Specification For Approval

Customer	
Customer Model	
DR Model	DR48100JC-26-21（16S200A200Ah）
File.No :	
Version	A0
Date	2024-03-26

Draft	Checked	Approval
庞荣艳	王冠	王伟员
Customer Approval		

■ROHS □REACH

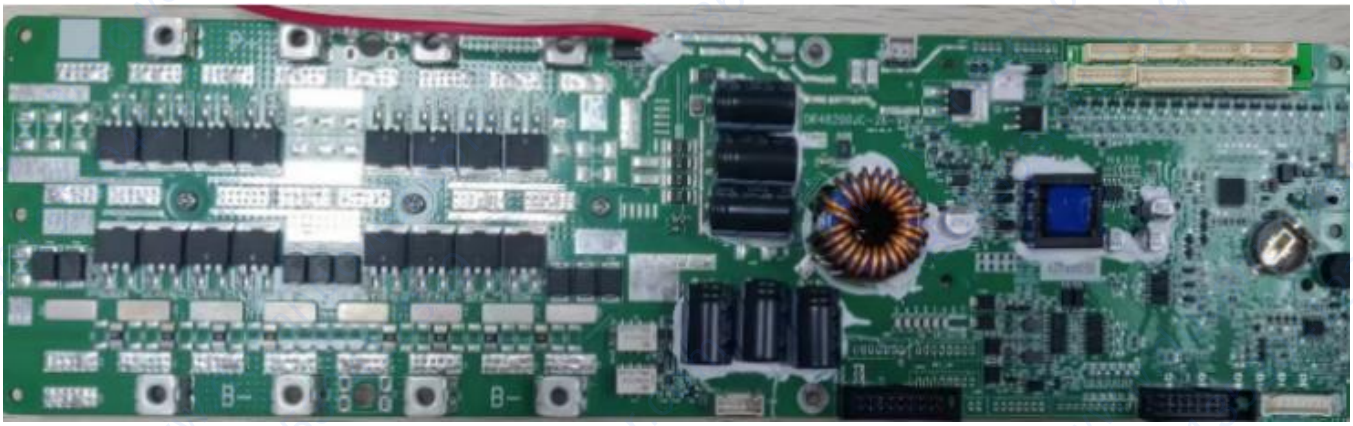
configuration table

功能 functional zone	Series cell	■16cell □15cell □14cell □12cell □8cell	
	Current-limiting	□No □ 10A ■20A □ ___A ■ Passive current limiting □ Active current limiting	
	Reverse connection protection	■ No □ Yes	
	Buzzer	□No ■Yes	
	Secondary protection	■No □ Yes（**optional**）	
	Heating membrane	■No □Yes（**optional**）	
	Pre-charge	□No ■Yes	
	Storage	□No ■500 □1000	
	Dip switch address	■6 c o d e s	
	LED Lights	■RUN ■ALARM ■SOC 4 p c s	
	CONS	■Vertical ■17+8 □6+7+6+7	
	Low voltage switch	□No ■Yes	■Harness Harness + switch
	Dry contact	□No ■Yes	□NO ■Yes
	LCD（optional）	□No ■English smart edition □5-inch touchscreen □7-inch touchscreen	□Key film ■Key cap
	communication port	■RS485 ■Double RS485 ■CAN □RS232（non-function）	
	External communication	□Bluetooth □WIFI	
	Upgrade mode	■RS485 □Bluetooth□WIFI	
		Goodwe\ Pylon\ Deye \Victron\SMA\Slfar\Growatt\SRNE\Voltronic etc. The inverter protocol supports the selection of host computer, display screen and dip switch	

CONTENT

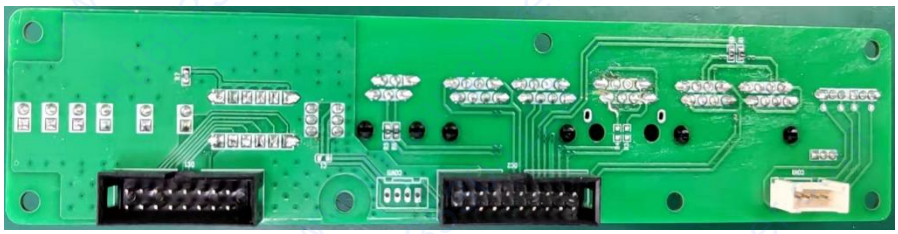
1.Product picture

1.1、Positive product physical picture

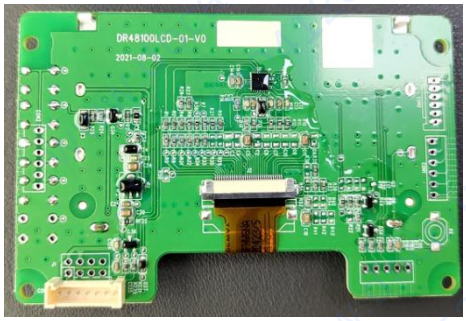


1.2、Reverse product physical picture

1.3、Switch communication board physical positive and negative picture



1.4、Display physical picture front and back(optional)1.5、



5 Inch touch screen physical picture(optional)

1.6、Physical image of 7-inch touch screen(optional)

Note: The physical picture is for reference only, subject to the actual.

2. Scope of application

This product is suitable for 16-string lithium battery management system, which provides overvoltage, undervoltage, overcurrent, high temperature, low temperature and short circuit protection and recovery functions for battery pack. To achieve accurate SOC measurement and SOH health status statistics in the process of charge and discharge. Realize voltage balance in charging process. Display and set alarm protection parameters, such as voltage, current and temperature, and store and display real-time and historical data of battery running status through human-computer interaction of the upper computer software. Has a variety of sleep and wake up modes. Parallel communication via RS485. Through RS485, CAN and PC data communication, through the PC software human-computer interaction for parameter configuration and data monitoring. It can be widely used in home energy storage inverter, indoor and outdoor base station, etc.

3. Function description

3.1、Voltage detection and protection function

It has the functions of overvoltage, low voltage alarm and overvoltage and undervoltage protection for single cell and battery pack.

3.2、Current detection and protection function

It has the functions of charge and discharge current detection, alarm and protection. The upper computer displays negative current for discharge and positive current for charging.

3.3、Short-circuit protection function

It has the function of detection and protection of output short circuit.**3.4、Temperature detection function**

With cell, environment, power MOS temperature detection, and can be charged and discharged in high temperature, low temperature alarm and protection. There are 4 channels of cell temperature detection, 1 channel of ambient temperature detection, 1 channel of power MOS temperature detector detection, and a total of 6 channels of NTCS.

3.5、Temperature detection function

The battery SOC can be calculated in real time. The full capacity and current capacity of the battery pack can be set by the upper computer for a complete charging and discharging cycle, and the post-cycle capacity can be automatically configured.

It has the function of calculating the number of charge and discharge cycles. When the cumulative discharge capacity of the battery pack reaches more than 80%, the number of cycles is increased once.

3.6、harge/discharge MOSFET switch function

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

3.7、Battery charging balancing function

The charging balancing policy can be flexibly set (starting voltage and balancing voltage), which can effectively improve the battery life and cycle life.

3.8、 LED status indicator function

It has 6 LED indicators, 4 remaining battery capacity indicators, 1 running indicator and 1 alarm protection status indicator.

3.9、Key switch function

One-button switch design, the system can be manually started when the shutdown state, when the standby state can be manually shut down.

