Manual on LiFePO4 Battery

Product model:LFF51280

www.lvfuenergy.com

This manual introduces 51.2V Floor Standing Lithium Energy Storage Battery. Please read this manual before you install the battery and follow the instruction carefully during installation process. Please contact immediately for advice and clarification if you have any question.

Contents

Catalogue

（Revision History）

Ver. No.	Date	Revised Content	Reasons for Change	Reviser	Approver
A0	2025.7.18	First Edition	First Draft	xueqiang.Yang	

1. Symbol Description

	Do not place near open fire or flammable materials.
	A potential hazard exists when the equipment is working. Wear personal protective equipment during operation.
	Warning electric shock. Power off the equipment before any operation.
	Grounding: indicate PE cable connection position.
	Do not place in areas accessible to children.
	Keep the battery away from open fire or ignition sources.
	Read the product and operation manual before operating the battery system.
	Label for Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU).
	The certificate label for CE.
	Recycle label.

2. Safety Precautions

 **Alert**

1) It is important and necessary to read the user manual carefully (and attachment) before installing or using battery. Failure to do so or to follow any instruction or warning in this document can result in electrical shock, serious injury, and death, or damage battery, potentially rendering it unusable.
2) When battery is stored for a long time, it is required to charge once every 6 months, and the SOC should be no less than 50%.
3) After battery module cannot be discharged, it needs to be recharged within 12h.
4) Do not connect power terminal reversely.
5) All power supplies must be disconnected during maintenance.
6) Please contact the supplier within 24 hours if there is something abnormal.
7) Do not use any liquid to clean the battery.
8) Do not expose battery to flammable or irritating chemicals or vapor.
9) Do not paint any part of battery, including any internal or external components.
10) Do not connect battery with PV solar wiring directly.
11) Do not install or use this product beyond provisions of the manual.
12) Direct or indirect damages caused by the above reasons are not covered by warranty claim.

 **Warning**

2.1 Before Connecting

1) Please check the external packaging condition before unpacking. If it is damaged, contact corresponding local retailer.
2) After unpacking, please check the products and spare parts according to spare parts list. If the product is damaged or missing, please contact your local retailer.
3) Connect to specified matching inverter.
4) Before installation, be sure to cut off the grid power and make sure battery switch is on OFF mode.
5) It is prohibited to connect the battery and AC power directly.
6) All electrical wiring must be connected in accordance with local regulations.
7) Please ensure that electrical performance of battery system is compatible with the equipment.
8) The installation onsite shall be equipped with fire-fighting facilities that meet relevant requirements, such as fire sand, dry powder fire extinguisher, etc.

2.2 In Using

1) If battery system needs to be moved or repaired, power must be cut off and battery is completely shut down.

2) It is prohibited to connect battery with different types of battery.
3) Do not connect battery to faulty inverter.
4) Except for personnel from Company or other authorized personnel, batteries shall not be opened, repaired or disassembled.The company shall not bear any liability or responsibility caused by violation of any safety operation or design standard, production standard, equipment safety standards or any other standards or requirements.

3. Introduction

This stand mode LifePo4 lithium battery belongs to one of the series of house hold energy storage products that are independently designed and developed. It has long cycle life, high safety standard BMS software protection and strong housing, exquisite looks, and easy installation, etc. It is widely used in energy storage system with off-grid inverters, on-off grid inverters and hybrid inverters.

