



产品规格承认书

Product Specification Approval

产品名称 (Product Name)	智能板 8~16 串 100~200A 同口带均衡 Smart BMS 8-16S 100-200A common port with passive balance	
产品型号 (Product Number)	DL-R16L TJ	
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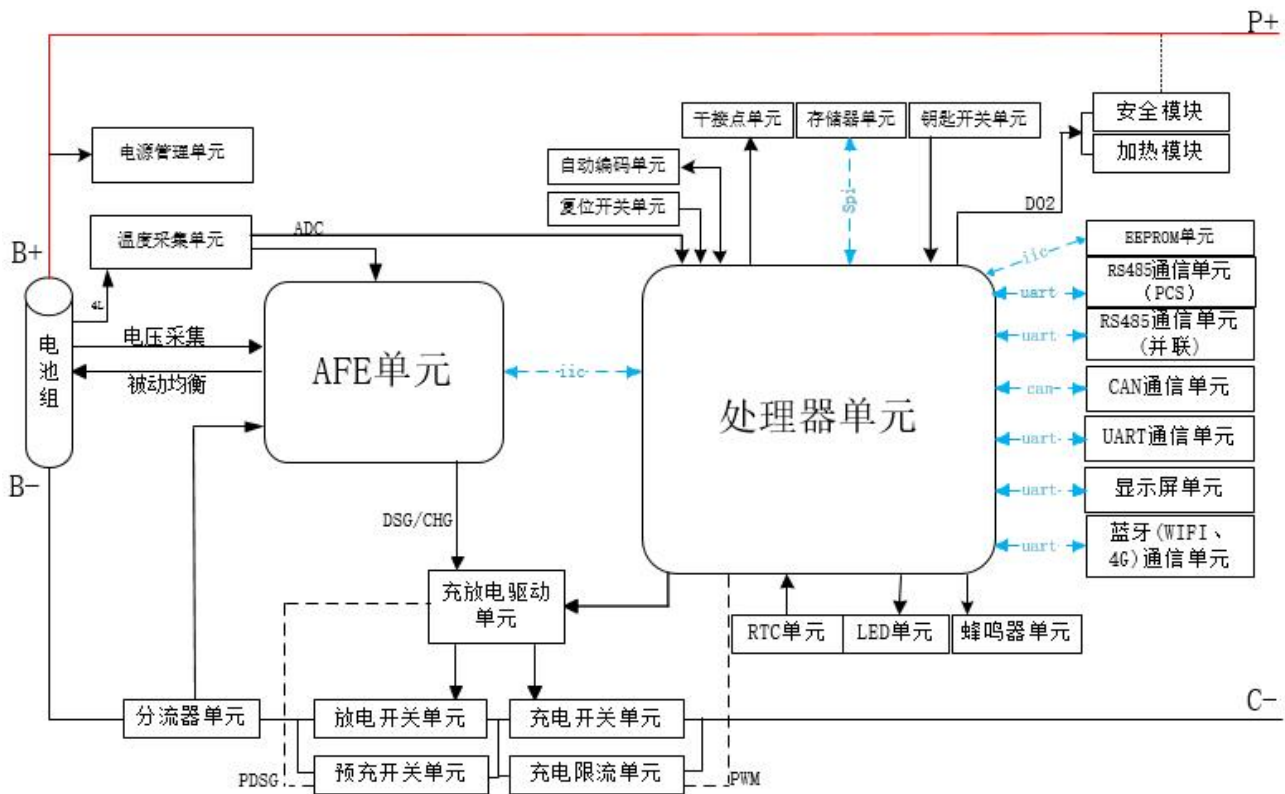
1. 简介 Brief introduction

- 随着铁锂电池在通信行业的广泛应用，对电池管理系统也提出了高性能、高可靠性及高性价比等要求。本产品是专门针对储能电池设计的 BMS，采用集成化的设计，将采集、管理、通信等功能集成于一体。该 BMS 产品以一体化作为设计理念，可广泛应用在室内室外储能电池系统，如 家庭储能、光伏储能、通信储能等。
- With the wide application of lithium iron batteries in the communication industry, the battery management system has also put forward high performance, high reliability and cost-effective requirements. This product is a BMS specially designed for energy storage battery. It adopts integrated design and integrates collection, management, communication and other functions into one. With integration as the design concept, the BMS product can be widely used in indoor and outdoor energy storage battery systems, such as home energy storage, photovoltaic energy storage, communication energy storage, etc.
- BMS 一体化设计，对于 Pack 厂家有更高的组装效率和测试效率，降低生产投入成本；一体化设计，减少对于整体安装质量保障有较大提升。
- BMS integrated design, for Pack manufacturers have higher assembly efficiency and test efficiency, reduce production input cost; Integrated design, reduce the overall installation quality assurance has a great improvement.

2. 产品选型 Product Selection

产品选型表 Product Selection list									
板型 Board type	☐ 一体式 integrated						☐ 分离式 split		
电池类型 Battery Type	☐ 三元 Li-ion						☐ 铁锂 LiFePO4		
电池串数 Battery Strings	☐ 8	☐ 9	☐ 10	☐ 11	☐ 12	☐ 13	☐ 14	☐ 15	☐ 16
放电电流 Discharge current	☐ 100A						☐ 200A		
干接点 Dry contact	☐ 有/Yes						☐ 无/No		
加热模块/安全模块 Heating module/ Safety module	☐ 加热模块 Heating module			☐ 安全模块 Safety module			☐ 无/No		
WIFI/Bluetooth/GPS	☐ WIFI		☐ Bluetooth		☐ GPS		☐ 无/No		
显示屏 Display	☐ 有/Yes						☐ 无/No		
外部通讯线 External communication cable	☐ 485 RJ45 cable			☐ UART RJ45 cable			☐ 无/No		

3. 系统框图 System chart



4. 技术参数 Technical parameter

4.1 充放电与均衡 Charge&Discharge and equalization

注意：n=电池串数；Note：n=Battery Strings

检测内容 Test content		默认参数 default parameters		单位 Unit
		三元 Li-ion	铁锂 LiFePO4	
放电 Discharge	额定放电电流 Rated discharge current	100/200		A
充电 Charge	充电电压 Charge voltage	=4.2*n	=3.65*n	V
	额定充电电流 Rated charging current	100/200		A
	过充后标定更新 SOC 为 100%，当 SOC < 96%或有放电电流允许再次充电 After over-charging, update SOC to 100%, when SOC < 96% or there is discharge current to allow charging again			
被动均衡功能 Passive equalization function	均衡开启电压 balance turn-on voltage	4.0	3.4	V
	均衡开启压差 Equalize the opening voltage difference	20		mV
	均衡电流 Balance current	150±30		mA
	均衡开启条件 Equilibrium on condition 1.达到设定均衡开启压差 Reach the set balanced opening voltage difference 2.达到设定均衡开启电压 Reach the set balanced start voltage			

4.2 过充保护 over-Charge protection

检测内容 Test content	默认参数 default parameters		单位 Unit
	三元 Li-ion	铁锂 LiFePO4	

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单体过充一级 Single Cell over-charge level1	过充告警电压 over-charge alarm voltage	4.2±0.05	3.6±0.05	V
	过充告警延时 over-charge alarm delay	1±0.8		S
	过充告警解除电压 over-charge alarm release voltage	4.1±0.05	3.5±0.05	V
单体过充二级 Single Cell over-charge level2	单体过充保护电压 Single Cell over-charge protection voltage	4.25±0.05	3.65±0.05	V
	单体过充保护延时 Single Cell over-charge protection delay	1±0.8		S
	过充保护解除电压 over-charge protection release voltage	4.1±0.05	3.5±0.05	V
单体过充三级 Single Cell over-charge level3	单体过充保护电压 Single Cell over-charge protection voltage	4.3±0.05	3.8±0.05	V
	单体过充保护延时 Single Cell over-charge protection delay	1±0.8		S
	过充保护解除电压 Over-charge protection release voltage	4.15±0.05	3.65±0.05	V
总压过充一级 Overall overcharge level1	过充告警电压 overcharge alarm voltage	4.15*n±0.8	=3.55*n±0.8	V
	过充告警延时 overcharge alarm delay	1±0.8		S
	过充告警解除电压 overcharge alarm release voltage	(4.15*n-1) ±0.8	(3.55*n-1) ±0.8	V
总压过充二级 Overall overcharge level2	过充保护电压 overcharge protection voltage	4.2*n±0.8	3.6*n±0.8	V
	过充保护延时 overcharge protection delay	1±0.8		S
	过充保护解除电压 overcharge protection release voltage	(4.2*n-1) ±0.8	(3.6*n-1) ±0.8	V
总压过充三级 Overall overcharge level3	过充保护电压 overcharge protection voltage	4.25*n±0.8	3.75*n±0.8	V
	过充保护延时 overcharge protection delay	1±0.8		S
	过充保护解除电压 overcharge protection release voltage	(4.25*n-1) ±0.8	(3.75*n-1) ±0.8	V
其它解除条件 Other conditions of release	剩余容量 SOC 解除 The SOC of remaining capacity release	< 96%		
	放电电流解除 Discharge current release	> 1		A

