

PC Master Software -V1.0

User Manual

Table of contents

Overview	3
1 PC Master connection	5
2 Introduction to the functions PC Master	9
2.1 Data Monitoring	错误! 未定义书签。
2.2 Active Balance	错误! 未定义书签。
2.2.1 Equalization Information	错误! 未定义书签。
2.2.2 Active Balance Parameters	错误! 未定义书签。
2.2.3 The special functions are as follows:	错误! 未定义书签。
2.3 Parameter setting	13
2.3.1 Parameter description	13
2.3.2 Quick writing	18
2.3.3 Save the configuration	19
2.3.4 Loading the configuration	20
2.3.5 Quick settings	21
2.4 Parameter reading	23
2.5 Engineering Mode	25
2.5 Historical Alarms	31
2.5.1 History alarm of the PC Master	31
2.5.2 PC Master SaveData	32
2.6 BMS upgrade	35
2.6.1 BMS upgrade function	35
2.6.2 Notes on BMS Upgrade	36
2.7 Universal Interface Board (WNT) upgrade	37
2.7.1 Universal Interface Board (WNT) upgrade function	37

Overview

PC Master is a PC-side Upper computer based on DALY BMS. It is compatible with UART, RS485, and CAN protocols. It manages battery information visually and displays the voltage, temperature, current, and other information collected by BMS. Users can view battery data and alarm information in real-time and parameter settings, replace or maintain abnormal batteries, track battery usage, and use IAP to upgrade BMS software version.

The host computer mainly includes "communication settings", "language switching", "board number switching", "refresh data", "data monitoring", "active balance", "parameter reading/setting", "engineering mode", "history alarm" ", "BMS upgrade" and other functions. **Figure 1-1**.

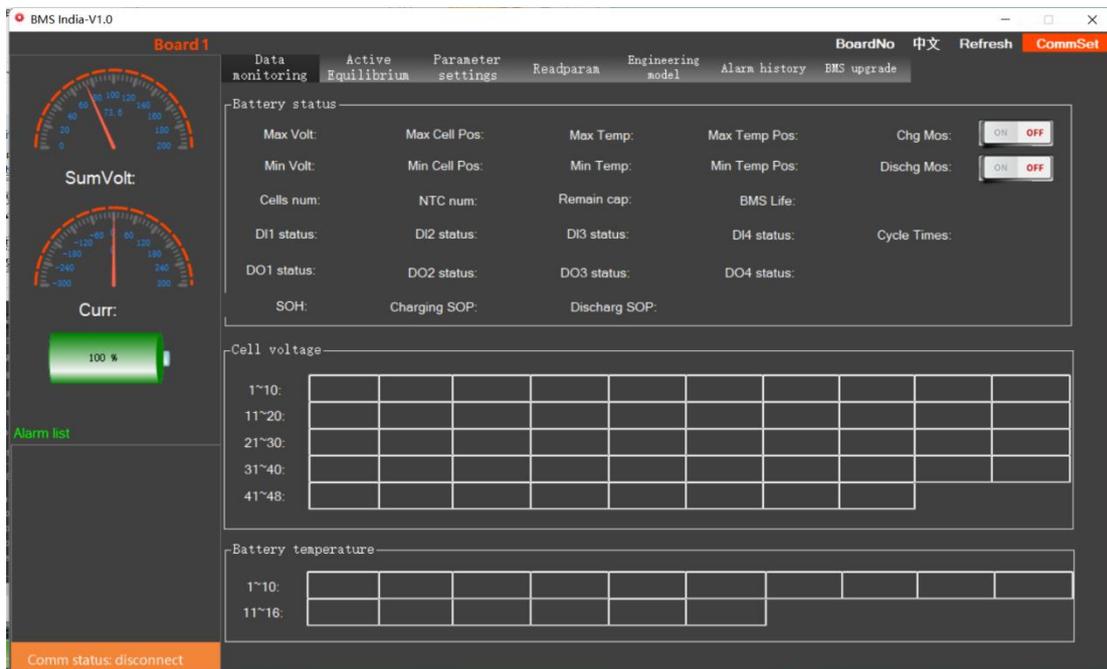


Figure 1-1 Main interface of the PC Master

- **BMS Communication Settings:** Set communication connection options.
- **BMS Language switch:** English, Chinese switch.
- **BMS Board number switching:** When the BMS is connecting in parallel, and switching the board number of the BMS to obtain the information of the corresponding BMS.
- **BMS Data monitoring:** Obtain the real-time voltage, current, temperature and other data of the battery pack.
- **BMS Active equalization:** read and set the parameter information of the active balance module of the software version.
- **BMS Parameter setting/reading:** Get or set the parameters of the BMS.
- **BMS Engineering mode:** Test BMS functions, such as restarting BMS, current calibration, charge and discharge control.
- **BMS Historical alarm:** Obtain the historical alarm data of the BMS. At present, only the BMS whose MCU is STM32F103C8T6 has this function. Since several current BMS's do not have RTC, the alarm time can't be record. To view the BMS historical data, you can find the saved data EXCEL file in the Saving Data directory in the PC Master installation file.
- **BMS upgrade:** used to upgrade the software programs in the BMS.

1. PC Master connection

Unzip the compressed file on the upper computer, enter the file, as shown in **Figure 1-2**, and double-click PC Master.exe to open it.

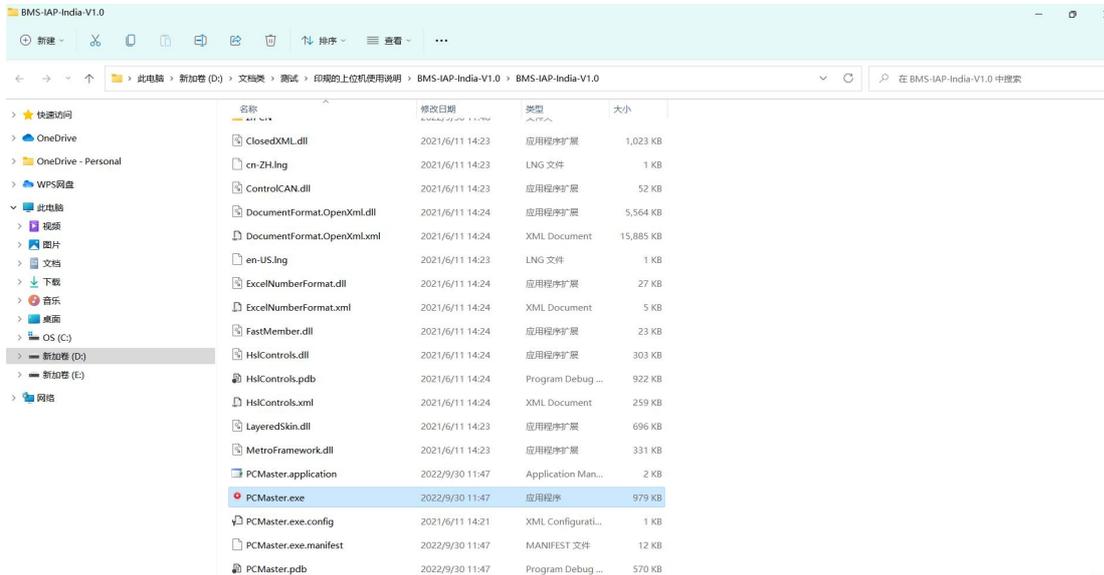


Figure 1-2 Upper computer file directory

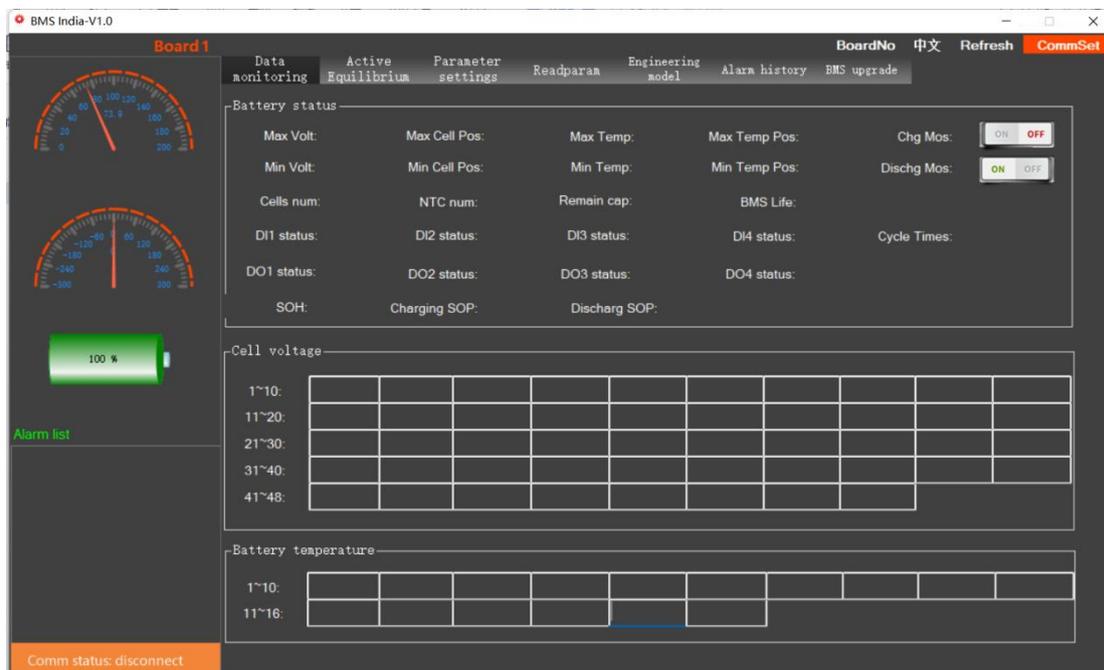


Figure 1-3 Upper computer interface

PC Master can communicate with BMS through UART, RS485, CAN. Click "Communication Settings" in the upper right corner if you need to connect UART or RS485, set the corresponding items directly in the "Serial Port Settings" interface, as shown in **Figure 1-4**. "Serial port number" can be viewed in the device manager of the computer management (right click on "this computer", select "manage", then click "device manager"), select "port (COM and LPT)" or "Universal Serial Bus" Controller" to find the corresponding COM, as shown in **Figure 1-5**, **Figure 1-6**. DALY BMS serial communication defaults to 9600bps without parity bit. After the setting is complete, click "Open Serial Port."

