

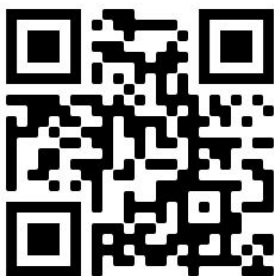


BYD Battery-Box Premium HVS/HVM

Service Guideline and Checklist

Version 1.0

Valid for HVS 5.1 / 7.7 / 10.2 / 12.8
HVM 8.3 / 11.0 / 13.8 / 16.6 / 19.3 / 22.1



**Make sure to always use the latest version of this service document,
available at: www.bydbatterybox.com**

Important: The installation and all other kinds of works or measurements in combination with the Battery-Box Premium are only allowed by professional and qualified electricians.

This checklist is a shortened assistance for the Battery-Box and does not replace the original manual, which can be found on www.bydbatterybox.com / www.eft-systems.de / www.alppower.com.au. Subject to technical modifications; no responsibility is accepted for the accuracy of this information. Attention: High Voltage! Improper handling can cause danger and damage.

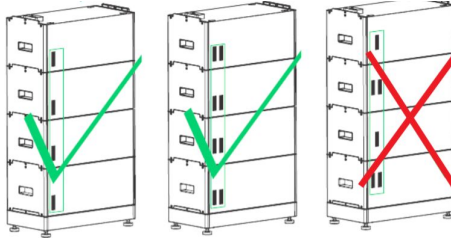
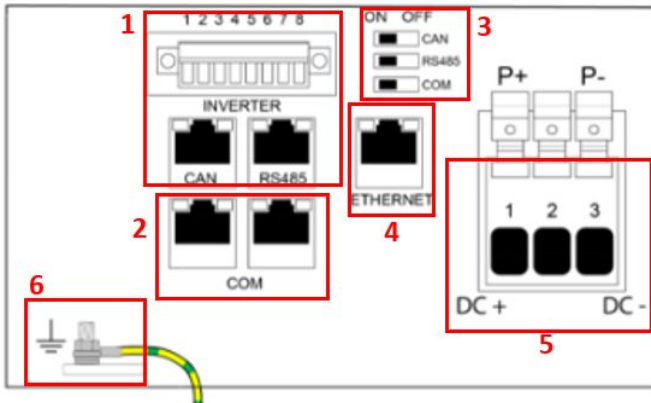
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1. GENERAL STEPS

Make sure to always use the latest version of this service document, available at: www.bydbatterybox.com

Please proceed first with the installation steps by:

No.	Name	Description
1	Configuration	Check if the configuration is correct. Refer to latest "BYD Battery-Box Premium HVS & HVM Compatible Inverter List" (V1.6 or above) available at: www.bydbatterybox.com Make sure the inverter is configured correctly.
2	Only HVS or HVM	Do not mix up HVS-modules ("I") with HVM-modules ("II"). 
3	External connections	 <ol style="list-style-type: none"> 1. Communication to inverter 2. Ports for parallel connection 3. Dip-Switches 4. Ethernet-Cable for Internet (strongly recommended!) 5. DC-Ports 6. Grounding
4	Closed Connection Area	The Connection Area must be closed in order to start the system (else the system switch will immediately shut off!)
5	Switch on procedure	Correct switch on procedure is important for a correct operation! <ol style="list-style-type: none"> 1. Switch on the fuse between Inverter and Battery (if there is any) 2. Switch on the Battery-Box 3. Activate the inverter
6	App Configuration Newest Firmware	To complete the commissioning, the configuration of the battery via "BYD Be Connect" App is mandatory! Always install the newest Firmware! Note: If not stated otherwise, wifi password is BYDB-Box After app configuration, please perform a proper restart of the system (see step 5)
7	Checking the correct operation	The system runs properly if: <ul style="list-style-type: none"> - Inverter displays battery SOC correctly - System charges / discharges Note: If you can not complete the commissioning, then turn off the battery before you leave the site and make sure all LEDs are off.

2. ERROR ANALYSIS

Please refer to the general steps before proceeding, see chapter 1.

2.1 BCU shows no reaction / No LED

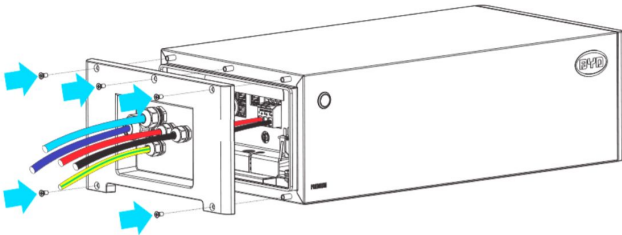
LEDs do not light up, although the system switch is ON.