4.3 过放保护 over-Discharge protection

	检测内容 Test content	默认参数 default parameters	单位 Unit
单体过放一级 Single Cell discharge level1	单体过放告警电压 Single Cell discharge alarm voltage	2.8±0.05	V
	单体过放告警延时 Single Cell discharge alarm delay	1±0.8	S
	单体过放告警解除电压 Single Cell discharge alarm release voltage	2.9±0.05	V
单体过放二级 Single Cell over-discharge level2	单体过放保护电压 Single Cell over-discharge protection voltage	2.7±0.05	V
	单体过放保护延时 Single Cell over-discharge protection delay	1±0.8	S
	过放保护解除电压 Over-discharge protection release voltage	2.9±0.05	V
	过放保护 30 秒后，仍无法恢复时，将进入休眠模式 Over discharge protection for 30 seconds, if the device still cannot be recovered, it enters sleep mode		
单体过放三级 Single Cell over-discharge level3	单体过放保护电压 Single Cell over-discharge protection voltage	2.6±0.05	V
	单体过放保护延时 Single Cell over-discharge protection delay	1±0.8	S
	过放保护解除电压 Over-discharge protection release voltage	2.8±0.05	V
总压过放一级 Overall discharge level1	总体过放告警电压 Overall discharge alarm voltage	=2.85*n±0.8	V
	总体过放告警延时 Overall discharge alarm voltage delay	1±0.8	S
	总体过放告警解除电压 Overall discharge alarm release voltage	= (2.85*n+1) ±0.8	V
总压过放二级 Overall discharge level2	总体过放保护电压 Overall discharge protection voltage	=2.75*n±0.8	V
	总体过放保护延时 Overall discharge protection delay	1±0.8	S
	过放保护解除电压 Discharge protection release voltage	= (2.75*n+1) ±0.8	V
	过放保护 30 秒后，仍无法恢复时，将进入休眠模式		

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	Over discharge protection for 30 seconds if the device still cannot be recovered, it enters sleep mode		
总压过放三级 Overall discharge level3	总体过放保护电压 Overall discharge protection voltage	$=2.65*n\pm0.8$	V
	总体过放保护延时 Overall discharge protection delay	1 ± 0.8	S
	过放保护解除电压 Discharge protection release voltage	$= (2.65*n+1) \pm0.8$	V

4.4 过流保护 over-current protection

	检测内容 Test content	默认参数 default parameters	单位 Unit
放电过流 Discharge over-current	放电过流一级告警电流 Discharge over-current Level 1 alarm current	$105\pm3/210\pm6$	A
	放电过流一级告警延时 Discharge over-current Level 1 alarm delay	1 ± 0.8	S
	放电过流二级保护电流 Discharge over-current Level 2 protection current	$110\pm3/220\pm7$	A
	放电过流二级保护延时 Discharge over-current Level 2 protection delay	1 ± 0.8	S
	放电过流三级保护电流 Discharge over-current Level 3 protection current	$150\pm5/300\pm9$	A
	放电过流三级保护延时 Discharge over-current Level 3 protection delay	1 ± 0.8	S
	解除条件 release condition 1、1min 后自动解除,连续出现 10 次将锁定该状态 ,不再自动解除 The lock will be automatically unlocked after 1 minute. If the lock occurs for 10 consecutive times, the lock will not be automatically unlocked 2、充电解除: 充电电流 > 1A charge release: charging current > 1A 达到任一条件可解除 Meet any condition can be released		
充电过流 Charge over-current	充电过流一级告警电流 Charge over-current Level 1 alarm current	$105\pm3/210\pm6$	A
	充电过流一级告警延时 Charge over-current Level 1 alarm delay	1 ± 0.8	S
	充电过流二级保护电流 Charge over-current Level 2 protection current	$110\pm3/220\pm7$	A
	充电过流二级保护延时 Charge over-current Level 2 protection delay	1 ± 0.8	S
	充电过流三级保护电流 Charge over-current Level 3 protection current	$150\pm5/300\pm9$	A
	充电过流三级保护延时 Charge over-current Level 3 protection delay	1 ± 0.8	S
	解除条件 release condition 1、5min 后自动解除充电限流并打开 mos, 持续监测是否继续触发过流; After 5min, the charge limit will be automatically lifted and mos will be turned on to continuously monitor whether overcurrent will continue to be triggered. 2、放电解除: 放电电流 > 1A discharge discharge: discharge current > 1A		

4.5 短路保护 Short circuit protection

	检测内容 Test content	默认参数 default parameters	单位 Unit
短路保护 Short circuit protection	短路保护电流 Short-circuit protection current	1000/2000	A
	短路保护延时 Short-circuit protection delay (实际以客户寄回我司测试为准 The actual customer sent back to our test shall prevail)	300 ± 200	uS
	短路保护解除: 移除负载解除/充电解除 Short-circuit protection release: Remove Load release/charge release		

4.6 高温保护 High temperature protection

	检测内容 Test content	默认参数 Default parameters	单位 Unit
充电高温 Charging high temperature	高温一级告警 high temperature level1 alarm	55 ± 2	°C
	高温一级告警延时 high temperature level1 alarm delay	1 ± 0.8	S
	高温一级告警释放 high temperature level1 alarm release	50 ± 2	°C
	高温二级保护 high temperature level2 protection	60 ± 2	°C

	高温二级保护延时 high temperature level2 protection delay	1±0.8	S
	高温二级保护释放温度 high temperature level2 protection release	55±2	°C
	高温三级保护 high temperature level3 protection	65±2	°C
	高温三级保护延时 high temperature level3 protection delay	1±0.8	S
	高温三级保护释放温度 high temperature level3 protection release	60±2	°C
放电高温 Discharge high temperature	高温一级告警温度 high temperature level1 alarm	60±2	°C
	高温一级告警延时 high temperature level1 alarm delay	1±0.8	S
	高温一级告警解除 high temperature level1 alarm release	55±2	°C
	高温二级保护 high temperature level2 protection	65±2	°C
	高温二级保护延时 high temperature level2 protection delay	1±0.8	S
	高温二级保护释放 high temperature level2 protection release	60±2	°C
	高温三级保护 high temperature level3 protection	70±2	°C
	高温三级保护延时 high temperature level3 protection delay	1±0.8	S
	高温三级保护释放 high temperature level3 protection release	65±2	°C

4.7 低温保护 Low temperature protection

	检测内容 Test content	默认参数 Default parameters	单位 Unit
充电低温 Charge low temperature	低温一级告警温度 low temperature level1 alarm	5±2	°C
	低温一级告警延时 low temperature level1 alarm delay	1±0.8	S
	低温一级告警解除 low temperature level1 alarm release	10±2	°C
	低温二级保护 low temperature level2 protection	0±2	°C
	低温二级保护延时 low temperature level2 protection delay	1±0.8	S
	低温二级保护释放温度 low temperature level2 protection release	5±2	°C
	低温三级保护 low temperature level3 protection	-5±2	°C
	低温三级保护延时 low temperature level3 protection delay	1±0.8	S
	低温三级保护释放温度 low temperature level3 protection release	0±2	°C
放电低温 Discharge low temperature	低温一级告警 low temperature level1 alarm	-15±2	°C
	低温一级告警延时 low temperature level1 alarm delay	1±0.8	S
	低温告一级警解除 low temperature level1 alarm release	-10±2	°C
	低温二级保护 low temperature level2 protection	-25±2	°C
	低温二级保护延时 low temperature level2 protection delay	1±0.8	S
	低温二级保护释放温度 low temperature level2 protection release	-20±2	°C
	低温三级保护 low temperature level3 protection	-30±2	°C
	低温三级保护延时 low temperature level3 protection delay	1±0.8	S
	低温三级保护释放温度 low temperature level3 protection release	-25±2	°C

