

APP[®] QUICK GUIDE

Battery Pack Bluetooth



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1. Overview

1.1 Brief introduction

The Bluetooth APP could realize the real-time monitoring of battery pack and make it easy to learn the battery health status.

1.2 Function

- **See information**

SOC, Current, Battery Voltage, Remaining capacity, Status of battery, Cell Voltage, Protection record, Real-time charge and discharge status curve, Temperature, Cycle time, Log, Sound alarm and Fault information, etc.

- **Parameter Settings**

2. Operating environment

Android or IOS is all available.

3. Use Manual

3.1 Install

Android mobile phone users can search "RAMCAR BT Li" in Google Mall to download and install.

Apple mobile phone users can search "RAMCAR BT Li" in Appstore to download and install.

3.2 Software operation

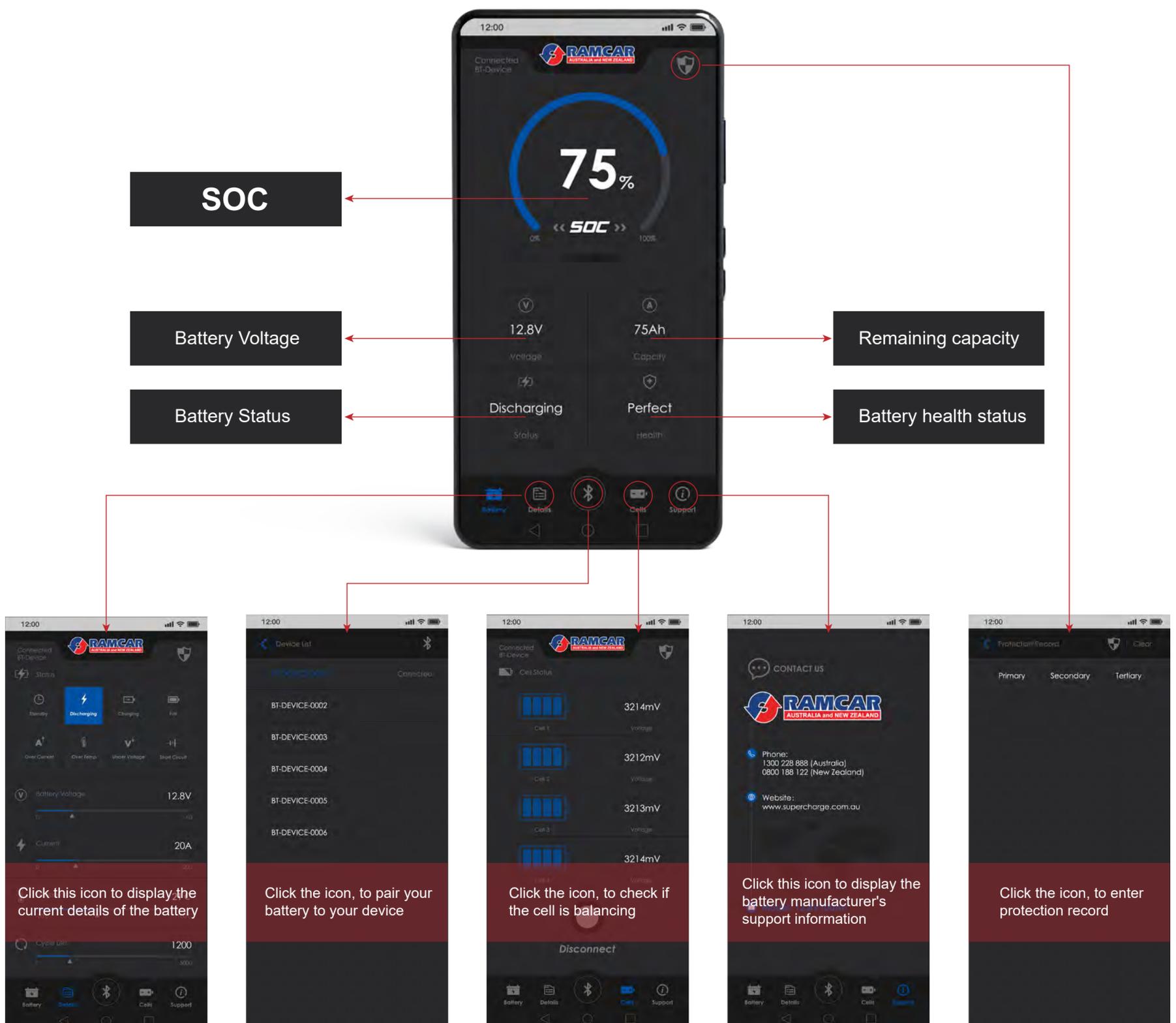
3.2.1 Overall interface



3.2.2 Interface operation

After download, turn on the Bluetooth of the mobile phone and click  to enter. Enter Pre-interface, after 3S pause, automatically enter page 1. You can switch to other pages through clicking the menu bar at the bottom of the interface.

3.2.3 Interface Introduction



4. Setting parameter modification

01 Click the LOGO for 10 times to enter the parameter setting interface

02 Modify the relevant parameters

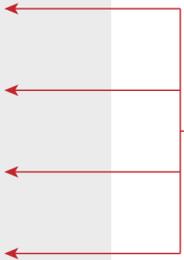
The image shows two screenshots from the RAMCAR app. The left screenshot is the home screen, featuring the RAMCAR logo, contact information (phone numbers for Australia and New Zealand, and a website), and a model number (12.8V100Ah). A red arrow points from the logo to the right screenshot. The right screenshot is the 'Device Setting' menu, which lists various parameters such as Basic setting, Sleep function, Heating function, Cooling function, Balancing function, OV_Cell, UV_Cell, OV_Bat, UV_Bat, OC_Chg, OC_Dsg, OT_Chg, UT_Chg, OT_Dsg, UT_Dsg, OT_MOS, Pressure difference is too large, Low electricity consumption, and Short Protection Para.

4.1 Basic setting

After modify the data, click this button to save data