No.	Name	Description
8	Module quantity	Check if module quantity fulfills minimum requirement (HVS: 2, HVM: 3 modules)
9	Voltage measurement	See step 2.7
10	Lift the BCU	Lift the BCU with the system switch activated for one minute. Attach it again.
11	BCU exchange	Only if cover is closed and voltage look good: Test another BCU, if available.

2.2 BCU switch shuts off immediately (within 5 seconds)

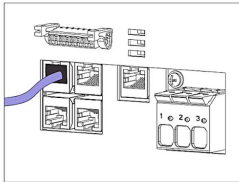
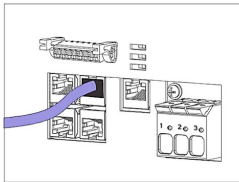
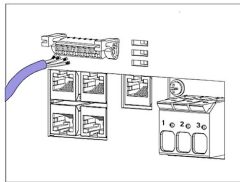
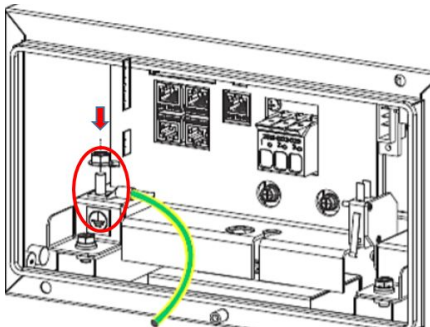
The system switch switches off immediately.

No.	Name	Description
12	Close the cover	Make sure the cover for the connection area on the BCU is properly closed. Important: If the panel is open, the battery won't turn on (safety reason)



13	Switch was pulled down by hand	If the switch was pulled down by hand, then it cannot be pushed up again within 10 minutes. (Please refer to the manual for the correct switch off procedure)
14	Voltage measurement	See step 2.7
15	BCU exchange	Only if cover is closed and voltage look good: Test another BCU, if available.

2.3 Communication problem with Inverter

No.	Name	Description
16	Configuration	Check if the configuration is correct. Refer to latest "BYD Battery-Box Premium HVS & HVM Compatible Inverter List" (V1.6 or above) available at: www.bydbatterybox.com Make sure the inverter is configured correctly.
17	Check DIP Switch	<p>If only one tower is in use (no parallel connection), all DIP switches should be in position: LEFT (except for Kostal PIKO MP plus - refer to manual)</p> <p>ON OFF</p> <p><input type="checkbox"/> CAN</p> <p><input type="checkbox"/> RS485</p> <p><input type="checkbox"/> COM</p> <p>If multiple HVS/HVM are in parallel connection, see manual for DIP configuration</p>
18	Communication cable	<p>- Confirm PIN / Cable Configuration for the specific inverter model</p> <p>- Replace the communication cable (min. CAT5!)</p>
19	Use another available communication port	<p>Dependent on the Inverter model, one or two of the three options of communication ports shown below can be used (refer to the manual!). Please try the other port and communication option if available for the inverter.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Option a) CAN</p> </div> <div style="text-align: center;">  <p>Option b) RS485</p> </div> <div style="text-align: center;">  <p>Option c) CAN/RS485</p> </div> </div>
20	Grounding	<p>Connect Battery-Box directly to the ground-bus of the house (do not connect over inverter casing!). Only with a correct grounding of the battery, a trouble-free and secure data transmission can be guaranteed. Use the correct connection, see picture:</p> 
21	App Configuration and Firmware	Please check if the App configuration was successful and the Firmware is the most recent one. If there are problems, please refer to Section 2.3 and 2.4
22	Restart the entire system	<p>- Switch off the Inverter</p> <p>- Switch off the battery (Press LED for 5 seconds until system switch falls)</p> <p>- Wait for 2 Minutes, Turn on the Battery first and then inverter second</p>

2.4 Problem with the Firmware Update / App Configuration

The BCU consists of two components: the BMU and the BMS. The Firmware Update from the App will update the BMU, which will then update the BMS. **The BMS will only be updated once there is communication between the battery and the inverter or just after the App configuration. It can take up to 15 Minutes until the firmware is updated on the BMS.**

