Specification

Product Name：12V200A Lithium Battery Management System

Product Model：12200-1202-EJ01-04S

Version	Date	Editor	Version Revision Note
V1.0	2025.2.6	Zhang Jiamin	Create the first draft

Functional configuration table

Customer		
Cell type	☑ Lithium-ion ☐Ternary Lithium ☐Sodium-ion ☐Other	
Number of battery cells	☑04S	
Current parameters	☑200A	
10A current limit	☐Active limit ☐Passive limit ☑Null	
Pre-charging function	☑Yes ☐No	
Memory function	☐Yes ☑No	
Communication	☐CAN ☐RS485 ☑UART	
Optional features	☐ External switch ☐Dry contact point ☑Bluetooth	
	Card type：☐Integrated ☑Split	Note: Splboard communication port and key indicator light can be drawn independently
Other parameters	Battery capacity （AH）：	

Signature and seal of the supplier			Signature and seal of the customer		
draw up	Amor	verify		authorize	

date		date		date	

Content

1、 System survey

1.1、Summary

This product is a fully functional 4 single group lithium ion battery pack management system, with single overvoltage / undervoltage, total voltage / overvoltage, voltage / discharge overcurrent, high temperature, low temperature, and short circuit protection and recovery functions. Realize the SOC precise measurement and SOH health status statistics in the process of charging and discharging. Realize the voltage balance during the charging process. Data communication with the host through RS485 communication, and parameter configuration and data monitoring through human-computer interaction of the upper computer software.

It can support 4 in parallel, 4 in series (after series system voltage 48V).

Note: The upper machine port rate is 9600

1.2、Enjie internal product model definition

12 200-1202-EJ 01-04S

A B C D E F

Num	Definition	Content
A	voltage	12V
B	current	200A
C	template	1202
D	customer	Based of the customer's of the customer, for example: EJ
E	model	The same customer orders different models, and the models are added up repeatedly
F	Sampling strings	04S

2、Normative reference documents

The following documents are essential for the application of this document. For dated

references, only the dated version applies to this document. For undated references, the latest version (including all amendments) applies to this document.

GB/T 191	Storage and transportation diagram signs
GB/T 2408-2008	Determination of plastic combustion properties, horizontal and vertical methods
YD/T 983-2013	Electromagnetic compatibility limits and measurement method of communication power supply equipment
GB/T 17626.5-2008	Electromagnetic compatibility test and measurement technology surge (impact) immunity test
GB/T 17626.2-2006	Electromagnetic compatibility test and measurement technology electrostatic discharge immunity test
YD/T 2344.1—2011	Lithium iron phosphate battery pack for communication- -Part 1: Integrated battery pack
YD/T 2344.2—2015	Lithium iron phosphate battery pack for communication- -Part 2: Discrete battery pack
YD/T 1363.3	Power supply, air conditioning and environment centralized monitoring and management system of communications Administration (station) - -Part 3: Front-end intelligent equipment protocol
YD/T 1058-2015	High-frequency switching power supply system used for communication

3、Functional features

3.1、Cell and battery voltage detection

Real-time collection and monitoring of voltage of 4 single set of cells to realize overvoltage, undervoltage alarm and protection.The detection accuracy of single voltage is less than ±20mV under the condition of-20~70℃, and the detection accuracy of PACK

voltage is less than ±0.5% under the condition of-20~55℃.

The alarm and protection parameters can be changed through the upper computer.

3.2、Cell, environment and power temperature detection

NTC conducts real-time collection and monitoring of 2 cell temperature, 1 ambient temperature and 1 power temperature to realize high temperature and low temperature alarm and protection. The temperature detection accuracy was ± 2℃.

The alarm and protection parameters can be changed through the upper computer.

3.3、Battery charge and discharge current detection

The current detection resistor connected to the main charge and discharge circuit is used to collect and monitor the charge and discharge current of the battery pack in real time, so as to realize the alarm and protection of charging current and discharging current. The current accuracy is ±2% for error below 10A and ±1% for error above 10A under the condition of-20~70℃.

The alarm and protection parameters can be changed through the upper computer.

3.4、Short circuit protection function

It has the detection and protection function of the short circuit to the output.

3.5、Battery capacity and cycle times

The calculation of real-time battery residual capacity, the learning of total capacity at one time, the SOC estimation accuracy is better than ± 5%.

It has the function of calculating charge and discharge cycle times. When the cumulative discharge capacity of the battery pack reaches 80% of the set full capacity, the cycle times is increased once.

The battery cycle capacity parameter setting value can be changed through the upper position computer.

3.6、Charge and discharge MOSFET switch

Low internal resistance, large current, for the application of backup power supply of large capacity value capacity load startup, zero switching, double the charging voltage optimization design.

3.7、Equilibrium of the intelligent single cell

Charging or standby battery can balance the unbalanced cell, which can effectively improve the service time and cycle life of the battery.

Balbalanced open voltage and balanced voltage difference can be set by the upper machine.