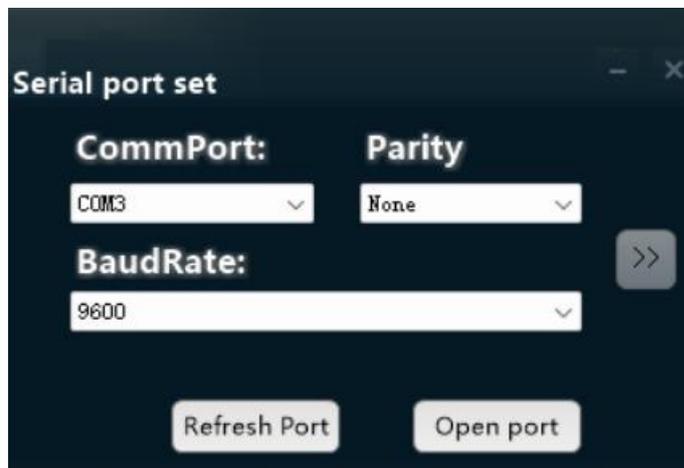


Figure 1-4 PC master communication settings

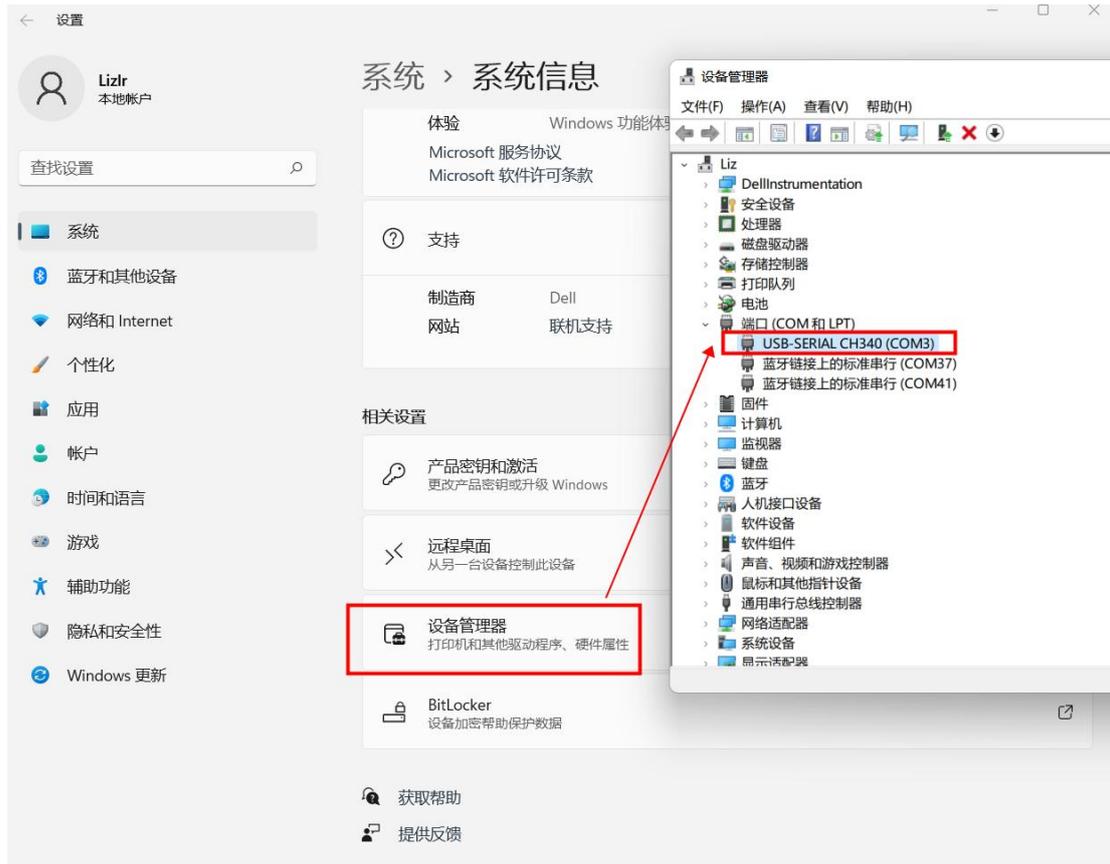


Figure 1-5 Computer Device Management

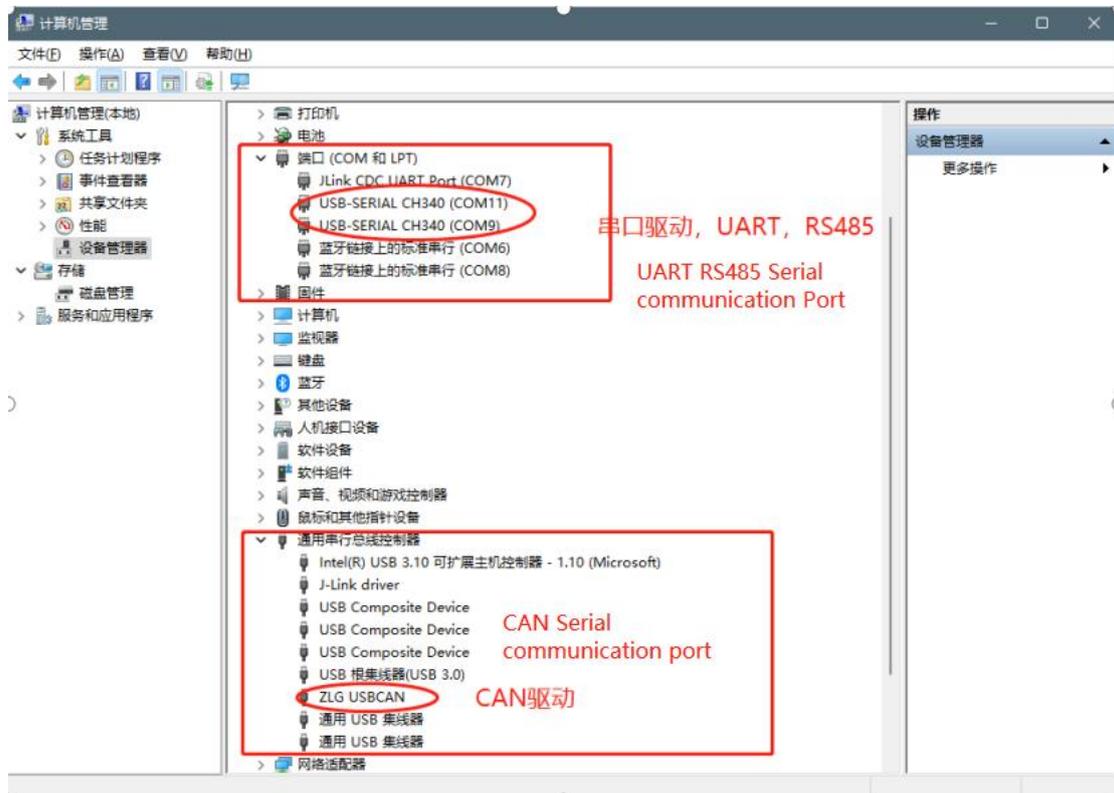


Figure 1-6 Computer Device Manager

If you need to connect CAN, first click ">>", as shown in **Figure 1-7**. Then set the corresponding items in the "CAN Settings" interface, as shown in **Figure 1-8**.

"CAN device" is written on the CAN box, the default is USB CAN-I, the default for "device index" and "CAN channel" is 0, and the default for "baud rate" is 250K. After the setting is completed, click "Enable CAN". After the setting is completed, the host computer can communicate with the BMS.

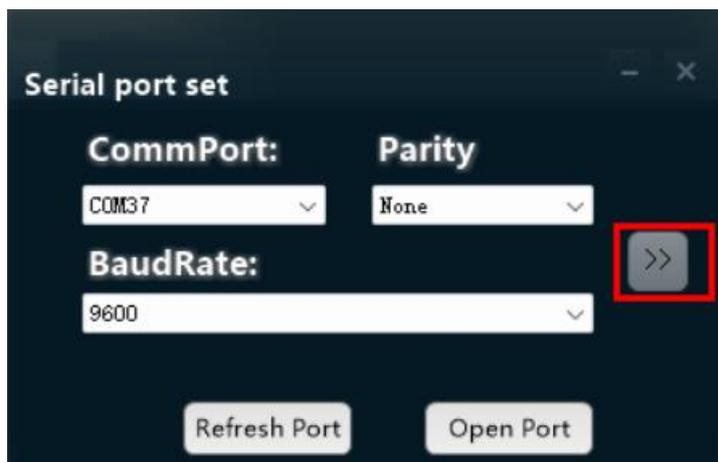


Figure 1-7 PC Master communication settings

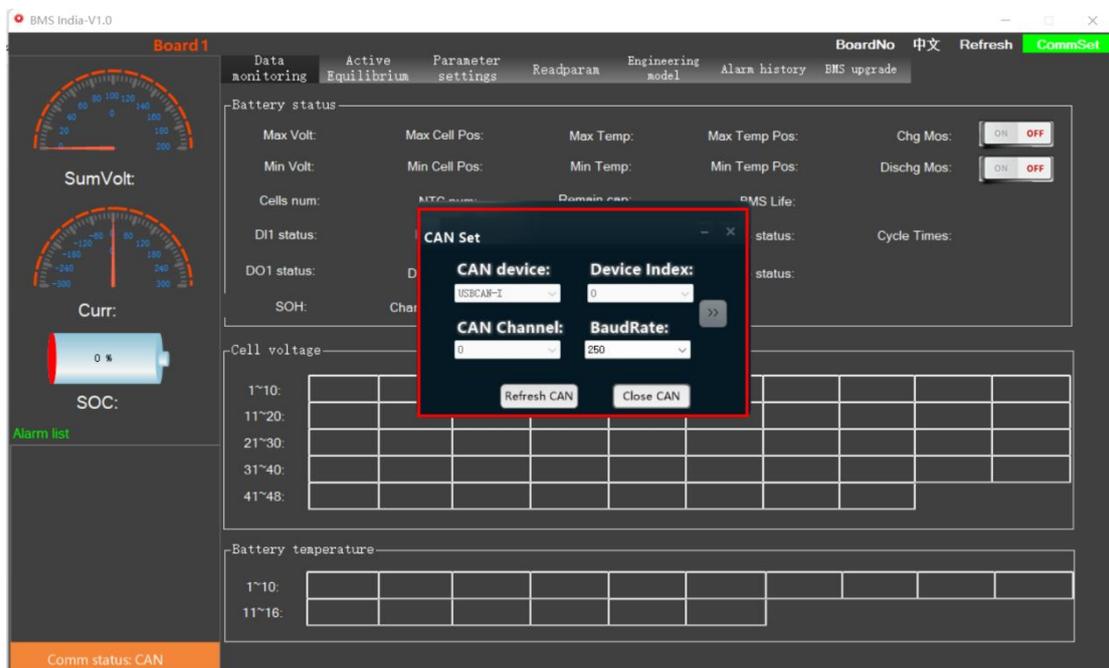


Figure 1-8 PC Master CAN communication settings

2. Introduction to the functions of the PC Master

2.1 Data Monitoring

The data on the data monitoring interface mainly includes battery voltage, current, temperature, SOC, charge and discharge MOS status, alarm list, etc., all of which require real-time data, as shown in **Figure 2-1**. The data refresh cycle of this interface is 1 second. When the communication is normally, the BMS life value are refreshing once, and the value changes cyclically.

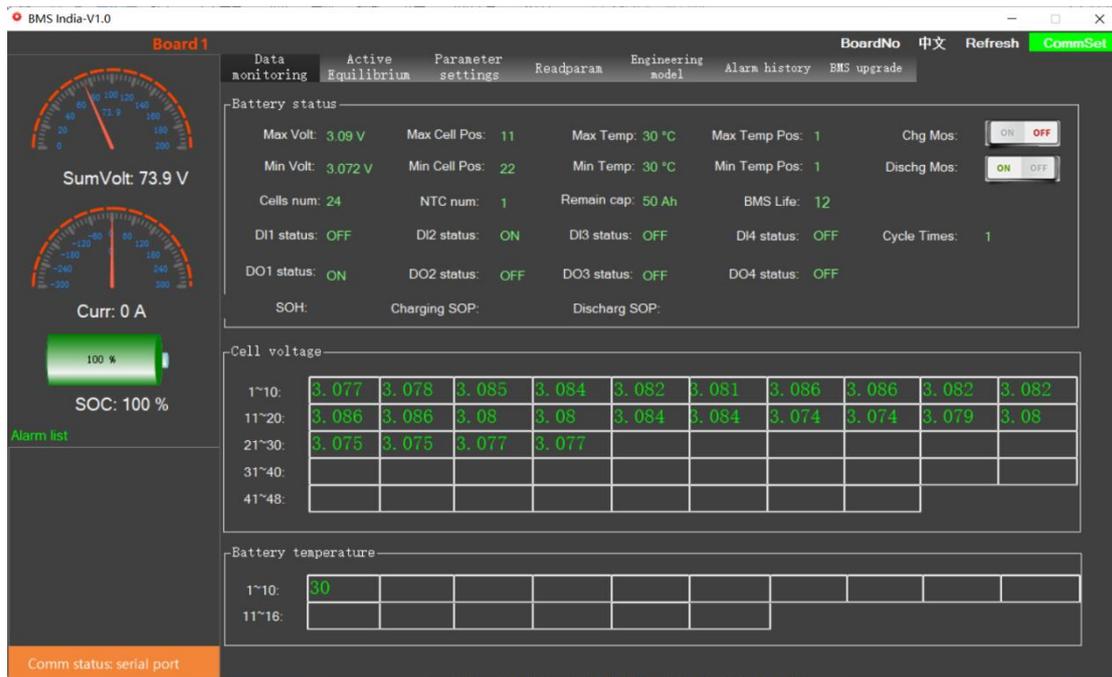


Figure 2-1 PC Master data monitoring interface

The data is detailed below:

- (1) "Total voltage": the total voltage of the battery pack, with an accuracy of 0.1V.
- (2) "Current": the charge and discharge current of the battery PACK, a positive

number means charging, a negative number means discharging, and the accuracy is 0.1A.

- (3) "SOC": state of charge (state of charge), indicating the percentage of remaining power of the battery PACK, with an accuracy of 0.1%.
- (4) "Alarm List": It is used to display the faults of the current BMS. The fault corresponds to the data ID "0x98" of the Lithium communication protocol. The default trigger fault can be protected, there are only three types of voltage protection, current protection, and temperature protection. Other faults only alarm but not protect.
- (5) "Communication status": indicates the connection status of the communication between the host computer and the BMS.
- (6) "Highest voltage": Indicates the highest voltage of a single cell of the battery pack, with an accuracy of 1mV.
- (7) "Minimum voltage": Indicates the minimum voltage of a single cell of the battery pack, with an accuracy of 1mV.
- (8) "Highest voltage position": Indicates which cell has the highest voltage.
- (9) "Lowest voltage position": Indicates which cell has the lowest voltage.
- (10) "Maximum temperature": indicates the maximum temperature with an accuracy of 1°C.
- (11) "Minimum temperature": Indicates the minimum temperature with an accuracy of 1°C.
- (12) "Highest temperature position": Indicates the highest temperature position.
- (13) "Lowest temperature position": Indicates the lowest temperature position.
- (14) "Charging MOS": Indicates the state of the charging MOSFET, ON means it is turned on and can be charged; OFF means it is not turned on and can't be charged.
- (15) "Discharge MOS": Indicates the state of the discharge MOSFET, ON means it is turned on and can be discharged; OFF means it is not conductive and cannot be discharged.
- (16) "Number of battery strings": Indicates the number of strings of battery

packs.

(17) "Number of Temperatures": Indicates the number of battery pack temperature controls.

(18) "Remaining capacity": Indicates the remaining capacity of the battery, with an accuracy of mAh.

(19) "BMS Life": Indicates whether the BMS is running, and Life will increase by one every second (0~255 cycles).

(20) "DI/O": Digital input/output (digital input/output), indicating the status of I/O.

(21) "Number of Charges and Discharges": indicates the number of charge and discharge cycles, total charging ampere hours/rated total ampere hours.

(22) "SOH": battery state of health.

(23) "Charging SOP": Charging SOP.

(24) "Discharging SOP": Discharging SOP.

(25) "Single voltage": Indicates the voltage of each cell of the battery pack, with an accuracy of 1mV.

(26) "Battery temperature": Indicates the temperature of each temperature control of the battery pack, with an accuracy of 1°C..

2.2 Active Balance

The active equalization function is used to read the BMS active equalization status information, and can set the battery PACK active equalization parameters. This page also has the functions of saving parameters, loading parameters, one-key setting, and one-key reading.

Active equalization is shown in **Figure 2-2**. Show:

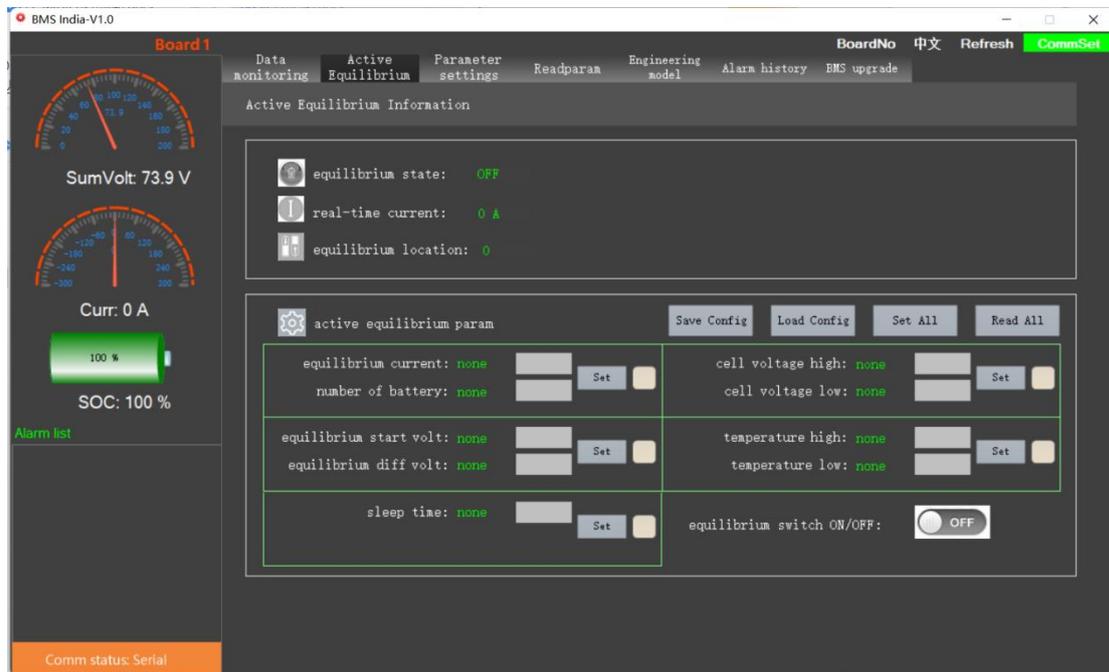


Figure 2-2 PC Master active equalization setting interface

2.2.1 Equalization Information

In the balance information bar, check the active balance on status, real-time current, and the battery position of the active balance.

