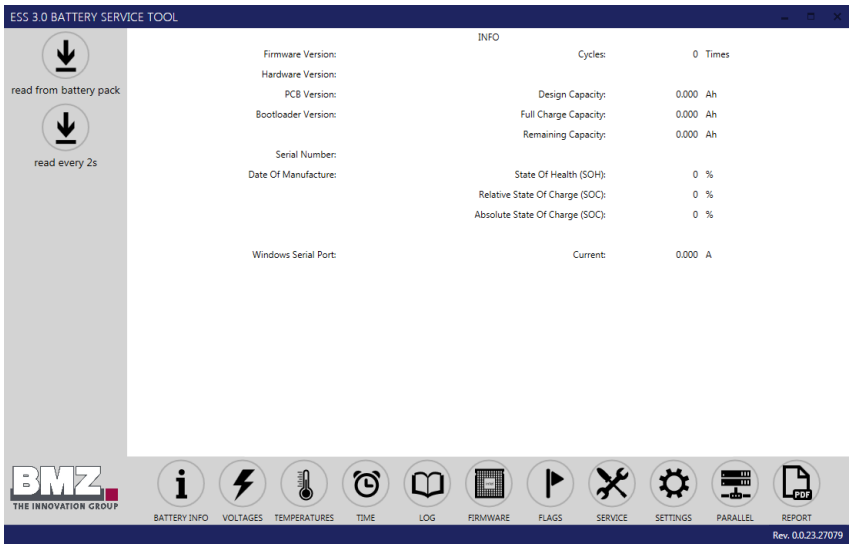

Service Tool and Firmware Update Guide for

BMZ ESS – Energy Storage System

Addresses, Identification and Notes

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Product Identification

Firmware: 31502A_V2.03 or higher
Battery: BMZ Art. Nr. 24930-01
Software: ESS 3.0 Service Tool (Rev. 0.0.27.25617)
Country of origin: Germany

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Document Identification

Based on Translation of Original Installation Guide ESS 3.0/7.0 Firmware
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Subject to modifications. BMZ shall not be liable for technical or editorial errors.

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Content

1 Safety Notes

1.1 Important information on this guide

Purpose, Target Group

This guide contains information for a firmware update of the BMZ ESS energy storage system. It is directed towards staff trained for the BMZ ESS 7.0, ESS 9.0, and ESS X.

Structure

Before you use the ESS Service Tool with the energy storage system, make sure to understand the contents of the ESS Operation Manual.

1.2 Explanation of illustraion

Safety notes

Safety notes apply at all times. They are placed in the Safety Notes chapter or at the beginning of other chapters.

Warning messages

Warning messages are placed directly before the instruction in question. They help you to avoid potential risks during the operation.

Warning messages consist of the following elements:

Table 1
Structure of warning messages

Safety alert symbol	is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
Signal word	**⚠ DANGER**
	indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	⚠ WARNING
	indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
	⚠ CAUTION
	indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
	NOTICE
	indicates situations with potential damage to property only
Hazard identification	**describes the kind and the source of the hazard.**
consequences	describes what may happen if the hazardous situation is not avoided.
means	▶ tells you what to do to avoid the hazard.

Pictograms and Symbols

Symbols and pictograms may be used in addition to the safety alert symbol. Hazard alert symbols (yellow) show the hazard. Prohibition symbols (red) and mandatory symbols (blue) show how to avoid the hazard.

Table 2
Safety Symbols

Symbol	Explanation
	General Hazard alert symbol. Observe additional information.

	Beware of electrical volage!
	Read the instructions before use.

1.3 Intended use

The software is only intended for firmware updates of ESS 7.0, ESS 9.0, and ESS X batteries. Other use than described in this document is not intended.

Explicitly not intended are:

- Use of damaged batteries or cables
- Use of unapproved software and firmware
- Installation by non-trained personnel
- Connecting more than one battery to the PC simultaneously

Dangerous misuse

Before using the Service Tool with the ESS battery, the battery must be disconnected from the inverter and the battery's main fuse must be removed.

