Installation guide

Smart connections.

PIKO MP plus with
KOSTAL Smart Energy Meter and
BYD Battery-Box Premium HVS/HVM

Legal notice

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KOSTAL Solar Electric GmbH is aware of the importance of language with regard to the equality of women and men and always makes an effort to reflect this in the documentation. Nevertheless, for the sake of readability we are unable to use non-gender-specific terms throughout and use the masculine form instead.

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Valid from:
PIKO MP plus: HMI 3.14
KOSTAL Smart Energy: SW 1.3.0

Installation guide

You can find this installation guide in our **download area** for the PIKO MP plus under Operating manual.

> ⚠️ **The installation guide does not replace the operating instructions or manuals for the inverter, battery and KOSTAL Smart Energy Meter required for correct assembly and installation.**

> **❗ IMPORTANT INFORMATION**
>
> **Installation may only be carried out by a trained and qualified electrician!**
>
> **Follow the safety instructions in the operating instructions for the inverter, battery and KOSTAL Smart Energy Meter.**
>
> **A battery activation code for the KOSTAL Smart Energy Meter and a computer / tablet are required to put the storage system into full operation and to make all the necessary settings.**
>
> **For all work on the devices or on the supply lines, the power supply in the house, the inverter and the battery must be completely de-energized. Take a look at the corresponding operating instructions for the respective devices (inverter / battery / KOSTAL Smart Energy Meter).**
>
> **The installation of data and signal lines is standardized according to: VDE 0800-174-2 / Part 2: Information technology; Installation planning and practices in buildings, VDE 0100-443 protection against overvoltages due to atmospheric influences or switching operations and VDE 0100-444 protection against interference voltages and electromagnetic interference. The separation between power lines and data / signal lines must be ensured by spacing for reasons of electromagnetic compatibility and functionality.**

PIKO MP plus applications

The PIKO MP plus can be used as a PV inverter, battery inverter or as a hybrid inverter with and without a battery.

PIKO MP plus 1.5 to 3.6 with 1 MPP tracker		PIKO MP plus 3.0 to 5.0 with 2 MPP trackers		
PV inverter	Battery inverter	PV inverter	Hybrid inverter	Battery inverter
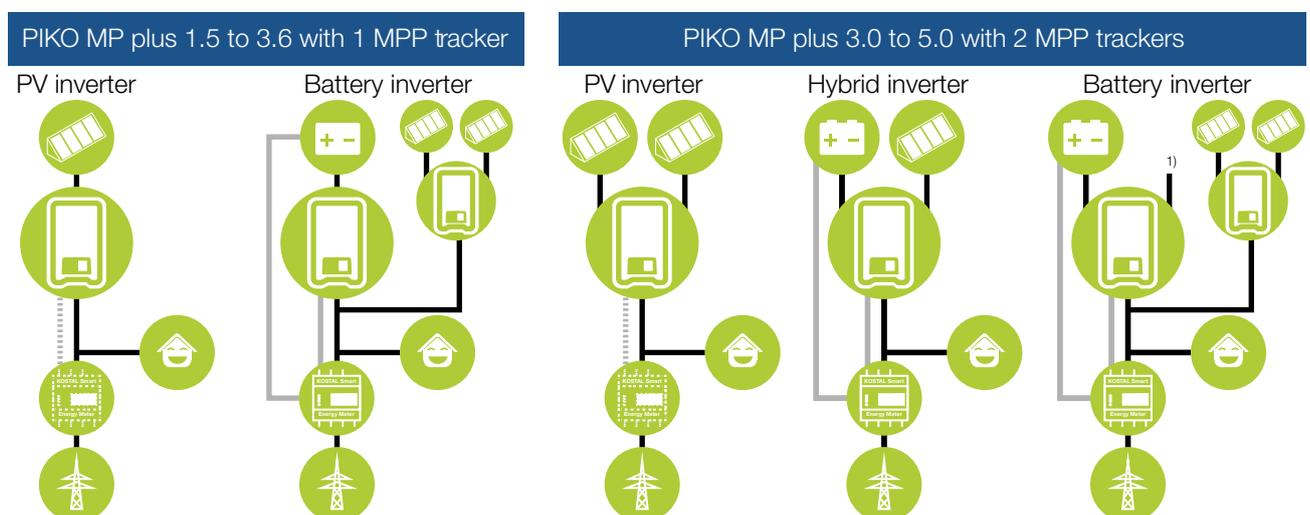
1) Second DC input not connected.