No.	Name	Description
23	Correct App and Firmware	<p>Make sure to have the latest App Version (>1.4.1) and Battery Firmware (download inside the App) on your mobile device before connecting the app with the battery WiFi.</p> <p>If the App cannot be installed, or other general Problems occur with the App:</p> <ul style="list-style-type: none"> - try with a different mobile device - For Android: min Android version requirement is 4.4.
24	App reports: "Data connection busy" / "Data connection failure."	Battery-Box is busy (e.g the battery could be updating the firmware). Please wait 10 minutes and try again.
25	BMS Version not updated	<p>The App will only update the BMU. The BMU will update the BMS, but only if there is a stable and correct communication with the inverter or just after the configuration with the App. Once the BMU is updated and the inverter communication is established correctly or right after the configuration is done, the BMS update can take about 15 Minutes</p> <p>If the BMS Version is not updated after 15min with stable inverter communication, follow the below Process:</p> <ol style="list-style-type: none"> 1. Update Firmware through the App again 2. Restart the system <ol style="list-style-type: none"> a. Switch off the Inverter first, then switch off the battery second (Press LED for 5 seconds) b. Wait for 30 Seconds c. Turn on the Battery first, then turn on the inverter second 3. Wait for 20 Minutes 4. Check BMS Firmware Version again with App. If Version is still wrong, do the update process again (if possible with another mobile device).



2.5 BCU LED event code (EC)

A constant white LED refers to standby mode. White blinking means charge or discharge.

When the battery is initiating, the LED will flash white and blue with an interval time of 0.5 seconds (normal during startup).

When the LED flashes blue with an interval time of 1 second it indicates an event code. We start to count when the white LED begins to flash, then we count how many times white and blue LED flashes. (also refer to the manual!)

Example: 1xwhite, 6xblue → EC 106 / 1xwhite, 11xblue → EC 111 / 3xwhite, 3xblue → EC 303

Most Errors come from a faulty communication line, incorrect app configuration or missing restart after app-configuration.

Please go in detail through: **Section 2.3 & 2.4**

Note: if the battery is not correctly configured with the app, the event code (EC) might be misleading.

Event Code (EC)	Measure
EC 101 EC 102 EC 108	- Check DC-cable connection on battery, inverter and combiner box (if there is any). - Restart system according to manual. (note: to properly shut down you need to press the button for 5 seconds. Make sure to start the battery before starting the inverter!)
EC 103 EC 203 EC 303 EC 403 EC 503 EC 603 EC 703 EC 803	- Make sure app-configuration has been completed correctly (especially module quantity!). - make sure all dip switches are in the correct position (For most configurations all on the left side (exception e.g. parallel connection and Kostal Piko MP). Refer to Manual!) - EC 103 to EC 803 means that a module is not recognized. The first number (= number of white flashes) indicates which module is probably affected. This module, or the module above it, can be responsible for the event code. Example: EC 103 = top module and EC 403 = fourth-top module. - Check the modules for bent PINs (visual inspection, see section 2.6) - Rearrange the modules in the tower. - Remove the affected module and check whether the event code disappears. If not, check the module above. Note: A module with communication problems often works without restrictions at the lowest module position, since no communication with the stand is necessary.
EC 106 EC 107 EC 109	Make sure that the latest firmware is installed and that the battery has been properly restarted. If problem remains: Probably caused by a module. Follow the "Module exclusion method" (see Section 2.8).
EC 111 EC 112	Check inverter communication (Section 2.3), BMS firmware (Section 2.4) and DIP switches

2.6 Visual Check

The PINs should not be bent. A module with twisted pins will still work as long as it is the bottom module in the tower. So if you find twisted pins in a module, make sure to position that module in the bottom of the tower.



2.7 Voltage measurement

ATTENTION: High voltage!

Take down the BCU and measure the tower voltage on the topmost module as shown below.

Note: The nominal voltage should be module quantity times 100V (for HVS) or module quantity times 50V (for HVM).



If the measured voltage deviates significantly from the nominal value, please check the electrical voltage at the individual modules, as shown below:

Positive



Negative



Measurement:

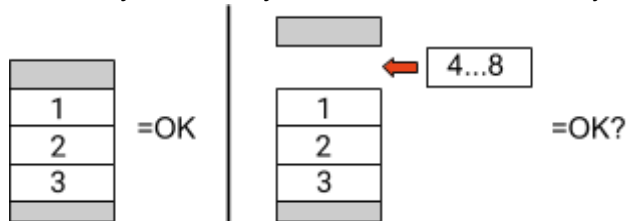


2.8 Identifying a faulty module

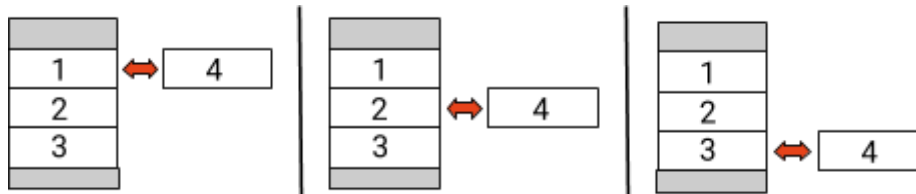
- The module quantity must be adjusted in the app whenever the number of modules is changed!
- Please perform a visual check of the communication pins according to step 2.6 for each module.