3.10、 RS485 and CAN communication functions

With RS485, CAN communication function, can realize the PC or intelligent front end through telemetry, remote communication, remote control, remote control and other commands to achieve battery data monitoring, operation control and parameter setting, to real-time monitoring BMS and battery pack status.

3.11、Upper computer control function

It can set various battery management parameters such as over and under voltage of single battery, over and under voltage of total battery, over current of charge, over current of discharge, over current of discharge,high and low temperature of battery cell high and low temperature of environment, balancing strategy, numberof battery series, and battery capacity. It can open and close discharge MOS, charge MOS, current limiting function switch, and buzzer alarm switch.
Forced sleep switch and realize the system software online upgrade function.

3.12Hardware voltage detection function

BMS design is equipped with unique hardware detection protection circuit.
Ensure that the BMS can runsafely and reliably for a long time under abnormal conditions.

3.13、Historical data storage function

The storage capacity of historical records is not less than 500 records, facilitating system monitoring, analysis,and maintenance.

3.14、Parallel communication function

It can realize the function of parallel communication through RS485 interface, with dip switch, which is used to set the address in parallel communication.

3.15、Charging current limiting function

It has 20A current limiting function. The current limiting mode includes passive current limiting mode and active current limiting mode.
The default passive current limiting mode of this product is passive current limiting.
Charging current greater than 220A start current limit.

3.16、matching

Dry contact definition: (Normally open by default)

（1）When there is protection and failure, dry contact 1 action closed;

（2）When an alarm is generated, dry contact 2 acts.

Attached: Reliability parameters

No.	Test items	Specifications/conditions
1	accuracy	Specifications/conditions：±2% Voltage accuracy:：±20mV Temperature accuracy：±2℃ SOC average accuracy：≤±5%
2	Current threshold	Charging current：0.5A Discharge current：0.5A
3	Failure type	1 charge and discharge MOS tube failure; 2、current detection failure; 3、Temperature detection failure; 4、voltage detection failure (voltage is lower than 1.0V, no charging)
4	Information storage	Store at least 500 pieces of historical data information, including the current total voltage, current, temperature, SOC, SOH, cycle times and running status
5	Communication interface	1、The inverter supports CAN or RS485 communication 2、support RS485 communication and upgrade 3、support RS485 parallel communication
6	Turn on	Under the shutdown mode, Turn on the weak current switch to start the machine, and the LED light corresponding to the real-time SOC will be on at the same time
7	Turn off	In startup mode, turn off the weak current switch for 3~6S until 6 leds are turned off successively
8	Short circuit	The internal resistance of the battery pack and short circuit circuit shall not be less short circuit 50 times than 40 M ω, and the short circuit current shall not exceed 1000A. Use the air switch to

4. Electrical characteristics

4.1、Electrical property

Item	min	max	nomal	unit
Operating voltage	35	60	52	V
充Charging voltage	42	60	56	V

Operating temperature range	-20	70	25	℃
Operating humidity range	10	85	/	%
Continuous charge and discharge current		200		A
Discharge output internal resistance	<10			mΩ
Normal operating power consumption	≤40（Without display）			mA
	≤60（With display）			mA
Sleep power consumption		200	100	uA

4.2、Basic parameter setting

Alarm value					
Function name	Function setting	Whether to set	Index item	Factory default	Notes
Cell voltage warning	ON	Yes	Over voltage warning	3600mV	±20mV
		Yes	Over voltage delay	3000mS	1000-5000mS
		Yes	Over voltage release	3450mV	±20mV
		Yes	Under voltage warning	2700mV	±20mV
		Yes	Under voltage delay	3000mS	1000-5000mS
		Yes	Over voltage release	3000mV	±20mV
Pack voltage warning	ON	Yes	Over voltage warning	57.0V	±50mV
		Yes	Over voltage delay	3000mS	1000-5000mS
		Yes	Over voltage release	55.0V	±50mV
		Yes	Under voltage warning	44.0V	±50mV
		Yes	Under voltage delay	3000mS	1000-5000mS

		Yes	Under voltage release	48.0V	±50mV
Charging Cells temperature warning	ON	Yes	Over temperature warning	50℃	±2℃
		Yes	Over temperature delay	3000ms	1000-5000mS
		Yes	Over temperature release	45℃	±2℃
		Yes	Under temperature warning	0℃	±2℃
		Yes	Under temperature delay	3000ms	1000-5000mS
		Yes	Under temperature release	5℃	±3℃
Discharging Cells temperature warning	ON	Yes	Over temperature warning	55℃	±3℃
		Yes	Over temperature delay	3000ms	1000-5000mS
		Yes	Over temperature release	50℃	±3℃
		Yes	Under temperature warning	-15℃	±3℃
		Yes	Under temperature delay	3000ms	1000-5000mS
		Yes	Under temperature release	-5℃	±3℃
ENV temperature warning	ON	Yes	ENV Over temperature warning	55℃	±3℃
		Yes	ENV Over temperature delay	3000ms	1000-5000mS
		Yes	ENV Over temperature	50℃	±3℃

			release		
		Yes	ENV Under temperature warning	-15℃	±3℃
		Yes	ENV Under temperature delay	3000ms	1000-5000mS
		Yes	ENV Under temperature release	-10℃	±3℃
Charging over current warning	ON	Yes	Charging over current warning	205A	±2A
		Yes	Charging over current delay	2000ms	1000-4000mS
		Yes	Charging over current release	200A	±2A
Discharging over current warning	ON	Yes	Discharging over current warning	205A	±2A
		Yes	Discharging over current delay	2000ms	1000-4000mS
		Yes	Discharging over current release	200A	±2A
MOS over temperature warning	ON	Yes	MOS over temperature warning	90℃	±3℃
		Yes	MOS over temperature delay	3000ms	1000-5000mS
		Yes	MOS over temperature release	80℃	±3℃

Voltage difference warning	ON	Yes	Big voltage difference warning	500mV	±50mV
		Yes	Big voltage difference release	300mV	±50mV
SOC warning	ON	Yes	Low SOC warning	15%	
		Yes	Low SOC warning release	20%	
Protection value					
Function name	Function setting	Whether to set	Index item	Factory default	Notes
Cell protection	ON	Yes	Over voltage protection	3680 mV	±20mV
		Yes	Over voltage delay	3S	±2000mS
		Yes	Over voltage release	3400mV	±20mV
		Yes	Under voltage protection	2500mV	±20mV
		Yes	Under voltage delay	3 S	±2000mS
		Yes	Under voltage release	3900 mV	±20mV
Pack protection	ON	Yes	Pack Over voltage protection	58.4V	±50mV
		Yes	Pack Over voltage delay	3S	±2000mS
		Yes	Pack Over voltage release	54V	±50mV
		Yes	Pack Under voltage protection	42V	±50mV

		Yes	Pack Under voltage delay	3S	±2000mS
		Yes	Pack Under voltage release	48.0V	±50mV
Cells charging temperature protection	ON	Yes	Charging Over temperature protection	55 ℃	±3℃
		Yes	Charging Over temperature delay	3000mS	±1000mS
		Yes	Charging Over temperature release	50 ℃	±3℃
		Yes	Charging Under temperature protection	-5 ℃	±3℃
		Yes	Charging Under temperature delay	3000mS	±1000mS
		Yes	Charging Under temperature release	0 ℃	±3℃
Cells discharging temperature protection	ON	Yes	Discharging Under temperature protection	60℃	±3℃
		Yes	Discharging Under temperature delay	3000mS	±1000mS
		Yes	Discharging Under temperature release	55℃	±3℃
		Yes	Discharging Under temperature protection	-20℃	±3℃
		Yes	Discharging Under temperature delay	3000mS	±1000mS
		Yes	Discharging Under temperature release	-15℃	±3℃

