Manual of High Voltage BMS

16S-128S- Master BMS

TOPBMS

珠海希望电子科技有限公司

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Content

1 概述 Brief

1.1 目的 Purpose

本文主要针对珠海市希望电子科技有限公司出品的 BMS 电池管理系统 16S-128S 高压版本进行原理架构描述、功能特性和各模块接口规格及使用应用场景进行详细介绍。

This chapter mainly describe the principle structure , features of the 16s-128s high voltage version of the BMS battery management system, which is produced by TOPBMS , and the application of the module interface and the use of the application scenario.

1.2 产品概述 Product Overview

珠海市希望电子 BMS 电池管理系统可实时高精度的监测锂电池系统的电芯电压、电池组总压、电芯温度、充放电电流等参数，并进行快速的分析处理，提供相应的锂电池过充、过放、过流、过温，短路等保护机制，确保锂电池系统的安全可靠运行，延长锂电池的使用寿命。

TOPBMS can monitor and control the battery cell voltage, total battery voltage, battery cell temperature, charge and discharge current and other parameters of the lithium battery system in real time and with high precision, and carry out rapid analysis and processing, and provide the corresponding lithium battery overcharge, over-discharge, over-current, over-temperature, short circuit and other protection mechanisms to ensure the safe and reliable operation of the lithium battery system. Extend the life of lithium batteries.

TOPBMS

主控（Master）

上 Up

下 Bottom

上 Up

下 Bottom

BMS 图示

1.2.1 产品主要功能特点 Main Features

➢ 具有单体电压数据采集、总电压数据采集、电流采集、温度采集、电池组绝缘状态检测功能

This BMS can measure each cell voltage , total cells voltage , current , and temperatures ,

➢ 具有完备的故障等级报警功能，包括电压、电流、温度、绝缘等故障报警

This bms has a complete faulty alarm function, including voltage, current, temperature, insulation and other faulty alarm

➢ 具有 SOC 估算功能 It has SOC estimation

> 具有充放电控制功能 it can control charge and discharge

1.3 Data Sheet of Master BMS

Item		Description
Power supply for BMS		18-120V
System power		工作模式：<10ma;休眠模式：<1ma;停机模式：<50UA
How to active bms		External passive switching(default self-locking switch)
One slave can take		5S～16S
One slave can take		2 NTC
Cell Voltage	Measurement Range	0～5V, lithium ion battery/Lifepo4 Battery/LTO battery
	Measurement Error	≤±0.1%
Total Voltage	Measure Range	20～120V
	Measuring Tolerance	≤±0.2%
Charge/Discharge	Measure Range	Shunt used
	Measuring Tolerance	±1 %
Temperature	Measure Range	-40～125℃
	Measuring Tolerance	±1℃
SOC Estimation		≤5 %
Balancing		Balancing current 80mA
RELAYS		12v drived
Communication		2 ways of CANbus 2.0 1 way of RS485
Working Temp	WorKing Temp	-30～105℃
	Operating environment	10～90 %RH,不结露，无腐蚀性气体
	Altitude	≤4500m

