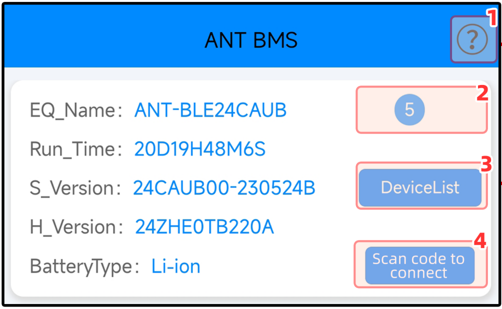
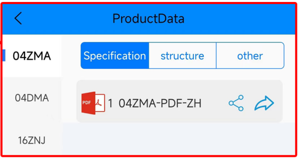
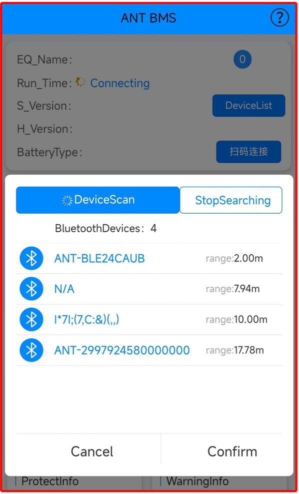
1.Real-time status page description introduction



EQ_Name: ANT-BLE24CAUB
Run_Time: 20D19H48M6S
S_Version: 24CAUB00-230524B
H_Version: 24ZHE0TB220A
BatteryType: Li-ion



1 04ZMA-PDF-ZH



EQ_Name:
Run_Time: Connecting
S_Version:
H_Version:
BatteryType:

BluetoothDevices: 4

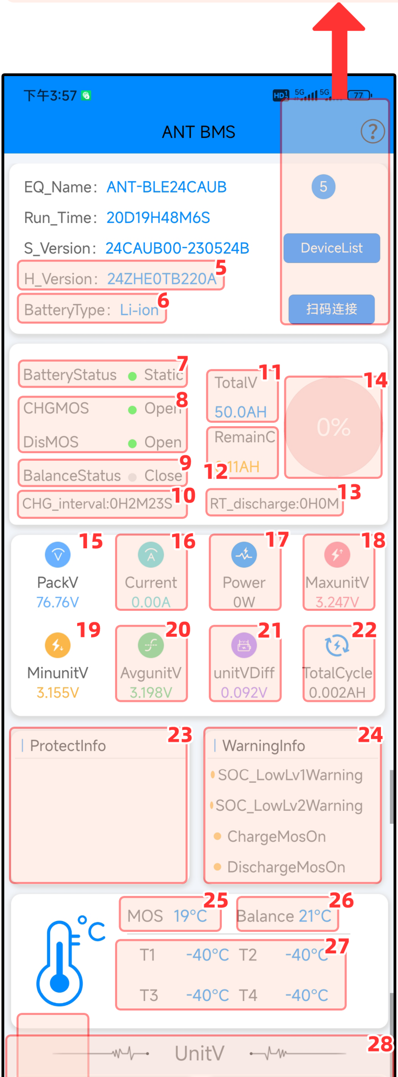
ANT-BLE24CAUB range:2.00m
N/A range:7.94m
I*7I;(7,C:&)(,,) range:10.00m
ANT-2997924580000000 range:17.78m

① ? Click to jump to the full series product specification introduction page

② 5 5 means that the factory default is the maximum authority password of level5.You can directly modify the setting parameters and display the level 0~5 authority. Level0 is displayed when Bluetooth is not connected. Level 1 can only view the real-time status page.Level 2 can view the user's parameter settings.Level 3 can set some parameters. Level 4 can modify more parameter settings. Level 5 is the largest and can replace 1-Level 5, all functions except key system parameters and configurations can be operated

③ DeviceList When the protective board is turned on for the first time, enter [Device List] to find the Bluetooth name starting with ANT, click on the name to select, and then click (OK/Sure) to make a Bluetooth connection.

④ Scan code to connect After the protective board is turned on and Bluetooth is turned on and there are no other devices nearby, you can use the QR code to quickly connect to Bluetooth



EQ_Name：ANT-BLE24CAUB
Run_Time：20D19H48M6S
S_Version：24CAUB00-230524B
H_Version：24ZHE0TB220A
BatteryType：Li-ion

BatteryStatus ● Static
CHGMOS ● Open
DisMOS ● Open
BalanceStatus ● Close
CHG_interval:0H2M23S
TotalV 50.0AH
RemainC 11AH
RT_discharge:0H0M

PackV 76.76V
Current 0.00A
Power 0W
MaxunitV 3.247V
MinunitV 3.155V
AvgunitV 3.198V
unitVDiff 0.092V
TotalCycle 0.002AH

ProtectInfo

WarningInfo
- SOC_LowLv1Warning
- SOC_LowLv2Warning
- ChargeMosOn
- DischargeMosOn

MOS 19°C
Balance 21°C

T1	-40°C	T2	-40°C
T3	-40°C	T4	-40°C

UnitV

⑤ Take 24S 130A peak 325A as an example: 24 ZHE means 24 strings, ZHE solution, TBis the Bluetooth version, 130A means the nominal current of the purchased product is 130A

⑥ Display the battery type set by one click,which can display ternary, lithium iron and sodium batteries

⑦ Display according to the current status of the battery: stationary, charging, standby, discharge, abnormal

⑧ Display green on status, indicating that the current status is normal and can be charged and discharged by BMS

⑨ Battery balancing will be automatically turned on when balancing conditions are met

⑩ The length of time between the current time and the last charging

⑪ According to the actual maximum capacity of the battery, the amount you set will be displayed

⑫ Fully charged is equal to the total capacity. Calculate the remaining battery capacity based on the amount consumed by discharge

⑬ Estimate how long it can be used based on the capacity and discharge current

⑭ Estimated display of battery power percentage

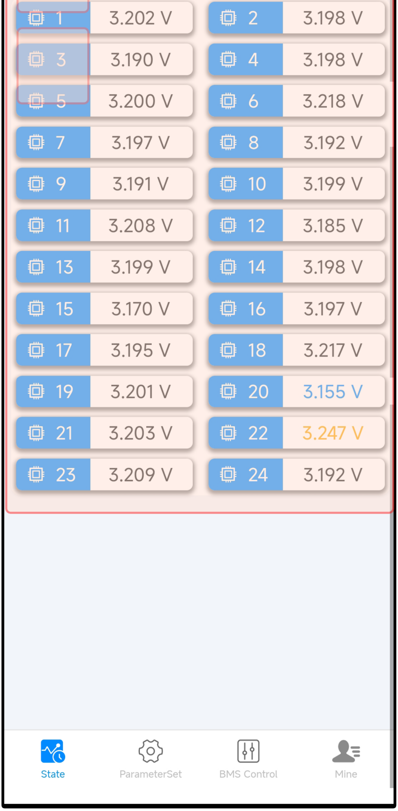
⑮ Average voltage * number of batteries in series = total voltage

⑯ The charging current has a-sign in front of it, and the discharging current does not show any sign

⑰ Total voltage*current = power, when charging, there is a - sign in front of it

⑱ In real-time status, the cell with the highest voltage is displayed in red

⑲ In real-time status, the cell with the lowest voltage is displayed in blue



1	3.202 V	2	3.198 V
3	3.190 V	4	3.198 V
5	3.200 V	6	3.218 V
7	3.197 V	8	3.192 V
9	3.191 V	10	3.199 V
11	3.208 V	12	3.185 V
13	3.199 V	14	3.198 V
15	3.170 V	16	3.197 V
17	3.195 V	18	3.217 V
19	3.201 V	20	3.155 V
21	3.203 V	22	3.247 V
23	3.209 V	24	3.192 V

⑳ Total voltage/number of series connections =average voltage

㉑ The voltage difference between the highest voltage of the unit and the lowest voltage of the unit

㉒ Half of the charging current value and half of the discharging current value are accumulated For example, if a 50AH battery is fully charged from 0, it will be counted as 25AH. After being fully discharged, an additional 25AH will be added. The total cycle accumulation of 50AH means that it has been cycled once

㉓ Display protection information for various reasons for power outage, used to analyze the cause of failure

㉔ Display various warning messages for impending power outage protection (for example, the temperature control protection is 60 degrees Celsius and the warning is 55 degrees Celsius. When it reaches 55 degrees Celsius, it will first prompt a warning, and when it reaches 60 degrees Celsius, the protection will be triggered