3.8、Upper monitor

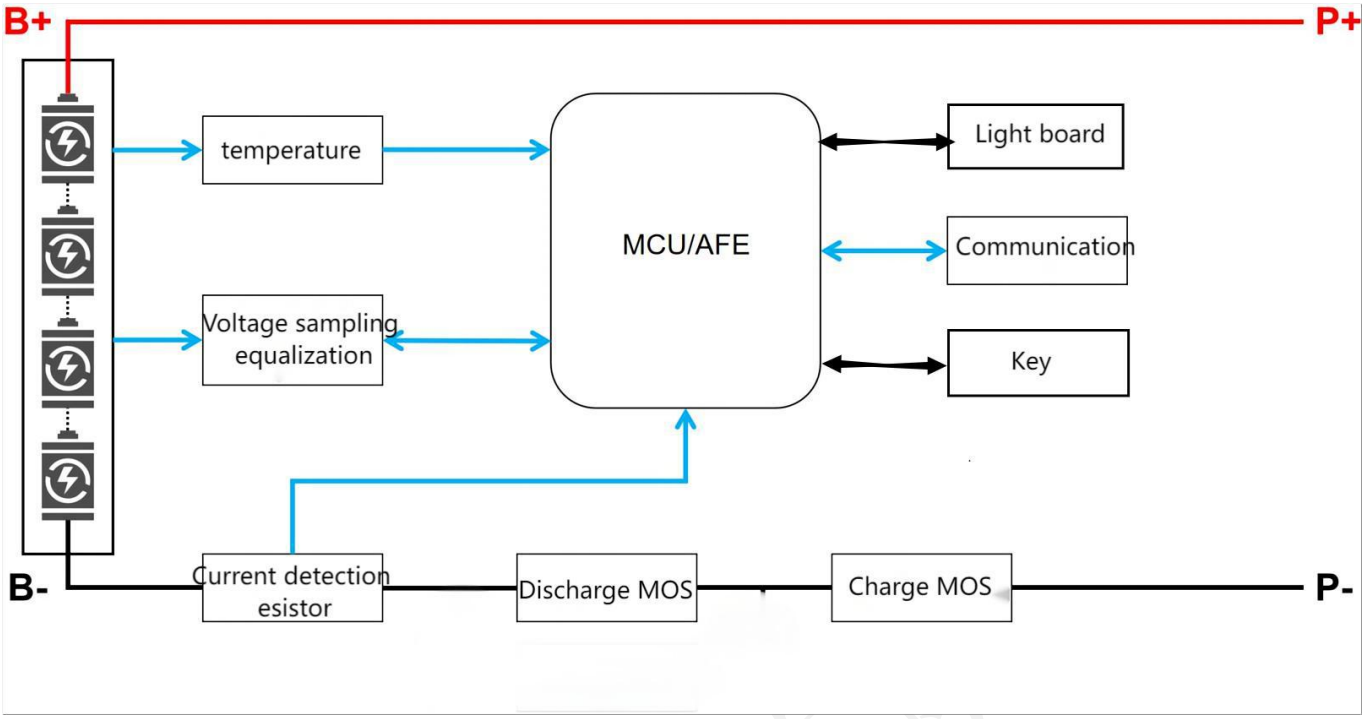
The host computer uses BatteryMonitor V2.1.13_ neutral _2025 version, which can be switched in Chinese and English (load English protocol when switching English), and loads the protocol (Chinese file name: 1204_04S_V20, English protocol name: 1204_04S_V20_EN). Using the operation instructions, please view the operation method in the upper computer file.

3.9、Program upgrade

1）The main program version can be upgraded through firmware updates in the host software.

2）The upper computer and the BMS are connected by RS485.

4、Functional framework diagram



5、Electrical character

Project	Min	Max	Type	Unit
Normal working voltage	8	15	12.8	V
Normal charging voltage	/	30	11.5	V
Operating temperature range	-20	70	25	℃
Storage environment temperature	-40	85	25	℃
Use ambient humidity	10	85	/	%
Continuous charging current	/	200	200	A
Continuous discharge current	/	200	200	A
Discharge output internal resistance	<2			mΩ
Normal operating power consumption	<50			mA
Sleep power consumption		300	0	uA
Shutdown power consumption		50	0	uA

6、 Basic parameter

6.1、Basic parameter setting

Function name	Function Settings	List of projects	Set the value	Setting range
Single voltage alarm	Open	Single high voltage alarm	3500mV	Monomer high voltage recovery ~ monomer overvoltage protection
		Single high voltage recovery	3400mV	3000mV~Single high voltage alarm
	Open	Single low voltage alarm	2800mV	monomer under voltage protection ~ monomer low voltage recovery
		Single low voltage recovery	3000mV	Single low voltage alarm~3300mV
Single overvoltage protection	Open	Single overvoltage protection	3650mV	Single high voltage alarm~4500mV
		Monomer overvoltage recovery	3400mV	High voltage recovery ~ monomer overvoltage
		Overvoltage recovery conditions	1、The monomer voltage drops to the overvoltage recovery point 2、The remaining capacity is 96% lower than the intermittent power supply capacity **Note: Two conditions must be met to recover**	
			Battery discharge current was detected>3A	
Single under-voltage protection	Open	Under voltage protection voltage	2600mV	1500mV~Single owe voltage recovery
		Overvoltage recovery voltage	2900mV	Single unit undervoltage protection ~ single unit low voltage alarm
		Single undervoltage shutdown	After undervoltage protection, shut down and maintain communication for 1 minute	