The image shows a screenshot of the 'Basic setting' menu. The menu items include: MOS_Same_Gate, MOS_Split_Gate, Relay_Same_Gate, Relay_Split_Gate, Battery type: ternary battery, Battery type:...ron phosphate, MOS Relay (with a toggle switch), SeriesNum (4), Battery capacity (100 Ah), Recycle count (1), PreChg_Time (0 Sec), Cs_Res (1 mΩ), and Cs_ResNum (10). Red arrows point to the save buttons (circular icons with a refresh symbol) next to SeriesNum, Battery capacity, Recycle count, PreChg_Time, Cs_Res, and Cs_ResNum. A text box on the right says 'After modify the data, click this button to save data' with a red dot pointing to one of the save buttons.

MOS-Same-Gate
MOS-Split-Gate
Relay-Same-Gate
Relay-Split-Gate



This function has not been opened.

Battery type:temary battery
Battery type:lithium iron phosphate



This function has not been opened.

MoS Relay



This button can force the MOS and Relay to be on

Series Num 4 series
Battery Capicity..... Actual capacity
Recycle count Needn' t be revised
PreChg-Time Input 10S

Cs-Res Sampling resistor



This is determined by the hardware resistor

Cs-Res Num Number of sampling resistors



This is determined by the number of hardware resistor.

4.2 Sleep function

Sleep function	
Sleep function	 
VNor	4200 mv
TNor	10800 Min
VLow	3000 mv
TLow	1 Min
VirCurChg	0.0 A
VirCurDsg	0.0 A
RTC_WT	240 Min

VNor: Sleep voltage under normal condition
 TNor: Sleep time under normal condition
 VLow: Sleep voltage under low voltage condition
 TLow: Sleep time under low voltage condition
 VirCurChg: Charging current filtering
 VirCurDsg: Discharge current filtration
 RTC-WT: RTC wake up time

Analysis of the above parameters:

- When the voltage range of single series is 2900-4200mv and the charge&-discharge current is less than 1a, it will enter sleep after 10800min;
- When the voltage range of single string is less than 2900mv and the charge discharge current is less than 1a, it will go into sleep after 1min;
- Every 240Min, the protection board will automatically wake up to scan whether it is still in static state. If yes, it will continue to sleep.

