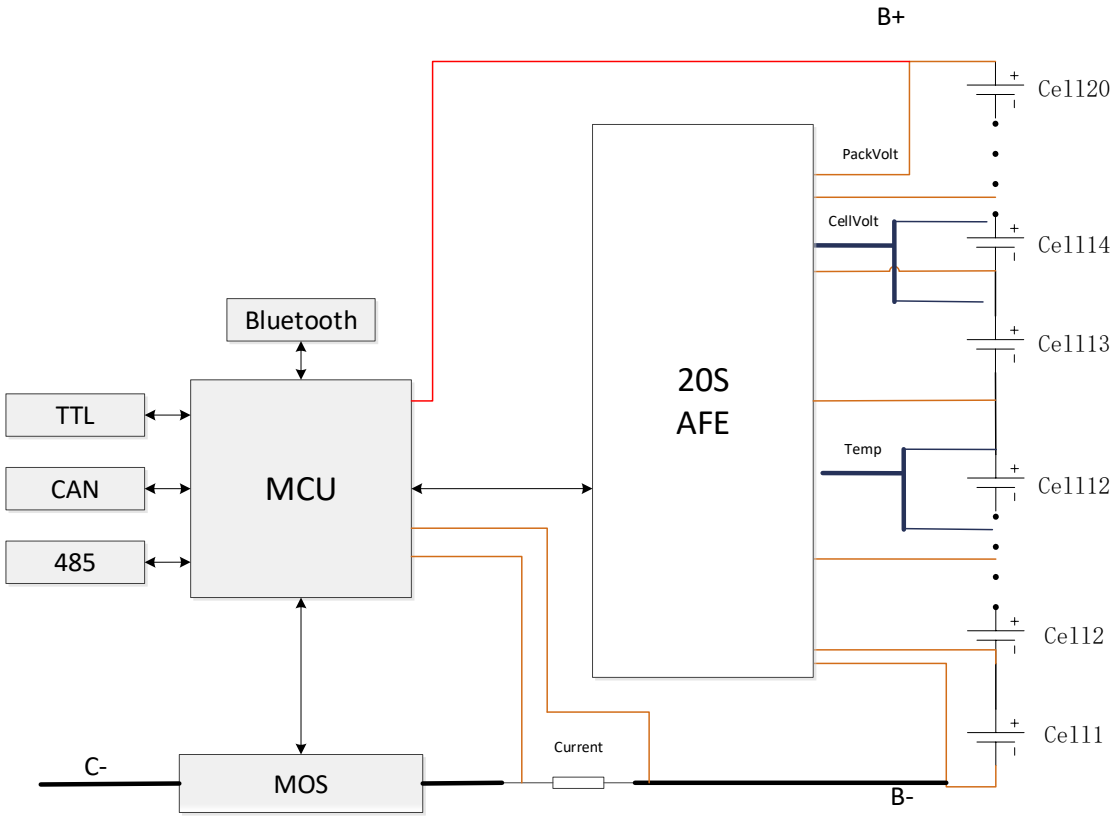
Product Specification

Edition：V1.4
Date: 20200303

1.1 Introduction

This is a smart BMS. Main function includes: cell voltage/ temperature/pack voltage/current measurement, passive balance control, CAN bus, RS485, TTL port, Bluetooth (APP supported), SOC calculation, MOS control.

1.2 System Topology



1.3 Function

1.3.1 CAN Bus

J N1939 protocol， CAN2.0A/B supported. 2500V isolated.

CAN /485/TTL can only choose one.

1.3.2 RS485 Bus

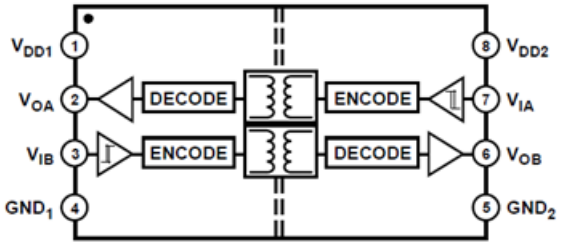
2500V isolated。Typical baud rate is 19200.

CAN /485/TTL can only choose one.

1.3.3 TTL Port

2500V isolated。Typical baud rate is 19200.

Need external isolated power.CAN /485/TTL can only choose one.



