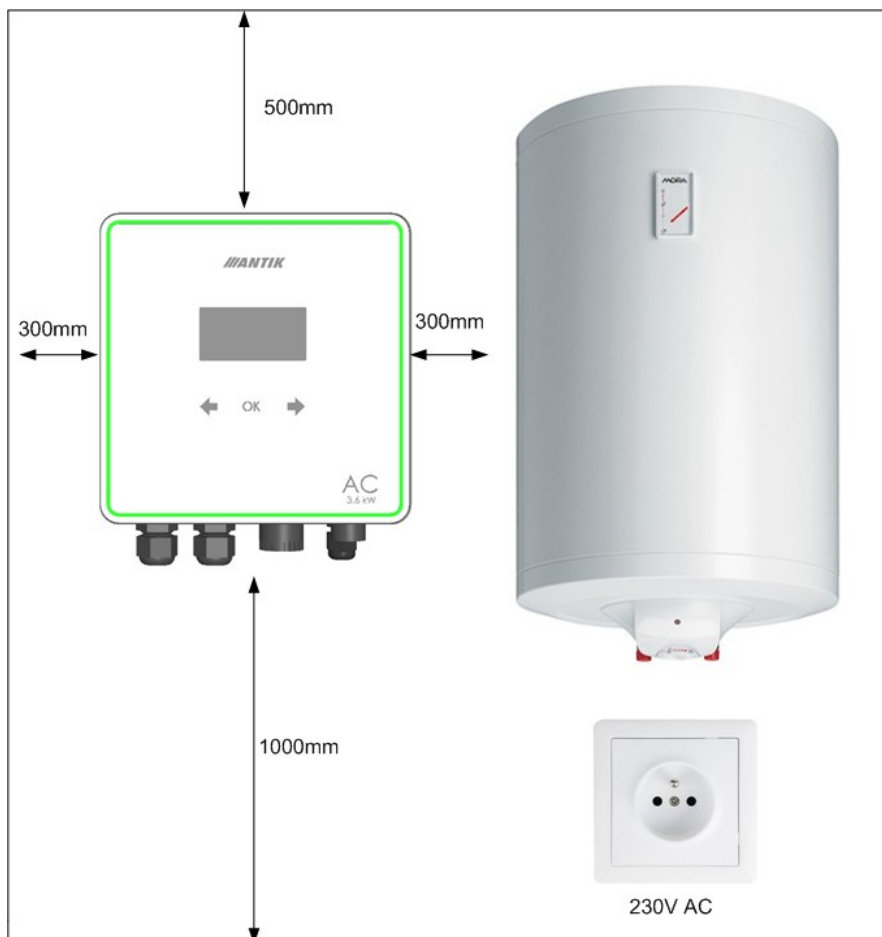
additional features:

- Remote monitoring via WiFi and the Antik Smart Home app
- Remote monitoring of water temperature in the boiler
- Option for backup heating from the 230V mains supply when the sun is not shining
- Intuitive user interface

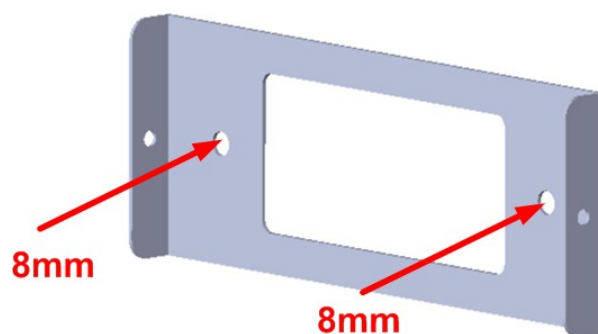


2 Installation

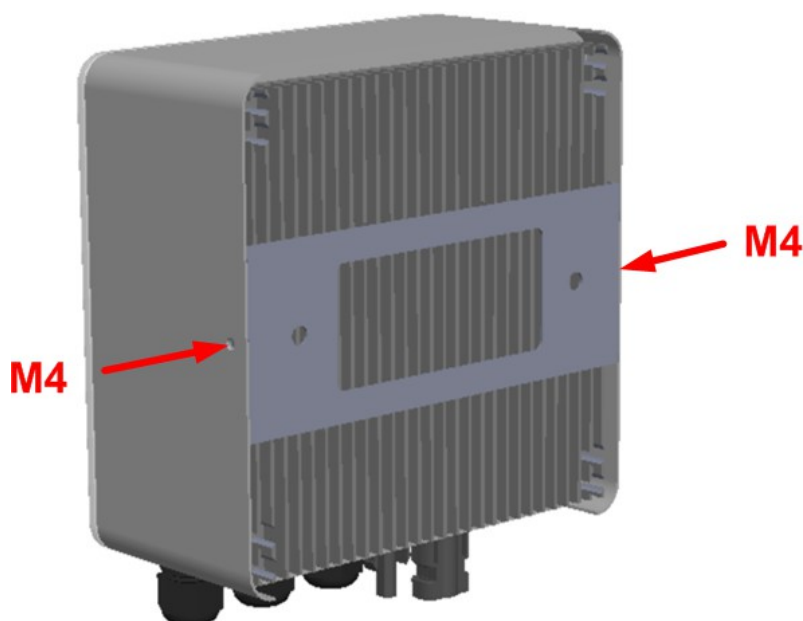
For installation, choose a location near the electric boiler and a 230V socket. The photovoltaic inverter heats up slightly during operation, so maintain minimum distances from surrounding objects and the ceiling to ensure the best possible air circulation.



Remove the wall bracket from the back of the unit and place it on the chosen location. Mark the position of the holes with a pencil. Then drill two holes for 8mm wall plugs.



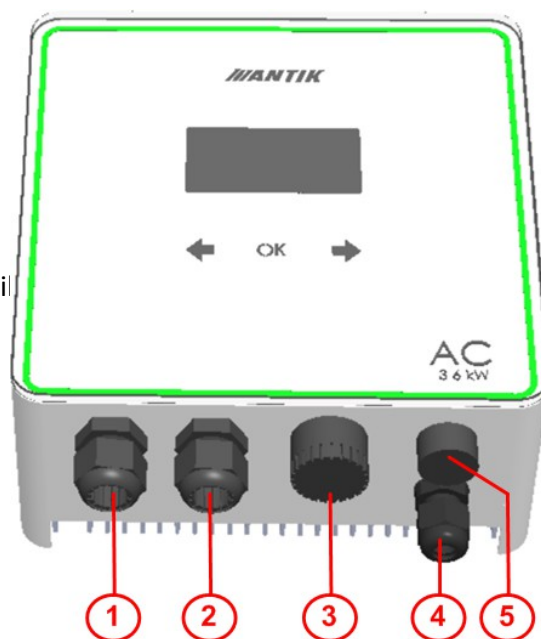
Insert the wall plugs into the drilled holes, then position the bracket and secure it to the wall using 6x60mm screws. Then attach the unit to the bracket using two M4 side screws.