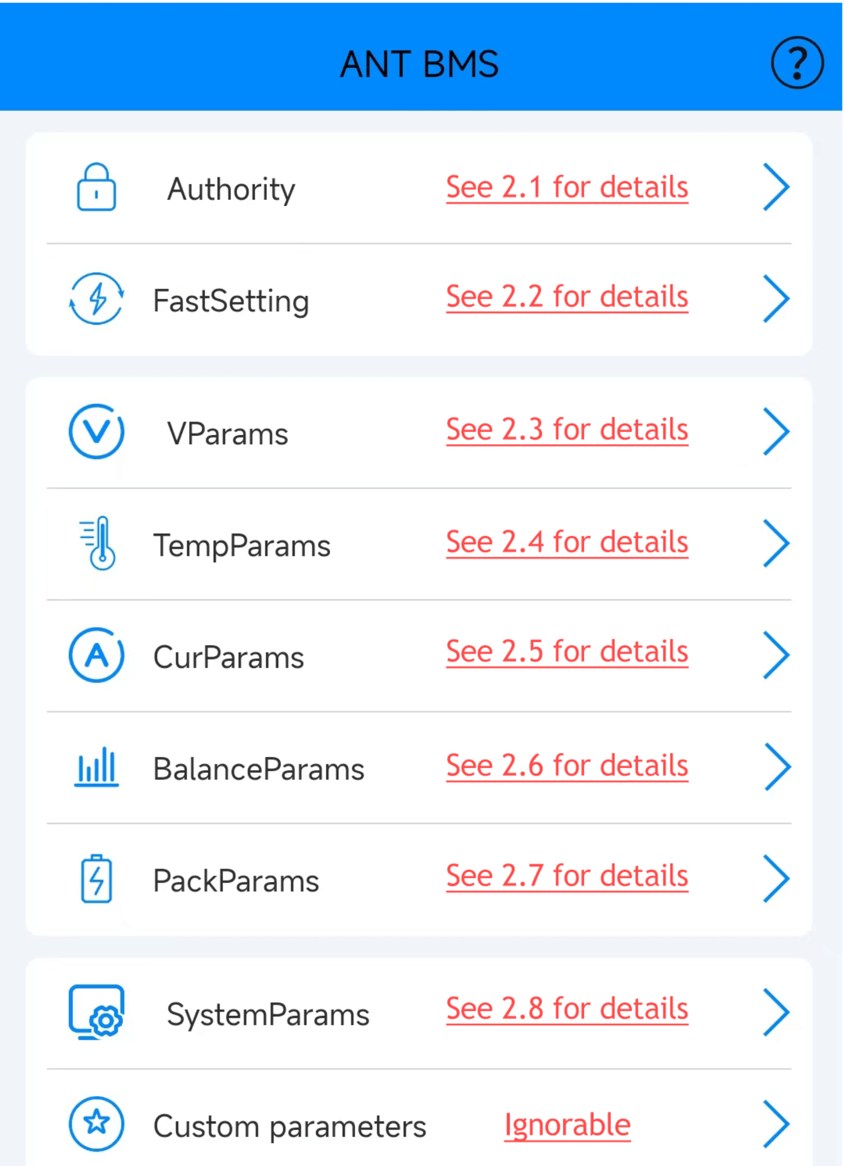
㉕ The built-in power of the protection board is MOS temperature controlled. If the temperature reaches 80 degrees Celsius, the power will be displayed as over-temperature. The protection will be powered off and the temperature will be restored if the temperature is lower than 65 degrees Celsius

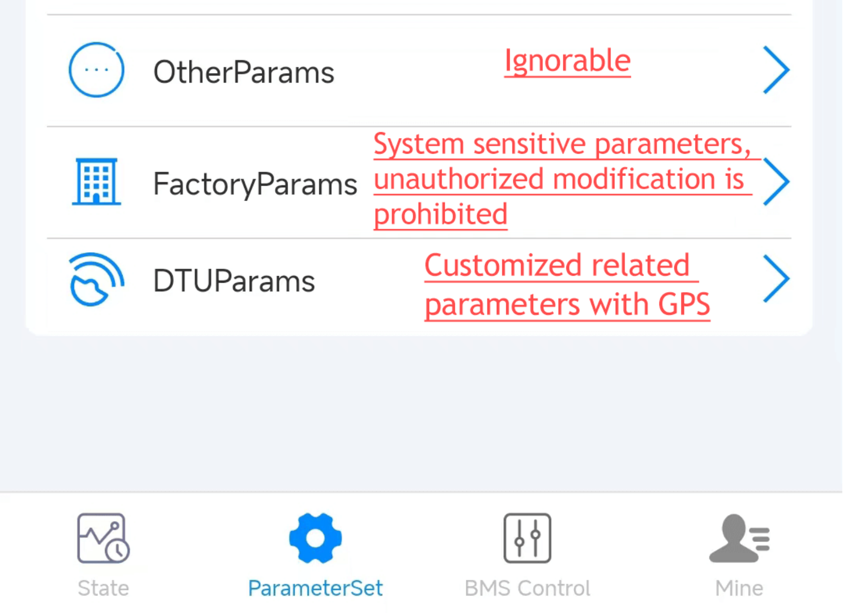
㉖ The protection board has built-in balancing temperature control. The balancing will stop when the temperature reaches 60 degrees Celsius, and will resume when the temperature reaches 60 degrees Celsius

㉗ The external battery temperature sensor defaults to -40 degrees Celsius when not connected. Depending on the BMS version, a maximum of 2 or 4 sensors can be connected

㉘ The protection board sets the corresponding number of series connections based on the actual number of batteries connected in series, and displays the single series voltage of each series-connected battery

2.Parameter setting page description introduction



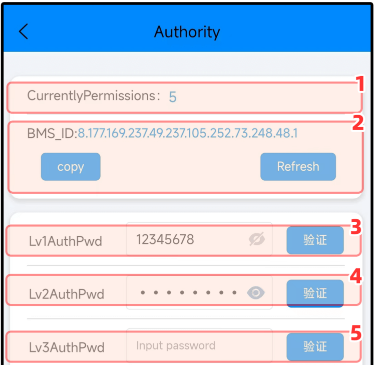


Ignorable

System sensitive parameters, unauthorized modification is prohibited

Customized related parameters with GPS

2.1 Permission verification



CurrentlyPermissions：5

BMS_ID:8.177.169.237.49.237.105.252.73.248.48.1

Lv1AuthPwd 12345678

Lv2AuthPwd • • • • • • • • •

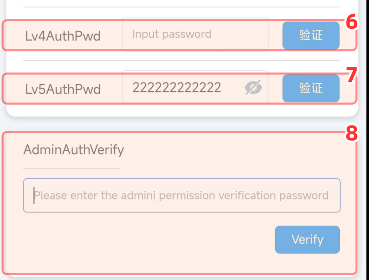
Lv3AuthPwd Input password

① The factory default of the protection board is current permission:5,which means there is no password and you can directly modify and set the basic battery parameters.

② It is a string of dynamic password characters that can be refreshed. If the user changes the level 5 password and forgets the level 5 password he set, he can use this ID to retrieve the level 5 password. Please see the operation process below ⑧

③ You can only view real-time status page information, but cannot set or modify any parameters

④ Can view user parameter settings, but cannot set parameters



The password can be displayed visible or invisible by clicking on the eye. The password is saved on this mobile phone. If you change a mobile phone to connect to Bluetooth, your password will not be displayed. You don't need to delete the password. Just click [Verify] next time you need to verify it. 】 Avoid entering password again.

⑤ Some parameter settings can be modified

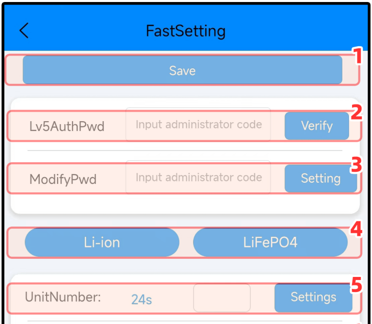
⑥ You can modify more parameter settings and operate more buttons

⑦ It has the highest authority and can replace levels 1-4. It can operate functions other than key system parameters and configurations

⑧ Click [Copy] to copy this string of characters from the chip ID and send it to the merchant.The merchant will reply to you with a string of characters in the same format. Copy and paste the characters given by the merchant into [Administrator Permission Verification] and click [Verify] , the device permission will display 9.At this time,you can modify the new 5-level permission password. The administrator's 9-level permission is a dynamic password,which will become invalid after one operation. (You can also clear the running time, protection records and other information of the protection board)

2.2 Quick Setup

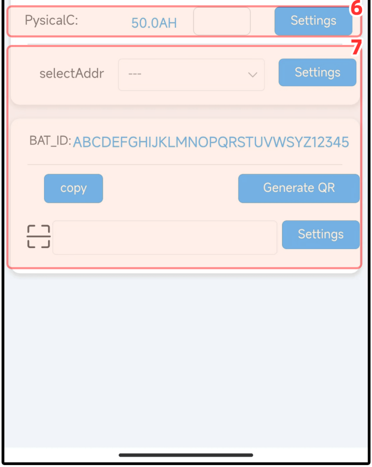
It is convenient for customers to quickly set necessary parameters (the battery can be used normally after simple settings) to avoid looking for these parameters on the corresponding parameter page.



① After setting and modifying parameters, you must click [Save Application Parameters] again for them to take effect

② When the protection panel is turned on for the first time, the default display is permission 5, which means there is no password and no verification is required. You can directly modify the setting parameters

③ The new 12-digit password can only be entered when level 5 permission is displayed, then click [Settings] and then click [Save Application Parameters] above to take effect. Be sure to record



PysicalC: 50.0AH

selectAddr ---

BAT_ID: ABCDEFGHIJKLMNOPQRSTUVWSYZ12345

the password after changing it, and change the parameters the next time you connect to Bluetooth. It will prompt that the permissions are insufficient. You need to enter the 12-digit password you set after [Level 5 Permission Verification]. After successful verification, permission 5 is displayed before you can modify the setting parameters

④ Quick settings can only set commonly used ternary and iron-lithium parameters with one click. Lithium titanate and sodium-lithium batteries need to be set on the BMS control page

⑤ Set as many strings as the number of assembled lithium batteries in series

⑥ Set the AH according to the total capacity of the assembled lithium battery. The purpose is to tell the protection board the maximum capacity of the battery.

