

Guideline

Commissioning PLENTICORE plus inverter in combination with a BYD Battery-Box HV H5.1 - H11.5



This guide does not replace the operating instructions or manuals required for proper assembly and installation.

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IMPORTANT INFORMATION

Installation may only be carried out by a trained and qualified electrician! Observe the safety instructions in the operating instructions for the inverter and the battery.

In order to start up the system completely and to make all necessary settings, the Service/PARAKO password and a computer/tablet as well as the battery activation code are required.

The inverter and the battery must be completely disconnected from the voltage supply for all work on the inverter or on the supply lines. Refer to the relevant operating instructions for the respective devices (inverter/battery).

ATTENTION - The following points should always be considered in order to successfully commission the PLENTICORE plus inverter with the BYD Battery-Box HV.

1. That it may be necessary to access the web servers of the inverter, the BYD Battery-Box HV and the KOSTAL Smart Energy Meter (KSEM), a small router should be carried in the case. If a customer network already exists in which all devices are integrated, the use of an external router can be dispensed with. Also in case of service, if something does not work correctly or has to be checked, access to all devices in the system is necessary, e.g. to provide support via TeamViewer.
2. All necessary and current updates for the inverter, battery and smart meter should always be carried on the computer. If no Internet is available, then no update can be carried out.
3. All necessary operating instructions, short manuals or quick guides should always be available on the computer in the current version in paper form or as a PDF file. Without these, installation and subsequent commissioning is not possible. Also **no support** can be granted, if due to missing documents or necessary updates no proper installation was accomplished.
4. Commissioning must be carried out in **3 STEPS**.

STEP 1: Installation and commissioning of the inverter - install the current FW for the inverter, select the energy or smart meter used in the inverter, select the correct sensor position and make the necessary settings (dynamic active power reduction, zero feed-in, etc.). **(However, do not select a battery in the service menu)**

Inverter starts up without error message and feeds in: **YES** **NO**

YES - continue to STEP 2 / **NO** - Determine and eliminate cause of error

STEP 2: Installation of the BYD Battery-Box HV (do not yet connect the DC plug to the inverter, install the current update and configure the battery in the web server.

Battery configured shows no error messages: **YES** **NO**

YES - continue to STEP 3 / **NO** - Determine and eliminate cause of error

STEP 3: Commissioning the PLENTICORE plus together with the BYD Battery Box HV

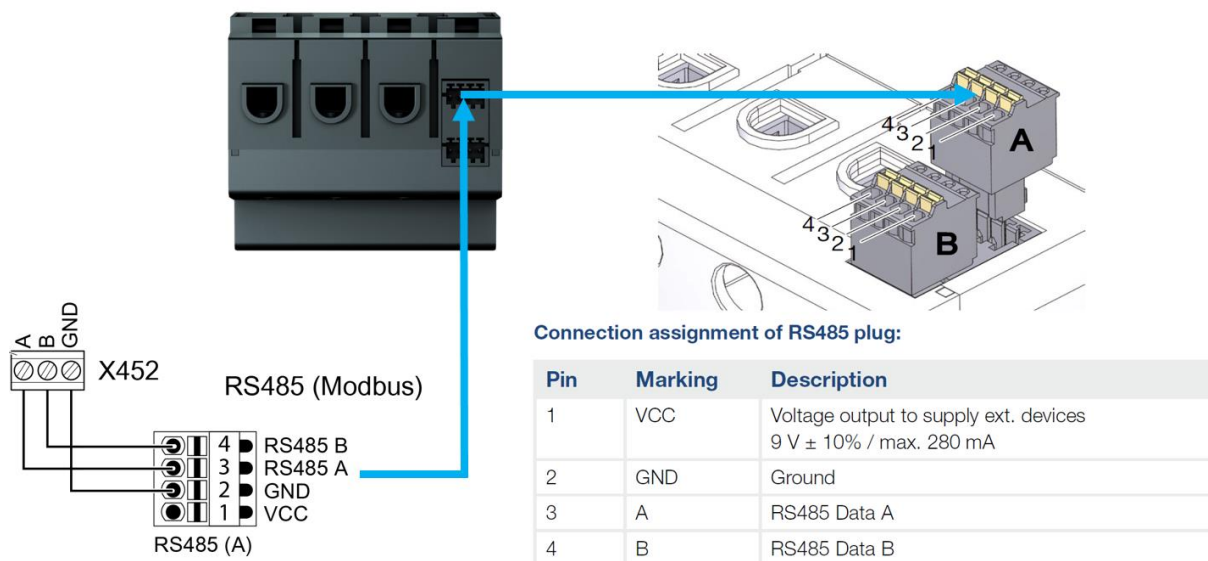
- Switch off battery
- Switch off inverter
- Connect the DC cable of the battery to the inverter.
- Switch on the inverter again and wait until it feeds in again.
- Switch battery on again
- Select the battery in the service menu of the inverter.
- After a short time, the battery goes into RUN mode and allows the DC connection to the inverter.