3 Connectors and controls

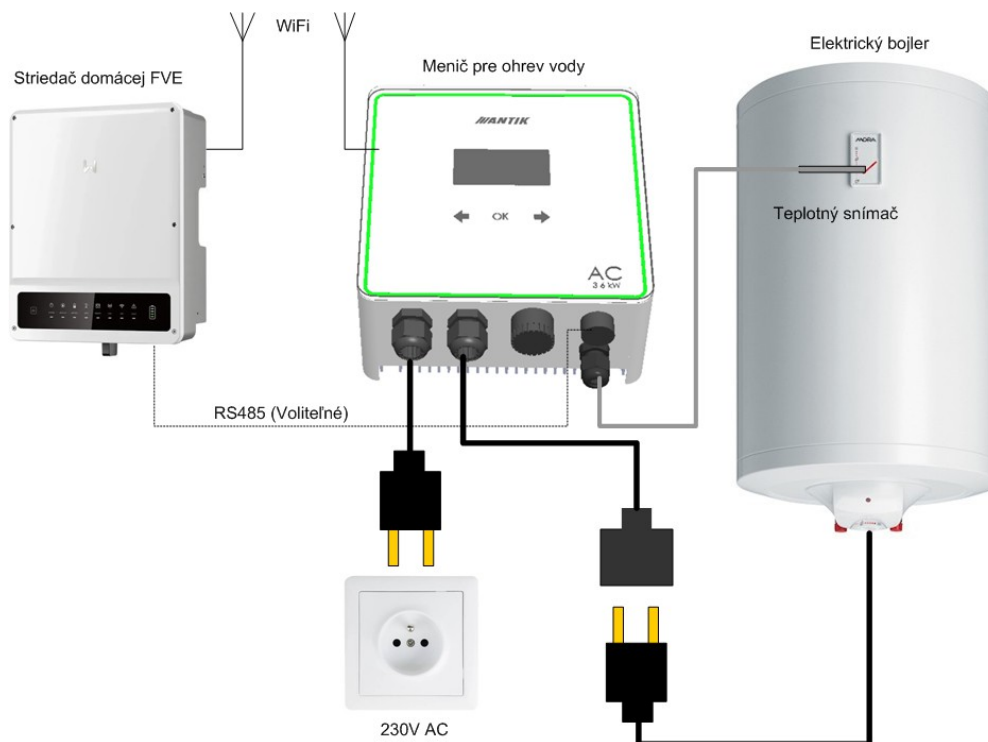
3.1 Description of connectors

1. Input 230VAC max. 16A
2. Output No. 1 – 3x2.5mm cable ²
3. Connector for output no. 2 – connector
4. Input for water temperature sensor in the boiler
5. RS485 connector



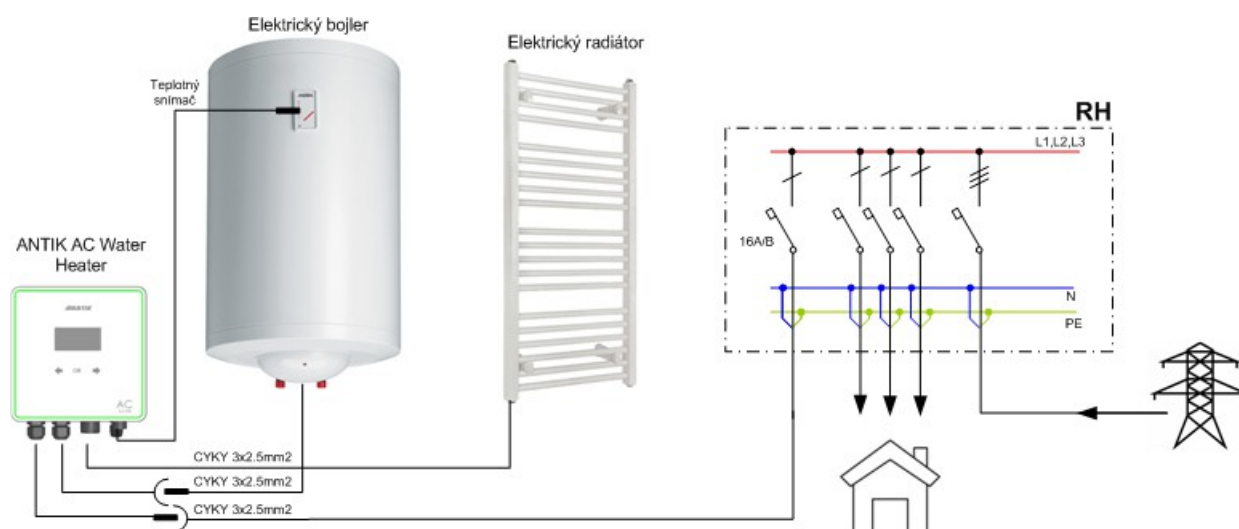
3.2 Connection

The device uses your existing electric boiler to heat water, which is currently connected directly to the 230V mains supply. Simplified connection of the water heater to the photovoltaic inverter:



We recommend that you have the system wired and installed by an electrician with the appropriate qualifications to work with electrical equipment.

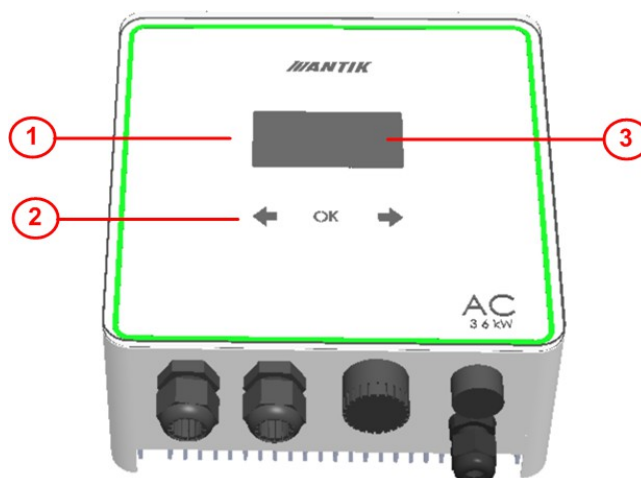
3.3 Single-pole diagram



4 Controls and menu

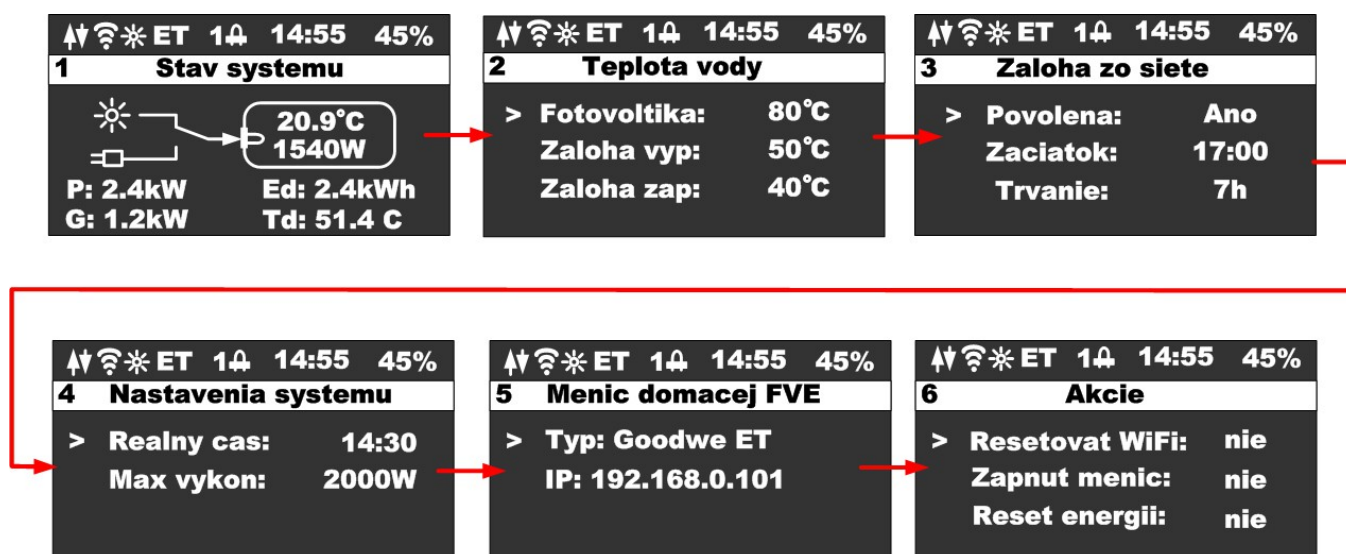
4.1 Description of controls

1. Operating status LED indicator
2. Touch keys
3. Graphical OLED display



4.2 Menu

The device menu contains 6 screens. After 30 seconds, the display switches off automatically and the menu returns to the home screen – 1. System status.



