Zhuhai Xiwang Electronic Co., Ltd

Manual of BMS 5S-256S

Product Mode: TOPBMS--5S-256S

Feature	Parameter	Feature	Parameter
Strings	5-256S	RS485 Port	Yes
Apply to	Lithium-ion battery /Lifepo4 Battery / lithium-titanate Battery/Sodium-ion Battery	URAT接口	No
Contonuoous Current	40A-500A	CAN Port	Yes
Chip	集撤	Wire harness	2.54 10+10 500MM
GPS	Yes	Bluetooth	Yes
Balance	Yes	Over Cuurent Protect	Yes
Current Measure	900a max supported	Display	Supported

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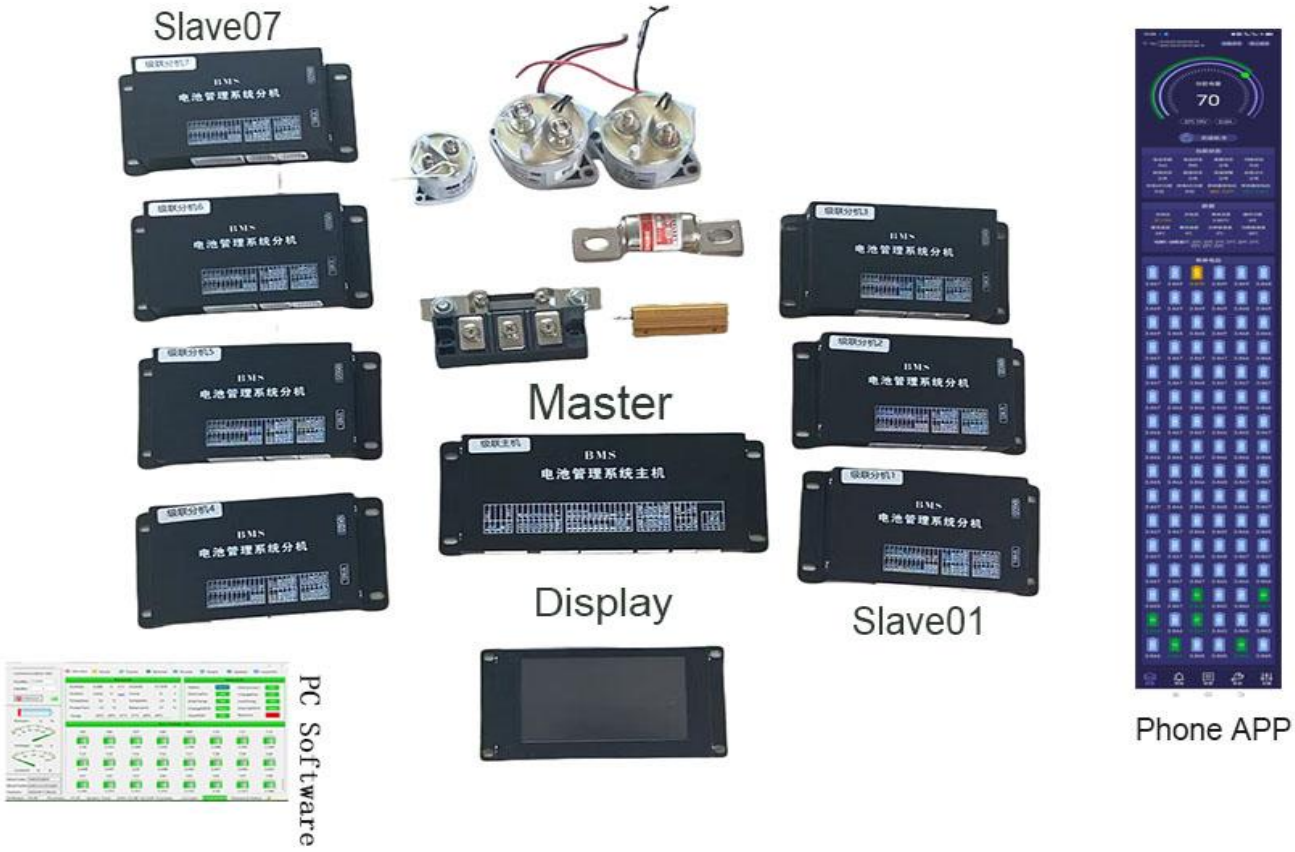
High Voltage BMS 5S-256S



Content

珠海市希望电子有限公司

A. Brief Introduction

This chapter mainly describe the principle structure , features of the 5s-128s high voltage version of the BMS battery management system,which is produced by TOPBMS , and the application of the module interface and the use of the application scenario.。

B. Product Feactures

- Customized Canbus communication Supported ; it is used for external devices ,such as ECU ,databoard and charger
- RS485-1 Port : RS485 communication, baud rate 9600, (connected to GPS with 12V power supply or display)
- RS485-2 Port: this port with isolation 2500V, connected to the special charger support, RS485 communication . Baud rate 9600, (connected to the external communication of the PC computer).
- Built-In Bluetooth
- This high voltage can work with GPS GPRS remote control
- Balance:

(1) Balance switch: in the case of switch on and off, any cell voltage exceeds the balancing start voltage, charging automatically starts the balance until stopping the balance, and the balance will stop when the balance temperature reaches the protected value and the cell wirings cut 0ff
(2)Balance start : When any one string exceeds the balance start voltage and the set voltage difference, balance is activated , and it automatically balances cell to be within the range the set cell voltage and the set ce voltage difference and then Balance stops
Balance starting : any cell voltage exceeds the balanced start voltage, exceeds the set voltage difference , start the balance , automatic balance to the start voltage and set voltage, stop the balance, there is current and battery offline
(3)Passive balancing ; Balancing current: 70-100mA

- Current calibration: in the case of discharge, use the multimeter to check the correct current, Bluetooth APP and PC computer,enter the actual value in the Bluetooth APP and PC computer, directly press the "calibration" button to correct the value , and then go to the home page to see if the current is displayed correctly.
- First of all , fill the actual capacity of the battery pack into the capacity setting of phone app . Set the charging and discharging protection voltage, and then charge the battery until it reaches the BMS charge cut-off voltage . SOC is correctly calibrated SOC Calibration: First of all .Please fill in the actual capacity of the battery pack into the capacity setting, set the charge and discharge cut-off voltage, and then charge the battery until the BMS protection and SOC can be calibrated automatically.

C. Product Parameters

详细项目		规格			单位	其他说明
		最小值	典型值	最大值		
充电电流		40		600	A	
放电电流		40		600	A	可持续工作电流
低功耗模式电流		-	-	100	μA	休眠
工作自耗电电流		-	20		mA	整机待机状态下
工作环境	工作温度	-20		+70	° C	正常工作温度范围
	工作湿度	0%		90%	RH	湿度低于90%，无凝结
存储环境	存储温度	- 40		+85	° C	正常存储温度范围
	存储湿度	0%		90%	RH	湿度低于90%，无凝结
电流积分	SOC估算精度	<5%				
	电流检测	采样频率<250mS，精度5%				
RS485接口		双路485口				
蓝牙/GPRS/GPS定位		蓝牙专用APP可快速检测分析电池健康状况；GPS实时定位；远程实时查询电池相关信息				
单位电压掉线检测		支持				
单体电压检测		支持，检测范围1.0V~4.35V				
总电压检测		检测范围0-100V				
电池类型		三元锂 磷酸铁锂 钛酸锂				参数可设置
电池组组合方式		5-128S				电池串数可选择

3.2、 基本功能参数

功能指标项目		出厂默认数值	备注
过充保护	单节过冲保护电压	三元4.25V / 铁锂3.65V	3.0-4.5V,可设置
	单节过冲保护延时时间	1.0S，可设置	软件控制，可设置
	单节过冲保护解除电压	三元4.15V / 铁锂3.5V	3.0-4.5V,可设置
	单节过冲保护解除	单体电压下降到恢复点， 自动恢复	
过放保护	单节过放保护电压	三元 2.75V / 铁锂 2.3V	可设置，过放保护后，单体电压铁锂<2.1V、三元<2.5V时进入低功耗模式
	单节过放保护延时时间	1.0S，可设置	
	单节过放保护解除电压	三元 3.0V / 铁锂 2.9V	
	单节过放保护恢复方式	接入充电器	
总体过充保护	总体过充保护电压	三元电池组串数 * 4.25V 铁锂电池组串数 * 3.6V	软件控制，可设置
	总体过充保护延时时间	1.0S，可设置	软件控制，可设置
总体过充保护解除	总体过充保护解除电压	三元电池组串数 * 4.0V 铁锂电池组串数 * 3.5V	软件控制，可设置
	总体过充保护解除	总体电压下降到恢复点， 自动恢复	
总体过放保护	总体过放保护电压	三元电池组串数 * 2.8V 铁锂电池组串数 * 2.3V	可设置，过放保护后，单体电压铁锂<2.1V、三元<2.5V 时进入低功耗模式
	总体过放保护延时时间	1.0S，可设置	
总体过放保护解除	总体过放保护解除电压	三元电池组串数 * 3.1V 铁锂电池组串数 * 2.9V	
	充电解除	接入充电器	
短路保护	短路保护电流	400±20%	A
	短路保护延时时间	200 / 600 / 800	μ S
	短路保护解除方式	断开负载；鉴于短路电流上千安，避免危险不建议客户做短路测试。	

需电流积分功能才支持	充电保护【软件控住，可设置调整】	充电过流保护	电流值	持续时间	恢复延时	备注
		过流保护	40-100A	5S	5S	可设置
	充电过流保护解除	自动解除	延时后自动恢复			
	放电保护【软件控住，可设置调整】	充电过流保护	电流值	持续时间	恢复延时	备注
		过流保护	40-100A	120S	10S	可设置
		峰值过流保护	96A	100mS	10S	可设置
	放电过流保护解除	自动解除	延时后自动恢复			
MOS 高温保护		MOS 高温保护温度	90° C，可设置			软件控制
		MOS 高温保护解除温度	85° C，可设置			软件控制
电芯温度保护		充电低温保护温度	-39° C，可设置			软件控制
		充电低温保护解除温度	-35° C，可设置			软件控制
		充电高温保护温度	65° C，可设置			软件控制
		充电高温保护解除温度	55° C，可设置			软件控制
		放电低温保护温度	-39° C，可设置			软件控制
		放电低温保护解除温度	-35° C，可设置			软件控制
		放电高温保护温度	65 ° C，可设置			软件控制
		放电高温保护解除温度	55 ° C，可设置			软件控制

均衡功能	均衡开启电压	三元 3.9V / 铁锂 3.3V，可设置	软件控制
	均衡开启压差	50mV，可设置	软件控制
	均衡电流	30~80 mA	
内阻	放电回路内阻	<40 mΩ	
容量默认设置 【需电流积分功能】	低电量警告	SOC＜10%，可设置，充电时不告警	
	满容量设置	20AH，可设置	

3.3、低功耗及唤醒

休眠模式

产品检测到 放电二次保护电压 会进入休眠状态，防止将电量耗尽损坏电池。

0启充电器 和485隔离口5V 激活

3.4、显示屏功能 Display Features

This BMS uses the TTL-RS485 interface to support the display to show battery pack status, including battery voltage, current, individual cell voltage, temperature and other related information on the screen.

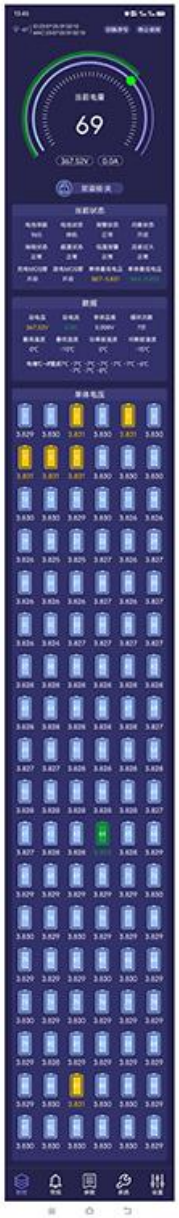
Touchable Display

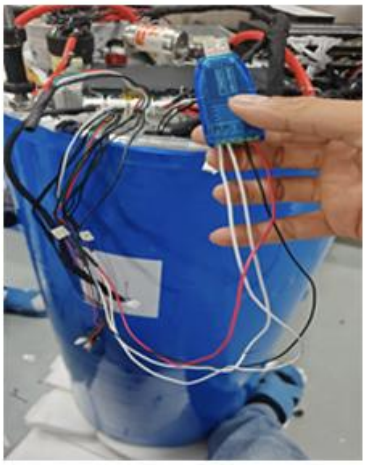
D. TTL and RS485 communication

This product supports the function of converting TTL to RS485 communication interface, and it can support the display

The BMS can communicate with the computer via the RS485 interface, allowing users to check /set partameters of the battery on the computer. The RS485 default baud rate is 9600bps.

