TOPBMS

Master BMS

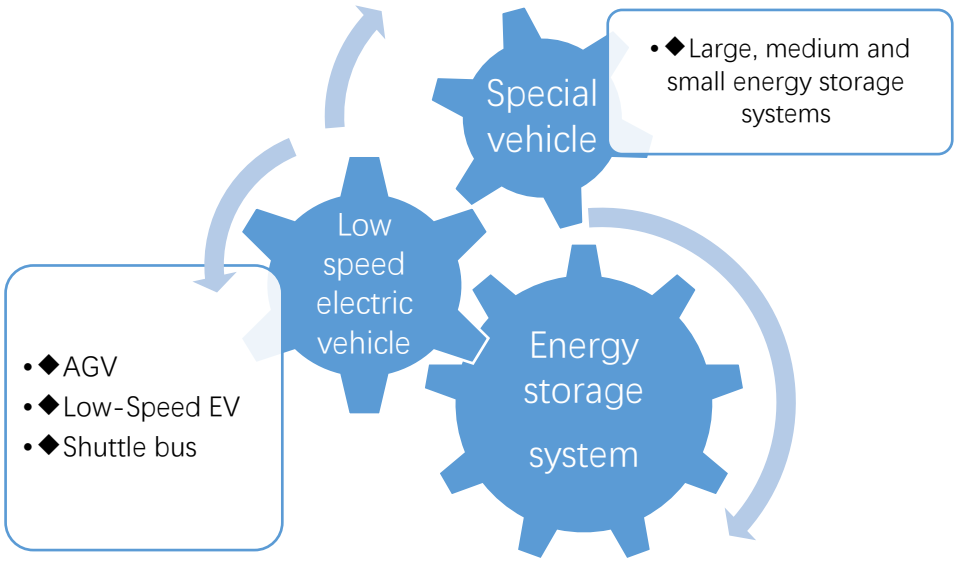
Product Name: BCU/Master BMS

Version: V1.2

1. Brief Introduction

随着锂电池行业的蓬勃发展，锂电池在各行各业得到了广泛应用。人们对锂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。本产品是专门针对高电压、大电流需求而提供一整套解决方案。本产品采用集成化和模块化设计。本 BMS 具有采集、管理、通讯等功能。可以广泛应用于大中小型储能系统、AGV 小车、低速车、特种工程车等。本产品对客户提供非常灵活的配置方案。整个系统的配置方案可以根据客户 PACK 方案灵活配置。

With the vigorous development of lithium battery industry, lithium battery has been widely used in all walks of life. People also put forward the requirements of high performance, high reliability and high cost performance of lithium battery management system. This product is specialized for high voltage, high current demand and provide a complete set of solutions. This product adopts integrated and modular design. This BMS has collection, management, communication and other functions. It can be widely used in large, medium and small energy storage systems, AGV cars, low speed vehicles, special engineering vehicles, etc. This product provides a very flexible configuration solution for customers. The configuration scheme of the entire system can be flexibly configured according to the customer's PACK scheme.



2. 功能特性 Product Features

.具有单体电压、总电压检测，过充、过放告警及保护功能。

With single voltage, total voltage detection, overcharge, overdischarge alarm and protection functions.

.具有充/放电电流检测，充/放电过流告警及保护功能。

With charge/discharge current detection, charge/discharge overcurrent alarm and protection functions

充电电流为正，放电电流为负。

Charging Current: “+’ Discharging Current:’-’

.具有电芯高/低温度告警及保护功能。

High/low cell temperature alarm and protection function.

.具有充电均衡功能 It has the function of charging balance

.电芯容量估算功能。电池组的容量可以通过上位机进行设置。

Cell capacity calculation; You can set the battery capacity on the upper host computer

.具有 1 路内部 CAN 用于主从通讯、BMS 状态显示（配合 CAN 上位机）、BMS 程序更新。

With 1 internal CAN for master-slave communication, BMS status indicates (via CAN host computer) BMS program update.

.具有 1 路对外 CAN 用于与 UPS/PCS 通讯。

Has one CAN port for communication with the UPS/PCS

.具有 2 路 RS485 接口。

Has two RS485 ports

1 路用于与上位机通讯，查看 BMS 状态和修改参数，BMS 程序更新。

One RS485 port is used to communicate with the upper computer, check BMS status and modify parameters, and update BMS program.