Use the  keys to navigate through the individual menu screens.

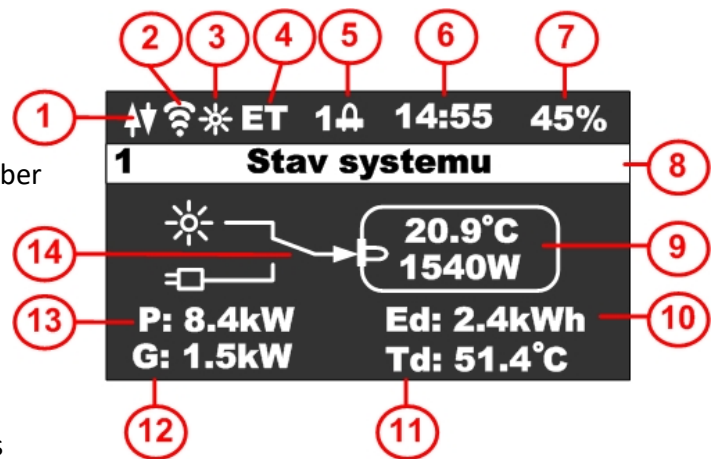
Pressing the **OK** key places the cursor on the current line; use the  keys to change the value on that line.

Pressing the **OK** key until the cursor disappears exits edit mode and allows you to switch to another screen.

4.3 Screen - System Status

Pressing any key displays the device's main screen. To conserve power on the OLED display, the screen turns off 60 seconds after the last key press.

1. Antik Smart Home Cloud Connection Status
2. Local network connection status
3. Icon indicating inverter detection
4. Abbreviation of the detected switch type
5. Icon indicating heating is on and output number
6. Current time
7. Percentage of internal PWM control
8. Name of the displayed screen
9. Water temperature and current output
10. Daily energy production
11. Inverter temperature
12. Current power flowing into the grid – surplus
13. Current power generated by the inverter
14. Energy flow status (surplus / grid)



4.4 Screen – Water temperature

This screen is used to set the monitoring of the required water temperatures in the boiler:

1. Status bar
2. Water temperature in photovoltaic mode
3. Water temperature at which the backup is s
4. Water temperature at which the backup is s



4.5 Screen - Grid backup

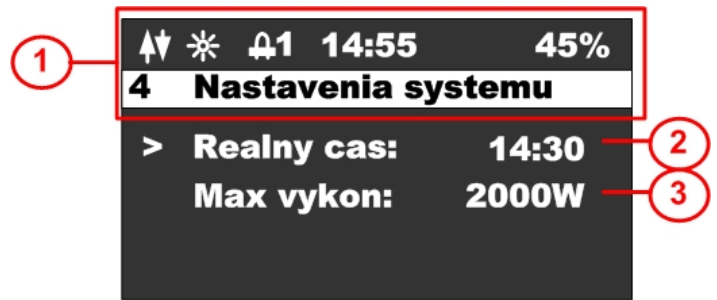
This screen is used to set the time at which and for how long the mains backup should be active if the water has not been heated to the required temperature.

1. Status bar with screen title
2. Global backup permission
3. Backup start time
4. Backup duration in hours (0 to 24)



4.6 Screen - System settings

1. Status bar with screen title
2. Real time (can set if the device is not connected to Wi-Fi)
3. Inverter power limit



4.7 Screen – Home PV system inverter

This screen is used to select the type of inverter used in the home photovoltaic system.

1. Status bar with screen name
2. Type of supported inverter
3. Inverter IP address on the network



4.8 Screen – Actions

Screen for performing an immediate action

4. Status bar with screen name
5. WiFi reset, EZ (easy mode – Android) and AP (access point mode – Apple).
6. Turn on inverter, options YES, NO
7. Power reset, options YES, NO



WiFi reset: if the device is not paired and neither of the two pairing options – EZ mode (letter P) or AP mode (letter A) – is lit in the status bar, a WiFi reset is required. Select one of the options during the reset. For iOS devices running OS 16 and above, you must select AP mode, as Apple has discontinued support for EZ mode. For Android devices, you can leave EZ mode selected. If the device is in pairing mode, the corresponding pairing mode will be displayed in the status bar.

5 Active cooling and protection against overheating and short circuits

The device contains a fan whose speed is controlled depending on the device's internal temperature. If the internal temperature exceeds 60 degrees Celsius, the inverter begins to reduce the output power, thereby preventing further overheating.

Fan control:

- Temperature below 40 degrees Celsius – fan is off
- Temperature between 40 and 60 degrees Celsius – fan speed regulation 0 to 100%
- Temperature above 60 degrees Celsius – fan at full speed and inverter power reduction

The device also includes the following protections:

- Short-circuit protection at the inverter input via a 16A 250VAC fuse

6 Supported photovoltaic inverters

The list of supported inverters is constantly updated; the device currently supports the following inverters:

- Goodwe – ET and ET Plus hybrid series
- SOLAX – X3 OnGrid series

6.1 Communication interfaces

Inverters can communicate with the water heater via the following interfaces:

- LAN network (via internal WiFi module)
- RS485 interface

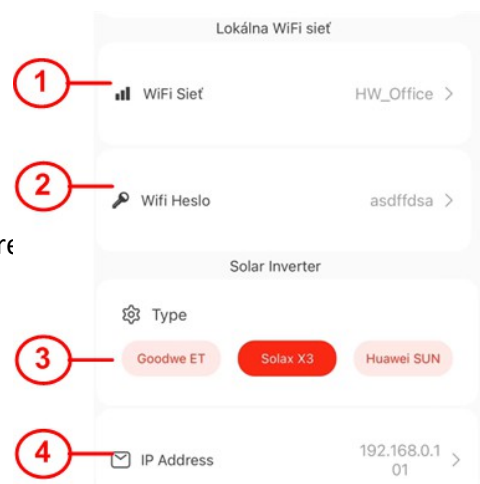
The RS485 interface takes priority over the LAN network; therefore, if an inverter is detected on the RS485 line, communication via the LAN ceases.

6.2 Inverter selection and configuration

The inverter can be selected via the device menu on screen 5 or via the mobile app.