手机APP+上位机软件





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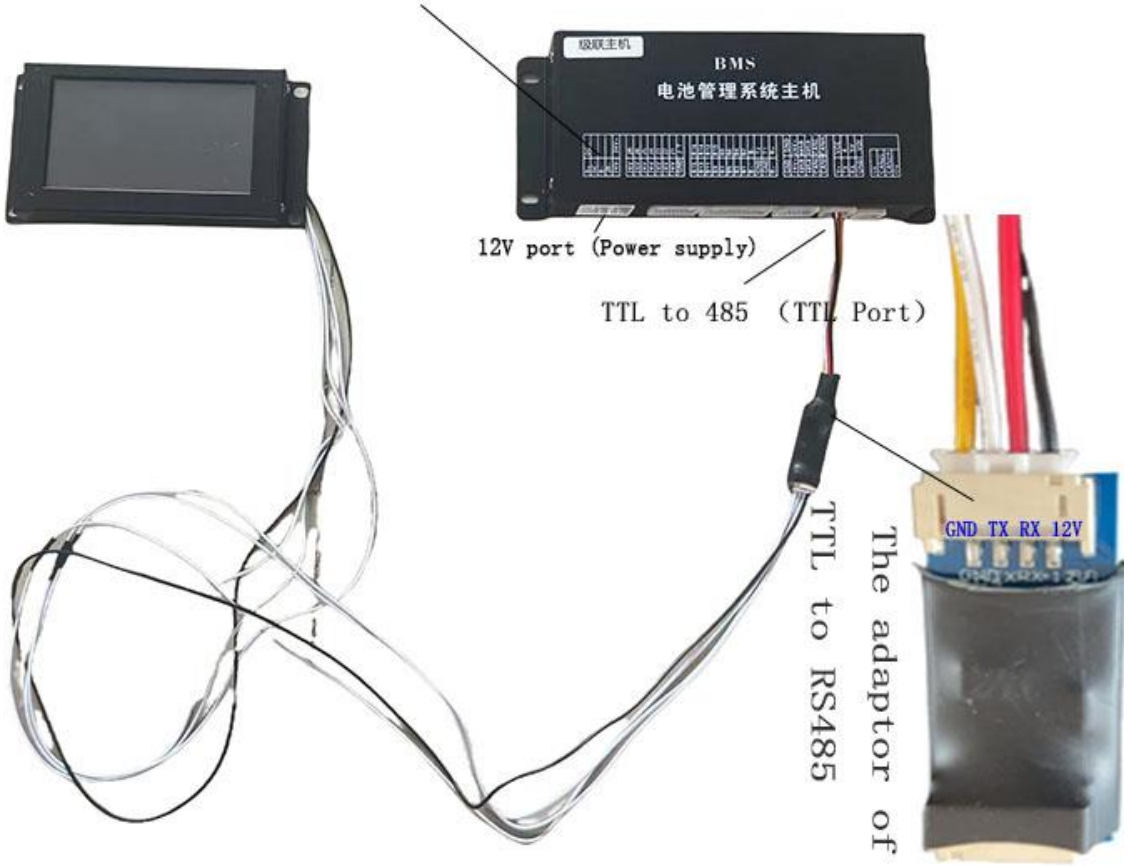
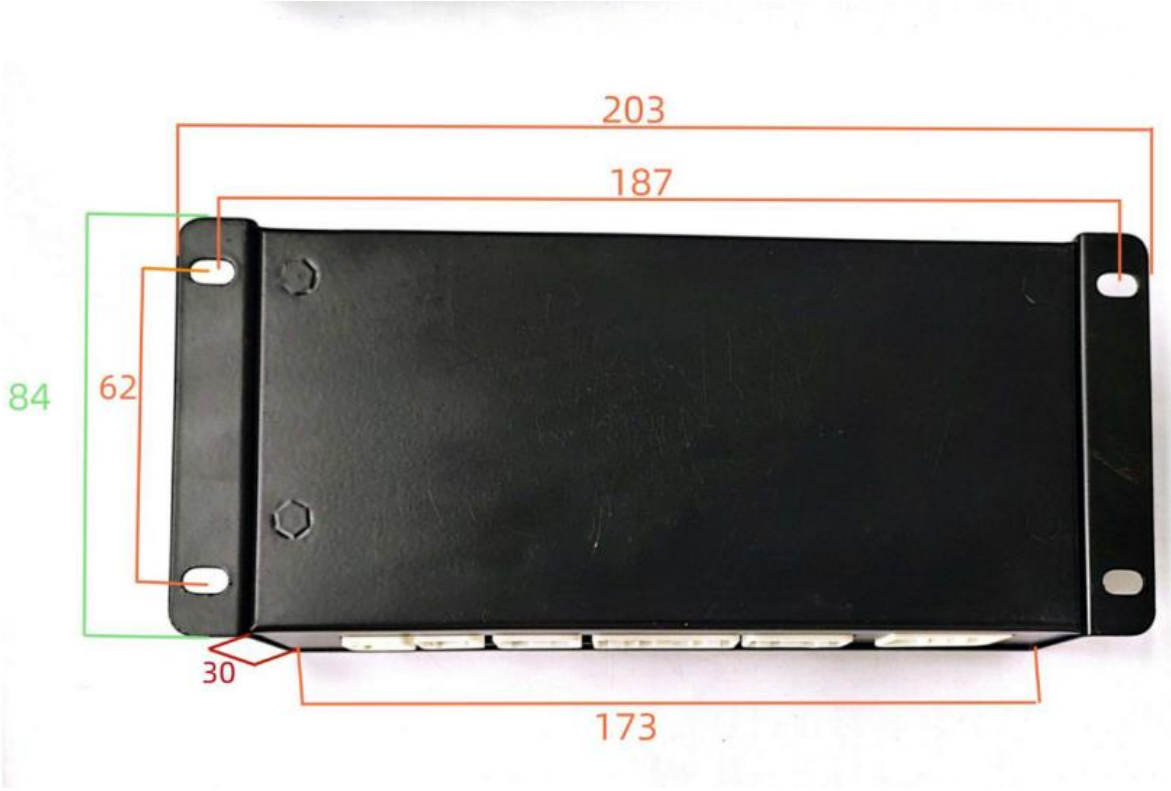
How to wire display to BMS

Note Power supply master bms is 12V ; 24V is not allowed ;
TTL port can only withstand 12V, exceeding 12V will damage the TTL port.
The display screen is also powered by 12V, and it cannot support 24V.



E.Dimensiom of Master BMS



6、Pin definition of each port of master bms

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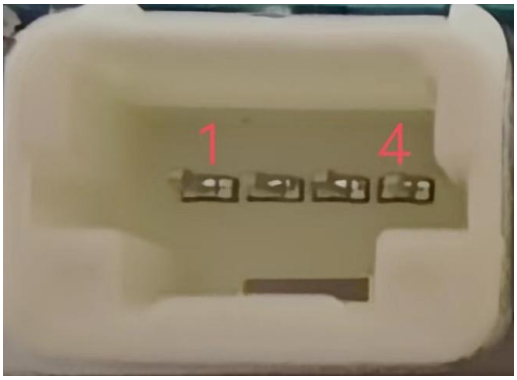
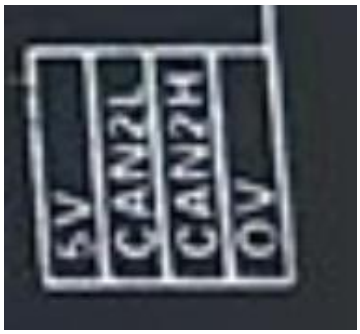
Master BMS

Note:
12V is supplied to BMS;
12V only is allowed;
24V is not allowed

6.1、LC-1 Port Description





No	Interface	Pin Definition	Remark
1	CAN-H for external	CAN-H	Not Available
2	CAN-L for external	CAN-L	Not Available
3	J+5V Go to slave	Plus of 5V	Not Available
4	J-5V Go to slave	Minus of 5V	Not Available

6.2、LC-2 Port Description

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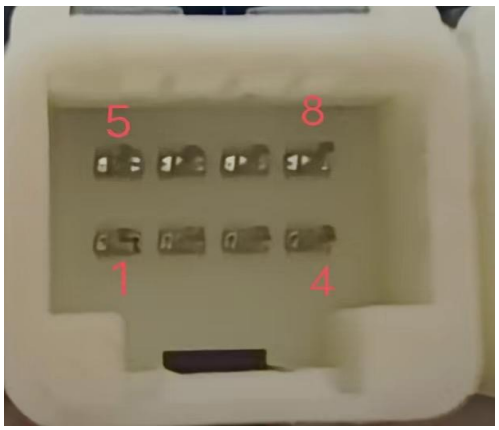
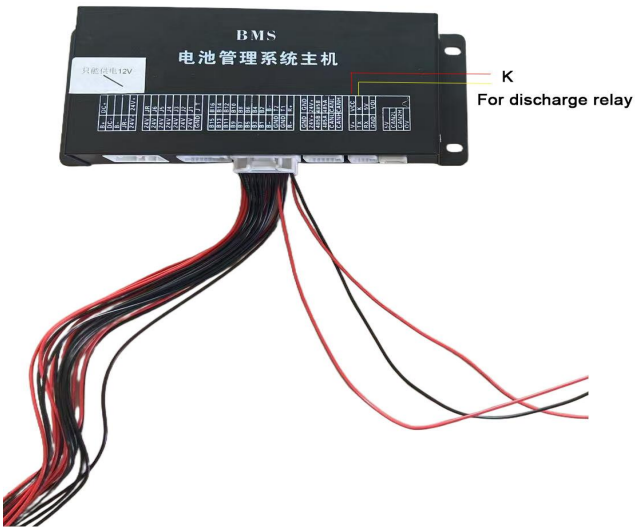


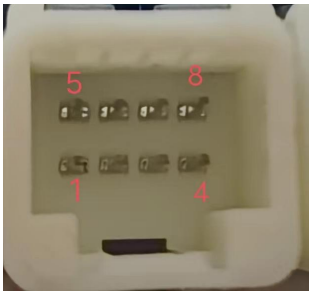
序号			Comment	
8	VOI	Minus of buzzer		
7	5V	Plus of buzzer		
6	K	Minus of ON/OFF Switch		
5	VCC	Plus of ON/OFF Switch		
4	GND	0V	TTL Port	
3	RX	RX TTL		
2	TX	TX TTL		
1	V+	12V		

How to Active BMS to Discharge?

Note: Add ON-OFF switches between VCC and K; this switch can control the discharge relay.



How to connect Display to Master bms ?



