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BMS JK SMART INVERTER line for home energy storage management.

The JK BMS Inverter for managing energy storage systems is a solution that combines a SMART BMS, a parallel module, an active balancer, and a communication interface board (Comboard) in a single device.

Such an integrated solution significantly simplifies installation and reduces its cost. This JK BMS series enables full communication (CAN-RS485) with most low-voltage inverters available on the market.

It supports the protective and monitoring functions of the Smart BMS while also allowing the safe parallel connection of multiple energy storage units (each equipped with identical BMS systems, up to 16). The active balancer ensures voltage equalization between cells by operating with a current of 1A or 2A, which meets the needs of high-capacity cells. Parameter monitoring is available via an optional LCD screens (4,3" touch LCD, 3,2" LCD and 2,3" indicator) or the standard Bluetooth app.

Through the communication interface board (comboard), it is possible to select the appropriate protocol and establish communication with most inverters on the market.

A PC program is not required for this; a mobile app is sufficient.

The JK BMS is a fully configurable device. This means it can be used to support Li-Ion, LiFePO₄, and LTO cell packs.

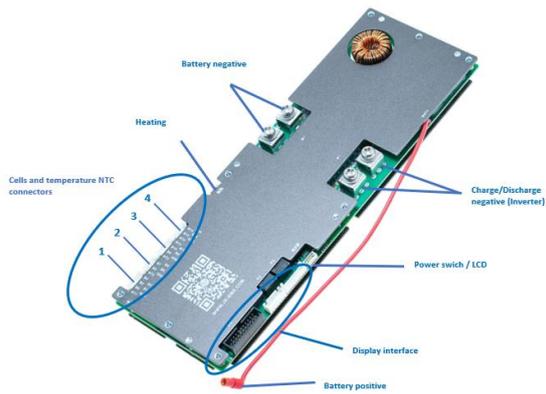
It's designed to work with a variable number of cells (within the range specified for the given BMS).

Proper device operation requires configuration through the mobile app. At least, the number of cells and battery type must be specified. Without configuration, the BMS does NOT properly protect the battery pack, which may lead to damage or even fire.

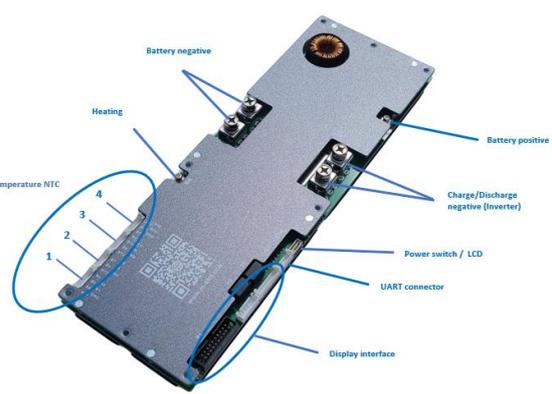
Configuration is described in detail in the "BMS Configuration" section.

Important Safety Instructions:

- **Never solder any wires to the batteries while the connector is plugged into the BMS. Doing so may result in damage to the BMS!**
- Please **carefully verify all connections**. Errors in wiring or short circuits between any pins in the BMS connectors will result in irreparable damage that is not covered by warranty.
- **Only use the cables and connectors supplied with the BMS.** Using cables from other manufacturers may damage the connection port or lead to incorrect wiring (e.g., using wires with different colors).
- Depending on the BMS version, **the layout and availability of ports may vary.**