4.8 环境温度保护 Environment temperature protection

检测内容 Test content	默认参数 default parameters	单位 Unit
环境温度 Environment temperature	高温告警温度 high temperature alarm	65±2
	高温保护温度 high temperature protection	70±2

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	高温保护解除 high temperature protection release	65±2	°C
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4.9 MOS 温度保护 MOS temperature protection

	检测内容 Test content	默认参数 default parameters	单位 Unit
MOS 温度保护 MOS temperature protection	高温告警 high temperature alarm	95±2	°C
	高温告警解除 high temperature alarm release	90±2	°C
	高温保护 high temperature protection	100±2	°C
	高温保护解除 high temperature protection release	65±2	°C

4.10 压差告警 voltage difference alarm

	检测内容 Test content	默认参数 Default parameters	单位 Unit
压差告警 voltage difference alarm	压差一级告警 voltage difference level 1 alarm	0.3	V
	压差一级告警恢复 voltage difference level 1 alarm release	0.25	V
	压差二级告警 voltage difference level 2 alarm	0.5	V
	压差二级告警恢复 voltage difference level 2 alarm release	0.45	V
	压差三级告警 voltage difference level 3 alarm	1	V
	压差三级告警恢复 voltage difference level 3 alarm release	0.8	V

4.11 温差告警 temperature difference alarm

	检测内容 Test content	默认参数 Default parameters	单位 Unit
温差告警 temperature difference alarm	温差一级告警 temperature difference level 1 alarm	10±2	°C
	温差一级告警恢复 temperature difference level 1 alarm release	7±2	°C
	温差二级告警 temperature difference level 2 alarm	15±2	°C
	温差二级告警恢复 temperature difference level 2 alarm release	12±2	°C
	温差三级告警 temperature difference level 3 alarm	20±2	°C
	温差三级告警恢复 temperature difference level 3 alarm release	15±2	°C

4.12 其它 others

	检测内容 Test content	默认参数 default parameters		单位 Unit
SOC 告警 SOC alarm	电池容量低告警 Battery capacity low alarm	< 10%		
内阻 internal resistance	主回路导通内阻 The main circuit conducts the internal resistance	<20		mΩ
消耗电流 current consumption	工作时自耗电电流 Self-consuming electrical current during operation	≤60	带显示屏 With display	mA
		≤45	不带显示屏 Without display	mA
	休眠模式自耗电电流 The sleep mode consumes electrical current	<800 (9-16 串)		uA
	休眠模式自耗电电流 The sleep mode consumes electrical current	<900 (8 串)		
	休眠时间 Sleep time	3600		S

通讯方式 communication mode	☒ UART	☒ CAN	☒ 485	☐ 232
充电限流 Charge current limiting	最大 5A, 当充电过流保护时开启 Max 5A, open when charging over-current protection			
重量 weight	540±100g			

4.13 可靠性参数 Reliability parameter

项 目 Item	条 件 condition
检测精度 Detection accuracy	电流检测精度: $\leq 3\%$ FSR Current detection accuracy: $\leq 3\%$ FSR 电压检测精度: $\leq 15\text{mV}$ Voltage detection accuracy: $\leq 15\text{mV}$ 温度检测精度: $\leq 3^{\circ}\text{C}$ (常温下) Temperature detection accuracy: $\leq 3^{\circ}\text{C}$ (normal temperature)
信息存储 Information storage	最大存储 10000 条履历信息, 含保护次数, 当前总电压、电流、温度、SOC、等 Store a maximum of 10,000 biographical information, including protection times, current total voltage, current, temperature, SOC, etc
工作环境条件 Working environment condition	工作温度: $-20^{\circ}\text{C} \sim 75^{\circ}\text{C}$ Operating temperature : $-20^{\circ}\text{C} \sim 75^{\circ}\text{C}$ 相对湿度: $5\% \sim 90\%\text{RH}$ Relative humidity : $5\% \sim 90\%\text{RH}$
存储环境条件 Storage environment condition	存储温度: $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ Storage temperature : $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ 相对湿度: $5\% \sim 90\%\text{RH}$ Relative humidity : $5\% \sim 90\%\text{RH}$

5. LED 指示说明 LED indication

状态 status	运行 LED RUN LED	告警 LED Alarm LED	电量指示 LED Battery Indicator LED				说明 Instructions
							
关机/休眠 Power Off /Sleep	灭 Off	灭 Off	灭 Off	灭 Off	灭 Off	灭 Off	/
待机 standby state	闪 1 Flash 1	灭 Off	Refer to 5.2				待机状态 standby state
	闪 1 Flash 1	闪 3 Flash 3					触发一级告警, 未触发保护 A level one alarm was triggered, but no protection was activated
充电 charge	常亮 on	灭 off	Refer to 5.2				正常充电 Normal charge
	常亮 on	闪 3 Flash 3					过充告警, 请拔掉充电器 Over-charge alarm, please unplug the charger
	常亮 on	灭 off	常亮 on	常亮 on	常亮 on	常亮 on	过充保护; 拔掉充电器, 指示灯转为待机状态 Overcharge protection; If the charger is unplugged, the indicator turns to standby state
放电 discharge	闪 3 Flash 3	灭 off	Refer to 5.2				正常放电 Normal discharge
	闪 3 Flash 3	闪 3 Flash 3					触发一级告警, 未触发保护 A level one alarm was triggered, but no protection was activated
	灭 off	灭 off	灭 off	灭 off	灭 off	灭 off	欠压休眠, 请给电池充电 Enter undervoltage sleep state, please charge the battery
失效 Failure state	灭 off	常亮 on	灭 off	灭 off	灭 off	灭 off	系统处于温度、过流、短路保护等等, 不能充放电, 需排查原因 The system is in temperature, over-current, short circuit protection, etc., can not charge and discharge, need to check the cause

注意: 触发充电限流时, 充电过流保护的状态会被解除, 此时指示灯状态会转为正常充电状态

Note: When the charging current limit is triggered, the status of the charging overcurrent protection will be released, and at this time, the indicator light status will switch to the normal charging state

5.1 LED 闪动说明 LED Flash Instructions

闪动方式Flash mode	亮on	灭off
闪1 Flash1	0.25S	3.75S
闪2 Flash2	0.5S	0.5S
闪3 Flash3	0.5S	1.5S

5.2 SOC 说明 SOC Instructions

电池剩余电量 SOC	充电 charging				放电 discharge				待机 standby state			
	L4	L3	L2	L1	L4	L3	L2	L1	L4	L3	L2	L1
0~25%	灭 off	灭 off	灭 off	闪 2 Flash2	灭 off	灭 off	灭 off	常亮 On	灭 off	灭 off	灭 off	常亮 On
25~50%	灭 off	灭 off	闪 2 Flash2	常亮 On	灭 off	灭 off	常亮 On	常亮 On	灭 off	灭 off	常亮 On	常亮 On
50~75%	灭 off	闪 2 Flash2	常亮 On	常亮 On	灭 off	常亮 On	常亮 On	常亮 On	灭 off	常亮 On	常亮 On	常亮 On
75~100%	闪 2 Flash2	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On	常亮 On

6. 复位按钮说明 Reset button description

1、BMS 处于休眠状态时，按下按钮后松开，保护板被激活，LED 指示灯从“RUN”开始依次点亮 0.5 秒。

When the BMS is in sleep state, press the button and release it. The protection board is activated, and the LED indicator turns on for 0.5 seconds from "RUN".

