voltgo

USER MANUAL

V1.0

VLEG 3276C 51.2V64Ah

Multi-purpose Lithium-ion Battery

CONTENTS

Disclaimer

Please read the product document and ensure that you fully understand it before using the product. After reading this document, keep it for future reference.

Improper use of this product may cause serious injury to yourself or others, or result in product damage and property loss. Once you use this product, it is deemed that you understand, approve, and accept all the terms and content in this document. The company is not liable for any loss caused by the user's failure to use the product in compliance with the product document.

In compliance with laws and regulations, the company reserves the right to the final interpretation of this document and all documents related to the product. This document is subject to changes (updates, revisions, or termination) without prior notice.

Safety Instructions

General

1. Please read and comply with the following conditions for the installation and use of the battery. Incorrect installation or use of the battery may cause personal injury or damage to the product.

2. The state of charge of the batteries is 80% before shipment; please charge the battery before using it.

3. This product is a dedicated energy storage battery. Do not use the battery as a starting battery or power battery for electric vehicles.

Environment

4. Do not throw the product into water.

5. Do not put the product into fire or heat the product to avoid explosion or other dangerous events.

6. To prevent irreversible damage, do not charge theproduct when the temperature falls below freezing (0°C/32°F).

Operation

7. Do not use the product if it is hot, bulging, deformed, leaking, has an abnormal smell, or exhibits any other concerning signs. Consult customer service immediately.

8. Do not connect different batteries. Different lithium batteries have diverse charging rates according to their specifications. When connected together, the battery with the lower charging current may be damaged.

9. Do not use batteries from different manufacturers or of different kinds and types in series or parallel, and do not mix old batteries with new batteries.

10. Do not reverse the positive and negative terminals, connect the battery directly to AC power, or allow short circuits.

11. Do not puncture the battery with nails or other sharp objects. Do not throw, stamp on, impact or hit the battery.

12. Do not dismantle or repair the battery in the event of damage. The warranty is void if the battery is repaired or disassembled.

13. The BMS will automatically cut off when the battery reaches a lower-limit voltage without human intervention. After the battery has finished discharging, disconnect all loads from the battery to avoid over-discharging.

Storage

14. If you stop using the product for an extended period, disconnect the switch and charge and discharge regularly.

15. Short-term storage (within 3 months): Store the product in a dry, non-corrosive gas environment at 10-45℃ (50-113℉), with a relative humidity of 60±30%, away from strong electromagnetic fields and direct sunlight.

16. Long-term storage (over 3 months): Keep the product's state of charge (SOC) between 30% and 60%, and store it in a dry, non-corrosive gas environment at 20-35°C (68-95°F), with a relative humidity of 50±15%, away from strong electromagnetic fields and direct sunlight. Make sure to charge it once every 3-6 months to avoid irreversible capacity loss caused by long-term storage.

17. See the following table for the time interval and method of replenishment.

Temperature	Refill Interval	Method
≤20°C (68℉)	Once every 3 months	57V30A CC/CV charging 57V, cut-off current 5A, and discharging at 0.5C to 51.2V-52.8V
20-30°C (68-86℉)	Once every 6 months	57V30A CC/CV charging 57V, cut-off current 5A, and discharging at 0.5C to 51.2V-52.8V
30-40°C (86-104℉)	Once every 3 months	57V30A CC/CV charging 57V, cut-off current 5A, and discharging at 0.5C to 51.2V-52.8V

Handling and Transportation

18. Forklifts or carts should be used for handling. Rough handling practices may cause short circuits or damage to the battery pack, resulting in battery leakage or fire.
19. Avoid the phenomenon of inverted and laminated battery packs when unloading.
20. Do not touch the terminals to avoid short circuits when handling the battery.
21. Avoid dropping and throwing the product.
22. Prevent the product from collisions and strong vibrations during transportation.

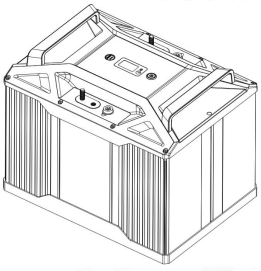
In Case of Emergency

1. In case of emergency, take precautions against electric shock before touching the product, such as wearing insulating gloves.
2. If the product gets wet, stop using it immediately and refrain from further operation or powering it on. Place the product in a secure, waterproof, and well-ventilated area, then contact the customer service for assistance.
3. If the product falls into water, place it in a secure, waterproof, and well-ventilated area, and keep it away from contact until it is completely dry. The dried product should not be used again and must be disposed of properly according to local laws and regulations.
4. If the product catches fire, we recommend that you use the fire extinguishers in the following order: water or water mist, sand, fire blanket, dry powder, and finally a carbon dioxide fire extinguisher.