Sequence of installation and commissioning

The following software is required for the PIKO MP plus function with battery. You can find these in the download area for the PIKO MP plus.

- PIKO MP plus: HMI 3.14.0 / PU-APP 4.1.43 / ENS 1.35 / PAR 23.0.12
- KOSTAL Smart Energy: 1.3.0

The following sequence must be observed when installing and commissioning the entire system to avoid errors.

1. Install the KOSTAL Smart Energy Meters (KSEM) energy meter according to the operating instructions.

2. Install the PIKO MP plus inverter according to the installation instructions and switch on the the AC side.

3. Install the BYD Battery-Box Premium HVS / HVM battery according to the operating instructions and preconfigure it with the BYD-APP.

4. Set the inverters DC switch to OFF (0).

5. Switch off the battery by pressing the power button (min. 6 sec.) on the front.

6. Switch on the battery using the main switch on the side of the BCU.

7. Set up the inverter and battery in the KOSTAL Smart Energy Meter (KSEM).

8. Set the inverters DC switch to ON (|).

Switch-on sequence after error

The following sequence must be followed if an error has occurred or the battery was switched off manually during operation using the circuit breaker on the battery.

1. Set the inverters DC switch to OFF (0).

2. Switch off the battery by pressing the power button (min. 6 sec.) on the front (if it is still switched on).

3. Switch on the battery using the main switch on the side of the BCU.

4. Set the inverters DC switch to ON (|).

Installation of KOSTAL Smart Energy Meters for battery operation

INFO

Use the KOSTAL Smart Energy Meter instruction manual for the complete installation.

It is impotant that the KOSTAL Smart Energy Meter is installed at the grid connection point.

When the battery input in the PIKO MP plus is activated, the installation position of the KOSTAL Smart Energy Meter is fixed to the grid connection point and cannot be changed.
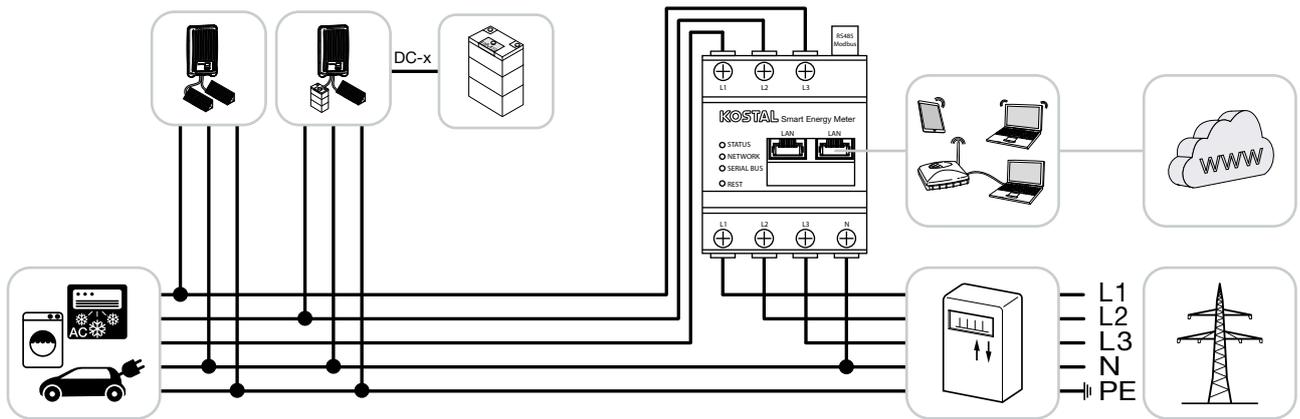
1. Install KOSTAL Smart Energy Meter as shown at the grid connection point.