⑦ This is for people with special needs. Please don't modify it without authorization, just ignore it!

4.3V high voltage cell setting

First set the ternary lithium parameters with one click, and then modify the following parameters based on the ternary lithium parameters:

1. In [Voltage Parameters]:

Single unit overvoltage protection is modified to 4.3v
The cell voltage recovery is modified to 4.2v
The single secondary overvoltage protection is modified to 4.4v
The monomer secondary overvoltage recovery is modified to 4.3v

2. In [Equilibrium Parameters]:

The balance limit voltage is modified to 4.3v
The balanced starting control voltage is modified to 4.2v during charging

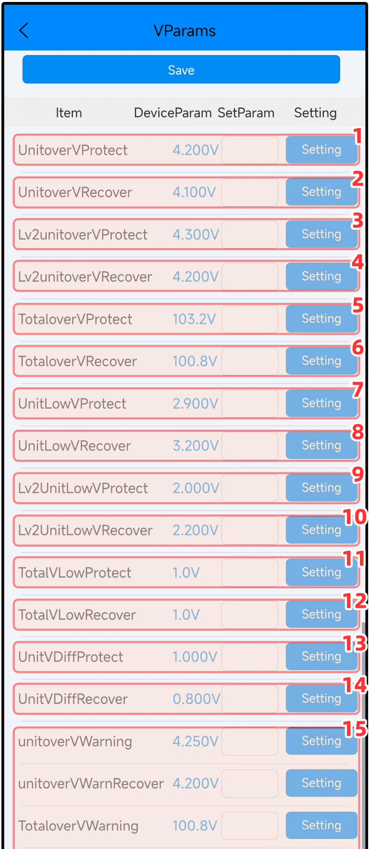
3. In [Battery Pack Parameters]:

The capacity calibration method is modified to 3

2.3 Voltage parameters

All the following protection information can automatically change the value according to the cell type set with one click, and also supports manual modification of the protection value range (non-professionals, without obtaining reasonable and valid data, please do not manually modify detailed parameters without authorization to avoid danger. ! Our company will not be responsible for any danger caused by unauthorized tampering with parameters.)

Take the ternary lithium parameters set in the picture as an example↓ :



	Item	DeviceParam	SetParam	Setting
1	UnitoverVProtect	4.200V		Setting
2	UnitoverVRecover	4.100V		Setting
3	Lv2unitoverVProtect	4.300V		Setting
4	Lv2unitoverVRecover	4.200V		Setting
5	TotaloverVProtect	103.2V		Setting
6	TotaloverVRecover	100.8V		Setting
7	UnitLowVProtect	2.900V		Setting
8	UnitLowVRecover	3.200V		Setting
9	Lv2UnitLowVProtect	2.000V		Setting
10	Lv2UnitLowVRecover	2.200V		Setting
11	TotalVLowProtect	1.0V		Setting
12	TotalVLowRecover	1.0V		Setting
13	UnitVDiffProtect	1.000V		Setting
14	UnitVDiffRecover	0.800V		Setting
15	unitoverVWarning	4.250V		Setting
	unitoverVWarnRecover	4.200V		Setting
	TotaloverVWarning	100.8V		Setting

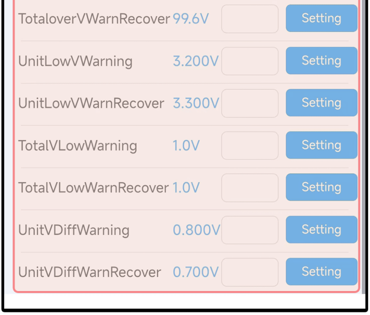
① During the charging process, when the voltage of any string reaches this value, charging will stop and the power-off protection will not affect the discharge use (can be called first-level overvoltage protection, with the largest protection weight). After protection, the voltage will generally be reduced. For example, when the ternary battery is charged to 4.2v and dropped to about 4.17 v; when iron lithium is charged to 3.65v and dropped to about 3.4v, it is normal (the amount of voltage reduction depends on many factors of the battery itself)

② After the cell overvoltage protection is triggered, the protection can be released and the charging function can be restored only when the voltage and power consumption of all cells drops below this value.

③ Reaching this value indicates that the cell voltage has exceeded the first-level overvoltage protection. At this time, the power supply will be cut off and we are not allowed to use the charging and discharging functions. The protection can only be released by solving the second-level overvoltage protection. Secondary overvoltage protection reminds us that we must pay attention to it and check what causes the voltage to be instantly too high. Under normal circumstances, secondary overvoltage protection is not allowed (except for 4.35V high-voltage ternary batteries).

④ After the secondary overvoltage protection is triggered, the protection can only be released when the voltage returns below this value.

⑤ You can fill in the value based on the maximum value of the battery cell * the number of battery strings. The default value is 103.2V (which can be



TotaloverVWarnRecover 99.6V

UnitLowVWarning 3.200V

UnitLowVWarnRecover 3.300V

TotalVLowWarning 1.0V

TotalVLowWarnRecover 1.0V

UnitVDiffWarning 0.800V

UnitVDiffWarnRecover 0.700V

called three-level overvoltage protection). The parameters do not need to be modified because there is a first-level monomer overvoltage priority protection.

⑥ After the total voltage overvoltage protection is triggered, the protection can only be released when the voltage returns below this value.

⑦ During the discharge process, when the voltage of any string reaches this value,the discharge will stop and the power-off protection will not affect the battery charging.(It can be called first-level undervoltage protection,with the largest protection weight).The voltage will rise after protection, which is the same as the voltage reduction when fully charged.

⑧ After the cell undervoltage protection is triggered, the protection can be released and the discharge function can be restored only when the voltage of all cells returns to above this value.

⑨ Reaching this value indicates that the cell voltage has been lower than the first-level under-voltage protection. At this time, the power-off protection will occur, and we are not allowed to use the charging and discharging functions. The protection can be released only by solving the second-level under-voltage protection.Secondary undervoltage protection reminds us that we must pay attention to it and check what causes the voltage to drop too much instantly. Under normal circumstances, secondary undervoltage protection is not allowed.

⑩ After the secondary undervoltage protection is triggered, the protection can only be released when the voltage returns to above this value.

⑪ You can fill in the value based on the lowest limit value of the battery cell * the number of battery strings. The default is 1.0v (can be called the third-level undervoltage protection). This parameter does not need to be modified because there is a first-level single unit undervoltage priority protection.

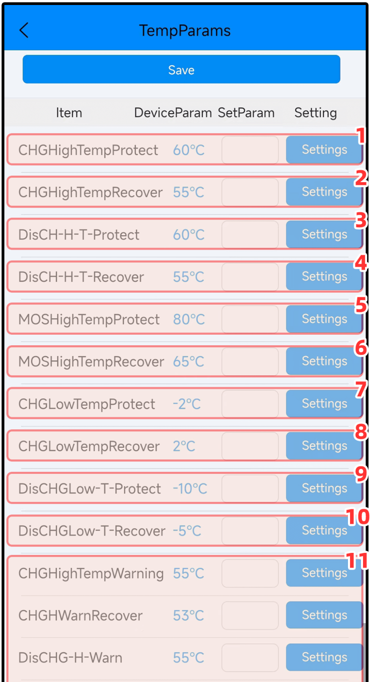
⑫ After the total voltage undervoltage protection is triggered, the protection can only be released when the voltage returns to above this value.

⑬ If the cell pressure difference exceeds this value, the pressure difference protection will be displayed;at this time,the power will be cut off and we will not be allowed to use the charging and discharging functions

⑭ After the voltage difference protection is triggered,the protection can only be released when the cell voltage difference returns to within this value.

⑮ The voltage alarm parameters corresponding to this column can be displayed in the [Real-time Status] alarm column. The alarm information only serves as a reminder.

2.4 Temperature parameters



Item	DeviceParam	SetParam	Setting
CHGHighTempProtect	60°C		Settings
CHGHighTempRecover	55°C		Settings
DisCH-H-T-Protect	60°C		Settings
DisCH-H-T-Recover	55°C		Settings
MOSHighTempProtect	80°C		Settings
MOSHighTempRecover	65°C		Settings
CHGLowTempProtect	-2°C		Settings
CHGLowTempRecover	2°C		Settings
DisCHGLow-T-Protect	-10°C		Settings
DisCHGLow-T-Recover	-5°C		Settings
CHGHighTempWarning	55°C		Settings
CHGHWarnRecover	53°C		Settings
DisCHG-H-Warn	55°C		Settings

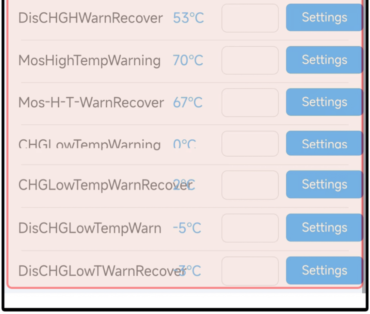
① During the charging process, if the external battery temperature sensor detects that the battery temperature reaches 60°C, it will display the battery charging over-temperature protection. At this time, the power will be cut off and we will not be allowed to use the charging and discharging functions.