4.3 Heating Function

▼ Heating function		
Heating function		<input checked="" type="checkbox"/>
HeatDsg_High	0.0	°C
HeatDsg_Mid	10.0	°C
HeatDsg_Low	10.0	°C
HeatChg_High	70.0	°C
HeatChg_Mid	60.0	°C
HeatChg_Low	-40.0	°C
HeatCur_Max	0.0	A
HeatCur_Min	0.0	A
HeatTime	0	Min

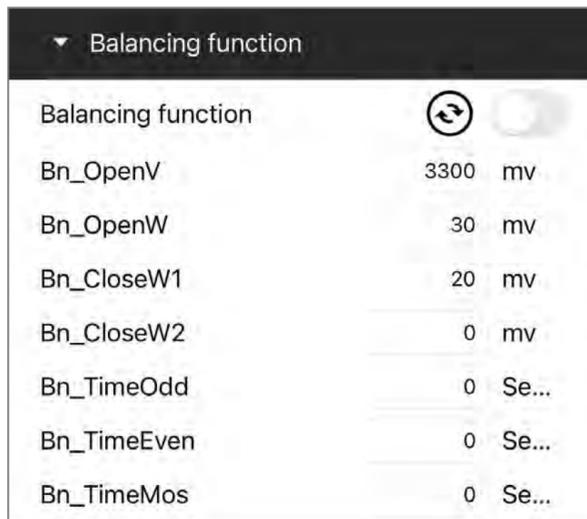
This function has not been opened.

4.4 Cooling Function

▼ Cooling function		
Cooling function		<input type="checkbox"/>
CoolDsg_High	-40.0	°C
CoolDsg_Low	-40.0	°C
CoolChg_High	-40.0	°C
CoolChg_Low	-40.0	°C
CoolCur_Max	0.0	A
CoolCur_Min	0.0	A
CoolTime	0	Min

This function has not been opened.

4.5 Balancing function



Bn-OpenV:	Voltage for open Balance
Bn-OpenW:	Voltage differential for open balance
Bn-CloseW1:	Balance close condition 1
Bn-CloseW2:	Balance close condition 2
Bn-TimeOdd:	Even serial time slice
Bn-TimeEven:	Odd serial time slice
Bn-TimeMos:	MOS time slice

Analysis:

The condictios to open balance:

- A、 When the "single section maximum voltage" is higher than the "open voltage", balance begins;
- B、 When the "voltage differential between cells" is higher than the "open voltage differential", the balance begins

The conditions to close balance:

The balance started by the above condition A, when the voltage differential is less than "Bn-CloseW1", the balance stops.

The balance started by the above condition B, when the voltage differential is less than "Bn-CloseW2", the balance stops.

Balance time:

Odd series time slice and even series time slice

Due to the hardware limitation, it is impossible to balance all cells at the same time. Only the odd string can be balanced for a period of time, then the even serial can be balanced for a period of time, and then the odd serial can be balanced again.....;

MOS time slice

Due to different customer needs, there are two strategies:

Forbid charging/discharging during balancing - when using this strategy, balance and charging & discharging are carried out alternately, that is, after balancing for a period of time, charging /discharging are allowed for a period of time, and then balance for a period of time again...

Balance and charging/discharging can be carried out simultaneously - when using this strategy, "MOS time slice" must be set to 0.