2、BMS 处于激活状态时，按下按钮（3~6S）后松开，保护板被休眠，LED 指示灯从最低电量灯开始依次点亮 0.5 秒。

When the BMS is in the active state, press the button (3~6S) and release it, the protection board will be hibernated, and the LED indicator will turn on for 0.5 seconds from the lowest power indicator.

3、BMS 处于激活状态时，按下按钮（6~10S）后松开，保护板被复位，LED 灯全部同时熄灭。

When the BMS is in the active state, press the key (6-10s) and release it, the protection board is reset, and all the LED lights are extinguished at the same time.

4、BMS 处于激活状态时，5s 内按 3 下按钮，即可重新自动编码。

When the BMS is in the active state, press the button three times within 5s, and the BMS can be automatically coded again.

7. 蜂鸣器逻辑 Buzzer logic

1、故障时，每 1S 鸣叫 0.25S；When a fault occurs, 0.25S is emitted every 1S.

2、保护时，每 2S 鸣叫 0.25S (过压保护除外，欠压时 3S 响 0.25S)；When protection, sound 0.25S every 2S (except overvoltage protection, 3S sound 0.25S when undervoltage);

3、告警时，每 3S 鸣叫 0.25S (过压告警除外)；When an alarm is generated, the alarm is generated every 3S for 0.25S (except for an overvoltage alarm).

4、热失控时，每 2S 鸣叫 1S。When the heat is out of control, sound 1S every 2S

蜂鸣器功能可通过上位机使能或禁止，出厂默认是禁止的 The buzzer function can be enabled or disabled by the host computer, but is disabled by factory default

8. 参数配置说明 Parameter configuration description

保存/加载配置：用户可对出厂配置或设置好的参数，通过上位机保存配置和加载； Save/load configuration: Users can save the configuration and load through the host computer for the factory-configured or set parameters;

9. 休眠与唤醒 Sleep and wake up

9.1 休眠 Sleep

当满足以下任意一条件时，系统进入休眠模式：

If any of the following conditions are met, the system enters sleep mode:

- 1) 过放保护 30 秒内仍未解除。 over-charge protection is not removed within 30 seconds.
- 2) 按下按键（3~6S），松开按键后。 Press the button (3~6S) and release the button.
- 3) 同时满足无通信、无保护、无均衡、无电流，且持续时间达到休眠延迟时间。 At the same time, no communication, no protection, no balance, no current, and the duration reaches the sleep delay time.

进入休眠前，需确保输入端未接入外部电压，否则将无法进入休眠模式。 Before entering sleep mode, ensure that no external voltage is connected to the input terminal. Otherwise, the sleep mode cannot be entered.

9.2 唤醒 wake up

当系统处于休眠模式，满足以下任意一条件时，系统将退出休眠模式，进入正常运行模式：

If any of the following conditions are met, the system exits the sleep mode and enters the normal running mode:

- 1) 接入充电器/负载。 Plug in charger/load.
- 2) 按下按键，松开按键后。 Press the button and release the button.
- 3) 具 485、CAN 通讯 激活。 With 485, CAN communication activation.

备注：单体或总体过放保护后进入休眠模式，每 4 个小时定时唤醒一次，开启充放电 MOS。如可以充电，将退出休眠状态进入正常充电； Note: After the single or overall over-discharge protection, it enters sleep mode, wakes up periodically every 4 hours, and starts charging and discharging MOS. If it can be charged, it will exit the resting state and enter normal charging;

10. 通讯说明 Communication instructions

10.1 外部通讯 External communication

RJ45 单网口集成了 RS485、UART、CAN 功能，BMS 可以通过 RJ45 单口与上位机进行通讯，从而可通过上位机监控电池的各种信息，包括电池电压、电流、温度、状态及电池生产信息等，默认波特率为 9600bps。

RJ45 single network port integrates RS485, UART, CAN functions, BMS can communicate with the host computer through RJ45 single port, so that the host computer can monitor various information of the battery, including battery voltage, current, temperature, status and battery production information, the default baud rate is 9600bps.

10.2 内部通信 Inner Communication

RJ45 双网口具有 RS485 的功能，可通过此网口进行 BMS 之间的内部通讯，实现 BMS 自动编码，波特率 115200bps

RJ45 dual network port has the function of RS485, through which internal communication between BMS can be carried out to achieve automatic coding of BMS, the baud rate is 115200bps.

11. 逆变器通讯 Inverter communication

保护板支持 RS485 和 CAN 通信接口的逆变器协议，上位机工程模式可以选择设置。

The protection board supports the inverter protocols of RS485, and CAN communication interfaces. The engineering mode of the upper computer can be selected.

协议类型 Protocol type	协议简称 Protocol abbreviation	协议名称 Protocol name	备注 Remark
RS485 协议 RS485 Protocol	SUNSYNK	阳光	
RS485 协议 RS485 Protocol	DEYE	德业	
RS485 协议 RS485 Protocol	SOROTEC	索瑞德	
RS485 协议 RS485 Protocol	SACOLAR	尚科	
RS485 协议 RS485 Protocol	GROWAT	古瑞瓦特	
RS485 协议 RS485 Protocol	SOFAR	首航	
RS485 协议 RS485 Protocol	VOLTRONICPOWER	日月元	
RS485 协议 RS485 Protocol	SRNE	朔日	
RS485 协议 RS485 Protocol	STUDER	特能	
CAN 协议 CAN Protocol	SUNSYNK	阳光	
CAN 协议 CAN Protocol	GOODWE	固德威	
CAN 协议 CAN Protocol	DEYE	德业	
CAN 协议 CAN Protocol	XMT		
CAN 协议 CAN Protocol	SOLARK	尚科	
CAN 协议 CAN Protocol	PYLON	派能	
CAN 协议 CAN Protocol	MEGAREVO	迈格瑞能	
CAN 协议 CAN Protocol	SOROTEC	索瑞德	
CAN 协议 CAN Protocol	SRNE	朔日	
CAN 协议 CAN Protocol	SOLIS	锦浪	
CAN 协议 CAN Protocol	LUXPOWERTEK	鹏城	
CAN 协议 CAN Protocol	SACOLAR	朔日	
CAN 协议 CAN Protocol	GROWAT	古瑞瓦特	
CAN 协议 CAN Protocol	SOFAR	首航	
CAN 协议 CAN Protocol	MUST	美克	
CAN 协议 CAN Protocol	VICTRONENERGY	victron 能源	
CAN 协议 CAN Protocol	SMA		
CAN 协议 CAN Protocol	AISWEI	爱士惟	
CAN 协议 CAN Protocol	STUDER	特能	