② After triggering the battery high-temperature charging protection, the protection can only be released when the temperature drops below 55°C

③ During the discharge process, if the external battery temperature sensor detects that the battery temperature reaches 60°C,it will display the battery discharge over-temperature protection. At this time,the power will be cut off and we will not be allowed to use the charging and discharging functions.

④ After triggering the battery high-temperature discharge protection, the protection can only be released when the temperature drops below 55°C.

⑤ During the charging process,the external battery temperature sensor detects that the battery temperature reaches -2°C and will display the battery charging low temperature protection. At this time, the power will be cut off and we



DisCHGHWarnRecover	53°C		Settings
MosHighTempWarning	70°C		Settings
Mos-H-T-WarnRecover	67°C		Settings
CHGLowTempWarning	0°C		Settings
CHGLowTempWarnRecover	2°C		Settings
DisCHGLowTempWarn	-5°C		Settings
DisCHGLowTWarnRecover	-3°C		Settings

will not be allowed to use the charging and discharging functions

⑥ After triggering the battery low-temperature charging protection, the protection can only be released when the temperature rises above 2°C

⑦ During the discharge process, the external battery temperature sensor detects that the battery temperature reaches -10°C and will display the battery discharge low temperature protection.At this time, the power will be cut off and we are not allowed to use the charging and discharging functions

⑧ After triggering the battery low-temperature discharge protection, the protection can only be released when the temperature rises above -5°C

*The above battery temperature protection parameters are only valid when connected to an external battery temperature sensor.Those without an external battery temperature sensor can be ignored. (T1, T2, T3, and T4 are displayed in the temperature area of the real-time status page to indicate the battery temperature. If no external temperature sensor is connected, the default display is -40°C. If the temperature sensor is extruded and deformed in the battery box, causing temperature detection errors, False protection, you can check how to shield [Battery Temperature Sensor Shielding] in [System Parameters]).

⑨ It is controlled by the built-in power temperature sensor of the protection board; regardless of charging or discharging, the greater the current and the closer to the power value of the protection board, the faster the temperature rises. When the MOS temperature reaches 80°, the power over-temperature protection will be displayed. At this time, the Power outage protection does not allow us to use the charging and discharging functions (triggering power high temperature protection means that the purchase options for the protection board are small and there is not much margin)

⑩ After triggering the power high temperature protection, the protection can be released only when the temperature drops below 65° (if you want to release the protection quickly, you can manually adjust it to 70°)

⑪ The voltage alarm parameters corresponding to this column can be displayed in the [Real-time

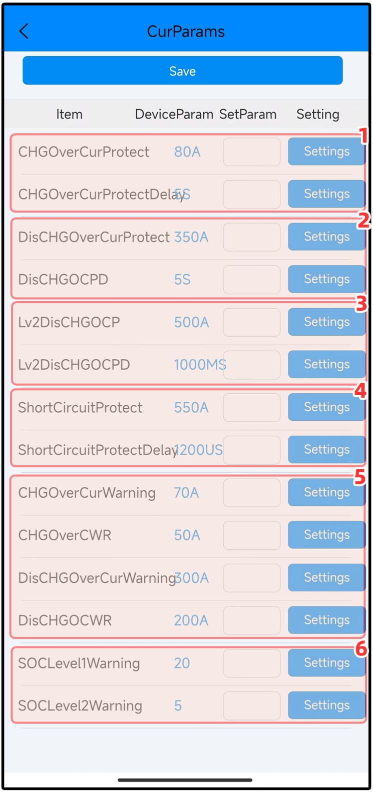
Status] alarm column. The alarm information only serves as a reminder.

2.5 Current parameters

Non-professionals, please do not modify detailed parameters without obtaining reasonable and effective data to avoid danger! Our company will not be responsible for any danger caused by unauthorized tampering with overcurrent parameters!

Different current models have different parameter values

Take the current parameters of the 24-string 130A [peak 325A] model as an example↓



Item	DeviceParam	SetParam	Setting
CHGOverCurProtect	80A		Settings
CHGOverCurProtectDelay	5S		Settings
DisCHGOverCurProtect	350A		Settings
DisCHGOCPD	5S		Settings
Lv2DisCHGOCP	500A		Settings
Lv2DisCHGOCPD	1000MS		Settings
ShortCircuitProtect	550A		Settings
ShortCircuitProtectDelay	1200US		Settings
CHGOverCurWarning	70A		Settings
CHGOverCWR	50A		Settings
DisCHGOverCurWarning	300A		Settings
DisCHGOCWR	200A		Settings
SOCLevel1Warning	20		Settings
SOCLevel2Warning	5		Settings

① Indicates that the charging current exceeds 50A and lasts for more than 5 seconds, and the charging overcurrent protection will be triggered.

② When the protection board detects that the discharge current is greater than 200A and lasts for more than 5 seconds, the discharge overcurrent protection will be triggered (can be called level 1 overcurrent protection, with the largest protection weight and priority to trigger protection). Why is the nominal 130A[peak value 325A] set like this? Woolen cloth? Because the load may generally reach 200-300A 1-2 seconds before starting, so we set a 5-second delay for the 200A overcurrent protection. There is a high probability that the protection will not be triggered. The protection board is rated at 130A and can support 130A or less for a long time if heat dissipation is done well.current,and ensure that there is a certain margin (ensure that there is enough margin for loading,climbing,and turning on the air conditioner in summer).Otherwise,the greater the continuous current, the greater the heat generated by the power MOS.When the temperature of the power MOS reaches 80°C, it will When the power over-temperature protection is triggered,the power protection will be cut off and we are not allowed to use the charging and discharging functions.The protection can be released only when the temperature drops below 65℃.

③ When the protection board detects that the discharge current is greater than 300A and lasts for more than 1000MS (1 second), it will trigger the level 2 discharge overcurrent protection. Why do we need a level 2 discharge protection when thereis already level 1 protection? If the protection board selection is too small, you can more intuitively see the level 2 protection triggered and record the current reached. The purpose is to remind us that we must pay attention to it and further analyze whether we need to replace the protection board with a larger current.Level 2 overcurrent protection is not allowed under normal circumstances

④ When the protection board detects that the short-circuit current is greater than 450A and exceeds 1200US=0.0012 seconds, the short-circuit protection will be triggered. At this time, the power will be cut off and we will not be allowed to use the charging and discharging functions.
Release protection conditions:Disconnect the load that consumes battery power

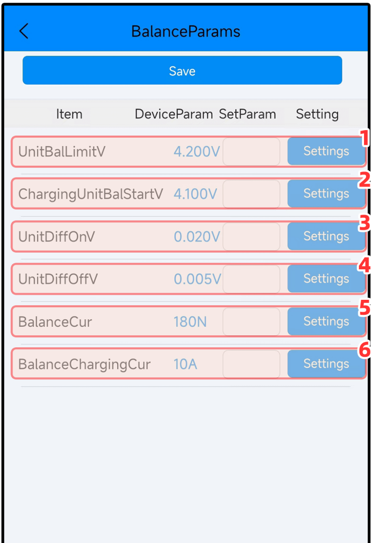
The short-circuit protection detected by the protection board is triggered at the microsecond level by an instantaneous large current. The system current measurement time is 1 second, which is tens of thousands of times different. Therefore, short-circuit protection occurs in many cases, but the APP displays the current as 0. Since the load is such as There is a large capacitor inside the vehicle controller (the voltage across the capacitor cannot change suddenly). When the positive and negative electrodes are directly connected to the battery,a very large current will be generated,usually hundreds or even thousands of amps

This problem can also be solved by adjusting the short-circuit protection delay. The smaller the short-circuit delay is(meaning the shorter the time), the higher the detection sensitivity when short-circuit protection actually occurs. However, the instantaneous high current that charges the capacitor at power-on increases the probability of triggering short-circuit protection. On the contrary, the larger the short-circuit protection delay is adjusted(meaning the longer the time),the lower the detection sensitivity will be,and the lower the success rate when a short circuit actually occurs. The probability of malfunction is also lower.Therefore, increasing the short-circuit delay mainly affects the sensitivity when short-circuit protection actually occurs, and has no impact on other operations of the system. If you often encounter short-circuit protection, it is recommended to increase the short-circuit protection delay by 200 each time until the short-circuit protection is no longer accidentally triggered,and then increase it by 500. This will not only prevent malfunctions, but also ensure that a short circuit actually occurs. time success rate

⑤ The overcurrent alarm parameters corresponding to this column can be displayed in the [Real-time Status] alarm column.The alarm information only serves as a reminder

⑥ SOC is the estimated battery charge percentage in real-time state
Set the physical capacity and full charge cycle, and the SOC percentage will be automatically calibrated.
When the remaining percentage of SOC power reaches 20%,a SOC level 1 alarm will be displayed, and there will be no power outage protection due to SOC alarm problems.
When the remaining percentage of SOC power reaches 5%,a SOC level two alarm will be displayed, and there will be no power outage protection due to SOC alarm problems.