4.6 OV-Cell (Overcharge parameter setting of single string cell)

OV_Cell		
Frist levelOV_Cell	3550 mv	
Second levelOV_Cell	3550 mv	
Third levelOV_Cell	3750 mv	
Recovery pointOV_...	3550 mv	
Delay pointOV_Cell	300 10ms	

- First level OV-Cell** - First-level warning of Battery string overvoltage. When the maximum single serial voltage exceeds the critical value, the first-level warning will be generated;
- Second level OV-Cell** - Secondary warning of battery string overvoltage. When the maximum single string voltage exceeds the critical value, the secondary warning will be generated;
- Third level OV-Cell** - Third-level warning of battery string overvoltage. When the maximum single string voltage exceeds the critical value, the third-level warning will be generated.
- Recovery point OV-Cell** - Recovery point of battery string overvoltage protection. After the battery string overvoltage protection is generated, when the maximum voltage of the battery string is lower than the value, the over-voltage protection of the battery string will be turned off;
- Delay point OV-Cell** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal.

4.7 UV-Cell (Over discharge parameter setting of single string cell)

UV_Cell	
Frist levelUV_Cell	2700 mv 
Second levelUV_Cell	2700 mv
Third levelUV_Cell	2300 mv
Recovery pointUV_...	2450 mv
Delay pointUV_Cell	300 10ms

- First level UV-Cell** - First-level warning of Battery string undervoltage. When the maximum single serial voltage lower than the critical value, the first-level warning of battery string undervoltage will be generated;
- Second level UV-Cell** - Secondary warning of battery string undervoltage. When the maximum single string voltage of battery string is lower than the critical value, the secondary warning of under voltage of battery string will be generated;
- Third level UV-Cell** - Third-level warning of battery string undervoltage. When the maximum single string voltage of battery string is lower than the critical value, the third-level warning of under voltage of battery string will be generated;
- Recovery point UV-Cell** - Recovery point of battery string undervoltage protection. After the battery string overvoltage protection is generated, when the maximum voltage of the battery string is higher than the value, the under-voltage protection of the battery string will be turned off.
- Delay point UV-Cell** - When it is lower than the critical value, it will delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt wave crest signal;

4.8 OV-Bat (Total voltage overcharge parameters setting of battery pack)

▼ OV_Bat	
Frist levelOV_Bat	14.60 V 
Second levelOV_Bat	14.60 V
Third levelOV_Bat	15.00 V
Recovery pointOV_...	14.40 V
Delay pointOV_Bat	100 10ms

- First level OV-Bat** - First-level warning of Battery pack overvoltage. When the total voltage of the battery exceeds the critical value, the first-level warning of battery pack over-voltage will be generated;
- Second level OV-Bat** - Secondary warning of Battery pack overvoltage. When the total voltage of the battery exceeds the critical value, the secondary warning of battery pack over-voltage will be generated;
- Third level OV-Bat** - Third-level warning of Battery pack overvoltage. When the total voltage of the battery exceeds the critical value, the third-level warning of battery pack over-voltage will be generated;
- Recovery point OV-Bat** - Recovery point of battery pack overvoltage protection.
 After the battery pack overvoltage protection is generated, when the total voltage of the battery pack is lower than the value, the over-voltage protection of the battery pack will be turned off.
- Delay point OV-Bat** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal;

4.9 UV-Bat (Parameter setting of battery pack under-voltage)

UV_Bat	
Frist levelUV_Bat	10.00 V
Second levelUV_Bat	10.00 V
Third levelUV_Bat	10.00 V
Recovery pointUV_...	10.40 V
Delay pointUV_Bat	100 10ms

- First level UV-Bat** - First-level warning of Battery pack undervoltage. When the total voltage of the battery pack is lower than the critical value, the first-level warning of battery pack under-voltage will be generated;
- Second level UV-Bat** - Secondary warning of Battery pack undervoltage. When the total voltage of the battery pack is lower than the critical value, the secondary warning of battery pack under-voltage will be generated;
- Third level UV-Bat** - Third-level warning of Battery pack undervoltage. When the total voltage of the battery pack is lower than the critical value, the third-level warning of battery pack under-voltage will be generated;
- Recovery point UV-Bat** - Recovery point of battery pack overvoltage protection. After the battery pack under-voltage protection is generated, it will be turned off when the total voltage recovers to above the value;
- Delay point UV-Bat** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal;