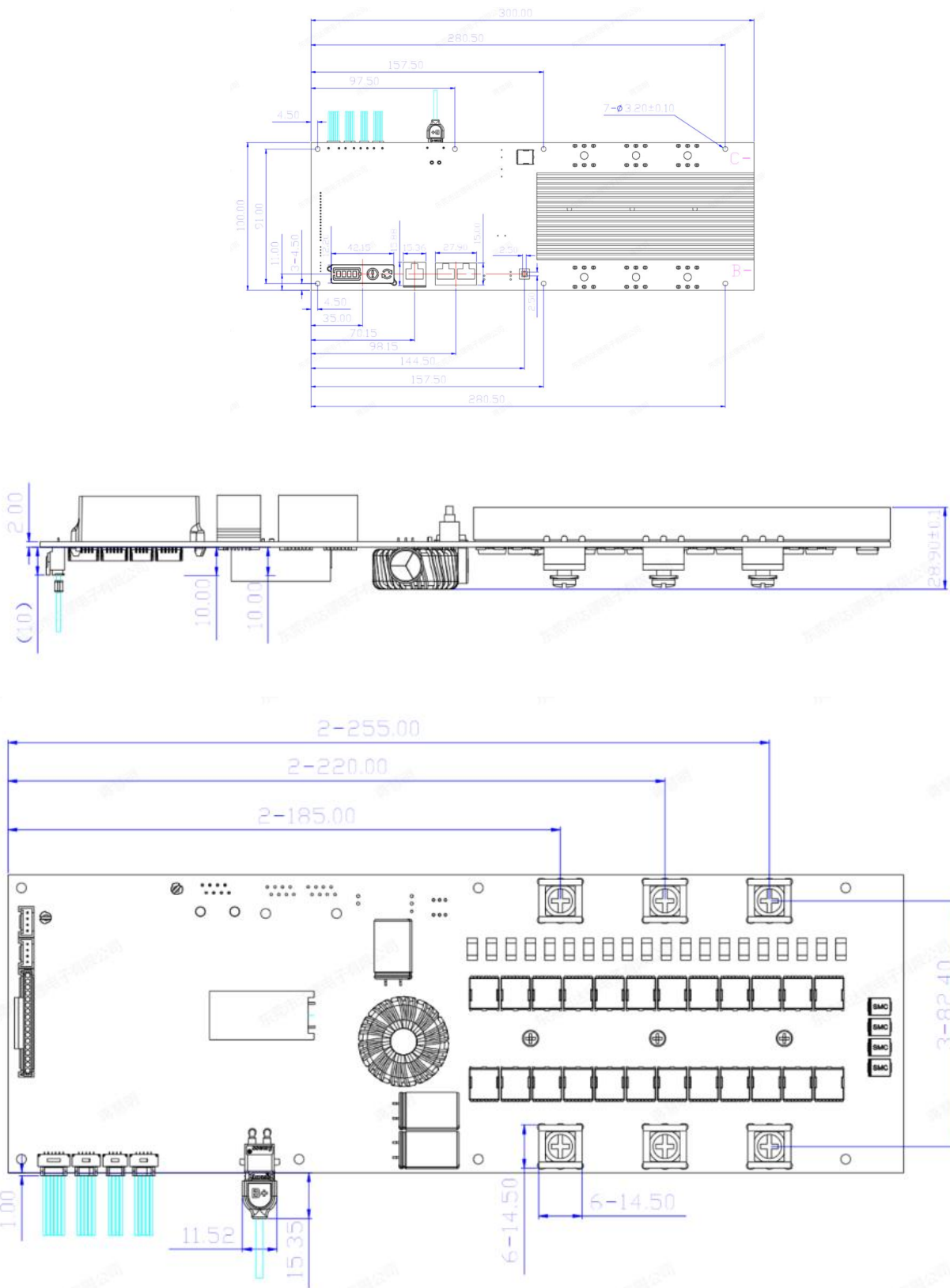
12. 尺寸图参考 Dimensional drawing reference

BMS 尺寸 Dimensions of the BMS	长*宽*高 (mm) Long * Width * High (mm) 300*100*26.3
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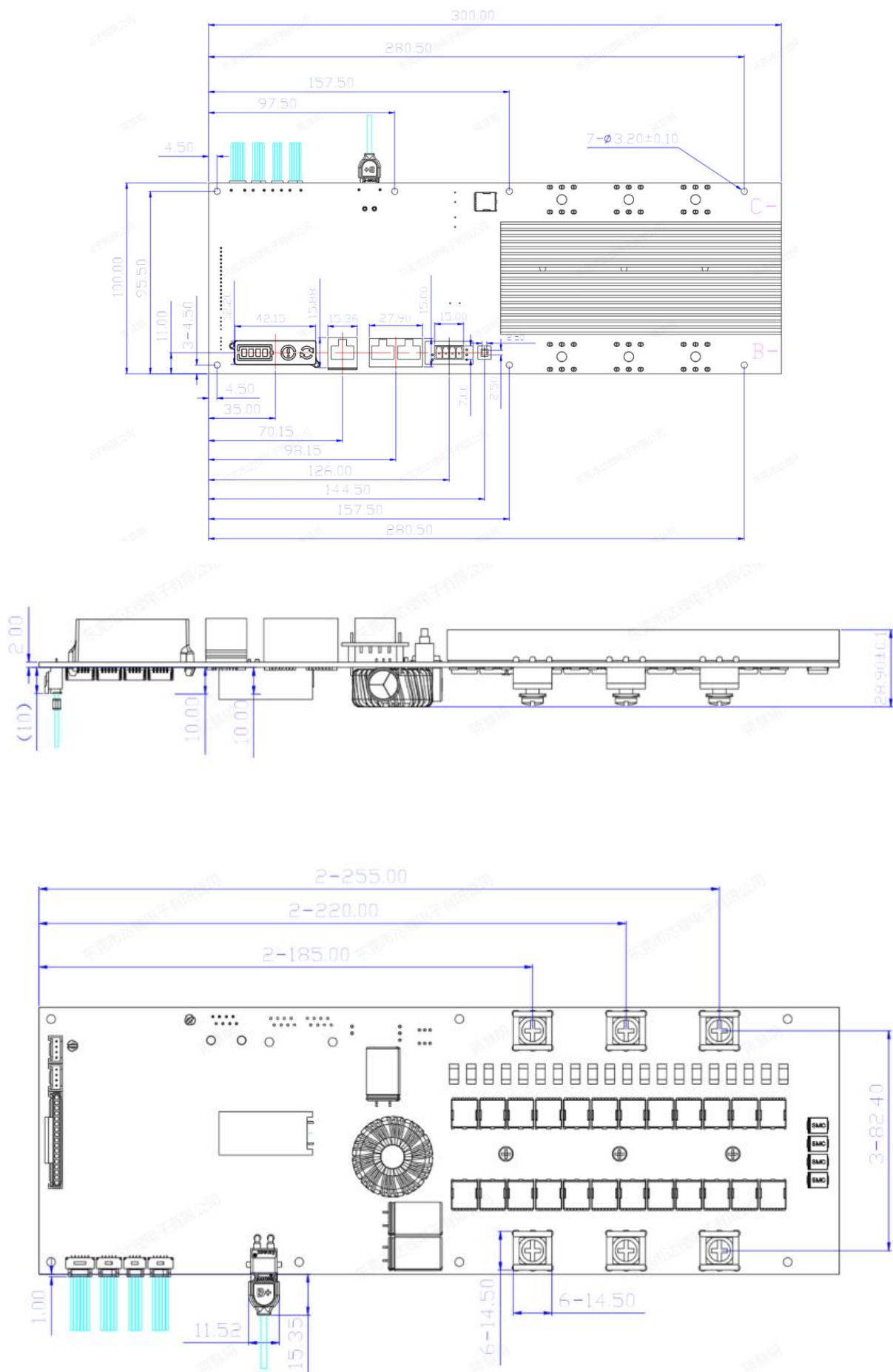
注:此尺寸不包括线束/配件尺寸, 请参考 2D、3D 数模并预留合适的空间安装线束/配件

Note: This size does not include the size of cables and accessories. Please refer to 2D, 3D drawing and reserve appropriate space to install the cables and accessories.

一体式 (不带干接点) Integrated (without dry contact)