2.2.2 Active Balance Parameters

The active equalization parameters are used to set the active equalization current, the number of strings, the equalization open voltage, the equalization open voltage difference, the sleep time, and the active equalization on or off parameters.

2.2.3 The special functions are as follows:

(1) Save parameters

Click to save the currently set parameters with one key, which can be using next time.

(2) Loading parameters

It is using to load parameters that have been set externally, instead of setting them one by one.

(3) One-key setting

After setting the parameters or after loading the parameters, click one key to set, or can set all the current parameters.

(4) One-click reading

Read all current parameters.

2.3 Parameter setting

The parameter setting function is using to set the basic parameters and protection parameters of the battery pack corresponding to the BMS. At present, BMS is suitable for NMC, LFP, LTO batteries. In addition, the interface also has functions such as "one key write", "save configuration", "load configuration", "quick setting" and so on.

2.3.1 Parameter description

Parameter setting interface, as shown in **Figure 2-3** below.

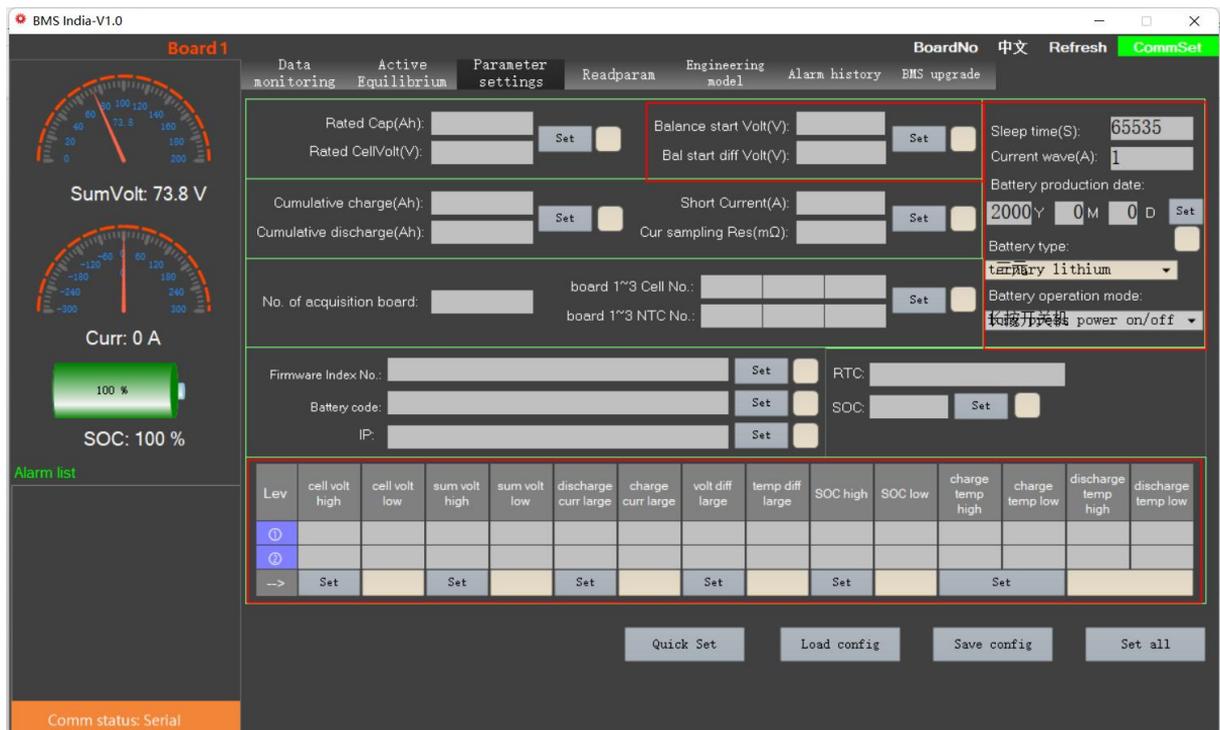


Figure 2-3 PC Master parameter setting interface

Description of special parameters:

(1) **Equalization parameters.** This parameter is a passive equalization setting parameter. The equalization opening conditions are charging, equalizing opening voltage, and equalizing opening voltage difference. After the passive equalization is turned on, you can check which string has the equalization turned on in the "Single Voltage".

(2) **Sleep time.** The sleep time is set to the number of seconds that the BMS waits to enter the low-power mode, that is, sleep, when there is no wake-up source. The wake-up source can be seen in "engineering mode", and the light is on to indicate that there is a wake-up source. As shown in **Figure 2-4**, it means that there is no wake-up source at present.

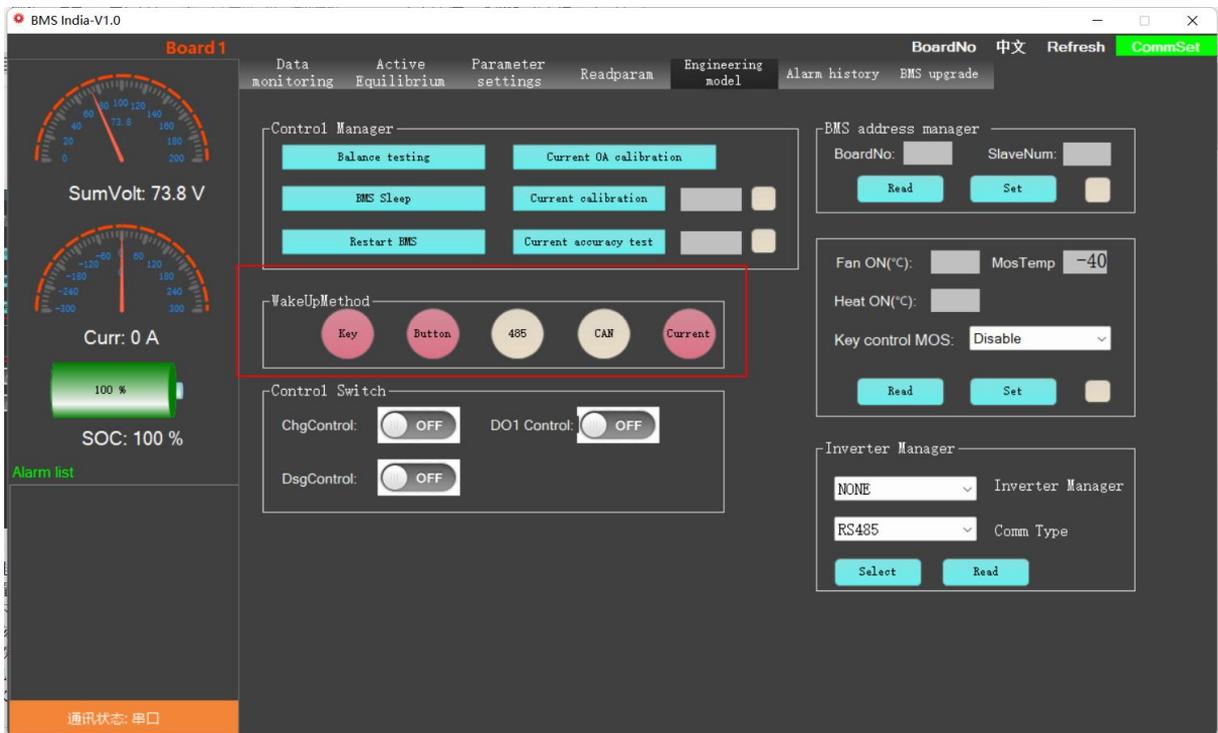


Figure 2-4 PC Master wake-up source

(3) **Current wave.** Due to the design of the electronic circuit, interference between electronic devices, environmental interference, and other factors, the BMS detects the current in the static state. Setting the zero drift means that the BMS will consider the current below the set value as an invalid current, still in a static state, and will not be included in the SOC's ampere-hour integral calculation.

(4) **Over voltage and Under voltage.** This value is set according to the characteristics of the battery. **Figure 2-5** NMC charging OCV, **Figure 2-6** NMC discharge OCV; **Figure 2-7** LFP charging OCV, **Figure 2-8** LFP discharging OCV; **Figure 2-9** LTO charging OCV, **Figure 2-10** LTO discharge OCV. The NMC over voltage protection value is 4.25V, and the Under voltage protection value is 2.7V; the LFP Over voltage protection value is 3.75, and the Under voltage protection value is 2.2V; the LTO Over voltage protection value is 2.75V, and the Under voltage protection value is 2.75V. The value is 1.7V.