2 Software Description

2.1 User interface

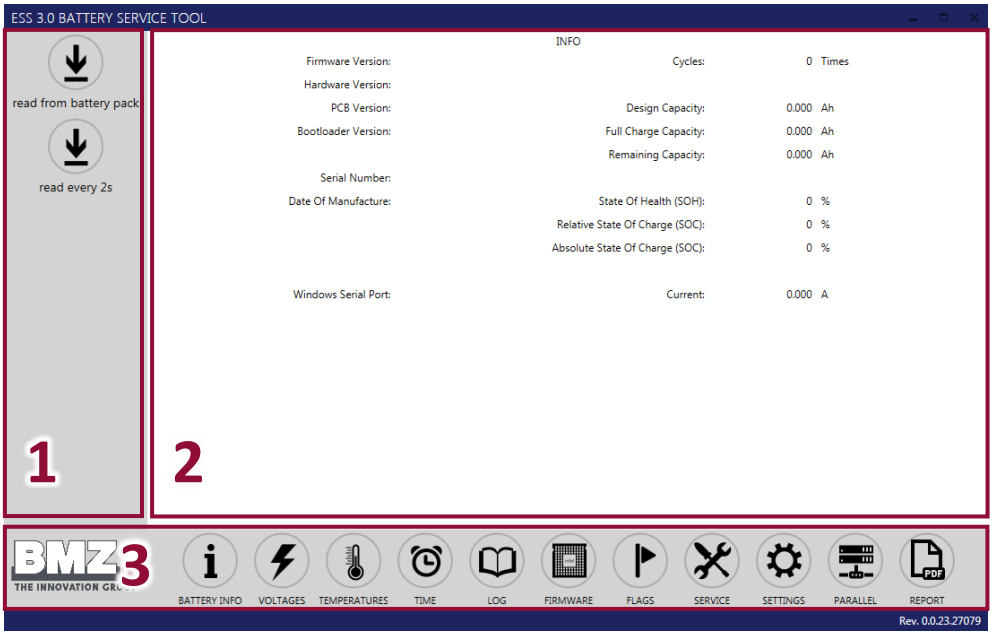


Fig. 1
User Interface

Table 3
User interface areas

Position	Description	Function
1	Task bar	Allowed actions to be performed
2	Panel	Information display area
3	Menu	Different accesable information screens

2.2 Area overview

Table 4
Area overview

Area	Contents
BATTERY INFO	■ Display batty data (serial numbers, versions, capacities, currents) ■ Set battery address
VOLTAGES	■ Display battery voltages ■ Display cell voltages
TEMPERATURES	■ Read current temperatures ■ Display the recorded minimum and maximum temperatures ■ Reset minimum and maximum temperatures
TIME	■ Display system time. ■ Set system time.
	■ Display batteriy log ■ Export log as Excel file

LOG	
 **FIRMWARE**	■ Update firmware
 **FLAGS**	■ Display status flags (operating and error status)
 **SERVICE**	■ Display error log ■ Display counter log
 **SETTINGS**	■ Settings
 **PARALLEL**	■ Settings for battery operation ■ Device mode (single, master, slave) ■ Device address (1-12)
 **REPORT**	■ Print PDF report

3 Software Installation

In many cases, the Service Tool will work without issue upon opening the tool and reading information from the battery. In some cases, you may get a communication error or otherwise are unable to read information from the battery. If that happens, the steps in this section will typically resolve the issue.

3.1 System requirements

- ✓ Operating system: Windows 7 or Windows 10 (recommended)
- ✓ RAM: min. 4 GB
- ✓ CPU: min. 1.5 GHz

3.2 Install Microsoft .NET Framework

On some computers, it may be necessary to update to the latest .NET framework. This is only required to be performed once on the computer which will run the Service Tool.

Microsoft .NET Framework 4.5 is required for the Service Tool to run properly.

Instruction

1. Open the website: `www.microsoft.com/en-us/download/details.aspx?id=42643`
2. Select language and click **Download**.
3. Save file and run as administrator: `NDP452-KB2901954-Web.exe` (File names may vary.)
4. Follow the instructions on screen.