2.6 Equilibrium parameters



BalanceParams

Save

Item	DeviceParam	SetParam	Setting
UnitBalLimitV	4.200V		Settings
ChargingUnitBalStartV	4.100V		Settings
UnitDiffOnV	0.020V		Settings
UnitDiffOffV	0.005V		Settings
BalanceCur	180N		Settings
BalanceChargingCur	10A		Settings

① Cell voltages higher than this value will force the balance to open,which is called balance limit voltage.If limit balance occurs in real-time,it means that the cell voltage has exceeded the normal cell overvoltage protection value.This reminds us that we must pay attention and check whether What causes the cell voltage to exceed the normal protection value.Under normal circumstances, extreme equilibrium is not allowed

② During the charging process,the balancing that is turned on when the cell voltage is higher than this value is called charging balancing (during the charging process, conditions ③ and ⑥ must be met at the same time before balancing can be turned on during charging)

③ During charging, the voltage difference is greater than this value (one of the conditions)

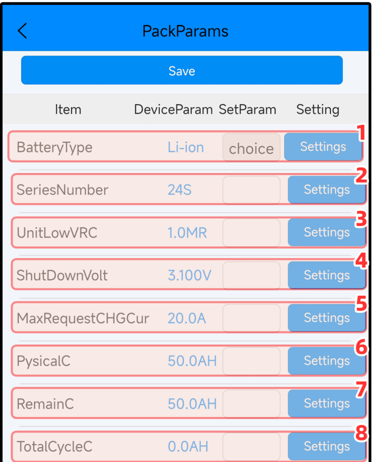
④ When balancing is turned on,balancing will stop when the cell pressure difference reaches below this value.

⑤ 180N means that the balancing effect is 100%.If set to 90,the balancing effect is 50% (depending on the ability of the protection board hardware to support the maximum balancing current. The balancing current of all models of ant protection boards is basically 100MA, 10-24 strings The balancing current is 200MA, the balancing current of 32 strings is 280MA)

⑥ During the charging process, the charging current must be less than this value and below 10A (one of the conditions)

To manually turn on the automatic equalization function:
On the BMS control page,you can manually click the [Turn on automatic balancing] and [Turn off automatic balancing] functions, which can be operated when the battery is not charged or discharged.

2.7 Battery parameters



PackParams

Item	DeviceParam	SetParam	Setting	
BatteryType	Li-ion	choice	Settings	1
SeriesNumber	24S		Settings	2
UnitLowVRC	1.0MR		Settings	3
ShutDownVolt	3.100V		Settings	4
MaxRequestCHGCur	20.0A		Settings	5
PysicalC	50.0AH		Settings	6
RemainC	50.0AH		Settings	7
TotalCycleC	0.0AH		Settings	8

① You can choose to set ternary,iron lithium,titanium lithium, and sodium electricity parameters with one click

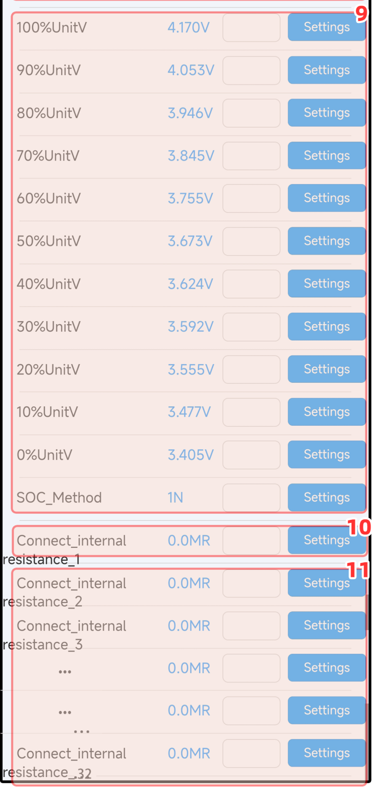
② Set the corresponding number of series according to the actual number of battery packs connected in series

③ Ignore,please do not modify without authorization

④ If the battery is not used for a long time, it will automatically shut down for protection due to the self-consumption of battery power and the self-consumption of power of the protective board, which consumes battery power and causes the cell voltage to reach 2.9V

⑤ Ignore,please do not modify without authorization

⑥ Set the actual total capacity of the battery pack according to the amp-hour capacity. Only by setting the protection board can you know the



100%UnitV	4.170V	Settings
90%UnitV	4.053V	Settings
80%UnitV	3.946V	Settings
70%UnitV	3.845V	Settings
60%UnitV	3.755V	Settings
50%UnitV	3.673V	Settings
40%UnitV	3.624V	Settings
30%UnitV	3.592V	Settings
20%UnitV	3.555V	Settings
10%UnitV	3.477V	Settings
0%UnitV	3.405V	Settings
SOC_Method	1N	Settings
Connect_internal resistance_1	0.0MR	Settings
Connect_internal resistance_2	0.0MR	Settings
Connect_internal resistance_3	0.0MR	Settings
...	0.0MR	Settings
...	0.0MR	Settings
...		
Connect_internal resistance_32	0.0MR	Settings

maximum capacity value of the battery pack

⑦ Under the premise of setting the physical capacity, for example, the current available capacity of the battery is about 20AH, set it to 20, which is used to calibrate the remaining capacity percentage. It is basically usable without setting this parameter. Do not set this parameter when the percentage power display is accurate

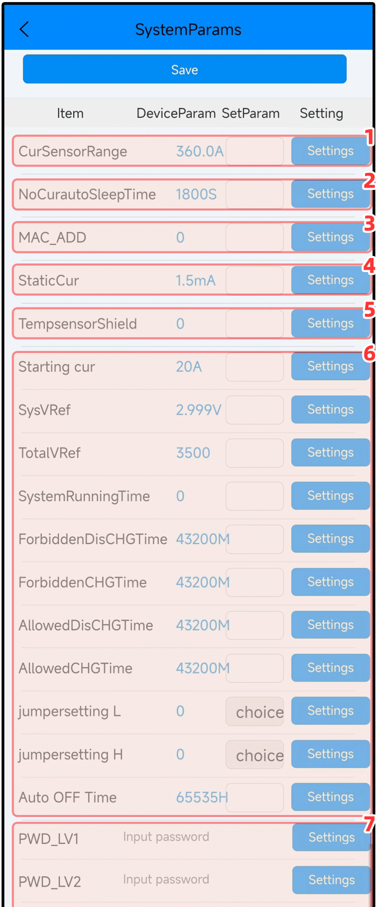
⑧ Ignore,please do not modify without authorization

⑨ This is a basis for judging the remaining power percentage of COS.For example,when ternary lithium is fully charged to 4.2V, the voltage will be reduced to about 4.17V.If the protection board detects that the ternary lithium cell voltage is4.17v, it will be estimated that the power is 100%.A voltage of 4.053v will be estimated as 90% of the battery capacity.If it is a ternary lithium battery,set the physical capacity and let it sit for 10 minutes, it will automatically calibrate the remaining battery percentage. Fully charged will be regarded as 100%. If the pressure difference is large, the corresponding percentage of electricity will be reduced according to the size of the pressure difference. The amount of electricity consumed will be reduced according to the corresponding proportion

⑩ Ignore,please do not modify without authorization

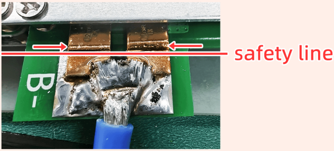
⑪ If the connecting piece of series connected batteries between each string of lithium batteries is inconsistent in thickness and length, the corresponding battery may have a greater resistance.When the entire battery set is being charged, the voltage of the battery string with a larger resistance will always be higher than that of the other batteries. Voltage, after stopping charging, the voltage remains consistent with other voltages.The same is true for discharge.The larger the current,the more obvious it is.You can compensate by setting the corresponding connection internal resistance. For example, the voltage of the 10th battery string is always 0.5 higher than other voltages every time it is charged. After V stops charging, it becomes consistent with other voltages. You can set the internal resistance of the 10th string to compensate. First set it to 2 and then observe the voltage jump to see if it is significantly reduced. Then set it to 4 and so on, until the internal resistance reaches the 10th level. Until the string voltage does not jump, the function of connecting the internal resistance can only be fine-tuned. If the internal resistance is too large, it can only be solved by the battery itself

2.8 System parameters



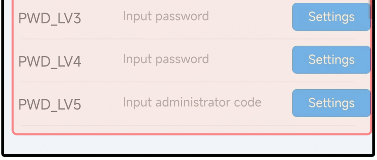
Item	DeviceParam	SetParam	Setting
CurSensorRange	360.0A		Settings
NoCurautoSleepTime	1800S		Settings
MAC_ADD	0		Settings
StaticCur	1.5mA		Settings
TempsensorShield	0		Settings
Starting cur	20A		Settings
SysVRef	2.999V		Settings
TotalVRef	3500		Settings
SystemRunningTime	0		Settings
ForbiddenDisCHGTime	43200M		Settings
ForbiddenCHGTime	43200M		Settings
AllowedDisCHGTime	43200M		Settings
AllowedCHGTime	43200M		Settings
jumpersetting L	0	choice	Settings
jumpersetting H	0	choice	Settings
Auto OFF Time	65535H		Settings
PWD_LV1	Input password		Settings
PWD_LV2	Input password		Settings

① If the current detected by the protection board is not accurate with the actual value,you can use this value. Each time you increase or decrease it by 10,the current will become larger and smaller accordingly. Repeatedly modify the value to check the current until the displayed current is equal to the actual current. You need to Use a high-precision multimeter to measure, and the error range is within 5%.