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How to wire display to BMS

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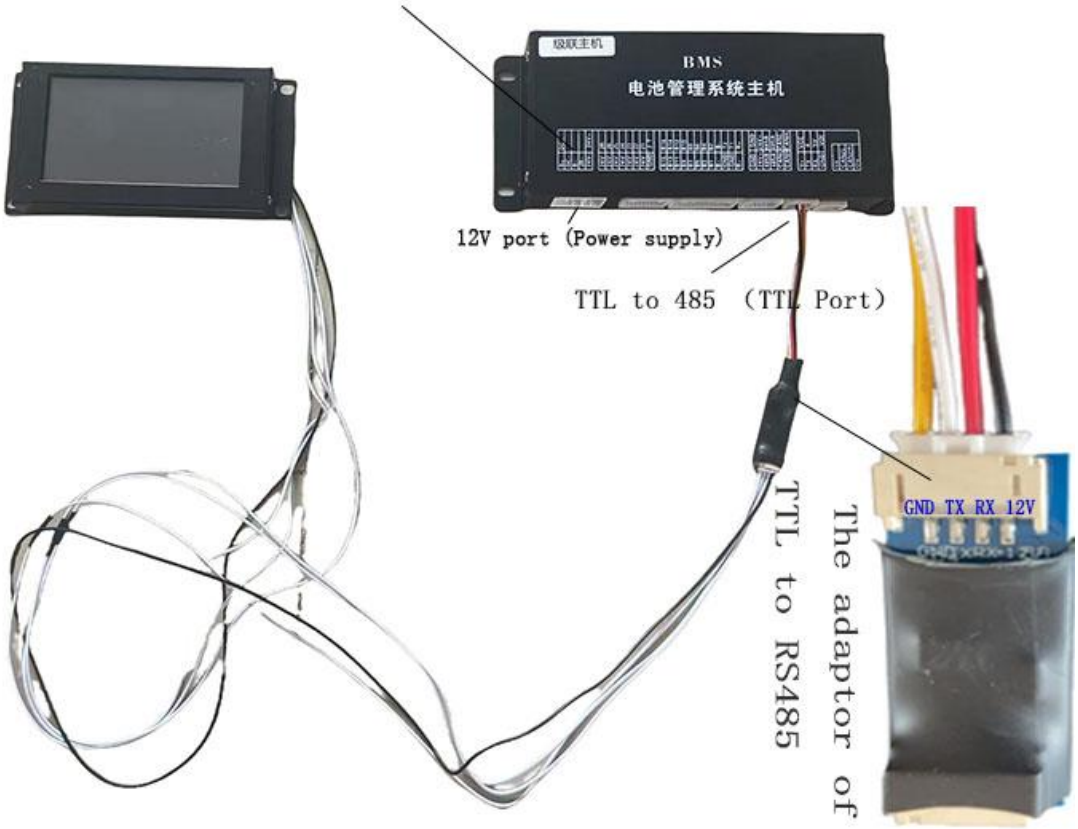

3、LC-3 Port Description

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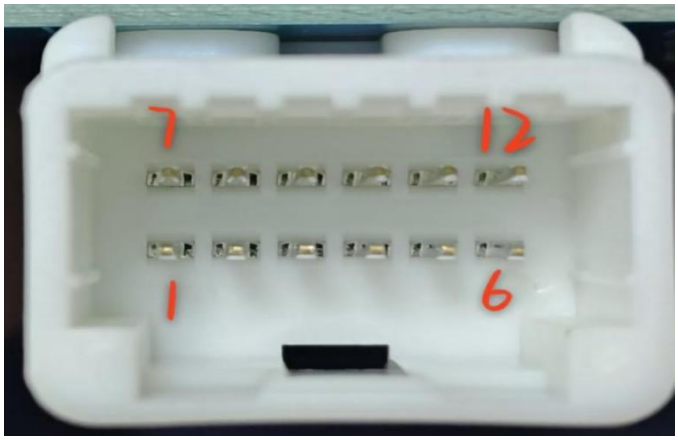
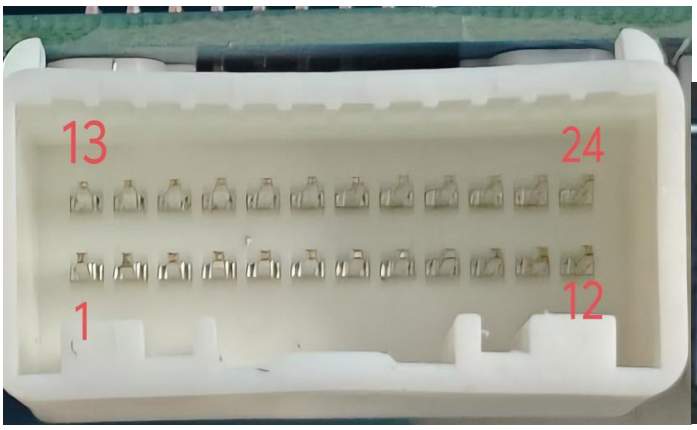
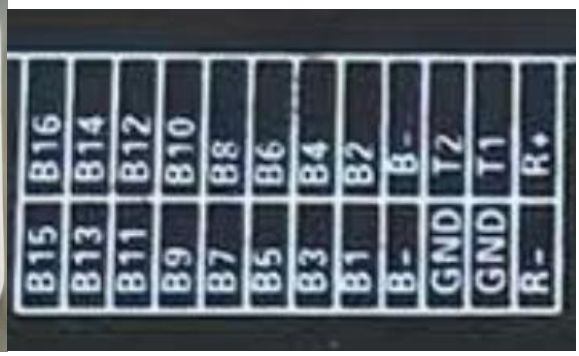
Item	Pin	Description
12	CANH	Go to slave01 CAN H
11	CANL	Go to slave01 CAN L
10	485A	RS485-A for PC software
9	485B	RS485-B for PC software
8	24V+	Go to 24V+(slave01)
7	24V-	Go to 24V-(slave01)
6	CANH	Go to slave01 CAN H
5	CANL	Go to slave01 CAN L
4	485A	RS485-A for PC software
3	485B	RS485-B for PC software
2	24V+	Go to 24V+(slave01)
1	24V-	Go to 24V-(slave01)

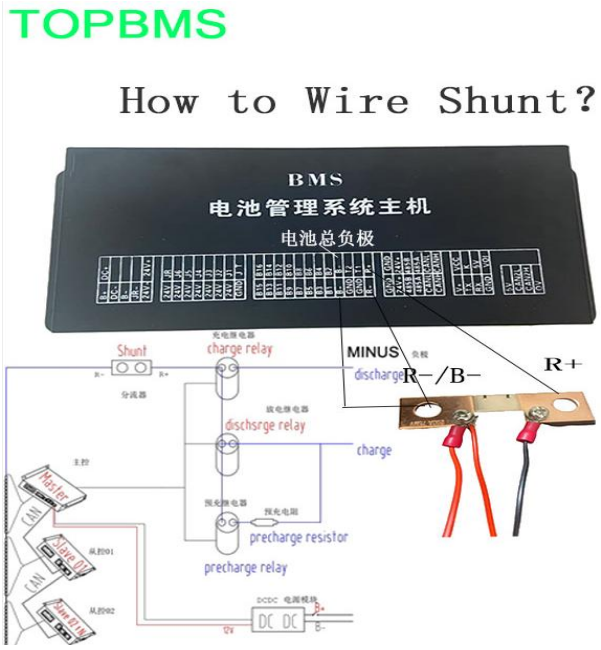


6.4、LC-4 Port Description



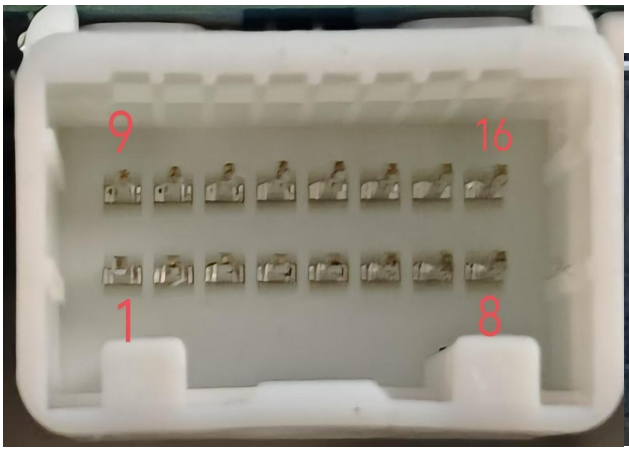


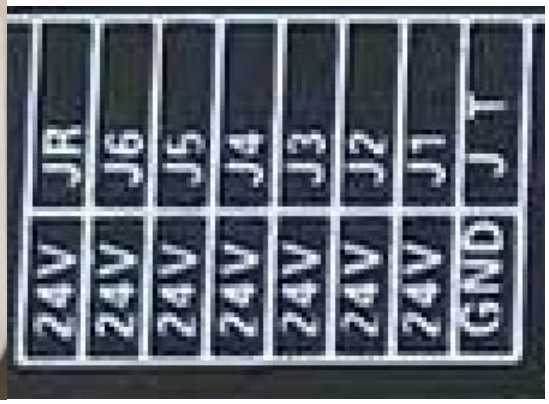
No	Interface	Pin Description
24	R+	Go to Shunt R+
23	T1	Plus of Temp Sensor 1
22	T2	Plus of Temp Sensor 2
21	B-	Minus of cell 01
20	B2	Plus of Cell 02
19	B4	Plus of Cell 04
18	B6	Plus of Cell 06
17	B8	Plus of Cell 08
16	B10	Plus of Cell 10
15	B12	Plus of Cell 12
14	B14	Plus of Cell 14
13	B16	Plus of Cell 16
12	R-	Go to Shunt R-
11	GND	Minus of Temp Sensor 1
10	GND	Minus of Temp Sensor 2
9	B-	Go to Shunt R-
8	B1	Plus of Cell 01
7	B3	Plus of Cell 03
6	B5	Plus of Cell 05
5	B7	Plus of Cell 07
4	B9	Plus of Cell 09
3	B11	Plus of Cell 11
2	B13	Plus of Cell 12
1	B15	Plus of Cell 15



Shunt

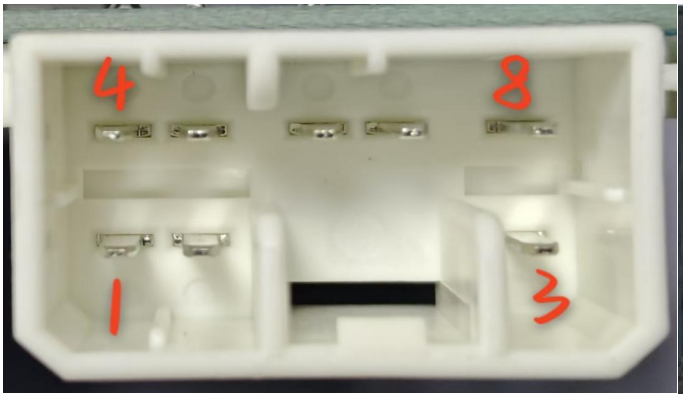
6.5、LC-5 Port Description

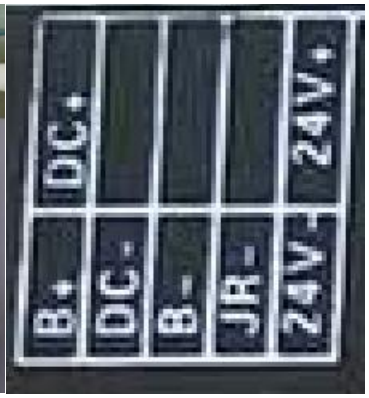




No	Interface	Pin Definiation	备注
16	JT	Plus of Temp Sensor for BMS	
15	J1	Minus of Discharge Relay	
14	J2	Minus of Precharge Relay	
13	J3	Minus of Charge Relay	
12	J4	Minus of Level-2 protect relay	
11	J5	N/A	
10	J6	N/A	
9	JR	Minus of Relay for heating	
8	GND	Minus of Temp Sensor for BMS	
7	24V/12V+	Plus of Discharge Relay	
6	24V/12V+	Plus of Precharge Relay	
5	24V/12V+	Plus of Charge Relay	
4	24V/12V+	Plus of Level-2 protect relay	
3	24V/12V+	N/A	
2	24V/12V+	N/A	
1	24V/12V+	Plus of Relay for heating	