Specifications

General		
Model	**VLEG 3276C**	
Dimensions (W×D×H)	360×261×282 mm (14.2x10.3x11.1 in.)	
Weight	31.5 kg (69.5 lbs)	
Capacity	51.2V,64Ah,3276Wh	
Environment		
Charge temperature	0℃-45℃ (32℉-113℉)	
Discharge temperature	-20℃-50℃ (-4℉-122℉)	
Storage Temperature	-20℃-60℃ (-4℉-140℉)	
Optimal Storage Temperature	20℃-30℃ (68℉-86℉)	
Humidity (RH)	5%-95%	
IP Rating	IP65	
Altitude	≤3,000 m (9,842 ft)	
Operation		
Voltage Range	44.8V-57.6V	
Cut-off Voltage	44.8V	
Recommended Charging Current	20A	
Max Charging Current	60A	
Max Discharging Current	150A	
Cycle Life	>6000 times (0.5C@25°C/77℉, 80% DOD)	
Max Discharging Rate	2.5C	
Charging		
Cell Overvoltage Protection	3.8V	Recovery@3.45V
Module Overvoltage Protection	60.0V	Recovery@55.2V
Overcurrent Protection	65A	Delay 10s
	70A	Delay 3s
Overtemperature Protection	<-5℃ or >70℃ (<23℉ or >158℉)	Recovery@>0℃ or <60℃ (>32℉ or <140℉)
Discharging		
Cell Undervoltage Protection	2.3V	Recovery@3.1V
Module Undervoltage Protection	44.8V	Recovery@48.0V
Overdischarging Current 1	300A	Delay 10s, recovery in 60s
Overdischarging Current 2	360A	Delay 6s, recovery in 60s
Short-circuit Current	>600A	<0.1ms
Overtemperature Protection	<-20°C or >70°C (<-4℉ or >167℉)	Recovery@>-10℃ or <65℃ (>14℉ or <149℉)

What's in the Box



51.2V 64Ah
Multi-purpose Lithium-ion Battery X 1

User manual X 1

Communication cable X 1

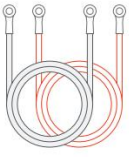
Power cable (Red) X 1
Power cable (Black) X 1

M8 Hexagon screws X 2
Hexagon flange nuts X 2

What you Need

Wrench 14 mm (9/16")

Screwdriver



Battery connection cables with M8 OT terminals ×2 or more

Protective gloves

Multimeter

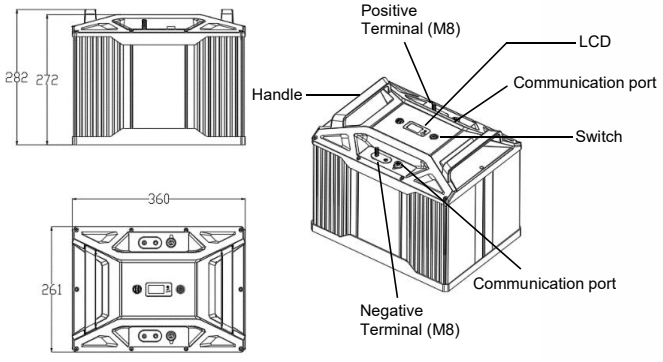
Communication cable

Battery connection cables should be appropriately sized to handle the expected load.
See the following table for specifications of battery connection cables:

Cable Gauge Size	Ampacity
25mm²	100A
35mm²	150A
50mm²	200A

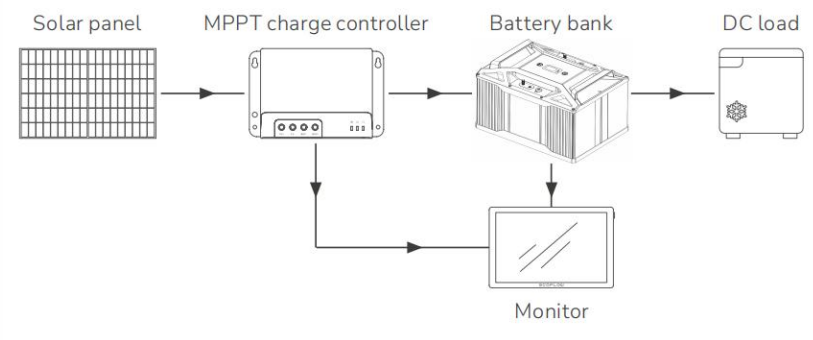
Overview

51.2V64Ah Lithium Battery adopts the highest safety performance lithium iron phosphate battery and has a built-in high-precision battery management system (BMS) to monitor voltage, current and temperature. The BMS also features passive balancing, which can effectively improve battery performance. Additionally, the built-in Bluetooth module enables remote monitoring on mobile devices in real time.



Communication port		
Pin No.	Definition	Remarks
3	12V	12V+
4	CANH	External display communication
5	CANL	
6	GND	12V-
7	RS485A	Parallel port for data monitoring and battery
8	RS485B	

This product is used for golf carts, RVs, marine systems, solar lights, trolling motors, and small energy storage. You can set up a system as shown below, for example:



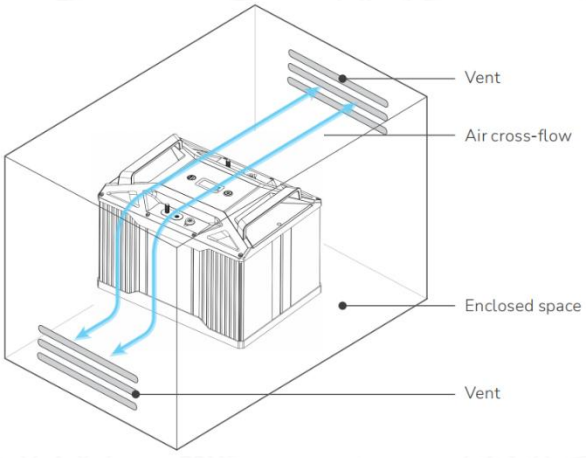
Installation

WARNING

- Keep away from any accumulation of water, oil, or dirt. Accumulation of such materials on the battery can lead to current leakage, self-discharge, and even short circuits.
- Ensure sufficient airflow to prevent excessive heat buildup and minimize temperature variations between the connected batteries.
- When used at sea, install the product in a dry and stable environment with minimal airflow to prevent external moisture. Ensure there is adequate space for the dissipation of heat. Recommended operating conditions are 20-25℃ (68-77℉) and a relative humidity of about 50%.

Step1 Confirm a Suitable Mounting Site

Install the battery in a tidy, dry, and well-ventilated environment. If you install it in an enclosed space, the environment should meet the following requirements.



AWAY FROM


Moisture


High temperature


Rain


Flammable material


Temperature below freezing


Snow


Explosive material

Keep dry

Handle with care to avoid damage

Keep well-ventilated


Charging: 0°C-45°C (32°F-113°F)
Discharging: -20℃-50℃ (-4°F-122°F)

5%-95% RH

Step2 Check the Battery

All connector contacts should be clean, free of dirt and corrosion, dry, and free of burning marks.

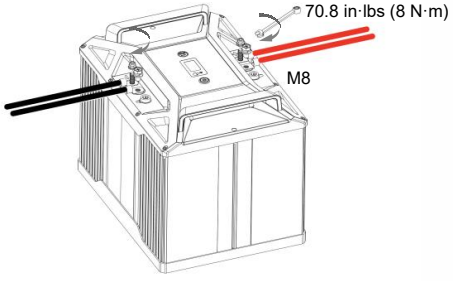
Inspect the battery for any visible damage, including cracks, dents, deformations, and other visible abnormalities.

The battery should be able to switch on normally, the LCD screen should display properly, and the state of charge (SOC) should not be less than 10% before use. If it is less than 10%, please charge it first.