		Reinstatement condition of undervoltage	A charge current is detected（>3A）	
Total battery voltage alarm	Open	Total voltage high voltage alarm	14.0V	Total voltage high voltage recovery ~ total voltage overvoltage protection
		Total voltage and high voltage recovery	13.4V	13.4V~General high voltage alarm
	Open	Always low voltage alarm	11.8V	Total voltage undervoltage protection ~ total low voltage recovery
		Always lower voltage recovery	12.5V	Always low voltage alarm~13.2V
Total voltage overvoltage protection	Open	Total voltage overvoltage protection	14.5V	Total voltage high voltage alarm~15.0V
		Total overvoltage was recovered	13.5V	Total voltage high voltage recovery ~ total voltage overvoltage voltage
		Overvoltage recovery conditions	1 、 The monomer voltage drops to the overvoltage recovery point 2、The remaining capacity is 96% lower than the intermittent power supply capacity **Note: Two conditions must be met to recover**	
			Battery discharge current was detected>3A	
Total voltage undervoltage protection	Open	Total voltage undervoltage protection	11.4V	4.0V~The total voltage is restored to the under-voltage
		Total voltage owed voltage recovery	12.5V	Total voltage undervoltage protection ~ total low voltage alarm
		Total voltage undervoltage shutdown	Power off after under-voltage protection and maintain communication for 1 minute	
		Reinstatement condition of undervoltage	A charge current is detected（>1A）	

Do not charge when the cell temperature is high	Open	Charging high temperature alarm	50℃	充电高温恢复~充电过温保护
		Charging high temperature recovery	47℃	35℃~Charging high temperature alarm
		Charge overtemperature protection	60℃	Charging over temperature recovery~80℃
		Overheating recovery after charging	50℃	Charging high temperature recovery ~ charging over temperature protection
		Charging low temperature alarm	2℃	Charging undertemperature protection ~ charging low temperature recovery
		Charging low temperature recovery	5℃	Charging low temperature alarm~10℃
		Charging undertemperature protection	-10℃	-20℃~Charging undertemperature recovery
		Charging undertemperature recovery	0℃	Charging undertemperature protection ~ charging low temperature recovery
The temperature of the cell is banned	Open	Discharge high temperature alarm	52℃	Discharge high temperature recovery ~ discharge overtemperature protection
		High temperature recovery after discharge	47℃	35℃~Discharge high temperature alarm
		Overtemperature protection of discharge	60℃	Overtemperature recovery of discharge~80℃
		Overtemperature recovery of discharge	50℃	Discharge high temperature recovery ~ discharge overtemperature protection
		Discharge low temperature alarm	-10℃	Discharge under temperature protection ~ discharge low temperature recovery
		Discharge low temperature recovery	3℃	Low discharge temperature alarm~10℃

		Discharge insufficient temperature protection	-20℃	-30℃~Undertemperature recovery of discharge
		The discharge undertemperature is restored	-10℃	Discharge undertemperature protection ~ discharge and low temperature recovery
Environmental temperature protection	Open	Environmental high temperature alarm	50℃	Environmental high temperature recovery ~ environmental overtemperature protection
		Environmental high temperature recovery	47℃	-20℃~Environmental high temperature alarm
		Environmental overtemperature protection	60℃	The environment is restored over temperature~80℃
		The environment is restored over temperature	55℃	Environmental high temperature recovery ~ environmental overtemperature protection
		Environmental low temperature alarm	-10℃	Environmental undertemperature protection ~ environmental low temperature recovery
		Low temperature recovery of the environment	3℃	Environmental low temperature alarm~60℃
		Environmental undertemperature protection	-20℃	-30℃~The low temperature of the environment is restored
		The low temperature of the environment is restored	-10℃	Environmental undertemperature protection ~ environmental low temperature recovery

Power temperature protection	Open	Power high temperature alarm	80℃	Power high-temperature recovery ~ power over-temperature protection
		Power high temperature recovery	75℃	60℃~Power high temperature alarm
		Power overtemperature protection	100℃	Power high temperature alarm~120℃
		Power overheating recovery	85℃	Power high-temperature recovery ~ power over-temperature protection
Charge excessive alarm	Open	Charge excessive alarm	205A	Charge overcurrent recovery ~ charge overcurrent protection
		Charging over-flow recovery	203A	0A~Charge excessive alarm
Charging over-current protection	Open	Charging over-current protection	210A	Charge excessive alarm~209A
		Charge over time delay	10S	0S~10S
		Overflow recovery conditions	The discharge resumes immediately, or automatically after 60S	
Effective charging current	Charge into the current		600mA	
	Charge out current		500mA	
Discharge overflow alarm	Open	Discharge overflow alarm	-205A	Discharge overcurrent protection ~ discharge overflow recovery
		The discharge over-flow is restored	-203A	Discharge overflow alarm~0A
Discharge overcurrent protection	Open	Discharge overcurrent protection	-210A	Transient overcurrent protection ~ discharge overcurrent alarm

		Discharge over-flow delay	10S	0S~10S
		Overflow recovery conditions	Charge immediately or automatically after 60S	
Transient over-current protection	Open	Transient over-current protection	-250A	Discharge overcurrent protection value~300A
		Transient overcurrent delay	100mS	0mS~100mS
		Transient overcurrent recovery	Charge back immediately, or automatically after 60S	
	Close	Transient overflow locking	Continuous secondary overcurrent, exceeding the number of overcurrent locks	
		Overflow lock times	5times	
		Transient lock release	Connect the charger	
Output short circuit protection	Open (Close settings is not supported)	Short-circuit protection current and time delay	Write into program (note: not allowed)	
		Short circuit protection recovery	Charge back immediately, or automatically after 60S	
	Open	Short circuit protection lock	Continuous output short circuit, exceeds the number of overcurrent lock	
		Short circuit lock times	5times	
		The short circuit lock is lifted	Connect the charger	
Effective discharge current	Discharge into current		-500mA	
	Discharge exit current		-400mA	

