



产品规格承认书

Product Specification Approval

产品名称 (Product Name) :	智能板 7~24 兼串 40~100A 同口带主动均衡 Smart BMS 7~24S 40~100A Common Port With Active Balance	
产品型号 (Product Number) :	DL-R24TK-TZJ	
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客户确认栏 Customer Confirmation Column		
确认意见 Confirm opinion:		
客户签章 Customer signature:		
日期 Date:		
注意 (Notice) :		
1.收到样机确认 OK 后请及时回签, 7 天内没有回签及问题反馈, 我司默认客户测试合格; 规格书中的图片为通用机型图片, 可能与送样样机有差异, 此份规格书达锂电子保留最终解释权.After receiving the prototype to confirm OK, please sign back in a timely manner, within 7 days without signing back and problem feedback, our default customer test qualified; specifications in the picture for the general model picture, may be different from the delivery of the prototype, this specification by the Dongguan Daly Electronics Co.		
2.客户批量前, 请在规格书中签字回传, 并说明详细功能说明, 我司才安排批量.Before the customer batches, please sign the specification and return it, and explain the detailed function description, and our company will arrange the batch.		

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1. 简介 (Introduction)

因电池的容量、内阻和电压等参数值不能完全一致，这种差异导致充电时容量最小的电池容易过充，过放，受损后最小的电池容量变得更小，进入恶性循环。单体电池性能的优劣直接影响到整组电池的充放电特性及电池组容量降低。没有均衡功能的 BMS 只是一个数据采集器，很难称得上是管理系统。本产品的主动均衡功能，可以实现最大峰值 1A 的均衡电流。将单体能量高的转移到单体能量低的电池，或用整组能量补充到单体最低电池，在实施的过程中通过储能环节把能量重新进行分配，最大程度的保证电池一致性、提高电池续航里程、延缓电池衰老。

Due to the battery capacity, internal resistance, voltage and other parameter values are not completely consistent, this difference causes the battery with the minimum capacity to be easily overcharged and discharged during charging, and the smallest battery capacity becomes smaller after damage, entering a vicious cycle. The performance of single cell directly affects the charge and discharge characteristics of the whole battery and the deduction of battery capacity. BMS lack of balance function is only a data collector, which is harghy a management system. The active equalization function can realize the maximum 1A equalization current. Transfer the high-energy single cell to the low-energy cell, or use the whole group of energy to supplement the lowest single cell. During the implementation process, the energy is redistributed through the energy storage link, so as to ensure the battery consistency to the greatest extent, improve the battery mileage and extend the battery life.

2. 产品概述及特点(Product Overview and Features)

- ◆ 集成第三代主动均衡功能;
Integrate the third generation active balancing function;
- ◆ 智能集成兼串设计，兼容 7~24 串使用;
Smart Integrated and string design, compatible with 7-24 strings;
- ◆ 集成蓝牙功能，可使用 APP 快速便捷查看及设置保护板的参数;
Integrated Bluetooth function, can use the APP quickly and easily view and set the parameters of BMS;
- ◆ 采用低封装电阻、低寄生电感、低热阻的 TOLL 封装 MOS 管，满足大功率、大电流等场景;
TOLL package MOS tube with low package resistance, low parasitic inductance and low thermal resistance is adopted to meet the application scenarios of high power and high current;
- ◆ 支持丰富的外设配件，满足多应用场景;
Supports a variety of peripheral accessories to meet multiple application scenarios;
- ◆ 支持云平台远程电池管理，满足终端远程监控;
Supports IOT cloud platforms and remote monitoring of terminals;
- ◆ 支持 PC 端上位机，快捷查看历史记录及批量设置参数;
Support PC host, quick view of history and batch set parameters;
- ◆ 使用专业大电流走线设计及工艺，经受超大电流冲击;
The use of professional high-current wiring design and technology, withstand the impact of large current;
- ◆ 支持过充保护、过放保护、过流保护、短路保护功能;
Supports over charge protection, over discharge protection, over current protection, short circuit protection;
- ◆ 具有通讯功能，可通过 PC 上位机或 APP 对过流、过放、过充、充放电过流、均衡、过温、欠温、休眠、容量等参数进行设置;
With communication function, you can set parameters such as over-current, over-discharge, over-current, charge and discharge over-current, equalization, over-temperature, under-temperature, hibernation and capacity through PC or APP;



3. 基础规格(Basic specification)

指标 Index	参数 Specification	备注 Remarks
电池组类型 Battery pack type	三元、铁锂、钛酸锂 NCM、LFP、LTO	
电池组串数 Number of battery strings	三元 (NCM): 7~17S/7~20S 铁锂(LFP): 7~17S/7~24S 钛酸锂(LTO): 7~17S/7~24S	
单体采样电压范围 Cell sampling voltage range	1.5V-4.9V	
工作电压范围 Operating voltage range	>10V	
均衡方式 Balance method	主动均衡 Active Balance	
工作功耗 Working power consumption	≤1.25W	空载状态 Idle State
休眠功耗 Sleep current	8-17S≤35mW 8-24S≤45mW	空载状态 Idle State
工作指示灯 Working Light	绿色: 正常工作 Green: works properly 红色: 告警或保护 Red: Alarm or protection	
产品重量 Product weight	245±5g	
产品尺寸 Product size	169.5*67.1*15.1mm 长*宽*高 Length*width*height	
预充大小 (uF) Precharge size	☐ 4700 ☐ 10000 ☒ 22000 ☐ 33000	并 25R 电阻