Step3 Install Battery Terminals

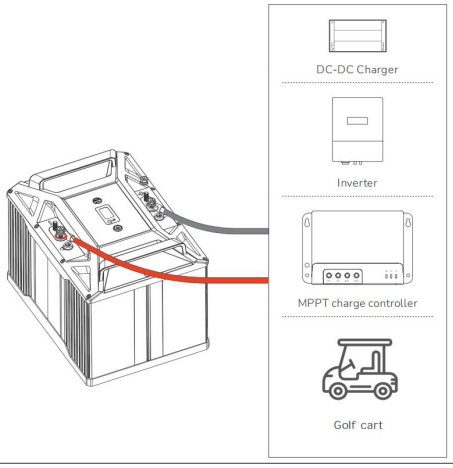
WARNING

- **Do not place washers between the battery terminal bolt and the cable lug, otherwise high resistance and excessive heating might occur.**
- **Avoid short-circuiting of battery terminals to prevent short-circuit current from damaging the battery and system.**
- **Verify polarity before wiring to avoid irreversible battery damage due to polarity reversal.**
- **Do not touch the positive and negative terminals of the battery with your hands.**
- **To ensure safe and reliable operation of the system, please follow the torque specifications recommended by the manufacturer when securing cable connections.**



Step4 Connect the Battery to Other Devices

You can connect the battery to a DC-DC charger, inverter, MPPT charge controller and so on.



To connect batteries in parallel, see “Connect Batteries in Parallel” for instructions.

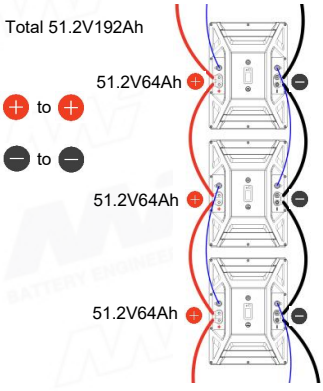
Connect Batteries in Parallel

Calculate Capacity and Current in Parallel Connections

This battery is designed for parallel use only.

You can connect up to 16 batteries in parallel. When used in parallel, the Bluetooth app should be used to set a different ID address for each battery.

In parallel, the capacity increases, the current increases, and the voltage remains unchanged.



Parallel No.	System Voltage	System Capacity	kWh
Single	51.2V	64Ah	3.276kWh
2	51.2V	128Ah	6.553kWh
3	51.2V	192Ah	9.830kWh
4	51.2V	256Ah	13.107kWh
8	51.2V	512Ah	26.214kWh
16	51.2V	1024Ah	52.428kWh

⚠ WARNING

- **Do not connect batteries with different chemistries, rated capacities, nominal voltages, brands, or models in parallel. This can result in potential damage to the batteries and the connected devices, and it can also pose safety risks.**
- **Avoid mixing old and new batteries, as this can affect their ability to deliver reliable power due to inconsistent battery performance and may lead to safety hazards.**
- **The cables between each connected battery should be of equal length to ensure that all batteries can work equally together.**
- **If high current is required, you need to choose suitable busbars for parallel connections to distribute electrical power efficiently; otherwise, it may lead to safety hazards.**

Balance Batteries Prior to Connection

Before connecting batteries parallel, balance them to reduce voltage differences and optimize their performance. Follow these three steps:

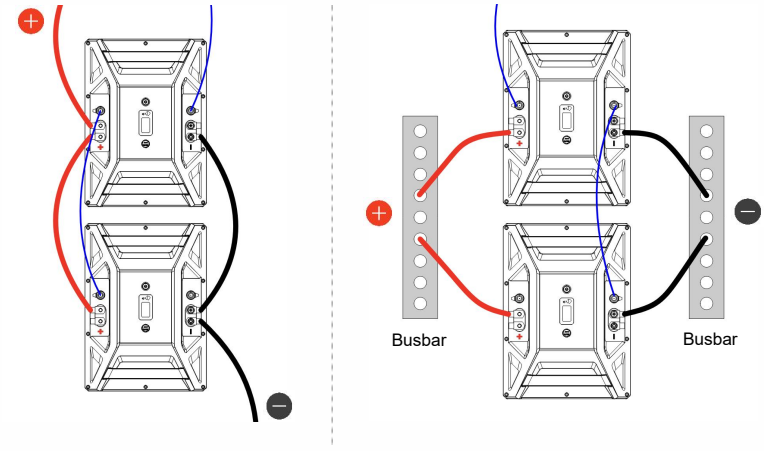
1. Charge each battery individually to its full capacity using a suitable charger, or use a qualified battery balancer to balance the batteries.
2. Monitor the voltage of each battery. A voltage difference of less than 0.1V among each battery is ideal.
3. Connect all the batteries in parallel and allow them to rest together for 12 to 24 hours.