1 路由于液晶屏显示。液晶屏端口不接显示屏可以根据客户需要进行功能修改。

The other RS485 port is used to connect display

.可以扩展 1 路 RS485（选配功能）。One more RS485 port can be expanded(Optional)

.可板载蓝牙通讯模块（选配功能）。Built-in Bluetooth can de added (Optional)

.具有彩色液晶屏状态显示（选配功能）。With color LCD display(Optional)

.具有 LED 状态指示功能（选配功能）。With LED status indicator (Optional)

.具有 4 路干接点输出（4 路常开/常闭），4 路干接点输入（选配功能）。

It has four dry contact outputs (four normally open/normally closed) and four dry contact inputs (optional).

.通过上位机软件可以对过充、过放、充放电过流、过温、欠温等保护参数、容量等参数进行设置。

The upper computer software can be used to set the protection parameters such as overcharge, overdischarge, charge and discharge overcurrent, overtemperature, undertemperature, and capacity.

.主控具有 16 路单体电压采集和 3 路温度采集（可以扩展到 32 路单体电压采集和 6 路温度采集）。

The master bms has 16 ways of cell voltage collection and 3 ways of temperature collection (which can be extended to 32 ways of cell voltage collection and 6

channels of temperature collection).

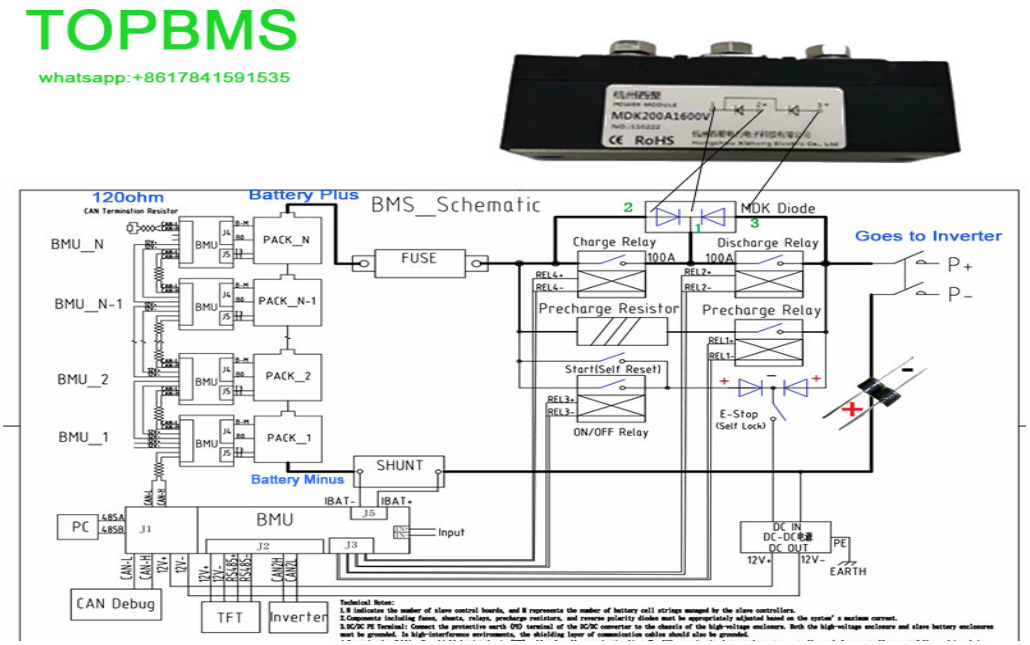
.从控具有 16 路单体电压采集和 3 路温度采集（可以扩展到 32 路单体电压采集和 6 路温度采集）。

The slave bms has 16 cell voltage acquisition and 3 temperatures acquisition (which can be extended to 32 cell voltage acquisition channels and 6 temperature acquisition).

.具备无人值守功能。BMS 保护后无法恢复自动关机后，在市电来了之后 AC/DC 供电给 BMS 系统，BMS 启动后充电继电器打开此时充电机给 BMS 充电。

With unattended function. After the BMS protection and it fails to recover the automatic shutdown, the AC/DC supplies power supplies the BMS system when the city power supplys, and the charging relay opens after the BMS starts, and the charger charges the BMS.