The inverter feeds in and the battery is charged or discharged: **YES** **NO**

YES - Congratulations / **NO** - Determine and correct cause of error

Connection of the RS485 cable of the Energy Meter or Energy Manager with the SCB (X452) of the PLENTICORE plus inverter.

View from above at the
KOSTAL Smart Energy Meter



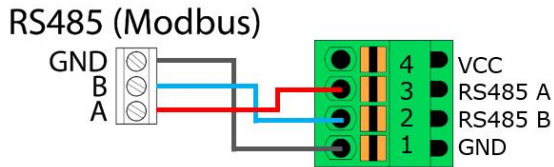
Connection assignment of RS485 plug:

Pin	Marking	Description
1	VCC	Voltage output to supply ext. devices 9 V ± 10% / max. 280 mA
2	GND	Ground
3	A	RS485 Data A
4	B	RS485 Data B

RS485 interface A - preconfigured for PLENTICORE plus/PIKO IQ
RS485 interface B - preconfigured for PIKO MP plus

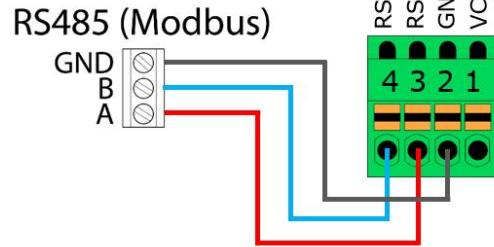
ATTENTION: The B-control EM300 LR and the KOSTAL Smart Energy Meter have different RS485 pin connections.

Terminal X452 on the SCB of the PIKO IQ or PLENTICORE plus inverter



View from above on the B-control EM300 LR

Terminal X452 on the SCB of the PIKO IQ or PLENTICORE plus inverter



View from above on the KOSTAL Smart Energy Meter

- The Modbus RTU interface (A) is preconfigured as standard with the readout intervals for the PLENTICORE plus or PIKO IQ inverters.
- The KOSTAL Smart Energy Meter can be installed directly in the sub-distribution cabinet and connected to the inverter without a PC (adjustment of parameters) and other settings. The device is immediately ready for use.