1. Build the Battery-Box with the minimum available number of Modules (HVS: 2 modules, HVM: 3 modules).

2. **Check System. If Okay**, add one module at a time, adjust module number in app and check again.



3. **If not okay**: The faulty module is probably one of the modules in the tower. Take one of the spare modules and exchange each of the remaining modules with the spare module one at a time. Check the battery status after each step. If battery status turns to "OK", the faulty module is the one that was exchanged.



3. SERVICE TASKS

Please go through the general steps beforehand, see chapter 1.

3.1 BCU replacement

Have you detected a faulty BCU?:

After replacing the BCU, please do not forget to re-do the configuration and firmware-update in the app.

3.2 Module Replacement

Have you detected a faulty module?:

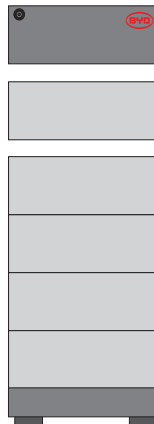
In the meantime you can use the battery system with the remaining modules and a correspondingly reduced capacity (take into account the minimum number of modules).

Please note: It is important that all modules of a battery tower have a similar state of charge (SOC) with a tolerance of 5%. New modules have about 25% SOC. If the remaining modules have not yet been put into operation (not charged / discharged), the new module can easily be added. Otherwise, it is basically a module extension. In this case, please add the new module to the system only when the system has a SOC between 20% and 30% (see extension process in the manual). Make sure to configure correctly after any change in module number.

New Battery
SOC ≈ 25%



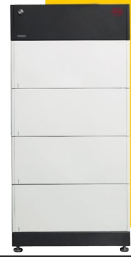
Original Battery
SOC ≈ 25%



Be Connect

BYD Battery-Box Premium HVS/HVM Service Checklist - V1.0 EN

Important: The installation and all other kinds of works or measurements in combination with the BYD Battery-Box are only allowed by professional and qualified electricians. Improper handling can cause danger and damage. This document does not replace the official BYD manuals and documents. No responsibility is accepted for the accuracy of the information.



1. GENERAL STEPS

Please carefully check **all** 7 „General Steps“ from page 3 of the Service Guideline and confirm this in the boxes below

- | | | |
|--------------------------|--------------------------------|-----------------------|
| 1.1 Configuration | 1.4 Closed Connection Area | 1.7 Correct Operation |
| 1.2 Only HVS or HVM | 1.5 Switch on Procedure | |
| 1.3 External Connections | 1.6 App Configuration + Update | |

2. ERROR RELATED ANALYSIS

Please mark the **error related** Analysis from Chapter 2 (page 4-9) of the Service Guideline that you checked, and collect all the information related to those Sections

- | | |
|--|---------------------------------|
| 2.1 BCU shows no reaction / No LED | 2.5 BCU LED event code |
| 2.2 BCU switch shuts off immediately (within 5 seconds) | 2.6 Visual Check |
| 2.3 Communication problem with Inverter | 2.7 Voltage measurement |
| 2.4 Problem with the Firmware Update / App Configuration | 2.8 Identifying a faulty module |

3. SERVICE INFORMATION

Please fill all available information in below table. Some information like the Serial Number of the BCU is mandatory to receive service.

• Service Ticket Number or System ID:

• Installer / Delivery Address / Contact:

Company	ZIP / City
Contact Person	Phone
Street / Nr.	Email

• System Information

Battery Configuration (HVS../HVM..)	BMU Firmware		
BCU Serial Number	BMS Firmware		
BCU Connected to Internet	Yes	No	Inverter Firmware
Inverter Brand + Model	Inverter Portal Name		
Inverter Serial Number	(State the system name. Provide access)		
Commissioning Date			

• Service Information

BCU EventCode (EC)	Inverter Error Code	
Was the battery charging / discharging before (was the system working normally before?)	Yes	No
Take pictures of open communication port in the BCU and Inverter clearly showing connection cables		

Description of the Problem

Please provide any additional information that is necessary or could help in the analysis of the service case (e.g. serial number of a wrong module, video of a special behaviour; pictures; app screenshots; module voltages...)

By contacting us you confirm, that a qualified person has done the necessary control and collected all available information above.

Service Contact: Europe: EFT-Systems GmbH
www.eft-systems.de
service@eft-systems.de
+49 9352 8523999

Australia: Alps Power Pty Ltd
www.alppower.com.au
service@alppower.com.au
+61 02 8005 6688