6.6、LC-6 Port Description

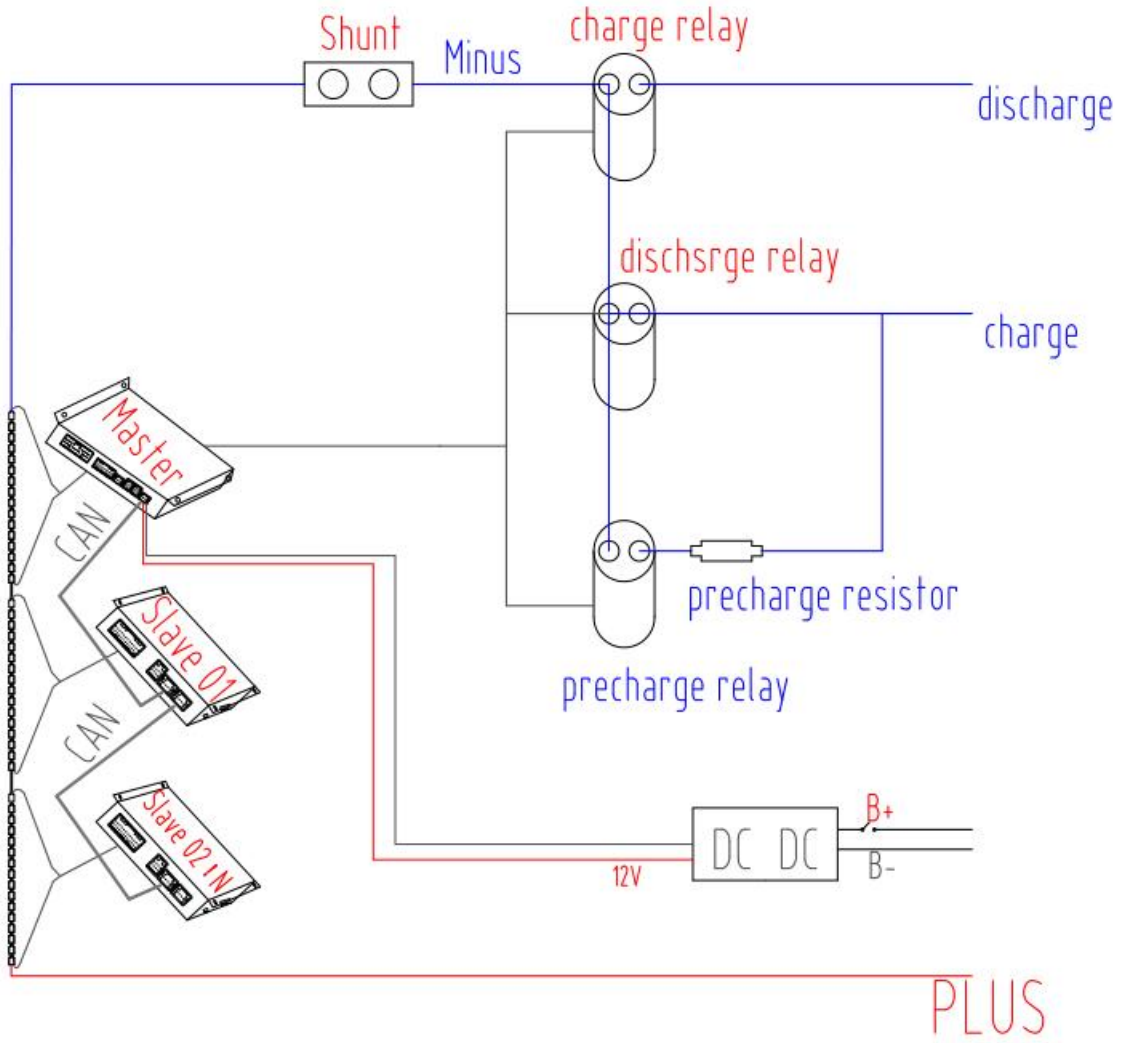




No	Interface	Pin Definiation
8	24V+/12V+	Go to plus of 12V power source
7	N/A	N/A
6	N/A	N/A
5	N/A	N/A
4	N/A	N/A
3	24V-/24v-	Go to Minus of 12V power source
2	N/A	N/A
1	N/A	N/A
Note :the high-voltage BMS should be connected to a 12V power supply. Do not connect it to a 24V one; otherwise, the display screen and the TTL port will be damaged		

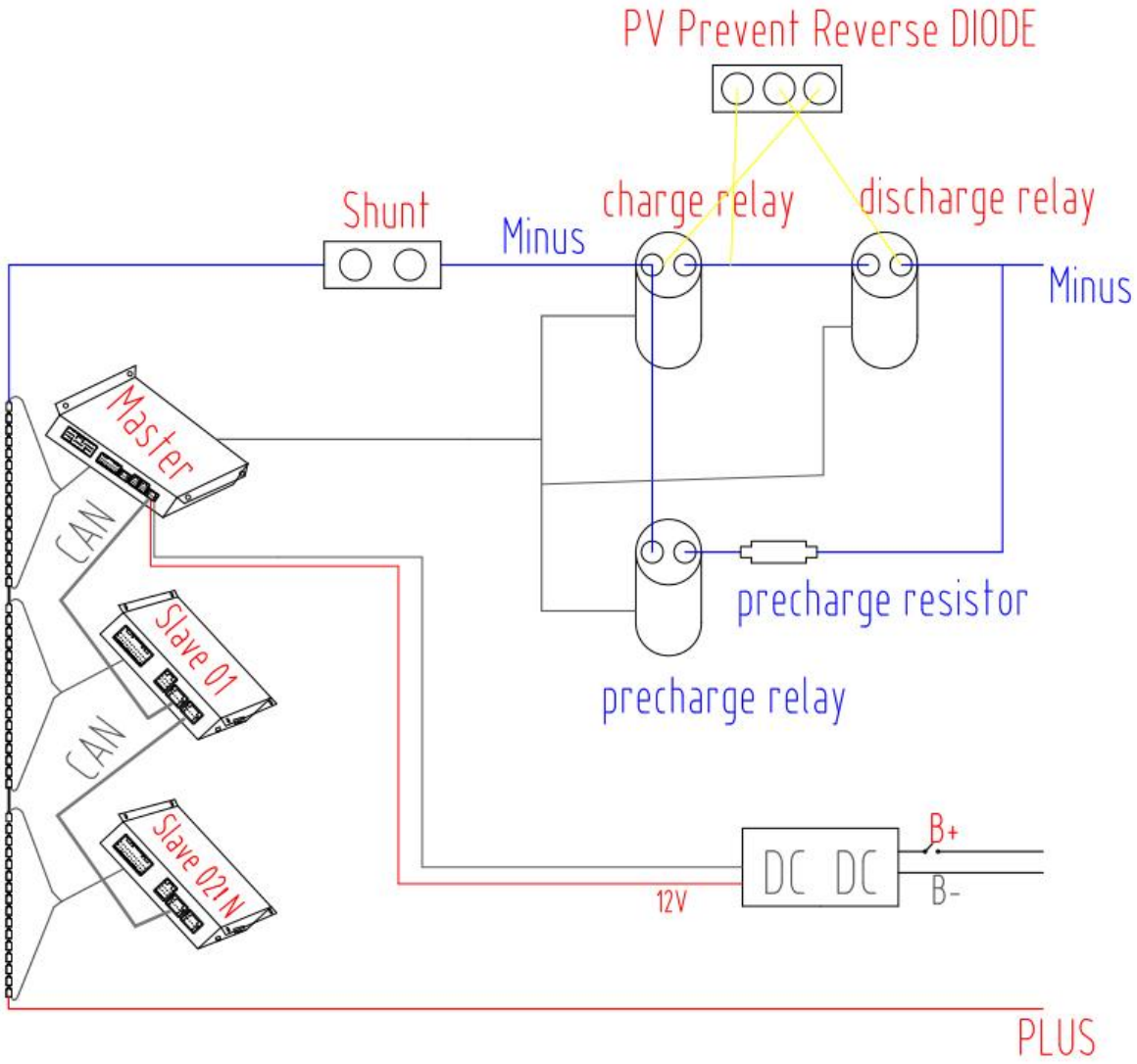
Wire Scheme of BMS Seperate Port

Wiring scheme of Seperate port for charging and discharging relays control a negative output, but the charging port cannot be used for discharge port , dis charge port cannot be used for charge port



Wire Scheme of BMS Same Port

It is usually suitable for energy storage or special needs where the battery has only one positive and negative for input and output:



7、Slave BMS

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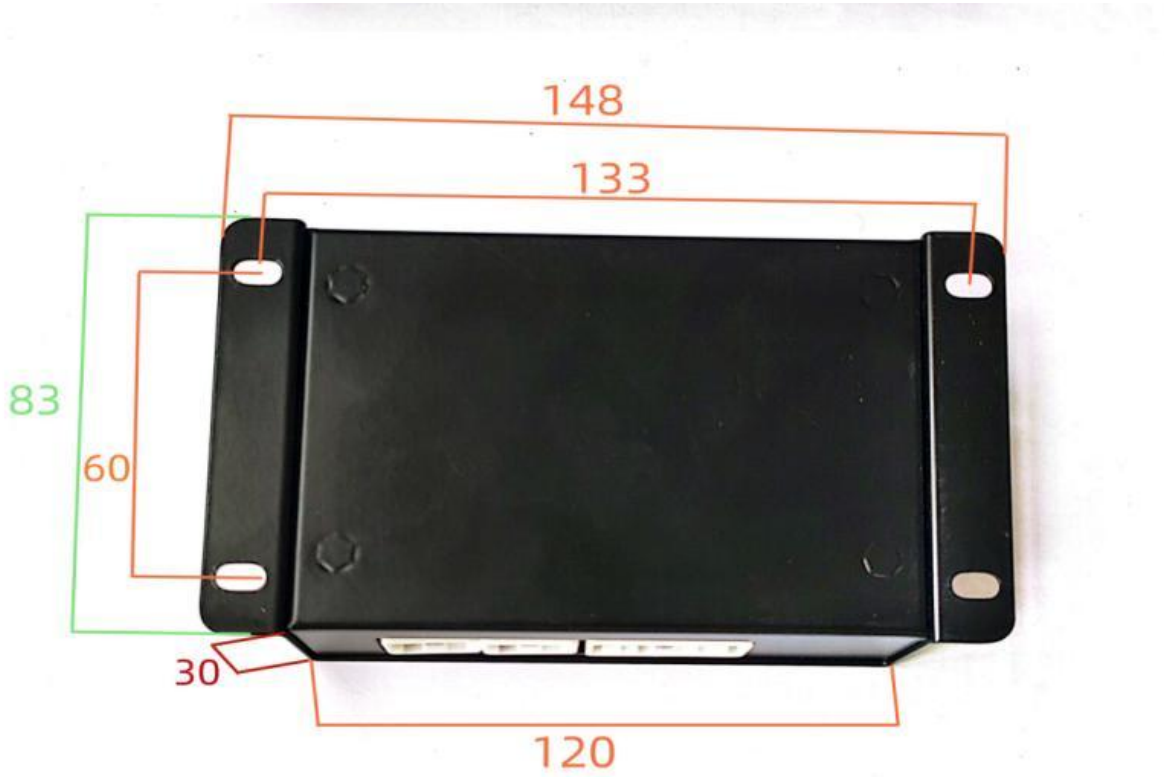
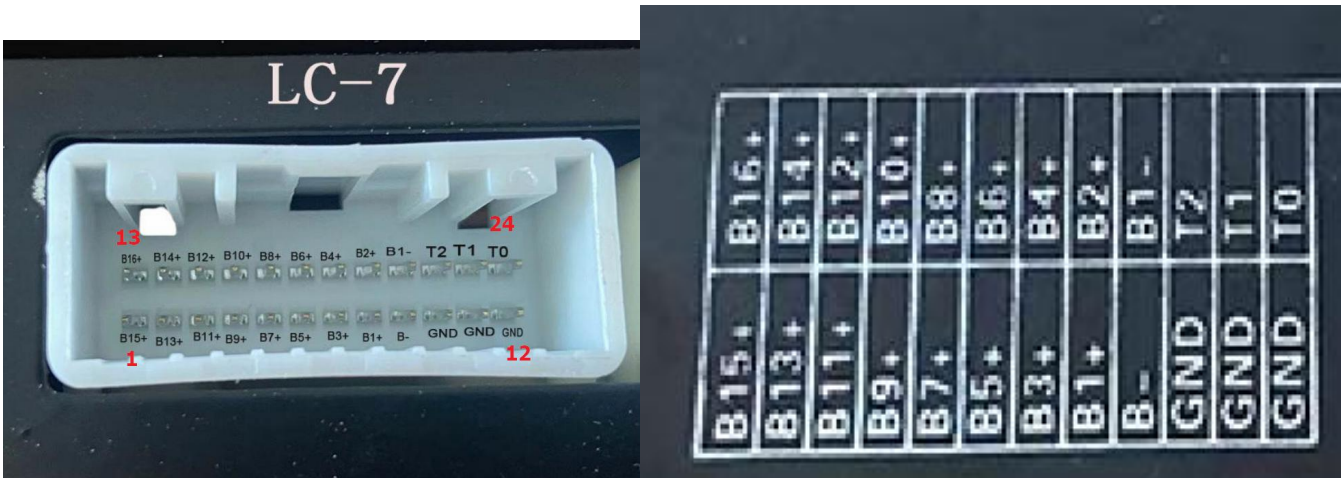
Slave BMS(5S-16S)