1.4 Master BMS Layout
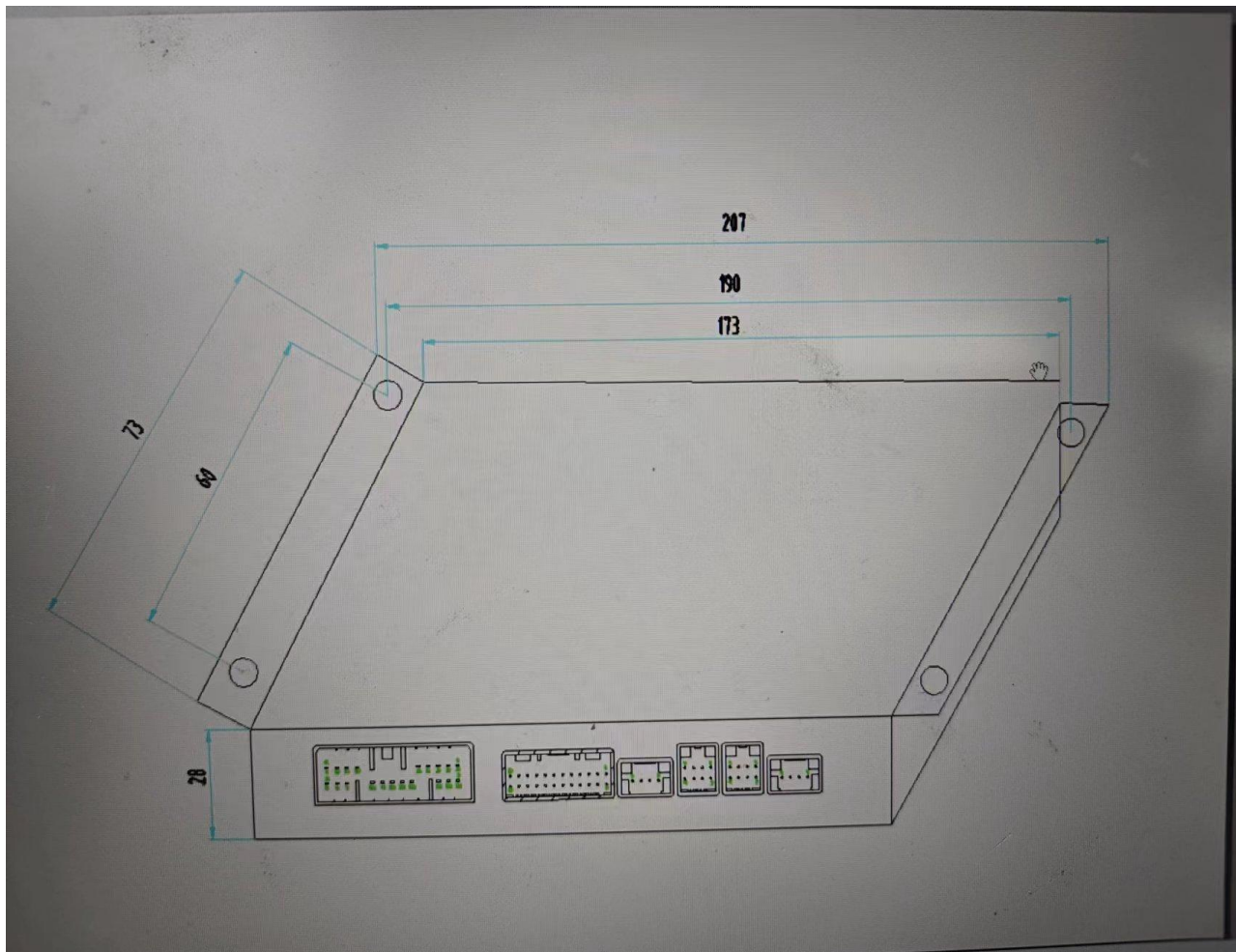
1.5 Definition of Master Bms Interface

1.5.1 RS485 接口定义 Definition of RS485 PORT

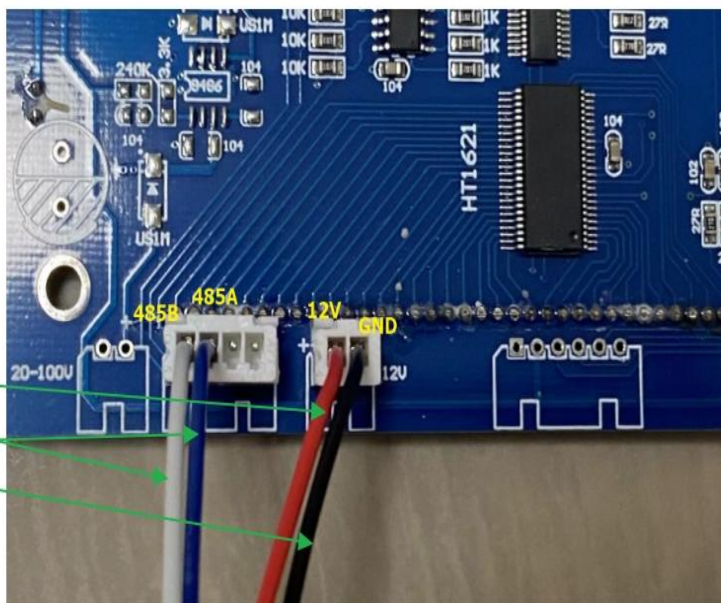| Pin No	Interface	PIN Definition
1	3.3V	3.3V
2	485B	RS 485B
3	485A	RS 485A
4	0V	GND
5	12V	12V
6	B	RS 485B for display
7	A	RS 485A for display
8	GND	GND