3. 系统组成原理图 BMS Schematic diagram



4. 电气特性 Electrical Features

主要技术指标 Parameters Sheet

技术参数 Parameters		技术指标 Value
Cell voltage Collection	Range	0-5V
	Tolerance	±10mV
Total current collection	Range	Depending on Shunt
	Tolerance	±%1FS
Temp Collection	Range	-40-100℃
	Tolerance	±3℃
SOC Calculation		<8%
Balancing Current		>80mA
Power Supply		12V

基本参数 Basic Parameters

No	Item	Description	Value		Comment
1	Cell overcharge protection	The alarm of cell overcharged at XXX Voltage	3600mV	adjustable	
		Cell overcharge protection at XX Voltage	3700mV	adjustable	
		cell overcharge protection delay	3000mS	adjustable	
	Cell overvoltage protection released	cell overcharge protection release at XXX voltage	3380mV	adjustable	
2	Cell over discharge protection	Cell overvoltage alarm at XXX voltage	2800mV	adjustable	automatical shutdown if bms cannot be recovered after 30 minutes of over-release protection
		Cell over discharge protect at xxx voltage	2500mV	adjustable	
		Cell overdischarge protection delay	3000mS	adjustable	
	Cell overdischarge protection relased	Cell overdischarge protection Release at the voltage of XXX	2900mV	adjustable	
3	overall cells overcharge protection	Overall overdischarge alarm at the voltage of XXX	3.6V*Series number	adjustable	
		Overall overdischarge alarm at the voltage of XXX	3.7V* Series number	adjustable	
		Overall overcharge protection delay	3000mS	adjustable	
4	Overall over voltage protection release	Overall over voltage protection release at the voltage of XXX	3.3V* Series number	adjustable	
5	Overall overdischarge protection	Overall overdischarge alarm at the voltage of XXX	2.8V* Series number	adjustable	automatical shutdown if bms cannot be recovered after 30
		Overall overdischarge protection at the voltage of XXX	2.5V* Series number	adjustable	
		Overall over-discharge protection delay	3000mS	adjustable	
6	Overall overdischarge protection release	Overall overdischarge protection release at the voltage of XXX	2.9V* Series number	adjustable	

7	Charging overcurrent protection	Charging overcurrent alarm at the current of XXX	125A	adjustable	
		Charging overcurrent protection at the current of XXX	130A	adjustable	
		Charging overcurrent protection delay	3000mS	adjustable	
8	Charging overcurrent protection release	Automatic release	It will be automatically released after 60 minutes		
9	Discharge overcurrent protection	Discharge Overcurrent alarm at the current of XXX	125A	adjustable	
		Discharge overcurrent protection at the current of XXX	130A	adjustable	
		Discharge overcurrent protection delay	3000mS	adjustable	
10	Discharge overcurrent protection release	Automatic release	It will be automatically released after 60 minutes		
11	Cell temperature protection	Charge Low temperature Alarm at the temperature of XXX	0℃	adjustable	
		Charge low temperature protection at the temperature of XXX	-5℃	adjustable	
		Charge low temperature protection at the temperature of xxxx	0℃	adjustable	
		Charging HT alarm at the temperature of xxx	50℃	adjustable	
		Charging high temperature protection at the temperature of xxx	55℃	adjustable	
		Charging high temperature protection release at the	50℃	adjustable	
		Discharge Low temperature alarm at the temperature of	-15℃	adjustable	
		Discharge low temperature protection at the temperature of XXX	-20℃	adjustable	
		Discharge low temperature protection release at the temperature	-15℃	adjustable	
		Discharge high temperature alarm at the temperature of XXX	55℃	adjustable	
		Discharge high temperature protection at the temperature of XXX	60℃	adjustable	
12	Balancing	Balancing Start at the Voltage of XXX	3450mV	adjustable	
		Balancing Start at the Voltage difference of XXX	30mV	adjustable	
13	Cell Capacity Default Setting	Low power Alarm	SOC < 10%	adjustable	
		Setting of the Remaining Capacity	70AH	adjustable	
		Full capacity Settings	100AH	adjustable	
14	Product Dimension	Metal Case Dimension	115*110mm		
15	Cables	Cables &Wires	MX3.0MM		