Vdd1 GND1 powered by BMS Vdd2 GND2 powered by external resource

1.3.4 Cell voltage measurement
Measures Up to 16 Battery Cells in Series.

1.3.5 Temperature measurement
MOS, balance circuit, and external temperature measurement.

1.3.6 SOC
AH integral method with OCV calibration.

1.3.7 MOS Control
Drive charge & discharge MOS to protect the battery.

1.3.8 Pack voltage measurement
Pre-charge and pack voltage are get by this function.

1.3.9 Current measurement
Short-circuit, auto wake up, soc calculation.

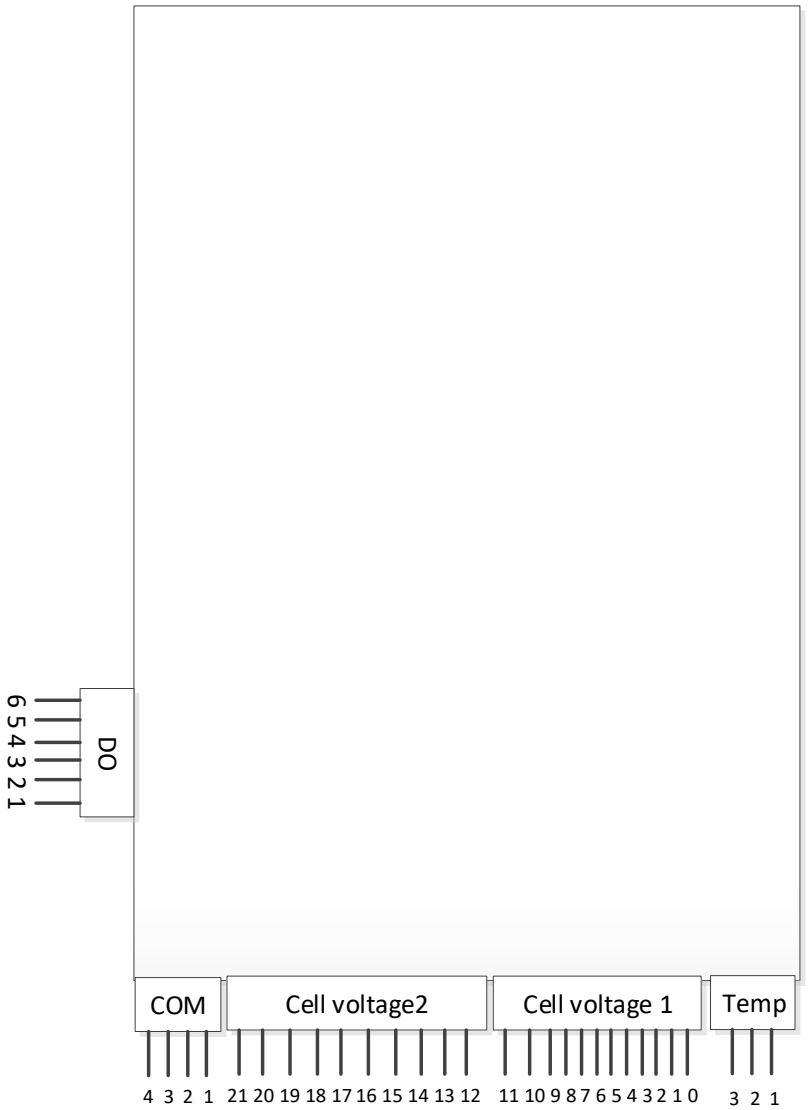
1.3.10 Balancing
Passive cell balancing with programmable current.
100mA/ channel for maximum.

1.4 Electrical characteristics

Index	Parameter	Detail	Remark
1	Total supply voltage	20-80V DC from battery	Auto change to sleep state
2	Cell number	8-20S	
3	Working state power consumption	< 10mA（72V）	
4	Sleep state power consumption	< 5mA（72V）	Auto wake up
5	Deep sleep state power consumption	< 20uA（72V）	Manual wake up
6	Working temperature	-40 ~ 85 ℃	
7	Storage temperature	-40 ~ 95 ℃	
8	Working humidity	5% ~ 95%	Conformal Coating
9	Cell voltage measurement	0-5V，measurement error< 10mV Typical is 5mV	Resolution 1mV
10	Open wire detection	Supported	
11	Passive balancing	Maximum 100mA/channel	
12	Temperature measurement	-30 ~ 125 ℃，	2 channels
13	Pack voltage measurement	1 channel. 0-100V. error <0.5% FSR.	
14	Current measurement	-150A ~ 300A，error<0.5% FSR	1channel
15	SOC	< 8%	
16	CAN	1 channel，bootloader supported	Choose one in three
17	485	1 channel，bootloader supported	Choose one in three
18	TTL	1 channel，bootloader supported	Choose one in three
19	Current ability	Rated 100A，Pulse 300A (30s) The value depends highly on heat radiation.	
20	Short circuit	default 300A	

21	System log	Support	FLASH
22	Bluetooth	Support	Connect to APP
23	IP level	IP30	
24	Weight	< 400g	
25	Size	130*70*16mm	

2. Interface definition



2.1 Output negative：

C-， Black wire。Charge and discharge negative share the same port.