V14/V15

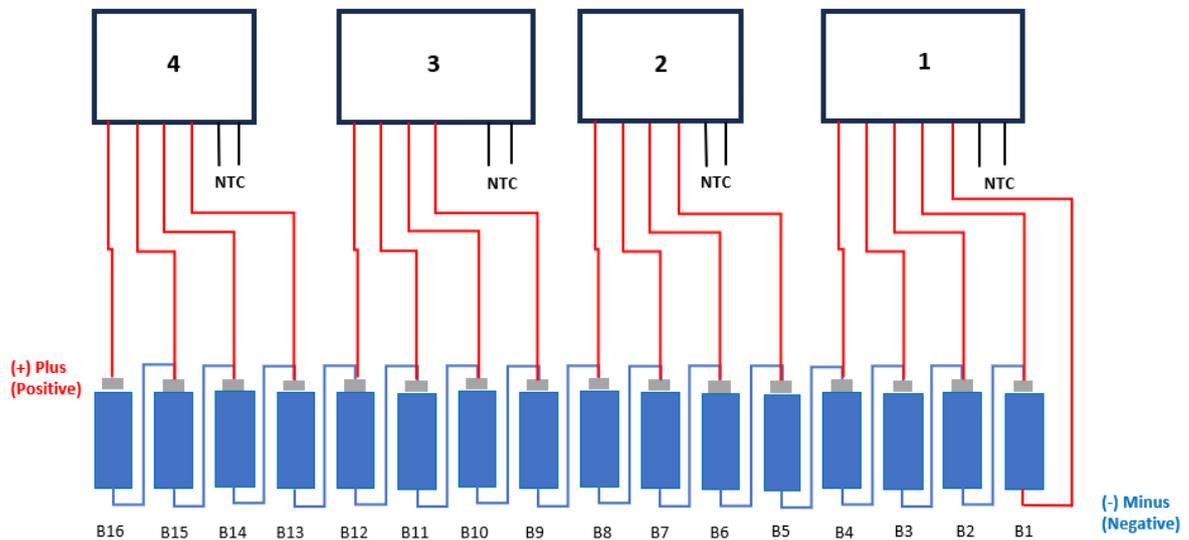


V19

Connecting the BMS to the cells

1. After assembling the battery pack, please connect the wires according to the diagram below. Before connecting, make sure that all cells in the pack are at a similar state of charge (the same voltage $\pm 0.1V$).
2. Four connectors labeled 1–4 are used to connect the cells. In addition to measurement wires, these connectors also include NTC temperature sensors (black wires).

WARNING: These are temperature sensors, **not wires for connecting the cell's negative terminals!** Do not cut, shorten, or modify them in any way. The sensors should be placed or attached to the cells in different locations within the pack.



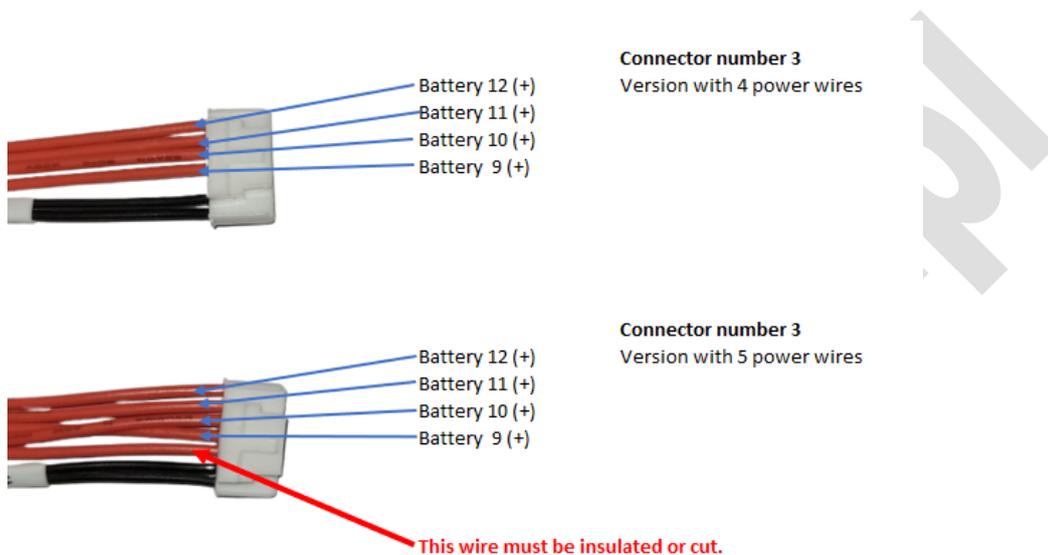
3. If fewer than 16 cells are connected, any unused wires must be insulated. Even if none of the wires from connectors 3 or 4 are used, these connectors **should still be plugged** into the BMS so that all four temperature sensors function properly.

Important notice:

There are two versions of connector number 3:

- One with four red wires (as shown in the diagram) and an empty pin near the temperature sensors.
- Another with five red wires (all pins used).