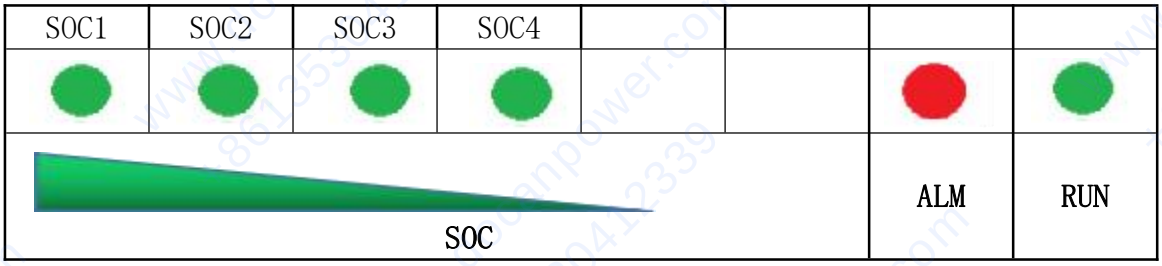
ENV Temperature protection	ON	Yes	ENV Under temperature warning	-25℃	±3℃
		Yes	ENV Under temperature release	-15℃	±3℃
		Yes	ENV Over temperature warning	65℃	±3℃
		Yes	Over temperature release	55℃	±3℃
		Yes	Environmental protection delay	4000mS	±1000mS
MOS Over Temperature protection	ON	Yes	MOS Over temperature protection	110℃	±3℃
		Yes	MOS Over temperature delay	3000mS	±1000mS
		Yes	MOS Over temperature release	90℃	±3℃
Voltage difference protection	ON	Yes	Voltage difference protection	800mV	±50mV
		Yes	Voltage difference release	500mV	±50mV
Charging over current protection	ON	Yes	Charging over current P rotection	220A	±2A
		Yes	Charging over current Delay	10000mS	8000-12000mS

		Yes	Charging over current P rotection	240A	±2.0A
		Yes	Charging over current Delay	500mS	100-2000mS
		No	charging ove current Release	10min	10min Automatically attempts torecover, canbe recovered manually or by discharging the current＞0.7A
Discharging over current protection	ON	Yes	Discharging over current 1 protection	220A	±2A
		Yes	Discharging over current 1 delay	10000mS	8000-12000mS
		Yes	Discharging over current 2 Protection	240A	±5.0A
		Yes	Discharging over current 2 delay	500mS	100-2000mS
		No	Discharging over current Release	1min	1minAutomatically tries to recover, locks after 3 consecutive times, can be manually recovered or charging current＞0.7A
Short circuit protection	ON	No	Short circuit protection	400A±100A	It can be modified after the program is upgraded
		No	Short circuit delay	450uS ± 100uS	It can be modified after the program is upgraded
		Short circuit Release	1、detected a valid charging current 2、Re-detect every mins and lock after 3 consecutive attempts		

Basic parameter setting					
Function name	Function setting	Whether to set	Index item	Factory default	Notes
Cells balancing function	ON	Yes	Cells charging balance	Static or charging	
		Yes	Balancing turn- on voltage	3450mV	±20mV
		Yes	Balancing turn-on voltage difference	30mV	±10mV
		NO	Balancing current	68mA	50-100mA
Battery capacity setting	ON	Yes	Battery design capacity	200AH	
		Yes	Battery remaining capacity	200AH	
BMS power Management	ON	Yes	Sleep voltage	3.3V	±50mV
		Yes	Sleep delay	1440min ± 10min	No charging and discharging current, no communication, no external charging voltage
Full charge settings	ON	Yes	Constant voltage value	56.0±0.5V	When the overall voltage is greater than the constant voltage value and the current is less than the constant current value,the BMS will consider that the battery capacity is full and the self-learningcondition
		Yes	Constant current value	1.5A±0.5A	
		NO	delay	10S±2S	

4.3、 LED indicator definition

LED lights: 4 green capacity indicators, one red alarm indicator, and one green running indicator



4.3.1、Capacity indication

state		charge				discharge			
Capacity indicato		SOC4●	SOC3●	SOC2●	SOC1●	SOC4●	SOC3●	SOC2●	SOC1●
	0～25%	Blink2	Off	Off	Off	On	Off	Off	Off
	25～50%	On	Blink2	Off	Off	On	On	Off	Off
	50～75%	On	On	Blink2	Off	On	On	On	Off
	75～100%	On	On	On	Blink2	On	On	On	On
● Running indicator light		Stady light				Blink 3 tims			

4.3.2、Status indication

System state	Abnormal event	SOC LED				ALM	RUN	description
		●	●	●	●	●	●	
Shut down	Shut down/sleep mode	All shut down						

standby	normal	Indicator by SOC	off	blink1	Standby only normal and alarm, protection and fault reported according to the charge and discharge status: Alarms include the following types: large pressure difference alarm, low capacity alarm, high and low voltage of a single unit, high and low overall voltage, all temperature alarms (high and low cell temperature, high and low ambient temperature, high and low MOS temperatur
	告警 alarm		blink2	blink1	
充电 charge	normal	Indicator by SOC Highest indication with blink	off	on	
	告警 normal		blink2	on	Alarms are classified into the following types: large pressure difference alarm, low capacity alarm, low voltage of a single unit, low voltage of the whole unit, and all temperature alarms (high and low cell temperature, high and low ambient temperature, high and low MOS temperature; Overcurrent alarm)
	Unit \ overall overvoltage protection \ full charge protection	Indicator by SOC	off	on	
	Overcurrent protection (Enter current limiting charge)	Indicator by power(When there is charging current, the LED with the highest power indicator flashes 2)	off	on	After charging over current protection, it enters current limiting charging and the charging current is displayed in normal state; After overcurrent protection, it enters current limiting charging and no charging current is displayed according to fault state, ALM steady on and all others are off
	Temperature protection	off	on	off	Cell, MOS, environment
discharge	normal	Indicator by SOC	off	blink3	
	alarm	Indicator by SOC	blink2	blink3	Alarms include the following types: large pressure difference alarm, low capacity alarm, high and low voltage of a single unit, high and low voltage of the whole system, and all temperature alarms (high and low cell temperature, high and low ambient temperature, high and low MOS temperature; Overcurrent alarm)

	Monomer/whole Undervoltage protection	依据电量指示 Indicator by SOC	blink2	off	
	Overcurrent, short circuit protection	off	on	off	
	Temperature protection	off	on	off	电芯，MOS，环境 Cell, MOS, environment
failure	NTC fault, MOS fault, reverse connection, differential pressure protection, ultra-low voltage protection	off	on	off	

4.3.3、Blink indication

Blink indication	on	off
blink1	0.25 S	3.75 S
Blink2	0.5 S	0.5 S
Blink3	0.5 S	1.5 S

5. Working mode

5.1、Basic mode

5.1.1、Charging mode

When the BMS detects that there is an external charging voltage and the voltage and temperature of the cell are within the rechargeable range, the charging MOSFET is turned on for charging. When the charging current reaches the effective charging current, the charging mode is entered. In charging mode, both charging and discharging MOSFETs are switched on.