2.2 Battery negative:

B-,blue wire。Connect to pack negative.

B- must be connected to battery first, then cell voltage interface can be plugged in.

2.3 Cell voltage port

20 series cell voltage and BMS power wire.

Index	Item	Details
0	B-	Connected to pack negative
1	B1+	Connect to positive terminal of cell 1
2	B2+	Connect to positive terminal of cell 2
3	B3+	Connect to positive terminal of cell 3
4	B4+	Connect to positive terminal of cell 4
5	B5+	Connect to positive terminal of cell 5
6	B6+	Connect to positive terminal of cell 6
7	B7+	Connect to positive terminal of cell 7
8	B8+	Connect to positive terminal of cell 8
9	B9+	Connect to positive terminal of cell 9
10	B10+	Connect to positive terminal of cell 10
11	B11+	Connect to positive terminal of cell 11
12	B12+	Connect to positive terminal of cell 12
13	B13+	Connect to positive terminal of cell 13
14	B14+	Connect to positive terminal of cell 14
15	B15+	Connect to positive terminal of cell 15
16	B16+	Connect to positive terminal of cell 16
17	B17+	Connect to positive terminal of cell 17
18	B18+	Connect to positive terminal of cell 18
19	B19+	Connect to positive terminal of cell 19
20	B20+	Connect to positive terminal of cell 20
21	B+	Connect to pack positive

For application less than 16s, please refer to the wiring guidance!!!

2.4 Temperature port

Index	Item	Details	Index	Item	Details
1	GND	NTC common ground	3	T2	NTC2 positive
2	T1	NTC1 positive			

2.5 Communication Port

Index	Item	Details	Index	Item	Details
1	CANL	CAN Low/485B	3	ACC-	Activation negative
2	CANH	CANHigh/485A	4	ACC+	Activation positive

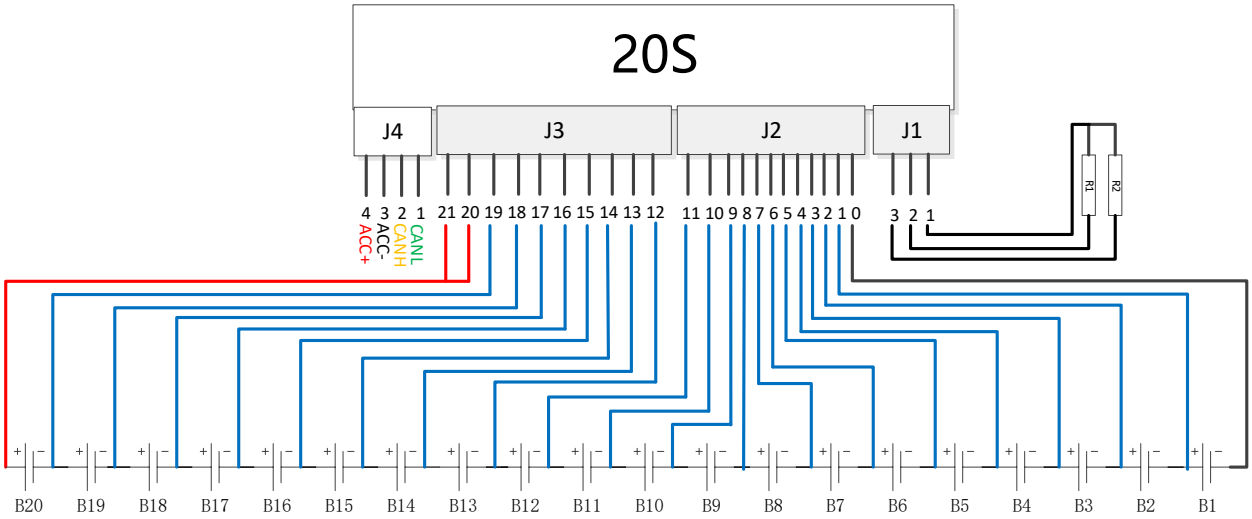
Remark： A Voltage source range from 3-12V can activate BMS via ACC + and ACC-.