4. 技术参数 (Technical Parameters)

4.1.充放电及均衡 Charging & Discharging With Active Balance

检测内容 Test content		默认参数 Default parameters	单位 Unit	备注 Remark
放电 Discharge	额定放电电流 Rated Discharge Current	40/60/80/100	A	
充电 charge	额定充电电流 Rated Charge current	40/60/80/100	A	
主动均衡 Active Balance	均衡开启电压 Balanced Start Voltage	3.0	V	可设置 Can Be Set
	均衡开启压差 Balanced Opening Voltage Difference	≥10	mV	可设置 Can Be Set
	均衡电流 Balance Current	900±200	mA	可设置 Can Be Set
	以下两个条件同时满足时开启均衡，只要有一项不满足，就会关闭 The above two conditions must be meet at the same time. if one of condition is not meet, balance will be closed. 1、达到设定开启电压；Reach the set opening voltage. 2、达到设定开启压差；Reach the set opening voltage difference.			



4.2.单体电压保护 Single cell voltage Protection

电压保护参数 Voltage Protection parameters	电池类型 Battery Type		
	三元 NCM	铁锂 LFP	钛酸锂 LTO
单体过压一级告警（V） Single cell over-voltage level 1 alarm (V)	4.1±0.05	3.55±0.05	2.65±0.05
单体过压一级告警恢复（V） Single cell over-voltage level 1 alarm recovery (V)	4±0.05	3.45±0.05	2.55±0.05
单体过压一级延时 Single cell over-voltage Level 1 delay	1±0.8s		
单体过压二级保护（V） Single cell over-voltage level 2 protection (V)	4.2±0.05	3.6±0.05	2.7±0.05
单体过压二级保护恢复（V） Single cell over-voltage level 2 protection recovery (V)	4.1±0.05	3.55±0.05	2.65±0.05
单体过压二级保护延时 Single cell over-voltage Level 2 delay	1±0.8s		
单体过压三级保护（V） Single cell over-voltage level 3 protection (V)	4.3±0.05	3.8±0.05	2.85±0.05
单体过压三级保护恢复（V） Single cell over-voltage level 3 protection recovery (V)	4.2±0.05	3.7±0.05	2.8±0.05
单体过压三级保护延时 Single cell over-voltage Level 3 delay	0.5±0.4s		
单体欠压一级告警（V） Single cell under-voltage level 1 alarm (V)	2.85±0.05	2.65±0.05	1.85±0.05
单体欠压一级告警恢复（V） Single cell under-voltage level 1 alarm recovery (V)	2.95±0.05	2.75±0.05	1.9±0.05
单体欠压一级延时 Single cell under-voltage Level 1 delay	1±0.8s		
单体欠压二级保护（V） Single cell under-voltage level2 protection (V)	2.82±0.05	2.6±0.05	1.8±0.05
单体欠压二级保护恢复（V） Single cell under-voltage level 2 protection recovery (V)	2.85±0.05	2.65±0.05	1.85±0.05
单体欠压二级延时 Single cell under-voltage Level 2 delay	5±0.8s		
单体欠压三级保护（V） Single cell under-voltage level 3 protection (V)	2.6±0.05	2.1±0.05	1.8±0.05
单体欠压三级保护恢复（V） Single cell under-voltage level 3 protection recovery (V)	2.7±0.05	2.2±0.05	1.7±0.05
单体欠压三级延时 Single cell under-voltage Level 3 delay	3±0.8s		
均衡起始电压（V） Balance ON voltage (V)	3±0.05	3±0.05	2±0.05
一级&二级保护延时 Level 1& Level 2 Protection delay	1±0.8s		
三级保护延时 Level 3 Protection delay	0.5±0.4s		
注：保护参数可被设置，恢复及延时参数不可设置； Note: Protection parameters can be set, recovery and delay parameters cannot be set;			

4.3.总压保护 Total Voltage Protection

总压保护参数 Voltage Protection parameters	电池类型 Battery Type		
	三元 NCM	铁锂 LFP	钛酸锂 LTO
过充告警电压（一级）Over-Charging Alarm（First Level）	(4.1-0.05)*N	(3.55-0.05)*N	(2.65-0.05)*N
过充告警解除电压（一级）Over-Charging Alarm Recover（First Level）	(4-0.05)*N	(3.45-0.05)*N	(2.55-0.05)*N
过充保护一级延时 Over-Charging Level 1 delay	1±0.8s		