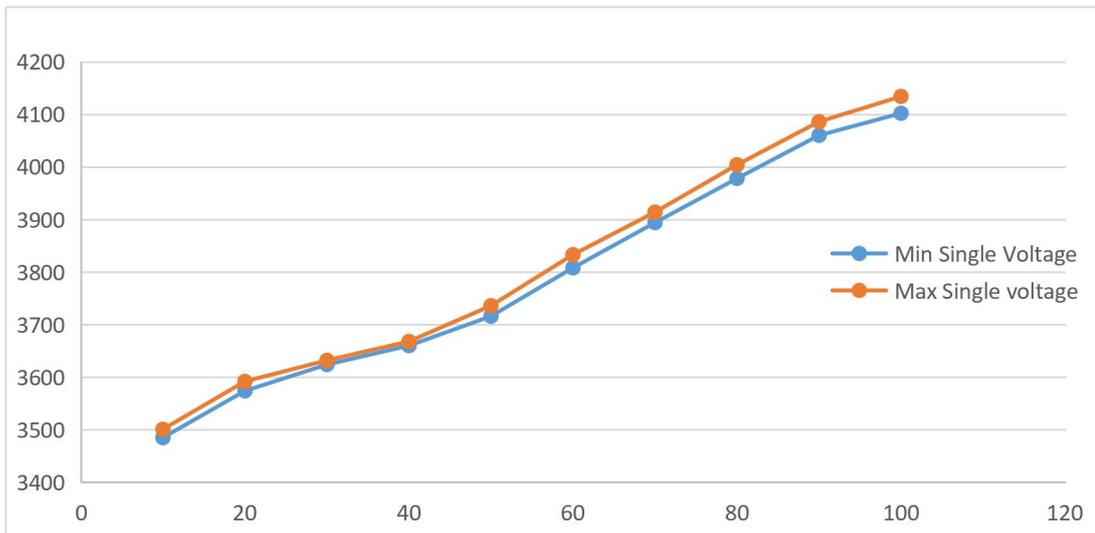


Figure 2-5 NMC Battery Charging OCV

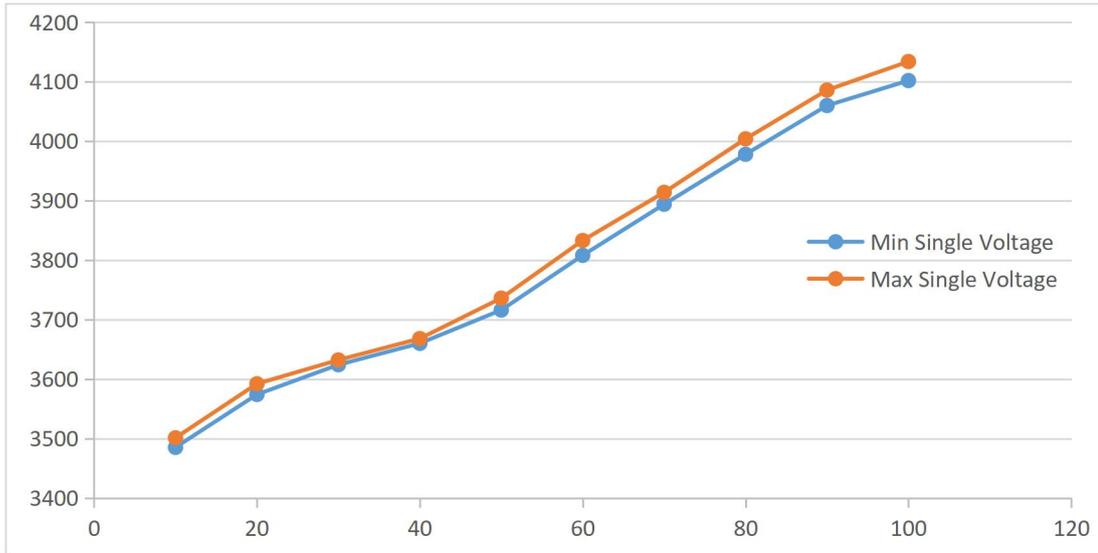


Figure 2-6 NMC Battery Discharging OCV

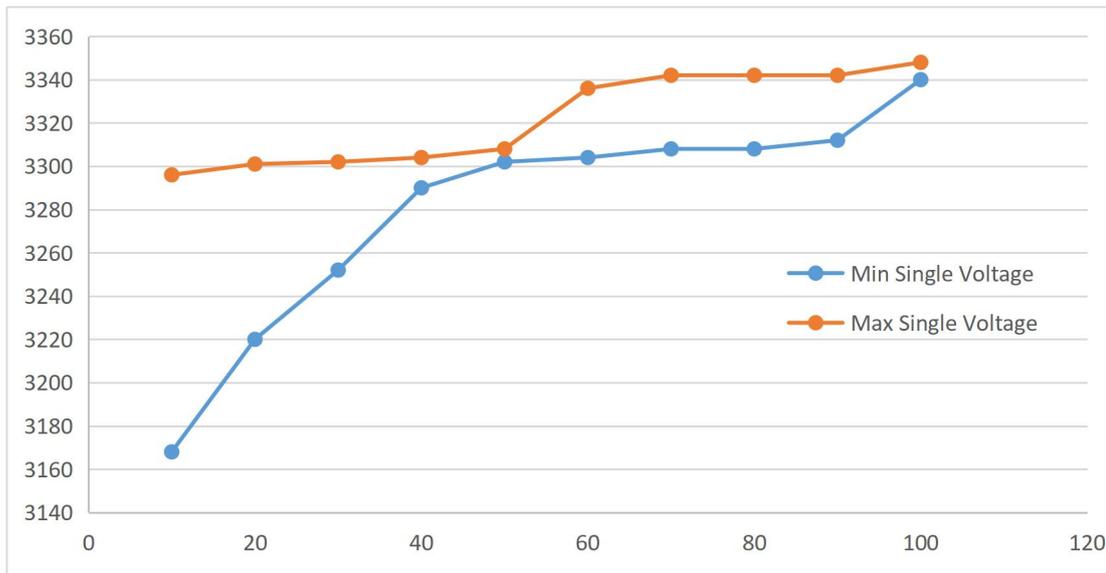


Figure 2-7 LFP Battery Charging OCV

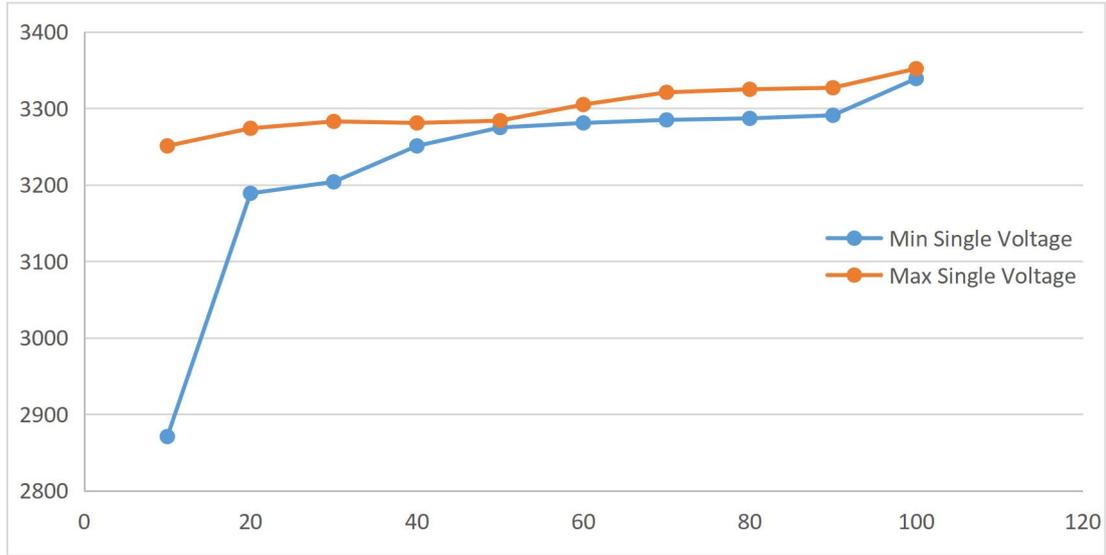


Figure 2-8 LFP Battery Discharging OCV

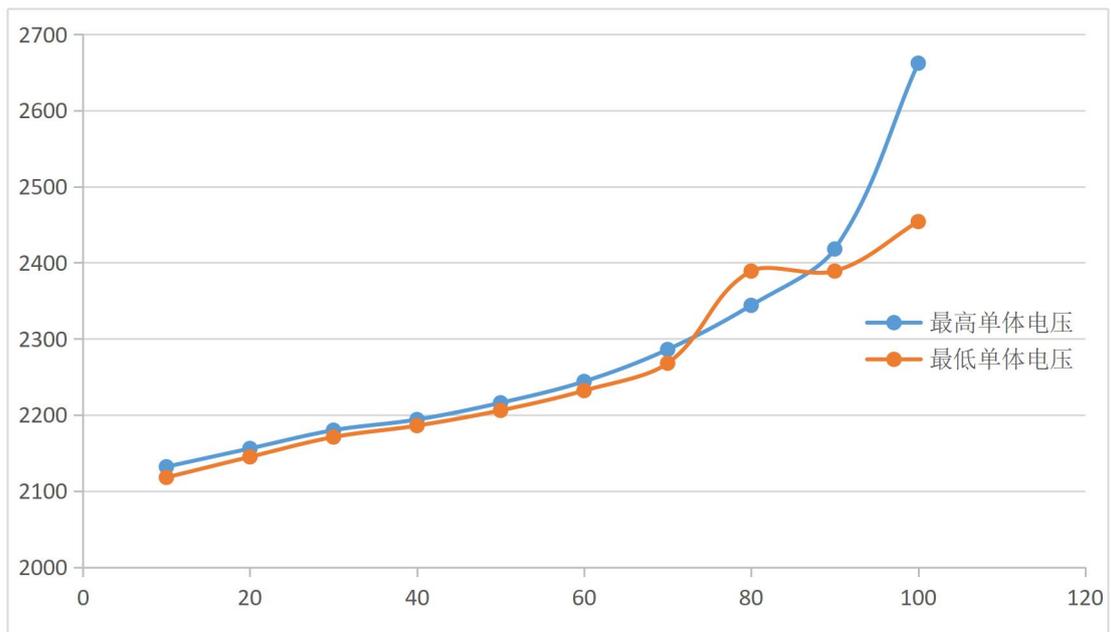


Figure 2-9 LTO Battery Charging OCV

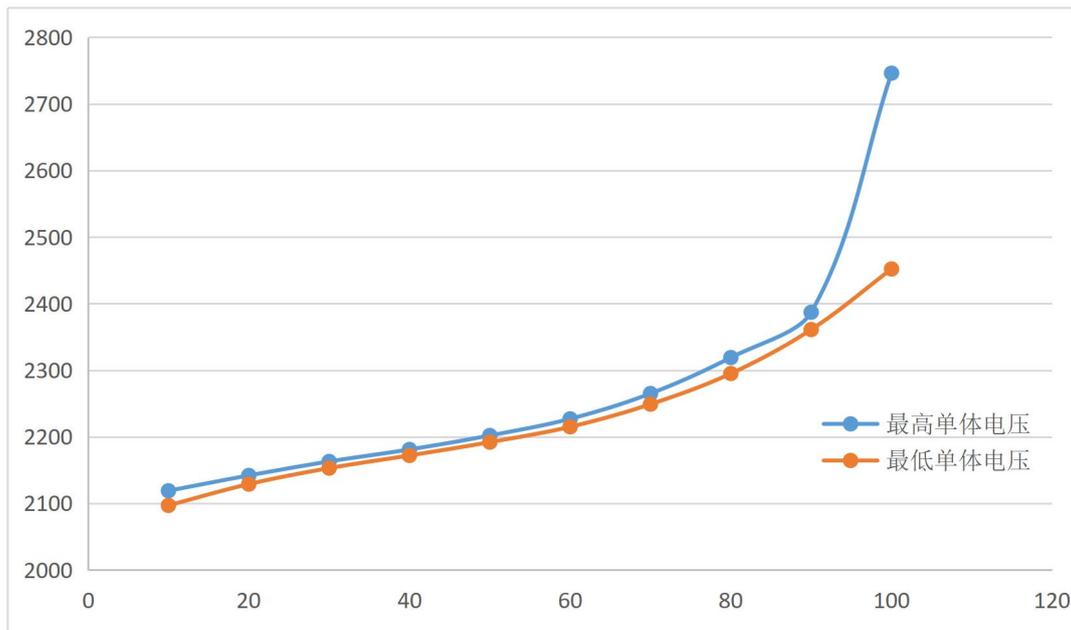


Figure 2-10 LTO Battery Discharging OCV

(5) SOC and RTC.

RTC sets the RTC of the protection board or interface board. This parameter requires the user to write the value of soc, and then click to set, the upper computer will print out the current time written to the RTC, and the historical alarm panel will print the correct time only after reading the historical data.

2.3.2 Set all data

One-click write can write all the data in the parameter setting interface into the BMS. When writing, the label after the parameter needs to have content, and the corresponding set of data must have content before writing. However, the waiting time for one-key writing is long. If you only modify a certain parameter, it's not recommended to use it. **Figure 2-11.**



Figure 2-11 Set all data to the PC Master

2.3.3 Save configuration

Save the configuration to save all the data content of the "parameter setting" interface. First click "Save Configuration", as shown in **Figure 2-12**. Then select the saved path, as shown in **Figure 2-13**.



Figure 2-12 PC Master saves the configuration

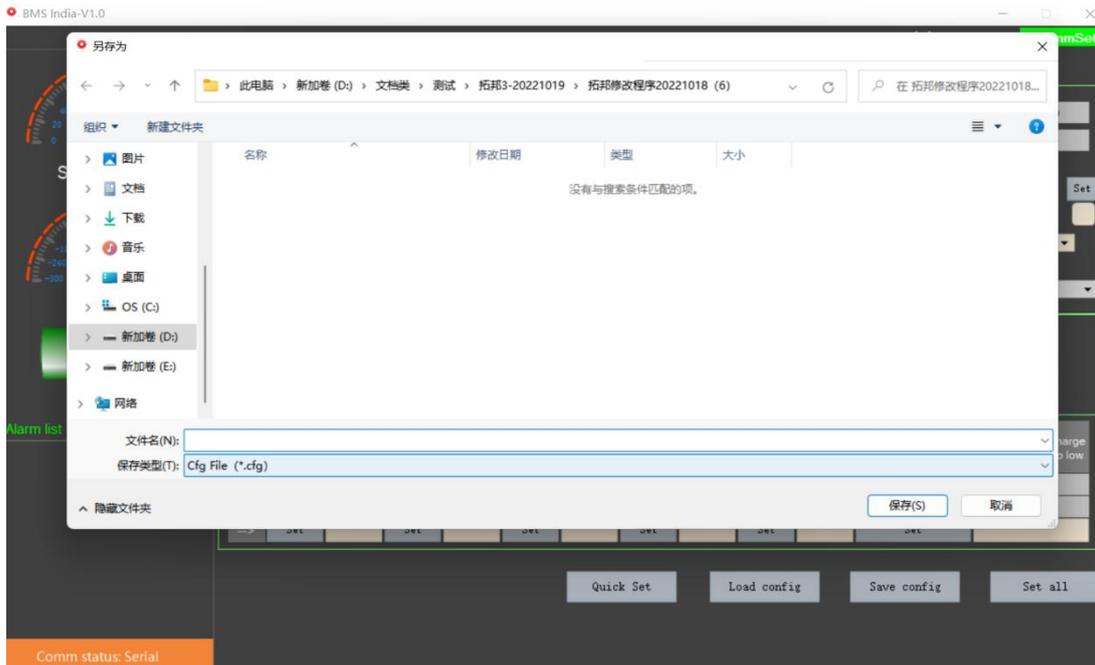


Figure 2-13 Save the configuration file path

2.3.4 Load configuration

Load configuration can load the local parameter configuration file into the PC Master. Click to load the file, select the local configuration file, and then load it into the host computer. **Figure 2-14.**

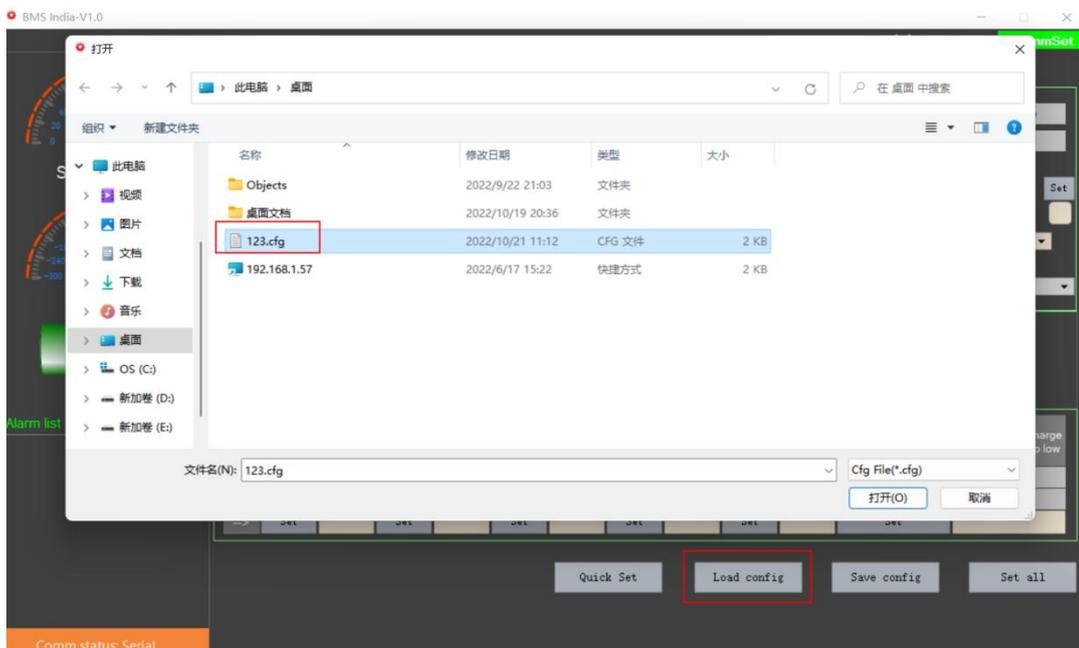


Figure 2 - 14 PC Master loads the configuration file

2.3.5 Quick Settings

In the parameter setting interface, some parameters are set according to the production order, and the rest can be configured as default parameters for shipment. The quick setting function is to set several parameters, and the rest are automatically loaded and calculated. First, fill in the content to be set in the label after the setting item, there are 6 items in total, and then click "Quick Settings".

The setting items are as follows:

- (1) Short circuit protection current, the label is the current of the order specification, such as 60A.
- (2) Current sampling resistor, the label of this item is the number of sampling resistors, such as 6.
- (3) The number of single collection boards, the label of this item is the number of battery strings of the BMS, such as 16+8.
- (4) The number of temperature of the collection plate, the label of this item is the temperature control number of the BMS, such as 1.
- (5) Battery type, select one of the check boxes, such as ternary.
- (6) The number of protection board acquisition chips, for example, the number of protection board acquisition chips is 1.