2. Establish a LAN connection from the KOSTAL Smart Energy Meter, battery and inverter to the Internet.

3. In this variant, the KOSTAL Smart Energy Meter runs as a master and sends data to the inverter and battery.

Installation of PIKO MP plus for battery operation

INFO

Use the PIKO MP plus instruction manual for the complete installation.

PIKO MP plus xx-1: DC1 - PV / Bat
PIKO MP plus xx-2: DC1 - PV

PIKO MP plus xx-2: DC2 - PV / Bat
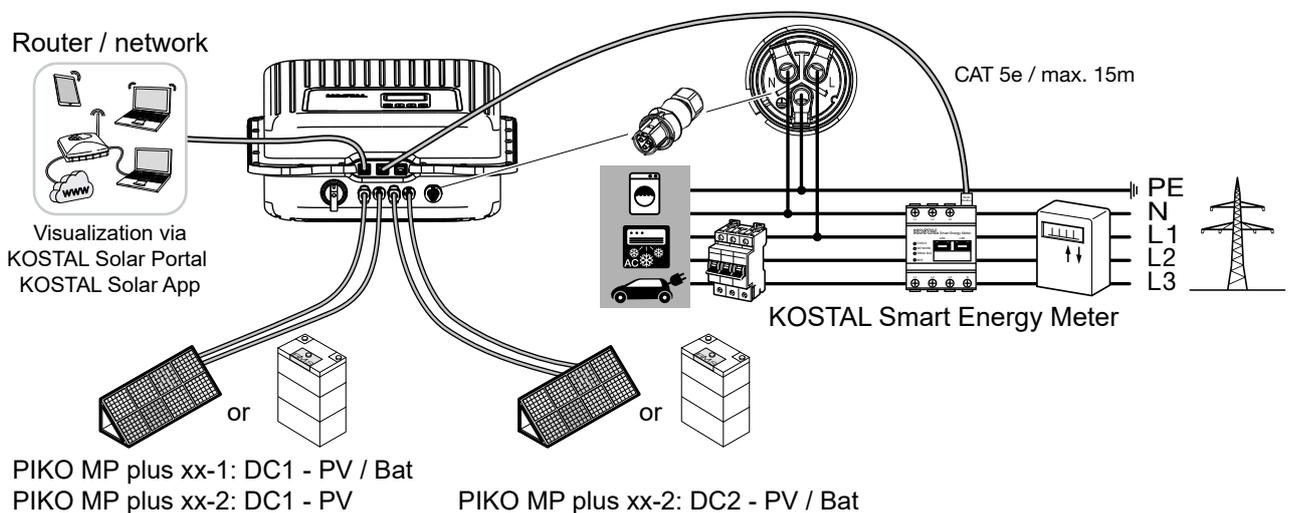
Connection of PIKO MP plus PIKO MP plus / Batterie BYD Battery Box Premium / KOSTAL Smart Energy Meter
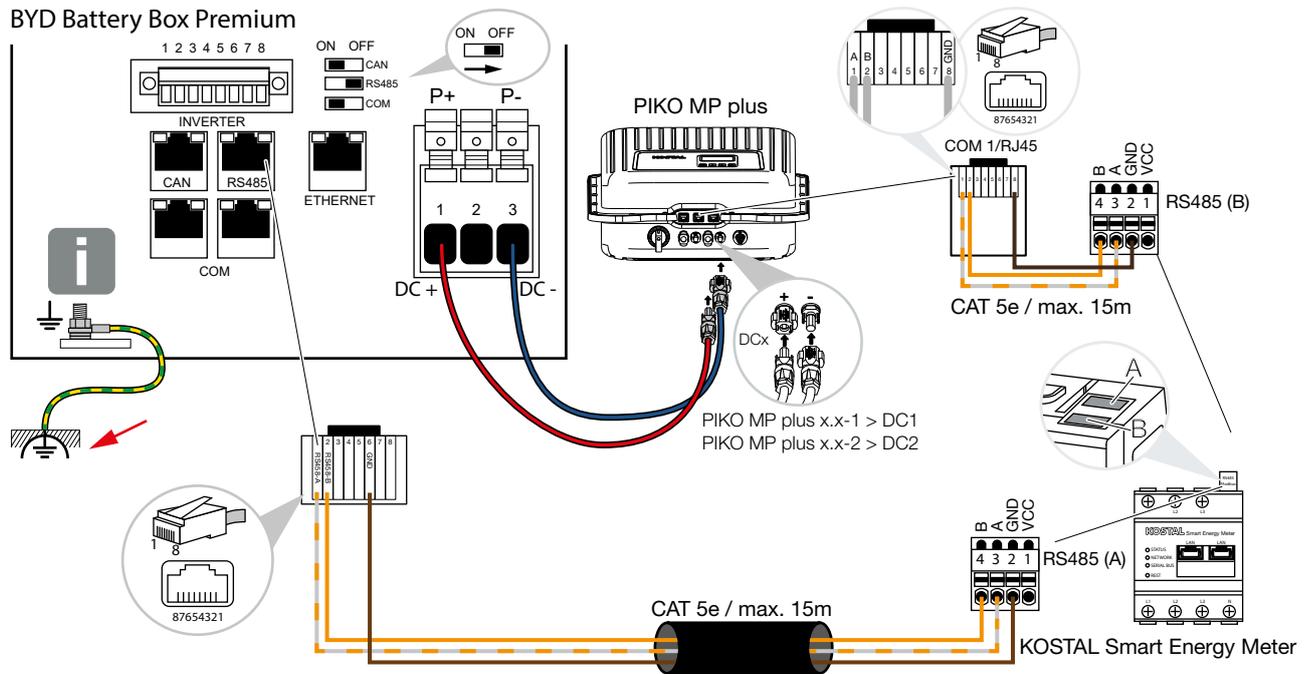
IMPORTANT!