How to wire the display to RS485 Port of MASTR BMS

How to wire the display to Master (显示屏接线图)

Pin No	Interface	PIN Definition
1	3.3V	3.3V
2	485B	RS 485B
3	485A	RS 485A
4	0V	GND
5	12V	12V
6	B	RS 485B for display
7	A	RS 485A for display
8	GND	GND

1.5.2 Definition of CAN port for Communication between Master and Slave BMS

Pin No	Interface	PIN Definition
1	CAN-H	CAN-H
2	CAN-L	CAN-L
3	J+5V	5V Plus (Input)
4	J-5V	5V Minus (Input)

2.2.3 Definition of CAN PORT for External Device
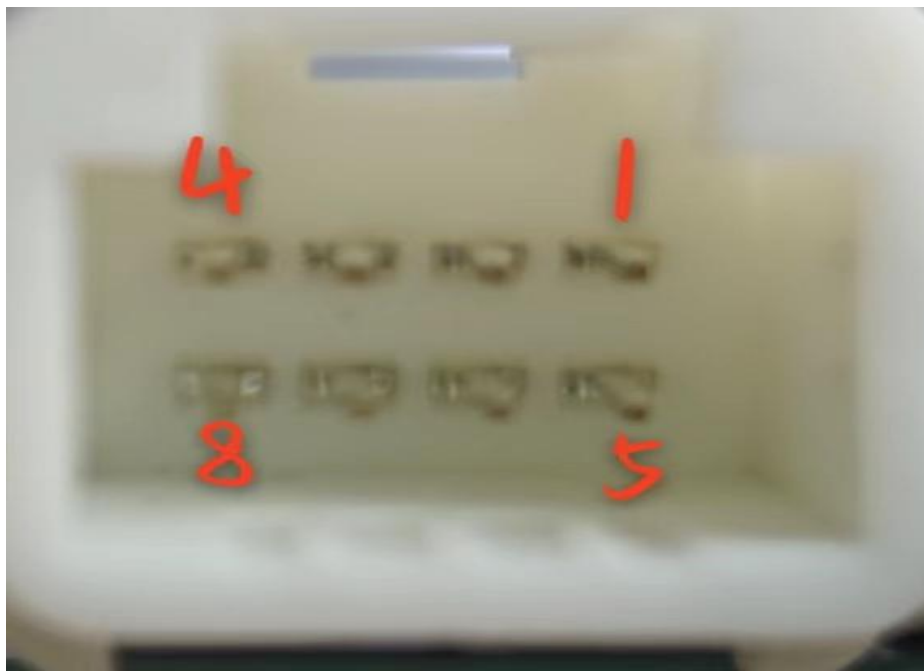
No	Interface	Pin definition
1	GND	弱电开关 Minus of ON-OFF Switch
2	K	弱电开关 Plus of ON-OFF Switch
3	5V-	蜂鸣器 Buzzer Minus
4	5V+	蜂鸣器 Buzzer Plus
5	CAN2H	外口看 CAN-H for external
6	CAN2L	外口看 CAN-L for external
7		
8		