As shown in the figure,the thick blue wire at the B-end of the protective board is a shunt that detects current. Different types of shunts on the protective board have different shunts.If you remove the original wire and re-solder it, be sure to pay attention that the welding wire or solder cannot exceed this line. wire, otherwise it will affect the current detection accuracy. A trace amount of solder can adjust the parameter calibration. If the soldering wire exceeds the safety line or there is too much solder,a new shunt needs to be replaced

② If the protective board is not charged or discharged after being turned on,it will enter sleep mode after 1800 seconds. Sleep will only turn off Bluetooth, not shut down. When the protective board detects charging or discharging current, it will wake up Bluetooth immediately. (The length of standby time can be modified),standby can reduce the power consumption of the protection board


PWD_LV3 Input password
PWD_LV4 Input password
PWD_LV5 Input administrator code

③ Change the Bluetooth address number:it can only be numbers without letters, for example, change it to numbers 1 or 2 or 3 in order.After modifying the Bluetooth address, Bluetooth will be disconnected immediately.You need to re-search for the Bluetooth name with the corresponding code to reconnect to Bluetooth.
This parameter is specifically for those who have many protective boards of the same model in order to make it easier to find the protective board corresponding to the Bluetooth name

④ Ignore,please do not modify without authorization

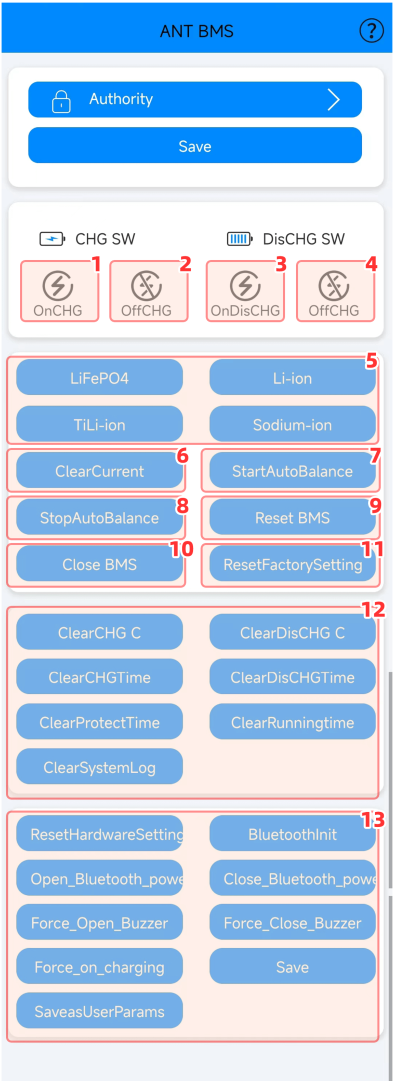
⑤ If an external battery temperature sensor is connected,if the temperature sensor is shaken,squeezed,deformed and damaged in the battery compartment,resulting in inaccurate temperature,the 'battery high temperature'or'battery low temperature' protection will be mistakenly triggered.
To block the T1 temperature sensor, set the number 1
To block the T2 temperature sensor, set the number 2
To block the T3 temperature sensor, set the number 4
To block the T4 temperature sensor, set the number 8

If you want to shield T1 and T4, add the shielding numbers 1 and 8 = 9 and set them in
If you want to block all 4, add the numbers 1248 = 15 and set them in

⑥ System sensitive parameters, please do not modify without authorization

⑦ The password for levels 1-4 is 8 digits
Level 5 password is 12 digits
Enter a new password in the corresponding level password, click [Settings] and then click [Save Application Parameters] above to successfully change the password. You need to verify the password for level 5 permissions first, and the permission 5 can be displayed before you can change it.
If you forget your Level 5 password, please click here to view **【2.1 Permission verification】**

3.BMS control page description introduction


ANT BMS
Authority
Save
CHG SW
DisCHG SW
1
OnCHG
2
OffCHG
3
OnDisCHG
4
OffCHG
5
LiFePO4
Li-ion
TiLi-ion
Sodium-ion
6
ClearCurrent
7
StartAutoBalance
8
StopAutoBalance
9
Reset BMS
10
Close BMS
11
ResetFactorySetting
12
ClearCHG C
ClearDisCHG C
ClearCHGTime
ClearDisCHGTime
ClearProtectTime
ClearRunningtime
ClearSystemLog
13
ResetHardwareSetting
BluetoothInit
Open_Bluetooth_powe
Close_Bluetooth_powe
Force_Open_Buzzer
Force_Close_Buzzer
Force_on_charging
Save
SaveasUserParams

① Manual operation control opens the charging MOS tube(the battery can be charged normally only after it is opened)

② Manual operation controls the closing of the charging MOS tube (after closing, the charging current cannot reach the battery through the MOS tube)

③ Manual operation controls the opening of the discharging MOS tube (after opening, the load can use the battery power normally)

④ Manual operation controls the shutdown of the discharge MOS tube (the load cannot use battery power after shutdown)

⑤ Click the corresponding parameter to set it to the corresponding cell parameter with one click. After clicking to enter the parameter setting, you will find the parameter change. The original parameter will be restored after a few minutes. It will only take effect after clicking [Save Application Parameters].

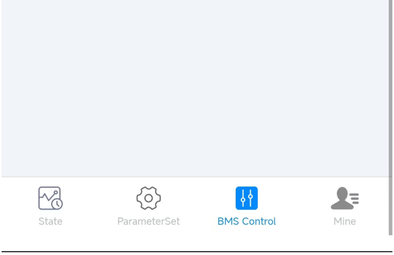
⑥ In some cases,the current position displayed in the real-time status shows 0.several amps of current.If there is no actual load consuming current,you can click Current Zero to clear the current

⑦ Manually turn on equalization. If the battery pressure difference is large, (you can click to turn on automatic equalization after arriving at the company without using the battery. Continuously balance when the balance is good, it will automatically stop when the balance is good)

⑧ Manually turn off automatic equalization

⑨ Protection board initialization refreshes current data

⑩ Shutdown protection board. If you do not use the battery for a few months on a business trip, you can click to turn off the BMS to avoid self-consumption of power and the battery will be exhausted.
You can also fully charge the battery before placing it. After shutting down, you need to re-


State
ParameterSet
BMS Control
Mine

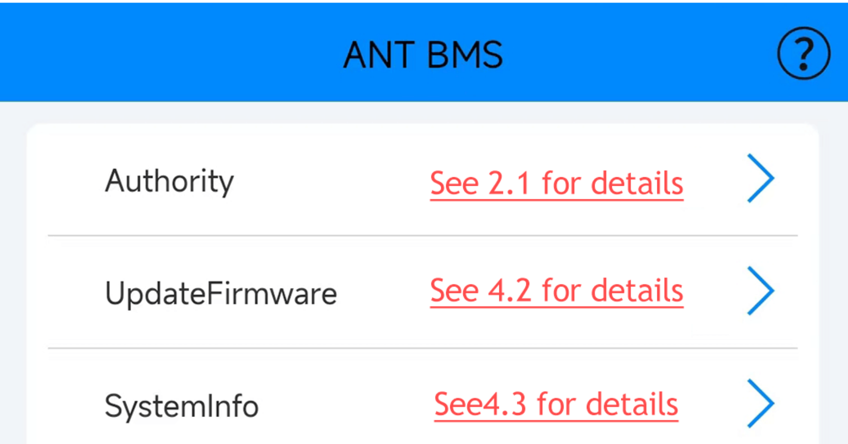
activate the BMS to turn it on.Use a charger to charge (the charger output voltage must be 2V or more higher than the current voltage of the battery pack to activate) or use a power-on cable to activate.

⑪ For example, after setting the ternary lithium parameters, and then modifying some of the parameters, click Restore Factory Settings to restore the ternary lithium parameters set with one click

⑫ The corresponding data can only be cleared after verifying the administrator's password for level 9 authority. The password for level 9 administrator authority is a dynamic password and becomes invalid after one-time operation. The purchased products can be obtained by contacting the corresponding sales service personnel (multiple applications are not malicious). This service Charges are prohibited (if charges are discovered, you can report it to 15672095835 to be disqualified and punished)

⑬ You can only operate after verifying the administrator's level 9 password. (If you verify level 9, please do not click and operate this section without authorization)