Slave BMS Dimension



8.Reference Diagrams and Installation Instructions

8.1、LC-7 Port Definition



序号	Interface	Description
24	T0	Plus of Sensor Temp T0
23	T1	Plus of Sensor Temp T1
22	T2	Plus of Sensor Temp T2
21	B1-	Minus of Cell 1of each module
20	B2+	Plus of Cell 2 of each module
19	B4+	Plus of Cell 4 of each module
18	B6+	Plus of Cell 6 of each module
17	B8+	Plus of Cell 8 of each module
16	B10+	Plus of Cell 10 of each module
15	B12+	Plus of Cell 12 of each module
14	B14+	Plus of Cell 14 of each module
13	B16+	Plus of Cell 16 of each module
12	GND	Minus of Sensor Temp T0
11	GND	Minus of Sensor Temp T1
10	GND	Minus of Sensor Temp T2
9	B-	Minus of Cell 1of each module
8	B1+	Plus of Cell 1of each module
7	B3+	Plus of Cell 3of each module
6	B5+	Plus of Cell 5of each module
5	B7+	Plus of Cell 7of each module
4	B9+	Plus of Cell 9of each module
3	B11+	Plus of Cell 11of each module
2	B13+	Plus of Cell 13of each module
1	B15+	Plus of Cell 15 of each module

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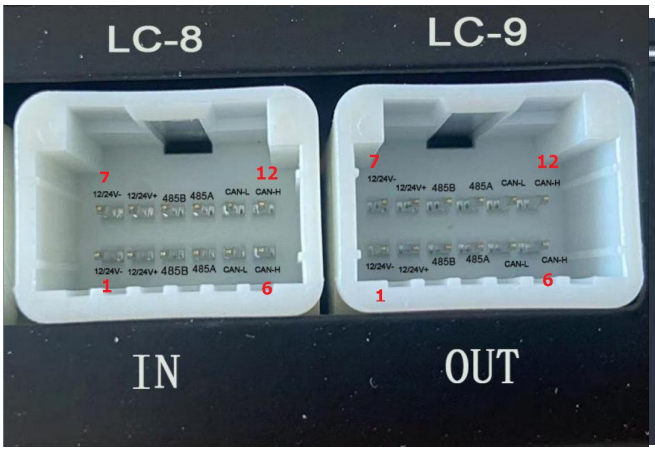
8.2、LC-8 /9 Port Definition



No	LC-8	PIN Description	LC-9	PIN Description
1	24V-/12V-	Go to 12V- of last slave bms	24V-/12V-	Go to 12V- of next slave bms
2	24V+/12V+	Go to 12V+ of last slave bms	24V+/12V+	Go to 12V+ of next slave bms
3	485B	N/A	485B	N/A
4	485A	N/A	485A	N/A
5	CAN L	Go to CAN L of last slave bms	CAN L	Go to CAN L of next slave bms
6	CAN H	Go to CAN H of last slave bms	CAN H	Go to CAN H of next slave bms
7	24V-/12V-	Go to 12V- of last slave bms	24V-/12V-	Go to 12V- of next slave bms
8	24V+/12V+	Go to 12V+ of last slave bms	24V+/12V+	Go to 12V+ of next slave bms
9	485B	N/A	485B	N/A
10	485A	N/A	485A	N/A
11	CAN L	Go to CAN L of last slave bms	CAN L	Go to CAN L of next slave bms
12	CAN H	Go to CAN H of last slave bms	CAN H	Go to CAN H of next slave bms

9. Points For Attention:

- Key Points Explanation for BMS wiring

1、The wiring cables should be connected to the battery cell properly while none of the plugs are attached to the BMS

2. After confirming that the wiring is correct, when the switch KEY is turned off, Slave BMS: Insert thecables to LC-7, LC-8, LC-9 interfaces one by one.Master BMS : Insert the cables yp LC-1, LC-2, LC-3... interfaces one by one;

注意：

1、禁止开关闭合情况下插拔接插件，否则带电插拔会引起板子故障 或者失效

2、务必确认线束定义和实际必须符合预期，否则会造成板子失效。

10、安装连接说明

警告：把保护板连接至电芯，或从电池组拆下保护板时，必须遵守以下连接顺序与规定；如果不按要求的顺序作业，会损坏保护板的元器件，从而导致保护板不能保护电芯，造成严重的后果。

A、连接保护板的步骤

1) 焊接电池组的负极B-
2) 焊接输出负载的负极P-；
3) 连接电池组的采样排线；(先插低压排线【带黑色线材的】，再插高压排线【带红色线材的】
4) 所有连接线安装好，再插入充电器激活保护板开机， 确认电池总电压与保护板输出电压相等 ；

B、断开保护板的步骤 重点确认

1) 断开负载或者充电器；
2) 断开电池组正极的B+连接线
3) 拔下电池组的采样排线；(先拔高压重点确认排线【带红色线材的】，再拔低压排线【带黑色 线材的】
4) 断开输出负载负极的P-连接线

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Phone APP & BMS PC software

The download link of Phone APP and BMS PC Software : https://www.topbms.com/news/93.html

Phone APP :

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STEP1 Start Up of BMS and Relay

After you enter the phone app, please go to the button “SET” and then set the correct batteries capacity and cell series in the app.

Step 2:How to Set Discharging /Charging

Charging Setting:

Please make sure to set charging current larger than actual one in the charging settings

Dischagring Setting :

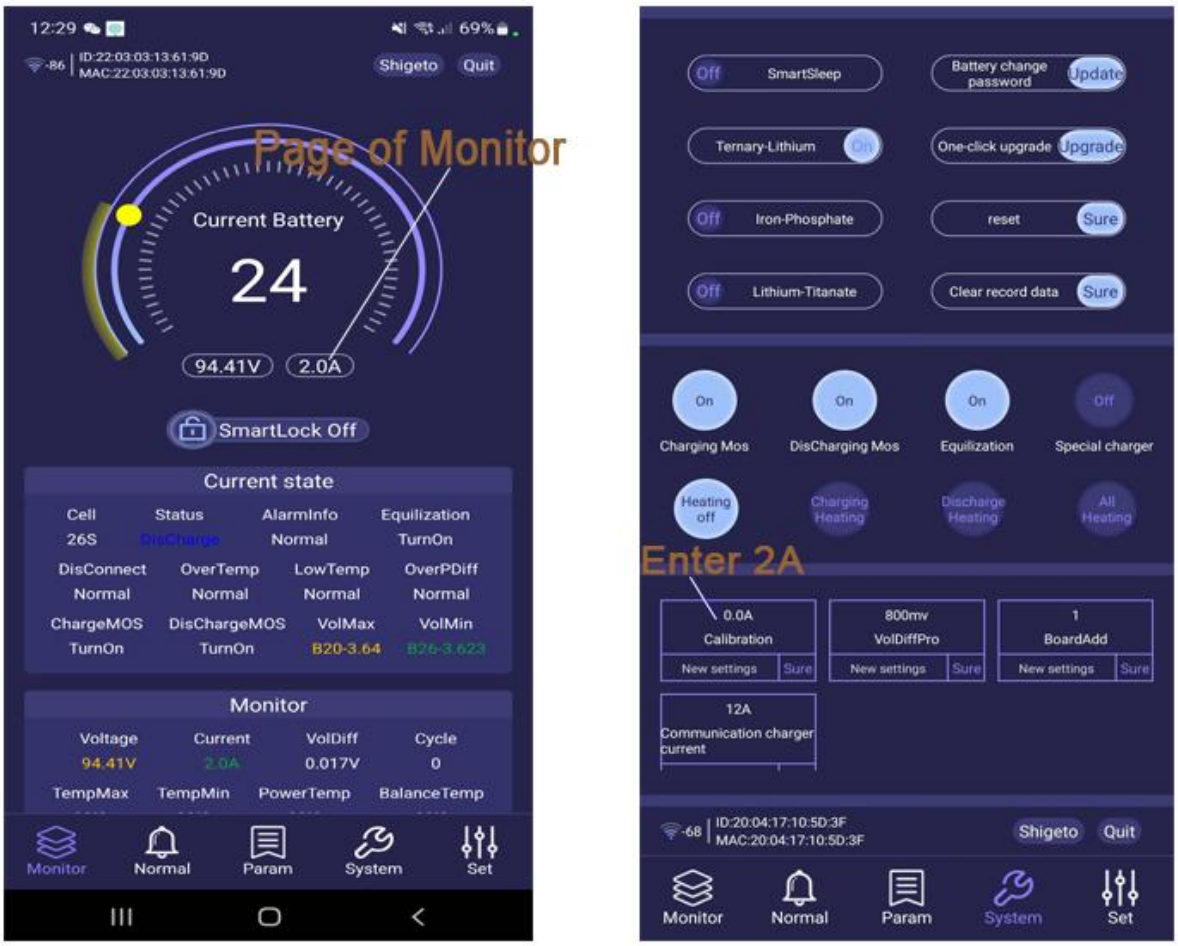
Please make sure to set discharging current larger than the actual one in the discharging settings;

Discharging over current is 2 times larger than discharging current

Attention:the bms will be dead if the set discharging/charging is less than actual one !!

Step 3.2 Current Calibration-2

If you get discharge current 2A after you connect a constant load to bms , you need to enter 2A at the calibartion and then check if the monitor shows 2A



Attentions: you must take a resistor load to BMS and measure the actual discharge current before you do current calibration

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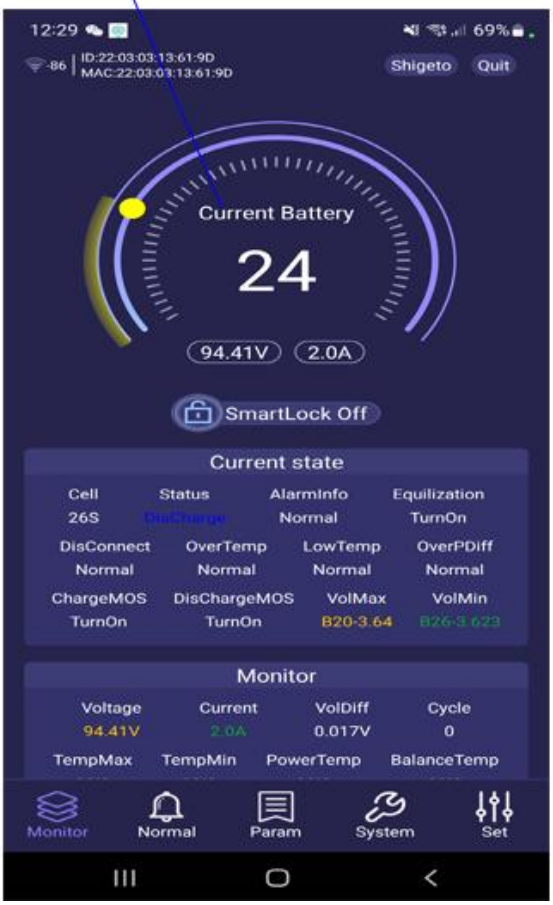
STEP 4 SOC Calibration

Set the actual capacity of the batteries pack in the phone APP ,and Discharge the batteries to under-voltage protection and then Charge batteries to the over voltage protection and then SOC can be corrected and calibrated