5. 通讯说明 Master BMS and Upper host Computer Communication Description

具有于上位机通讯的 RS485 接口。通讯协议按照 YD/T 1363.3 中的电池协议。主控默认没有拨码开关，默认地址为 1。默认波特率 9600bps。

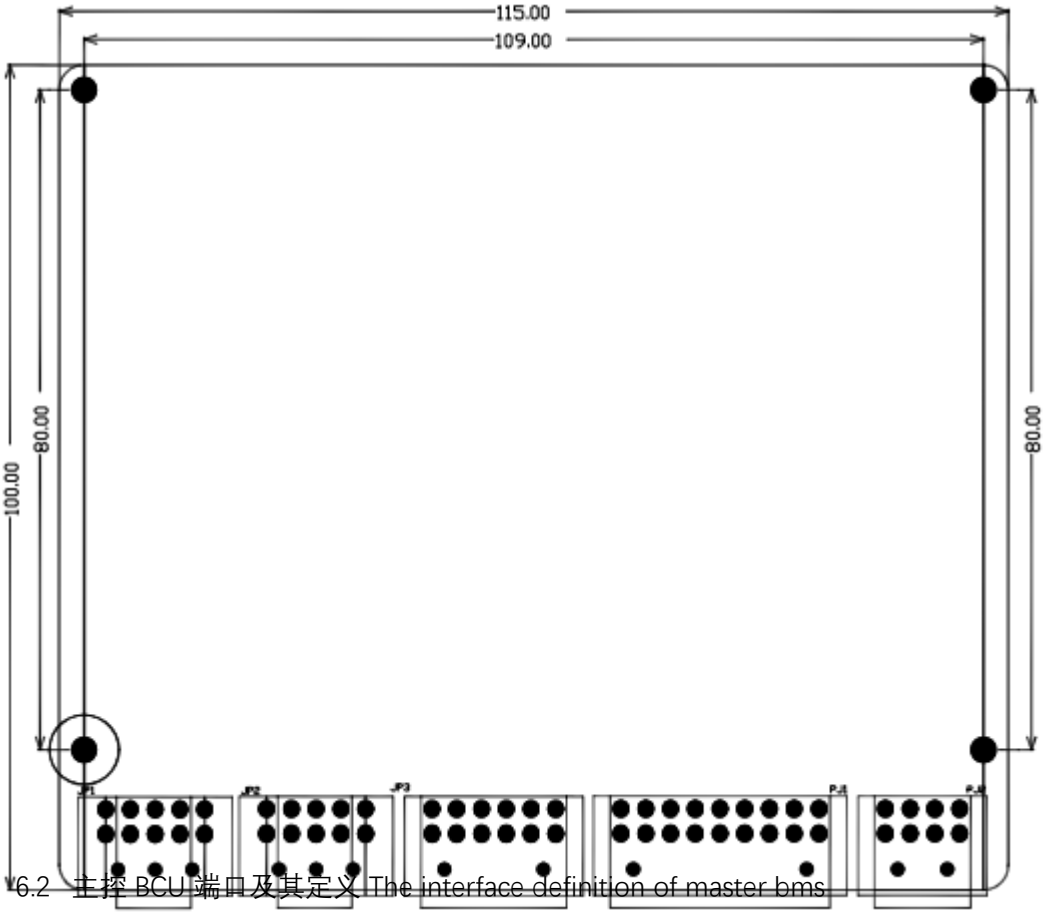
RS485 port for communication with upper computer. The communication protocol is according to the battery protocol in YD/T 1363.3. The main control has no DIP switch by default, and the default address is 1. The default baud rate is 9600bps.

6. 接口定义 Interface Definition

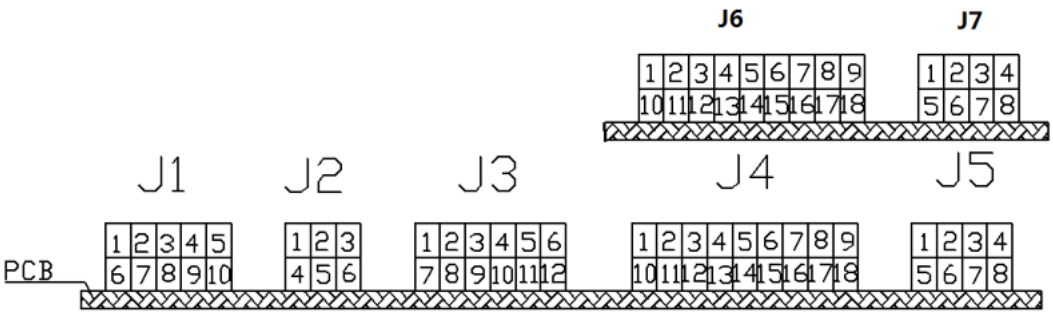
6.1 BCU(Master BMS)及 BMU(Slave BMS)安装尺寸 BCU/BMS Layout