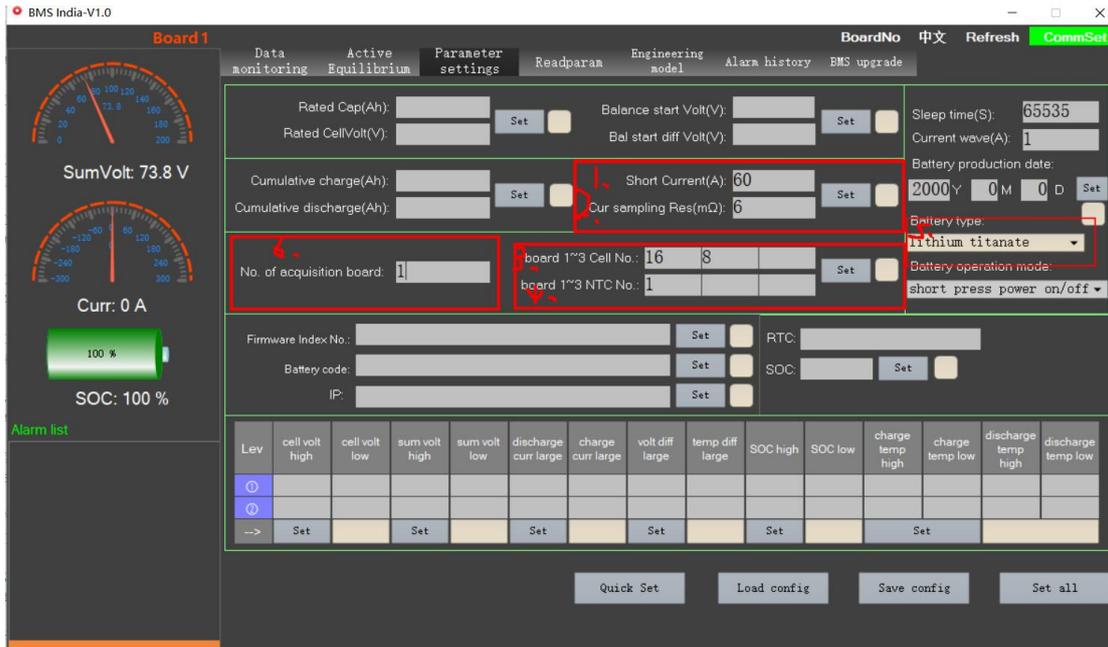


Figure 2-15 Quick setting of the PC Master

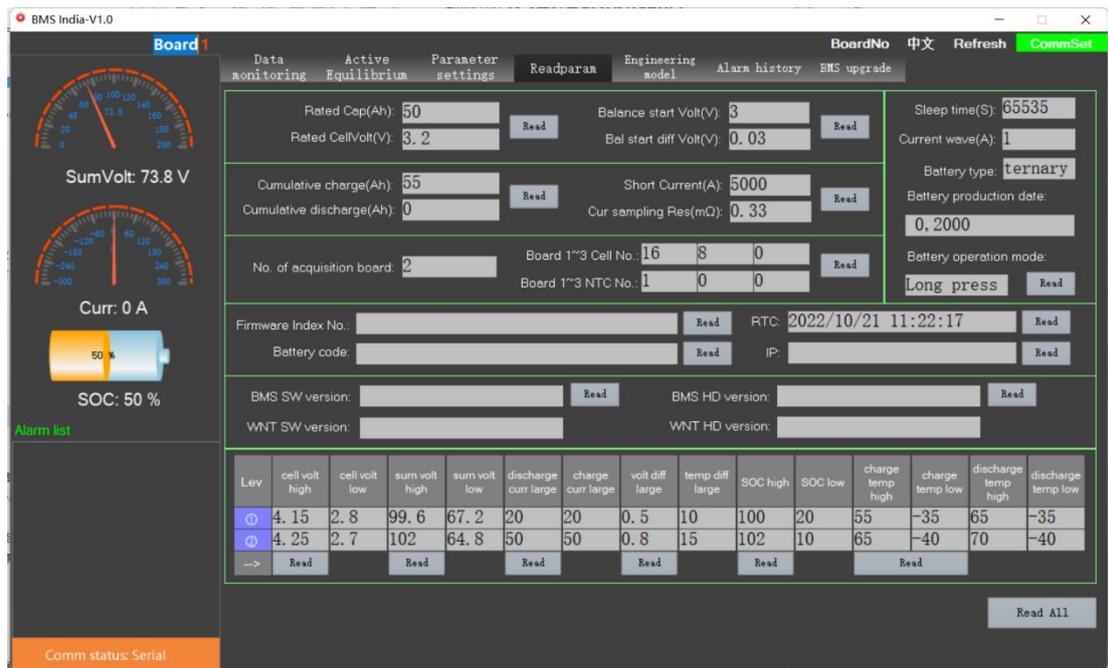


Figure 2 - 16 Display of the quick setting result of the PC Master

2.4 Parameter reading

The parameter reading function can obtain the basic battery parameters and protection parameters stored in the EEPROM in the BMS. At the same time, you can also check the software and hardware model scheme of BMS.

The "parameter reading" interface provides single-group reading and one-key full-reading functions. **Figure 2-17.**

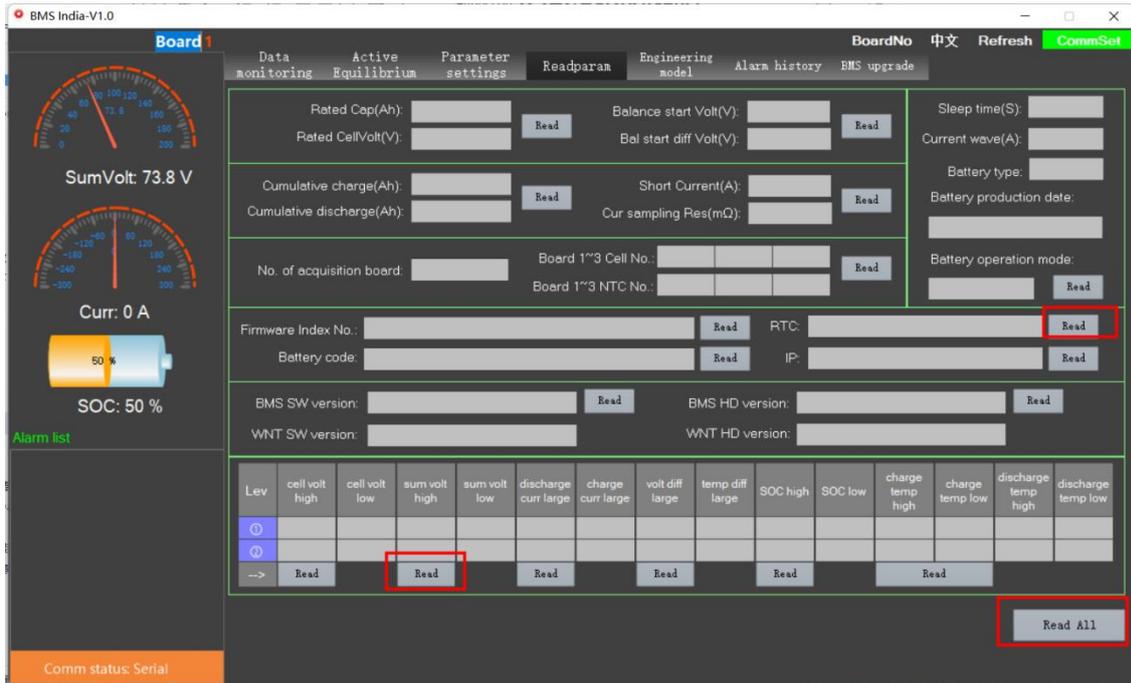


Figure 2 - 17 Read the parameters of the PC Master

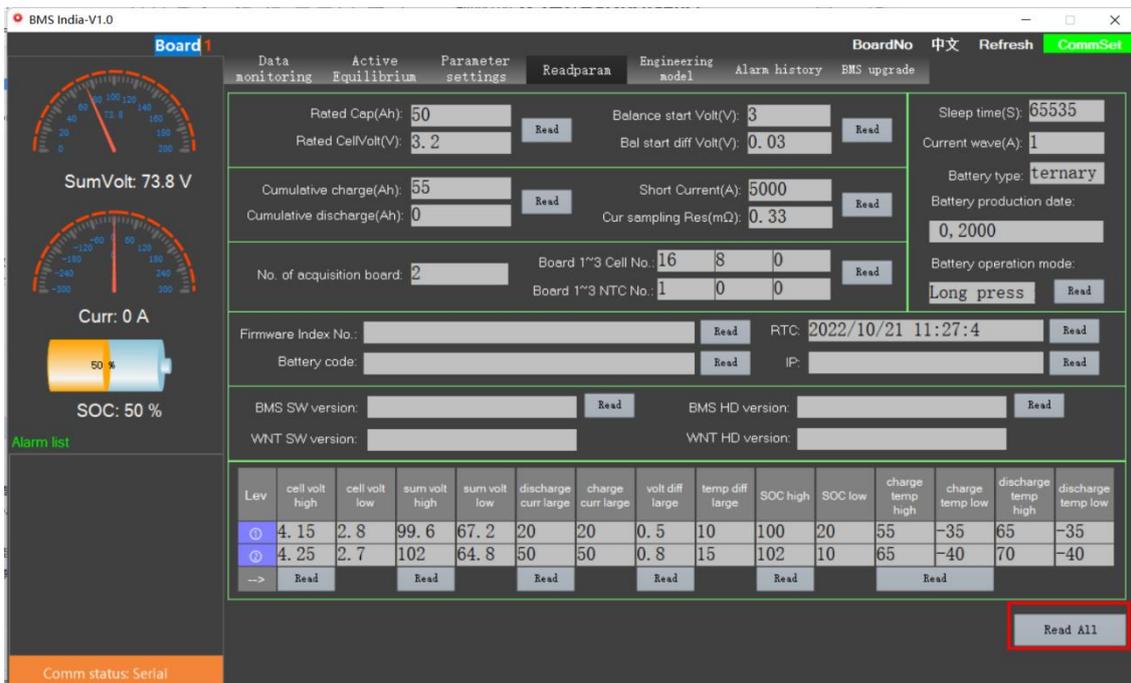


Figure 2 - 18 Read All of the PC Master

Although the "Read All" function can read all parameter values on the interface, it takes a long time. If you just want to know a single parameter value, it is recommended to use the "read" function.

Compared with "Parameter Setting" on the "Parameter Read" interface, read-only items have been added: software version number and hardware version number, interface board software version number, and hardware version number. **Figure 2-19.**

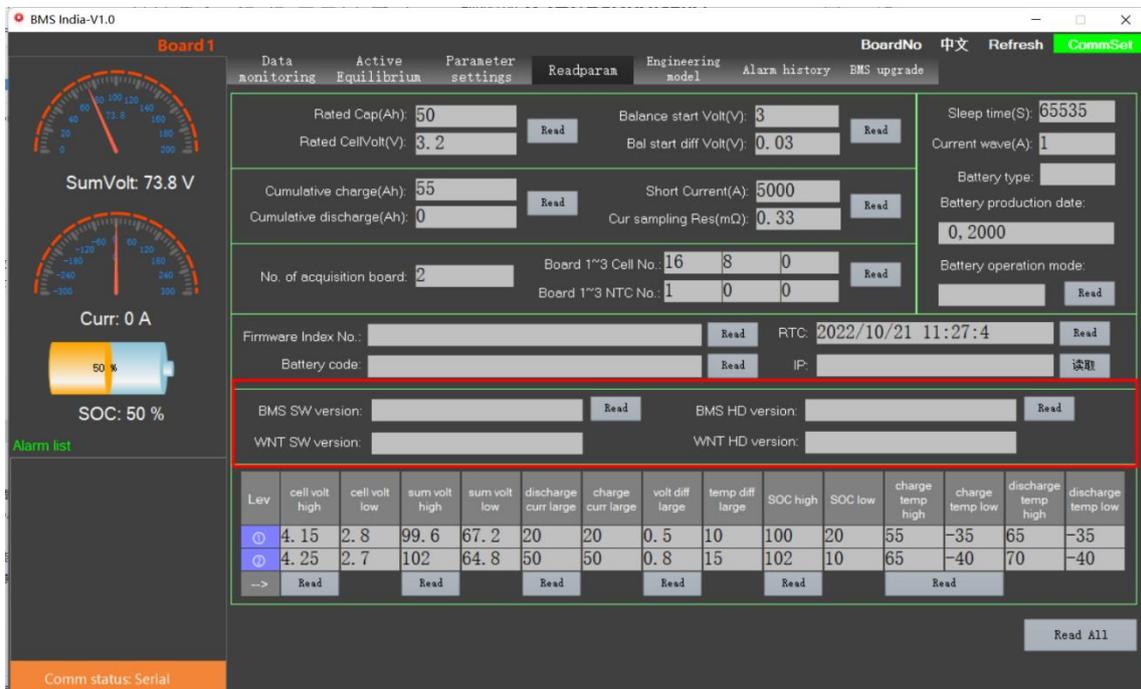


Figure 2 - 19 Software and hardware version numbers

"BMS hardware version number" records the hardware chip scheme selected by the BMS. For a total of thirteen characters, the first three digits are fixing as BMS, the middle is MCU, as shown in Table 2.1, and the last four digits are AFE, as shown in Table 2.2.

Table 2.2 MCU

MCU Abbreviation	MCU Full Name
ST103	STM32F103RBT6
ST030	STM32F030C8T6
GD230	GD32E230C8T6

Table 2.2 AFE

AFE Abbreviation	AFE Full Name
309E	SH367309
303E	SH367303
DVCE	MT DVC
9818	9818

"BMS software version number" records the project software version of the BMS. Total of thirteen characters, the first two digits represent the chip solution, the middle represents the release date, the last four digits are reserved, and the default represents the project code.

(1) The first item of the item number: 1, STM32F103; 2, STM32F030; 3, GD32E230.

(2) The second digit of the item number: 1, 309; 2, 303; 3, 9818; 4, DVC.

2.5 Engineering Mode

"Engineering Mode" is mainly a BMS function test, and special function parameter setting. The main functions include current calibration, restart/sleep BMS, equalization test, set board number, set heating/fan temperature, wake-up source, charge and discharge MOS control, DO1 control, and inverter protocol.

Figure 2-20.