5.1.2、Discharge mode

The BMS enters discharge mode when it detects that the load is connected, the voltage and temperature of the cell are within the discharge range, and the discharge current reaches the effective discharge current. In discharge mode, both charge and discharge MOSFETs are switched on.

5.1.3、Sleep and wake modes

1.The system enters hibernation mode when the following conditions are met:
①Single undervoltage protection or total undervoltage protection is not removed within 15 minutes;
②Press the key for 3 seconds and release the key;
③The minimum cell voltage is lower than the set voltage of sleep (default: 3300mV), and the duration reaches the delay time (default: 1440min) without communication and charge-discharge current;
④Forced shutdown through the upper computer software.
Before hibernation, ensure that no external voltage is connected to the P-terminal. Otherwise, the low-power mode cannot be entered.

2、Wake up conditions for sleep mode:
1)The input voltage of the charger should be greater than 48V.
2)Press the button for 1S to release the button and wake up.

5.2、Key description

When the BMS is in hibernation state, press the button for 1S and release it. The protection board is activated, and the LED indicator lights up successively for 0.5 seconds from RUN.

When the BMS is in the working state, press the key for 3S-6S and release it. The protection board is put to sleep,The LED indicator lights up successively for 0.5 seconds from the lowest power lamp.

When the BMS is in working state, press the button for more than 6S and release it. The protection board will be reset, and the LED indicator will be displayed according to the current power.

6.communication

6.1 RS485 communication

BMS can communicate with the upper computer through the RS485 communication interface, through the upper computer to view various information of the battery, such as voltage, current, temperature, SOC, SOH, working state, battery production information and can be set parameters.

The RS485 parallel port supports a maximum of 16 battery strings simultaneously. The default baud rate is 9600bps.

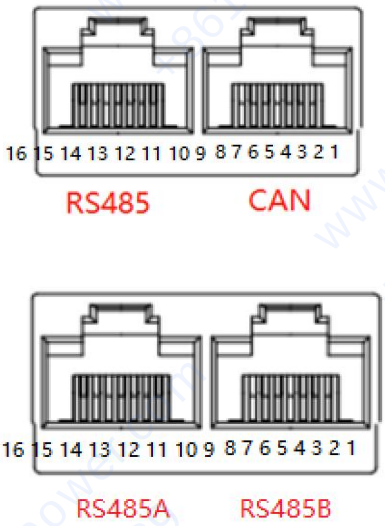
With upper computer/inverter communication RS485 interface, the default baud rate is 9600bps;

6.2、 CAN communication

The BMS CAN communicate with the inverter through the CAN interface, and upload various information of the battery, such as voltage, current, temperature, SOC, SOH, working status, and battery production. The default baud rate is 500Kbps.

6.3、Communication interface definition

6.3.1、 Interface diagram



Parallel communication interface

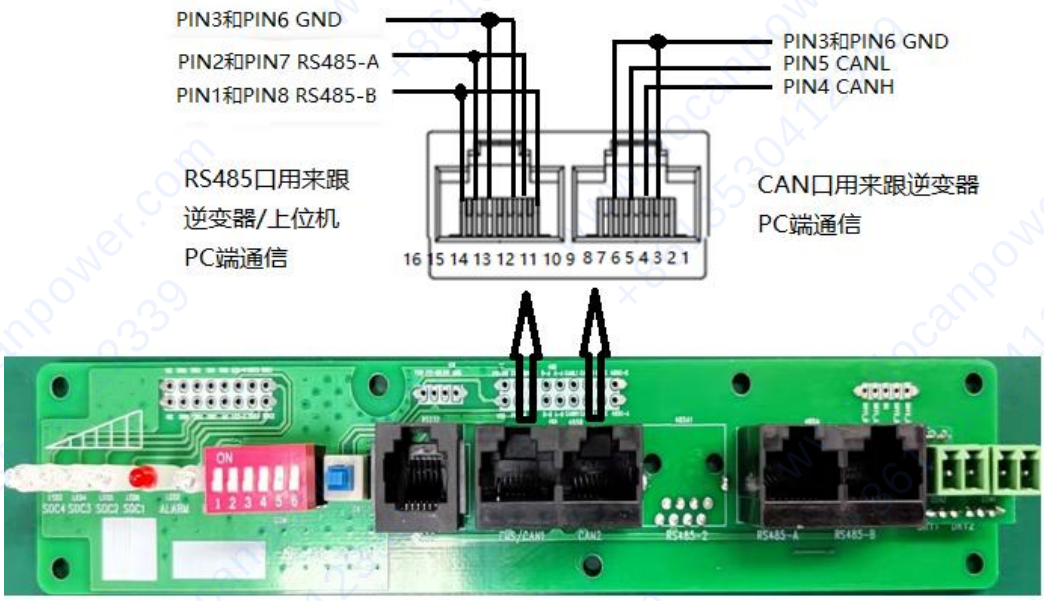
6.3.2、 Communication interface definition

RS485 interface (communication with host computer or inverter) Support for SRNE、Voltronic and Geowatt inverter protocol-Select different addresses using DIP switches		CAN communication interface (only inverter communication) Support for Victron、Pylon and Geowatt inverter protocol--Use DIP switches to select different protocols	
RS485—Use 8P8C vertical RJ45 socket		CAN—Use 8P8C vertical RJ45 socket	
RJ45 pin	defined declaration	RJ45 pin	defined declaration
9、16	RS485A-B	4	CANH
10、15	RS485A-A	5	CANL
11、14	GND	3、6	GND
12、13	NC	1、2、7、8	NC

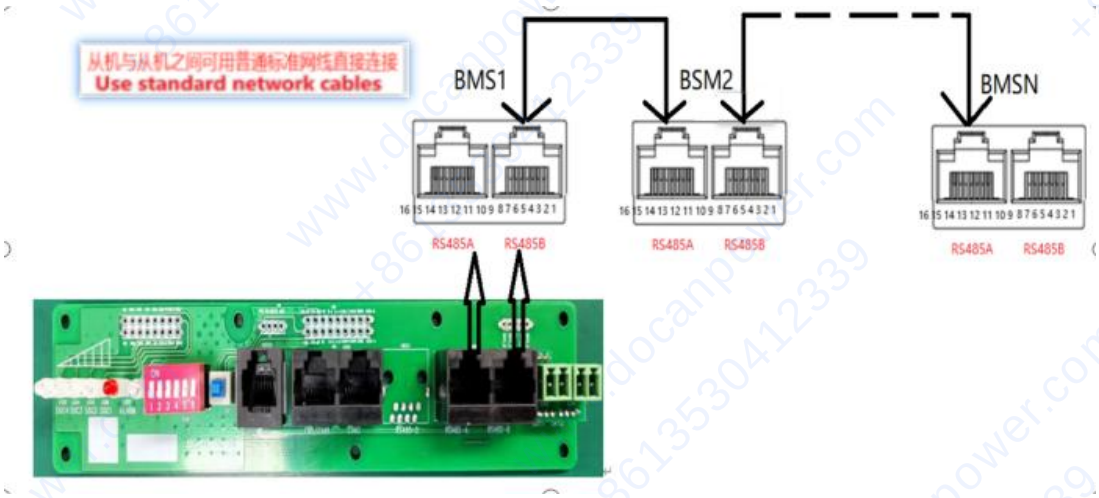
Parallel communication port (for parallel only)			
RS485-A—Use 8P8C vertical RJ45 socket		RS485-B—Use 8P8C vertical RJ45 socket	
RJ45 pin	defined declaration	RJ45 pin	defined declaration
9、16	RS485B-B	1、8	RS485B-B
10、15	RS485B-A	2、7	RS485B-A
11、14	GND	3、6	GND
12、13	NC	4、5	NC

6.3.3 、 Communication connection between BMS and inverter/upper computer PC)

The connection mode of the communication interface between the host and the inverter should be defined. The network cable used for connecting the host and the inverter should be matched according to the following definition. The standard network cable should not be used directly



6.3.4、 BMS board parallel connection mode



6.4 、Dip switch setup (supports parallel and protocol selection)

When battery strings are connected in parallel, the hardware DIP address of each PACK is unique. The hardware address is set by the DIP switch on the board. See the following table.