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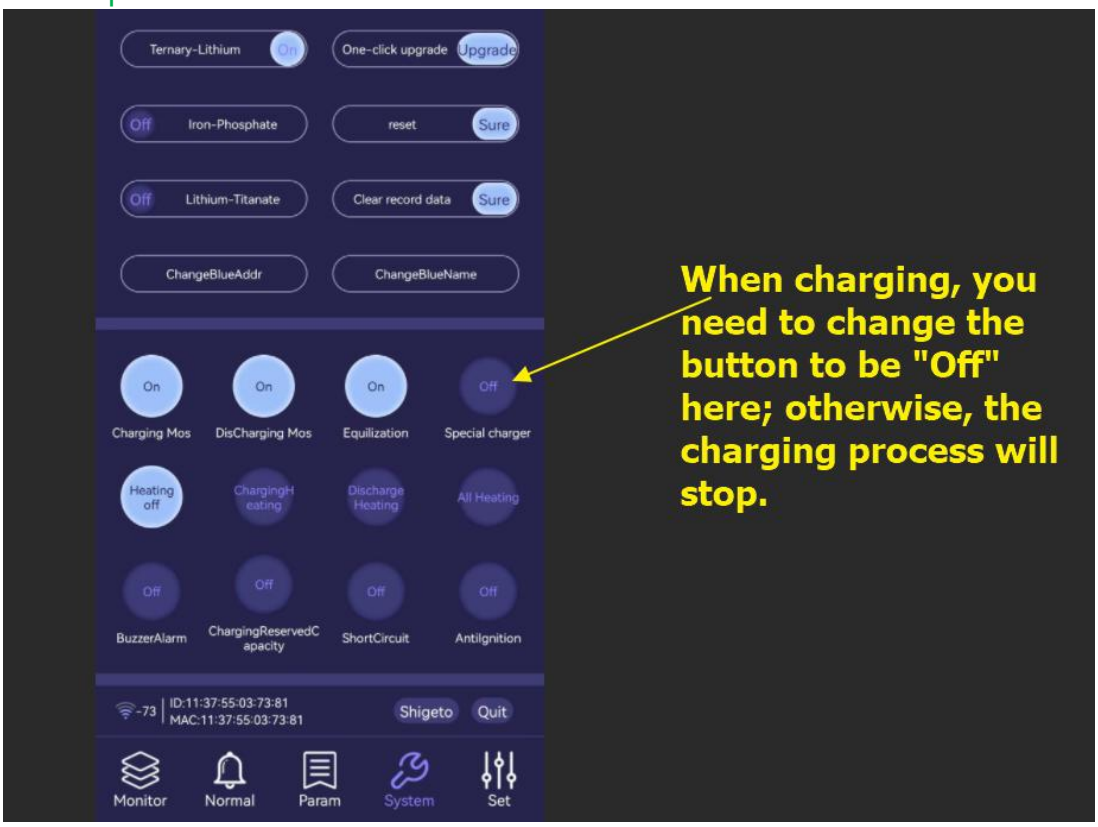
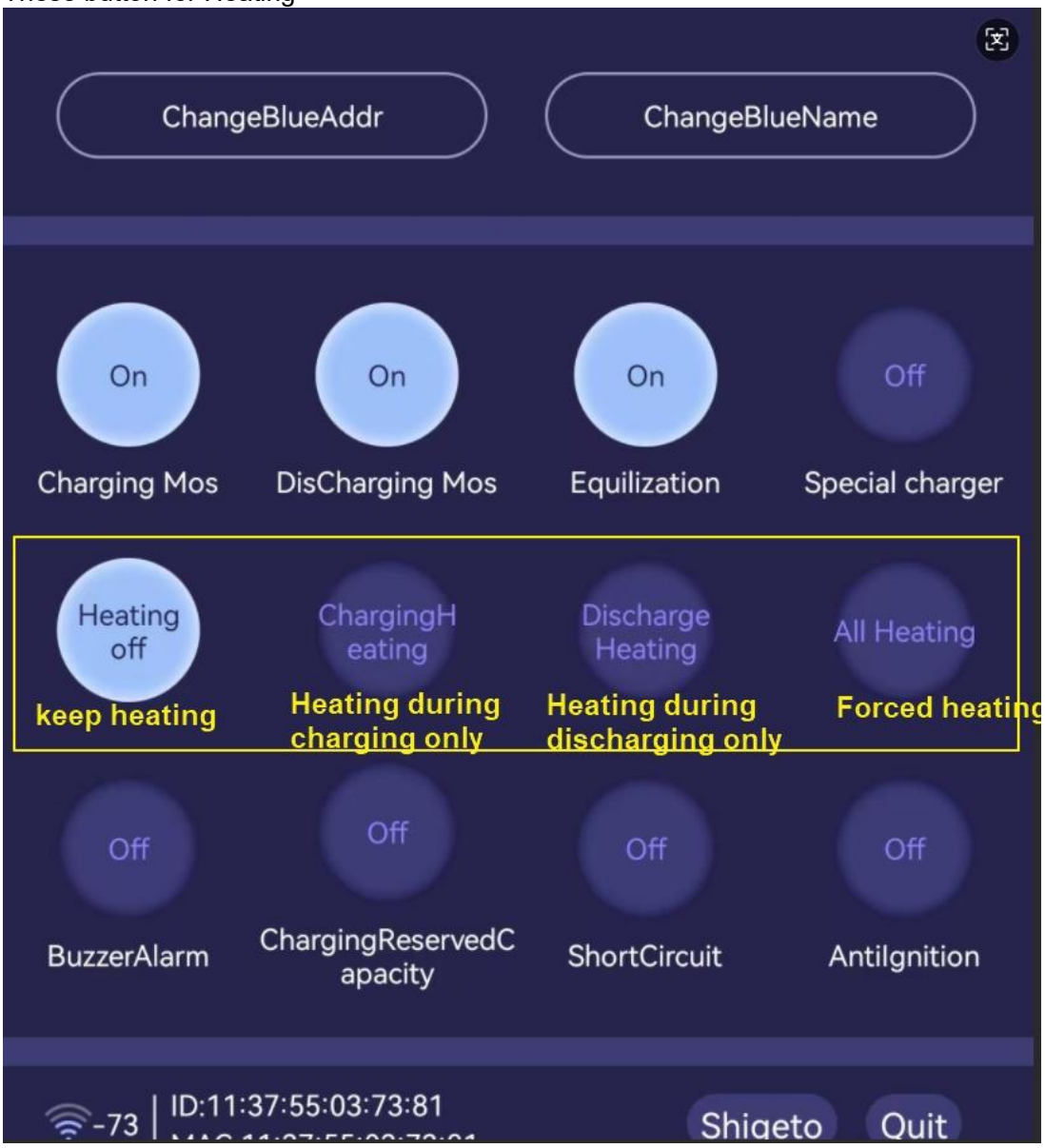


These button for Heating



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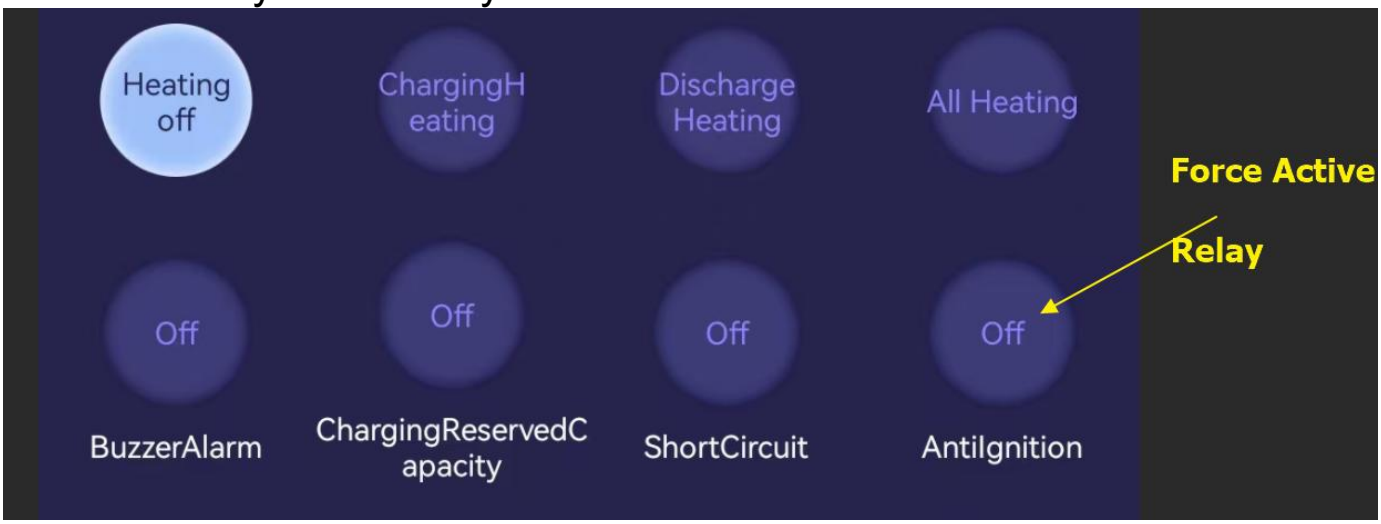
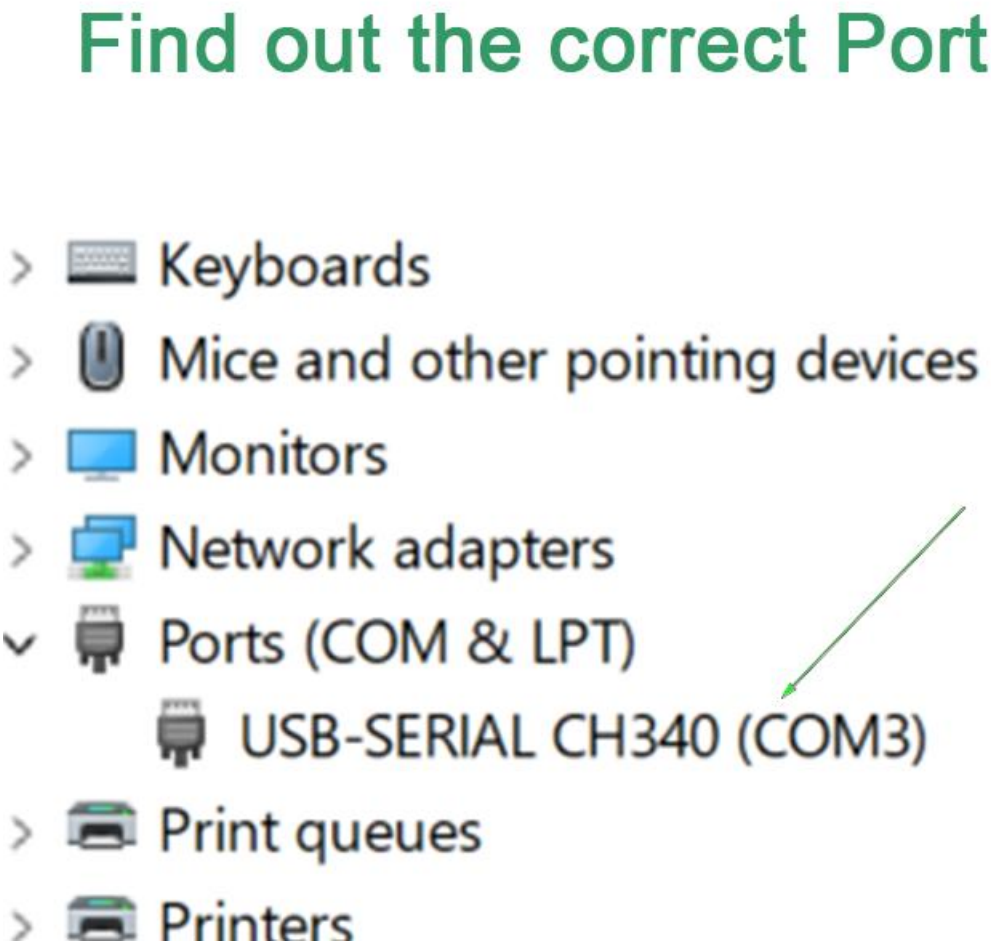
How to forcely active relay ? Click the button to be “ON”



BMS PC Software :
Password : 123456
You need to configurate bms after entering password 123456;
And select correct port