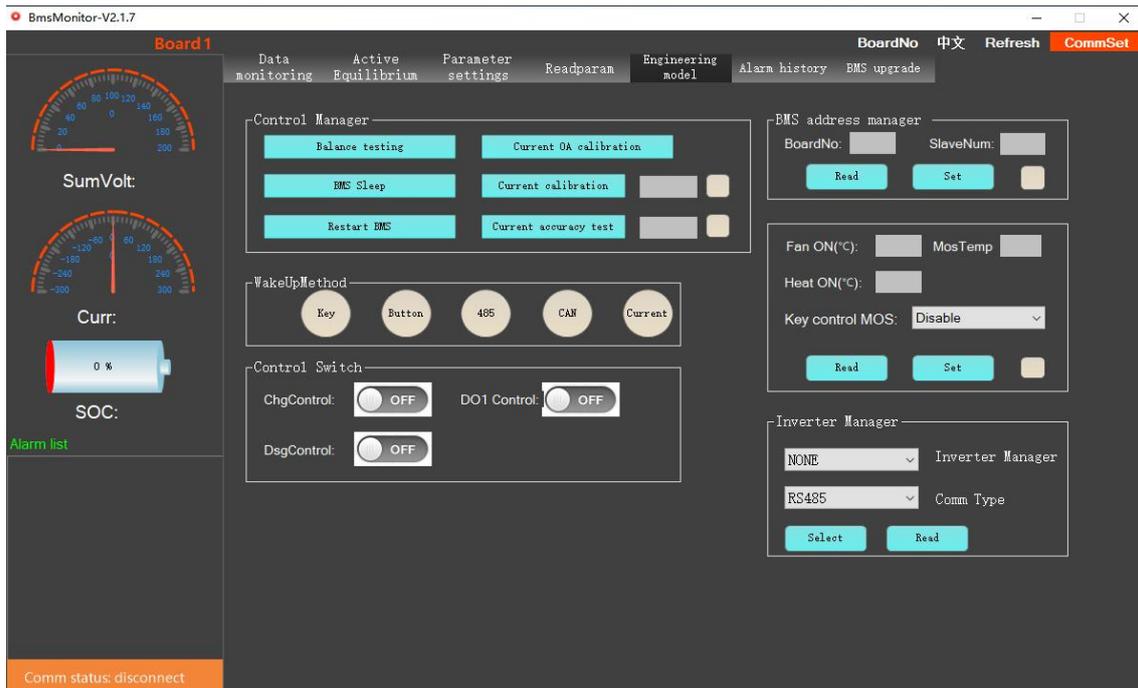


Figure 2-20 PC Master Engineering Mode Interface

Current calibration steps:

- (1) Set the current sampling resistor of the protection board in the parameter setting panel. **Figure 2-21.**
- (2) When the battery is not connected to the charger and load, click "Current 0A Calibration".
- (3) Charge or discharge the battery. For example, if the discharge is 10A, then enter "-10" in the input box next to "Current Calibration", and if it is charging 10A, then enter "10". Then click "Current Calibration". **Figure 2-22.**

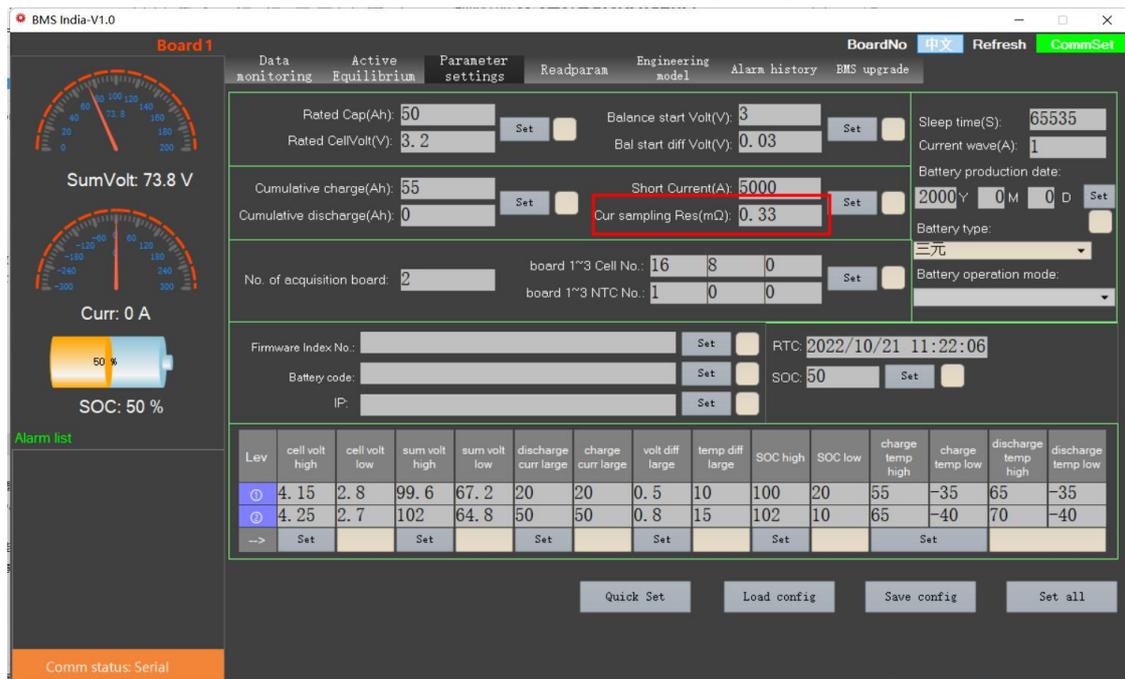


Figure 2-21 Setting the current sampling resistor of the BMS

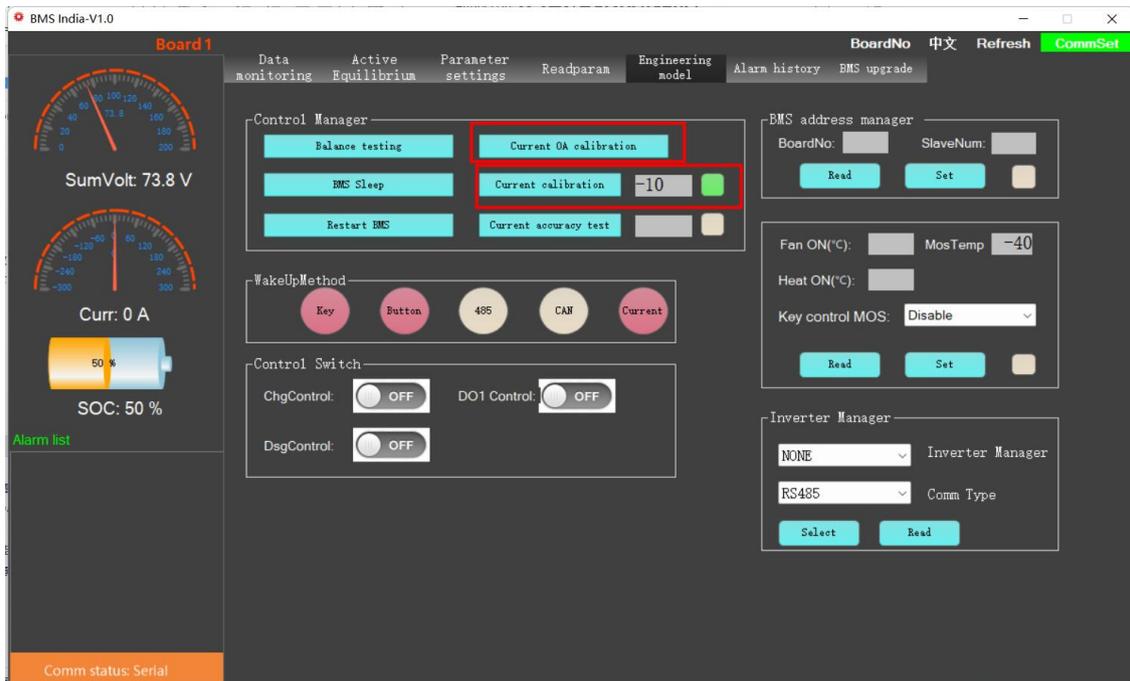


Figure 2 - 22 Current Calibration

Restart/Hibernate BMS: Click "Restart BMS", the BMS will perform software reset and restart. When the BMS is set not to sleep (sleep time 65535), it needs to be restarted, or it needs to be restarted when it is changed from not to sleep. The BMS also needs to be restarted when the protection recovery value is modified through the upgrade program and the protection is delayed. Click "Sleep BMS", the BMS enters the sleep mode and waits for the wake-up source to wake up the BMS. **Figure 2-23.**

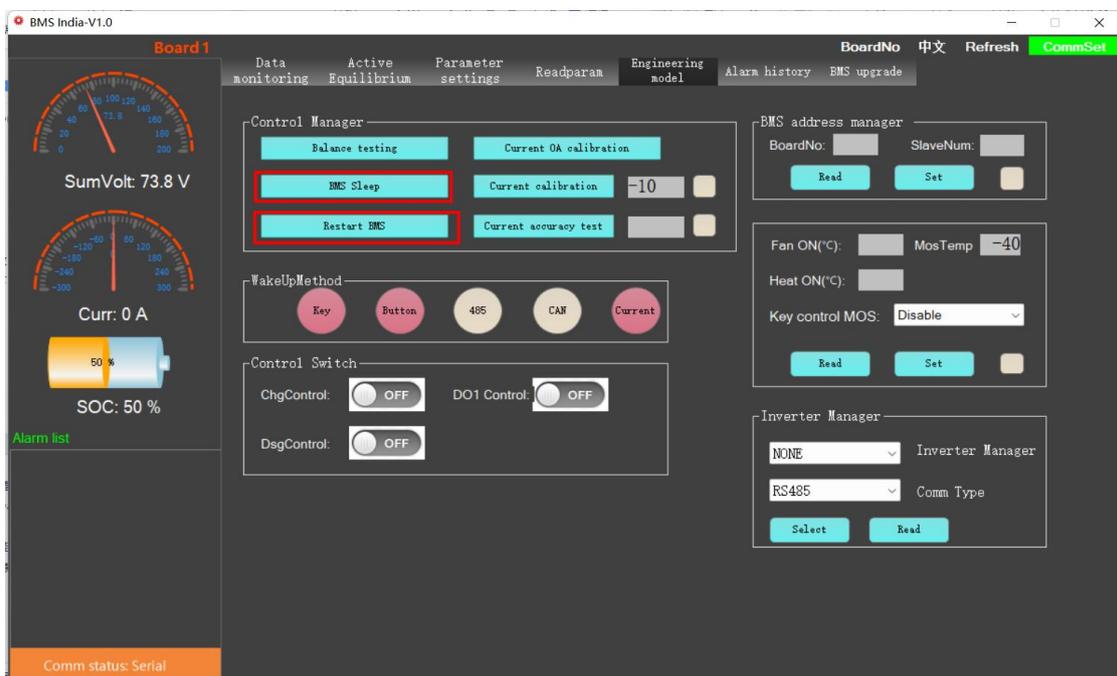


Figure 2-23 PC Master Restart/Hibernate BMS

Wake-up source: The wake-up source includes key KEY, button light board button or Bluetooth button, RS485 and CAN communication, charging and discharging current. **Figure 2-24.** If the BMS is not automatically activated when it power on for the first time, it can only be woken up by the "key" and "current" wake-up sources. But in the subsequent wake-up logic, the wake-up source can wake up. Pay special attention to the under-voltage fault of the BMS, it will go to sleep after 60 seconds. At this time, RS485 cannot be used, and the CAN communication wakes up the BMS.



Figure 2 - 24 Wake-up sources

Charge and discharge MOS control, DO1 control: click the switch to control. If it has not been clicked, this item is disabled by default.

Set board number: This item is used in parallel BMS. Set different board numbers for the BMS to distinguish the BMS on the bus. It can also be said that the board number is the number of the BMS, which is used to identify the BMS on a bus. The number of slave boards is not currently used, and can be set to 1, as shown in **Figure 2-25**. The default setting range of the base version software board number ranges from 0 to 7.

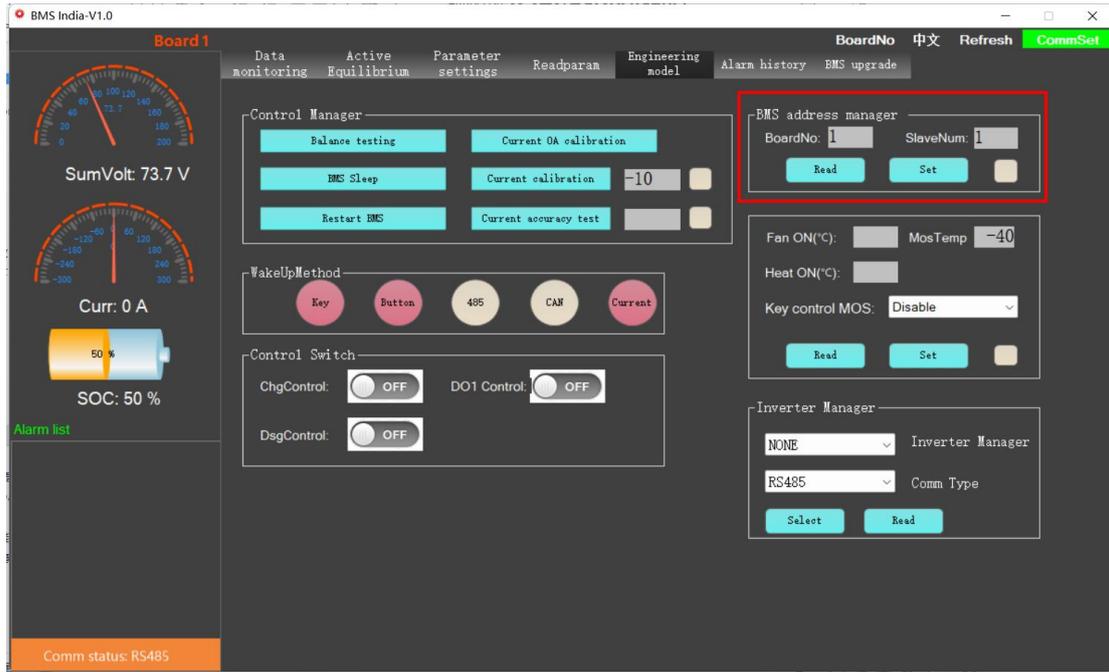


Figure 2 - 25 Set the board number

After modifying the board number, select BMS through "Board Number" to obtain the data of the current BMS. At present, the PC Master can switch to board No. 24 at most. **Figure 2-26.**

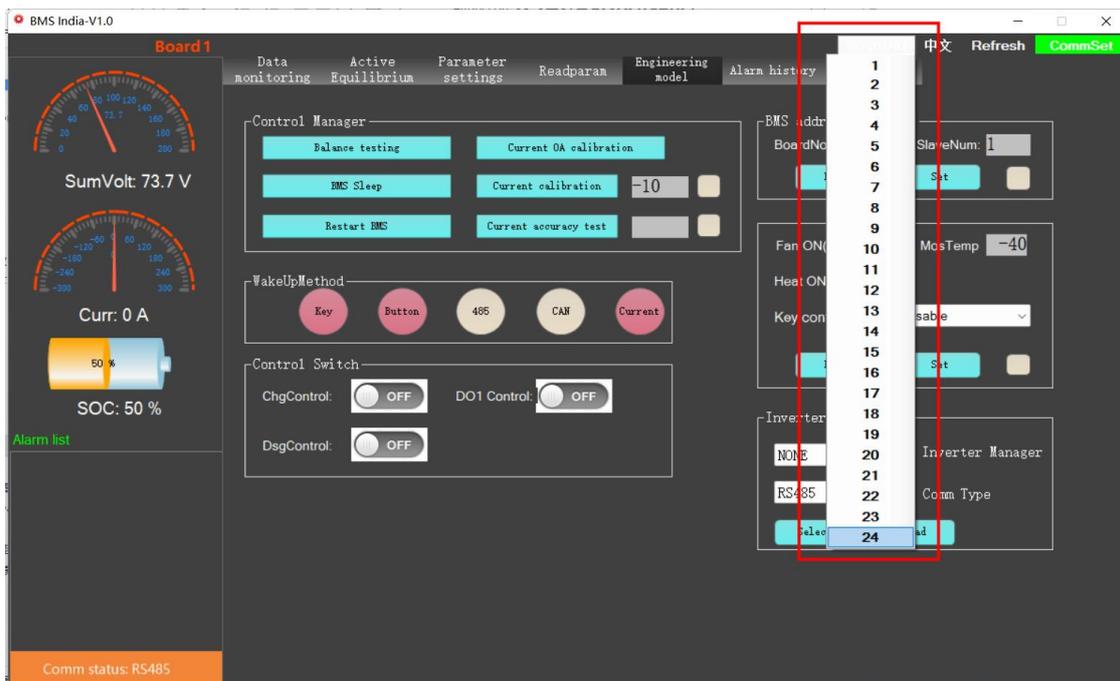


Figure 2-26 Switching the board number

Fan/Heat On: Set the fan and heat the temperature of the BMS. The MOS temperature indicates the temperature of the BMS protection board, and this temperature is the judgment temperature when the fan is turned on. The judgment temperature for heating is the temperature controlled by the BMS.