BMS How to active Master BMS

First of all , Add ON-OFF Switch on to the positive and negative wires of the

following picture and then Turn on this switch , and then plug in the wires of

cell voltage measurement ; Afterwards,   the BMS is activated, there will be
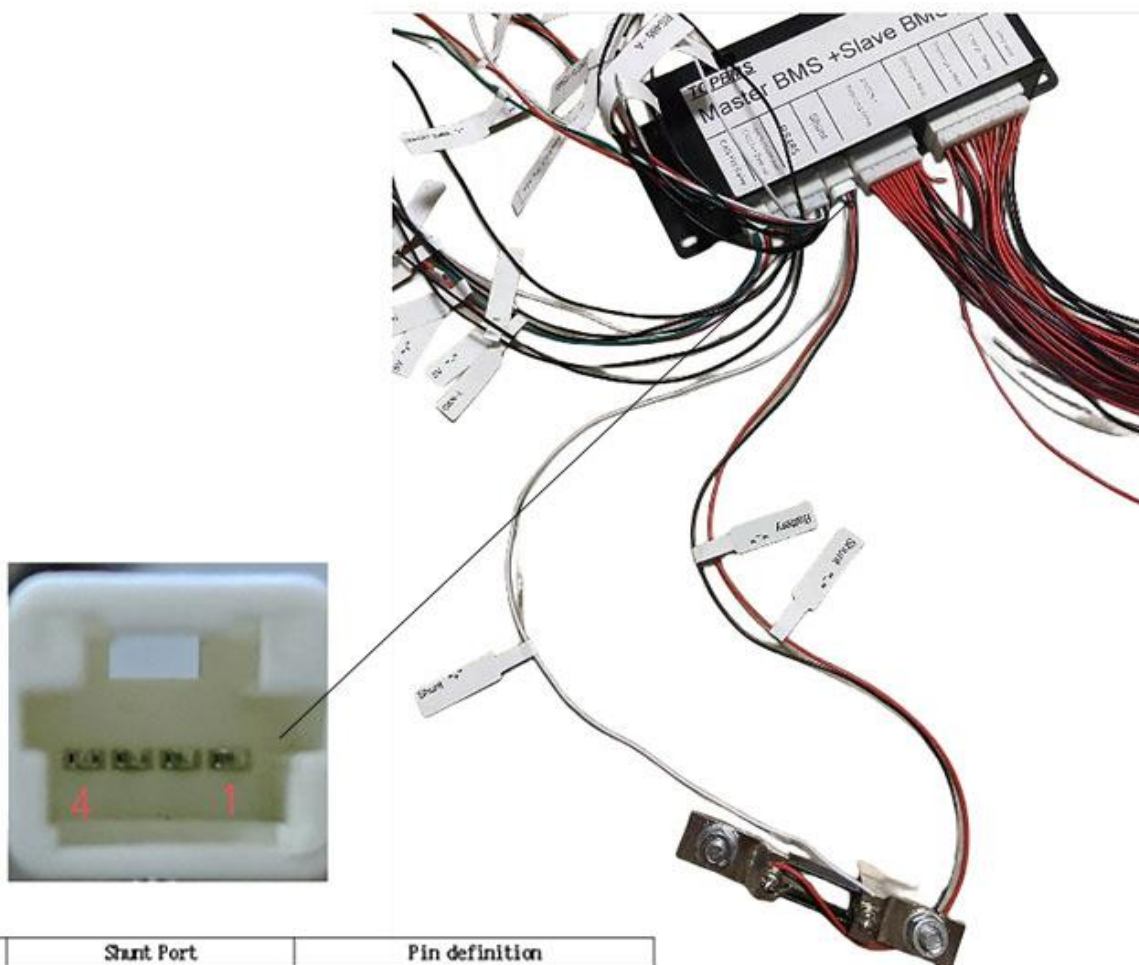
LEDs flashing