过充保护电压（二级）Over-Charging Protection（Second Level）	$(4.2-0.05)*N$	$(3.6-0.05)*N$	$(2.7-0.05)*N$
过充保护解除电压（二级）Over-Charging Protection Recover（Second Level）	$(4.1-0.05)*N$	$(3.55-0.05)*N$	$(2.65-0.05)*N$
过充保护二级延时 Over-Charging Level 2 delay	1±0.8s		
过充保护电压（三级）Over-Charging Protection(Level 3)	$(4.3-0.05)*N$	$(3.8-0.05)*N$	$(2.85-0.05)*N$
过充保护解除电压（三级）Over-Charging Protection Recover(Level 3)	$(4.2-0.05)*N$	$(3.7-0.05)*N$	$(2.8-0.05)*N$
过充保护三级延时 Over-Charging Level 2 delay	0.5±0.4s		
过放告警电压（一级）Over-Discharging Alarm（First Level）	$(2.85+0.05)*N$	$(2.65+0.05)*N$	$(1.85+0.05)*N$
过放告警解除电压（一级）Over-Discharging Alarm Recover（First Level）	$(2.95+0.05)*N$	$(2.75+0.05)*N$	$(1.9+0.05)*N$
过放保护一级延时 Over-Discharging Level 1 delay	1±0.8s		
过放保护电压（二级）Over-Discharging Protection（Second Level）	$(2.82+0.05)*N$	$(2.6+0.05)*N$	$(1.8+0.05)*N$
过放保护解除电压（二级）Over-Discharging Protection Recover（Second Level）	$(2.85+0.05)*N$	$(2.65+0.05)*N$	$(1.85+0.05)*N$
过放保护二级延时 Over-Discharging Level 2 delay	5±0.8s		
过放保护电压（三级）Over-Discharging Protection(Level 3)	$(2.6+0.05)*N$	$(2.1+0.05)*N$	$(1.7+0.05)*N$
过放保护解除电压（三级）Over-Discharging Protection Recover(Level 3)	$(2.7+0.05)*N$	$(2.2+0.05)*N$	$(1.75+0.05)*N$
过放保护三级延时 Over-Discharging Level 3 delay	3±0.8s		
一级&二级保护延时 Level 1& Level 2 Protection delay	1±0.8s		
三级保护延时 Level 3 Protection delay	0.5±0.4s		
注：1、保护参数可被设置，恢复及延时参数不可设置；2、N 为电池串数； Note: 1、 Protection parameters can be set, recovery and delay parameters cannot be set;2、 N is the number of battery strings;			

4.4.过流保护 Over-Current Protection

持续电流 Continuous Current		充放电过流告警(一级) Charging / Discharging Over-Current Value Alarm (Level 1)	充放电过流保护(二级) Charging / Discharging Over-Current Value Protection (Level 2)	充放电过流保护(三级) Charging / Discharging Over-Current Value Protection (Third Level)
充电 Charging	放电 Discharging			
40A	40A	$48\pm 3\%A$ @ Delay $1\pm 0.8s$	$60\pm 3\%A$ @ Delay $55\pm 0.8s$	$120\pm 3\%A$ @ Delay $1\pm 0.8s$
60A	60A	$72\pm 3\%A$ @ Delay $1\pm 0.8s$	$90\pm 3\%A$ @ Delay $55\pm 0.8s$	$180\pm 3\%A$ @ Delay $1\pm 0.8s$
80A	80A	$96\pm 3\%A$ @ Delay $1\pm 0.8s$	$120\pm 3\%A$ @ Delay $55\pm 0.8s$	$160\pm 3\%A$ @ Delay $1\pm 0.8s$
100A	100A	$120\pm 3\%A$ @ Delay $1\pm 0.8s$	$150\pm 3\%A$ @ Delay $55\pm 0.8s$	$200\pm 3\%A$ @ Delay $1\pm 0.8s$
备注 Remark		1、参数可设置 Can Be Set; 2、充电过流保护解除条件：移除充电器 Charging Over-Current Protection Recover condition: Remove the charger 3、放电过流保护解除条件：移除负载 Discharging Over-Current Protection Recover condition: Remove the load 4、解除延时为 $1\pm 0.8s$, Release delay: $1\pm 0.8s$		

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	短路保护条件 Short Circuit Protection Conditions	外部负载短路 External load short circuit	A



保护	短路保护延时 Short Circuit Protection Delay	50~200	uS
Short Circuit Protection	说明：短路电流小于最小值或高于最大值可能会造成短路保护失效，不保证有短路保护，也不建议做短路保护测试。实际以客户寄回电池包到我司测试为准。Note: Short-circuit current less than the minimum value or higher than the maximum value may cause short-circuit protection failure, does not guarantee short-circuit protection, and is not recommended to do short-circuit protection test. It is not recommended to do the short-circuit protection test. The actual test is subject to the customer sending back the battery pack to our company for testing.		
	解除条件 Release Condition	移除负载解除/充电解除 Remove Load Release/Charging Release	