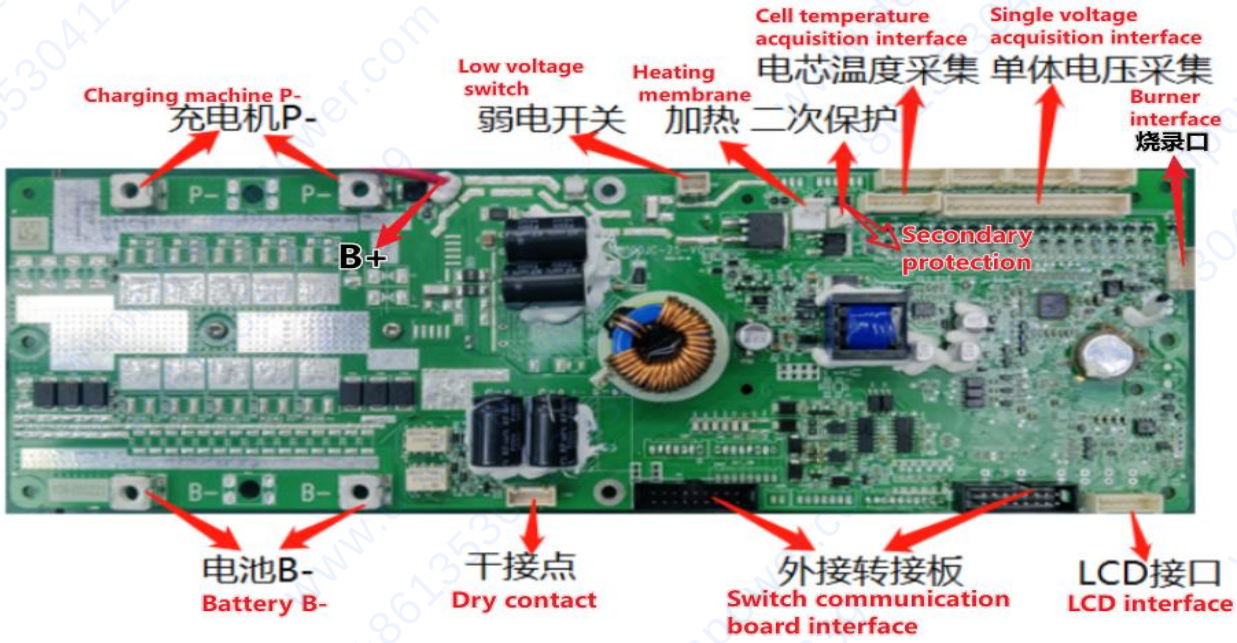
address	Dip switch position				reserved	Host	declaration
	#1	#2	#3	#4	#5	#6	
0	OFF	OFF	OFF	OFF	OFF	OFF	(Main) Pack1
1	ON	OFF	OFF	OFF	OFF	OFF	(Slave)Pack2
2	OFF	ON	OFF	OFF	OFF	OFF	(Slave)Pack3
3	ON	ON	OFF	OFF	OFF	OFF	(Slave)Pack4
4	OFF	OFF	ON	OFF	OFF	OFF	(Slave)Pack5
5	ON	OFF	ON	OFF	OFF	OFF	(Slave)Pack6
6	OFF	ON	ON	OFF	OFF	OFF	(Slave)Pack7
7	ON	ON	ON	OFF	OFF	OFF	(Slave)Pack8
8	OFF	OFF	OFF	ON	OFF	OFF	(Slave)Pack9
9	ON	OFF	OFF	ON	OFF	OFF	(Slave)Pack10
10	OFF	ON	OFF	ON	OFF	OFF	((Slave)Pack11
11	ON	ON	OFF	ON	OFF	OFF	(Slave)Pack12
12	OFF	OFF	ON	ON	OFF	OFF	(Slave)Pack13
13	ON	OFF	ON	ON	OFF	OFF	(Slave)Pack14
14	OFF	ON	ON	ON	OFF	OFF	(Slave)Pack15
15	ON	ON	ON	ON	OFF	OFF	(Slave)Pack16
Inverter communication protocol Select CAN communication (select by DIP 5 and 6 in host mode)							
1	ON	OFF	OFF	OFF	OFF	OFF	**Supports host computer/display Select the inverter protocol**
17	ON	OFF	OFF	OFF	OFF	ON	Pylon
33	ON	OFF	OFF	OFF	ON	OFF	MUST
49	ON	OFF	OFF	OFF	ON	ON	Geowatt
Inverter communication protocol RS485 communication (Select DIP 5 and 6 in host mode)							
1	ON	OFF	OFF	OFF	OFF	OFF	**Supports host computer/display Select the inverter protocol**
17	ON	OFF	OFF	OFF	OFF	ON	Voltronic
33	ON	OFF	OFF	OFF	ON	OFF	Reserved
49	ON	OFF	OFF	OFF	ON	ON	Geowatt

Note: Protocol dialing addresses 5 and 6 must be OFF when selecting through the upper computer or display screen.

7. Electrical interface definition

7.1、 BMS interface definition

Motherboard interface definition



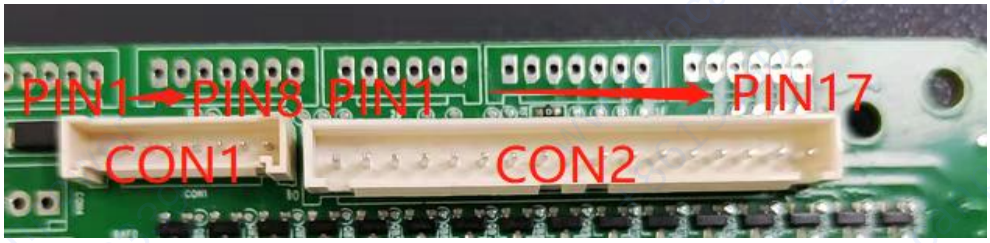
Definition of an interface on a conversion board

7.2、 Connection definition

B+: the positive electrode of PACK, which is used to supply power to BMS. The power positive electrode P+ is directly connected to the positive electrode of the cell;

B-:Cell PACK negative (using M5 terminal)
P-:Battery PACK negative electrode, the charging negative
Note: B-P - uses M5 wiring terminals

When using 17+8PIN sampling line:



CON1:(PHS-2.0-8PIN)从 PIN1→PIN8：NTC1+，NTC1-，NTC2+，NTC2-，NTC3+，NTC3-，NTC4+，NTC4-
CIN2: (XHB-2.5-17PIN)从 PIN1→PIN17：CELL0，CELL1，CELL2，CELL3，CELL4，CELL5，CELL6，CELL7，CELL8，CELL9，CELL10，CELL11，CELL12，CELL13，CELL14，CELL15，CELL16