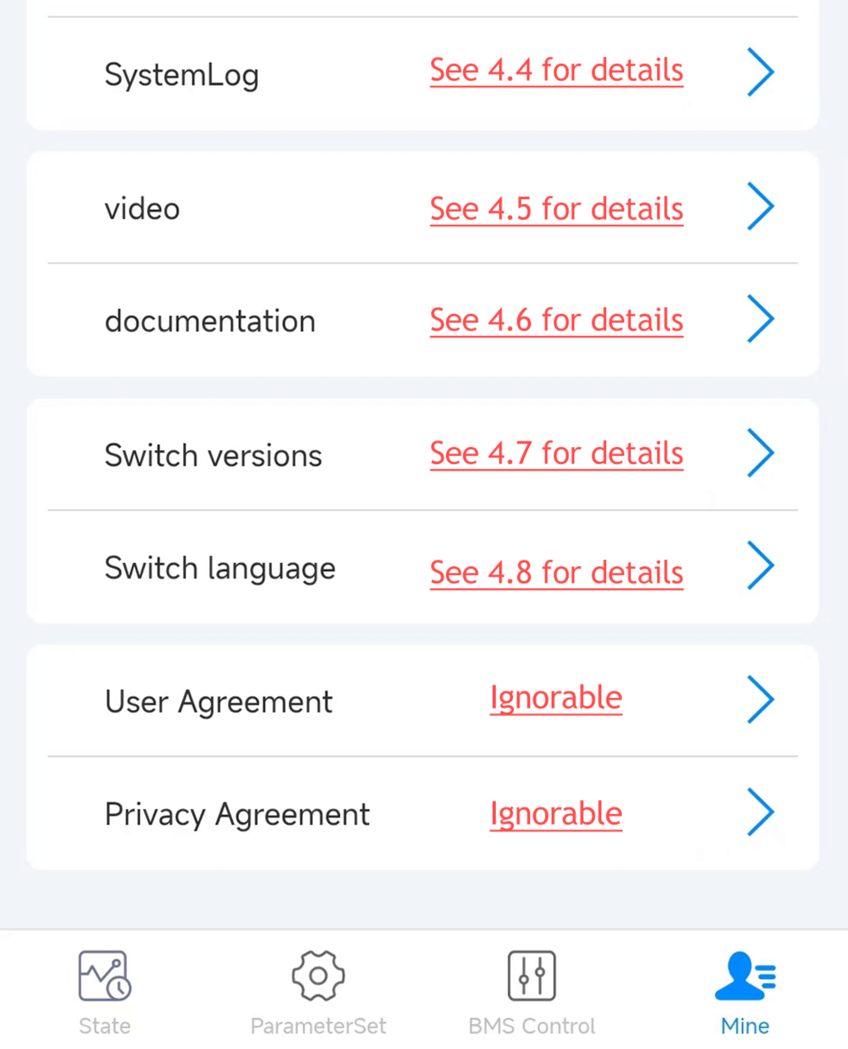
4.Mine page description introduction



Authority See 2.1 for details

UpdateFirmware See 4.2 for details

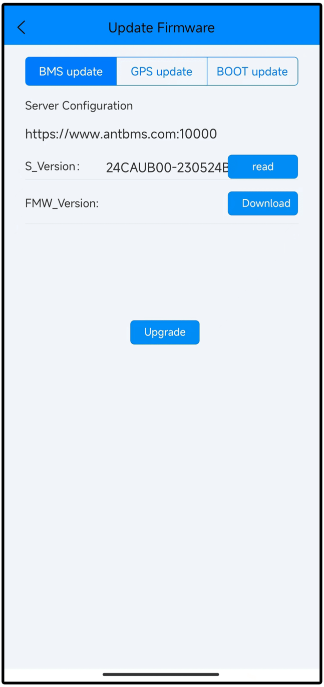
SystemInfo See4.3 for details



SystemLog	See 4.4 for details
video	See 4.5 for details
documentation	See 4.6 for details
Switch versions	See 4.7 for details
Switch language	See 4.8 for details
User Agreement	Ignorable
Privacy Agreement	Ignorable

State
ParameterSet
BMS Control
Mine

4.2 Upgrade firmware

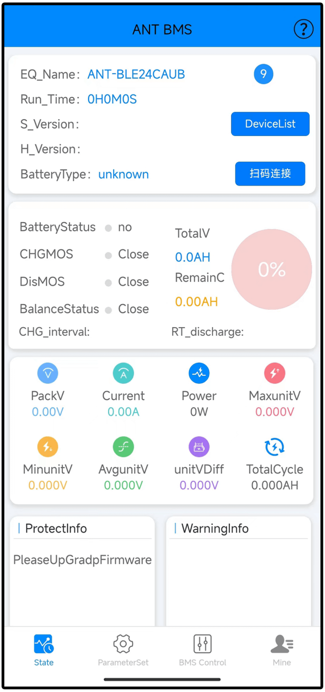

Update Firmware
BMS update
GPS update
BOOT update
read
Download
Upgrade

Server Configuration

https://www.antbms.com:10000

S_Version: 24CAUB00-230524B

FMW_Version:


ANT BMS
9
DeviceList
扫码连接
State
ParameterSet
BMS Control
Mine

EQ_Name: ANT-BLE24CAUB

Run_Time: 0H0M0S

S_Version:

H_Version:

BatteryType: unknown

BatteryStatus ● no

CHGMOS ● Close

DisMOS ● Close

BalanceStatus ● Close

TotalV 0.0AH

RemainC 0.00AH

0%

CHG_interval:

RT_discharge:

PackV 0.00V

Current 0.00A

Power 0W

MaxunitV 0.000V

MinunitV 0.000V

AvgunitV 0.000V

unitVDiff 0.000V

TotalCycle 0.000AH

ProtectInfo

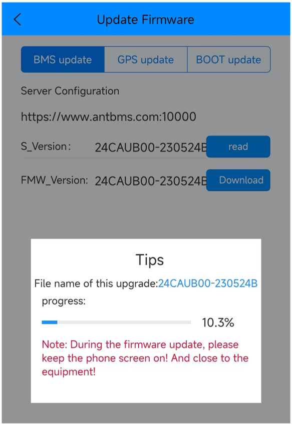
PleaseUpGradpFirmware

WarningInfo

What is the role of firmware upgrade?

It is to customize the communication protocol and parameter requirements for our company to communicate with customers. Our company writes the program and then gives the corresponding customer software version code. After the customer fills it in, click 'Read' and 'Download' to upgrade, which can effectively solve the sample collection period remotely. Program customization reduces supply and demand time for both parties and improves efficiency.

Note: Please do not be curious or accidentally enter this page and click 'Start Upgrade'. Upgrading the normally working protective board does not make any sense. On the contrary, if it is not upgraded properly, the program will be lost and the protective board will not be able to operate normally. When connecting to Bluetooth again, it will appear as shown below: The running time is 0, all parameters are not displayed, and the protection information is displayed: Please upgrade the firmware.


Update Firmware
BMS update
GPS update
BOOT update
read
Download

Server Configuration

https://www.antbms.com:10000

S_Version: 24CAUB00-230524B

FMW_Version: 24CAUB00-230524B

Tips

File name of this upgrade:24CAUB00-230524B

progress:

10.3%

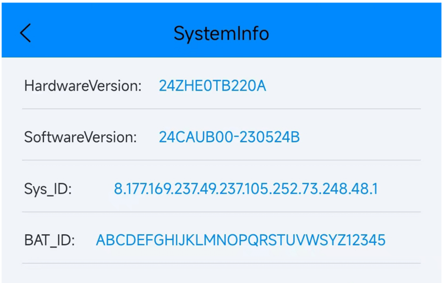
Note: During the firmware update, please keep the phone screen on! And close to the equipment!

How to solve?

You need to connect to Bluetooth. As shown in the picture above, "Please upgrade the firmware", enter [Me], [Firmware Upgrade], click 'Read' and 'Download', and then click 'Start Upgrade' after the corresponding software number appears. Wait for the progress bar to complete the upgrade, and the program can The whole process from retrieval to restoration to normal is quite troublesome. If you don't know how to operate it or can't successfully upgrade it, you can only return it to the factory.

4.3 system message

Record the number of times corresponding to the protection project and the number of debugging parameters.