If you received connector no. 3 with five red wires, the wire closest to the temperature sensor must be insulated or cut. Under no circumstances should it be connected to the 9th cell. **Doing so will damage the BMS, and such damage is not covered by the warranty.**



4. **After connecting the wires to the battery pack, a connection test must be performed before plugging the connectors into the BMS.**
 - a. Using a multimeter, measure the voltage at each pin of the connectors. Connect the negative probe of the meter to the first measurement pin of the first connector. At each subsequent pin, the voltage should increase by approximately 2.5–3.6V for LiFePO4 cells or 3.5–4.2V for Li-Ion cells, up to the full pack voltage at the last pin. This test ensures there are no wiring errors in the battery pack. **Incorrect cell connections will damage the BMS, and such damage is not covered by the warranty!**
 - b. **Do not connect the connectors to the BMS before completing the following steps (5-12).**
5. Connect the communication interface to the BMS using the three supplied connectors.
6. Connect a switch or an LCD screen (a 3.2" or 4.3" screen is required) to the port next to the communication connectors. The smallest 2.3" JK LCD indicators are **not compatible** with the BMS INVERTER. If an LCD screen designed to work with multiple BMS units is used, it should be connected to the UART port.
7. Connect the negative terminal of the battery pack to the **B-** port on the BMS. The maximum cable length is 40 cm.
Use a wire gauge appropriate for the expected current draw.
8. Connect the orange wire or connector (**B+**) to the battery's positive terminal.
9. Prepare the power wires for the BMS-to-inverter connection (from the **P-** terminal on the BMS INVERTER and from the battery's positive terminal). **Do not connect the inverter yet.**

10. Once all components are connected to the BMS, plug in the connectors carrying the voltage signals from the individual cells. Connect them in sequence: **connectors 1–4**.

BMS Activation

The BMS does not require a special activation procedure. It activates automatically after pressing the power button.

11. **Measuring the voltage between the P- terminal on the BMS and the battery's positive terminal** (it should equal the pack voltage) completes the BMS connection process.
12. If you plan to connect multiple batteries equipped with the BMS INVERTER in parallel, this should be done at this stage. After connecting them, but **before connecting the inverter**, wait until the voltages of all the battery packs have equalized.

Installing software for mobile devices



Android.

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

IOS

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

BMS Configuration

After installing and launching the app, some versions of Android may prompt for location access. The BMS does not use this information; however, it is required by the Android system.

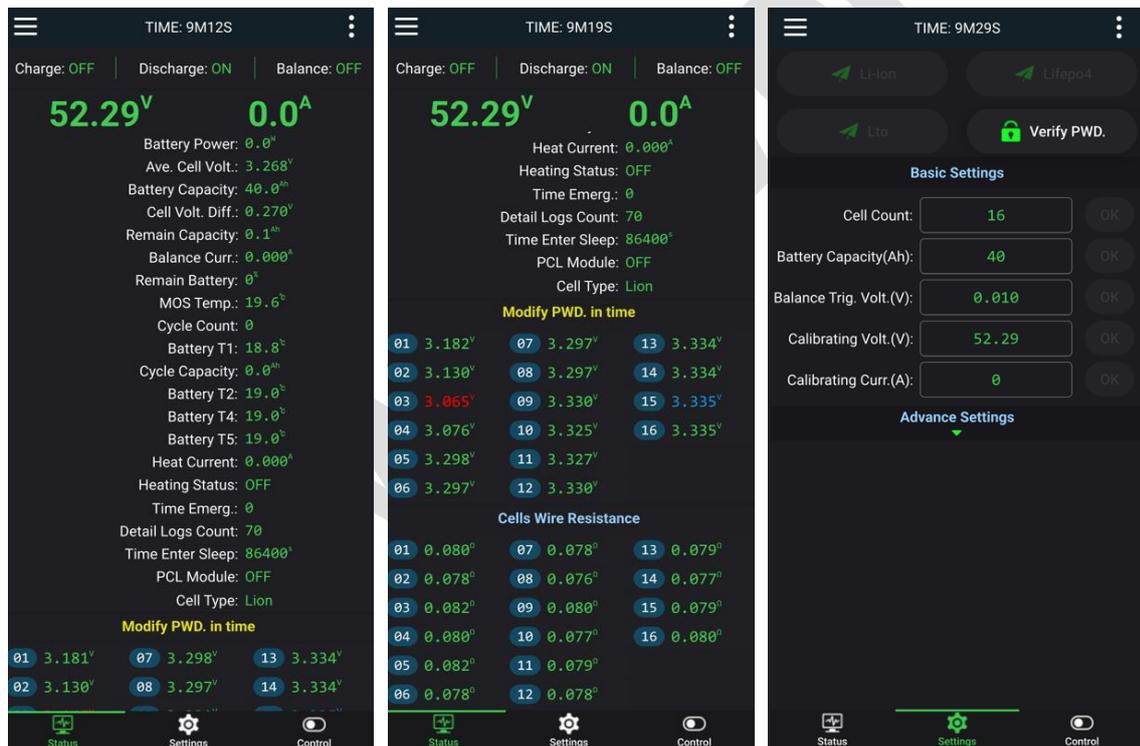
After scanning, the Bluetooth device of the connected BMS will appear in the list. If multiple BMS units are within range, select the one you want to connect to.

