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Instructions for Connecting and Using the JK SMART BMS with a Pack of Li-Ion (NMC) or LiFePO4 Cells

The BMS you have purchased is a precise device designed to protect lithium batteries. The protection consists of monitoring various parameters specific to the cell type and number (charging and discharging voltage for individual cells and the entire pack, charging and discharging current, short-circuit protection, operating temperature range). If any of these parameters are exceeded, the BMS interrupts the operation of the battery.

An additional feature of the JK BMS is active cell balancing. This means transferring energy from stronger cells to weaker ones. Since JK BMS units carry out this process using relatively high currents (0.4–2.0A), they are well-suited for large-capacity battery packs.

The JK BMS is fully configurable. It can be used for Li-Ion, LiFePO4, and LTO battery packs and is compatible with a wide range of cell counts (as described for each BMS model).

For the device to operate correctly, configuration in the mobile app is required. At the very least, the number of cells and battery type must be specified and entered into the app. Without configuration, the BMS will not properly protect the pack, which could lead to damage or even fire.

Configuration details are described in the "BMS Configuration" section.

⚠ Never solder wires to the batteries while the connector is plugged into the BMS. This may damage the BMS!

Please carefully verify all connections and BMS settings in the app. Errors in wiring or shorts between BMS connector pins will damage the system and are not covered by warranty.

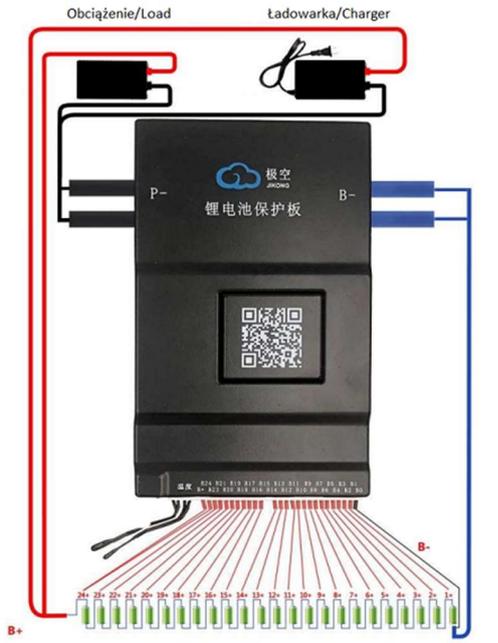
Only use the wires and connectors provided with the BMS. Using cables from other manufacturers may result in connector damage or incorrect wiring due to different wire colors.