3.3 Install the FTDI driver

On some computers, it may be necessary to install the FTDI driver. This is only required to be performed once on the computer which will run the Service Tool.

3.3.1 With internet connection

Overview

It is possible Windows will install this driver automatically if your computer is connected to the internet. If Windows does not automatically the driver or you need to manually download the driver and transfer it to the computer which will run the Service Tool, continue with the next section.

3.3.2 Without internet connection

Overview

If you have no internet access near the computer to be connected to the ESS, you can copy the driver to a USB stick from another PC with internet access. If you are manually downloading the driver to the computer you will install it on, you do not need a USB stick for this.

Auxiliaries

- ✓ USB stick

Instruction

1. Open the website
   `www.ftdichip.com/Drivers/VCP.htm`
2. Download the following file:
   `CDM v2.12.06 WHQL Certified.exe`
   (`or latest version`)
   Note: The page which you download this from has a table showing different download options for Windows. Clicking “setup executable” on the right side of the chart for Windows will allow a download of the latest version.
   If it’s needed to transfer the file to another computer, copy it onto a USB stick.
3. Once the file is downloaded to the computer you plan to use with the Service Tool or the USB stick with the file has been connected to the computer you will use with the Service Tool, open the file.
4. Follow the instructions on screen.

3.4 Open the ESS Service Tool

Auxiliaries

✓ File `ESS30ServiceTool_0_0_27.zip` (Provided by BMZ)

Instruction

1. Create an appropriate folder where you want to have the Service Tool.
   (e. g. `C:\Program Files\ESS`)
2. Open the zip-File.
3. Unpack the following files to the new folder:
   - `ESS30ServiceTool.exe`
   - `System.Windows.Interactivity.dll`

Note

Both files must be in the same folder!

It is not recommended to open the Service Tool from a USB stick.

4 Connecting Laptop to Battery

4.1 Connect the battery to a laptop

⚠ WARNING

Electric shock can kill

Touching live parts can cause electrical shocks, which may have thermal or muscle paralyzing effects. The latter can lead to ventricular fibrillation, cardiac arrest or respiratory paralysis resulting in death.

- ▶ Disconnect the ESS from the inverter.
- ▶ Do not touch contacts.

ACHTUNG

Damage to your laptop by ground loops.

If the laptop is connected to the ESS when the laptop is plugged in, ground loops may damage the laptop.

- ▶ Run laptop in battery mode only.

OR

- ▶ Use active USB amplifier or HUB.

Prerequisites

- ✓ The **Battery** is disconnected from the **Inverter**.

Auxiliaries

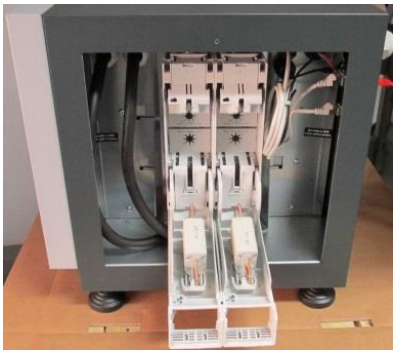
- ✓ Screwdriver (PH2)
- ✓ optional: USB 2.0 cable (A-A)
- ✓ optional: active USB amplifier or HUB
- ✓ optional: small side cutter

Instruction

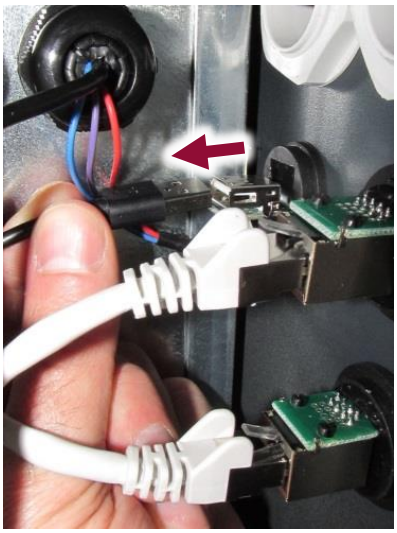
1. Open service cover with screwdriver.