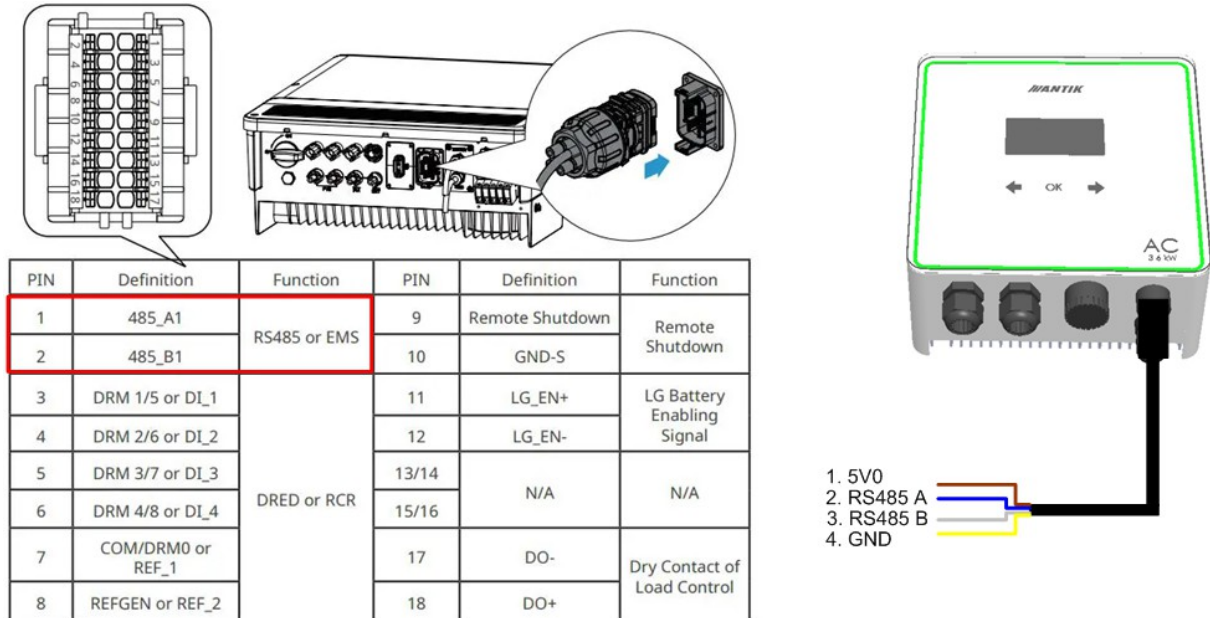
For LAN communication, the following details must be entered:

1. Home WiFi network name
2. Home WiFi network password
3. Converter type
4. Inverter IP address



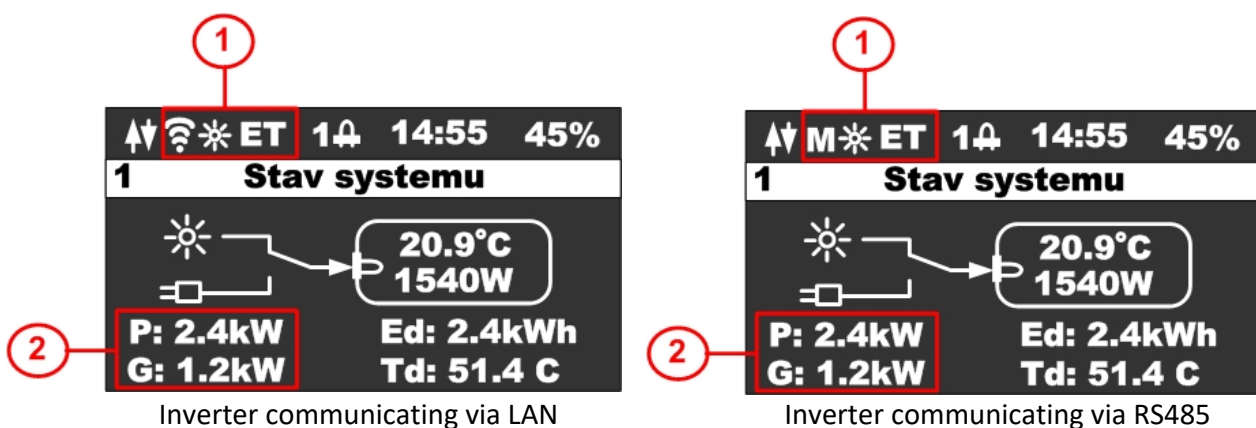
The inverter IP address only needs to be entered for SOLAX inverters; GOODWE inverters are configured automatically.

For communication via the RS485 bus, connect the supplied 4-pin connector with cable to the AC water heater and connect the RS485 A and RS485 B wires to the corresponding signals on the photovoltaic inverter connector. For Goodwe ET and ET Plus inverters, the RS485 interface is on pins 1 and 2 of the additional 14-pin connector.



SOLAX X3 inverters have the RS485 interface on an RJ45 connector. One RS485 is labelled 'Meter' and serves as the master interface for connecting the Smart Meter. To connect to the water heater, an unlabelled RS485 port is required, which operates in slave mode. Not all inverter models have this port, so we recommend using LAN network communication with SOLAX inverters.

If the inverter is communicating correctly, the following data will be displayed on the device's screen and in the mobile app:



When connected via LAN, the status bar will display an icon indicating a successful connection to the local network, a sun icon, and the inverter abbreviation (ET-Goodwe ET, X3-Solax X3)

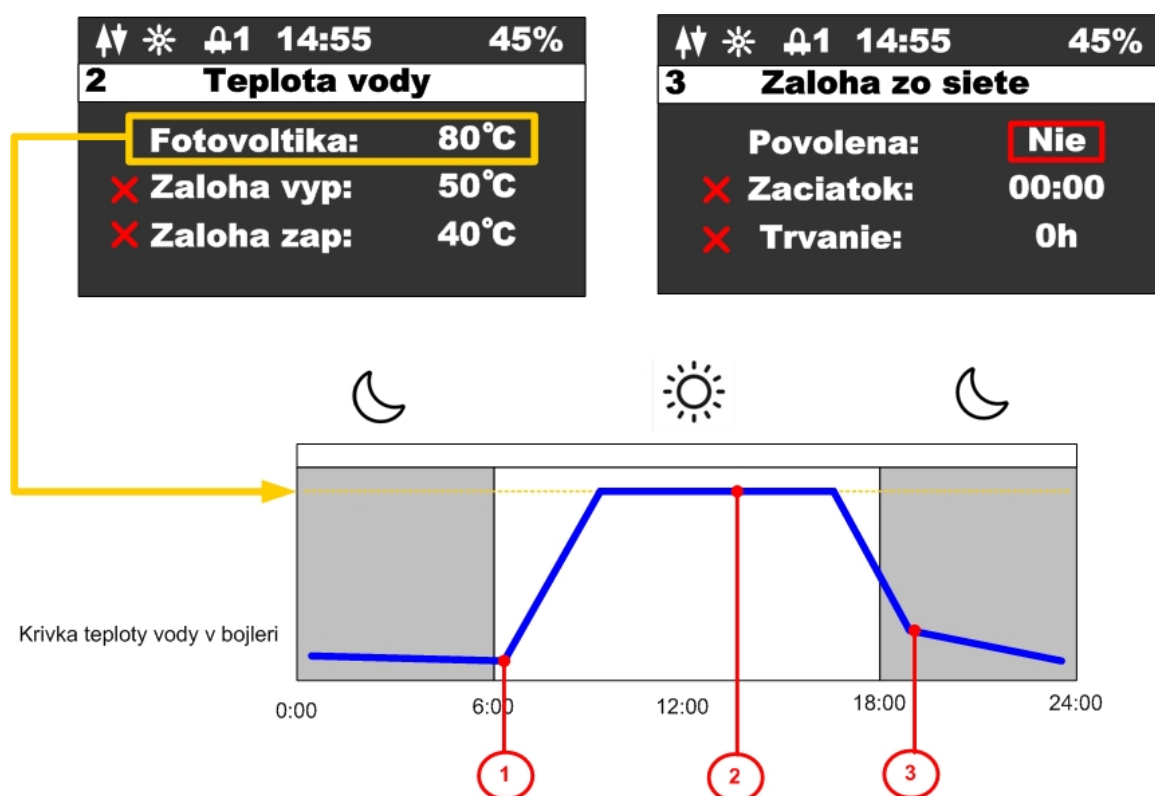
In the case of communication via RS485, the letter M will be displayed instead of the local network icon, indicating communication via the MODBUS RTU protocol. The main screen will display information on the current power output P and the feed-in to the grid G. In addition, the battery SOC is read from hybrid inverters.