- Refer to the instructions of the battery balancer for safety operation.
- It is recommended to periodically rebalance the battery voltage every 6 months when connecting multiple batteries, except during initial connection. Slight voltage differences can occur among batteries over time due to factors such as battery chemistry, capacity, temperature, and usage patterns.

Connect Directly or Use Busbars

You can connect batteries in parallel directly or connect them to busbars for efficient power distribution.

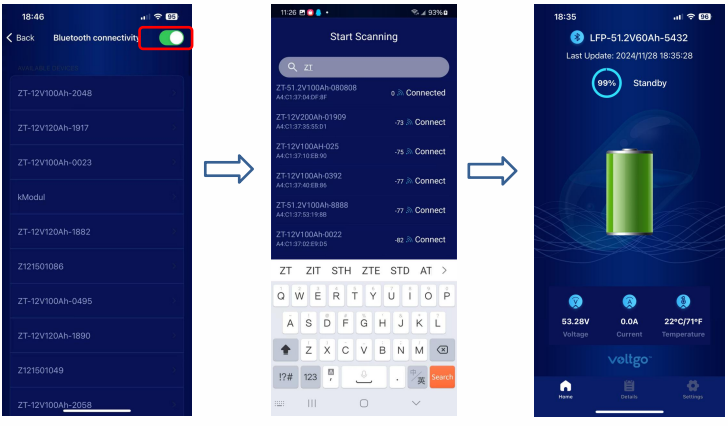
For example, consider a parallel connection of two batteries:



Monitoring via App

Step 1: Download the BatteryMonitorBL app. Open the app and turn on your phone's Bluetooth.

Step 2: Find the battery ID and pair it with the app. Once paired, you can monitor the battery parameters or set the battery ID via the app.

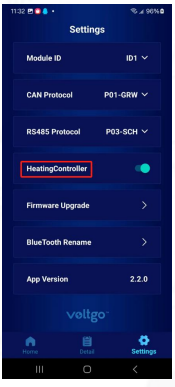


Heating Settings

Heating settings are as shown in Figure.

Step 1:Click the heating to turn on and open the heating film heating function. When the low temperature condition is met, the battery starts to heat.

Step 2: Click the heating off, close the heating film heating function, when the low temperature condition is met, the battery prohibit heating.



Firmware Upgrade

Comm pcb Upgrade

① Click "Firmaware Upgrade" firmware upgrade;

② Click "Comm PCB";

③ Click "BROWSE" to select the program;

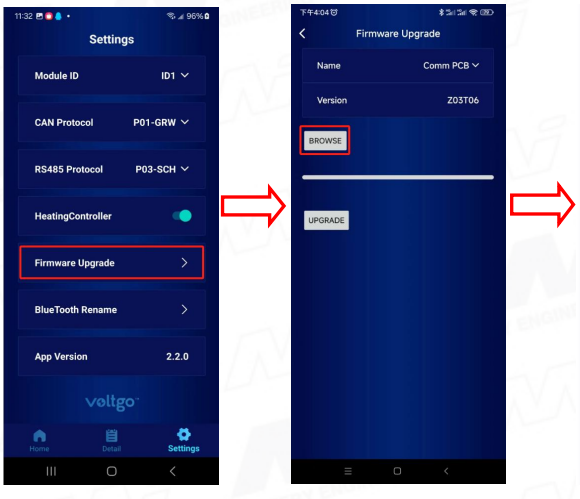
④Select the program "ZTHV-C" as the communication board program;（Note: Product model number）

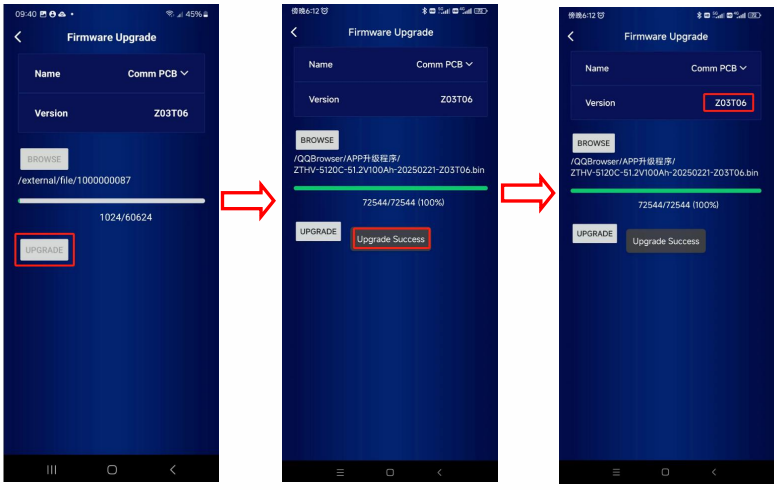
⑤ Click "Done" ;