When using 7+6+7+6P sampling line:

1#(PHS-2.0-7P)PIN1→PIN7：
NTC1+，NTC1-，CELL0，CELL1，CELL2，CELL3，CELL4
2#(PHS-2.0-6P)PIN1→PIN6：
NTC2+，NTC2-，CELL5，CELL6，CELL7，CELL8
3#(PHS-2.0-7P)PIN1→PIN7：
NTC3+，NTC3-，CELL8，CELL9，CELL10，CELL11，CELL12
4#(PHS-2.0-6P)PIN1→PIN6：
NTC4+，NTC4-，CELL13，CELL14，CELL15，CELL16

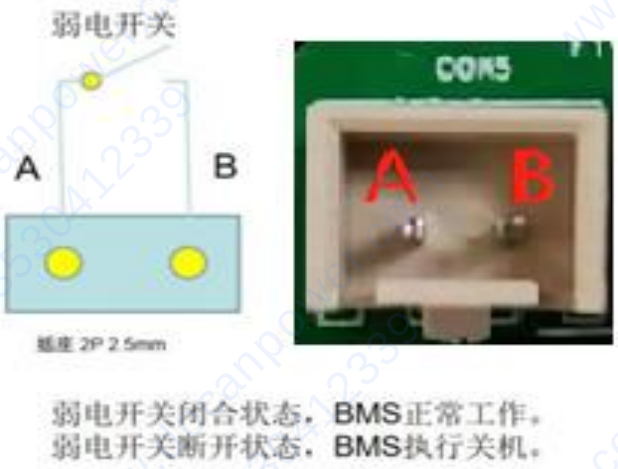
The collection line can only follow one of these connections!

Notes:
CELL0 is the B-terminal cell, CELL16 is the B+ terminal cell
NTC Model: NTC tadpole, B value 3950,10 K±1,%@25℃
Points to note:
If you want to change to 15S, CELL15 and CELL16 should be connected to the B+ end cell together or notify the BMS manufacturer in advance to remove the short resistor of CELL15 and CELL16. This shipment is 16 strings.

Only one connection can be selected for the 7+6+7+6P and 17+8P cables.

Do not connect the two at the same time. Do not insert the cables incorrectly or incorrectly, which may damage the BMS.

7.3、Description of weak current switch (normally open normally closed switch, self-locking switch)



Note: The weak current switch is connected to the CON5 port of the BMS board on the main board. Only the weak current switch can be connected to the normal communication

7.4、Description of the BMS power cable

The B+ power supply line of the BMS must be connected to the main positive terminal of the battery independently, and cannot be connected behind the circuit breaker switch (circuit breaker) or the B+ power line, otherwise the normal operation of the BMS will be affected. Please comply with this when connecting PACK.

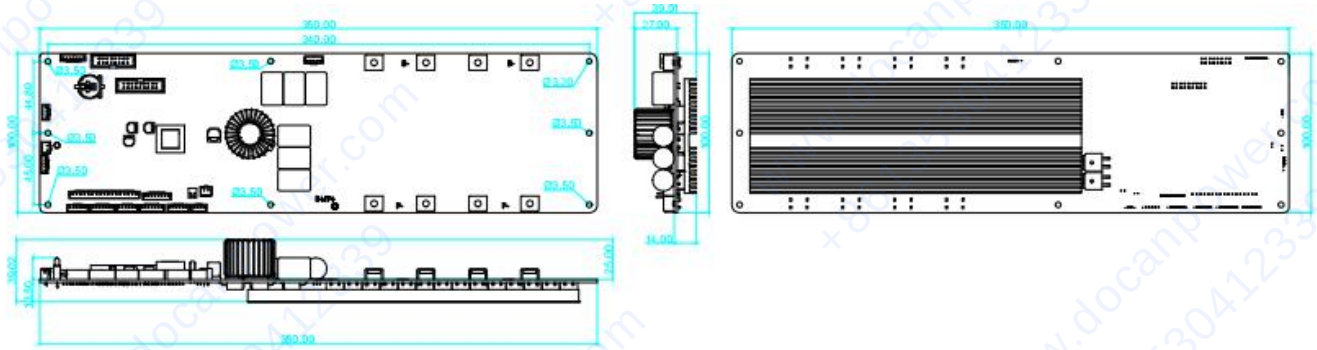
7.5、Power on/off sequence

Power on the mainboard in the following order: Connect the mainboard B-, then the sampling cable, then the B+ , then the P-, and then the P+ to the negative Load or charger.

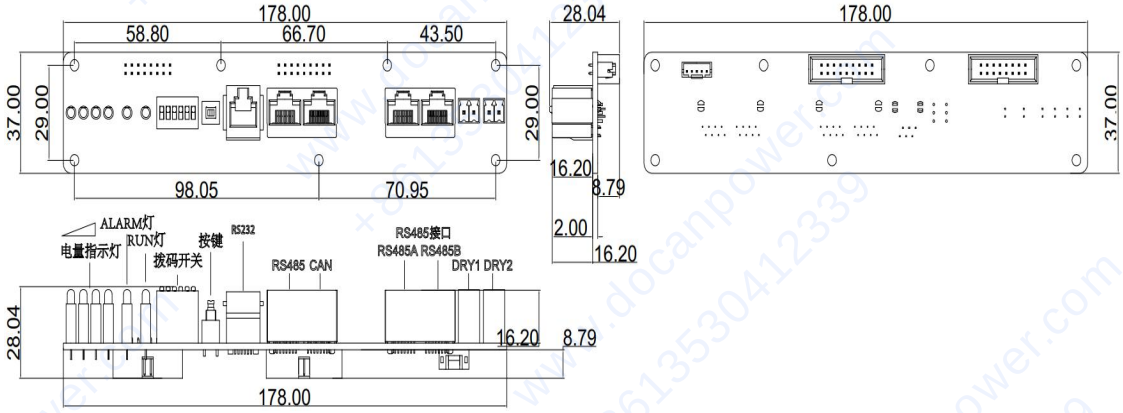
The power-off sequence is reversed: disconnect the charger and load first, then the B+, then the port sampling line, and finally the B-.