Connecting the BMS to the Cells

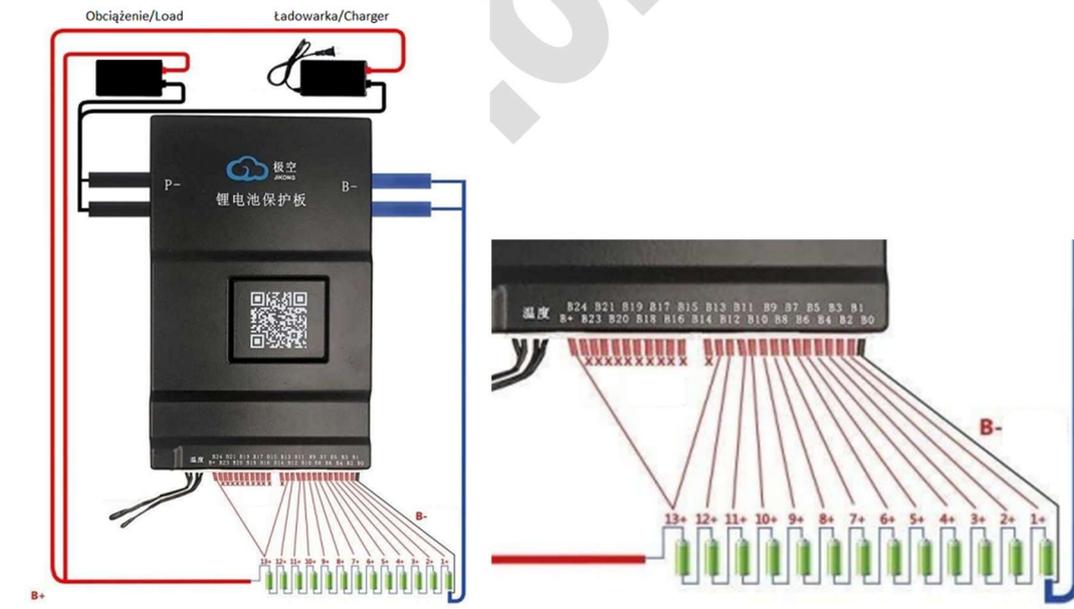
- 1) After assembling the battery pack, connect the wires according to the diagram. Before connecting, ensure that all cells in the pack are at a similar state of charge (same voltage $\pm 0.05V$).
- 2) The first pin of the connector (black wire) is connected to the negative terminal of the entire pack. In JK BMS, the black wire always represents the pack's minus.
- 3) BMS models supporting more than 8 cells are equipped with two connector sockets. When fully used (e.g., 24S pack), connect each subsequent cell to the next pin, starting from the pack's negative terminal and black wire. The last pin of the first (or second) connector must be connected to the positive terminal of the last cell.

- If your pack has fewer cells than the BMS's maximum, connect each cell's wire sequentially, ending with the positive terminal of the last cell. This last positive terminal must also be connected to the last pin of the first or second connector. Unused wires must be cut and insulated to avoid accidental circuit shorts.

Full utilization wiring diagram:



Partial utilization wiring diagram:



- After connecting wires to the pack, test the connections before plugging the connector into the BMS:
Using a multimeter, measure the voltage at each connector pin. Connect the multimeter's negative probe to the first pin (black wire). Each subsequent pin should show an increase of

approx. 3.0–4.1V for Li-Ion or 2.5–3.6V for LiFePO₄, up to the full pack voltage. This ensures correct wiring. Incorrect connections will damage the BMS and void the warranty.

Do not connect the plug to the BMS before completing steps 6–10.

- 6) If not preinstalled, connect the temperature probe(s) to the NTC socket. NTC temperature probes are mandatory for proper SMART BMS operation.
- 7) Solder the negative wire (B-) to the battery pack. Maximum wire length is 40 cm.
- 8) Solder the P- wire and pack's positive wire to the connector used for powering the device and charging the pack.
- 9) If applicable, connect:
 - a. BMS switch to the LCD port
 - b. Communication cables (e.g., RS485) to the respective ports
- 10) If a voltage display or screen is used, connect it to the LCD port. If the display has a switch, the BMS switch is not used.
- 11) ⚠ Note: The number and arrangement of ports may vary across different JK BMS versions. After connecting all devices, plug in the cell voltage connector. Then proceed with BMS activation.

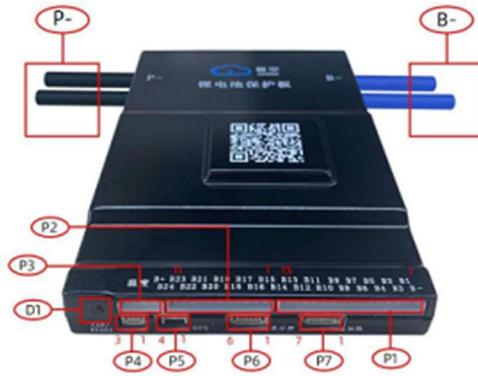
P1	Cells connector 1
P2	Cells connector 2
P3	NTC temperature probe connector
P4	RS485 communication (optionally CAN)
P5	GPS (optional)
P6	LCD or switch
P7	Battery heating control (optional)