4.6.外部温度保护 Temperature Protection

检测内容 Test content		默认参数 Default parameters	单位 Unit
充电高温 Charging High Temperature	充电高温告警温度（一级）Charging High Temperature Alarm(Level 1)	55±3	℃
	充电高温告警释放温度（一级）Charging High Temperature Alarm Release(Level 1)	50±3	℃
	充电高温保护温度（二级）Charging High Temperature Protection(Level 2)	65±3	℃
	充电高温保护释放温度（二级）Charging High Temperature Protection Recover(Level 2)	60±3	℃
	充电高温保护温度（三级）Charging High Temperature Protection(Level 3)	75±3	℃
	充电高温保护释放温度（三级）Charging High Temperature Protection Recover(Level 3)	70±3	℃
放电高温 Discharging High Temperature	放电高温告警温度（一级）Discharging High Temperature Alarm(Level 1)	65±3	℃
	放电高温告警释放温度（一级）Discharging High Temperature Alarm Recover(Level 1)	60±3	℃
	放电高温保护温度（二级）Discharging High Temperature Protection(Level 2)	70±3	℃
	放电高温保护释放温度（二级）Discharging High Temperature Protection Recover(Level 2)	65±3	℃
	放电高温保护温度（三级）Discharging High Temperature Protection(Level 3)	75±3	℃
	放电高温保护释放温度（三级）Discharging High Temperature Protection Recover(Level 3)	70±3	℃
充电低温 Charging Low Temperature	充电低温告警（一级）Charging Low Temperature Alarm (Level 1)	-10±3	℃
	充电低温告警释放温度（一级）Charging Low Temperature Alarm Recover (Level 1)	-5±3	℃
	充电低温保护（二级）Charging Low Temperature Protection (Level 2)	-20±3	℃
	充电低温保护释放温度（二级）Charging Low Temperature Protection Recover (Level 2)	-15±3	℃
	充电低温二级保护（三级）Charging Low Temperature Protection(Level 3)	-40±3	℃
	充电低温保护释放温度（三级）Charging Low Temperature Protection Recover(Level 3)	-35±3	℃
放电低温 Discharging Low Temperature	放电低温告警（一级）Discharging Low Temperature Alarm (Level 1)	-10±3	℃
	放电低温告警释放温度（一级）Discharging Low Temperature Alarm Recover (Level 1)	-5±3	℃
	放电低温保护（二级）Discharging Low Temperature Protection (Level 2)	-20±3	℃
	放电低温保护释放温度（二级）Discharging Low Temperature Protection Recover (Level 2)	-15±3	℃
	放电低温保护（三级）Discharging Low Temperature Protection(Level 3)	-40±3	℃
	放电低温保护释放温度（三级）Discharging Low Temperature Protection Recover(Level 3)	-35±3	℃
说明 Description	一级&二级温度告警及保护延时 Level1&Leve2 Temperature Alarm&Protection Delay	1±0.8	S
	三级温度告警及保护延时 Leve3 Temperature Alarm&Protection Delay	0.5±0.4	S
	逻辑说明：达到开启条件时，会触发告警或保护，告警不会关闭充放电 MOS，保护时会关闭充放电 MOS。 Logic description: When the open condition is reached, alarm or protection will be triggered, alarm will not turn off the charging/discharging MOS, and protection will turn off the charging/discharging MOS. 保护值及恢复值可被设置，恢复延时参数不可设置； Protection value and recovery value can be set, recovery delay parameter cannot be set; 注意：当温度采集线束出现断线或者短接等故障时，默认过滤该温度故障(维持充放电 MOS 状态，但显示对应的告警信息)。 Note: In case of faults such as open circuits or short circuits in the temperature sensing harness, the temperature failure will be filtered by		



default (maintaining the charging/discharging MOS state but displaying the corresponding warning message)

4.7.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 MOS Temperature	高温告警（一级）High Temperature Alarm (Level 1)	90±3	℃
	高温告警恢复（一级）High Temperature Alarm Release (Level 1)	85±3	℃
	高温保护（二级）High Temperature Protection (Level 2)	100±3	℃
	高温一级保护恢复（二级）High Temperature Protection Release (Level 2)	95±3	℃
	高温二级保护（三级）High Temperature Protection(Level 3)	110±3	℃
	高温二级保护恢复（三级）High Temperature Protection Release(Level 3)	105±3	℃
说明 Description	一级&二级温度告警及保护延时 Level1&Level2 High Temperature Alarm&Protection Delay	1±0.8	S
	三级温度告警及保护延时 High Temperature Alarm&Protection Delay	0.5±0.4	S
	逻辑说明：达到开启条件时，会触发告警或保护，告警不会关闭充放电 MOS，保护时会关闭充放电 MOS。 Logic description: When the open condition is reached, alarm or protection will be triggered, alarm will not turn off the charging/discharging MOS, and protection will turn off the charging/discharging MOS.		

4.8.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	压差过大一级告警 Level 1 alarm of excessive differential pressure	0.5	V
	压差过大二级告警 Excessive differential pressure Level 2 protection	0.8	V
	压差过大三级告警 Excessive differential pressure Level 3 protection	1	V
	压差过大一级告警恢复 Level 1 alarm recovery of excessive differential pressure	0.3	V
	压差过大二级告警恢复 Excessive differential pressure, level 2 protection recovery	0.5	V
	压差过大三级告警恢复 Excessive differential pressure, level 3 protection recovery	0.8	V
延时 Delay	一级&二级压差告警及保护延时 Level 1&level 2 Excessive differential pressure Alarm&Protection Delay	1±0.8	S
	三级压差告警及保护延时 Level 3 Excessive differential pressure Alarm&Protection Delay	0.5±0.4	S

4.9.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 First Level Temperature Difference Alarm	10±2	℃
	温差一级告警恢复 First Level Temperature Difference Alarm Recover	5±2	℃
	温差二级告警 Second Level Temperature Difference Alarm	15±2	℃
	温差二级告警恢复 Second Level Temperature Difference Alarm Recover	10±2	℃
	温差三级告警 Third Level Temperature Difference Alarm	20±2	℃
	温差三级告警恢复 Third Level Temperature Difference Alarm Recover	15±2	℃
延时 Delay	一级&二级温差告警延时 Level 1&level 2 Temperature Difference Alarm Delay	1±0.8	S