4. Product Function Description

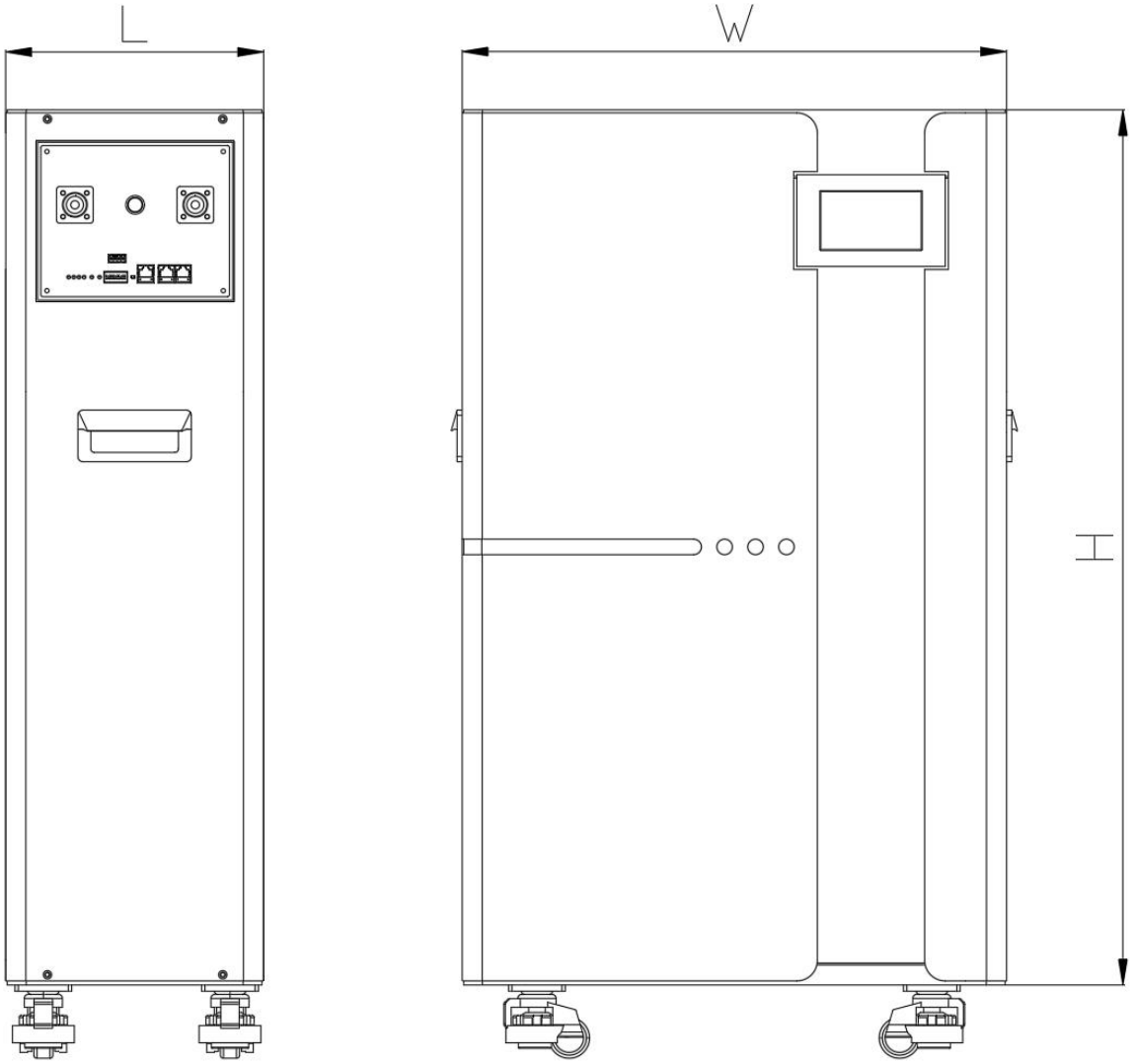


Figure 4-1

product model			
Specification	Length (L)	Width (W)	High (H)
51.2V280Ah	849mm	528mm	250mm

4.2 Product Specifications

Items		Condition	Specification
Nominal Capacity		Standard charge/discharge	280.0Ah
Nominal Voltage		Average	51.2V
Standard Charging		Constant current Constant voltage End current(Cut off)	100A 57.6V 2A
Charging Voltage		/	57.6V
Max. Continuous Charge Current		25±3℃	200.0A
Standard Discharging Refer to 5.2		Constant current End voltage(Cut off)	100A 43.2V
Max Continuous Discharge Current		25±3℃	200.0A
Nominal Energy		25±3℃	14.33kWh
Available Energy		25±3℃	12.9kWh
Operating Temperature	Charge	/	-5℃~ 55℃
	Discharge	/	-10℃~ 55℃
Storage Temperature		/	-20℃~ 30℃
Weight		/	~123kg

4.3 Equipment interface instruction

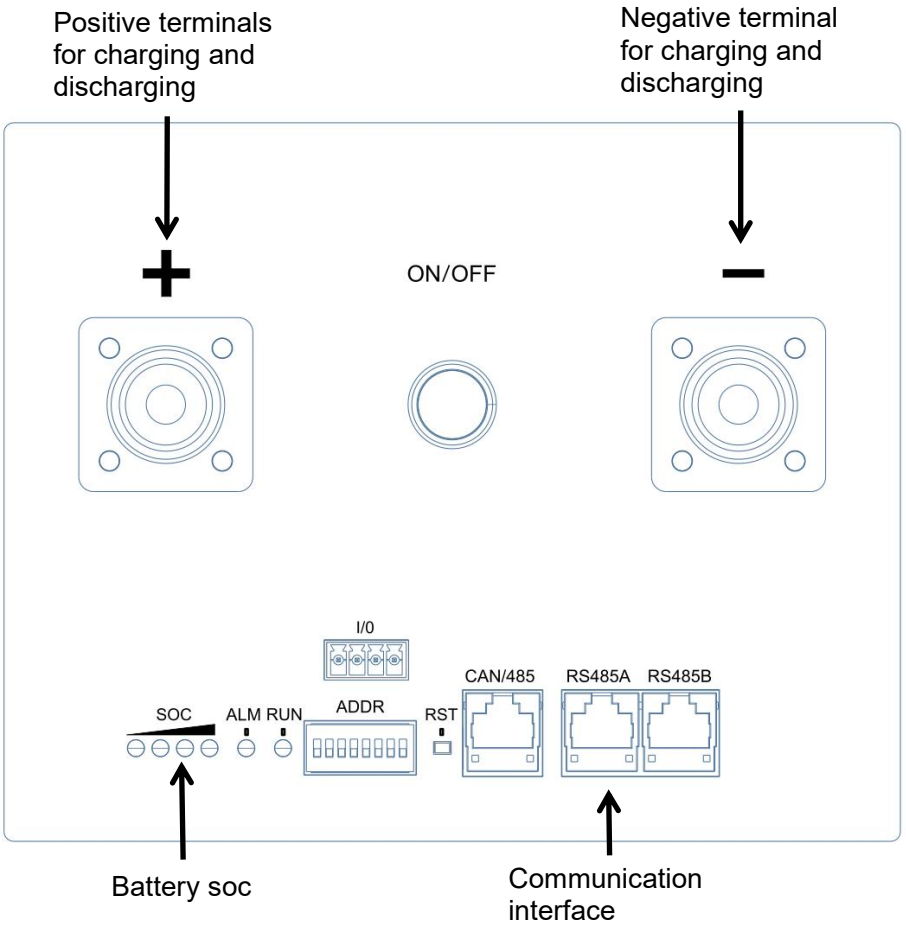
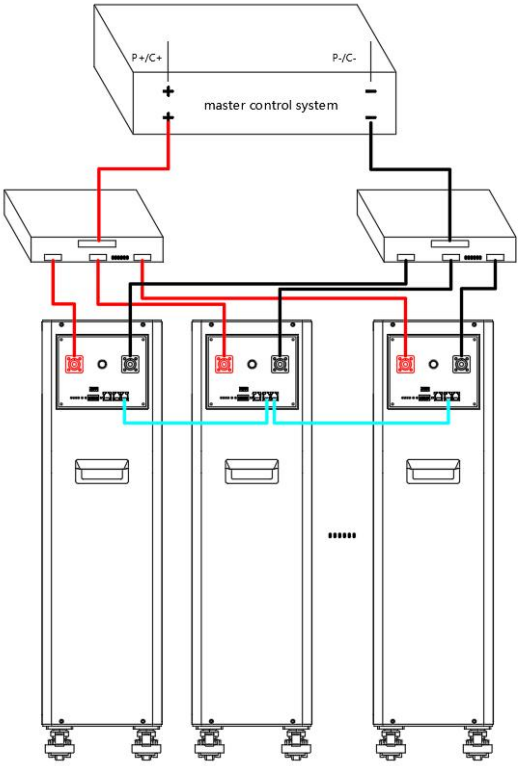