4.10 OC-Chg (Charging over-current protection parameters)

OC_Chg		
Frist levelOC_Chg	80.0 A	
Second levelOC_C...	100.0 A	
Third levelOC_Chg	110.0 A	
Recovery pointOC...	100.0 A	
Delay pointOC_Chg	100 10ms	

- First level OC-Chg** - First-level warning of Battery charging over-current. When the charging current of battery exceeds the critical value, the first-level warning of Battery charging over-current will be generated;
- Second level OC-Chg** - Secondary warning of Battery charging over-current. When the charging current of battery exceeds the critical value, the secondary warning of Battery charging over-current will be generated;
- Third level OC-Chg** - Third-level warning of Battery charging over-current. When the charging current of battery exceeds the critical value, the third-level warning of Battery charging over-current will be generated;
- Recovery point OC-Chg** - Recovery point of battery charging over current protection.
 When the charging current is lower than this value, the battery charging over-current protection will be turned off.
- Delay point OC-Chg** - After exceeding the critical value, delay a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by sudden wave crest signal;

4.11 OC-Dsg (Discharging over-current protection parameters)

OC_Dsg		
First levelOC_Dsg	700.0 A	
Second levelOC_D...	750.0 A	
Third levelOC_Dsg	800.0 A	
Recovery pointOC...	750.0 A	
Delay pointOC_Dsg	300 10ms	

- First level OC-Dsg** - First-level warning of Battery discharging over-current. When the discharging current of battery exceeds the critical value, the first-level warning of discharging over-current will be generated;
- Second level OC-Dsg** - Secondary warning of Battery discharging over-current. When the discharging current of battery exceeds the critical value, the secondary level warning of discharging over-current will be generated;
- Third level OC-Dsg** - Third-level warning of Battery discharging over-current. When the discharging current of battery exceeds the critical value, the third-level warning of discharging over-current will be generated;
- Recovery point OC-Dsg** - Recovery point of battery discharging over current protection.
 When the discharging current is lower than this value, the battery charging over-current protection will be turned off.
- Delay point OC-Dsg** - After exceeding the critical value, delay a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by sudden wave crest signal;

4.12 OT-Chg (Charging over temperature protection parameters)

OT_Chg		
Frist levelOT_Chg	50.0 °C	
Second levelOT_Chg	50.0 °C	
Third levelOT_Chg	65.0 °C	
Recovery pointOT_...	50.0 °C	
Delay pointOT_Chg	100 10ms	

- First level OT-Chg** - First-level warning of Battery charging over temperature. When the temperature of battery exceeds the critical value during charging, the first-level warning of Battery charging over temperature will be generated;
- Second level OT-Chg** - Secondary warning of Battery charging over temperature. When the temperature of battery exceeds the critical value during charging, the secondary warning of Battery charging over temperature will be generated.
- Third level OT-Chg** - Third-level warning of Battery charging over temperature. When the temperature of battery exceeds the critical value during charging, the third-level warning of Battery charging over temperature will be generated.
- Recovery point OT-Chg** - Recovery point of battery charging over temperature protection.
 When the temperature is lower than this value during charging, the battery charging over temperature protection will be turned off;
- Delay point OT-Chg** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal.