Connect the battery earth (BCU) to the equipotential earth connection.

Connection via RJ45 connector			
BYD Battery-Box Premium	**KOSTAL Smart Energy Meter**	**Connection**	**Cable**
1	3	RS485 A	min. Cat.5e / Twisted pair max. Ø 6,8mm / max.15m
2	4	RS485 B	
6	2	GND	

1. Establish and connect the RS485 communication line between the inverter and the KOSTAL Smart Energy Meter RS485 (B).

2. Establish and connect communication line RS485 between battery and KOSTAL Smart Energy Meter RS485 (A).

3. Set the terminating resistor of the RS485 interface in the battery to OFF.

4. Connect the DC cables of the battery to the inverter.

Commissioning of the entire system

Commissioning configuration of the inverter and DC input for battery

1. Commission the PIKO MP plus inverter according to the inverter installation manual and carry out the initial configuration.

2. Switch the DC input in the inverter to battery. By default, the inputs are set to PV. To switch the DC input to battery, press the SET button in the main menu of the inverter under Settings > Service > Inputs > DCx and select the battery. Exit the menu with the ESC key. The DC input is now switched to battery.

    DCx = DC1 for PIKO MP plus xx-1 (AC-storage mode with 1 MPP tracker)
          DC1 - DC2 for PIKO MP plus xx-2 (AC- or hybrid storage mode with 2 MPP trackers)

    > **INFO**
    >
    > **To access the service menu, press the arrow keys ⇧ and ⇩ on the keyboard simultaneously for a few seconds in the Service menu.**
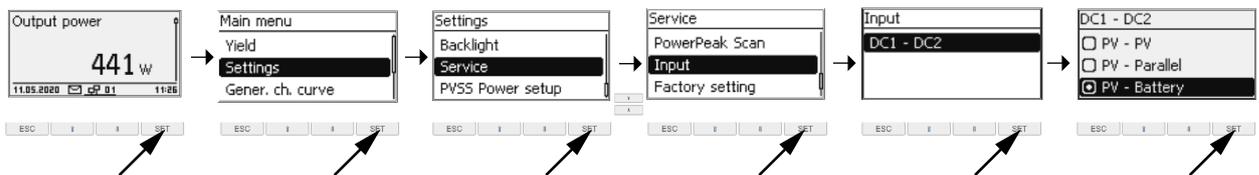
➔ After this configuration, the display of the inverter lights up in red and shows the following error message because the inverter and the battery in the KOSTAL Smart Energy Meter have not yet been configured.