Figure 4-2

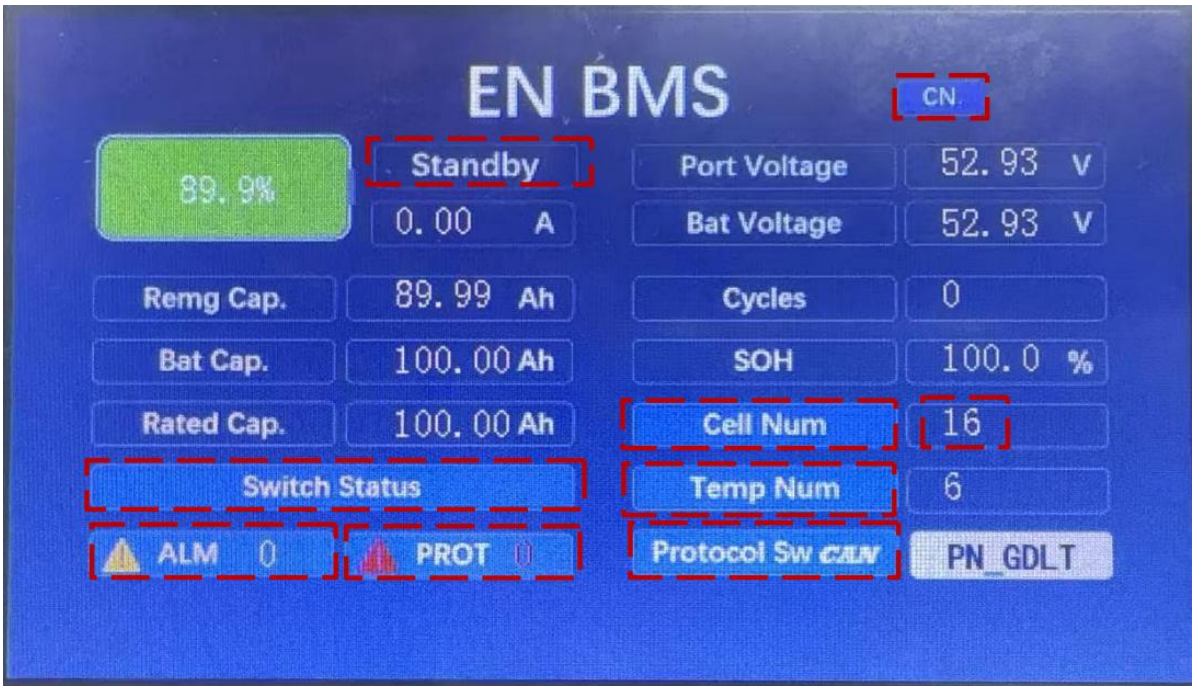
4.4 Parallel Connection

When Connect the batteries in parallel, connect the positive terminal and positive terminal (red colour) in parallel, and the negative terminal and negative terminal (black colour) in parallel, the max parallel quantity is 15pcs, as shown in the figure below,the parallel communication line between the battery and the inverter is connected in a staggered manner, with one end at the second 485 port and the other end at the first 485 port of the parallel .



4.5 LCD Function Description

4.5.1Main Interface

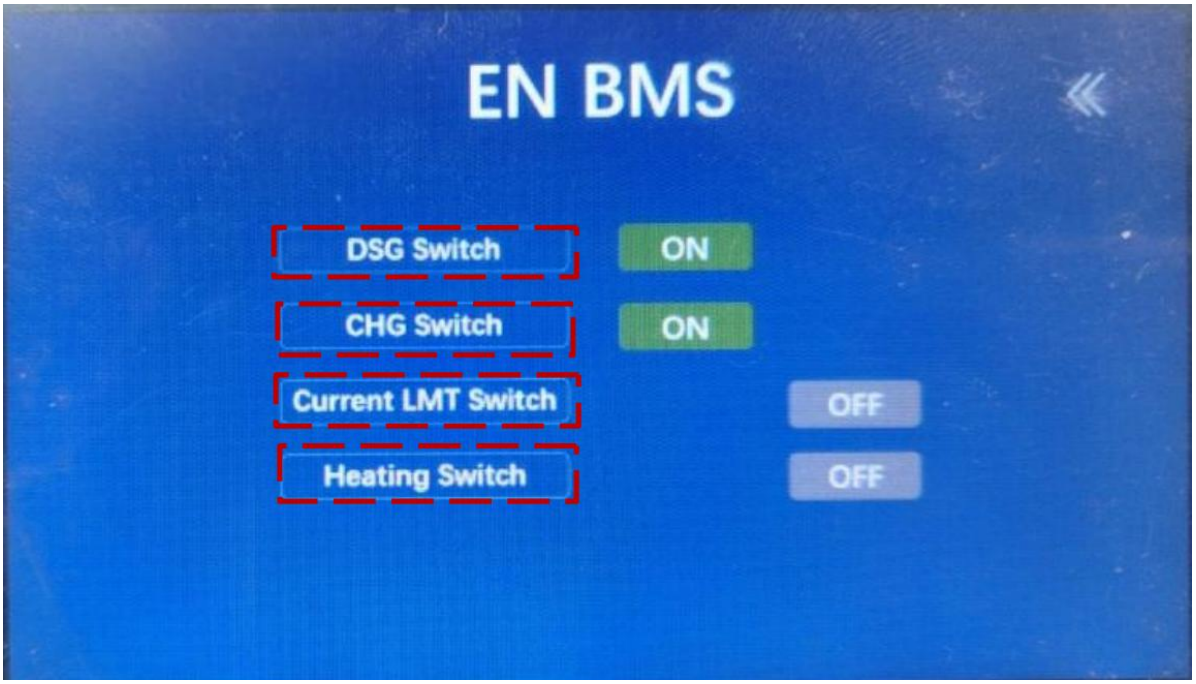


According to the current working status of the BMS board, as shown in the above figure, the display screen will show several modes including "charging""discharging", and "standby", as well as various parameters of the current BMS board: remaining capacity, battery capacity, rated capacity, port voltage.total battery voltage, and number of cycles, SOH. The blue icons ("EN""switch status", "alarm quantity", "protection quantity", "cell quantity","temperature quantity", "protocol switching") can all be touched to view. Details are as follows.