2.2.3 Definition of CAN PORT for External Device
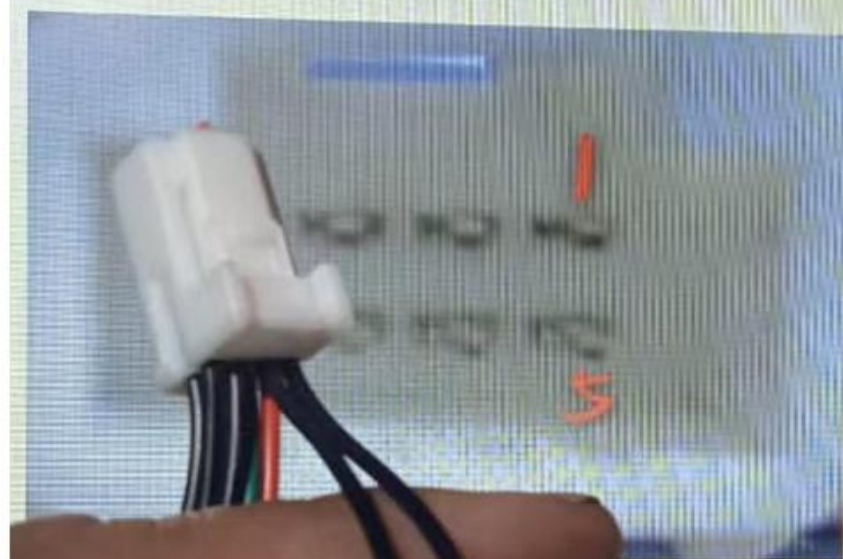
Pin definition
弱电开关 Minus of ON-OFF Switch
弱电开关 Plus of ON-OFF Switch
蜂鸣器 Buzzer Minus
蜂鸣器 Buzzer Plus
外口看 CAN-H for external
口看 CAN-L for external

2.2.4 Definition of Port for Shunt


Definition of Shunt Port

序号	Shunt Port	Pin definition
1		No connection
2	R+	Shunt "+"
3	R-	Shunt "-"
4	GND	Shunt "GND"

2.2.5 Definition of Port for cell voltage measurement

No	Interface	Pin definition
1	GND	Minus of NTC1
2	T1	Plus of NTC1
3	GND	Minus of NTC2
4	T2	Plus of NTC2
5	B-	Total Minus of the entire batteries
6	B1-	Minus of the 1st cell
7	B1+	Plus of the 1st cell
8	B2+	Plus of the 2nd cell
9	B3+	Plus of the 3rd cell
10	B4+	Plus of the 4th cell
11	B5+	Plus of the 5th cell
12	B6+	Plus of the 6th cell
13	B7+	Plus of the 7th cell
14	B8+	Plus of the 8th cell
15	B9+	Plus of the 9th cell
16	B10+	Plus of the 10th cell
17	B11+	Plus of the 11th cell
18	B12+	Plus of the 12th cell
19	B13+	Plus of the 11th cell
20	B14+	Plus of the 14th cell
21	B15+	Plus of the 15th cell
22	B16+	Plus of the 16th cell
23	B+	Total Plus of the entire batteries
24	No connection	No connection

2.2.6 **Definition of Port for Relays**
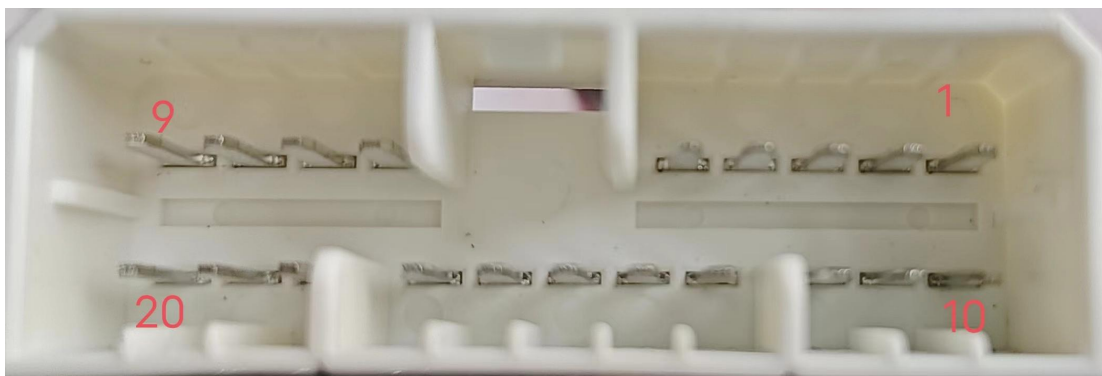
No	Interface	Pin Definition
1	J1	Minus of discharge relay
2	J2	Minus of precharge relay
4	J3	Minus of charge relay
4	J4	
5	J5	
6	12V-	Minus of DC-DC Converter
7	DC-	
8	JR-	
9	V-	
10	12V+	Plus of discharge relay
11	12V+	Plus of precharge relay
12	12V+	Plus of charge relay
13	12V+	
14	12V+	
15	12V+	
16	J6	
17	12V+	Plus of DC-DC Converter
18	V+	
19	V+	
20	V+	