Interface RS485 A

Enable slave

Preset: PIKO IQ / PLENTICORE plus

Advanced

Slave address: 1

Baudrate: 38400

Databits: 8

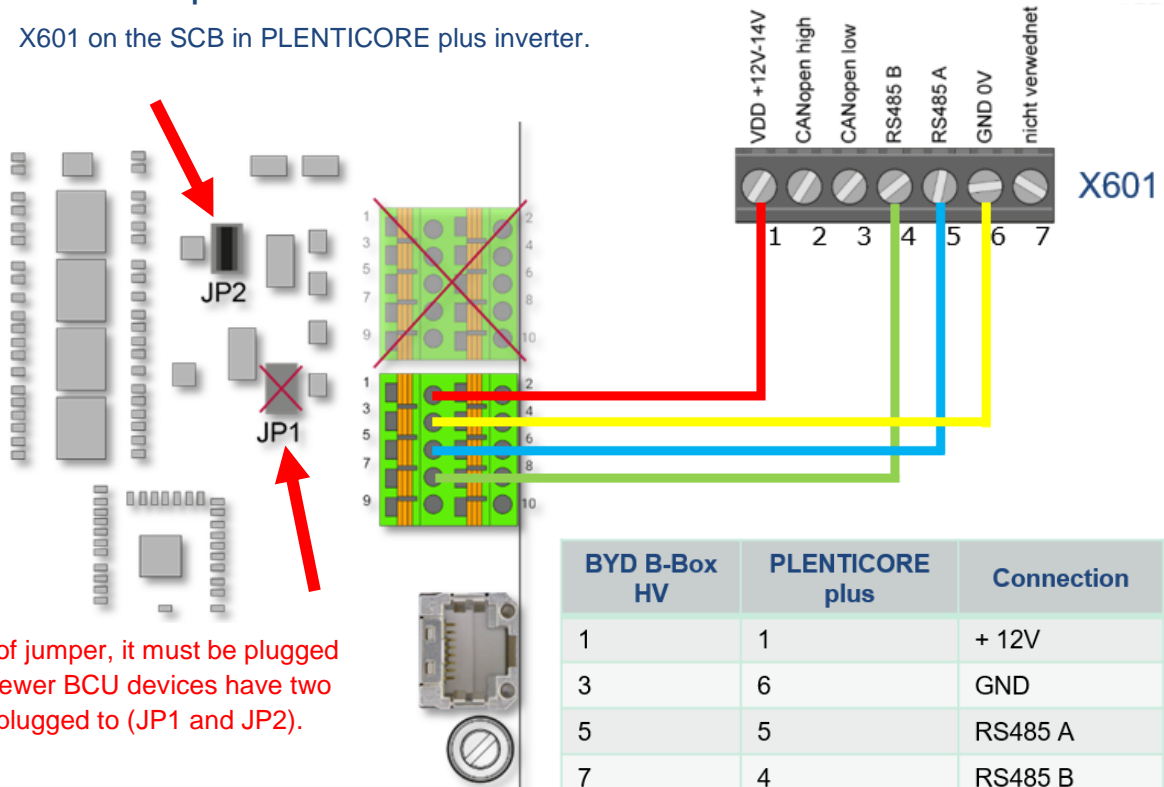
Parity: None

Stopbits: 2

Intelligent verbinden.

Connection of the RS485 cable of the BCU from the BYD Battery-Box HV to the SCB (X601) of the PLENTICORE plus inverter.

X601 on the SCB in PLENTICORE plus inverter.



BYD B-Box HV	PLENTICORE plus	Connection
1	1	+ 12V
3	6	GND
5	5	RS485 A
7	4	RS485 B

Cable

Cat.5e „Twisted-Pair“

Telecommunication cable „Twisted-Pair“
J-Y(ST)Y 3x2x0,6 GR oder J-Y(ST)Y 4x2x0,6 GR

Outside diameters max. 6,8 mm
Length max. 15 m

Configuring the BCU of the BYD Battery-Box HV via WLAN

- Activating the WLAN on the computer
- Select the BYD battery from the list of devices in the WLAN network
- Enter the network key for the WIFI of the BYD battery access: **123456789**
- In the URL field of the browser now enter the IP of the BCU: **192.168.5.1**
- A login window will open
- Enter username: **installer** and password: **byd@12345** and confirm
- The web server opens with the "HOME" page
- Click on "Installation" in the menu
- The "Installation" window opens
- All necessary values for the configuration are now entered here

- The installation wizard starts with step 1. Enter the time and date here and click "Next".



Time and Date * Hour: 09 Min: 12 Day: 25 Month: 03 Year: 2019

Next

- In step 2 of the installation, the number of memory modules "**Series Battery Counts**", the inverter manufacturer "**Inverter**" and the country "**Country**" must be entered.
- Then click on the "Finish" button. A small window will appear with the question: "**Are you sure**". Please click the OK button here. Now the installation is finished and the system reboots.



Server IP Address * bbboxserver.byd.com.cn

Series Battery Counts * 9

Inverter * KOSTAL

Country * Germany

Asterisk (*) indicates required fields

Previous Finish

- The time and date must be entered.
- Then click on the "Next" button.
- Series Battery Counts - Enter number of memory modules - 4 to 9
- Inverter - Select inverter manufacturer - KOSTAL
- Country - Select your country – e.g. Germany
- Finally click on the "Finish" button.
- **The battery system restarts and is ready for operation.**

Intelligent verbinden.