4.5.2Language Switching Display

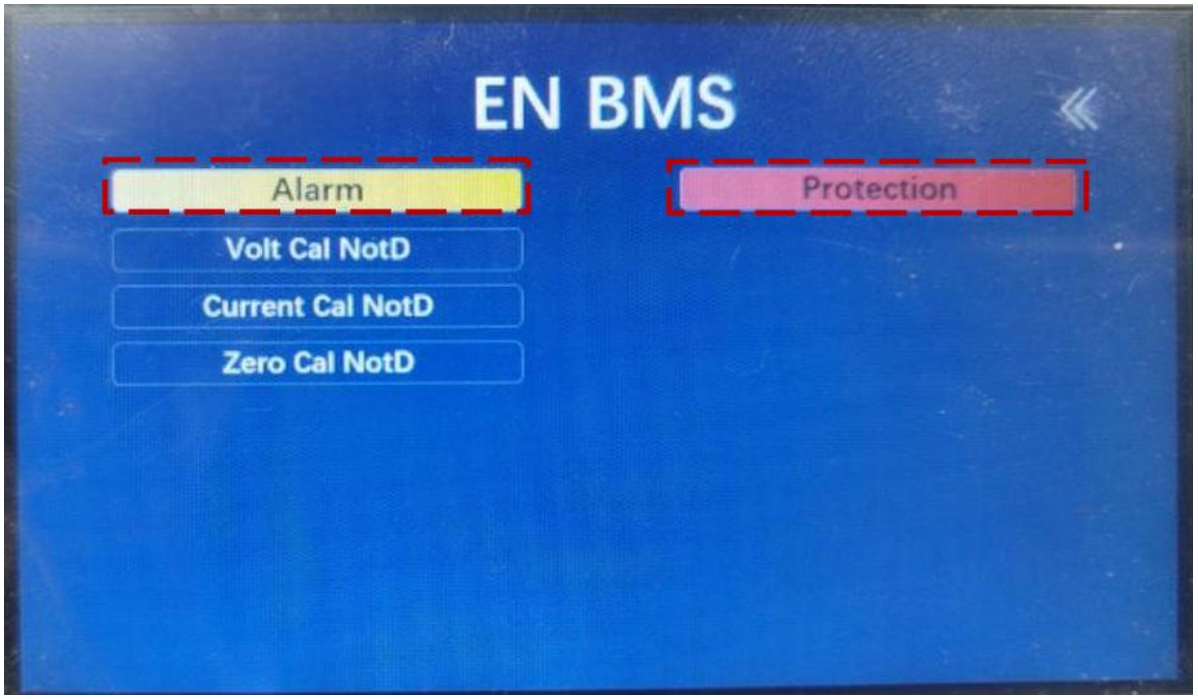
This touch screen can switch between Chinese and English. Customers should click on the blue icon "EN" or "CN" in the upper right corner according to their needs to achieve language exchange.

4.5.3 Switch Status Display



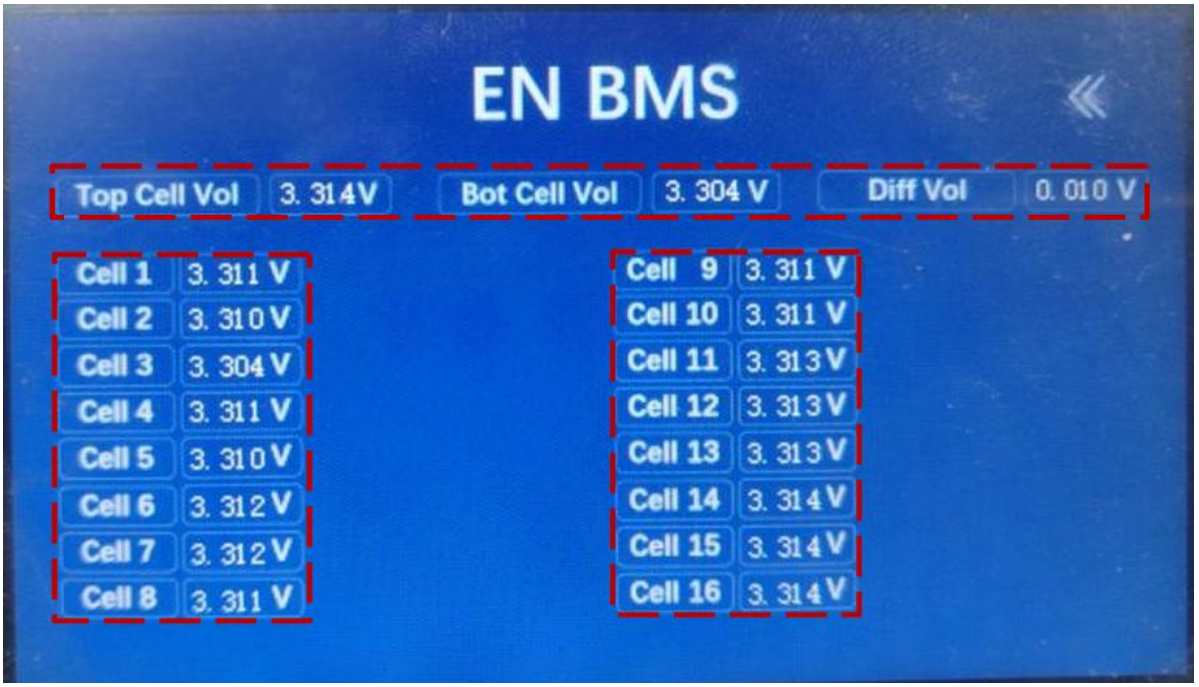
As shown in the figure click "Switching Status" to view the current status of various switches including discharge switch status charge switch status current limit switch status and heating switch status.