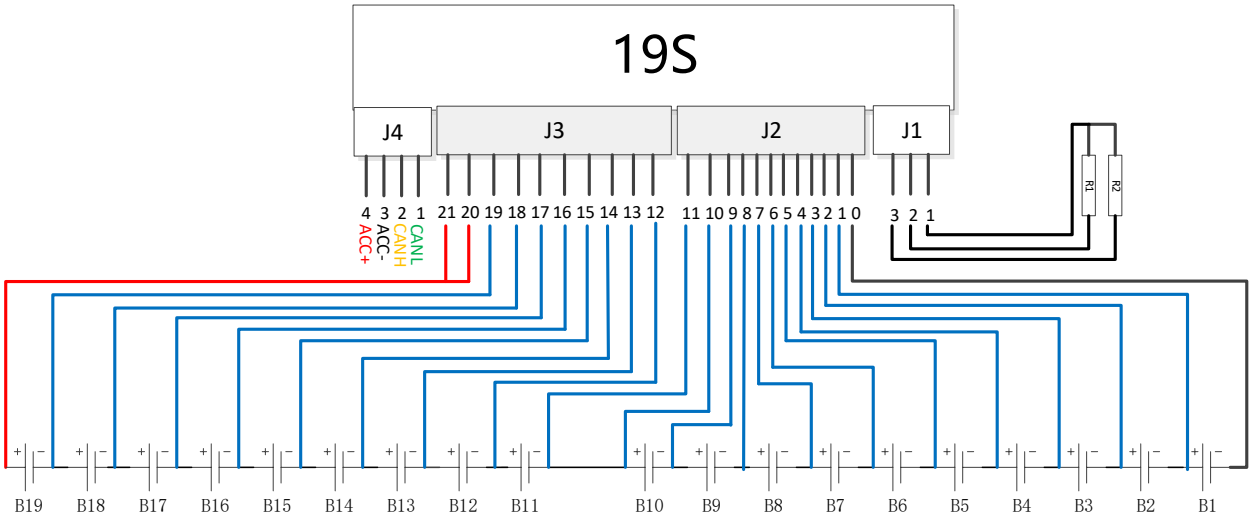
By the way, a charger can also activate BMS.