Initial commissioning of the PLENTICORE plus inverter

- **Attention:** Commissioning only possible with sufficient PV voltage and irradiation.
- Check the RS485 connection Energy Meter to the SCB of the inverter.
- Plug in the DC plug of the PV strings.
- Connect the DC plug of the battery.
- Switch on AC fuses.
- Switch on DC Switch.
- The start-up process of the inverter has started.
- The installation assistant appears in the inverter display.
- Commissioning can be carried out completely via the display.
- Simply follow the instructions on the display.
- Alternatively, the commissioning can also take place partly via the web server.
 - Select language, date and country in the display.
 - Activate IPv4 / DHCP in the display
 - Select e.g. the NSR Germany country code in the display and complete the installation.
- Make all other settings on the web server of the inverter.
- Read IP address from inverter display.
- Enter the IP of the inverter into the URL line of your browser e.g. Mozilla or Firefox.
- The login window will open.

In order to be able to log on to the web server as an installer, the "**Master key**" which can be found on the inverter label and the service code "**PARAKO password**" are required

Inverter label of the PLENTICORE plus

The image shows the web server interface for the PLENTICORE plus inverter. At the top, it says 'PLENTICORE plus' and 'Info'. Below is a 'Login' section with three input fields: 'Installer' (a dropdown menu), 'Master Key', and 'Service code'. A blue arrow labeled 'PARAKO password' points to the 'Master Key' field. Below the login fields is a 'Danger notices and disclaimer of liability' section with a checkbox and a 'Login' button. To the right is the inverter label, which includes the KOSTAL logo, contact information, technical specifications (DC input, AC output, etc.), a warning about dual supply, and a barcode.



- All other settings can now be entered in the service menu.
- Service menu → Energy management: Choice of energy meter and position of the sensor

Energy management

Energy meter	<input type="text" value="TQ EM300"/>	
Sensor position	<input type="text" value="Grid connection point"/>	
Limitation of the active power to [W]	<input type="text" value="10000"/>	

Dynamic limitation of the active power takes place under consideration of the home consumption.

Energy management

Energy meter	<input type="text" value="KOSTAL Smart Energy I"/>	
Sensor position	<input type="text" value="Grid connection point"/>	
Limitation of the active power to [W]	<input type="text" value="10000"/>	

Dynamic limitation of the active power takes place under consideration of the home consumption.

- Service menu → Energy management: Activate storage of excess AC energy from local generation.

Energy management

Energy meter	KOSTAL Smart Energy Meter	←
Sensor position	Grid connection point	←
Limitation of the active power to [W]	10000	

Dynamic limitation of the active power takes place under consideration of the home consumption.

→ Storage of excess AC energy from local generation

If there is a ripple control receiver connected to another inverter's digital inputs, these signals can be allocated to all inverters in the local area network (LAN) for active and reactive power control by means of UDP broadcast. A local energy manager can also generate signals for active and reactive power control in the local area network.

Activate reception of Broadcast control signals

Save 

Checkbox: "Storage of excess AC energy from local generation."

This feature works with the Energy Manager from B-control, the EM300 LR as well as with the KOSTAL Smart Energy Meter (KSEM).

IMPORTANT: The sensor (Energy Manager/Meter) must be mounted in the "Mains connection point" position.

- Service menu → Battery settings: All settings for the connected battery made here.

Battery settings

Battery type

BYD B-Box HV

Battery settings

Battery use as of [W]

50

Battery use strategy

Automatic


Min. depth of discharge (SoC) [%]

5

Activate smart battery control

Advanced battery options

In exceptional cases, the current battery mode may have to be reset. This may be necessary e.g. if the battery is in sleep mode and battery modules are to be installed.

 Reset battery mode

Save 

- When all settings have been completed, the KOSTAL storage system is running. The green LED on the inverter lights up.
- **The PLENTICORE plus (or PIKO IQ) is now ready for operation.**

A firmware update is available: Download from our homepage

Download and install the software for the PLENTICORE plus inverter that was released/up to date at the time of installation. This software can be downloaded from our homepage under the following link: <https://www.kostal-solar-electric.com/de-de/download/download#PLENTICORE%20plus/PLENTICORE%20plus%2010/Deutschland/Update/>



Install the software package as described in detail in the inverter operating instructions.