4.5.4Alarm and Protection Status Display



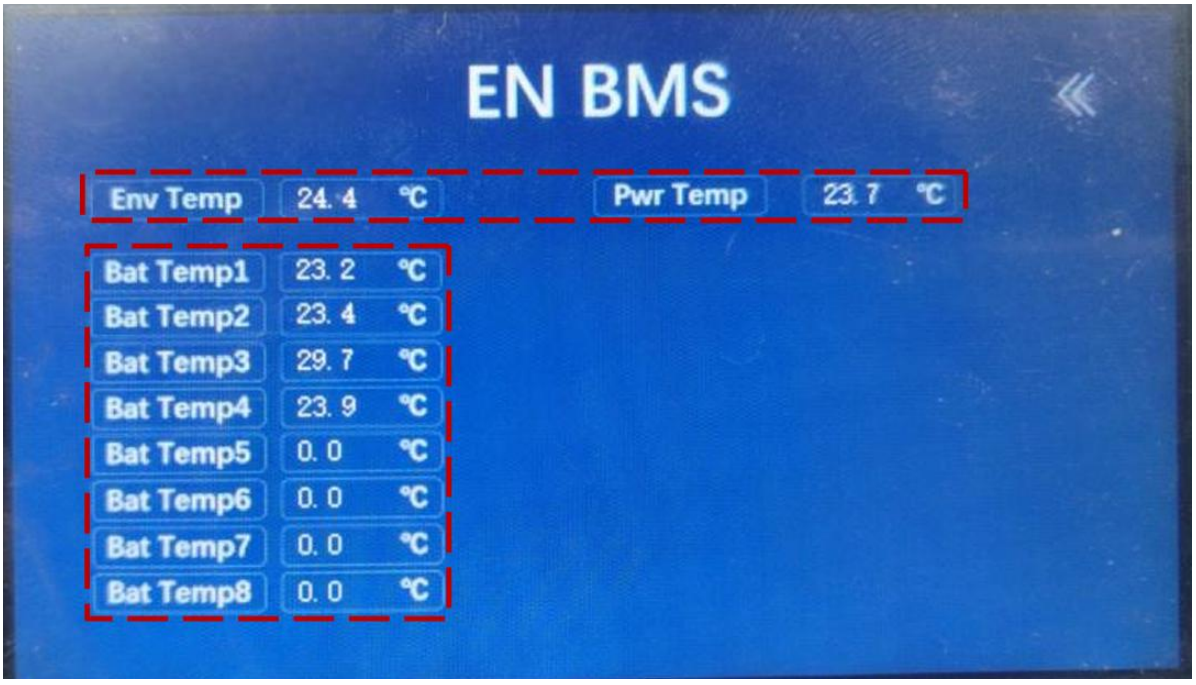
As shown in the image clicking on "Alerts" on the left or "Protection" on the right (indicated by a yellow icon and protection by a red icon) will display the specific alerts and protections that are currently in use

4.5.5 Details Of Battery Cell Quantity



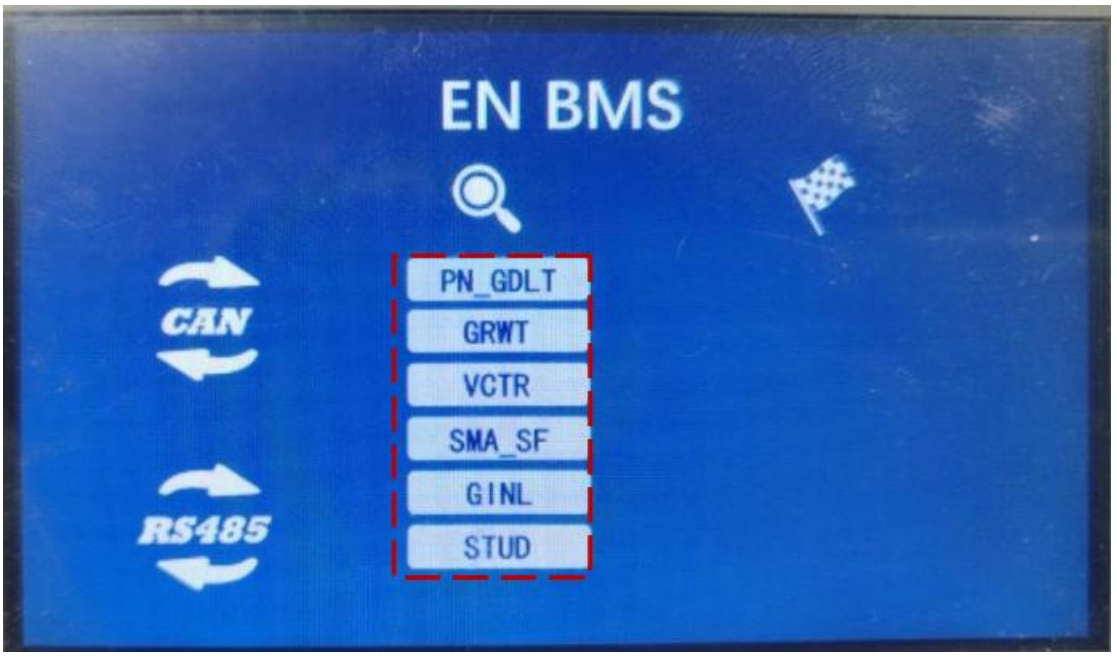
The image above shows the voltage details of individual battery cells In order to help customers understand the voltage of the battery cell more intuitively the highest and lowest battery cell voltages and voltage differences are also shown in the figure

4.5.6 Details Of Temperature Quantity



The image above shows the temperature details of each battery including the current ambient temperature and power temperature.

4.5.7 Protocol Switching



The first picture is the page that pops up when clicking on the blue label"Protocol Switch", displaying the currently used protocol on the page, click 

The second picture will be displayed, and various protocol clients can switch according to their needs (the table below lists the currently displayed RS485protocols from top to bottom).Note: 

Not currently supported.