⑥ Click "UPGRADE" to start downloading;

⑦The word "Upgrade Success" was downloaded successfully;

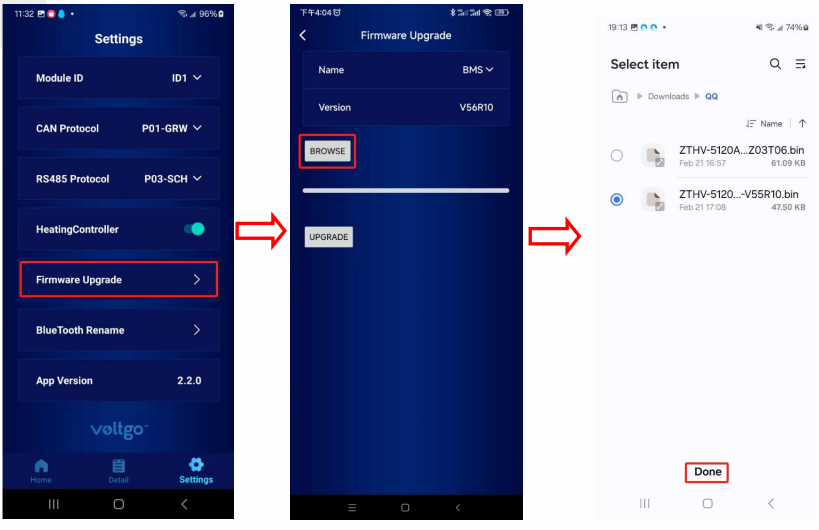
⑧ Return to the main page and click "Comm PCB" to display the current communication board version number.