When connecting to a new device for the first time, you must enter the password **1234**. This will not be required for future sessions.

Configuration steps:

1. In the “STATUS” tab, check whether the voltages of all connected cells are visible.
If any cell is not visible, it indicates a wiring error or poor connection quality (e.g., cold solder joint or poor connector contact).
All connected cells must be visible before proceeding.
2. In the “SETTINGS” tab, enter the password **123456** via the “VERIFY PWD.” option to enable parameter editing.
You can change this password later in the settings to prevent accidental parameter modifications.
If the password is changed, **make sure to save or remember it**. There is no way to recover a forgotten password without contacting the manufacturer.
3. Once unlocked, **select the battery type: LI-ION, LiFePO4, or LTO**.
Pressing one of these buttons uploads a factory-set parameter profile tailored for that battery type into the BMS.

WARNING: The battery type should be selected once, during the initial setup of the BMS. Pressing these buttons again will restore factory settings, deleting any previously made changes to parameters such as cell count.



4. In the “Cell Count” field, be sure to enter the number of **series-connected cells**, and in “**Battery Capacity (AH)**”, enter the battery’s capacity.
5. The default value of **0.01V** in “**Balance Trig. Volt (V)**” represents the voltage difference between individual cells, above which the balancer will activate. In most cases, there is no need to change this setting.
6. For very precise BMS calibration, you can enter the voltage measured by a multimeter and the current currently being drawn in the “**Calibrating Volt (V)**” and “**Calibrating Curr (A)**” fields.
This is particularly important when working with inverters. Ideally, calibration should be

performed **simultaneously in both the BMS and the inverter.**

WARNING: Current calibration should be performed under **stable charging or discharging conditions.**

The **minimum calibration current is 15A.**

7. In the **“Advance Settings”** menu, you can access many detailed parameters. These are factory-set based on the selected battery type, and **we do not recommend changing them unless absolutely necessary.**

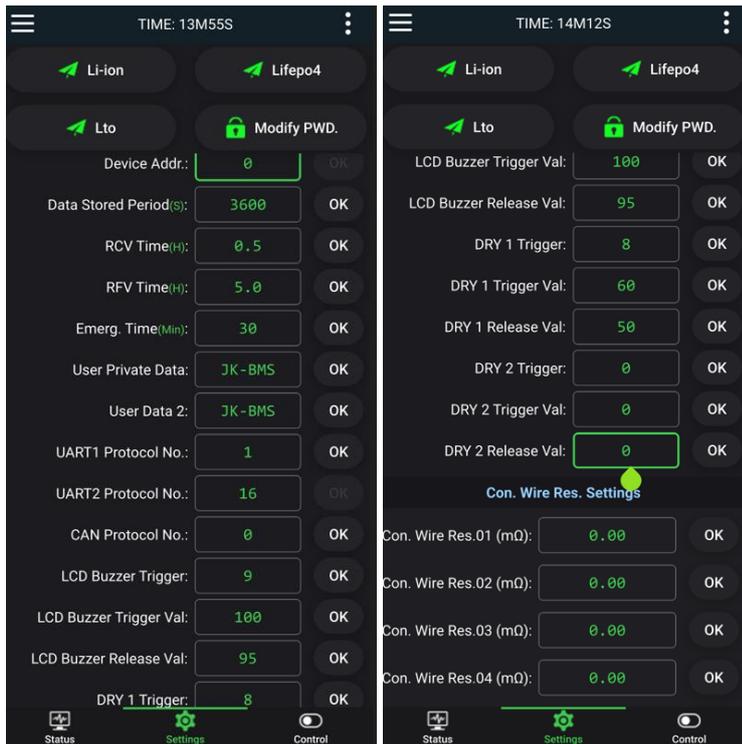
Many of these parameters are interdependent and must be changed together according to specific rules.