7 Water temperature monitoring

The device ensures that the correct water temperature in the boiler is maintained according to your settings. It is possible to use a pure solar mode using surplus energy or a mode with grid backup (without surplus energy) if the water in the boiler is not sufficiently heated.

7.1 Surplus heating mode

In solar mode, the 'Allow mains backup' parameter is set to NO, and therefore all temperatures and times relating to the backup are ignored. The water will only be heated during the day and to the temperature specified by the parameter named 'Photovoltaics' (or until interrupted by the boiler thermostat).



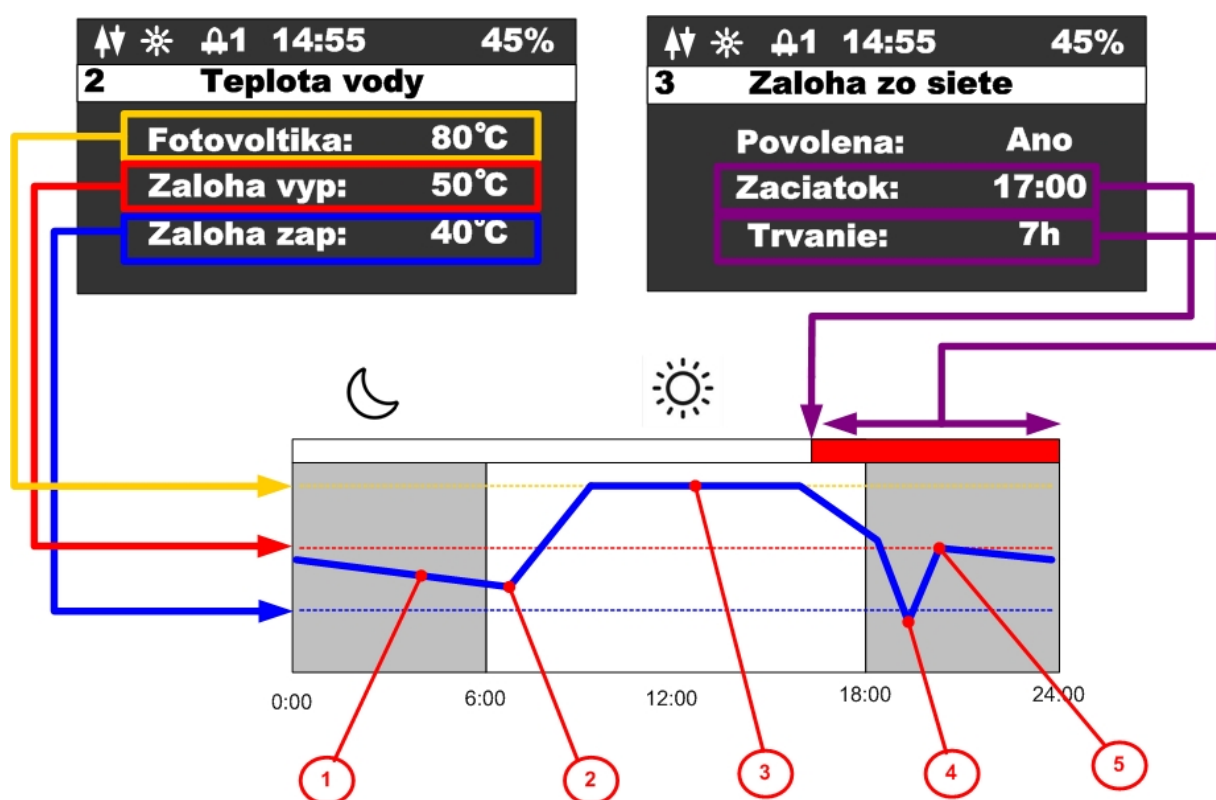
Description of individual points in the temperature curve:

1. After sunrise, the temperature in the boiler begins to rise
2. If the water temperature reaches the required value, heating is interrupted and the device switches to the secondary output, which is indicated by the display of the relevant icon in the **⚡2** status bar
3. If the water temperature drops by 5 degrees Celsius on the external sensor, the output switches back to the first heating element.

7.2 Backup mode

In backup mode, the 'Enable mains backup' parameter is set to YES, and in this case the device will be controlled by the backup temperatures, the start time and the duration of the backup.

There are two backup temperatures. The upper temperature (Backup off) sets the temperature at which heating is switched off in the event of backup. The lower temperature (Backup on) sets the temperature below which, if the water temperature drops, the backup is activated. At the same time, the start time and duration specify the interval during which the backup will be active. Outside this interval, the backup will not switch on even if the temperature drops below the lower temperature. The backup is activated no sooner than 5 minutes after the device is connected to the mains.



Description of the individual points in the temperature curve:

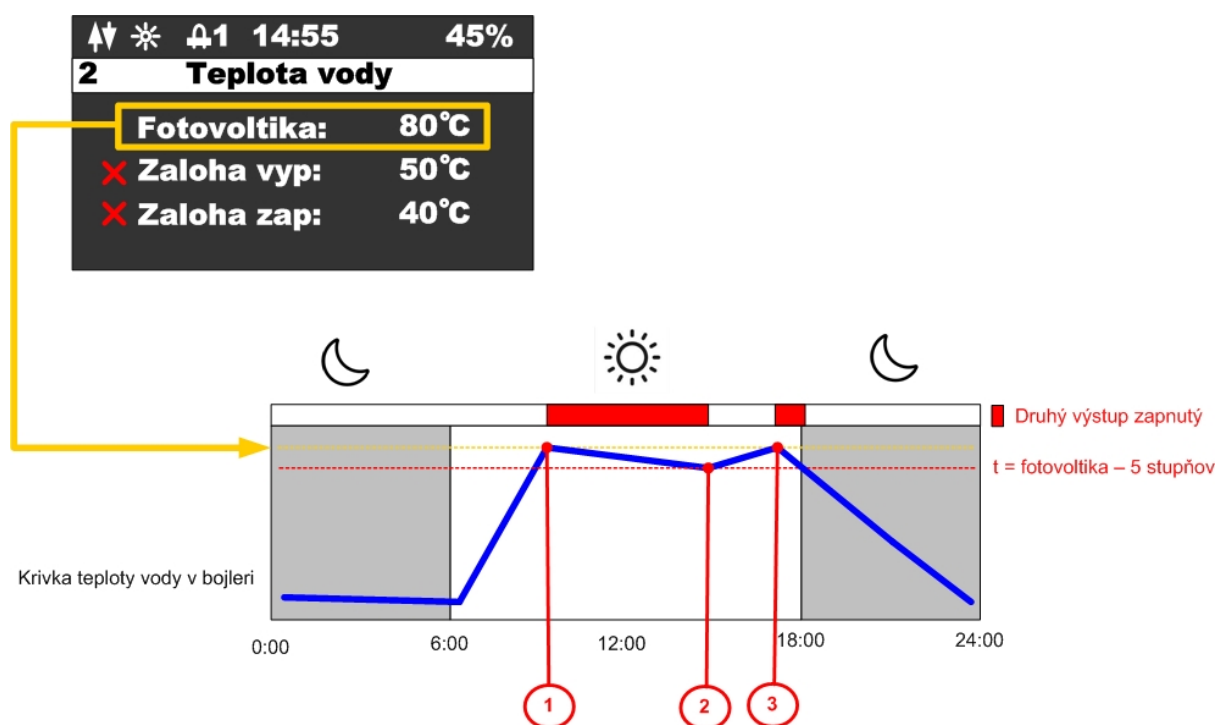
1. At night, the water temperature drops but has not reached the lower temperature
2. During the day, the temperature begins to rise due to heating from surplus energy
3. If the temperature for the photovoltaic system is reached, heating is interrupted and the device switches to the secondary output, which is indicated by an icon in the status bar **⚡2**
4. Following a large draw of hot water, the temperature drops significantly; as it has fallen below the lower limit and this occurred during the active backup interval, the backup is activated and the water begins to be heated from the mains regardless of any surplus
5. The water temperature has reached the upper limit for the backup system, and heating from the 230V mains supply is switched off