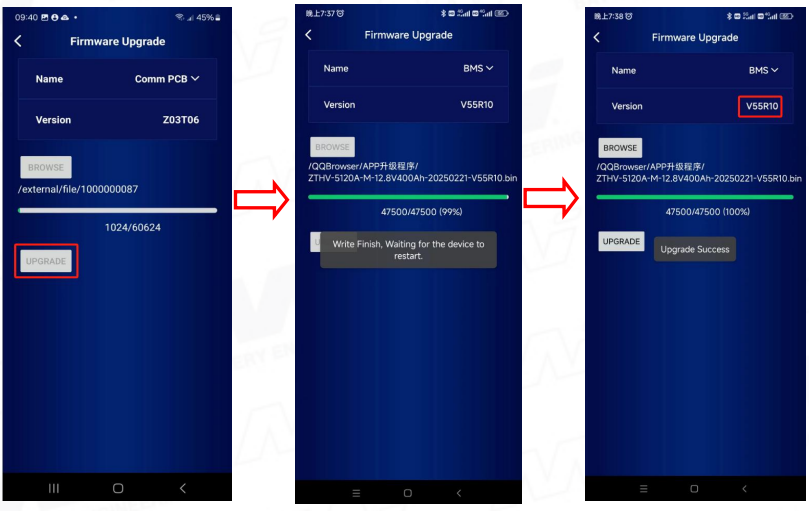




BMS Upgrade

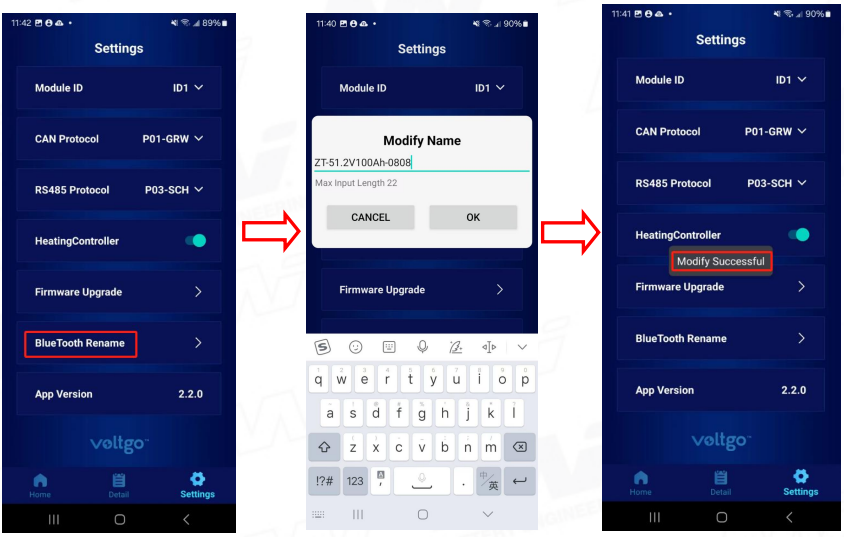
① Click "Firmaware Upgrade" firmware upgrade;
② Click "Comm PCB";
③ Click "BROWSE" to select the program;
④ Select the program "ZTHV-M" as the communication board program;（Note: Product model number）
⑤ Click "Done" ;
⑥ Click "UPGRADE" to start downloading;
⑦ Show 99%,Write Finish, Waiting for the device torestart;(The loading time is about 30s)
⑧ The word "Upgrade Success" was downloaded successfully;
⑨ Return to the main page and click "BMS" to display the current BMS version number.





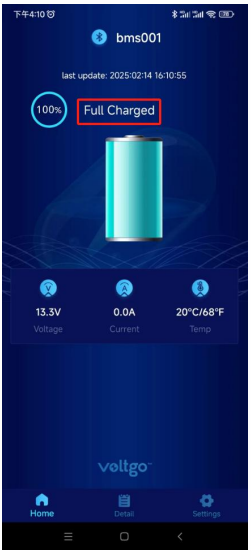
Bluetooth Rename

① Click "Bluetooth Rename" ;
② Click the name to modify, pay attention to the number of 22 digits;
③ Eediting is completed, click "ok";
④ The word "Modify Successful" appears;
⑤ Restart the battery, and the modification is complete.



Battery status

Battery status are as shown in Figure.



Battery status corresponding table

status information	explain
CELL OVP	Single overpressure protection
CELL UVP	Single under-pressure protection
PACK OVP	Overpressure protection in the whole group
PACK UVP	The whole group is under pressure protection
CHG OTP	Charging high temperature protection
CHG UTP	CHG UTP Charging low temperature protection
DSG OTP	Discharge high temperature protection
DSG UTP	Discharge low temperature protection
CHG OCP	Charging over-current protection
DSG OCP	Discharge overcurrent protection
SHORT Circuit	short-circuit protection
FULL CHARGE	The battery full charged
FULL DISCHARGE	The battery is full discharged

Troubleshooting

No.	Fault	Analysis	Solution
1	No DC output	low voltage	Charge the battery
2	Power supply time is too short	Battery capacity lack or failure to fully charge due to battery cell failure	Replace a new battery
3	Battery can't be charged fully	DC output voltage in the power system is below the minimum charge voltage	Adjust DC output voltage in the power system
4	The charging and discharging capacity are insufficient	Unbalance voltage with cell	Check or balance the cell
5	Unable to charge and discharge	BMS or cell/temperature sensor damaged	Replace a new BMS/battery
6	Different SOC value of batteries in parallel	Normal phenomenon	Recharge each battery to full charged

Maintenance

Item	Instruction	Interval
Power Cables	• Check for any mechanical damage to the power cables and ensure that the insulation sleeves and cables are installed securely. If any cable damage is found, replace the cables. • Check whether there are loose screws or copper bus bar discoloration. If screws are loose, tighten them using a standard torque wrench. For discolored copper bus bars, contact customer service for replacement.	Once every 6 months
Cleanliness	Check the appearance of the battery. Clean up if there is obvious dust.	Once every 6-12 months
System running	• Check if all parameters are normal while the system is running (system voltage, current, temperature, etc.) • Check if the main components are functioning properly, such as system switches and loads. • Check whether the system air inlet and outlet, air ducts are normal. If there is blockage and congestion, clean up.	Once every 6 months
Charging and discharging maintenance	• Use low-power loads and shallow charging to charge and discharge to check whether the battery works properly. (It is recommended to discharge and charge at levels below 20% of the rated value)	Once every 3-6 months