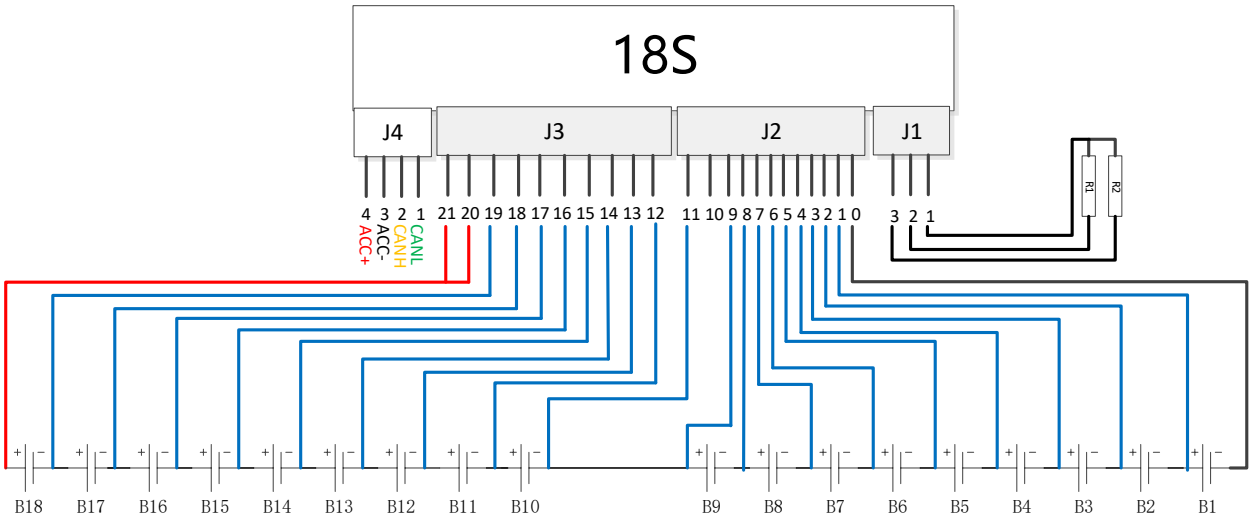
2.6 DO

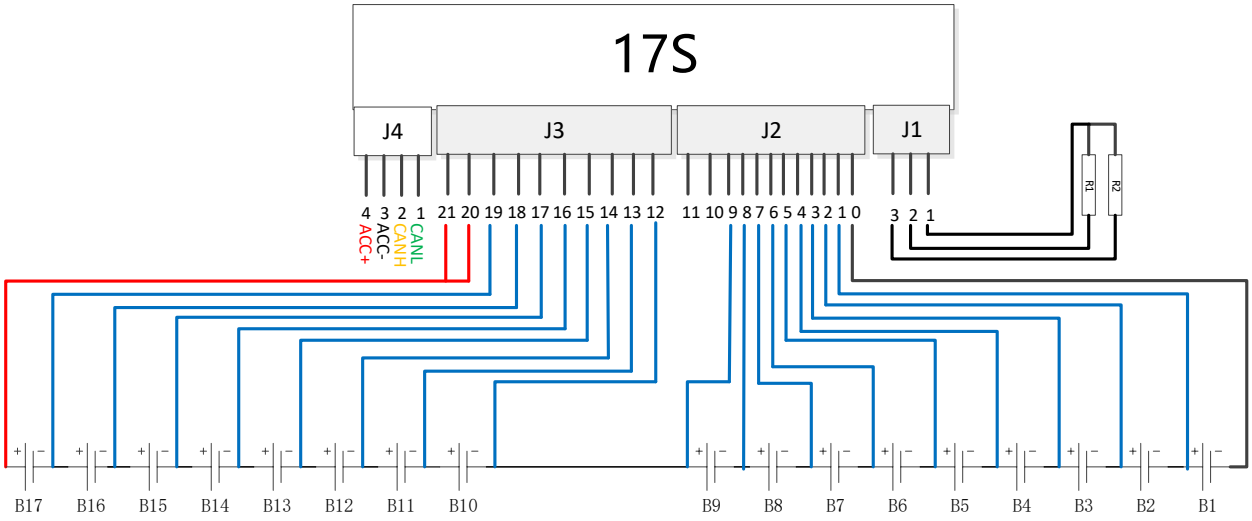
Index	Item	Details	Index	Item	Details
1	DO1+	DO1 output	4	DO2-	DO2 output
2	DO1-		5	DO3+	DO3 output
3	DO2+	DO2 output	6	DO3-	

3. Wiring


20S
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B20 B19 B18 B17 B16 B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1


19S
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B19 B18 B17 B16 B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1