Language ▾

 scb • Feed in
Installer

 Home
 Current values
 Statistics
 Log data
 Settings ▾
 Service menu ▾
 Update
 Info

Update

Updates and release notes are available in the [download area](#) on the KOSTAL Solar Electric GmbH website.

The latest version can also be downloaded directly [here](#).

Select update file...

Alternatively, an update file (.swu) can also be dragged & dropped here and stored.

Run ✓



IMPORTANT INFORMATION

If the update is successful, the inverter starts in the regular operating mode.

If, contrary to expectations, this does not happen, please disconnect the inverter from the DC and AC side for 2 minutes and then put the device back into operation.

Troubleshooting – Commissioning

- **EC 6006:** „A parameterizable number of attempts to read a value from the sensor failed“
- It indicates an error in the communication between the Energy Meter and the inverter.
 - Check RS485 data cable
 - Check pin configuration of the RS485 connector
 - Is the right Energy Manager/Meter selected?
 - Is the correct sensor position selected?
 - Restart the Energy Meter, use the RESET Button
- **EC 6009:** „Five attempts to communicate with the battery system failed“.
- It indicates an error in the communication between the inverter and the battery.
 - Is the BCU ground correctly connected to Equipotential bonding rail?
 - Check RS485 data cable
 - Check pin configuration of the RS485 connectors
 - Is the battery correctly configured?
 - Check position of jumper, must be plugged in to 2, newer BCU devices have two jumpers plugged in (to 1 and 2)
- **EC 5095:** „The inverter cannot measure the battery voltage at DC input 3“
- With this message no voltage is detected at the DC3 input of the WR from the battery.
 - Is the battery on the circuit breaker switched on?
 - Is an error displayed on the battery's web server?
 - Is the polarity of the DC cables from the battery OK?
 - Is the battery correctly configured?
- **The battery is OK and shows no error.** In this case, restart the PLENTICORE plus inverter. Restart sequence: Switch off the device at the DC switch, switch off AC fuses, remove DC strings and wait 2 minutes. Then plug in the DC strings, switch on the AC fuses and switch on the DC switch again. The device restarts. The EC should no longer be present and the battery has been detected and is in operation.

Further information and help

- Link to the KOSTAL download page: <https://www.kostal-solar-electric.com/de/de/download/download>
- Link to the EFT Software download page: <https://www.eft-systems.de/de/downloads>

Please register the inverter to receive the 5 year warranty.

- Link to registration: <https://shop.kostal-solar-electric.com/de/kostal-smart-warranty.html>

Basic information by communication problems

Experience has shown that switches or WLAN repeaters that do not support multicasting or do not properly process and distribute multicast packets (keywords: IPTV, network printer, IP camera, etc.) are often installed in the event of communication problems.

It must therefore be ensured that the communication interfaces of the PV system are not disturbed in any way.

If multicast filtering with Internet Group Message Protocol (IGMP*) is not used, the interfaces may be overloaded because they must respond permanently to multicast traffic that is not intended for them.

Please note that KOSTAL cannot provide detailed recommendations for suitable network devices or support for the network architecture.

If you are using a Telekom media receiver that is to be connected via WLAN, powerline or switch, you will find a list of working combinations in the official Telekom Helps Community:

<https://telekomhilft.telekom.de/t5/Fernsehen/EntertainTV-neu-Liste-funktionierender-Kombinationen-mit-WLAN/td-p/1867188>

Please consult your network specialist or provider if you need further assistance.

*Note: The current IGMP version 3 is used e.g. for the provision of the IP-TV service "Entertain" of Deutsche Telekom.

In addition, the following points must be observed to ensure interference-free and secure data transmission:

1. Signal, data and communication lines must be strictly separated from power cables. Pay attention to separators in cable ducts.
2. Only use cables and wires for data transmission that are approved and/or suitable for this purpose.
3. The inverter (additional grounding on the casing frame) and the battery (grounding of the BMS) must be at exactly the same ground potential. Determine the low resistance of the individual protective conductors by means of a measurement. Only if the battery and the inverter are properly grounded can trouble-free and reliable data transmission be guaranteed.