8. Dimensional drawing）

8.1、Motherboard size diagram



8.2、Adapter board dimensions

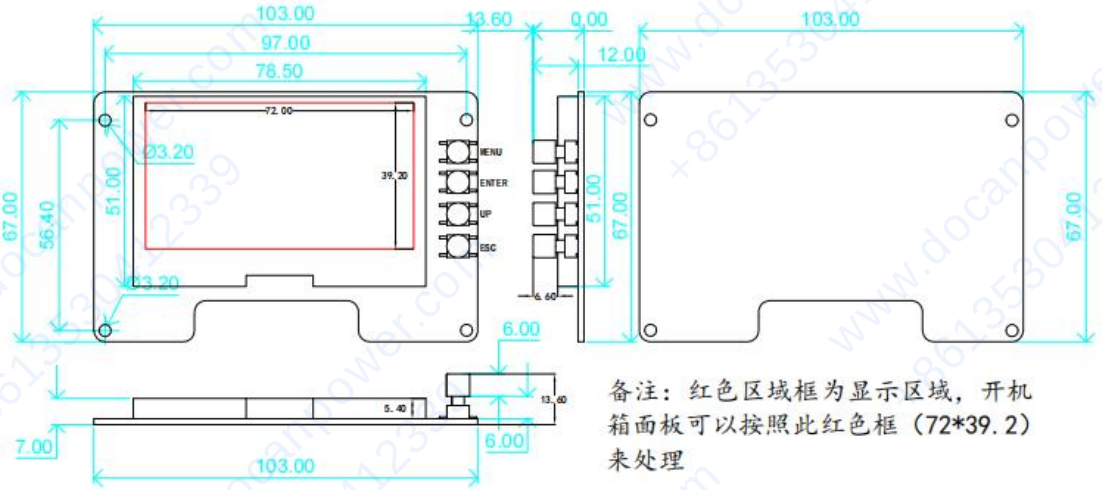


Note：

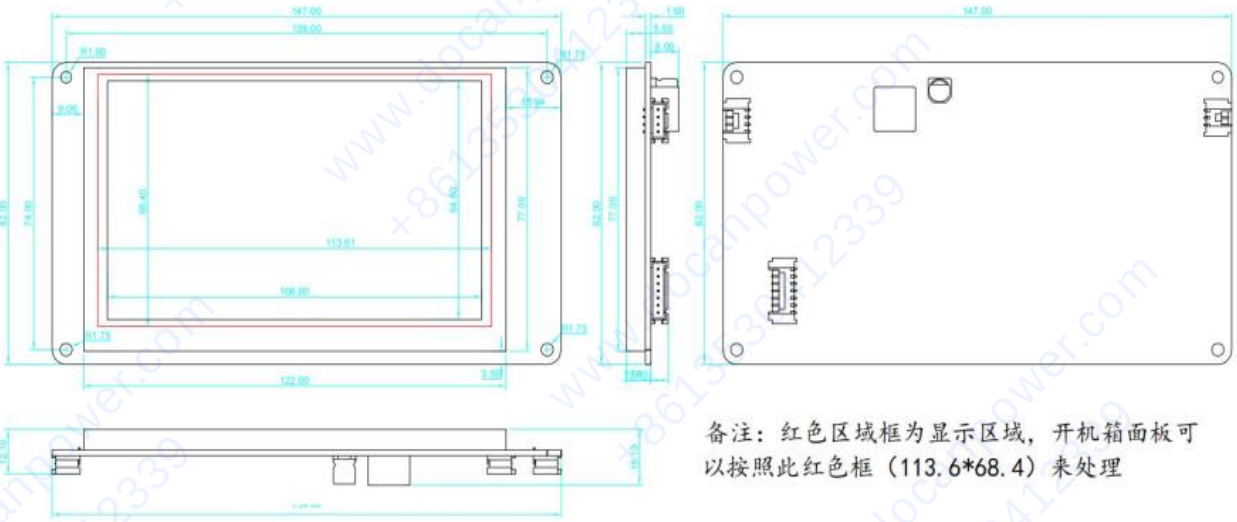
1、RS232 port, if no communication function is required, the corresponding hole can not be opened on the panel.

2、2 dry contact ports. If this function is not required, do not open corresponding holes on the panel.

8.3、Button cap blue and white screen size diagram)



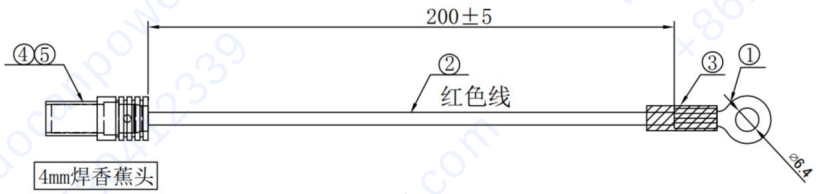
8.4、5-inch touch screen size diagram



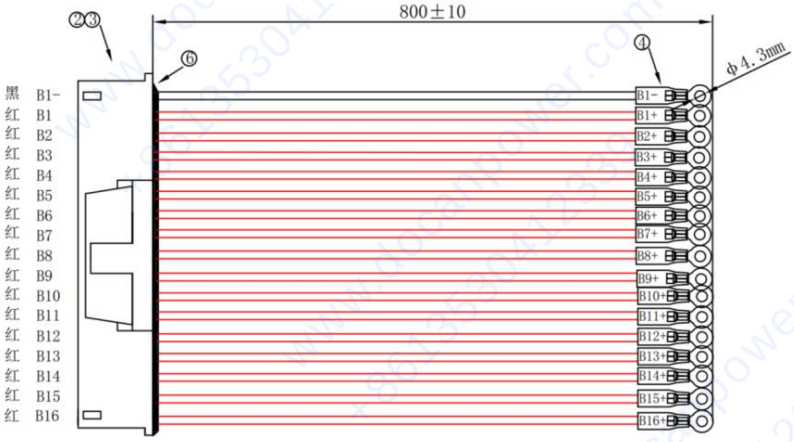
图片尺寸仅供参考，实际已实物为准。

9. Line pattern

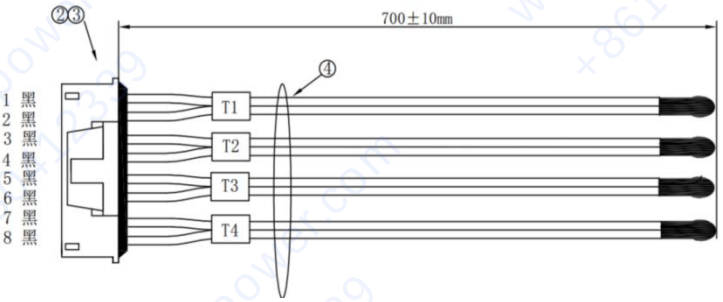
9.1 、BMS board B+ is connected to battery cell B+



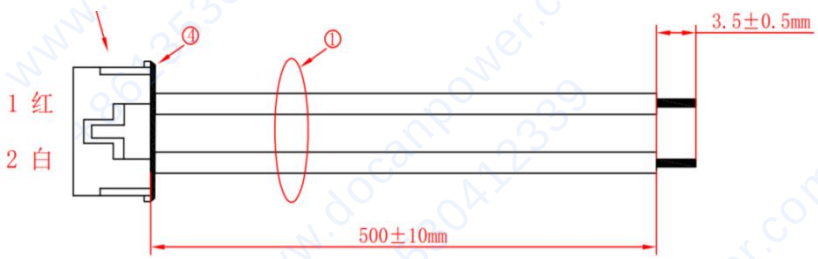
9.2、 Single cell acquisition connection line



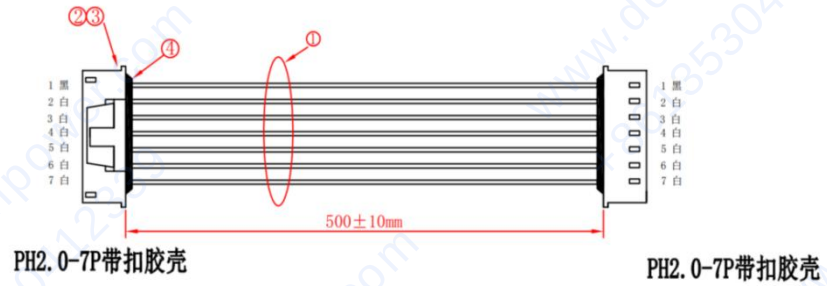
9.3、 Cell temperature NTC connection cable