7.3 Secondary output

The device includes the option to connect a secondary output via a three-pin connector, which is protected by a waterproof cover. To connect the output, you need to purchase a cable connector, which is an optional accessory.

Operating logic of the secondary output:

The device switches heating to the secondary output if the water temperature at the external sensor reaches the set temperature for surplus heating. The second output remains switched on until the temperature at the external sensor drops 5 degrees below the set temperature for photovoltaics. The grid backup function is not supported on the second output.



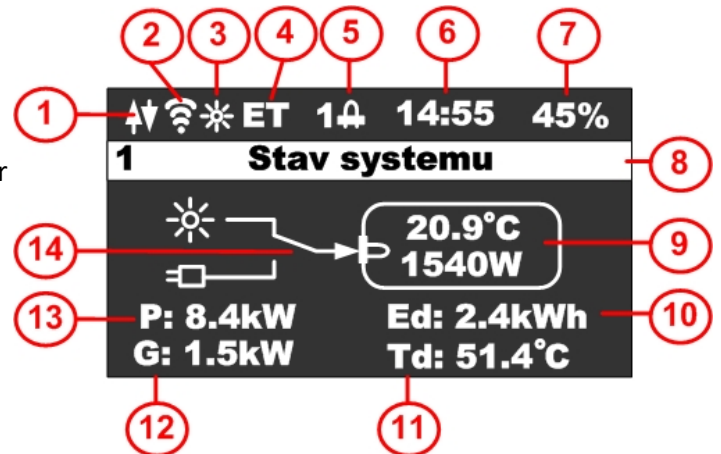
Description of individual points:

1. The water temperature has reached the set temperature for photovoltaics – the second output is activated
2. The water temperature has dropped 5 degrees below the set temperature – the system switches back to the first output
3. The water temperature has again reached the set temperature for photovoltaics – the second output is activated

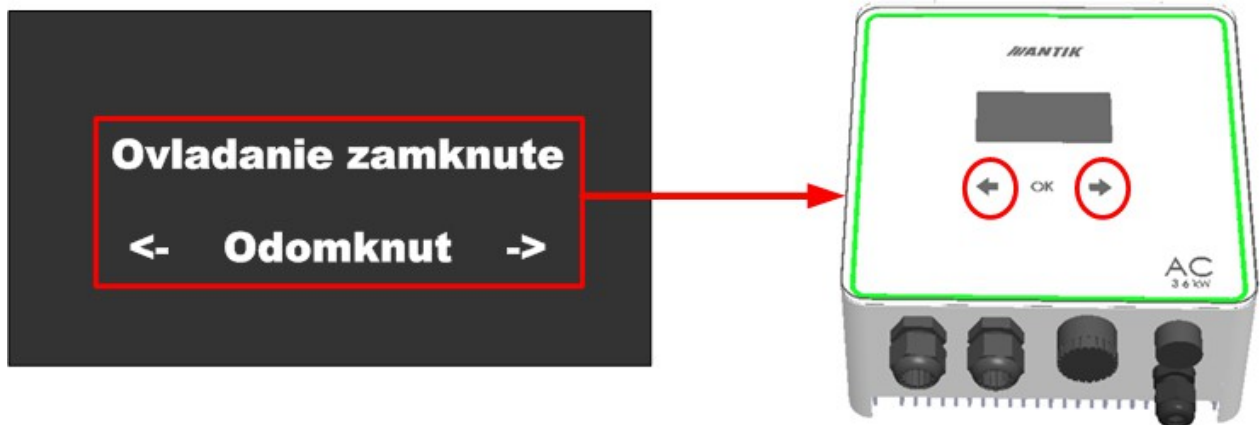
8 Display and control

The device can be monitored and configured locally using three touch buttons and a graphical OLED display.

- 15. Antik Smart Home cloud connection status
- 16. Local network connection status
- 17. Icon indicating inverter detection
- 18. Abbreviation of the detected inverter type
- 19. Icon indicating heating is on and output number
- 20. Current time
- 21. Percentage of internal PWM control
- 22. Name of the displayed screen
- 23. Water temperature and current output
- 24. Daily energy production
- 25. Inverter temperature
- 26. Current power flowing into the grid – surplus
- 27. Current power generated by the inverter
- 28. Energy flow status (surplus / grid)



After 1 minute of inactivity, the display switches off and the touch buttons lock, protecting the device from unauthorised access. Upon any touch, a prompt appears showing how to unlock the device – by pressing the two outer keys (arrows) simultaneously.



9 Mobile app

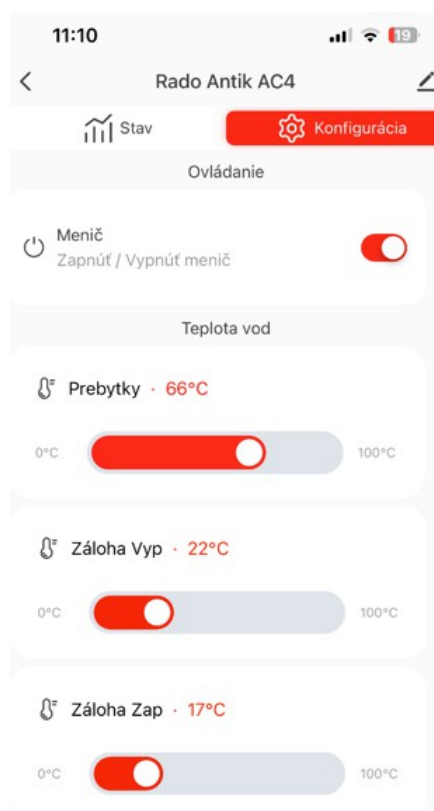
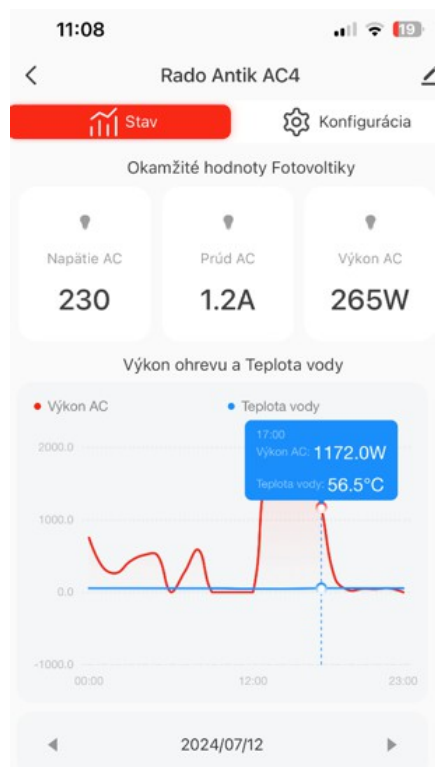
Using the ANTIK Smart Home mobile app, you can:

Monitor parameters:

- Real-time values for panel voltage, current and power
- Water temperature in the boiler / storage tank
- Device temperature
- Daily energy generated
- Total energy generated
- Power and water temperature graph with annual history
- Current operating mode (grid, solar, off)
- Current output of the home PV system inverter
- Home PV system battery status (if hybrid)

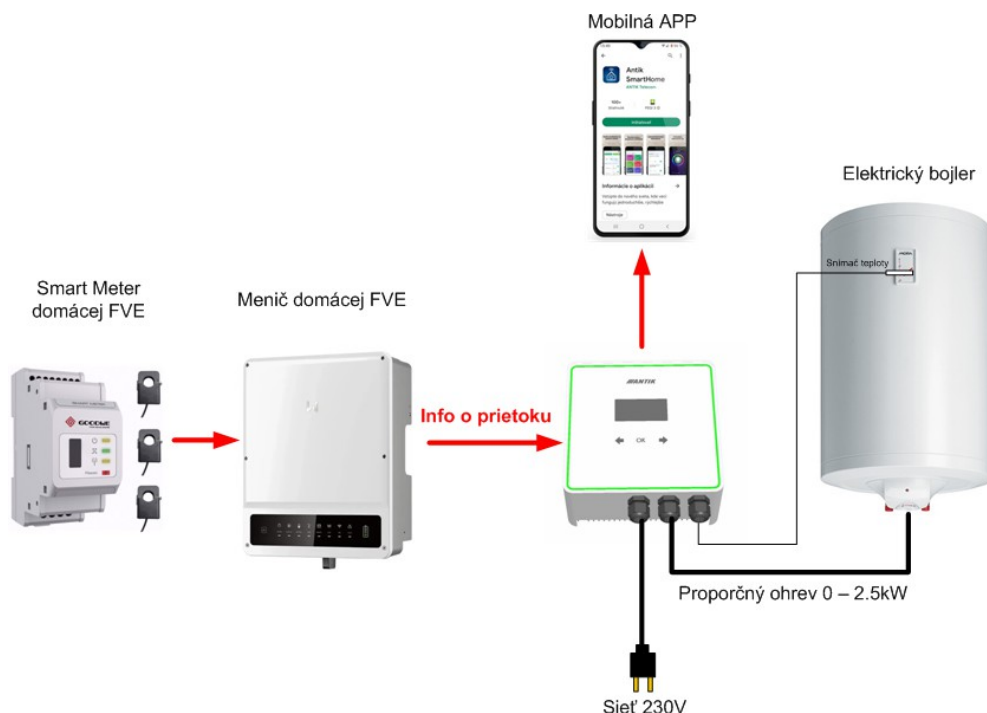
Set parameters:

- Limit maximum power
- Set the desired water temperature
- Set the time for switching the heating to 230V
- Switch the inverter on / off
- Create follow-up actions for other smart home devices
- Selecting the type of inverter for a domestic PV system
- Setting the inverter's IP address



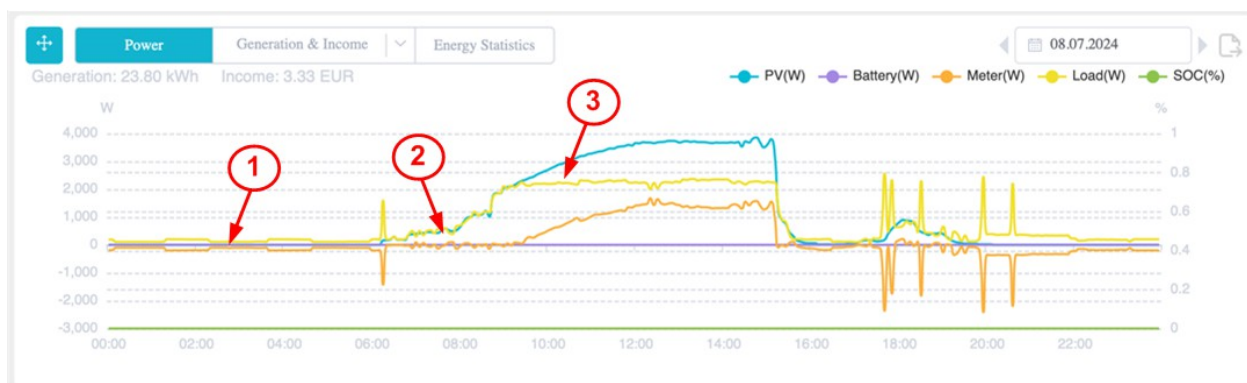
10 Basic operation

The basic operation involves detecting the home PV inverter on the local network, connecting to it, and regularly reading data on grid flows from the inverter using the MODBUS TCP protocol. Based on this information, the output of the electric DHW heating system is controlled. All operational data is recorded in the Antik Smart Home mobile app.



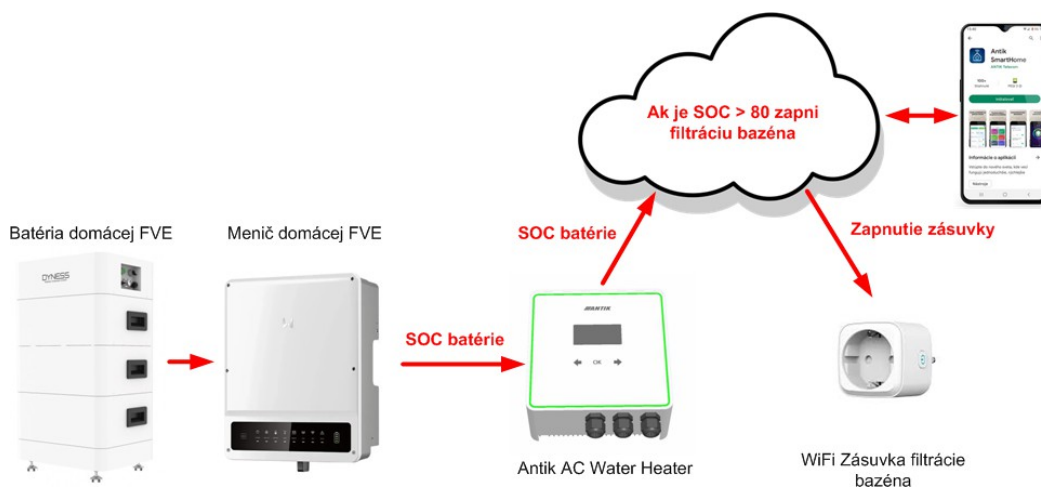
The pattern of heating from surplus energy is also clearly illustrated on the daily graph in the photovoltaic power plant monitoring system.