2. To switch off the ESS, hold button for about 10 seconds.

3. Pull fuse holder and remove from NH isolator.



4. If available, a USB-A to USB-A cable can be used to connect a laptop to the USB port on the rear of the ESS. If one is not available, then proceeding with the following is also acceptable.
   Remove cable tie from the USB cable. Remove the USB plug form the rear wall.



5. Connect laptop and ESS with USB cable.

6. Push the button to switch on the ESS.

In order to disconnect the laptop from the ESS after a successful software update, see section 4.7.

4.2 Start the ESS Service Tool

Preprequisites

✓ The battery is connected with the laptop via USB cable

Instruction

▶ Open file `ESS30ServiceTool.exe`.

⇨ *The start screen opens and shows the **INFO** area.*

Note

If the software does not communicate with the battery, check your cabling, then please contact customer service. The battery may need to be replaced.

4.3 Check the cell voltages

The cell voltages can be read with the button **read from battery pack** in the **VOLTAGES** area (see Table 4). Clicking the button **read every 2s** updates the panel every two seconds.

Prerequisites

✓ The battery and the laptop are connected with a USB cable.

Instruction

1. Click **VOLTAGES** in the menu.
2. Click **read from battery pack** in the task bar.
3. Compare cell voltage 1 to 15: The difference between the highest and the lowest voltage must not exceed 200 mV. If the difference is higher, please contact the customer service. The battery must be checked in more detail and, if necessary, replaced.

Note

If one of the cell voltages is below **2.5 V** the cell is deeply discharged. Please contact the customer service. The battery must be replaced.

4.4 Update the firmware

New ESS batteries normally come with the latest available firmware, so there is no need to update. If the battery does not have the latest firmware or there is a need to update, then this section will cover that.

NOTICE

After a successful firmware update the ESS must be switched off.

Booting the system must be done in accordance to the respective operating instruction.

NOTICE

Non-authorized firmware may damage the ESS.

The manufacturer will not assume any liability for malfunction or damage caused by non-authorized firmware.

- ▶ Only authorized service personnel may install firmware.
- ▶ Only install firmware which is authorized by BMZ GmbH.

For a proper operation, the ESS must run with the latest firmware recommended by the manufacturer. The area **BATTERY INFO** provides information about the firmware version.

Prerequisites

- ✓ The required driver and software are installed.
- ✓ The battery and the laptop are connected by a USB cable.

Auxiliaries

- ✓ Firmware V2.03 or higher

Instruction

1. Click the **FIRMWARE** button in the menu and the **open firmware** button in the task bar.
2. Select the firmware file (`*.flash`) and click **open**.
3. Click the **write to battery pack** button in the task bar.
4. Confirm the information with **ok**.

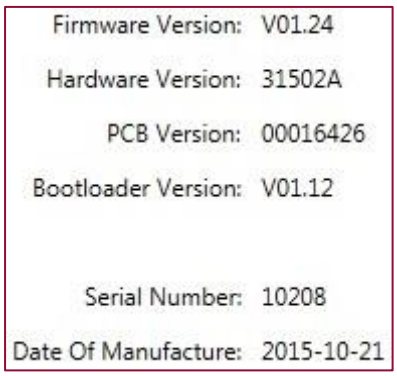
   ⇨ *After the update the battery is switched off.*

5. Hold battery button for approximately 3s, to restart the battery.

   ⇨ *After a short self-test, the battery indicates the operating mode: the red and the green LED flash simultaneously.*

6. Click **BATTERY INFO** in the menu.
   Click **read from battery pack** in the task bar.
   Check, whether the installed firmware is displayed.



4.5 Device Mode – Single and Parallel Modes

NOTICE

For a proper operation of the ESS, the settings in Device Mode must be reviewed and then adjusted if required.

If the parameters are not set correctly, the ESS may not operate correctly. The manufacturer will not assume any liability for malfunction caused wrong parameters.