Num	Corresponding protocol
1	PN-GDLT
2	GRWT
3	VCTR
4	SMA-SF
5	GINL
6	STUD

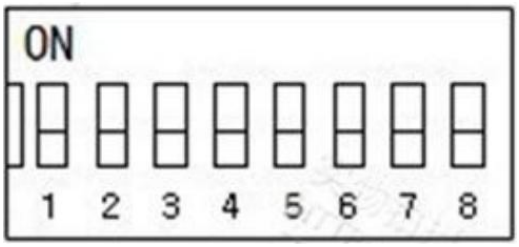
4.6 Dial code address selection

Definition of parallel machine dialing switch: multi-machine communication when the battery Pack is in parallel. The dial switch is used to distinguish the different PACK addresses. The hardware address can be set by the dial switch on the board.

The code dialing switches bit1 to bit8 define: bit1 to bit4 is used to set the address and bit5 to bit8 is used to set the number of slave machines.

Host setting: bit1 to bit4 is 0, host address is fixed at 0, bit5 to bit8 is set according to the number of parallel slave machines.(See Table 2) .

From machine: bit1 to bit4 is set according to device order, from machine address range 1 to 15.Bit5 through bit8 is fixed at 0.(See table 1) Address settings: Dial code switches are defined in the following table.



From the machine address(See Tab1）

address	Dial the code switch position				Note
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Pack1
2	OFF	ON	OFF	OFF	Pack2
3	ON	ON	OFF	OFF	Pack3
4	OFF	OFF	ON	OFF	Pack4
5	ON	OFF	ON	OFF	Pack5
6	OFF	ON	ON	OFF	Pack6
7	ON	ON	ON	OFF	Pack7
8	OFF	OFF	OFF	ON	Pack8
9	ON	OFF	OFF	ON	Pack9
10	OFF	ON	OFF	ON	Pack10
11	ON	ON	OFF	ON	Pack11
12	OFF	OFF	ON	ON	Pack12
13	ON	OFF	ON	ON	Pack13
14	OFF	ON	ON	ON	Pack14
15	ON	ON	ON	ON	Pack15

Host address(See Table 2)

Number of computers	Dial the code switch position				Note
	#5	#6	#7	#8	
1	OFF	OFF	OFF	OFF	Stand-alone use
2	ON	OFF	OFF	OFF	2 units in parallel
3	OFF	ON	OFF	OFF	3 units in parallel
4	ON	ON	OFF	OFF	4 units in parallel
5	OFF	OFF	ON	OFF	5 units in parallel
6	ON	OFF	ON	OFF	6 units in parallel
7	OFF	ON	ON	OFF	7 units in parallel
8	ON	ON	ON	OFF	8 units in parallel
9	OFF	OFF	OFF	ON	9 units in parallel
10	ON	OFF	OFF	ON	10 units in parallel
11	OFF	ON	OFF	ON	11 units in parallel
12	ON	ON	OFF	ON	12 units in parallel
13	OFF	OFF	ON	ON	13 units in parallel
14	ON	OFF	ON	ON	14 units in parallel
15	OFF	ON	ON	ON	15 units in parallel

Example of parallel dial code set

Number of computers	Dial the code switch position								Note
	#1	#2	#3	#4	#5	#6	#7	#8	
16 set weaver	OFF	OFF	OFF	OFF	ON	ON	ON	ON	The first host
	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	The second slave
	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	The third slave
	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	The fourth slave
	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	The fifth slave
	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	The sixth slave
	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	Seventh slave
	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	Eighth slave
	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	The ninth slave
	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	The tenth slave
	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	The eleventh slave
	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	Twelfth slave
	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	The thirteenth slave
	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	Fourteenth slave
	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	Fifteenth slave
	ON	ON	ON	ON	OFF	OFF	OFF	OFF	Sixteenth slave

4.7 Communication Function

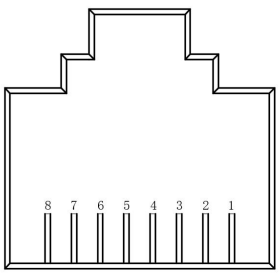
1)CAN communication and RM485 communication

BMS have battery pack upload CAN communication function, Baud rate 500K. CAN .

communication interface adopts 8P8C network interface. You can communicate with the inverter or CAN TEST via CAN interface. When the battery pack is connected, By RS485 communication sets, The data, status and information of battery pack are uploaded and PCS. by CAN communication.

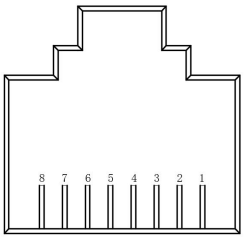
BMS have battery pack upload RM485 communication function, Baud rate 9600. RM485 communication interface adopts 8P8C network interface. When the battery pack is connected, By RS485 communication sets, The data, status and information of battery pack are uploaded and PCS. by RM485 communication.

CAN and RM485 communication interface definition:



PIN	Definitions
1、8	RS485-B
2、7	RS485-A
4	CAN-H
5	CAN-L
3、6	GND

2)RS485 communications



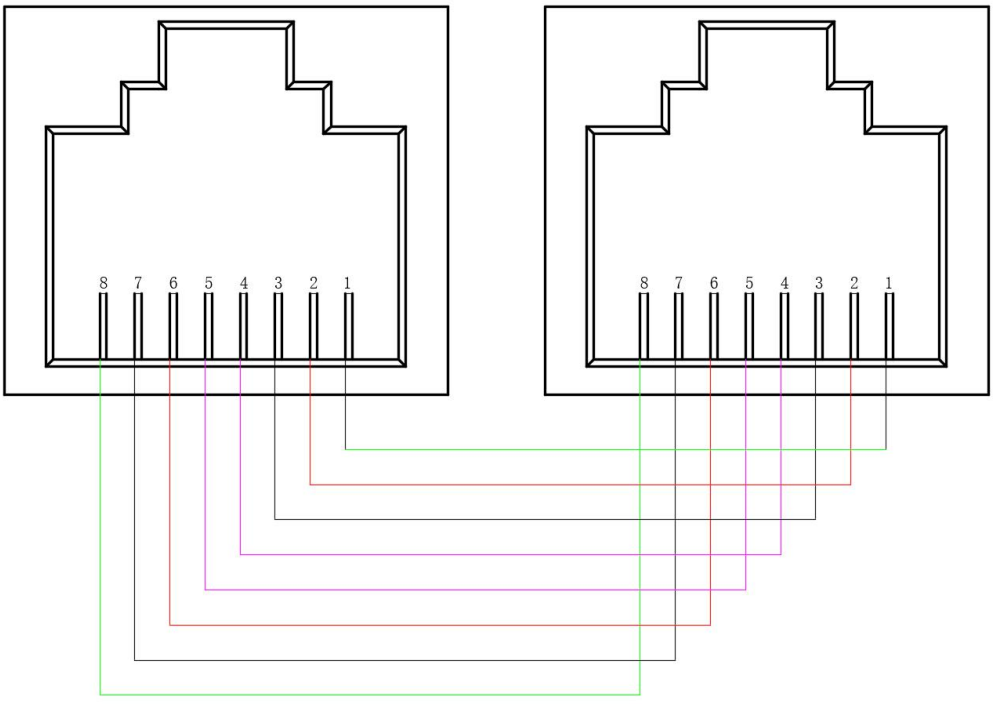
BMS RS485 communication with battery packs, baud rate 19200 bps. RS485 communication interface adopts 8 P8C network interface.

RS485 communication interface definition

PIN	Definitions
1、8	RS485-B
2、7	RS485-A
3、6	GND
4、5	Internal communication

3)Parallel communication

RS485 interface is used as parallel communication interface and CAN interface as upper communication interface. the terminal device can read the sum of battery data of all parallel PACK through the CAN interface. RS485 interface connection is shown in the following figure：



4.8 LED Indication Function

The current power consumption and operation status of the product are shown through LED indicator Light (See Table 1, Table 2, and Table 3 for details)Working status indication.

Status	Normal/ warning/ protection	RUN	ALM	Battery capacity LED				Specification
		●	●	●	●	●	●	
Power off	Dormancy	NO	NO	NO	NO	NO	NO	All NO
Ready mode	Normal	YES	NO	Indicate according to the battery capacity				Ready mode status
Charging	Normal	YES	NO	Indicate according to the battery capacity				LED 2 flash when it is highest battery Capacity.
	Warning	YES	Flash2					
	Over charging protection	Flash1	NO	NO	NO	NO	NO	
	Temperature over current, failure protection	Flash1	Flash1	NO	NO	NO	NO	
Discharging	normal	Flash3	NO	Indicate according to the battery capacity				
	warning	Flash3	Flash3					
	Under voltage protection	NO	YES	NO	NO	NO	NO	Stop discharging
	Over temperature, current, short circuit, reverse connection, failure protection	NO	NO	NO	NO	NO	NO	Stop discharging, forced dormancy without action after 48h when the mains is offline

Capacity Indicator

Status		Charging				Discharging			
Capacity dictator		L4 ●	L3 ●	L2 ●	L1 ●	L4 ●	L3 ●	L2 ●	L1 ●
Battery level (%)	0~25%	NO	NO	NO	Flash	NO	NO	NO	YES
	25~50%	NO	NO	Flash	YES	NO	NO	YES	YES
	50~75%	NO	Flash	YES	YES	NO	YES	YES	YES
	75~100%	Flash	YES	YES	YES	YES	YES	YES	YES
Working dictator●		YES				Flash			

LED Flashing Instructions

Flash way	Bright	NO
Flash 1	0.25S	3.75S
Flash 2	0.5S	0.5S
Flash 3	0.5S	1.5S

4.9Turn on and off

Serial number	Function	Definition
1	Boot/boot	BMS in hibernation, press the reset button, the BMS is activated,After the LED indicator lights shine in turn,turn to normal working state.
2	Shutdown / Sleep	BMS in standby or discharge state, press this key, after 6 s, the BMS is dormant, and the LED indicator lights shine in turn, and turn to sleep state. Sleep after BMS no power consumption.
3	External switches	External switch can control BMS switch machine, external switch priorit

4.10 Standby state

BMS the correct connection on the power, in no over voltage, under voltage, over current, short circuit, over temperature, under temperature and other protection state, press the reset button to boot, BMS in standby state. BMS standby state, the running lamp flashes, and the battery can be charged and discharged.

4.11.Over-protection and rehabilitation

4.11.1.Monomer overcharge protection and recovery

If any section of the battery core is higher than the set value of the monomer overcharge protection, the BMS enters the overcharge protection state, and the charging equipment can not charge the battery. After the monomer over voltage protection, when the maximum monomer voltage drops below the monomer overcharge recovery value and the SOC is below 96%, the overcharge protection state is relieved. can also discharge release.

4.11.2.Total pressure overcharge protection and recovery

If the battery voltage is higher than the set value of the total voltage overcharge protection, the BMS enters the overcharge protection state, and the charging equipment can not charge the battery. If the total voltage drops below the recovery value and SOC below 96%, the overcharge protection is relieved. It can also be released Except.

4.12.Protection and rehabilitation

4.12.1.Protection and restoration of monomers

If any section of the battery core is lower than the set value of the monomer over-discharge protection, the BMS enters the over-discharge protection state, and the load can not discharge the battery. Hold 1 minute communication after BMS shutdown. After over-discharge protection occurs, charging the battery pack can release the over-discharge protection state. or press the reset button, BMS will boot to re- detect whether the battery pack voltage reaches the recovery value. Note: After the BMS discharges under-voltage protection, it is shut down, and the button is activated or the charging is activated. The BMS keeps the output voltage for 1 minute for the inverter to detect the battery voltage, so it is not allowed to discharge within 1 minute.