If needed, we can provide a detailed description and acceptable ranges of these parameters. Please note that available settings **may vary depending on the software version** and are continuously updated.

However, it is worth expanding this menu to **confirm that the correct battery type has been selected:**

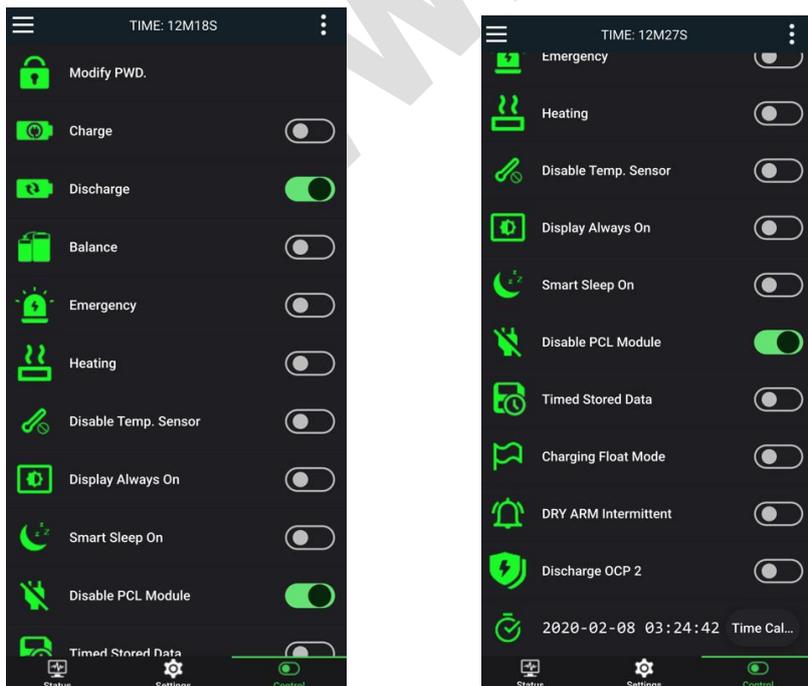
- a. **Cell OVP (V) = 4.20V** indicates **LI-ION**
 - b. **Cell OVP (V) = 3.60V or 3.65V** indicates **LiFePO4**
 - c. **Cell OVP (V) = 2.70V** indicates **LTO**
8. For **LiFePO4 cells** that are **not suitable for charging at sub-zero temperatures**, and where operating conditions may reach such temperatures, you must set the **Charge UTP (Under Temperature Protection) to 2°C**, and the **Charge UTPR (Re-enable Temperature) to 2–3°C higher, e.g., 5°C.**
 9. If a **higher charging current** than the default set in **“Continued Charge Cur.”** is expected, you can increase it, but **do not exceed the BMS’s rated specifications.**





10. In the “CONTROL” tab, you can enable or disable specific BMS functions:

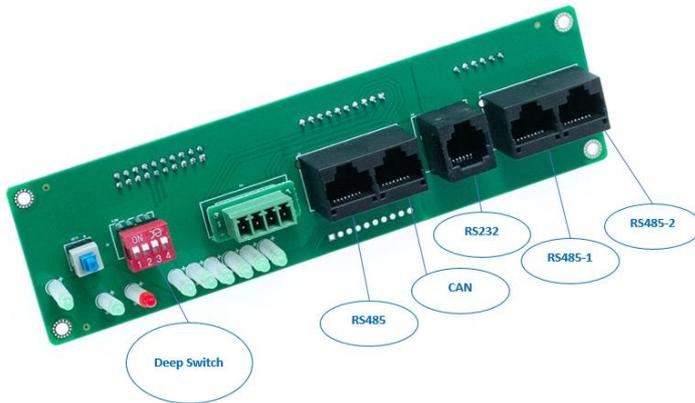
- a. “Charge” (charging), “Discharge” (discharging), and “Balance” (balancing) should be **enabled**.
- b. **Do not enable “Disable Temp. Sensor”**, as it will **deactivate temperature monitoring**.
- c. **Do not use the “Emergency” switch** — it disables the BMS's protection functions. It should **only** be used in exceptional situations, such as when you temporarily need to use a deeply discharged battery, below the BMS's protected limits.
- d. “Display Always On” keeps the LCD screen continuously lit, if an LCD display is in use.



Before starting regular operation of the battery pack, it is recommended to perform a **discharge and charge protection test**, verifying whether the BMS disconnects the battery at the specified voltage thresholds.