Balanced function of cell	Open	Standby equilibrium	No charge or discharge state is on equilibrium	
		Standby equilibrium time	10hours	Can set
	Open	Charging is balanced	Charging state and floating charging state to open the equilibrium	
	Turn on voltage conditions	Balanced turn on voltage	3400mV	Can set
		Balanced open voltage difference	30mV	
		Balanced end voltage difference	20mV	
	Open	Equilibrium temperature limit	According to (note: the ambient alarm temperature determines) the balanced shutdown temperature range	
		Balanced high temperature is prohibited	50℃	Can set
		A ban on moderate cooling	0℃	
The cell fails to alarm	Open	Power cell failure voltage difference	500mV	Can set
		The cell recovers the voltage difference	300mV	
Battery capacity setting	Battery rated capacity		200Ah	5Ah~300Ah
	Battery residual capacity		Based on the cell voltage estimate	Can set
	Cycle cumulative capacity		80%	Cycle index （Can set）
	Open	Remaining capacity alarm	15%	
	Open	Remaining capacity protection	5%	Close the output

Pre-charging function	300ms	Do not set	BMS boot instantly start the precharge function	
BMS power consumption management	Open	Maximum standby time	48h（The charger is absent and has no effective discharge current）	
External switch	Open	The BMS can operate the external switch to turn off and on the BMS in standby mode		
LCD	Open	Simplify the monitoring software, you can view the cell, temperature, current and other data		
Manual charging activation	Open	1min	After the under-voltage protection, the BMS shuts down and manually presses the button to activate and clear the forced output of the under-voltage protection	Can set

6.2、Basic working mode

Charging mode	When the BMS detects the charger connection and the external charging voltage is greater than the internal battery voltage above 0.5V, the charging current reaches the effective charging flow.	
Discharge mode	When the load connection is detected and the discharge current reaches the effective discharge current, BMS enters the discharge mode.	
Standby mode	When the above two modes are not satisfied, enter the standby mode.	
Shutdown mode	cut-off condition ： 1）Normal standby for 48 hours; 2）The battery triggers undervoltage protection; 3）Press the ReSet key;	Wake up conditions： 1）Charging activation; 2）12V voltage activation; 3）Press the ReSet key;

6.3、LED light instructions

6.3.1、LED light sequence

1 running light, 1 alarm light, 4 capacity indicator lights

L1●	L2●	L3●	L4●	●	●
SOC				ALARM	RUN

6.3.2、Capacity indication

status		charge				discharge			
Capacity indicator light		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
residual capacity	0～25%	off	off	off	flicker	off	off	off	on
	25～50%	off	off	flicker	on	off	off	on	on
	50～75%	off	flicker	on	on	off	on	on	on
	≥75%	flicker	on	on	on	on	on	on	on
Run the indicator light ●		on				flicker			

6.3.3、Flash description

Flash mode	ON	OFF
flicker1	0.25s	3.75s
flicker2	0.5s	0.5s
flicker3	0.5s	1.5s

6.3.4、State instructions

System state	Running state	RUN	ALM	SOC				Explain
		●	●	L4 ●	L3 ●	L2 ●	L1 ●	
Power off	Sleep	Off	Off	Off	Off	Off	Off	All off
Standby	Normal	Flicker1	Off	Off	Off	Off	Off	Stand by

Charge	Normal	On	Off	According to the electricity instruction				Maximum LED flash of 2
	Overflow alarm	On	Flicker2	According to the electricity instruction				Maximum LED flash of 2
	Overvoltage protection	Flicker1	Off	Off	Off	Off	Off	
	Temperature, overcurrent protection	Flicker1	Flicker1	Off	Off	Off	Off	
Discharge	Normal	Flicker3	Off	Based on the power meter				According to the power quantity of constant lighting indication
	Alarm	Flicker1	Flicker1					
	Temperature, overcurrent, short circuit, etc	Off	On	Off	Off	Off	Off	Stop discharging, and the system will be forced into sleep after 48h without action when the mains power is disconnected
	Undervoltage protection	Off	Off	Off	Off	Off	Off	Stop discharge

7、 Functional description

7.1、Running state

Num	Function	Definition
1	Boot / Start	The BMS is in a dormant state. Press the reset button to start the BMS,after the LED indicator lights flash in turn, it enters the normal working state.

2	Shut off / Sleep	BMS is in standby or discharge state, press this key for 6s (including 3s flash time), BMS is dormant, LED indicator light shines in turn, turn to dormant state. BMS without power consumption after dormancy.
3	Stand by	1) Under the protection state of no overvoltage, undervoltage, overcurrent, short circuit, overtemperature and undertemperature, press the reset button to start up, and the BMS is in standby state. 2) In the standby state, the running light flashes, and the battery can be charged and discharged.

7.2、Overcharge protection and recovery

Overcharge	Single	Protect	If any section is above the single overcharge protection set point, the charging device cannot charge the battery.
		Recover	When the highest monomer voltage drops to below the recovery value of monomer overcharge and the SOC is lower than 96%, the overcharge protection state is relieved. It can also be discharged.
	total voltage	Protect	When the battery voltage is higher than the total voltage overcharge protection set point, the BMS enters the overcharge protection state, and the charging device cannot charge the battery.
		Recover	When the total voltage drops below the recovery value of the total voltage and the SOC is lower than 96%, the overcharge protection state is relieved. It can also be discharged.