3. Wiring diagram

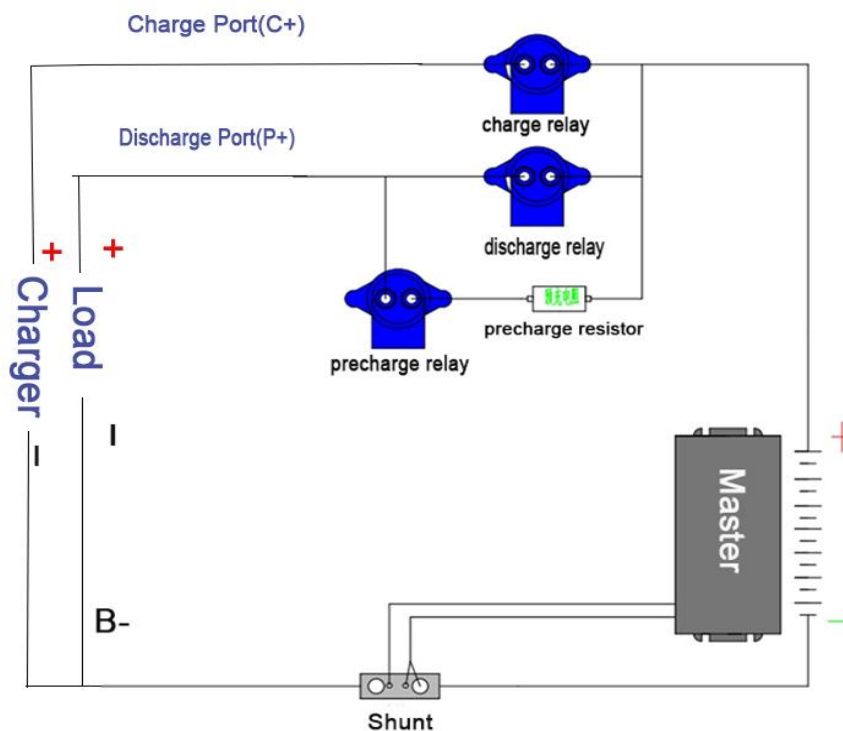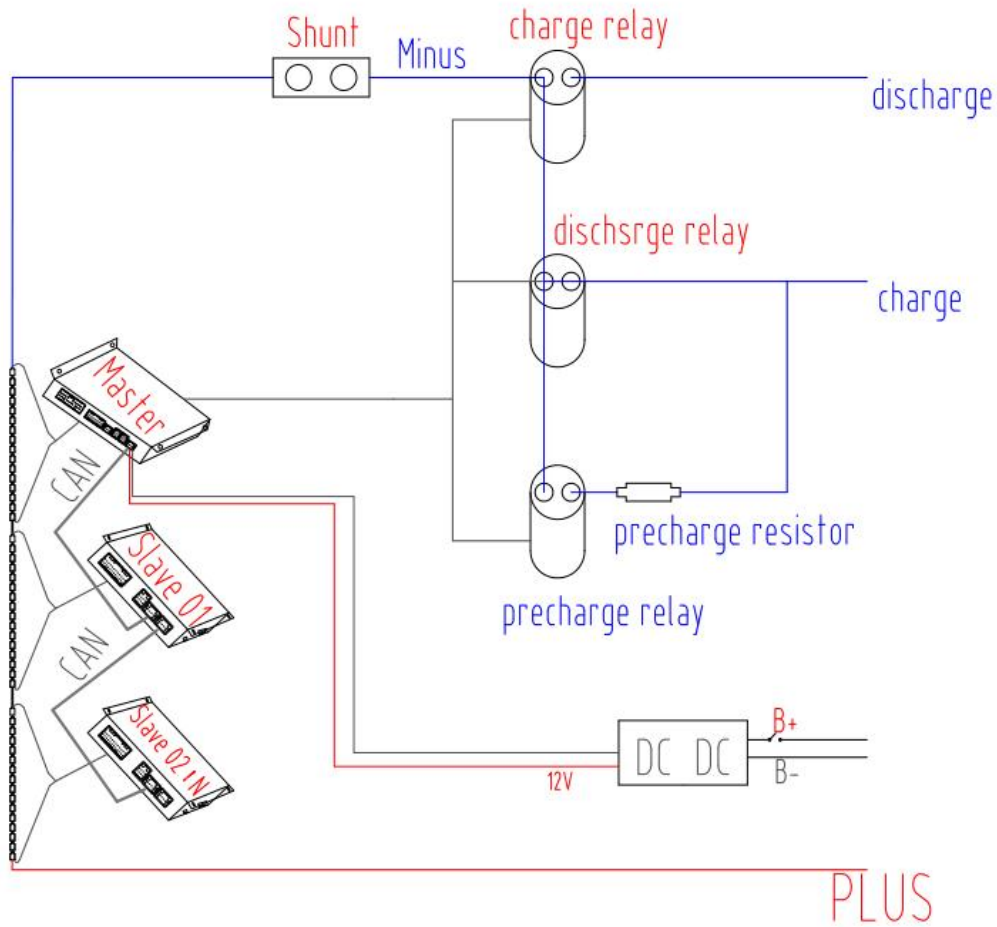## 3.1 Wiring diagram for bms with seperate port