一体式（带干接点） Integrated （with dry contact）

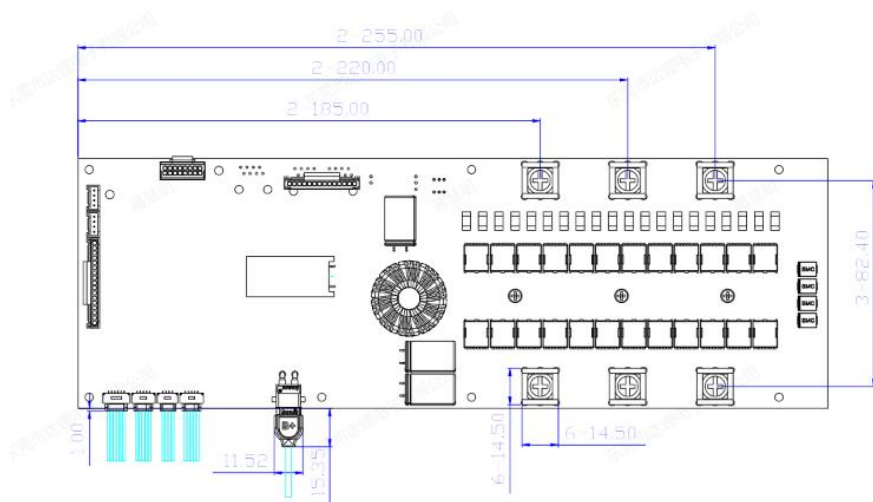
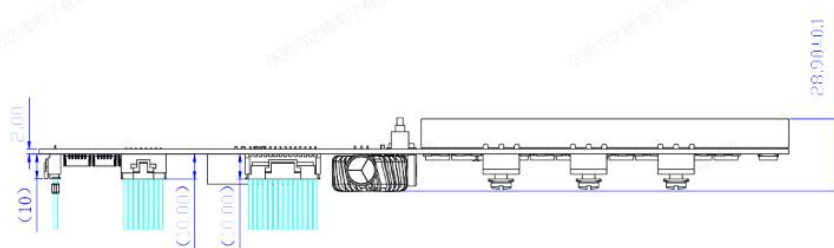
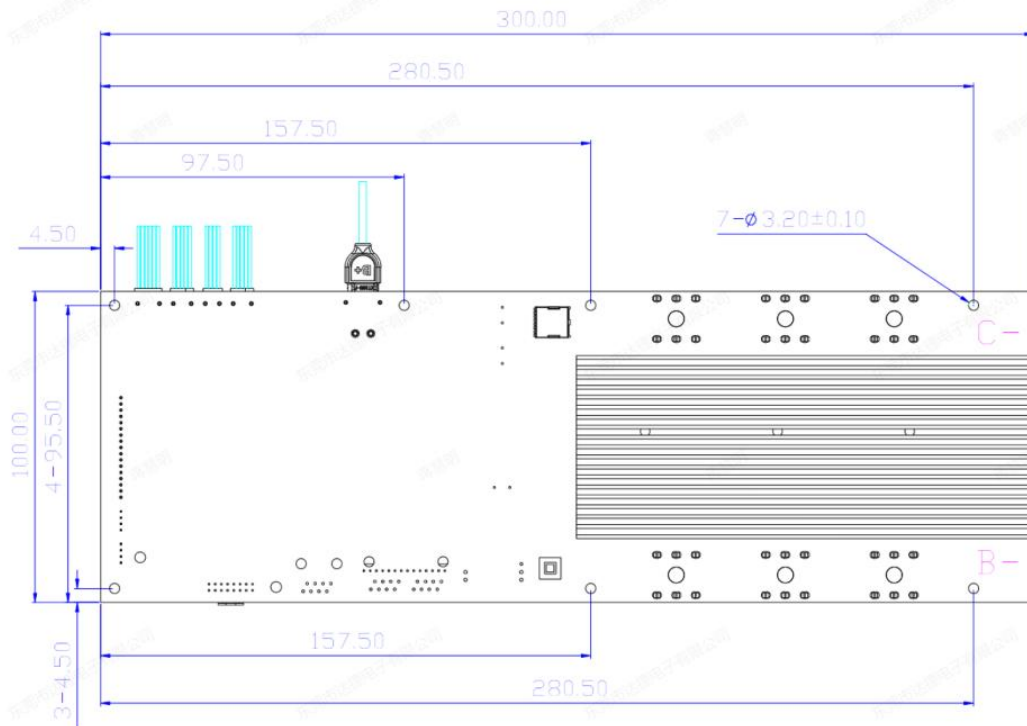


分离式主板 Separated Main Board

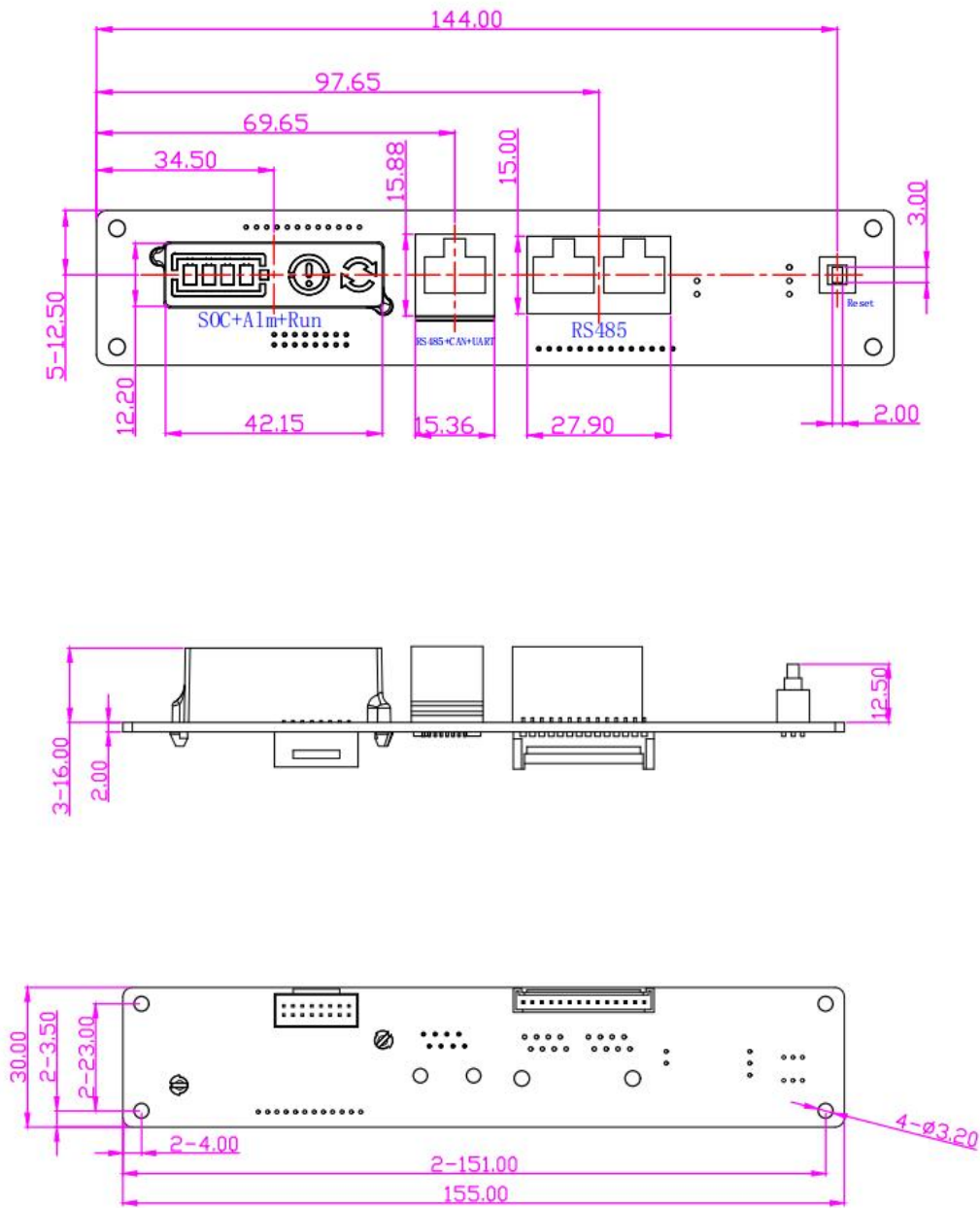
地址：东莞市松山湖区工业南路 14 号天安云谷 7 号楼 21 层

电话：0769-82822953

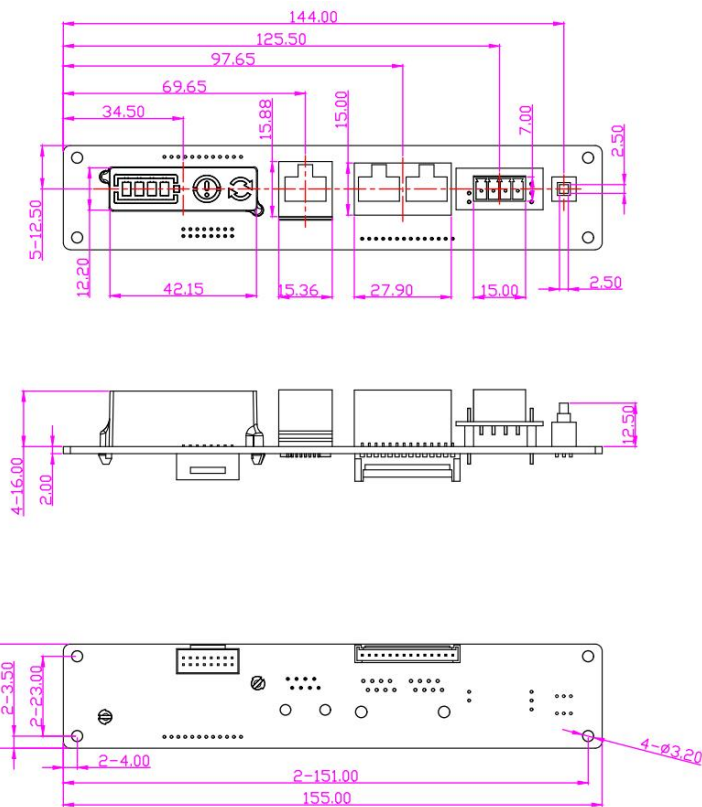
Address: 21 / F, building 7, Tian'an Yungu, No. 14, Gongye South Road, Songshanhu District, Dongguan TEL: 0769-82822953