BCU(Master BMS)和 BMU(Slave BMS)的 PCB 尺寸相同 115*100mm，安装位置及尺寸相同，安装孔为 4 个 3.5mm 孔，尺寸 109*80mm。

The PCB dimensions of BCU and BMU are 115 x 100mm, and the installation positions and dimensions are the same. The mounting holes are four 3.5mm holes, and the dimensions are 109 x 80mm.



6.2 主控 BCU 端口及其定义 The interface definition of master bms



备注：BMU,BCU 不带采集时没有 J4，J6，J7 端口

BMU and BCU do not have ports J4, J6, and J7

BMU,BCU 采集 5-16 串单体电压时没有 J6，J7 端口

The BMU and BCU do not have J6 or J7 ports when collecting the voltage of 5-16 cells

Master BMS(BCU)

J1 Interface

J1 Port used for Power supply and communication

Pin	Definition	Description	PIN	Definition	Description
1	PW+	+12V/DC	6	PW-	GND/DC
2	PW+	+12V/DC	7	PW-	GND/DC
3	CH	CAN1H	8	CL	CAN1L
4	CH	CAN1H	9	CL	CAN1L
5	RSB	RS485B	10	RSA	RS485A

J2 Interface

J2 Port is used for (or configured according to customer requirements)

Pin	Definition	Description	Pin	Definition	Description
1	PW+	+12V/DC	4	PW-	GND/DC
2	RS-	RS485-	5	RS+	RS485+
3	CH2	CAN2H	6	CL2	CAN2L

J3 Interface

J3 Port used for relay interface

Pin	Definition	Description	Pin	Definition	Description
1	REL1	RELAY 1" – "	7	12V	RELAY 1" + "
2	REL2	RELAY 2" – "	8	12V	RELAY 2" + "
3	REL3	RELAY 3" – "	9	12V	RELAY 3" + "
4	REL4	RELAY 4" – "	10	12V	RELAY 4" + "
5	REL5	RELAY 5" – "	11	12V	RELAY 5" + "
6	REL6	RELAY 6" – "	12	12V	RELAY 6" + "

J4 Interface

J4 Port used for Battery balancing cables

Pin	Definition	Description	Pin	Definition	Description
1	B15	15#Batt" +"	10	B16	16# Batt" +"
2	B13	13# Batt" +"	11	B14	14# Batt" +"
3	B11	11# Batt" +"	12	B12	12# Batt" +"
4	B9	9# Batt" +"	13	B10	10# Batt" +"
5	B7	7# Batt" +"	14	B8	8# Batt" +"
6	B5	5# Batt" +"	15	B6	6# Batt" +"
7	B3	3# Batt" +"	16	B4	4# Batt" +"

8	B1	1# Batt" +"	17	B2	2# Batt" +"
9			18	B0	1# Batt" -"

J5 Interface

J5 Port used for Current and temperature sampling line

Pin	Definition	Description	Pin	Definition	Description
1	I-	Shunt "-"	5	I+	Shunt "+"
2	T1	NTC1+	6	T1-	NTC1-
3	T2	NTC2+	7	T2-	NTC2-
4	T3	NTC3+	8	T3-	NTC3-

J6 Interface

J6 Port used for expansion module battery sampling cable

Pin	Definition	Description	Pin	Definition	Description
1	B15	15# Batt" +"	10	B16	16#Batt" +"
2	B13	13# Batt" +"	11	B14	14# Batt" +"
3	B11	11# Batt" +"	12	B12	12# Batt" +"
4	B9	9# Batt" +"	13	B10	10# Batt" +"
5	B7	7# Batt" +"	14	B8	8# Batt" +"
6	B5	5# Batt" +"	15	B6	6# Batt" +"
7	B3	3# Batt" +"	16	B4	4# Batt" +"
8	B1	1# Batt" +"	17	B2	2# Batt" +"
9			18	B0	1# Batt" -"