	三级温差告警延时 Level 3 Temperature Difference Alarm Delay	0.5±0.4	S
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4.10.热失控 Thermal runaway

热失控 Thermal runaway		
	检测内容 Test content	动作 Action
开启条件一 Opening condition I	单体电压持续下降(每秒下降 $\geq 0.1V$ 判断, 持续检测三秒), 且瞬时温升过大(参考阈值温度每 2 秒上升 $5^{\circ}C$ 以上判断) The voltage of the single unit drops continuously ($\geq 0.1V$ per second judgement, continuous detection for three seconds), And the instantaneous temperature rise is too large (reference threshold temperature rises more than $5^{\circ}C$ every 2 seconds to judge)	关断充放电 MOS 管, 且蜂鸣器(DO1 输出高电平)持续响; 上位机报热失控故障; Turn off the charging and discharging MOS tubes, and the buzzer (DO1 output high level) continues to sound; the host computer reports thermal runaway fault;
开启条件二 Opening condition II	单体电压持续下降(参考阈值为: 每秒下降 $\geq 0.2V$ 以上为判断, 持续检测三秒)且瞬时温升过大(参考阈值: 温度以每 2 秒上升 $10^{\circ}C$ 以上为判断) The voltage of the single unit continues to drop (reference threshold: a drop of $\geq 0.2V$ per second or more is judged, and continuous detection for three seconds) and the instantaneous temperature rise is too large (reference threshold: the temperature rises by more than $10^{\circ}C$ every 2 seconds as a judgement)	
开启条件三 Opening condition III	电池温度上升(超过最大工作温度 $70^{\circ}C$)且瞬时温升过大(参考阈值: 温度以每 2 秒上升 $10^{\circ}C$ 以上为判断) Battery temperature rises (above the maximum operating temperature of $70^{\circ}C$) and the instantaneous temperature rise is too large (reference threshold: the temperature is judged to rise by more than $10^{\circ}C$ every 2 seconds)	
关闭 Turn off	重启 BMS Reboot BMS	解除热失控故障 Deactivating Thermal Runaway Failure

4.11.性能参数 Reliability Parameter

序号	项 目	条 件
1	检测精度 (常温 $25^{\circ}C$) Detection accuracy (Normal temperature $25^{\circ}C$)	电流检测精度(Current detection accuracy): $\leq (\pm 3\%FSR)$ 电压检测精度(Voltage detection accuracy): $\leq \pm 10mV$ 温度检测精度(Temperature detection accuracy): $\leq 2^{\circ}C$
2	信息存储 (512Kb, 符合印规需求) Information storage (512Kb, meets India AIS-156 requirement requirements)	最大存储大于 380 条履历信息, 含单体过压欠压保护, 当前总电压、电流、温度、SOC、mos 管状态、短路及运行状态等 Maximum storage of more than 380 pieces of history information, including single cell over-voltage and under-voltage protection, current total voltage, current, temperature, SOC, MOS tube status, short circuit and operating status, etc.
3	通讯接口 Communication interface	CAN 通讯波特率 250K,485/UART 波特率 9600bps 支持通讯端口升级程序 CAN communication baud rate 250K, 485/UART baud rate 9600bps ,supports communication port upgrade program
4	SOC 计量 measurement	采用电流积分 uses current integration
5	短路 Short circuit	电池包短路电流超过系统参数的短路电流, 使用空气开关短路 5 次, 且能正常恢复。短路回路线长不超过 1.2m, 回路内阻低于 $20m\Omega$ The short-circuit current of the battery pack exceeds the short-circuit current of the system parameters. Use an air switch to short-circuit 5 times and recover normally. The length of the short-circuit loop should not exceed 1.2m, and the internal resistance of the loop should be lower than $20m\Omega$.



5. 通信说明(Communication Description)

5.1.UART 通讯

默认为达锂 UART 通讯协议，可直接与达锂蓝牙、显示屏、上位机等进行通讯使用，也可定制客户通讯协议。

The default communication protocol is UART, which can be used to communicate directly with Bluetooth, display, and host computer, etc., and can also be customised to meet the customer's communication protocol.

5.2.RS485 通讯(选配 optional)

默认达锂 RS485 通讯协议，通过专用通讯盒与指定上位机进行通讯，波特率默认为 9600bps。从而在上位机端察看电池的各种信息，包括电池电压、电流、温度、状态、SOC、及电池生产信息等，可授权登录后进行参数设置及相应控制操作，支持程序升级功能。（本上位机适用于 Windows 系列平台的 PC 机）。

The default is up to the Daly RS485 communication protocol, which communicates with the designated host computer through a special communication box, and the default baud rate is 9600bps. Therefore, various information of the battery can be viewed on the host computer, including battery voltage, current, temperature, state, SOC, and battery production information, etc., parameter settings and corresponding control operations can be performed after login, and the program upgrade function can be supported. (This host computer is suitable for PCs of Windows series platforms).

5.3.CAN 通讯 (选配 optional)

默认达锂 CAN 协议，通信速率为 250KB/S。

The default is Daly CAN protocol, and the communication rate is 250 kb/s.