BMS Activation

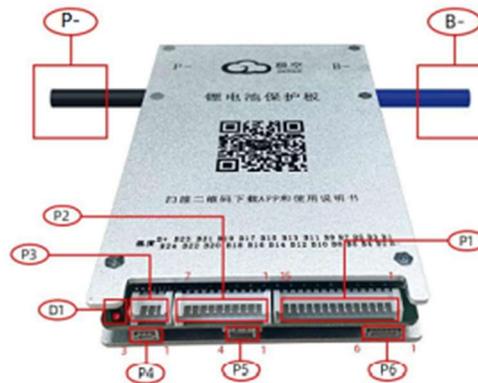
Before first use or after disconnecting the cell voltage connector, the SMART BMS must be activated via one of the following methods:

- a. Press the switch twice briefly. The same button is found on the voltage indicator, if used. To turn off the BMS, hold the button longer.
- b. If using an LCD indicator, activate/deactivate using the switch on the display.
- c. Via charger: If no switch or LCD is used, activate the BMS by connecting a charger for a few seconds. Ensure the charger voltage is at least 5V higher than the current pack voltage. Note: Smart chargers may not work if no battery voltage is detected. Use a standard charger.

Measuring the voltage at the output plug (should match pack voltage) completes the connection process.



BD6AxxS-10P/ B1AxxS-15P/B2AxxS-15P/B2AxxS20P



BD4AXXS-4P/ BD6AxxS-6P/ BD6AxxS8P

Installing Mobile App

System Android.



<https://play.google.com/store/apps/details?id=com.jktech.bms&gl=PL>

System IOS

<https://apps.apple.com/us/app/%E6%9E%81%E7%A9%BAbms/id1425725691>

BMS Configuration

After installing and launching the app, grant location access if prompted (required by Android, not used by the BMS). Once scanning is complete, you'll see the BT device representing the connected BMS. If multiple BMS devices are in range, choose the correct one.

For the first connection, enter the **default password: 1234**. Subsequent connections will not require this.

Configuration steps:

1. In the "STATUS" tab, ensure all connected cell voltages are visible. If any are missing, check wiring and solder joints. All cells must be visible before proceeding.
2. In the "SETTINGS" tab, enter the password 123456 via "VERIFY PWD." This can later be changed to prevent unauthorized parameter changes.
3. After unlocking, choose battery type: LI-ION, LIFEP04, or LTO This loads default factory settings for the selected type.
4. In "Cell Count", enter the number of series-connected cells. In "Battery Capacity (AH)", enter the battery capacity.
5. Default "Balance Trig. Volt (V)" is 0.01V – this is the voltage difference at which balancing starts. Typically doesn't need changing.
6. For precise calibration, enter the actual measured voltage and current under "Calibrating Volt (V)" and "Calibrating Curr (A)".
⚠ Minimum current for calibration is 15A, under constant charge or discharge.
7. In "Advance Settings", detailed parameters can be adjusted. These are preset for the selected battery type and should not be changed without a clear reason. Parameters are often interdependent.
8. Notable setting:

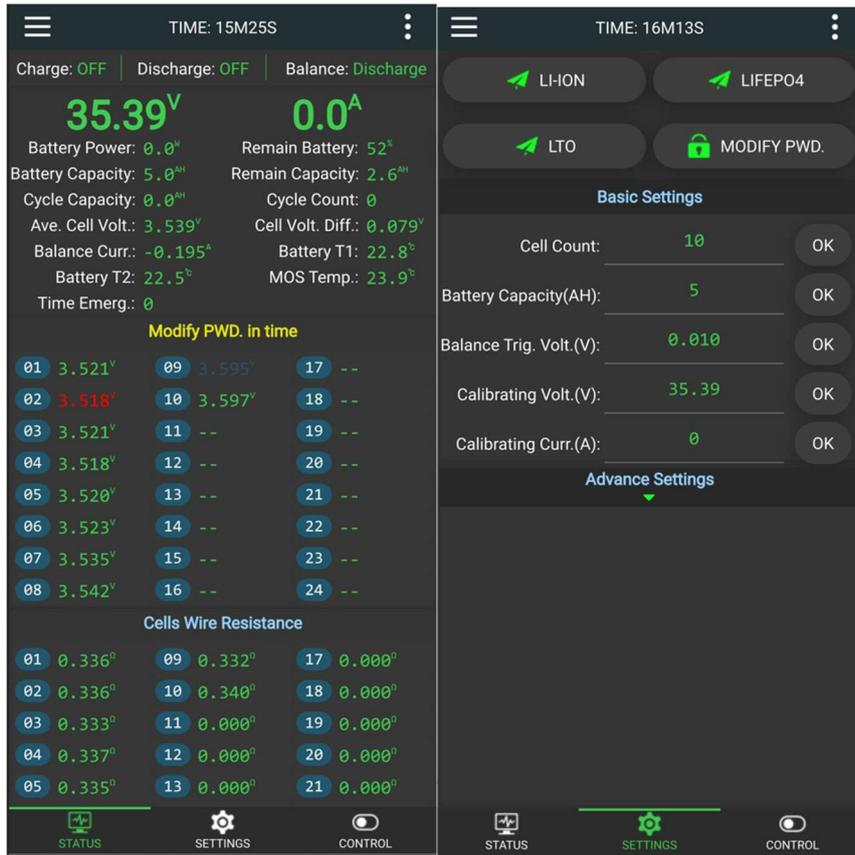
"Constant Charge Current (A)" – default is ~25% of the allowed current. Adjust if higher charging current is expected.

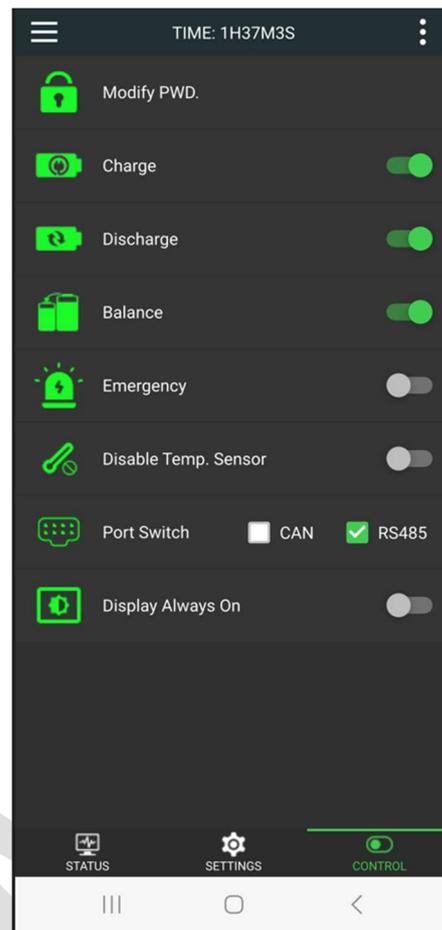
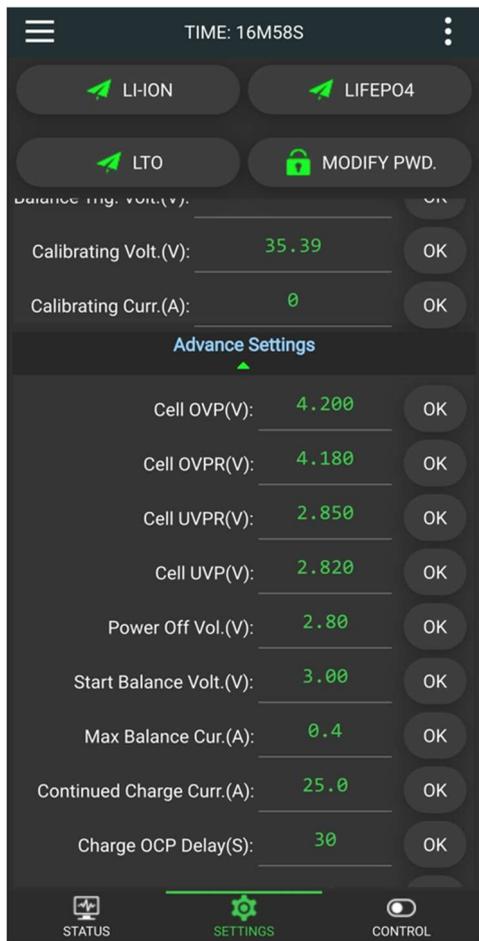
To block charging at low temperatures, set:

"Charge UTPR (°C)" = 5°C

"Charge UTP (°C)" = 1–2°C

9. You can confirm the selected battery type by checking:
Cell OVP (V) = 4.20V → Li-Ion
Cell OVP (V) = 3.60V → LiFePO4
Cell OVP (V) = 2.70V → LTO
10. In the "CONTROL" tab, you can toggle BMS functions:
Enable: "Charge", "Discharge", "Balance"
Do NOT enable: "Disable Temp. Sensor"
"Port Switch" is irrelevant unless using RS485/CAN
"Display Always On" keeps the LCD always on
"Emergency" allows using residual battery energy after BMS shutdown — use with caution, as the battery is unprotected in this mode





Before Use

Perform a **charge/discharge protection test** to verify BMS correctly disconnects the pack at set thresholds.

If an error is detected, it will appear in the **STATUS tab** and on the LCD (if used). Below are common error codes:

1	Single cell under-voltage alarm
2	Single cell over-voltage alarm
3	Overcurrent during charge/discharge
4	BMS temperature (MOSFET) exceeded
5	Cell temperature exceeded
6	Short circuit detected
7	Internal communication error
8	Balancer error
9	Cell connection missing or poor quality

Safety Precautions

WARNING:

JK BMS units, as delivered to the customer, must not be used without completing the parameter adjustment process described above.

Their installation requires appropriate knowledge and skills.

Neither the manufacturer nor the distributor shall be held liable for damages resulting from:

- using the BMS without configuring the necessary parameters,
- or entering incorrect parameters not in accordance with this manual.

Any changes made by the user to the protection parameters may be dangerous and can result in battery pack or BMS damage, or even fire.

By making such changes, the user assumes full responsibility for any resulting consequences.

In the event of an incident that may result in BMS damage — such as an external short circuit, operation with a damaged external device, contact with water or other liquids, overheating, etc. — the device must no longer be used until its proper functioning has been verified.

Continuing to operate the device without verification may lead to a hazardous situation for the user. It is recommended to contact the service center or the seller to determine the appropriate course of action.

	Warning! The instructions for installation and operation of the device form the basis for its safe use. For this reason, after reading the instructions, they should be kept for future reference.
	Caution, Warning: Incorrect connection may cause damage to the BMS and/or the cells and devices connected to it.
	Warning! Only personnel with the necessary qualifications are allowed to service this device.
	Under no circumstances should a short circuit occur between the current outputs (B-, P-, outputs to individual cells).
	Safety Hazard. Improper installation may cause a fire hazard.
	The BMS is not intended for installation in locations where flammable vapors or explosion hazards are present.
	In case of incorrect connections or disconnecting connections under load, there is a risk of electric arc formation.
	The BMS should not be installed in a way that allows access by children or pets.

	It is unacceptable to install and operate the BMS in a location where it is exposed to water or other liquids.
	Information. (Do not dispose of in the trash)

Manufacturer: JKBMS Electronic Technology Co., Ltd

1204, Block B4, Yunzhi Science Park, Guangming District, Shenzhen, Guangdong, CN
www.jkbms.net

Importer and distributor: Onvolt Urbański sp.k.

Ul. Pływacka 136 94-127 Łódź POLAND

www.onvolt.pl

sklep@onvolt.pl

www.onvolt.pl