4.13 UT-Chg (Charging low temperature protection parameters)

▼ UT_Chg	
Frist levelUT_Chg	5.0 °C 
Second levelUT_Chg	2.0 °C
Third levelUT_Chg	-2.0 °C
Recovery pointUT_...	0.0 °C
Delay pointUT_Chg	100 10ms

- First level UT-Chg** - First-level warning of Battery charging low-temperature. When the temperature of battery is lower than the critical value during charging, the first-level warning of Battery charging low-temperature will be generated;
- Second level UT-Chg** - Secondary warning of Battery charging low-temperature. When the temperature of battery is lower than the critical value during charging, the secondary warning of Battery charging low-temperature will be generated;
- Third level UT-Chg** - Third-level warning of Battery charging low-temperature. When the temperature of battery is lower than the critical value during charging, the third-level warning of Battery charging low-temperature will be generated;
- Recovery point UT-Chg** - Recovery point of battery charging low-temperature protection.
 When the temperature exceeds this value during charging, the low temperature protection of battery charging will be turned off;
- Delay point UT-Chg** - When it is lower than the critical value, it will delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt wave crest signal;

4.14 OT-Dsg (Discharging over-temperature protection parameters)

OT_Dsg		
Frist levelOT_Dsg	50.0 °C	
Second levelOT_Dsg	50.0 °C	
Third levelOT_Dsg	65.0 °C	
Recovery pointOT_...	55.0 °C	
Delay pointOT_Dsg	100 10ms	

- First level OT-Dsg** - First-level warning of Battery discharging over temperature. When the temperature of battery exceeds the critical value during charging, the first-level warning of Battery discharging over temperature will be generated;
- Second level OT-Dsg** - Secondary warning of Battery discharging over temperature. When the temperature of battery exceeds the critical value during charging, the secondary warning of Battery discharging over temperature will be generated;
- Third level OT-Dsg** - Third-level warning of Battery discharging over temperature. When the temperature of battery exceeds the critical value during charging, the third-level warning of Battery discharging over temperature will be generated;
- Recovery point OT-Dsg** - Recovery point of battery discharging over temperature protection.
 When the temperature is lower than the value during charging, the battery discharging over temperature protection will be turned off;
- Delay point OT-Dsg** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal.

4.15 UT-Dsg (Discharging low temperature protection parameters)

▼ UT_Dsg	
Frist levelUT_Dsg	-10.0 °C 
Second levelUT_Dsg	-10.0 °C
Third levelUT_Dsg	-20.0 °C
Recovery pointUT_...	-10.0 °C
Delay pointUT_Dsg	100 10ms

- First level UT-Dsg** - First-level warning of Battery discharging low-temperature. When the temperature of battery is lower than the critical value during charging, the first-level warning of Battery discharging low-temperature will be generated;
- Second level UT-Dsg** - Secondary warning of Battery discharging low-temperature. When the temperature of battery is lower than the critical value during charging, the secondary warning of Battery discharging low-temperature will be generated;
- Third level UT-Dsg** - Third-level warning of Battery discharging low-temperature. When the temperature of battery is lower than the critical value during charging, the third-level warning of Battery discharging low-temperature will be generated;
- Recovery point UT-Dsg** - Recovery point of battery discharging low-temperature protection.
 When the temperature exceeds this value during discharging, the low temperature protection of battery charging will be turned off;
- Delay point UT-Dsg** - When it is lower than the critical value, it will delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt wave crest signal.

4.16 OT-MOS (MOS Over temperature protection parameters)

OT_MOS	
First levelOT_MOS	60.0 °C
Second levelOT_M...	70.0 °C
Third levelOT_MOS	85.0 °C
Recovery pointOT_...	80.0 °C
Delay pointOT_MOS	100 10ms

- First level OT-MOS** - First-level warning of MOS over temperature. When the MOS temperature exceeds the critical value during battery charging/discharging, the first-level warning of MOS over temperature will be generated;
- Second level OT-MOS** - Secondary warning of MOS over temperature. When the MOS temperature exceeds the critical value during battery charging/discharging, the secondary warning of MOS over temperature will be generated;
- Third level OT-MOS** - Third-level warning of MOS over temperature. When the MOS temperature exceeds the critical value during battery charging/discharging, the third-level warning of MOS over temperature will be generated;
- Recovery point OT-MOS** - Recovery point of MOS over temperature protection during charging/ discharging. When the MOS temperature is lower than this value, the MOS over temperature protection will be turned off;
- Delay point OT-MOS** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal;