7.3、Overrelease protection and recovery

Overdischarge	Single	Protect	If any section is lower than the set value of single overdischarge protection, BMS enters the overdischarge protection state and the load cannot discharge the battery. BMS is off after 1 minute communication.
		Recover	After the protection, the battery pack can be relieved from the protection state. Or press the reset button, the BMS will turn on and re-check whether the battery pack voltage reaches the recovery value.

	total voltage	Protect	When the total voltage is under the overdischarge protection set point, the BMS enters the overdischarge protection state, and the load cannot discharge the battery. BMS is off after 1 minute communication.
		Recover	After the protection, the battery pack can be relieved from the protection state. Or press the reset button, the BMS will turn on and re-check whether the battery pack voltage reaches the recovery value.

Note: BMS discharge undervoltage protection after shutdown, button activation or charging activation, BMS maintained for 1 minute with the output voltage to the inverter to detect the battery voltage, so the discharge is not allowed within 1 minute.

7.4、Overcurrent protection and recovery

Charging over the flow	Protect	When the charging overcurrent protection set value is exceeded, and the delay time is reached. The BMS enters the charge overcurrent protection, and the charging device cannot charge the battery.
	Recover	After over-current protection, BMS automatically delay recovers and redetects the external charger current. Discharge can also remove the charge overcurrent protection.
Discharge overflow	Protect	When the setting value of discharge overprotection is exceeded, the delay time is reached. BMS into the discharge overcurrent protection, the load can not charge the battery.
	Recover	After over-current protection, BMS automatically delay recovery and retest the external load current. Charging can also remove the discharge overcurrent protection.

Note: 1) When there is no charging current limiting function, the charging overcurrent protection can be triggered.

2) Discharge overcurrent protection has secondary protection, achieving transient overcurrent protection and discharge overcurrent protection recovery. Transient overcurrent protection will be locked when the condition reaches the condition, and the recovery must be shut down during startup or charging.

7.5、Temperature protection and recovery

Note: BMS has 4 temperature detection ports, monitoring temperature change to achieve protection measures.

charge-discharge	high temperature	Protect	When the NTC of any cell is higher than the high temperature protection set point, the BMS enters the high temperature protection. The BMS stops charging or discharging.
		Recover	When the temperature of the cell is lower than the high temperature recovery value, the BMS resumes charging or discharging.
	low temperature	Protect	When any cell NTC is below the cryogenic protection set point, BMS enters the cryoprotection. The BMS stops charging or discharging.
		Recover	When the cell temperature is higher than the low temperature recovery value, the BMS resumes the charge or discharge.
Environmental temperature protection	Over temperature	Protect	When NTC detects that the ambient temperature is higher than the ambient high temperature set value, BMS enters the ambient overtemperature protection. The BMS stops charging and discharging.
		Recover	When the ambient temperature is lower than the ambient recovery value, the BMS resumes the charge or discharge.
	Under the temperature	Protect	When the NTC detects that the ambient temperature is lower than the ambient low temperature set value, the BMS enters the ambient under-temperature protection. The BMS stops charging and discharging.
		Recover	When the ambient temperature is higher than the ambient recovery value, the BMS resumes the charge or discharge.
Power temperature protection	When the NTC detects that the power temperature is higher than the power protection set value, the BMS enters the power high temperature protection. The BMS stops charging and discharging.		

7.6、Optional features

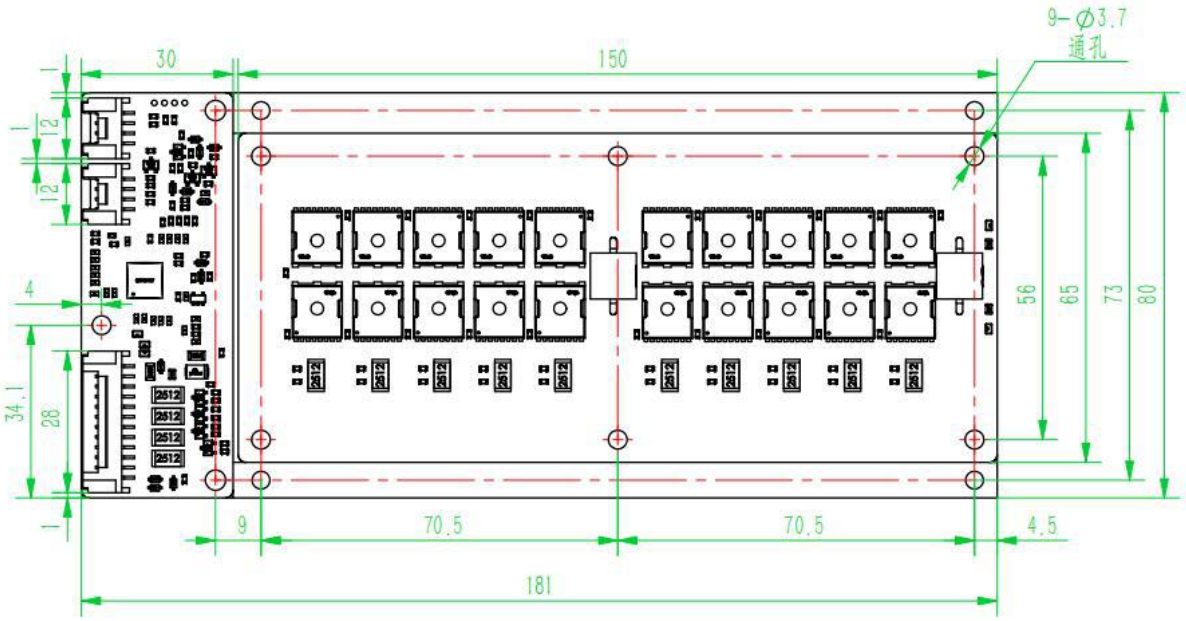
Bluetooth	It can be realized through the main board or display Bluetooth. Through the wireless connection between the mobile phone Bluetooth and the battery pack Bluetooth module, the battery pack management, and alarm information collection, query, display, configuration and modification functions. The Bluetooth APP can implement the following functions: 1）Battery pack basic information is displayed； 2）BMS and inverter communication configuration；