1. At night, there is no generation and therefore no feed-in to the grid, and the heating is switched off
2. As generation increases, power begins to flow into the grid (if there is no consumption in the house) and the heating system proportionally supplies energy to the boiler coil depending on the current flow
3. If the flow reaches the set maximum power limit for the heating, the power does not increase further and the surplus begins to flow into the grid.

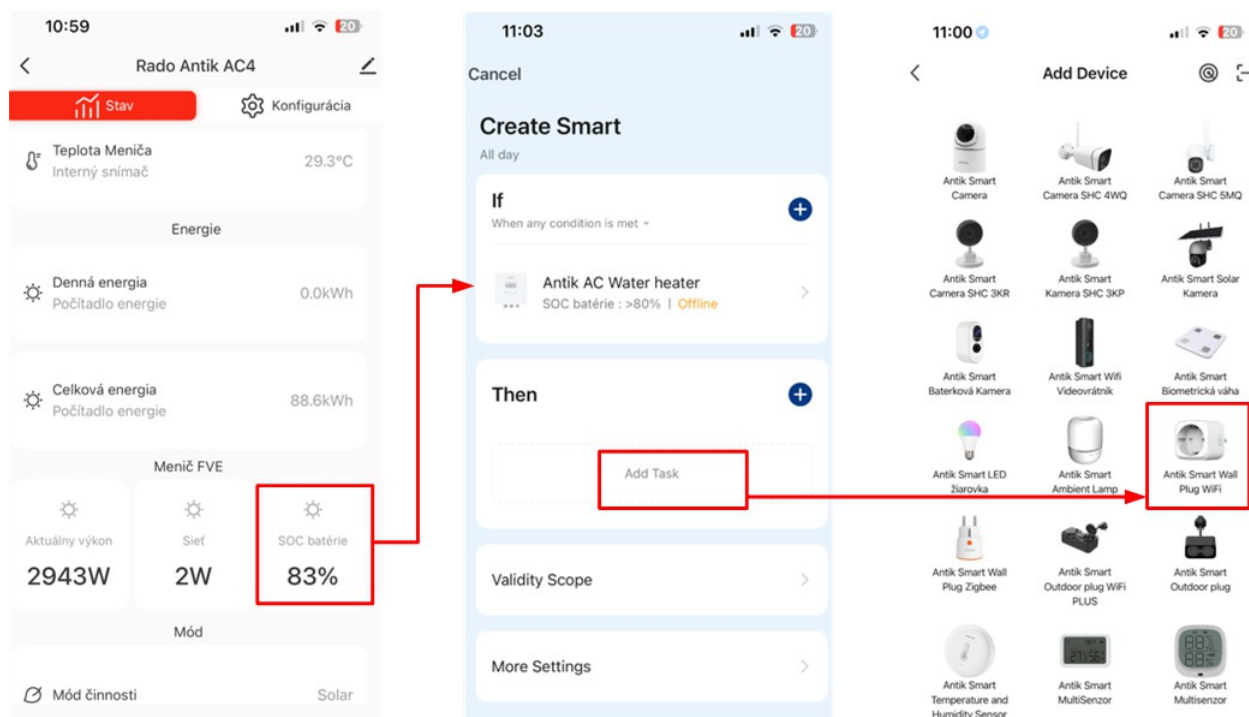


11 Antik Smart Home Actions

The Antik AC Water Heater inverter is part of the Antik Smart Home platform, which allows you to create actions based on the values of any parameter transmitted from the inverter to the cloud; this can be used, for example, to control other switched loads in the home depending on the battery status or the current output of the PV system.



Example of setting up a schedule to control a socket based on the battery SOC. An endless range of devices and control options is available to suit individual requirements.



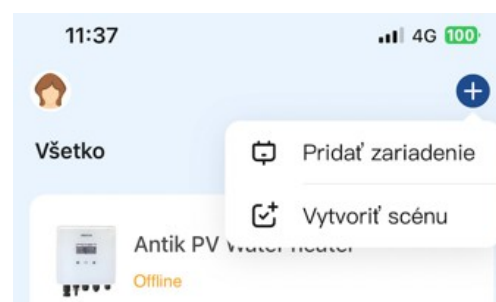
12 Pairing

12.1 EZ mode

Reset the Wi-Fi module from the device menu and ensure that the letter “P” is displayed in the status bar:



Open the “ANTIK Smart Home” app . In the top right-hand corner, select “Add new device”:



In the list of devices, select “Antik Photovoltaic Water Heater” and follow the instructions in the mobile app.



A successfully paired device is indicated by a two-way communication icon with the server.



If an icon with an antenna and a cross appears, there is a problem with the WiFi signal. Check that the WiFi router is switched on and in the correct position.

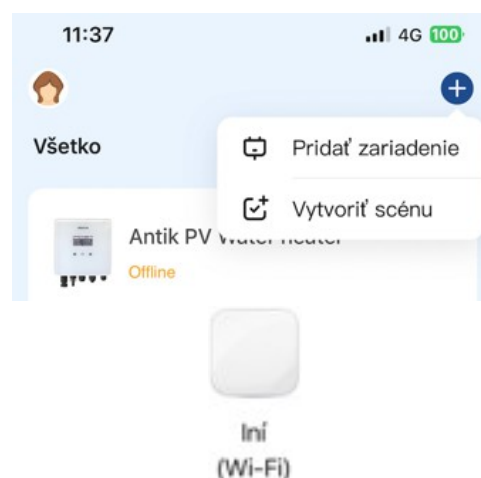


12.2 AP mode

Reset the WiFi module from the device menu and ensure that the letter “A” is displayed in the status bar:

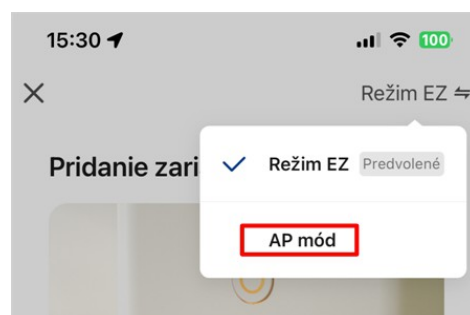


Open the “ANTIK Smart Home” app. In the top right-hand corner, select “Add new device”:



In the device list, select “Others (Wi-Fi)”

On the next screen, change the pairing mode to “AP mode”. The app will then prompt you to connect to the Wi-Fi network created by the converter. Once connected to its network, everything else will happen automatically.



A successfully paired device is indicated by an icon showing two-way communication with the server.



If an icon with an antenna and a cross appears, there is a problem with the Wi-Fi signal. Check that the Wi-Fi router is switched on and in the correct position.



13 Technical specifications

Technical specifications	
AC input	230VAC, max. 16A
AC output	0 – 250VAC 50Hz Suitable for resistive loads only!
User interface	2.5" OLED display, touch buttons
Communication interfaces	WiFi – Connection to ANTIK Smart Home WiFi – Connection to the inverter via local RS485 – optional communication
Dimensions and weight	160x160x80mm 2kg
Installation	Wall mounting using the supplied bracket
Operating temperature	-20 to +60°C
Rating	IP30