4.17 Pressure difference is too large

▼ Pressure difference is too large		
Frist levelPressure...	1000 mv	
Second levelPress...	1000 mv	
Third levelPressure...	1000 mv	
Recovery pointPre...	900 mv	
Delay pointPressur...	100 10ms	

- First level Pressure** - First-level warning of battery voltage differential. When the battery voltage differential exceeds the critical value, the first-level warning of battery voltage differential will be generated;
- Second level Pressure** - Secondary warning of battery voltage differential. When the battery voltage differential exceeds the critical value, the secondary warning of battery voltage differential will be generated;
- Third level Pressure** - Third-level warning of battery voltage differential. When the battery voltage differential exceeds the critical value, the third-level warning of battery voltage differential will be generated;
- Recovery point Pressure** - Recovery point of voltage differential protection. When the battery differential pressure returns below this value, the battery differential pressure protection will be turned off;
- Delay point Pressure** - After exceeding the critical value, delay for a certain time, and then trigger the protection (or generate a warning). This function is to prevent misoperation caused by abrupt peak signal;

4.18 Low electricity consumption (Low electricity protection parameters)

Low electricity consumption	
First levelLow elect...	3 %
Second levelLow el...	2 %
Third levelLow elec...	1 %
Recovery pointLow...	2 %
Delay pointLow ele...	100 10ms

- First level Low electricity consumption** - First-level warning of low electricity. When the battery electricity is lower than the critical value, the First-level warning of low electricity will be generated;
- Second level Low electricity consumption** - Secondary warning of low electricity. When the battery electricity is lower than the critical value, the Secondary warning of low electricity will be generated;
- Third level Low electricity consumption** - Third-level warning of low electricity. When the battery electricity is lower than the critical value, the third-level warning of low electricity will be generated;
- Recovery point Low electricity consumption** - Recovery point of Low electricity alarm. When the battery electricity returns to higher than the value, the low battery electricity alarm will be turned off;
- Delay point Low electricity consumption** - When it is lower than the critical value, it will delay for a certain time, and then trigger a warning. This function is to prevent misoperation caused by abrupt peak signal;

4.19 Short Protection Para (Short circuit protection parameters)

▼ Short Protection Para		
CS_CurCHG(A)	849 A	
CS_CurDSG(A)	849 A	
CBC_CurCHG(A)	350 A	
discharge current	800 A	
passW_Once	1	
passW_Forever	0	
Res1	1000	
Res2	30	

- **CS-CurCHG(A)** - Maximum charging current collected by protection board
- **CS-CurDSG(A)** - Maximum discharging current collected by protection board
- **CBC-CurCHG(A)** - Charging short circuit current
- **Discharge current** - Setting of short-circuit protection current, that is, when the short-circuit protection current reaches the set value, BMS turns off the discharge MOS at the set time
- **PassW-Once** - One time password
Input one-time password into the protection board, and the protection board can only be used once!
- **PassW-Forever** - Permanent password
The protection board can only be used permanently if the permanent password is input!
- **Res1** - Reserve 1
- **Res2** - Reserve 2