3. Set the inverters DC switch of the PIKO MP plus to OFF (0).

4. Switch on the battery using the main switch on the side of the BCU.

5. Open the web server of the KOSTAL Smart Energy Meter via the internet browser. To do this, you can call up the KOSTAL Smart Energy Meter (KSEM) appearing on your PC via the file explorer under Devices.

6. In the KOSTAL Smart Energy Meter menu, call up the menu item „Modbus settings"> „Modbus RTU" and deactivate both RS485 interfaces and confirm with Save.
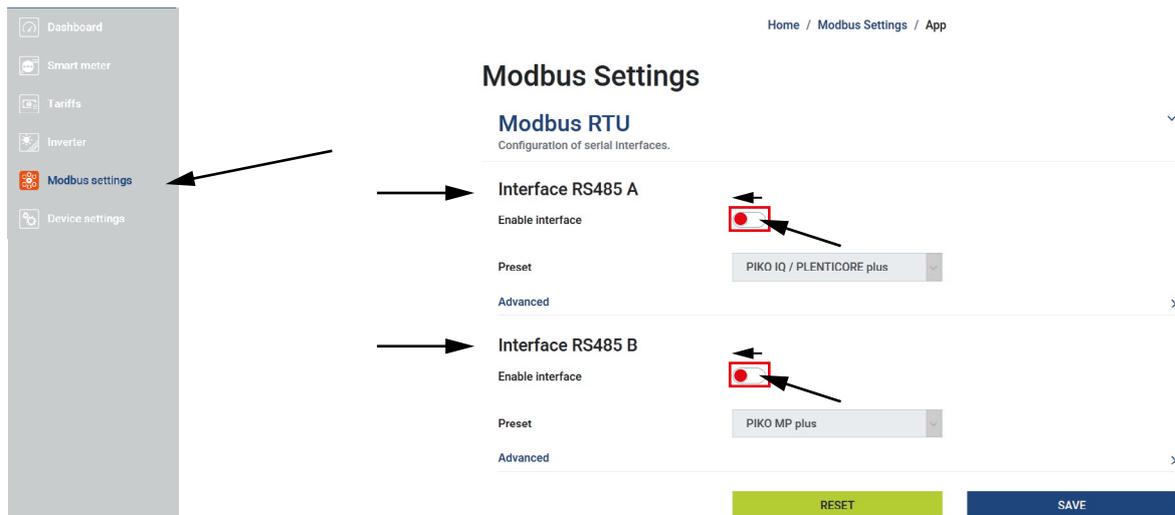
7. In the KOSTAL Smart Energy Meter menu, call up the menu item „Inverter" > „Activation code". The activation code, which is subject to a charge, must be purchased in advance via our web shop **shop.kostal-solar-electric.com**