分离式接口板（不带干接点） Separated interface board（without dry contact）

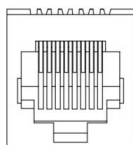


分离式接口板（带干接点） Separated interface board（with dry contact）

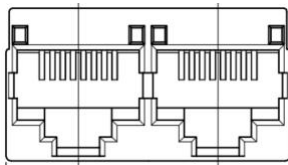


13. 接口定义 Interface definition

13.1 RJ45 网口 RJ45 network port



外部通讯 (RJ45 单网口)	
External communication (RJ45 single network port)	
引脚 pin	定义 Definition
1	485B1
2	485A1
3	ISO_GND
4	CAN1_H
5	CAN1_L
6	GND
7	485A1
8	485B1



内部通讯并联接口 (RJ45 双网口)			
Internal communication parallel interface (RJ45 double network port)			
引脚 pin	定义 Definition	引脚 pin	定义 Definition
1	485B2	1	485B2
2	485A2	2	485A2
3	ISO_GND	3	ISO_GND

4	TBD	4	TBD
5	TBD	5	TBD
6	ISO_GND	6	ISO_GND
7	485A2	7	485A2
8	485B2	8	485B2

13.2 B-/C-/B+接口 B-/C-/B+ interface

接口名称 Interface name	引脚 Pin	定义 Definition	说明 Instructions
B-接口 B-interface	/	B-	电池总负, 接电池总负 Battery negative, connect to battery negative
C-接口 P-interface	/	C-	保护板充放电负电极, 接充放电负端 The charging and discharging negative terminal of the protection board is connected to the charging and discharging negative terminal
B+接口 B+interface	/	B+	电芯、PACK 正极, 用来给 BMS 供电; 功率正极 P+ 直接接电芯正极 Battery cell, PACK positive electrode, used to supply power to BMS; The positive power terminal P+ is directly connected to the positive electrode of the cell

13.3 其它接口 Other interfaces

接口名称 Interface name	引脚 Pin	定义 Definition	说明 Instructions	接口规格 Interface spec
采集接口 Collecting interface	1	B0	接第 1 节电池负级 Connect to the negative stage of the first battery	PHB2.0 (串数+1) pin 带扣 PHB2.0 (Strings+1) pin with buckle
	2	B1+	接第 1 节电池正极 Connect to the positive stage of the first battery	
	3	B2+	接第 2 节电池正极 Connect to the positive stage of the second battery	
	...	...	接最后 1 节电池正极 Connect to the positive stage of the last battery	
NTC 接口 1 NTC interface 1	1	NTC1	1#温度线 1# temperature cable	PHB2.0 4pin
	2	GND	地 GND	
	3	NTC2	2#温度线 2# temperature cable	
	4	GND	地 GND	
NTC 接口 2 NTC interface 2	1	NTC3	3#温度线 3# temperature cable	
	2	GND	地 GND	
	3	NTC4	4#温度线 4# temperature cable	
	4	GND	地 GND	

UART 接口 UART interface	1	GND	地 GND	GH1.25 6pin
	2	3.3	供电电源 3.3V Power supply 3.3V	
	3	12	12V 正极输出 12V positive output	
	4	S1	激活按键 Activate key	
	5	TX	通讯发送端 Communication sending terminal	
	6	RX	通讯接收端 Communication receiver	
钥匙开关接口 Key switch interface	1	TRIG+	钥匙开关正极 Key switch positive pole	GH1.25 4pin
	2	TBD	TBD	
	3	TBD	TBD	
	4	TRIG-	钥匙开关负极 Key switch negative electrode	
LCD 接口 LCD interface	1	12V+	12V 正极输出 12V positive output	GH1.25 5pin
	2	TX	通讯发送端 Communication sending terminal	
	3	5V+	5V 正极输出 5V positive output	
	4	RX	通讯接收端 Communication receiver	
	5	GND	电源输出负极 Power output negative	
DO 接口 DO interface	1	3.3	供电电源 3.3V Power supply 3.3V	GH1.25 5pin
	2	GND	地 GND	
	3	TBD	TBD	
	4	TBD	TBD	
	5	TBD	TBD	
干接点 Dry contact	干接点 1 Dry contact 1		PIN1 to PIN2: 常开, 低电量闭合 PIN1 to PIN2: Open normally and close at low power	
	干接点 2 Dry contact 2		PIN3 to PIN4: 常开, 故障 保护时闭合 PIN3 to PIN4: Open normally and closed during fault protection	

14.主要线材说明 Main cable description

线材名称 Name of cable	默认规格 Default specification	数量 Qty	备注 remark
B- 线 B- cable	100A: 双端导线_3512_7AWG_150MM 蓝色(B-)_SC16-5 端子 100A: Double-ended wire 3512 7AWG 150MM blue (B-) SC16-5 terminal 200A: 双端导线_3512_6AWG_150mm 蓝色(B-)_SC25-5 端子 200A: Double-ended wire 3512 6AWG 150mm blue (B-) SC25-5 terminal	100A: 2pcs 200A: 3pcs	选配 Option
C- /P- 线	100A: 双端导线_3512_7AWG_150MM 黑色(P-)_SC16-5 端子 100A: Double-ended conductor _3512_7AWG_150MM_ Black (P-)_SC16-5 terminal 200A: 双端导线_3512_6AWG_150mm 黑色(P-)_SC25-5 端子 200A: Double-ended conductor _3512_6AWG_150mm_ Black (P-)_SC25-5 terminal	100A: 2pcs 200A: 3pcs	选配 Option
B+ 线 B+ cable	B+线_XT30U-F+14AWG B+ cable_XT30U -F+14AWG	1pcs	标配 standard config 长/length: 600mm
NTC 线 NTC cable	带插头 NTC_2 路_PHB2.0_4Pin_3435_1%_24AWG_250mm With plug NTC _2pcs_ PHB2.0_4Pin_3435_1%_24AWG_250mm	2pcs	标配 standard config
RJ45 (RS485) 转 USB 线 RJ45 (RS485) to USB cable	转换器_DL-USB 转 RS485_注胶_达锂 LOGO_RJ45-8P_1000mm Converter _DL-USB to RS485_ Glue _ Lithium LOGO_RJ-45-8P_1000mm	1pcs	选配 Option
RJ45 (UART) 转 USB RJ45 (UART) to USB cable	转换器_DL-USB 转 UART_注胶_达锂 LOGO_RJ45-8P_1000mm Converter _DL-USB to Uart_ Glue _ up to lithium LOGO_RJ-45-8P_1000mm	1pcs	选配 Option
钥匙开关线	连接线_4Pin_GH1.25_船型开关_26AWG_红黑线_450mm_打胶_带扣	1pcs	标配 standard config

Key switch cable	Connecting cable_4pin_GH1.25_Ship switch_26AWG_Red and black cable_450mm_Glue_Buckle		
采集线 Collection cable	参考: 17. 采集线 VS 串数 Collection cables VS strings Refer to: 17. 采集线 VS 串数 Collection cables VS strings	1pcs	标配 standard config
接口板连接线 1 Interface board cable 1	连接线_14Pin_PHB2.0_24AWG_300mm_打胶_带扣_R16L 接拓展板(V3.3) Cable_14pin_phb2.0_24awg_300mm_gluing_Buckle_R16L Expansion plate (V3.3)	1pcs	接口板标配 Standard config of interface board
接口板连接线 2 Interface board cable 2	连接线_2×8Pin_PHB2.0 双排_24AWG_300mm_R16L 接拓展板(V3.3) Cables_2×8Pin_PHB2.0 Two rows_24AWG_300mm_R16L Connect expansion boards (V3.3)	1pcs	接口板标配 Standard config of interface board