Establishing Communication with the Inverter

Communication with the inverter is handled via the communication board, which is included as part of the INVERTER package.



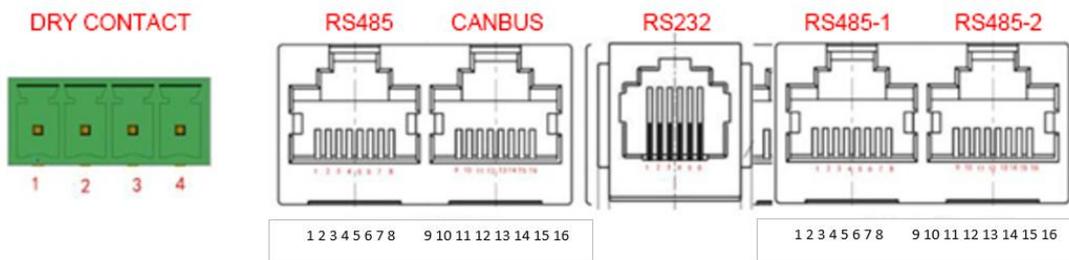
Communication with the inverter is possible via **CAN** or **RS485** interface. After selecting one of these standards, a cable with **RJ45 connectors** must be prepared to connect the communication board to the inverter.

This cable must connect the corresponding pins: **H and L** for **CAN**, or **A and B** for **RS485**, both on the board and the inverter.

To communicate with the inverter, use the **connectors to the left of the RS232 port**, i.e., the **CAN** or **RS485** interface.

The **RS485-1** and **RS485-2** ports are used for:

- Connecting additional boards for **parallel-connected batteries**
- Connecting the **BMS to a PC** for configuration and **firmware updates**.



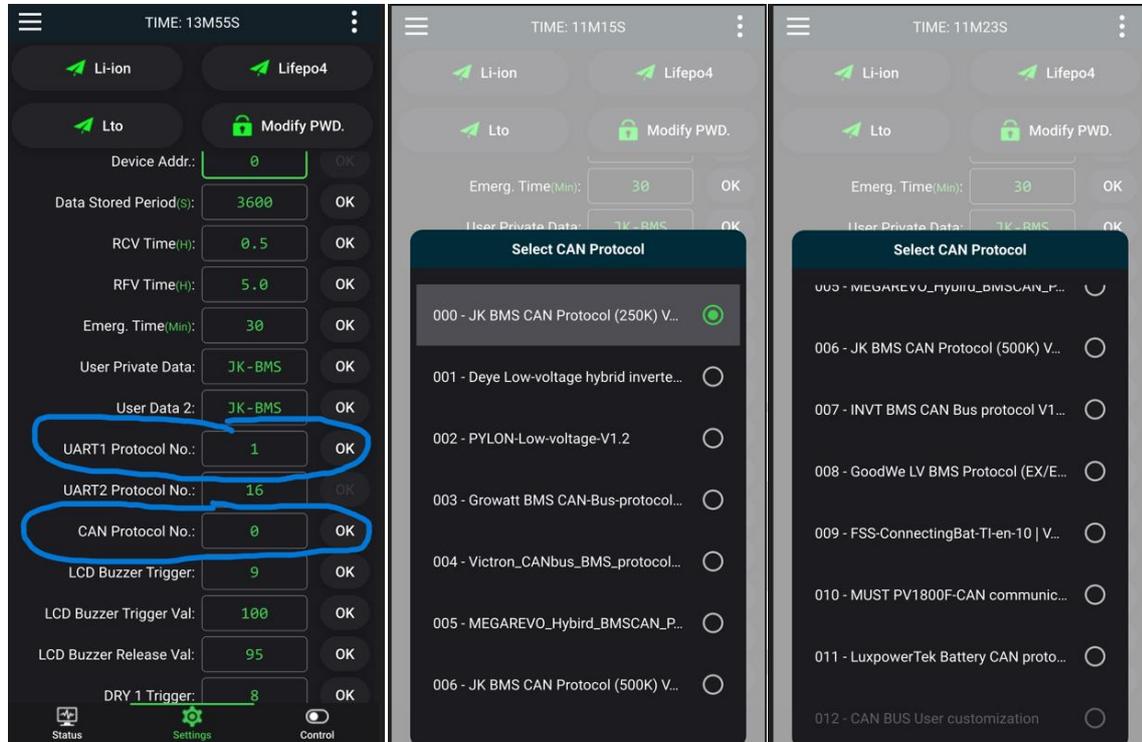
RS485- RJ45 Connector		CAN- RJ45 Connector	
Pin No.	Pin Definition	Pin No.	Pin Definition
1, 8	RS485- B1	9, 10, 11, 14, 16	NC
2, 7	RS485-A1	12	CANL
3, 6	GND	13	CANH
4, 5	NC	15	GND