5. App errors and Solutions

APP Error description	Solution
<p>1.ComError_AFE1: The analog front-end 1 (1-15 series) has an error in the acquisition process.</p>	<p>Generally, it is AFE communication fails or chip not welded, and it needs to be returned to the factory for maintenance</p>
<p>2.ComError_AFE2: The analog front-end 1 (16-30 series) has an error in the acquisition process.</p>	<p>Generally, it is AFE communication fails or chip not welded, and it needs to be returned to the factory for maintenance</p>
<p>3.ComError_Can: The CAN signal is not received normally, indicating an error</p>	<p>Generally, the CAN communication fails and the code needs to be upgraded or returned to the factory for maintenance</p>
<p>4.ComError_E2P: E2P chip (the function of storing data) is not well soldered or interfered, and an error is reported</p>	<p>Generally, it is the IIC communication in EEPROM fails or the chip is not soldered and needs to be returned to the factory for repair</p>
<p>5.ComError_SPI: SPI signal is not received normally, indicating error (the signal is not designed at present)</p>	<p>Reserved: SPI communication is not designed yet</p>
<p>6.ComError_Upper: Communication error of upper computer</p>	<p>Generally, BMS and upper computer have not communicated successfully. Please check the wiring or judge whether the PC terminal has been connected</p>
<p>7.ComError_Client1: Communication error with customer back end</p>	<p>Generally, the communication between BMS and back-end load is not successful. Check the wiring or judge whether the protocol is correct</p>

APP Error description	Solution
8.ComError_Screen: LCD display is abnormal or data is not interworking or data communication error	If the LCD fails to connect, check whether the RX TX is reversely connected, or whether the power on of the LCD is normal
9.ComError_WiFi:WiFi communication error	WiFi module failed to communicate successfully
10.Bluetooth Device: Bluetooth communication error	Bluetooth module failed to communicate successfully
11.ComError_APP:APP Communication error	App and BMS communication error, check the wiring or check whether the BMS is in sleep, power off state
12.Error_CBC_CHG: Charging short circuit protection is triggered (this function is not easily triggered)	Charging short-circuit protection, Generally, it is the current of the charging gun is too high, or there is a relay or a large capacitive element inside the gun, and the specific problems need to be modified
13.Error_StoreE2P: E2P storage error, which is caused by some data setting errors of the software	To reset other parameters, click, and then reselect the correct and reasonable parameters
14.Error_HSE: Internal crystal oscillator error (crystal oscillator is used for timing)	Ignore, generally use external crystal oscillator
15.Error_LSE:External crystal error	Hardware error, return to factory

APP Error description	Solution
16.Error_Flash:Internal flash storage error will cause abnormal data reading	Internal code logic problem, upgrade code
17.Error_ADC:Single chip sampling error, generally for voltage or temperature display abnormal, common abnormal temperature 105	If the temperature wire is not inserted or inserted tightly, check the wiring or unplug it again
18.Error_HEAT: Heating error	HT is wrong for some reason and needs to check the code logic
19.Error_COOL: Condensation error	Need to check the logic code for some reason
20.Error_CBC_DSG:Triggered discharge short circuit protection (this function is not easily triggered)	Discharge short circuit protection, generally, the discharge current of the load is too large or there is a relay or a large capacitive element inside the load, and the specific problems need to be modified
21.OV_Cell:Single section over voltage error	When the voltage falls back to the recovery point, it will be released automatically
22.UV_Cell:Single undervoltage error	Automatically release when the voltage rises to the recovery point
23.OV_Bat:Total voltage over-voltage error	When the voltage falls back to the recovery point, it will be released automatically

APP Error description	Solution
24.UV_BAT:Total voltage under-voltage error	When the voltage rises to the recovery point, it will be released automatically
25.OC_Chg:Charging over current error reporting	When the current is less than the recovery point, it will be released automatically
26.OC_Dsg: Discharge over current error	When the current is less than the recovery point, it will be released automatically
27.OT_CHG:Charging over temperature error	It will be released automatically when the temperature is lower than the recovery point
28.OT_DSG:Discharge over temperature error	It will be released automatically when the temperature is lower than the recovery point
29.UT_DSG:Error reporting at low temperature of discharge	When the temperature is higher than the recovery point, it will be released automatically
30.Vdelta_OP:Error report for excessive differential voltage	When the volatge differential is less than the recovery point, it will be released automatically
31.RES: Reserved	Reserved
32.OT_MOS:MOS Over temperature error	
33.SOC_LOW_P:SOC Low alarm (this will not Ttrigger protection, only alarm)	
34.Balanced_Cnt: The times of trigger balance	

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