5.4.蜂鸣器逻辑 Buzzer logic

在上位机配置蜂鸣器使能，且蜂鸣器接在 DO1 口；

默认逻辑为当充放电温度到达 60℃ 时，响 1 秒停 1 秒，如此持续进行蜂鸣报警，直到温度小于 60℃。

其他逻辑可联系我司业务进行软件定制；

Configure a buzzer to enable on the computer APP , and connect the buzzer to the DO1 port;

When the charging and discharging temperature reaches 60 ° C, the sound will stop for one second, and then the buzzer alarm will continue;

Other logic can contact our business for software customization;

5.5.钥匙开关逻辑 Keyswitch logic

支持钥匙开关控制 MOS 跟休眠，默认为失能，有以下两种可选逻辑通过上位机或出厂配置：

逻辑一：钥匙控制放电 MOS 管；

逻辑二：钥匙控制放电 MOS 管与休眠；

钥匙开关的控制逻辑为正逻辑，也就是开关闭合时才做控制。

其他逻辑可联系我司业务进行软件定制，例如 5V/12V/24 外部电源唤醒，同时控充放电 MOS 等。



Support key switch control MOS to follow the sleep, the default is disable, there are the following two optional logic through the host computer or factory configuration:

1. key control discharge MOS tube;
2. key control discharge MOS tube with hibernation;

The control logic of the key switch is positive logic, that is, the control is done when the switch is closed.

Other logic can contact our business for software customisation, such as 5V/12V/24 external power supply wake-up, simultaneous control of charging and discharging MOS and so on.

6. 上位机说明(PC Master Description)

PC 上位机 (DALY BMS Tool) 功能默认显示数据监控界面, 登陆界面输入密码并连接上位机通讯后, 显示数据监控, 参数读写, 生产制造, 更多等界面。手机 APP 设置保护(二级)参数。

- 1、解析各模块发送的数据信息, 然后将电压、温度、配置值等显示出来;
- 2、通过上位机向各模块配置信息;
- 3、生产参数校准, BMS 升级。

The DALY BMS function of the PC software displays the data monitoring interface by default. After entering a password and connecting to the upper computer for communication, the data monitoring, parameter reading and writing, production manufacturing, and more interfaces are displayed.

The mobile app sets protection parameters and synchronizes secondary and tertiary protection.

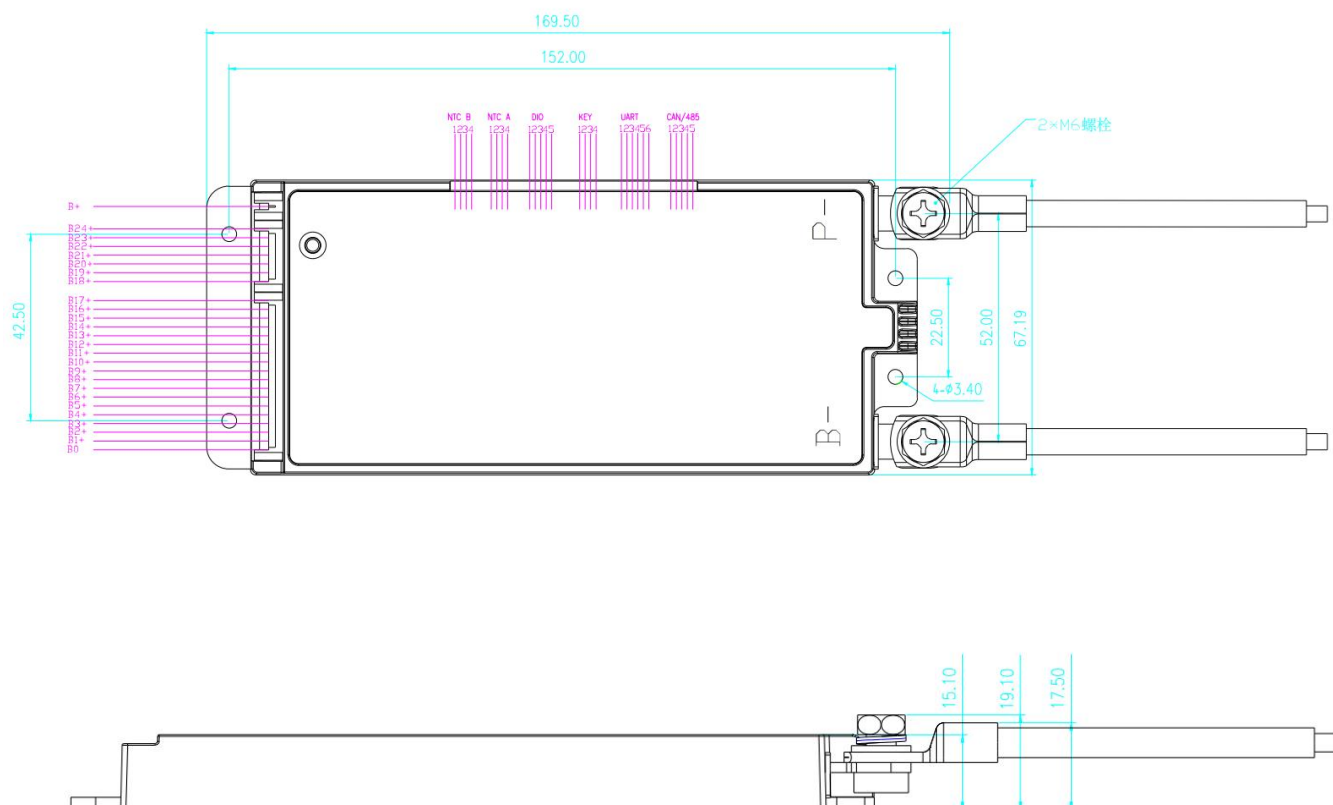
1. Analyze the data information sent by each module, and then display the voltage, temperature, configuration value, etc.;
2. Configure information to each module through the host computer;
3. Calibration of production parameters, BMS upgrade.