- ▶ Only authorized service personnel may set the parameters.
- ▶ Only set parameters which are authorized by BMZ GmbH.

After the firmware update, the following values must be adjusted in the area labeled **PARALLEL**:

- Device Mode
  - Single Mode
  - Master Mode
  - Slave Mode
- Device Address

Prerequisites

- ✓ The required drivers and software are installed.
- ✓ The battery and the laptop are connected by a USB cable.

Instruction

1. Click the **PARALLEL** button in the menu.
2. In **Device Mode**, select and click the appropriate mode.
   If you have a single ESS battery that is not in parallel with any other ESS battery, then Single Mode must be set. Otherwise, Master and Slave Modes will be set.
3. Click **set mode** in the task bar.

4. In **Device Address**, assign the ESS an address between 1 and 12. NOTICE: Even if the required number is already shown in the **Device Address** field, the number must be typed again. If no new entry is made, the system will not recognize the address.
5. Click **set address** in the task bar.
6. After setting the Device Mode and Device Address, click **read from battery pack** to check the new settings.
7. Create PDF report (see 4.6).
8. Disconnect battery from laptop and switch it off (see 4.7).

NOTICE
Recommended settings for a stand-alone system: ■ Device Mode: Single Mode ■ Device Address: 1
Recommended settings for a cluster system: Master settings: ■ Device Mode: Master Mode ■ Device Address: 1 Slave settings: ■ Device Mode: Slave Mode ■ Device Address: 2 … 12
The device addresses between 1 and 12 may be assigned freely, but every number may be assigned only once! Cluster systems may have only one master. The master must be connected directly to the inverter via CAN interface. **Note: If you have less than 12 batteries in parallel, please choose a device address of 2 for the master and 3-12 for the slaves.**

4.6 Create PDF report

The PDF-Report must contain the following:

- Customer name
- Customer address
- The battery's serial number
- Name of installer, service person or executing company

Prerequisites

✓ The battery and the laptop are connected by a USB cable.

Instruction

1. In the menu, click **REPORT** button.
2. Fill out the **REMARK** field with the data provided above.
3. In the task bar, click **create pdf report**.
4. Define a folder and a filename and click **save**. The filename is always `ESS_SNxxxxx` (e. g. `ESS_SN10208`)

5. Send the PDF file to **ess.service@bmz-gmbh.de**.

4.7 Disconnect battery from laptop and switch it off

	⚠ WARNING
	**Electric shock can kill** Touching live parts can cause electrical shocks, which may have thermal or muscle paralyzing effects. The latter can lead to ventricular fibrillation, cardiac arrest or respiratory paralysis resulting in death. ▶ Do not touch contacts.

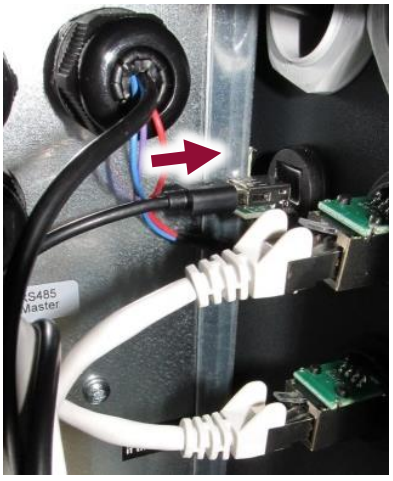
Auxiliaries

- ✓ Screwdriver (PH2)
- ✓ Cable tie (290 x 3,6 mm)

Instruction

1. Hold battery button for approximately 10 seconds, to switch off the battery. Wait until the LEDs turn off.
2. Remove USB cable from laptop.

3. Reconnect internal USB cable to socket in back wall if it was removed.



4. Stow cables securely. If required, fasten with cable tie.
   Insert main fuse in NH isolator.
5. Start the battery according to the operating manual.
6. Screw service lid to housing (#902512).
   Torque: max. 2 N m

4.8 Spare parts

BMZ Art. No.	Description	Measures (mm)
902512	Oval head screw	M4 x 6 (PH2)
2580	cable tie	290 x 3,6

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