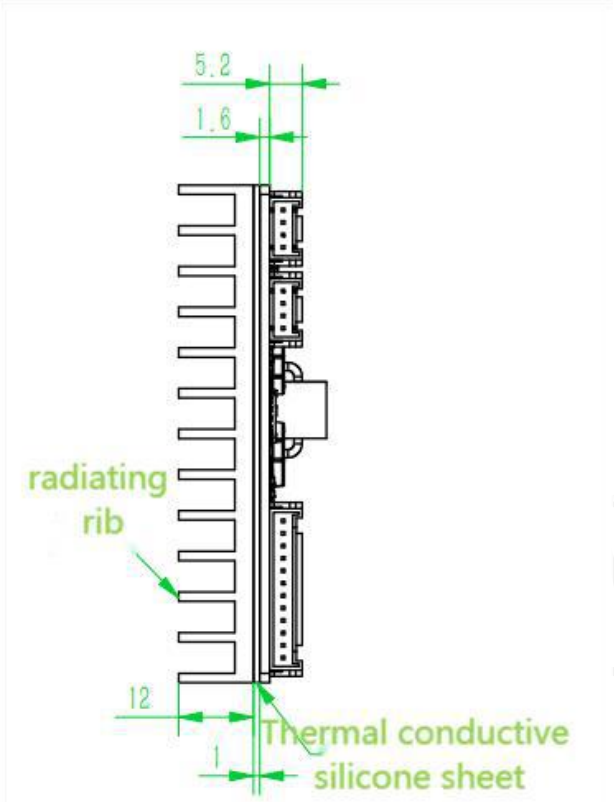
	3）Battery pack alarm / protection parameters and control switch configuration； 4）Support single and parallel; support real-time switching； 5）Both Chinese and English display switch。

7.7、Other features

Other functions	Balance	The BMS system adopts the energy consumption equalization circuit, and the equilibrium open voltage software is adjustable. The equilibrium opening condition is higher than the equilibrium open voltage, and the voltage difference reaches the condition together. The charging is stopped or the voltage difference of the cell is less than the set value.	
	Dormancy	Automatic dormancy: When the battery is automatically automatically for 48 hours. When the battery pack is protected, maintain communication for 1 minute, and the BMS becomes dormant.	Manual hibernation: 1) By manually pressing the 6S reset button, the 4 LED lights are lit in turn, and the BMS enters sleep mode. 2) The switch is controlled by an external switch to turn on and off. The switch is turned on when the switch is closed, and the switch is turned off when the switch is open. 3) Standby sleep can be set through the upper computer.
	Pre-charge	The precharge function is started at the instant of machine startup or discharge tube opening, and the precharge time is fixed (300mS), which is used to deal with various capacitive load scenarios and avoid BMS output short circuit protection.	
	One key switch machine	When the BMS is connected, the main machine can control the slave machine and the boot. The host must dial the code in accordance with the parallel mode, and the host dial address is not dial.(During the connection, the battery returns and cannot be turned down with one key)	