7. 保护板尺寸图(Dimensional Drawing Reference)

40/60/80/100A 结构尺寸 (不含配件) Dimensions of mainframe structure (without accessories)	长*宽*高 : 169.5*67.1*15.1 (mm) Length*Width*Height: 169.5*67.1*15.1 (mm)
注: 示意图为最大串数全功能版本, 以实物的配置为准 Note: The schematic is for the maximum number of strings full-featured version, the configuration of the physical object shall prevail	



8. 接口定义(Interface Definition)

8.1.接口引脚说明 Interface pin instructions

接口名称 Interface name	Pin 脚	标 号 Label	定义说明 Definition description
接口 B-interface	/	B-	电池总负, 接电池总负 Battery negative, connect to battery negative
接口 P-interface	/	P-	保护板充放电负极, 接充放电负端 The charge and discharge negative terminal of the BMS is connected to the negative terminal of the charge and discharge
采样线接口 Sampling line interface PHB 2.0 带扣 PHB 2.0 with a buckle	1	B0	接第 1 节电池负级 Connect to the negative terminal of the first battery
	2	B1+	接第 1 节电池正级 Connect to the positive terminal of the first battery
	3	B2+	接第 2 节电池正级 Connect to the positive terminal of the second battery
	...	...	接最后 1 节电池正级 Connect the positive terminal of the last battery
注: ≤17 串为 1 个接口; >17 串为 2 个接口; Note: ≤17 strings are 1 interface; >17 strings are 2 interfaces;			



B+接口	1	B+	接最后 1 节电池正极 Connect the last positive battery terminal
NTC-A 接口 NTC-A interface DL1.25 4Pin	1	GND	地 GND
	2	NTC-1	1#温度线 1 # Temperature cable
	3	GND	地 GND
	4	NTC-2	2#温度线 2 # Temperature cable
NTC-B 接口 NTC-B interface DL1.25 4Pin	1	GND	地 GND
	2	NTC-3	3#温度线 3 # Temperature cable
	3	GND	地 GND
	4	NTC-4	4#温度线 4 # Temperature cable
DIO 接口 DIO interface DL1.25 5Pin	1	DO	DO, 12V (标配功能为蜂鸣器输出, 可定制其他功能; The standard function is the buzzer output. Other functions can be customized)
	2	GND	地 GND
	3	DI1	DI (Input)
	4	GND	地 GND
	5	DO	DO, 3.3V (标配功能为加热模块输出, 可定制其他功能; The standard function is the output of the heating module. Other functions can be customized)
KEY 接口 KEY interface DL1.25 4Pin	1	KEY+	钥匙开关正 Key switch positive
	2	TBD	/
	3	TBD	/
	4	KEY-	钥匙开关负 Key switch negative
WIFI/GPS/UART/LCD/电 量灯板接口 WIFI/GPS/UART/LCD /SOC display interface DL1.25 6Pin	1	GND	地 GND
	2	3.3V	供电电源 3.3V Power supply is 3.3V
	3	12V	供电电源 8-12V Power supply is 8- 12V
	4	S1	激活按键 Activate button
	5	RX	通讯发送端 Communication sending end
	6	TX	通讯接收端 Communication receiving end
RS485/CAN 接口 (选配) RS485/CAN interface (Optional) DL1.25 5Pin	1	485_B	485 通讯接收端 485 communication receiver
	2	485_A	485 通讯发送端 485 communication sender
	3	ISO_GND	隔离地 Isolation ground GND
	4	CAN_H	CAN 通讯高 CAN communication high
	5	CAN_L	CAN 通讯低 CAN communication low

8.2.主要线材说明 Description of main wires

线材名称 Line name	默认规格 Default specification	选配规格 Optional specifications
NTC 线 NTC line	28AWG L=250mm DL1.25	L=500mm、L=700mm、L=900mm
CAN/485 线 CAN/485 line	/	26AWG L=300mm DL1.25
Key 线 Key cable	/	26AWG L=450mm DL1.25
B-线	10AWG/7AWG (40-60A 为 10AWG, 80-100A 为 7AWG) L=100±8mm 蓝色	/
P-线	10AWG/7AWG (40-60A 为 10AWG, 80-100A 为 7AWG) L=100±8mm 黑色	/
B+线	2Pin_PHB2.0_18AWG_450mm 红色	/
采样线 Sampling line	7~17S: 1007 24AWG L=450mm (18PIN) 红色 7~24S: 1007 24AWG L=450mm (18+7PIN) 红色	可选配 L=600mm、L=800mm

9. 接线使用说明及 APP 下载 (Wiring instructions and APP downloads)

扫码查看说明书及下载 APP, 或使用电脑浏览器登录: <https://www.dalyelec.com/service.html>

Scan the QRcode using the browser to view the user manual and download APP, or use a computer browser to access

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



this website: <https://www.dalyelec.com/service.html>



10. 自动兼串操作说明(Automatic Series/Parallel Operation Description)