J7 Interface

J7 Port used for Temperature collecting wires of the expansion module

Pin	Definition	Description	Pin	Definition	Description
1			5		
2	T1	NTC1+	6	T1-	NTC1-
3	T2	NTC2+	7	T2-	NTC2-
4	T3	NTC3+	8	T3-	NTC3-

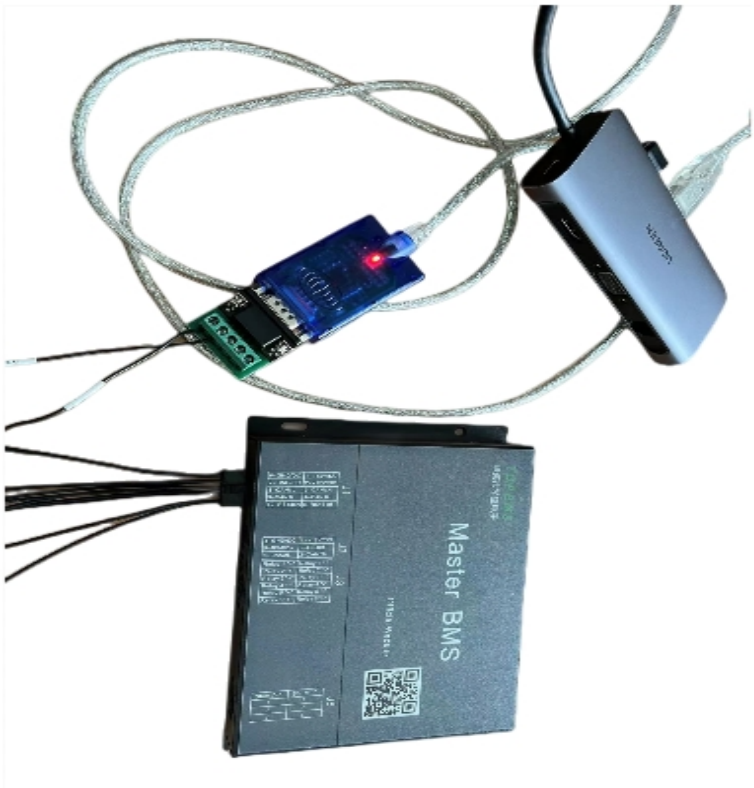
7. 上位机软件 Upper host computer software

   我司提供 RS485 和 CAN 接口的上位机软件（备注 CAN 接口上位机软件只能使用 ZLG 和 ITEKON 的 CAN 盒）。

   Our company provides the upper computer software of RS485 and CAN interface (Note that the upper computer software of CAN interface CAN only use the CAN box of ZLG and ITEKON).

   The following photo is RS485 to USB converter +Master BMS

TOPBMS



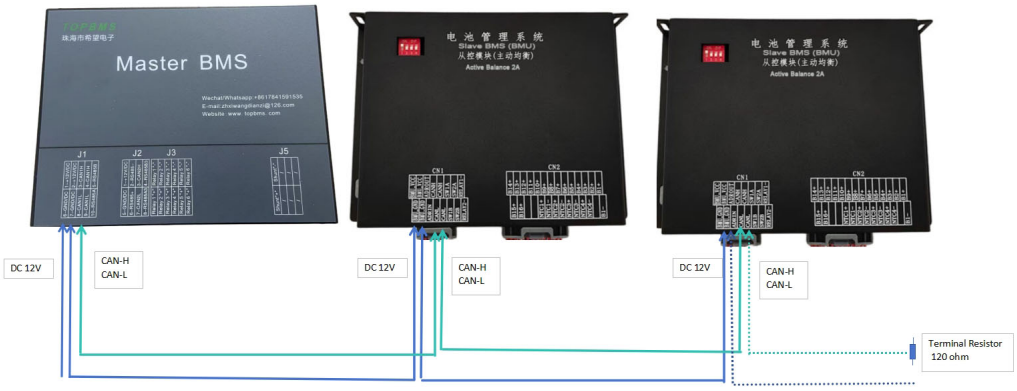
How to connect Master bms to Slave bms ? See below

TOPBMS

www.topbms.com

Master BMS communicate with slave bms 16S via canbus

With Active Balance 2 Ampere



WIRE SCHEME OF MASTER BMS + SLAVE BMS WITH ACTIVE BALANCE 2A