2.5 Historical Alarms

2.5.1 Historical alarms of the PC Master

(1) read

Click the "Read" button on the "Historical Alarm" interface to read the BMS historical alarm data. This feature is only available for 103 plans. 030 and 230 have not developed this function due to insufficient memory.

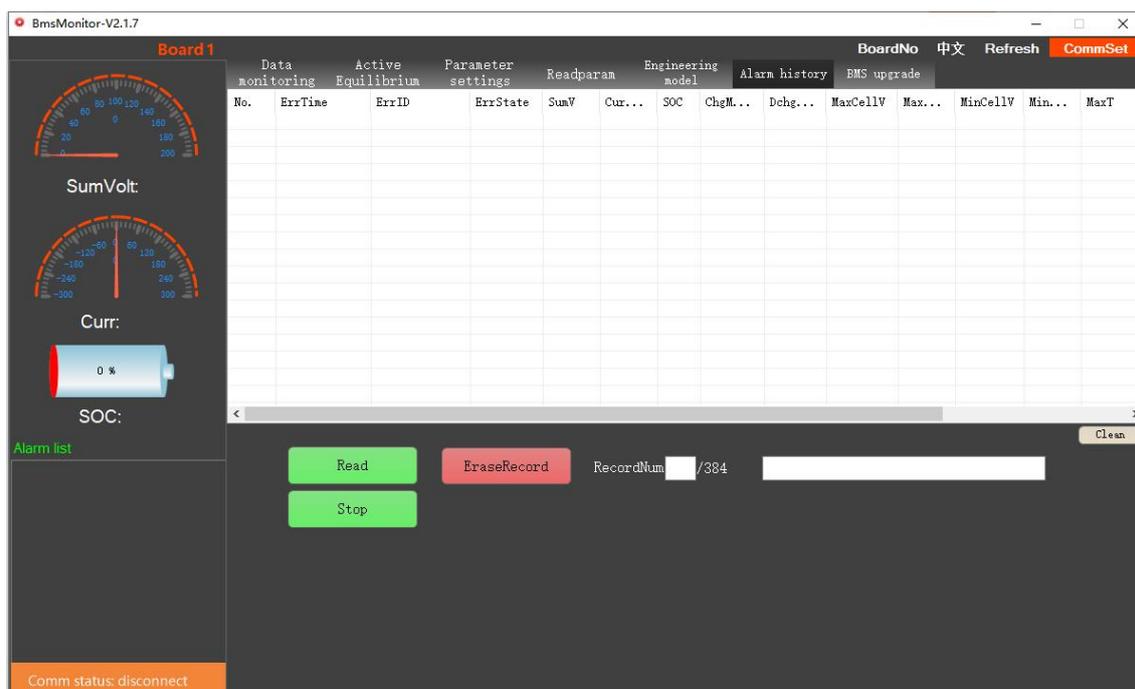


Figure 2-27 History alarm

(2) Stop button

Forcibly exit the "Read History Alarm" mode, and let the host computer re-poll the BMS data. When you click "Read" again, it starts from the first alarm and can read up to 384 historical data.

(3) Erase historical data

Clear the historical warning log data. After erasing the historical records, the protection board needs to be powered on again.

2.5.2 Host computer Save Data

After the communication between the host computer and the BMS is successful, the basic data of the BMS can be seen on the data interface. At the same time, the host computer will also save these data to local. The save location is in the Save Data folder in the same directory as PC Master. Compared with "historical alarm", the data saved by Save Data is more detailed and comprehensive. **Figure 2-28.**

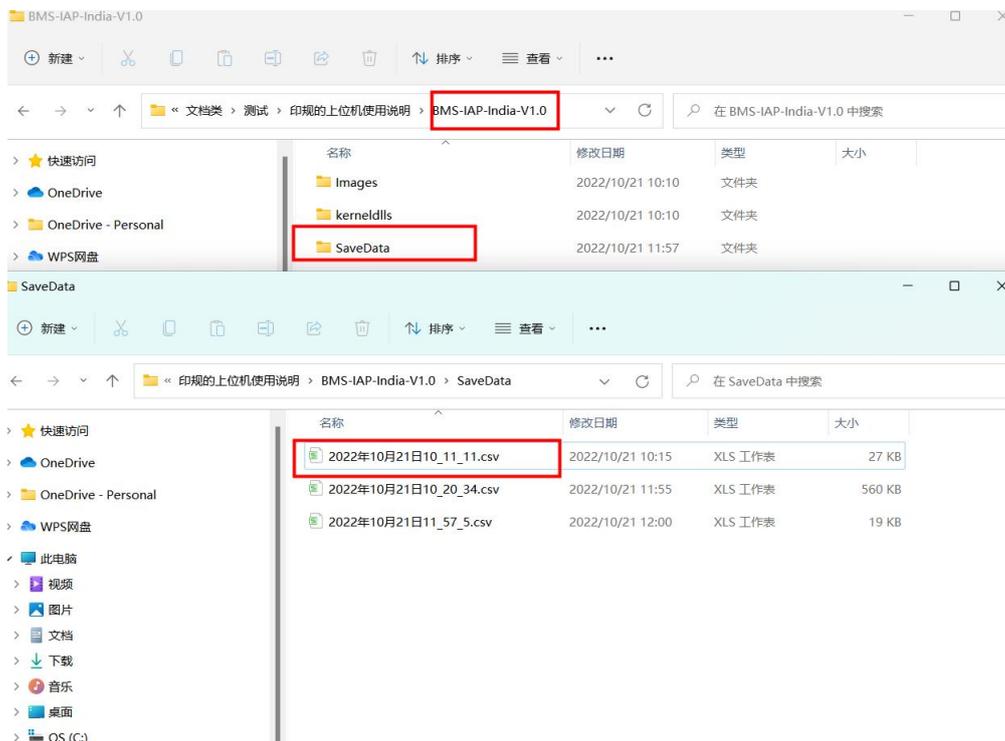
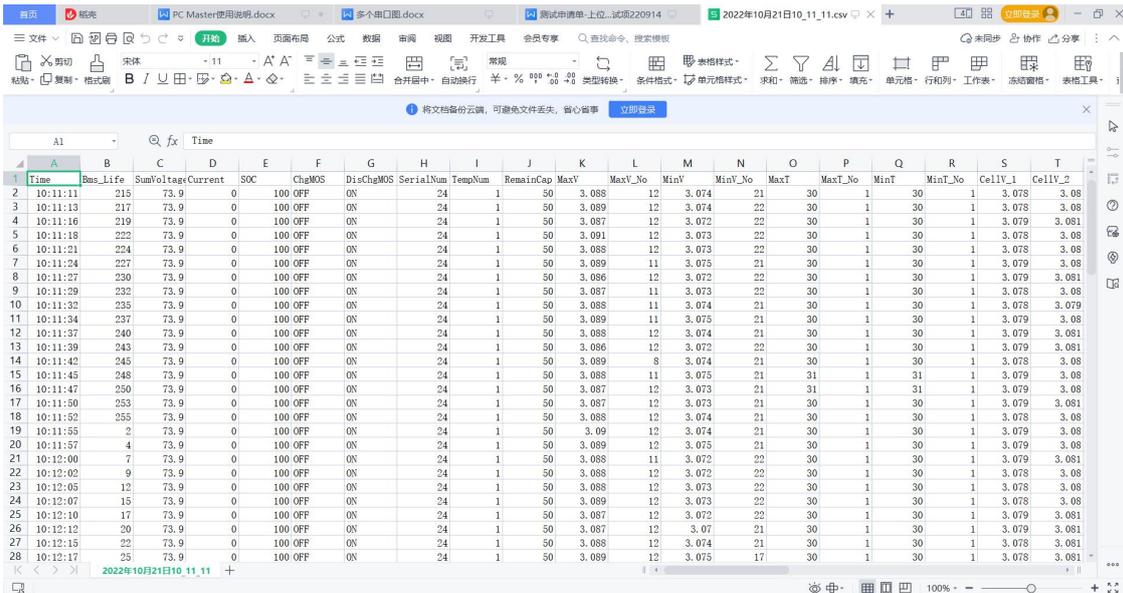


Figure 2 - 28 Save Data local path

The file name is the time when the host computer and BMS start to communicate, and the file format is "CSV". The table will save the time of writing data, and all

data in the "Data Monitoring" interface, as shown in **Figure 2-29**. The host computer obtains the "data monitoring" data for the timer event monitoring, and requests data from the BMS every second. However, saving data as a thread task may lose data at a certain time. And File Stream cannot be read and written at the same time. When connecting to the host computer, please do not open the write file of Save Data.



Time	Bms_Life	SumVoltage	Current	SOC	ChgMOS	DisChgMOS	SerialNum	TempNum	RemainCap	MaxV	MinV	MinV_No	MaxT	MaxT_No	MinT	MinT_No	CellV_1	CellV_2	
10:11:11	215	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.074	21	30	1	30	1	3.078	3.08
10:11:13	217	73.9	0	100 OFF	ON		24	1	50	3.089	12	3.074	22	30	1	30	1	3.078	3.08
10:11:16	219	73.9	0	100 OFF	ON		24	1	50	3.087	12	3.072	22	30	1	30	1	3.079	3.081
10:11:18	222	73.9	0	100 OFF	ON		24	1	50	3.091	12	3.073	22	30	1	30	1	3.078	3.08
10:11:21	224	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.073	22	30	1	30	1	3.078	3.08
10:11:24	227	73.9	0	100 OFF	ON		24	1	50	3.089	11	3.075	21	30	1	30	1	3.079	3.08
10:11:27	230	73.9	0	100 OFF	ON		24	1	50	3.086	12	3.072	22	30	1	30	1	3.079	3.081
10:11:29	232	73.9	0	100 OFF	ON		24	1	50	3.087	11	3.073	22	30	1	30	1	3.078	3.08
10:11:32	235	73.9	0	100 OFF	ON		24	1	50	3.088	11	3.074	21	30	1	30	1	3.078	3.079
10:11:34	237	73.9	0	100 OFF	ON		24	1	50	3.089	11	3.075	21	30	1	30	1	3.079	3.08
10:11:37	240	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.074	21	30	1	30	1	3.079	3.081
10:11:39	243	73.9	0	100 OFF	ON		24	1	50	3.086	12	3.072	22	30	1	30	1	3.079	3.081
10:11:42	245	73.9	0	100 OFF	ON		24	1	50	3.089	8	3.074	21	30	1	30	1	3.078	3.08
10:11:45	248	73.9	0	100 OFF	ON		24	1	50	3.088	11	3.075	21	31	1	31	1	3.079	3.08
10:11:47	250	73.9	0	100 OFF	ON		24	1	50	3.087	12	3.073	21	31	1	31	1	3.079	3.08
10:11:50	253	73.9	0	100 OFF	ON		24	1	50	3.087	12	3.073	21	30	1	30	1	3.079	3.081
10:11:52	255	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.074	21	30	1	30	1	3.078	3.08
10:11:55	2	73.9	0	100 OFF	ON		24	1	50	3.09	12	3.074	21	30	1	30	1	3.079	3.08
10:11:57	4	73.9	0	100 OFF	ON		24	1	50	3.089	12	3.075	21	30	1	30	1	3.079	3.08
10:12:00	7	73.9	0	100 OFF	ON		24	1	50	3.088	11	3.072	22	30	1	30	1	3.079	3.081
10:12:02	9	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.072	22	30	1	30	1	3.078	3.08
10:12:05	12	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.073	22	30	1	30	1	3.078	3.08
10:12:07	15	73.9	0	100 OFF	ON		24	1	50	3.089	12	3.073	22	30	1	30	1	3.078	3.08
10:12:10	17	73.9	0	100 OFF	ON		24	1	50	3.087	12	3.072	22	30	1	30	1	3.079	3.081
10:12:12	20	73.9	0	100 OFF	ON		24	1	50	3.087	12	3.07	21	30	1	30	1	3.079	3.081
10:12:15	22	73.9	0	100 OFF	ON		24	1	50	3.088	12	3.074	21	30	1	30	1	3.078	3.081
10:12:17	25	73.9	0	100 OFF	ON		24	1	50	3.089	12	3.075	17	30	1	30	1	3.078	3.081

Figure 2-29 Save Data

Since the "CSV" table encoding is utf-8, it will be garbled when opened with some excel that recognizes the ANSI encoding format, so the encoding of the file needs to be changed. First, open with Notepad, then save as select the encoding format. The operation steps are as follows.