8、Size positioning diagram

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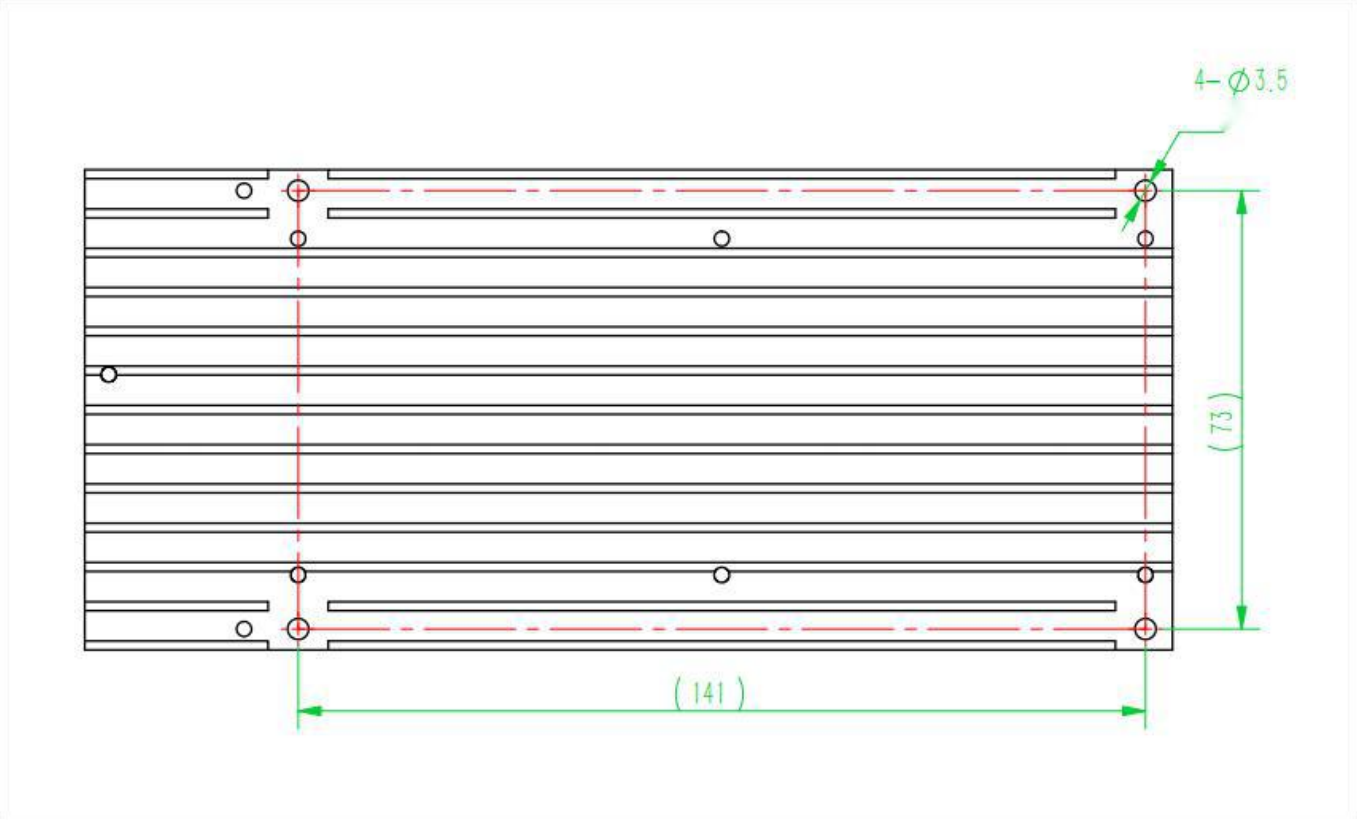
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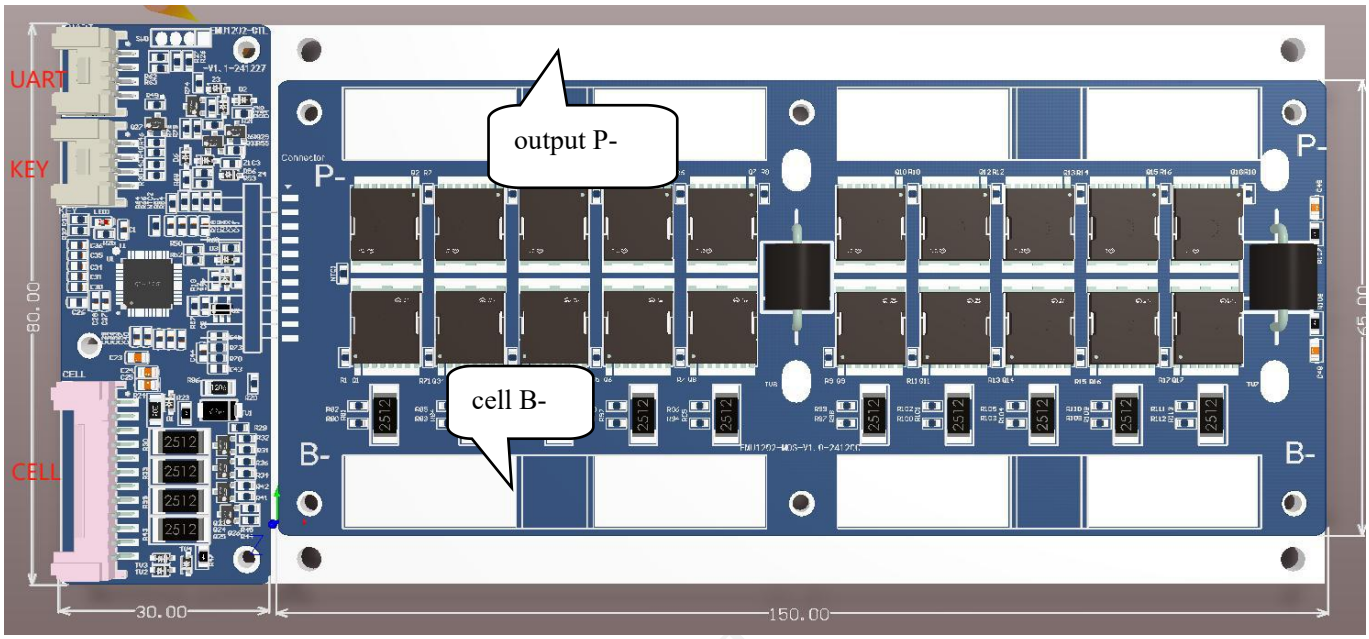
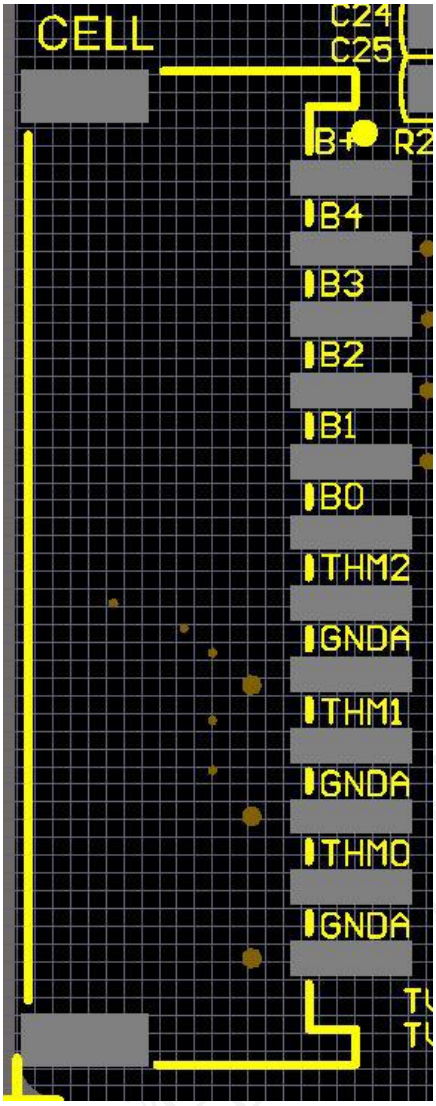
9、Refer to figure and connection instructions