4.12.2.Total pressure protection and recovery

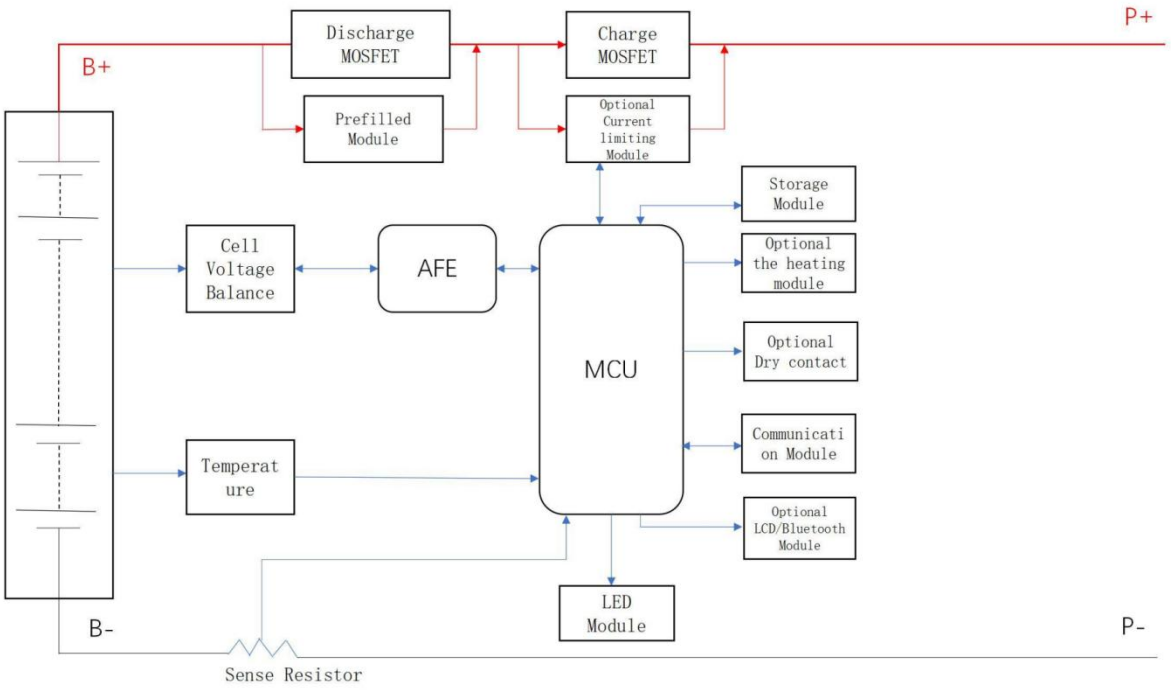
When the battery voltage is lower than the total voltage over-discharge protection set value, the BMS enters the over-discharge protection state, and the load can not discharge the battery. Hold 1 minute communication after BMS shutdown.

After over-discharge protection occurs, charging the battery pack can release the over-discharge protection state. or press the reset button, BMS will boot to re-detect whether the battery pack voltage reaches the recovery value.

Note: After the BMS discharges under-voltage protection, it is shut down, and the button is activated or the charging is activated. The BMS keeps the output voltage for 1 minute for the inverter to detect the battery voltage, so it is not allowed to discharge within 1 minute.

5. BMS

5.1 BMS System Schematic Diagram



5.2 BMS Parameter

No.	Item		51.2V 280Ah
1	Power Consumption	Low power consumption mode	≤ 100μA
2	Over charge Protection	Over charge detection voltage	3.65V
		Over charge release voltage	3.4V
3	Over discharge protection	Over discharge detection voltage	2.7V
		Over discharge release voltage	3.1V
4	Over current protection	Charging over current detection current (detection time)	210A (10S)
		Discharging over current detection current 1 (detection time)	210A (10S)
		Discharging over current Detection current2 (detection time)	≥ 300A 30ms
5	Temp. Protection	Detection temperature	60℃
6	Balance	Balance voltage	3.5V

6. Product Life

The design life of this product is 10 years.

7. Transportation

During transportation, please keep the battery from acutely vibration, impacting, over-exposure to the sun and drenching.

8. Emergency Situations

8.1 Battery Leakage

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

1)Inhalation: Evacuate contaminated area and seek medical aid.
2)Contact with eyes: Rinse eyes with flowing water for 15 minutes and seek medical aid.
3)Contact with skin: Wash affected area thoroughly with soap water and seek medical aid.
Ingestion: Induce vomiting and seek medical aid.

8.2 On Fire

NO WATER!
Only dry powder fire or carbon dioxide extinguisher can be used; if possible, move the battery module to a safe area before it catches fire.

8.3 Wet Batteries

If the module is wet or submerged in water, do not let people access it, then contact us or an authorized dealer for technical support. Cut off all power switch on inverter side.

8.4 Damaged Batteries

Damaged batteries are dangerous and must be handled with utmost care. They are not fit for use and may pose a danger to people or property. If the module seems to be damaged, pack it in its original container, then return it to authorized dealer.

 **Warning**

Damaged batteries may leak electrolyte or produce flammable gas.

9. Remarks

9.1 Recycle and Disposal

In case a battery (normal condition or damaged) needs disposal or needs recycling, it shall follow the local recycling regulation (Suggest Regulation (EC) Nº 1013/2006 among European Union) to process, and using the best available techniques to achieve a relevant recycling efficiency.

Parts List

Item	Part Name	Description	Unit	Quantity
1	Network line	1 meters network line	PCS	1
2	Network cable	2 meters of inverter communication network cable	PCS	1
3	Positive and negative pole line	A pair of 35-square wires with red positive pole and black negative pole, 1.2 meters in length and connected in parallel. The terminals at both ends are SC50-8.	PCS	1
4				
5				
6				
7				
8				
9				

Maintenance Record

Dear user. thank you for selecting our product, Please fill in and keep the warranty card for better services.

Attn:_____Product No. :_____

Tel :_____ E-mail:_____

Purchase Date:_____

Address:_____

Maintenance Record			
Date of repair	Content	Maintenance Personnel	Note

Chengdu Greenfaith New Energy Technology Co., Ltd.

Add:No. 619, Tomorrow Base, No. 555, Xinyu Road, High-tech Zone, Chengdu,
Sichuan, P.R.China
Email:info@lvfubattery.com
Web:www.lvfuenergy.com