RS485- RJ45 Connector		RS485- RJ45 Connector	
Pin No.	Pin Definition	Pin No.	Pin Definition
1, 8	RS485- B2	9, 16	RS485-B2
2, 7	RS485-A2	10, 15	RS485-A2
3, 6	GND	11, 14	GND
4, 5	NC	12, 13	NC

Before connecting to the inverter, you must select the correct inverter protocol in the "Advance Settings" tab.

If you are using a CAN connection, set it in the "CAN Protocol No." field.

If you are using RS485, set it in the "UART1 Protocol No." field.



It may also be necessary to select the correct **communication port** on the **inverter**.

For this, please refer to the inverter's **documentation**, or use a **trial-and-error method** if such information is not available.

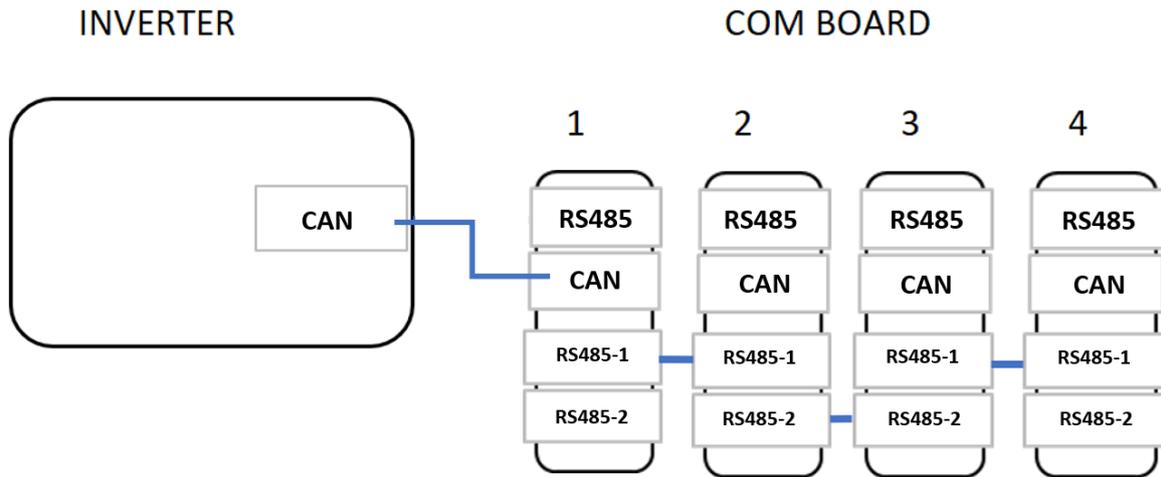
The above information applies to the integration of a **single battery** with the **JK SMART INVERTER BMS**, a **communication board**, and an **inverter**.

If you want to establish communication with **multiple batteries connected in parallel** (each with its own JK INVERTER BMS), you must **connect the boards** using **RJ45 cables**, via the **RS485-1** and **RS485-2** ports.

The **first board** (connected as described above) acts as the **"Master"** and is connected to the inverter.

The **remaining boards** are connected as **"Slaves"**, using the second communication channel.

Example connection diagram of 4 batteries with JK Inverter BMS (batteries connected in parallel), with communication to the inverter via **CAN**:



When connecting multiple BMS INVERTER units, each board must be indexed. Each board must have its own unique number.

The board connected to the inverter should have index “0”, which means all DIP switches down (OFF). For these boards, indexing is not done in software, but rather by physically setting the DIP switches correctly.

Below is a table showing which switch positions correspond to which board number.

Address	DIP Switch Positions			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Since the primary source of information for the inverter about the battery’s condition is the State of Charge (SOC) indicator, and its proper calibration requires several charge/discharge cycles, the inverter-battery system may only reach optimal performance after SOC calibration.

For accurate SOC calibration, it is important that the battery is charged up to the upper voltage limit appropriate for the cell type. Ideally, the final phase of charging should be carried out with a low current, allowing the BMS balancer to equalize the voltage across individual cells,

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)

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