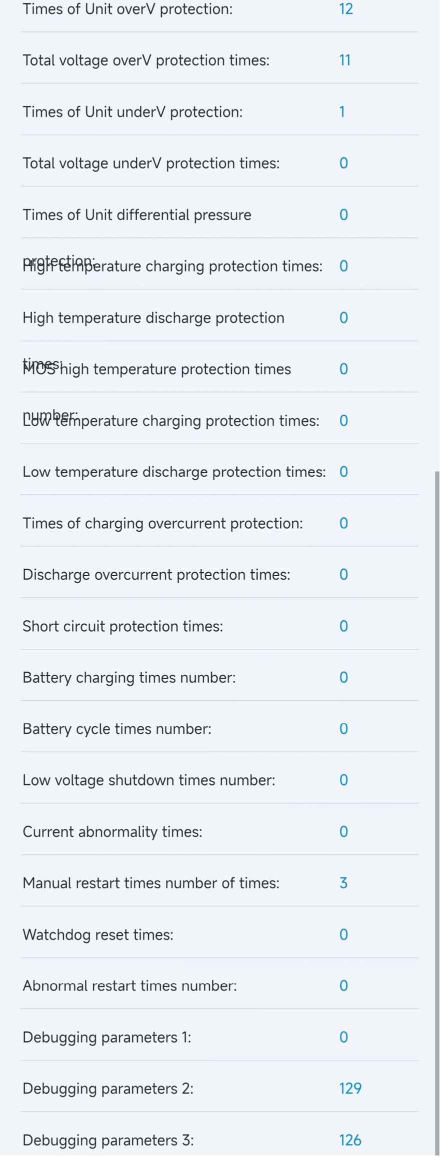

SystemInfo

HardwareVersion: 24ZHE0TB220A

SoftwareVersion: 24CAUB00-230524B

Sys_ID: 8.177.169.237.49.237.105.252.73.248.48.1

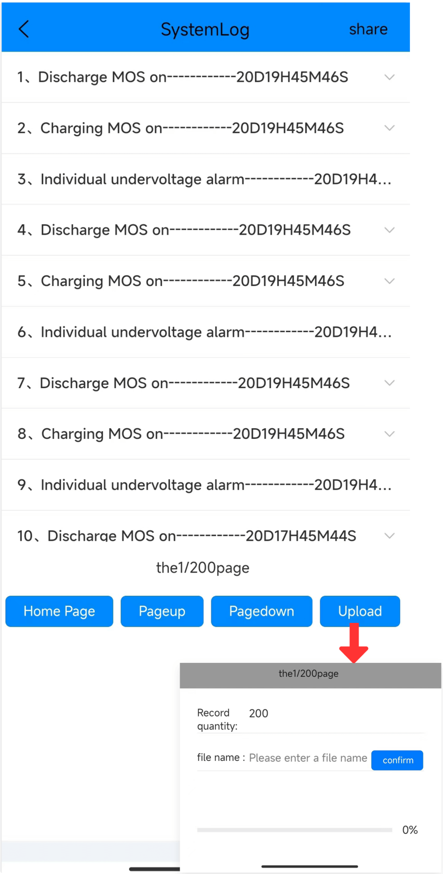
BAT_ID: ABCDEFGHIJKLMNOPQRSTUVWSYZ12345



Times of Unit overV protection:	12
Total voltage overV protection times:	11
Times of Unit underV protection:	1
Total voltage underV protection times:	0
Times of Unit differential pressure protection:	0
High temperature charging protection times:	0
High temperature discharge protection times:	0
MOS high temperature protection times number:	0
Low temperature charging protection times:	0
Low temperature discharge protection times:	0
Times of charging overcurrent protection:	0
Discharge overcurrent protection times:	0
Short circuit protection times:	0
Battery charging times number:	0
Battery cycle times number:	0
Low voltage shutdown times number:	0
Current abnormality times:	0
Manual restart times number of times:	3
Watchdog reset times:	0
Abnormal restart times number:	0
Debugging parameters 1:	0
Debugging parameters 2:	129
Debugging parameters 3:	126

4.4 system log

Record historical preservation data


SystemLog
share
Home Page
Pageup
Pagedown
Upload
confirm

```
1、Discharge MOS on------------20D19H45M46S
2、Charging MOS on------------20D19H45M46S
3、Individual undervoltage alarm------------20D19H4...
4、Discharge MOS on------------20D19H45M46S
5、Charging MOS on------------20D19H45M46S
6、Individual undervoltage alarm------------20D19H4...
7、Discharge MOS on------------20D19H45M46S
8、Charging MOS on------------20D19H45M46S
9、Individual undervoltage alarm------------20D19H4...
10、Discharge MOS on------------20D17H45M44S
```

the1/200page

the1/200page

Record quantity: 200

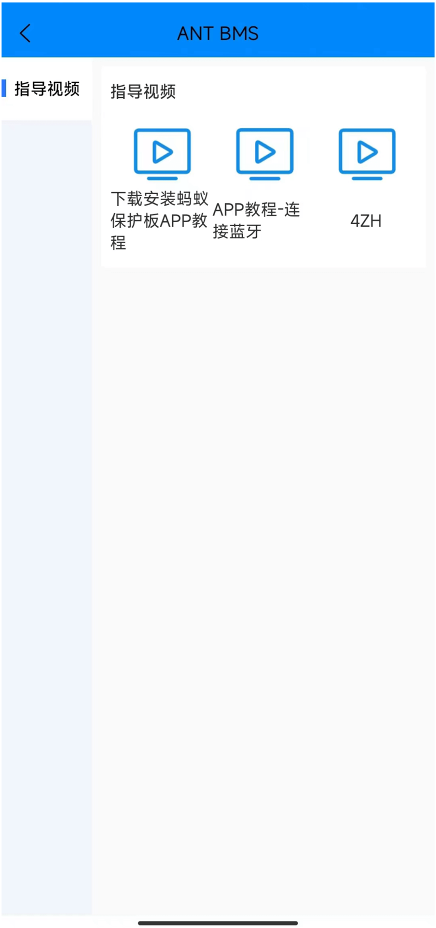
file name : Please enter a file name

0%

Click [Upload] and note the file name here. It can be sent to the manufacturer's server platform. Note the file name here.
And contact the manufacturer's personnel to help check the protection information of this file, which can help analyze the cause of the protection failure remotely.

4.5 Video

Video to be improved…



ANT BMS

指导视频

指导视频

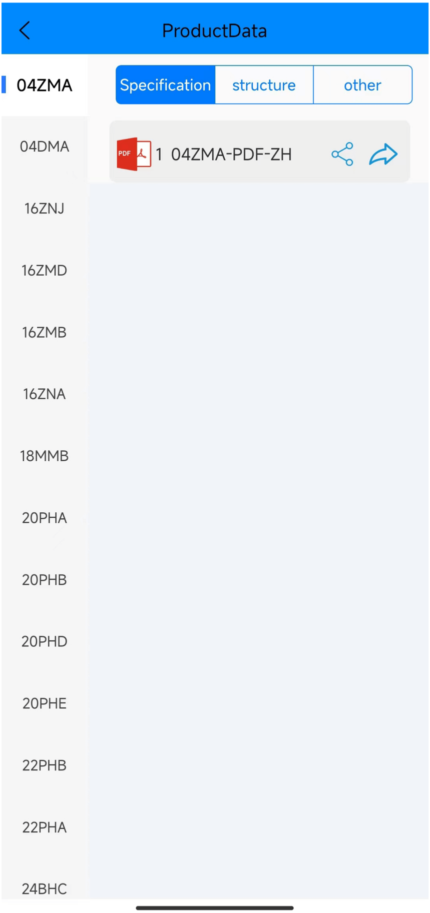
下载安装蚂蚁保护板APP教程

APP教程-连接蓝牙

4ZH

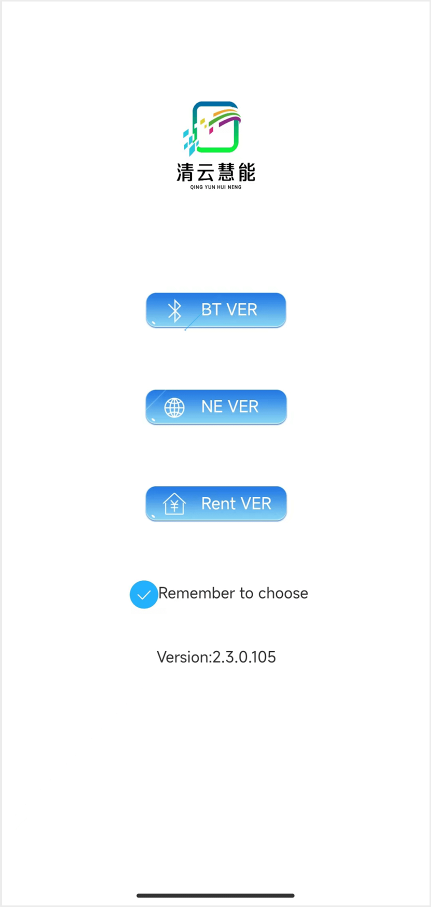
4.6 Documentation

Full range of product specifications introduction page


ProductData
04ZMA
Specification
structure
other
04DMA
1 04ZMA-PDF-ZH
16ZNJ
16ZMD
16ZMB
16ZNA
18MMB
20PHA
20PHB
20PHD
20PHE
22PHB
22PHA
24BHC

4.7 Switch versions

Ordinary users can choose the Bluetooth version to use.
Customized with GPS function, you can choose the online version.
For rental cabinet projects, you can choose the rental version.

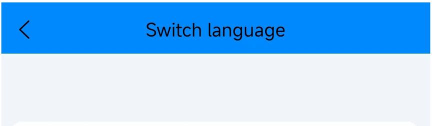

清云慧能
QING YUN HUI NENG
BT VER
NE VER
Rent VER

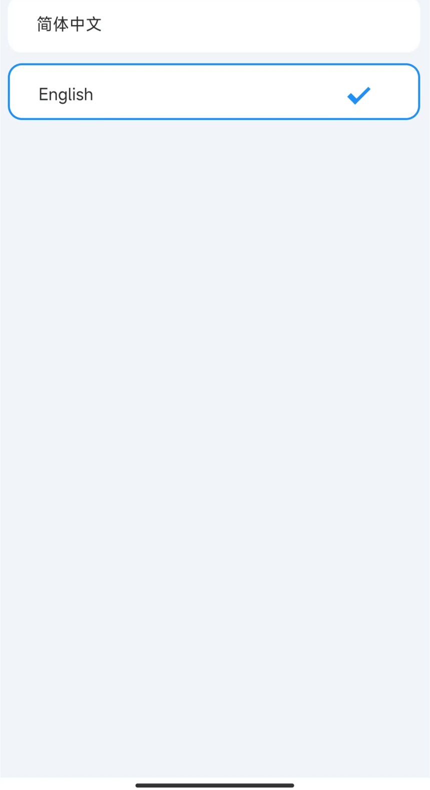
☑ Remember to choose

Version:2.3.0.105

4.8 Switch language

Support Chinese and English language display switching


Switch language



简体中文

English ✓