Seperate port wiring connection is used to charging and discharging relays ; It usually suitable for automotive batteries, but the charging port cannot be used while discharge, and it cannot be charged from the discharge port.

3.2 Wiring diagram for bms with same port

The same port connection is used   for   the charging and discharging relays are seriesly connected on the same positive pole of battery , which is usually suitable for energy storage   system or special needs when the battery input has only one positive and negative pole :
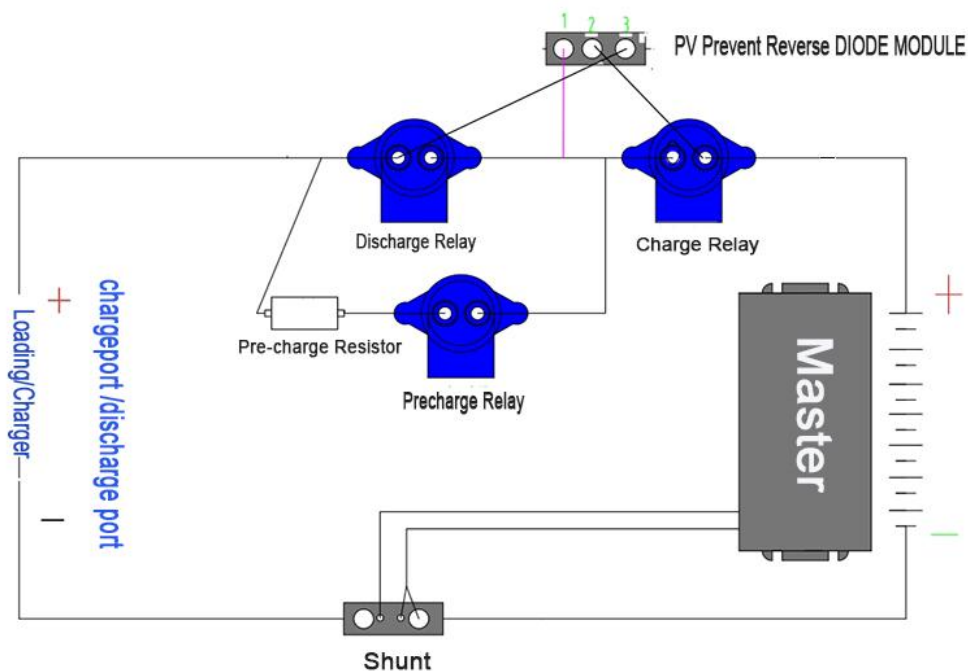
TOPBMS   www.cleverbms.com

Wiring Diagram of BMS 4S-128S

(Same Port)

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