15.可选配件说明 Optional accessories description

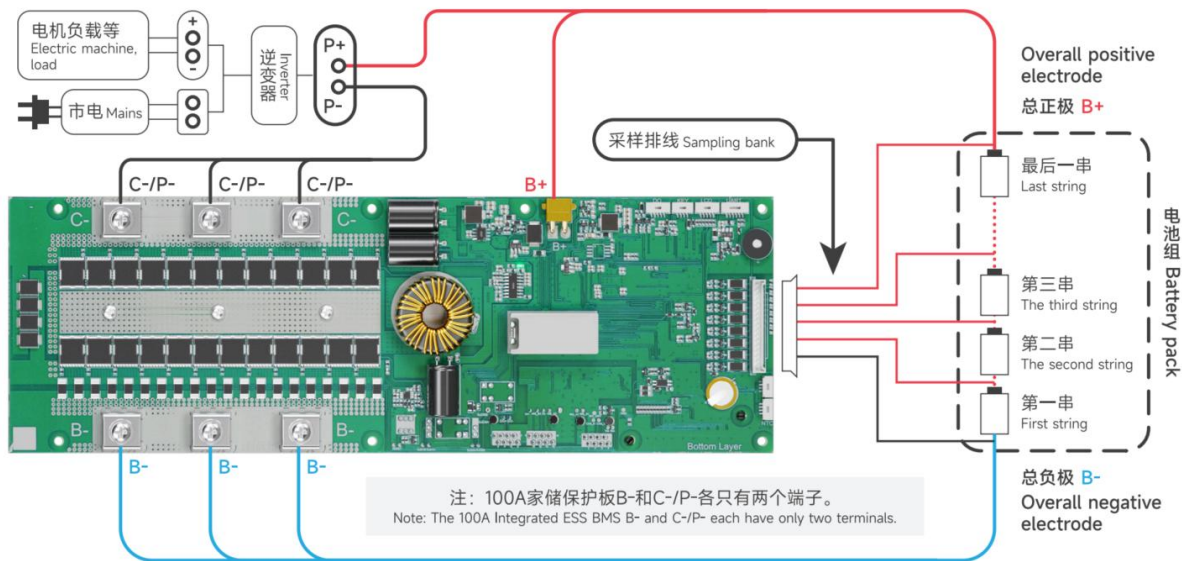
配件 accessories	默认规格 (含线束) Default specification (Include cables)	数量 Qty	备注 remark
LCD	显示屏_DL-KDDBB08_3.2 寸显示屏_蓝底白字_GH1.25 Display DL-KDDBB08 3.2 inch display GH1.25 in white on blue background	1pcs	选配 Option
WIFI 模块 WIFI module	WIFI 模块_DL-APP 专用_注胶_Φ37×6.5_带按键_达锂 LOGO_GH1.25 连接线带扣 WIFI module_DL-APP dedicated_Glue_Φ37×6.5_with keys_Lithium LOGO_GH1.25 cable buckle	1pcs	选配 Option
蓝牙模块 Bluetooth	蓝牙模块_注胶_Φ37×6.5_不带按键_达锂 LOGO_中英文(低功耗防水/GH1.25) Bluetooth Module_Glue_Φ37×6.5_Without keys_Lithium LOGO_Chinese and English (low-power waterproof/GH1.25)	1pcs	选配 Option
加热模块 Heating module	加热模块_40×63×12mm_V4.1_(GH1.25/R16L V3.X) Heating module 40 x 63 x 12mm V4.1 (GH1.25/R16L V3.X)	1pcs	选配 Option
安全模块 Safety module	安全模块_AQM Safety module AQM	1pcs	选配 Option

16. 采集线 VS 串数 Collection cables VS strings

串数 Strings	采集线规格 collecting cable specification	采集线抽线 collecting cable cutting
8	1007 24AWG L=600mm (9PIN) with buckle	/
9	1007 24AWG L=450mm (11PIN) with buckle	抽掉 11P 中最后 1P 线 cutting the last cable of the 11PIN cable
10	1007 24AWG L=450mm (11PIN) with buckle	/
11	1007 24AWG L=450mm (13PIN) with buckle	抽掉 13P 中最后 1P 线 cutting the last cable of the 13PIN cable
12	1007 24AWG L=450mm (13PIN) with buckle	/
13	1007 24AWG L=450mm (14PIN) with buckle	/
14	1007 24AWG L=450mm (15PIN) with buckle	/
15	1007 24AWG L=450mm (16PIN) with buckle	/
16	1007 24AWG L=800mm (17PIN) with buckle	/
采集线接口规格 collecting cable interface specification: PHB2.0 (n+1) pin with buckle		

n=电池串数; n=Strings

17. 接线说明 Cable connection instructions



- 先将保护板 B- 用动力线接到电池组总负极；First connect the protection board B- with the power cable to the total negative electrode of the battery pack;
- 排线从细黑线连接 B- 开始，第 2 根线连接第 1 串电池正极，后面依次连接每一串电池的正极，使用线序检测器检测排线连接正确后再把排线插入保护板；Start with a thin black wire connecting B-, connect the second wire to the first series of positive battery terminals, and then connect the positive terminals of each series of batteries in turn; Use the wire sequence detector to check that the cables are correctly connected, and then insert the cables into the protection board.
- 插上 NTC 线，最后用 B+ 线将电池组正极与 BMS B+ 接口相连接；Plug in the NTC cable. Finally, the positive electrode of the battery pack is connected to the BMS B+ interface with the B+ cable.
- 以上线完成后即可唤醒 BMS 正常工作；否则请按照上面重新操作；Wake up BMS after the above cable is completed & works normally; Otherwise, please follow the above operations again;
- 拆卸保护板时，先拔排线，再拆动力线 B-。When removing the protection board, remove the power cable B-. If there are two protection boards, remove the high and voltage cables first, and then the low voltage cables.

18. 注意事项 Precautions

- ① 不同电压平台的保护板不能混用；Protection boards of different voltage platforms cannot be mixed;
- ② 不同厂家的排线不通用，请确保使用我们公司配套排线；Different manufacturers of wiring is not common, please make sure to use our company matching wiring;
- ③ 在测试、安装、接触和使用保护板时，要做好防静电措施；When testing, installing, touching and using the protection board, take measures to discharge static electricity;
- ④ 不要使保护板的散热面直接接触电芯，否则热量会传送到电芯，影响电池的安全；Do not make the heat dissipation surface of the protection plate contact the battery directly, otherwise the heat will be transferred to the battery, affecting the safety of the battery;
- ⑤ 不可自行拆卸、更改保护板元器件；Do not disassemble, change the protection board components;
- ⑥ 如果保护板出现异常，请停止使用，等问题解决了再使用；If the protection board is abnormal, please stop using it and use it again after the problem is solved.



修订记录 Revision record

日期 Date	版本号 Ver.	修订说明 Revision note	制定人 Made by	核准人 authorizer
2025/08/09	A0	初版发行 Initial release	Jianghuiming	Thomas
2025/12/8	A1	更新工作温度 Update working temperature	JiangHuiming	Thomas Lin
2026/1/9	A2	更新待机 LED 指示说明 Update the standby LED indicator instructions.	HuangYanshan	JiangHuiming
2026/1/29	A3	外部通讯 7&8 脚更改为 485A1 和 485B1 The external communication pins 7 & 8 have been changed to 485A1 and 485B1	HuangYanshan	JiangHuiming
2026/2/3	A4	更新放电时灯语说明 Update the indicator light specifications for the discharge state	HuangYanshan	JiangHuiming
2026/2/4	A5	更新分离式接口板（不带干接点）图片 Update Pictures in the Datasheet for the Separated Interface Board (without Dry Contacts)	HuangYanshan	JiangHuiming
2026/4/14	A6	温度检测精度更改 Change of Temperature Detection Accuracy	HuangYanshan	JiangHuiming