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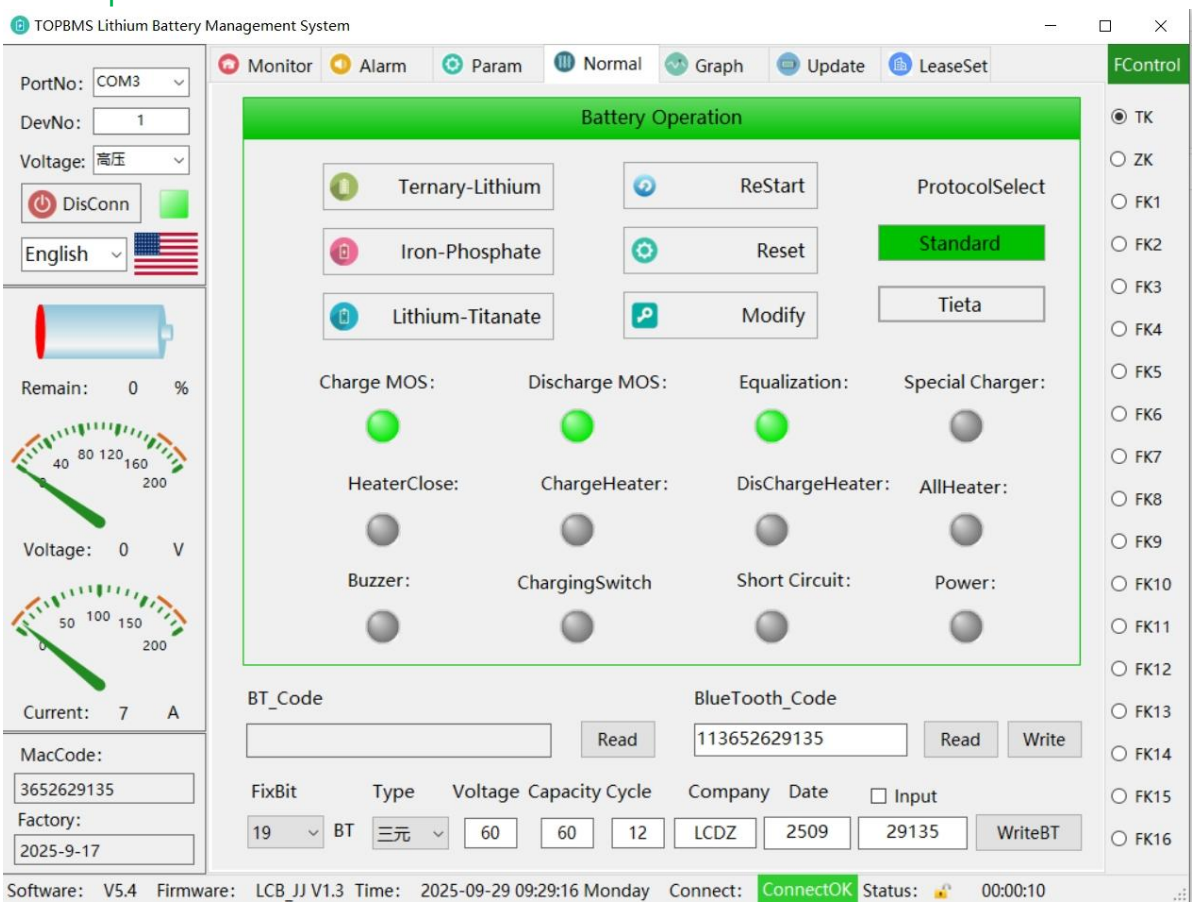
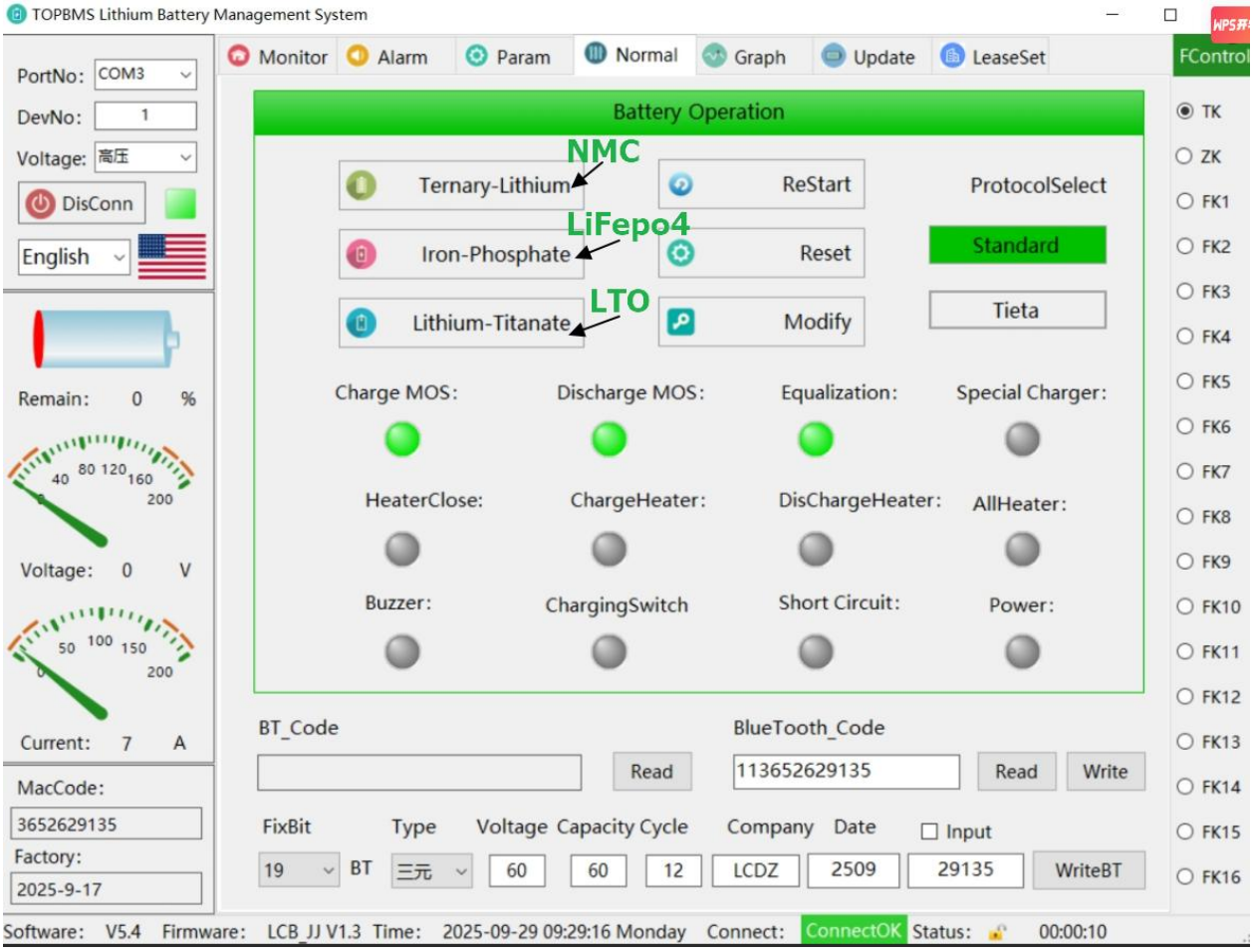


How to select battery types in the BMS PC software ?



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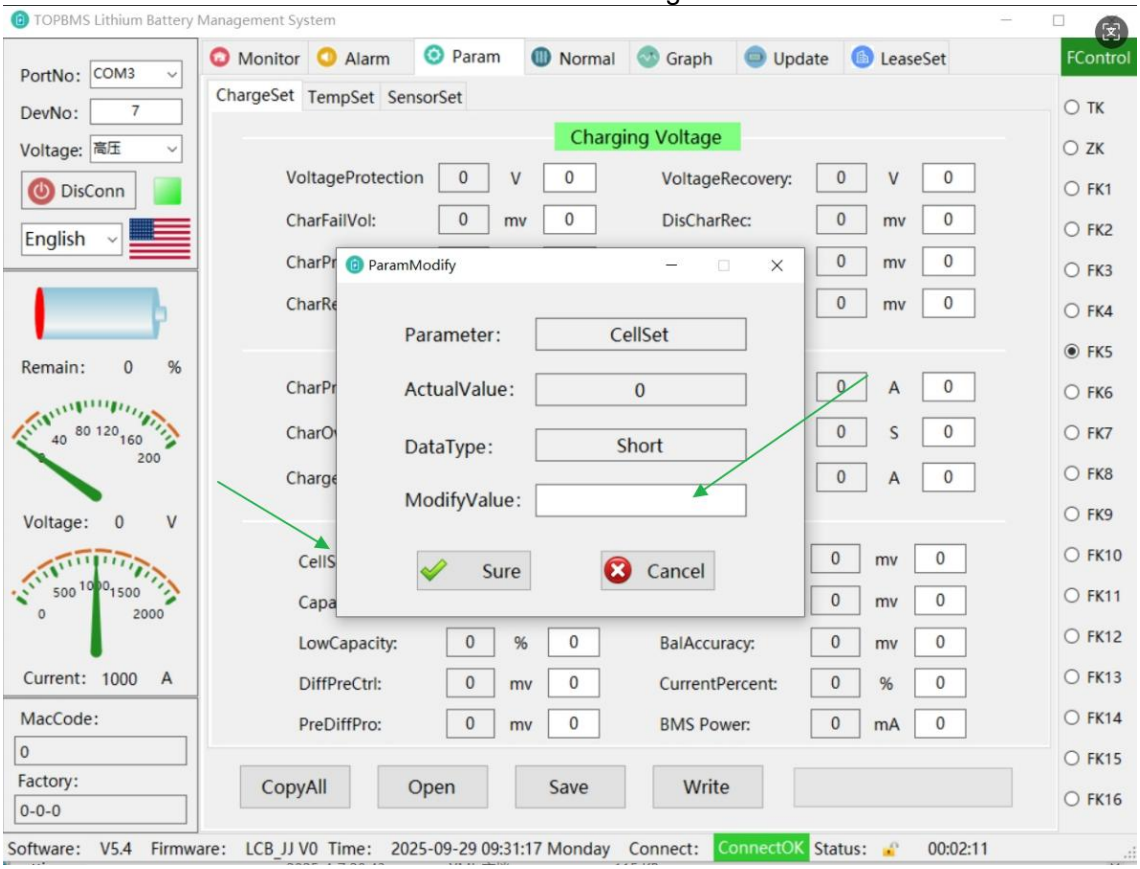
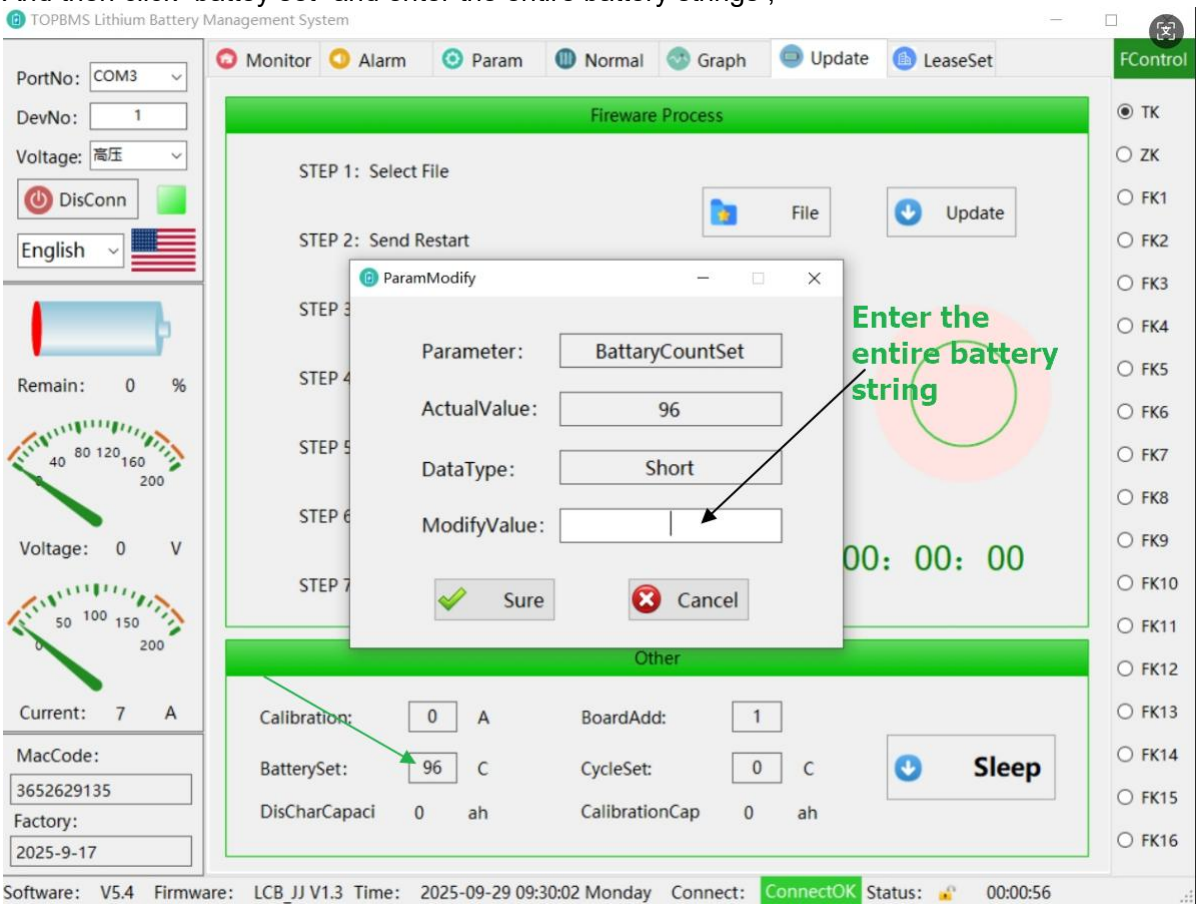
How to set the cell strings in the BMS PC software ?