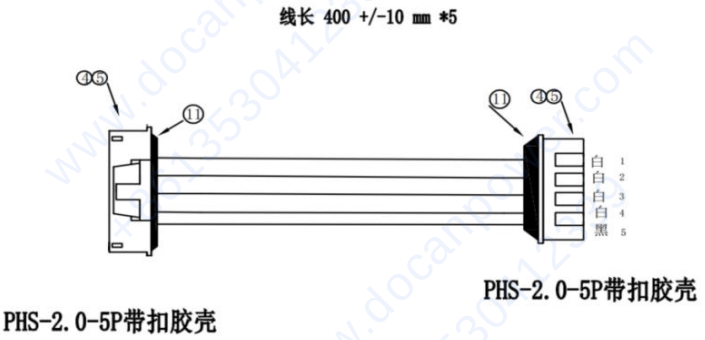
9.4 、Weak current switch connection cable



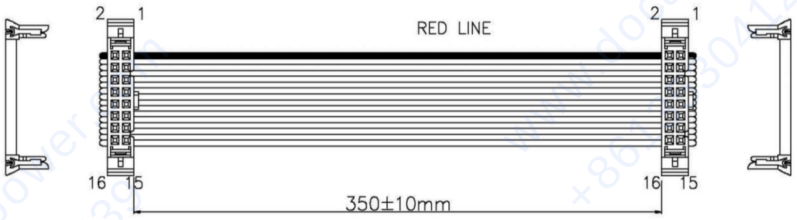
9.5 、Display harness



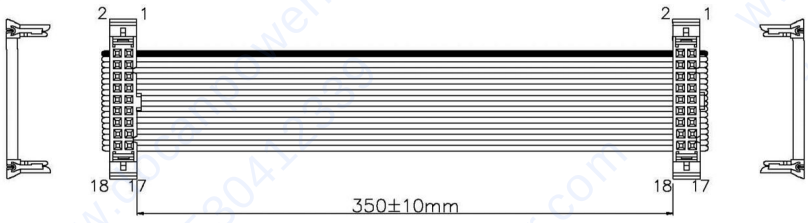
9.6 、Dry contact harness



9.7 、Bull Horn 1 Connection Line



9.8 、Bull Horn 2 connecting cable

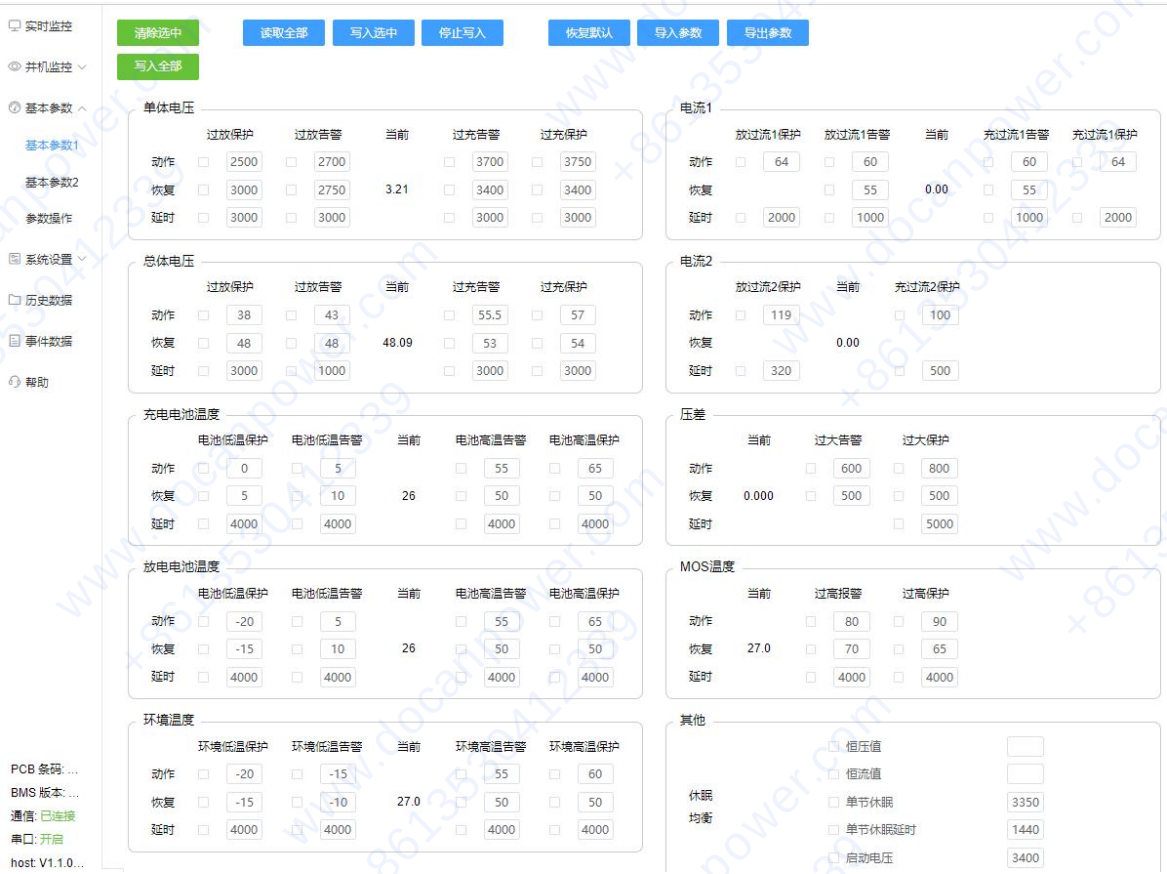


10. Assembly and use precautions

This software is used for Windows series platform PC.
Before using the device, ensure that the USB cable has the data transmission function, and that the communication tool is properly connected to the USB port on the protection board and the PC. Open the dedicated PC client dedicated upper computer software and set the communication mode corresponding t o the BMS. After the connection is successful, "Communication: Connected"
is displayed in the lower left corner of the home page of the upper computer.
If the communication is not connected, check whether the communication
mode of the upper computer is set correctly and whether the connection is good.
The host computer can switch between English and Chinese. In the left column of the home page, go to " Help" to switch the language.
The following parameter snapshots are for reference only. The actual parameters of the BMS prevail.

10.1、Real-time monitoring interface

10.2、Basic parameter 1



11. Assembly and use precautions

1、Power-on and power-off operations must be performed in sequence.

2、When connecting the battery pack, do not misconnect or even reverse connect the battery pack. If the battery pack cannot be connected to the upper computer, or the main chip of the circuit board heats up obviously, power off the circuit board quickly. In this case, the circuit board may be faulty and needs to be replaced or maintained.

3、During assembly, do not touch the circuit board components, such as wire, solder, etc., in case of contact, it may damage the circuit components, resulting in bad.

4、Strictly follow the design parameters specified in the specification, otherwise the circuit board may be damaged.

5、Keep away from moisture, water and static electricity.

6、Do not use the battery aging cabinet to measure the voltage of each battery string when testing the battery string installed with the management system. Otherwise,
the management system and batteries may be damaged.

7、After assembling the battery pack, complete charging and discharging cycles should be carried out to trigger the overcharge and overdischarge protection,
so that the circuit board can learn the initial capacity of the battery.

8、The management system has no 0V battery charging function. Once the battery is 0V, the battery performance will be seriously degraded or even damaged. In order not to damage the battery,
users should charge regularly to supplement the power when they are not in use for a long time (storage exceeds 3 months).When in use, it is necessary to charge in time within 12 hours after discharge, to prevent the battery from discharging to 0V due to self-consumption.