设置串数为 0 时使能自动兼串功能，重新上电 45 秒后自动识别串数，同时更新总压过压和总压欠压参数。自动兼串功能仅生效一次，之后需重新设置串数为 0 来重新使能自动兼串。若自动兼串失败，可直接设置串数为目标串数（手动模式），然后重新设置电池类型即可自动设置单体/总压欠压/过压、SOC 标 0 标 100 参数。

Setting the number of series cells to 0 enables the Automatic Series/Parallel Operation function. After the device is powered on again, it automatically detects the series cell count within 45 seconds and updates the total-voltage overvoltage and undervoltage parameters accordingly. This function takes effect only once. To enable it again, the series cell count must be set to 0 once more. If the automatic series/parallel operation fails, you can directly set the series cell count to the desired value (manual mode), and then re-select the battery type. The device will then automatically configure the cell overvoltage/undervoltage, total-voltage overvoltage/undervoltage, and SOC 0%/100% calibration parameters.

11. 保修(Warranty)

本公司生产的所有锂电池保护板，质保一年；人为因素导致损坏的，有偿维修。

All lithium battery BMS produced by our company has one-year warranty; if the damage caused by human factors, paid maintenanc

12. 注意事项(Precautions)

12.1. 不同电压平台的电池使用前需对 BMS 进行电池类型的设置，一般情况出厂默认为铁锂参数；

Batteries of different voltage platforms need to be set for the BMS before use of the battery type, the general situation of the factory default lithium iron parameters;

12.2. 产品出厂时默认为最大串数，初次上电使用时会自动识别串数，如识别失败，可用 APP 或者上位机进行设置；

The product defaults to the maximum number of strings when the product is shipped from the factory, and the number of strings will be recognized automatically when the product is first powered up and used, if the recognition fails, it can be set by APP or the host computer;

12.3. 焊接采样排线：从细黑线连接电池 B- (总负极)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；最后将 B+ 线也焊接在最后一串(总正极)上；

Welding sampling cable: Start with the thin black wire connecting battery B-(total negative electrode), the second wire connects the positive electrode of the first string of batteries, and then connects the positive electrode of each string of



batteries in turn;finally,weld the B+wire on the last string (total positive pole);

12.4.不同厂家的排线不通用，请确保使用我们公司配套排线；

The cables of different manufacturers are not universal, please make sure to use our company's matching cables;

12.5.在测试、安装、接触和使用保护板时，要做好防静电措施；

Take measures to discharge static electricity when testing, installing, touching and using the BMS;

12.6.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 let the heat dissipation surface of the BMS directly contact the battery cells, otherwise the heat will be transferred to the battery cells and affect the safety of the battery;

12.7.不可自行拆卸、更改保护板元器件；

Do not disassemble or change BMS components by yourself;

12.8.组装作业中避免散热片与电芯、镍带接触；

Avoid contact between the heat sink and the battery core and nickel strip during assembly operations;

12.9.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 BMS is abnormal, please stop using it and use it after the problem is solved;

12.10.插拔针座连接线，注意按压卡扣位拔插，否则可能造成线材损坏；

Plug and unplug the connector cable, pay attention to press the buckle position to unplug and unplug, otherwise the wire may be damaged.

12.11.当电池为 4、5 串铁锂时，保护板的 Uart 及 DO 的 12V 电压不会稳压输出，会根据电池总压变化，实际电压值会略低于电池总压。故欠压时，涉及的 12V 输出的配件会因供电不足而无法使用，例如 WIFI 模块、4G 模块等；

When the battery is 4、5strings of LiFePO4, the 12V voltage of the Uart and DO of the BMS does not regulate the voltage output, and the actual voltage value will be slightly lower than the total battery voltage according to the total battery voltage change. Therefore, in the case of undervoltage, accessories with 12V output will be unable to be used due to insufficient power supply, such as WIFI module, 4G module, etc.

12.12.请在保护板上电前确保 B-连接可靠；

Please ensure that the B- connection is secure before powering on the BMS.

12.13.参数及规格可能会周期优化迭代，以 BMS 实际为准；

Parameters and specifications may undergo periodic optimization iterations, subject to the actual situation of BMS.

13. 特别说明(Special Note)

我司产品进行严格的出厂检验测试，但是因为客户使用的环境不同（特别是在高温、超低温、太阳下等），难免会出现保护板故障，所以客户在选择和使用保护板时，需要在友好的环境下使用及选择一定冗余量的保护板。

Our products undergo strict factory inspection and testing, but due to the different environments used by customers (especially in high temperature, ultra-low temperature, under the sun, etc.), it is inevitable that the protection board will fail. Therefore, when customers choose and use BMS, they need to be in a friendly environment, and select a BMS with a certain redundancy capability.



产品更改说明 Product change Instructions			
版本 (Version)	更改内容 (Change content)	更改人 (Editor)	更改日期 (Change date)
A0	初版	Tan lejun	2026/04/28
A1	电压检测精度 $\leq \pm 5\text{mV}$ 改为 $\leq \pm 10\text{mV}$ Changed voltage detection accuracy from $\leq \pm 5\text{ mV}$ to $\leq \pm 10\text{ mV}$	Huangyanshan	2026/5/22
A2	增加自动兼串操作说明 Automatic Series/Parallel Operation Description	Huangyanshan	2026/6/23