8. Enter the previously purchased activation code for the battery function under the „Activation code" item.
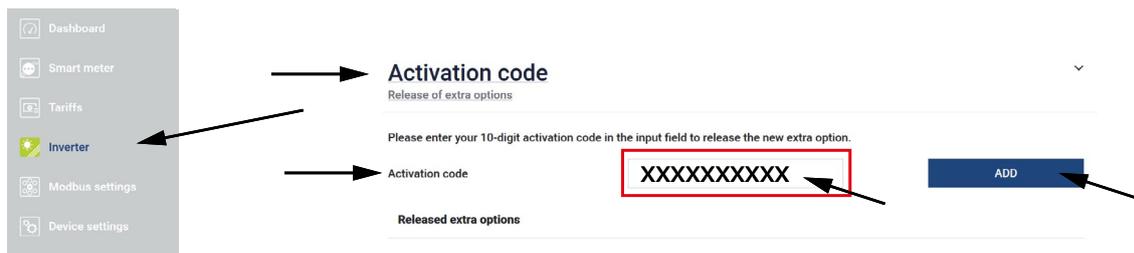
→ The „Battery management" field then appears under „Activated additional options".
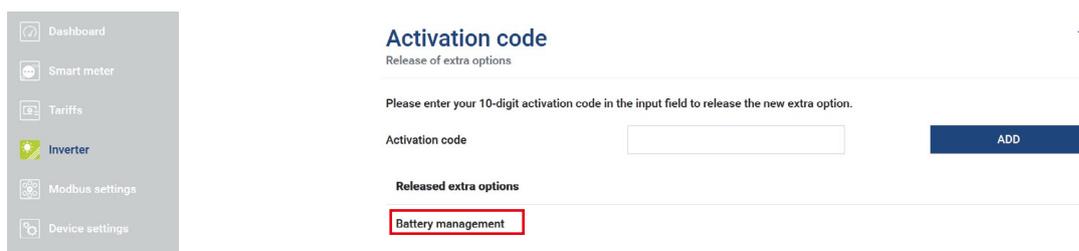
9. In the KOSTAL Smart Energy Meter menu, call up the menu item „Inverters" > „Devices" and add a new device using ✚.
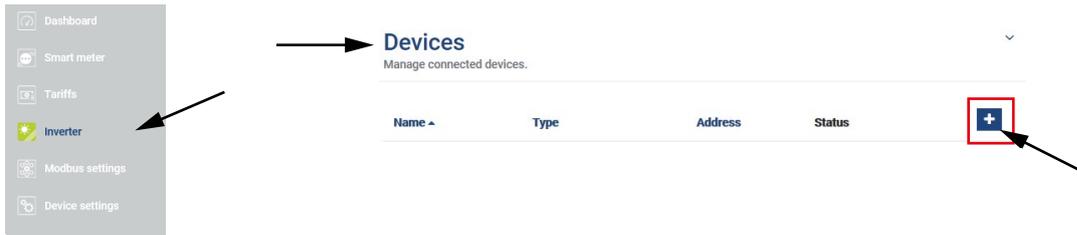
10. Enter values for new devices and confirm with OK.

Parameter	Value
Series	Select **PIKO MP plus**.
Type	Select the power class of the inverter e.g. B. **PIKO MP plus 4.6-2**.
Serial interface	Select **RS485 B**
Timeout	Does not have to be changed.
Max. AC output power of inverter	Does not have to be changed. The max. The output power of the inverter is set automatically by the above selection (e. g. for PIKO MP plus 4.6-2 = **4600**).
Battery management	☑ Enable battery support
Serial interface of battery	Select **RS485 A**
Battery type	Select the battery type that is connected to the PIKO MP plus (e.g. **BYD HVS** or **BYD HVM**).
Number of modules	Specify the number of battery modules installed in the battery (e.g. **5**).
Max. SOC (charging status)	Set the desired value for max. battery charge state (default 100%). The battery is charged up to this SOC value.
Min. SOC (charging status)	Set the desired value for min.x battery depth of discharge (**default 5%**). The battery is discharged up to this SOC value. Note the information provided by the battery manufacturer (BYD Battery = 5%).
Nominal charge/discharge power of battery	Does not have to be changed. The value is automatically set by the battery information above.
Advanced	
RS485 adress	Enter **1**

Add new device   ✕

Series	PIKO MP plus
Type	PIKO MP plus 4:6-2
Serial interface	RS485 B
Timeout	60 S
Max. AC output power of inverter	4600 W
Battery management	☑ Enable battery support
Serial interface of Battery	RS485 A
Battery type	BYD HVM Premium
Number of modules	5
Max. SOC (charging status)	100 %
Min. SOC (charging status)	5 %
Nominal charge/discharge power of battery	3330 W
Advanced	⌄
RS485 adress	1