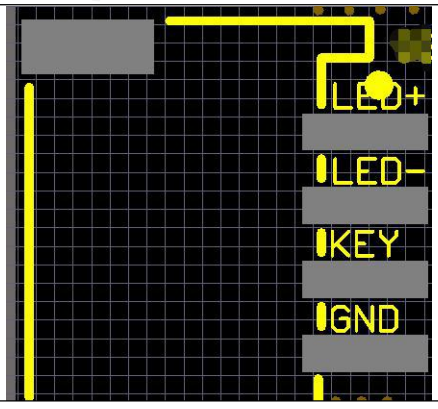


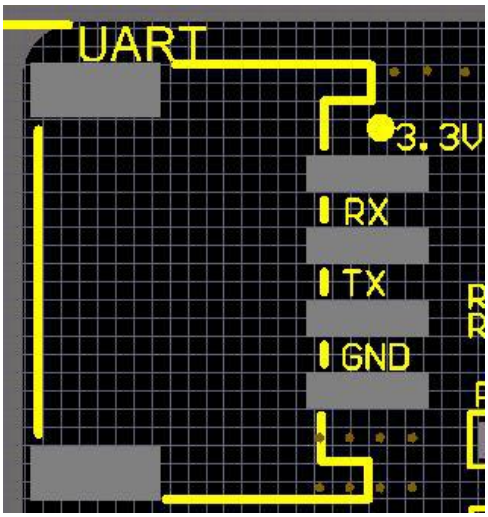
Num	Name	Describe	Affect	Type
1	CELL	Cell voltage collection and temperature collection interface	Sample cell voltage and cell temperature	HX20020-12AWB
2	KEY	Key interface	Keyswitch	HX20020- 4AWB
3	UART	Reserve the UART interface	Connect to the Bluetooth / upper computer	HX20020- 4AWB

Note: There may be some differences between the actual product and the above product physical map.

9.1、Wiring definition

CELL interface pin definition			
	PIN1	B+	Connect to the positive electrode of the fourth battery
	PIN2	B4	Connect to the positive electrode of the fourth battery
	PIN3	B3	Connect to the positive electrode of the third battery
	PIN4	B2	Connect to the positive electrode of the second battery
	PIN5	B1	Connect to the positive electrode of the first battery
	PIN6	B0	Connect to the negative electrode of the first battery
	PIN7	THM2	Connect temperature sensor NTC2
	PIN8	GNDA	Ground
	PIN9	THM1	Connect to the temperature sensor NTC 1
	PIN10	GNDA	Ground
	PIN11	THM0	Connect to the temperature sensor NTC 0
	PIN12	GNDA	Ground

KEY interface pipe foot definition			
	PIN1	LED+	LED positive pole
	PIN2	LED-	LED negative pole
	PIN3	KEY	Positive external switch
	PIN4	GND	Negative external switch

UART interface pipe foot definition			
	PIN1	3V3	Connect the power supply to the Bluetooth / upper computer
	PIN2	RX	TX on Bluetooth / upper computer
	PIN3	TX	Bluetooth / upper computer RX
	PIN4	GND	Ground

9.2、Up and down electric order

1）The power supply is connected in the following order: first connect the motherboard B-, then connect the wiring CELLSAMP and CELLS1, and finally connect P+ and P-to the charger or load (Note: the motherboard is in a shutdown state after the wiring is connected. The BMS can also be activated by closing the external switch or charging).

2）The power-down sequence is completely opposite: disconnect the charger or load first (note: disconnect the external switch to shut down), then disconnect CELLSAMP and CELLS1, and finally disconnect B-.

3）Input and output

When charging: the positive of the charger is connected to the total positive of the battery pack, and the negative of the charger is connected to the "P-" of the protection plate.

During discharge: the positive terminal of the load is connected to the total positive terminal of the battery pack, and the negative terminal of the load is connected to "P-" of the protection board.

10、List of accessories

Num	Name	Number	Configure
1	Voltage collection line	1	optional
2	Regular switchboard line	1	optional
3	M5*12 screw	4	optional
4	Conventional transfer board	1	optional

11、Attention

- The battery management system cannot be used in series.
- The withstand voltage resistance of BMS power components is 100V.
- If the cell module is assembled in the form of long wire and long copper row, it must communicate with the BMS manufacturer to make impedance compensation. Otherwise, it will affect the cell consistency.
- The external switch on the BMS is prohibited from connecting to other devices. If necessary, please confirm with the technical team. Otherwise, BMS will not be liable for any damage.
- The protective plate should not directly touch the cell surface during the assembly to avoid damage to the cell. The assembly should be firm and reliable.
- In use, pay attention to the lead head, soldering iron, solder and do not touch the components on the circuit board, otherwise it may damage the circuit board.
- The use process should pay attention to anti-static, moisture-proof, waterproof, etc.
- Please follow the design parameters and conditions of use, and shall not exceed the value in this specification, otherwise the protective plate may be damaged.
- After combining the battery pack and the protection panel, if there is no voltage output or no charge, please check if the wiring is correct.
- The final right of interpretation belongs to the company.