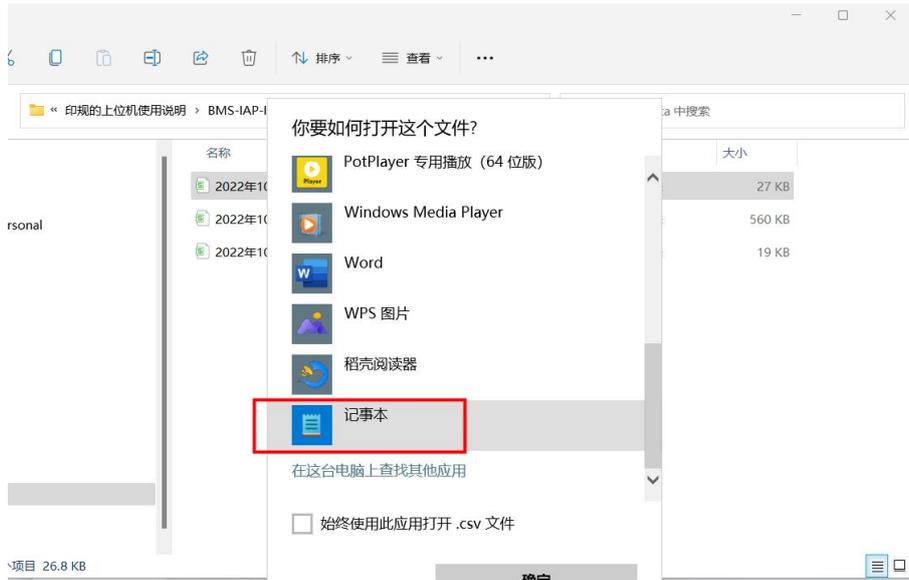


Figure 2-30 Notepad to open the CSV file

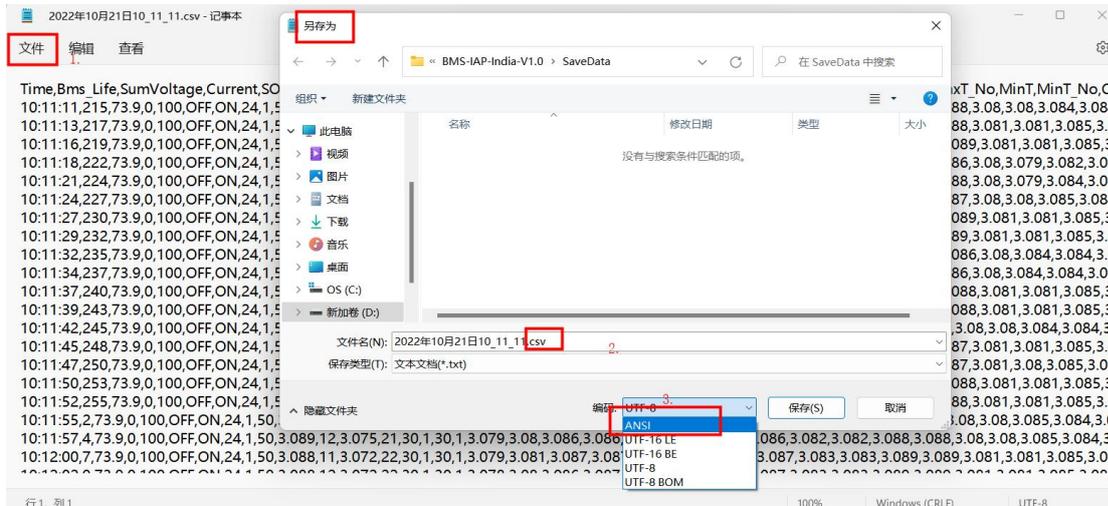


Figure 2-31 Save as CSV file

2.6 BMS upgrade

2.6.1 BMS upgrade function

BMS uses the IAP (In Application Programming) design scheme to complete the software upgrade. IAP mainly includes Boot Loader and App programs. After the BMS receives the upgrade request from the host computer, the Boot Loader erases the App (Using Flash). Then receive the upgrade file sent by the PC Master and write it into the App. The steps to upgrade BMS using the PC Master are as follows:

- (1) **The PC Master communicates with the BMS.** Check the "Communication Status" to see if the connection is successful. At this time, don't care whether there is data in "Data Monitoring", because the APP may have been erased.
- (2) **Click "Open Upgrade Program"** to load the upgrade file into the host computer, or directly drag the upgrade file into the "BMS Upgrade" interface.

Figure 2-32.

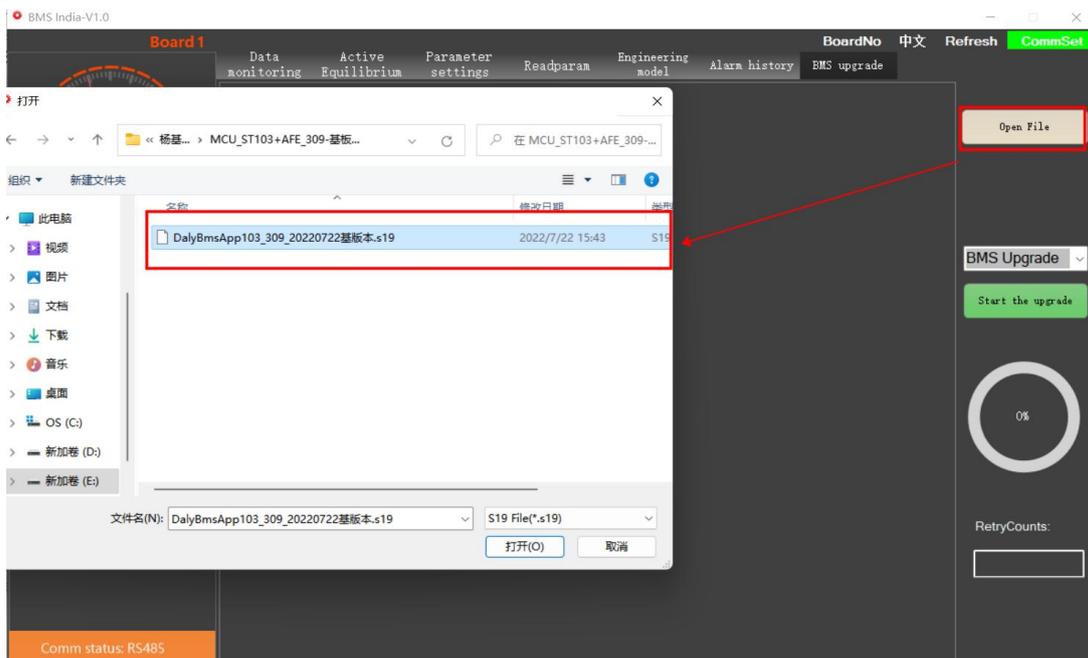


Figure 2-32 Open S19 file to upgrade

(3) Click "Start Upgrade" and wait for the upgrade.

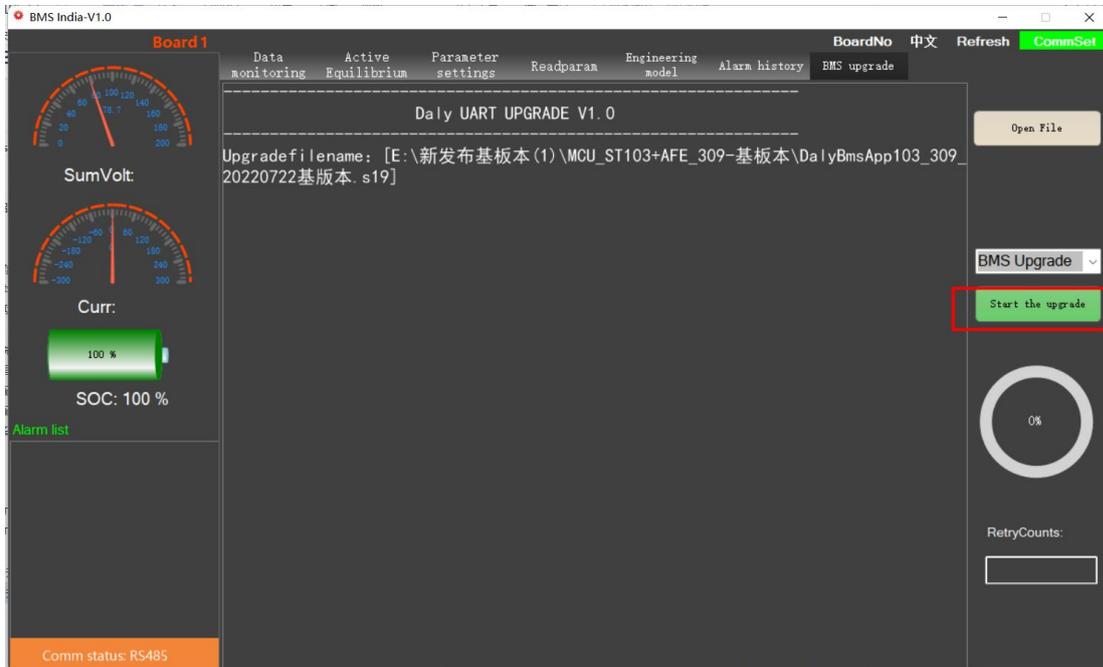


Figure 2 - 32 Click to start the upgrade

2.6.2 Notes on BMS Upgrade

The upgrade program matches the BMS. The current BMS software versions are 103+303, 103+309, 030+303, 030+309, 230+303, 230+309.

Before upgrading, make sure the program matches the BMS. In addition to the software and hardware version numbers, you can also confirm the MCU through the boot version. "V1.01.1E" is 103; "V2.01.1E" is 030; "V3.01.1E" is 230. The scheme of collecting chips can be directly determined by the number of strings, three-five strings are 303, and more than six strings are 309.

Upgrade failed, BMS has no data. During the fourth step of the IAP upgrade, the APP program will be erased. The BMS has no data at this time. The BMS upgrade is completed by Boot, and you don't need to worry about whether there is data, just perform the upgrade operation directly.

2.7 Universal Interface Board (WNT) upgrade

2.7.1 Universal Interface Board (WNT) upgrade function

Universal Interface Board (WNT) uses the IAP (In Application Programming) design scheme to complete the software upgrade. IAP mainly includes Boot Loader and App programs. After the BMS receives the upgrade request from the host computer, the Boot Loader erases the App (Using Flash). Then receive the upgrade file sent by the PC Master and write it into the App. The steps to upgrade BMS using the PC Master are as follows:

(1) **The PC Master communicates with the Universal Interface Board (WNT).** Check the "Communication Status" to see if the connection is successful. At this time, don't care whether there is data in "Data Monitoring", because the APP may have been erased.

(2) **Click "Open Upgrade Program"** to load the upgrade file into the host computer, or directly drag the upgrade file into the "Universal Interface Board (WNT) Upgrade" interface. **Figure 2-33.**

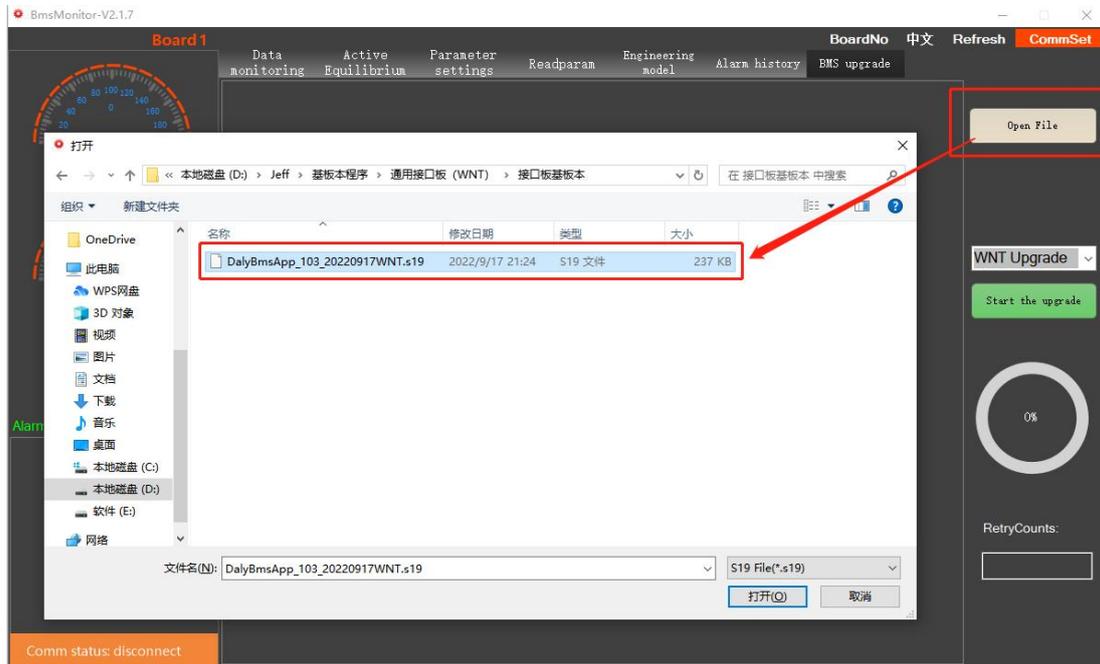


Figure 2-33 Open S19 file to upgrade

(3) Click "Start Upgrade" and wait for the upgrade.

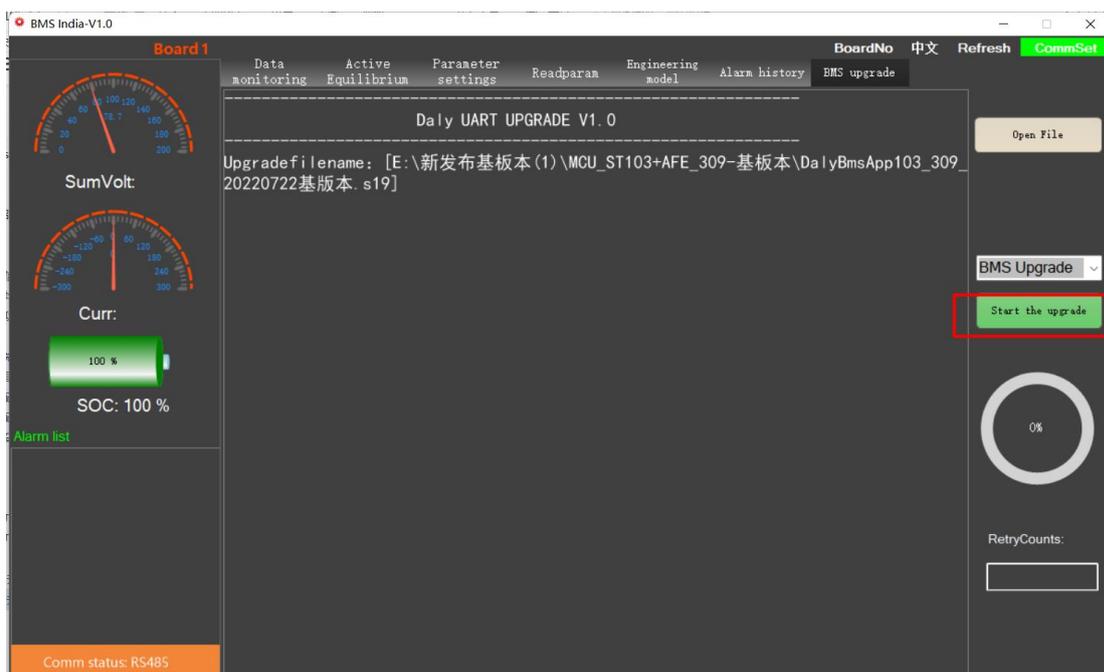


Figure 2 - 34 Click to start the upgrade