Click the “Parameter” and then double click “ cell string” and enter cell number of each module in this page as below



How to set the entire battery strings in the BMS PC software ? Please go to the page “Update”

And then click “battey set” and enter the entire battery strings ;



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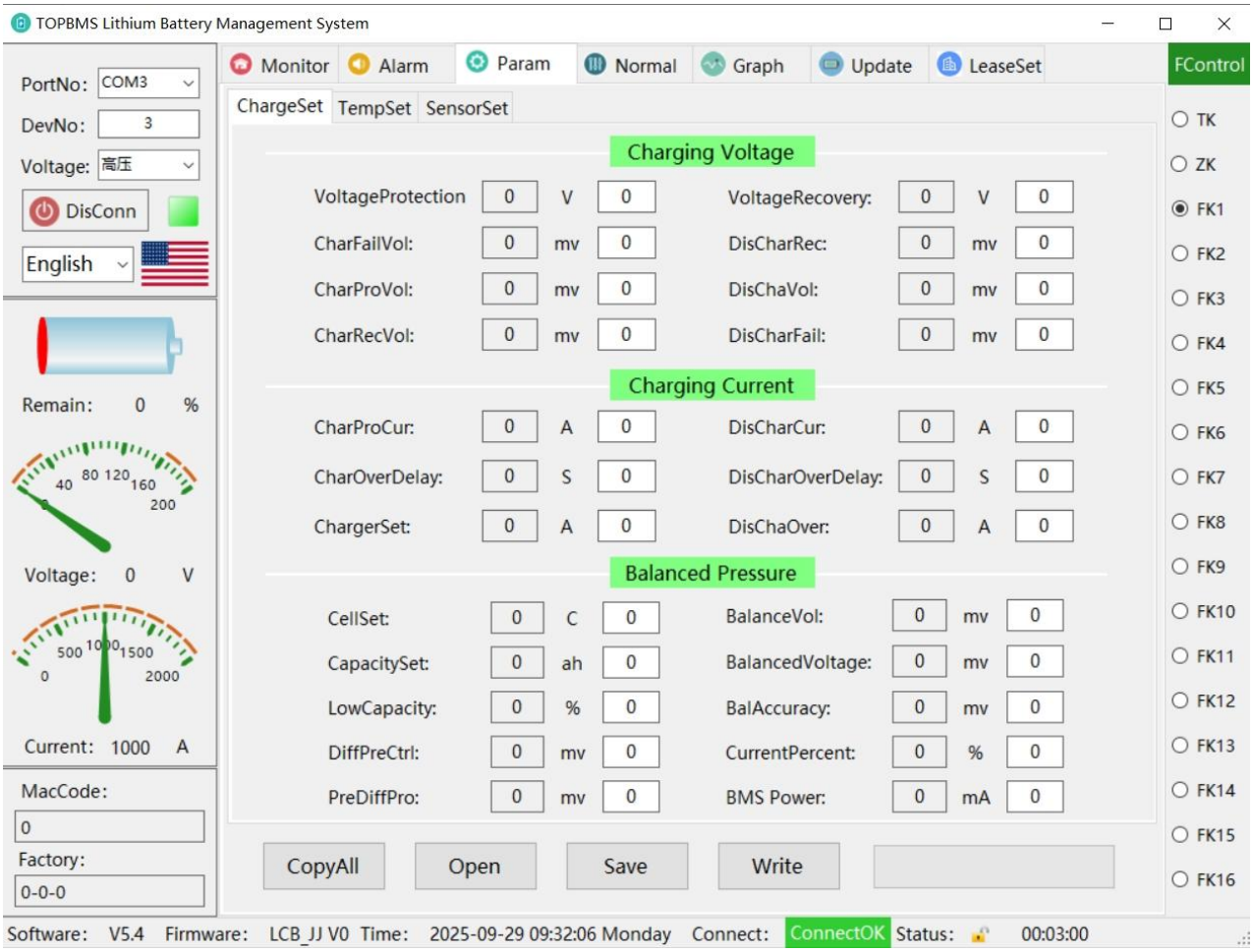
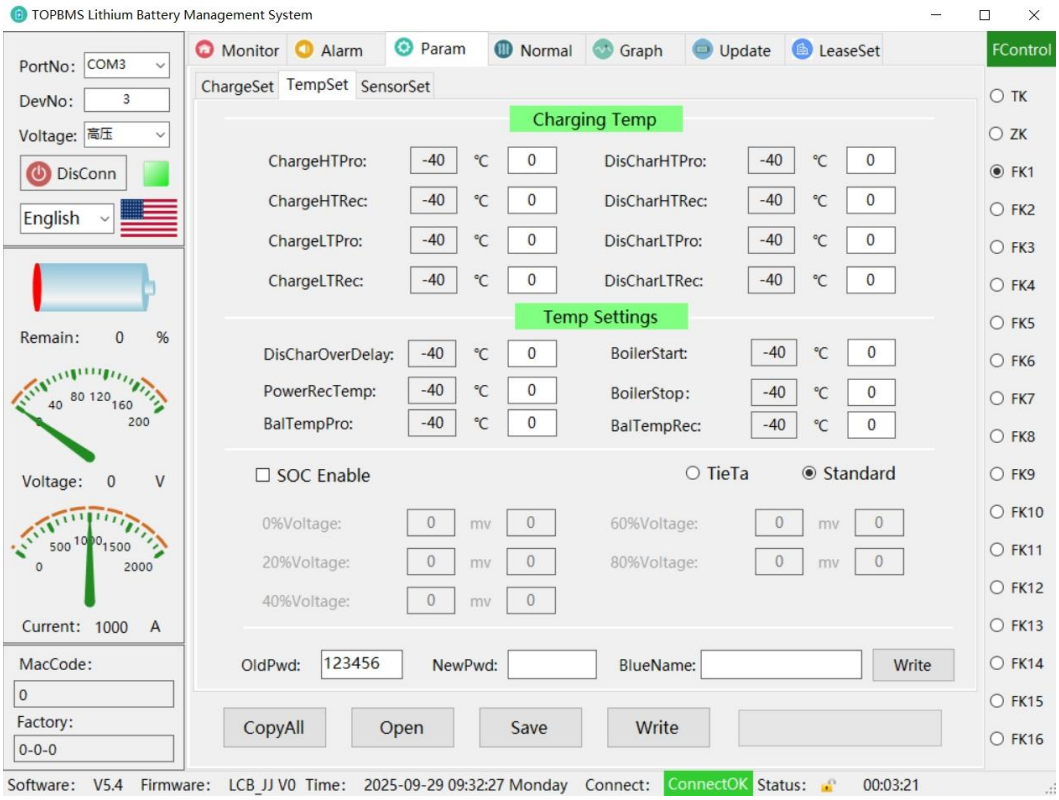
How to set the charge and discharge voltage / current ? Please go to this page" Param" and do settings



How to set the charge and discharge voltage / current ? Please go to this page" Param" and do settings



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How to set cell strings of each module ? Please see below

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How to change cell strings of each module ?

Step1:Pull button 1 down first

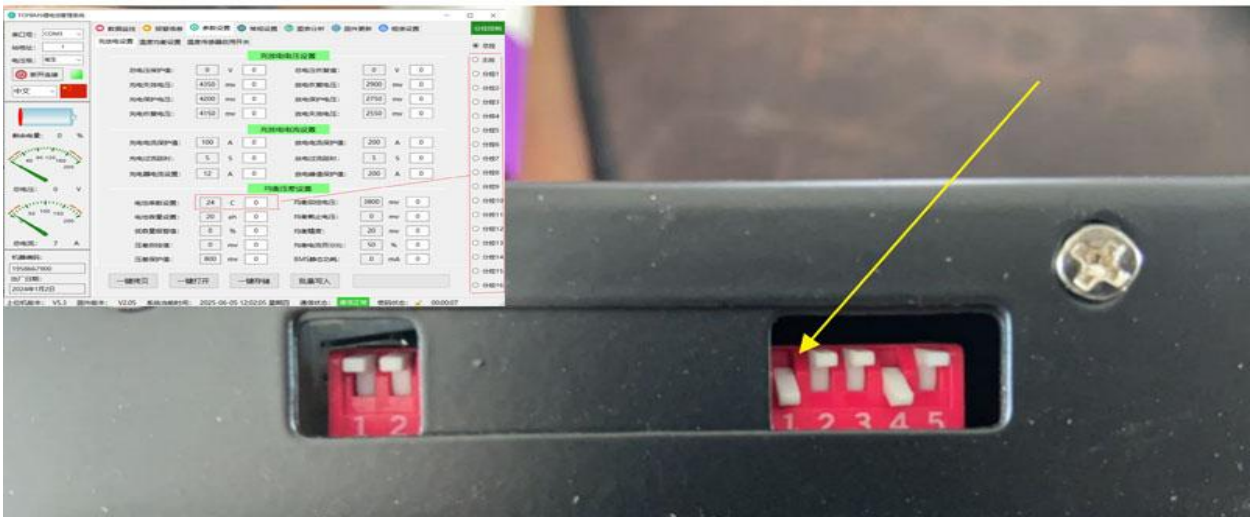
Step2:On the page "Parameter", enter the expected cell string after the corresponding slave bms is selected

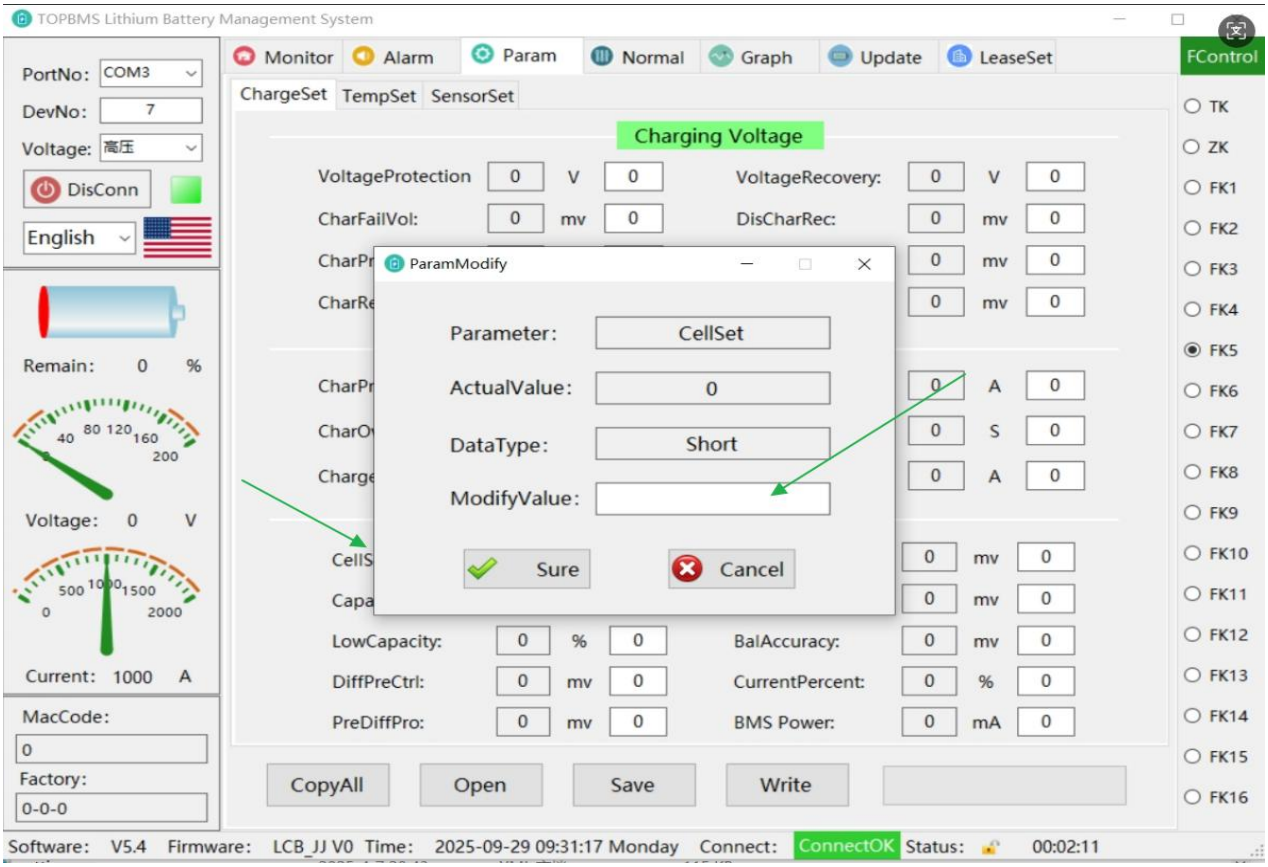
Step3: Enter the expeced cell string and then pull button 1 up and then he cell string is locked ;

Step4:Please go to the page “Update” and then click “battey set” and enter the entire battery strings ;

Step5 :Finally, Please go to the page"Normal " to restart the battery system.

The settings of the total battery strings will take effect only after this operation.





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