OK

11. Set the DC switch on the PIKO MP plus inverter to ON (|).

12. In the inverter view under „Status overview" all values of the battery including the state of charge are shown.

13. The two devices - inverter and battery - are displayed in the inverter view under „Devices".
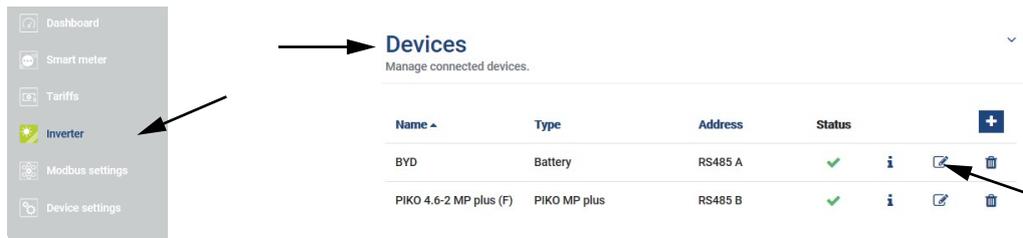
INFO

If the SOC for the battery is to be changed, this can be done via the modify button (pin) in the battery device line.

14. Finally, the transfer of the data to the KOSTAL Solar Portal must be set up.

Set up data transfer to the KOSTAL Solar Portal

The yield data of the overall system can be called up via the KOSTAL Solar Portal or the KOSTAL Solar App. To do this, the inverter and the KOSTAL Smart Energy Meter must be configured to send data to the KOSTAL Solar Portal.

1. The transfer of data (yield data) is activated in the PIKO MP plus as follows:
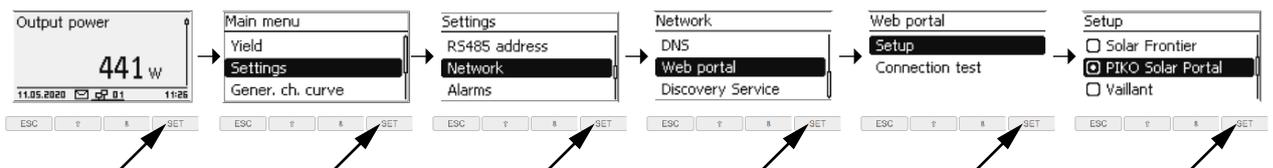
2. The transfer of data (house consumption, self-consumption and battery values) is activated in the KOSTAL Smart Energy Meter via the menu item „Inverter „Solar Portal".
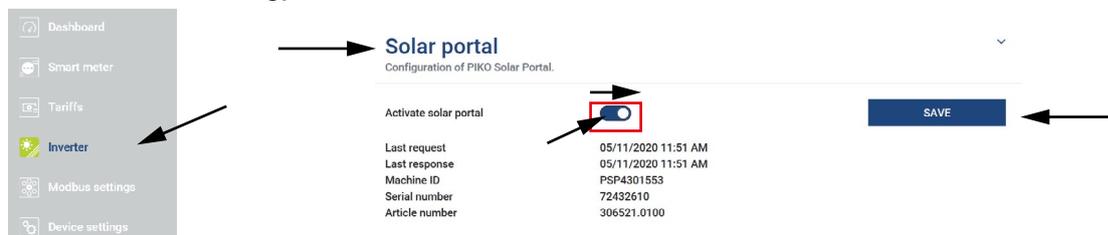
3. Set up the PIKO MP plus inverter and the KOSTAL Smart Energy Meter in the KOSTAL Solar Portal www.kostal-solar-portal.com.

4. To set up a device, a system must first be created. To do this, click the „Create new system" button under the „System overview" section.

5. Enter the data for the system and click on „Create".

6. In the next window, enter the article number and the serial number. Click on "Create". The inverter and KOSTAL Smart Energy Meter must be added to the same system.

> **INFO**
>
> With the PIKO MP plus you will find the necessary data (article number / serial number) on the type label.
>
> With the KOSTAL Smart Energy Meter, please use the data from the internal web server of the KOSTAL Smart Energy Meter, which can be found under Inverters > Solar Portal.

✓ **Commissioning of the entire system has now been completed.**

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