18S
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B18 B17 B16 B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1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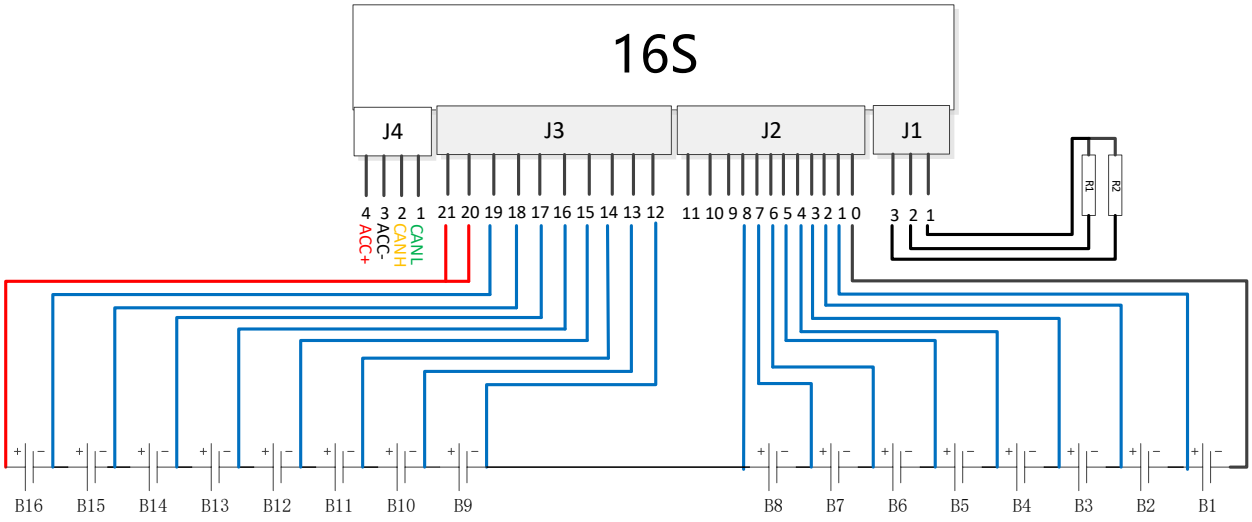
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B17 B16 B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1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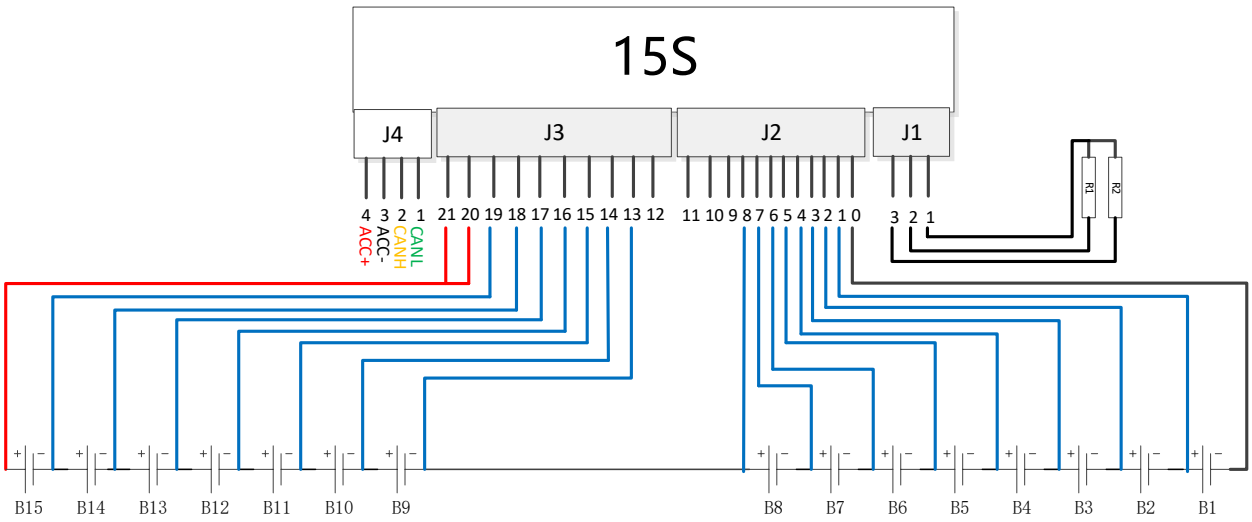
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B16 B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1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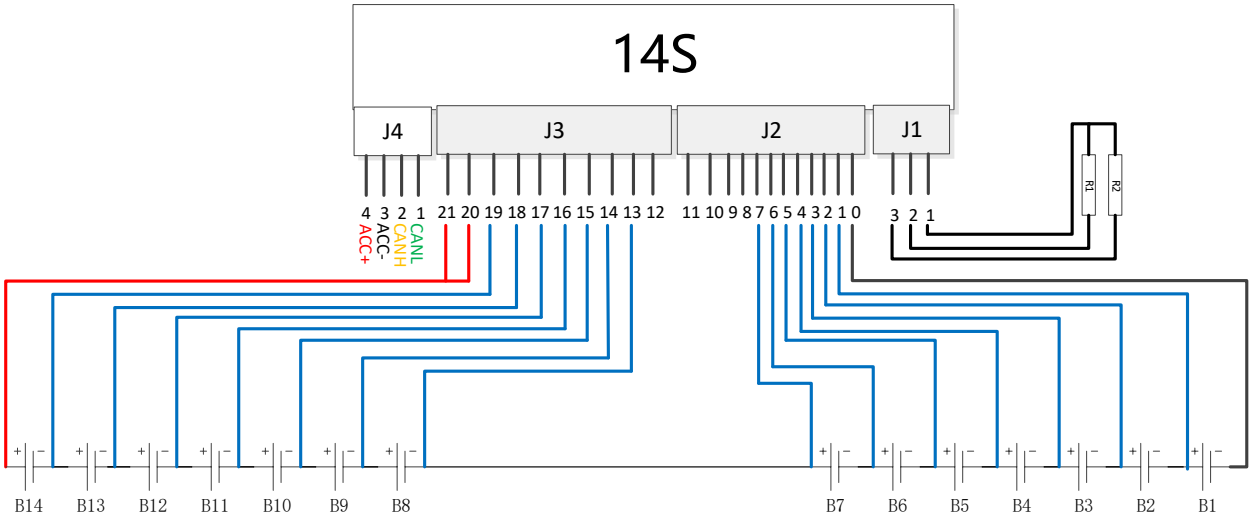
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1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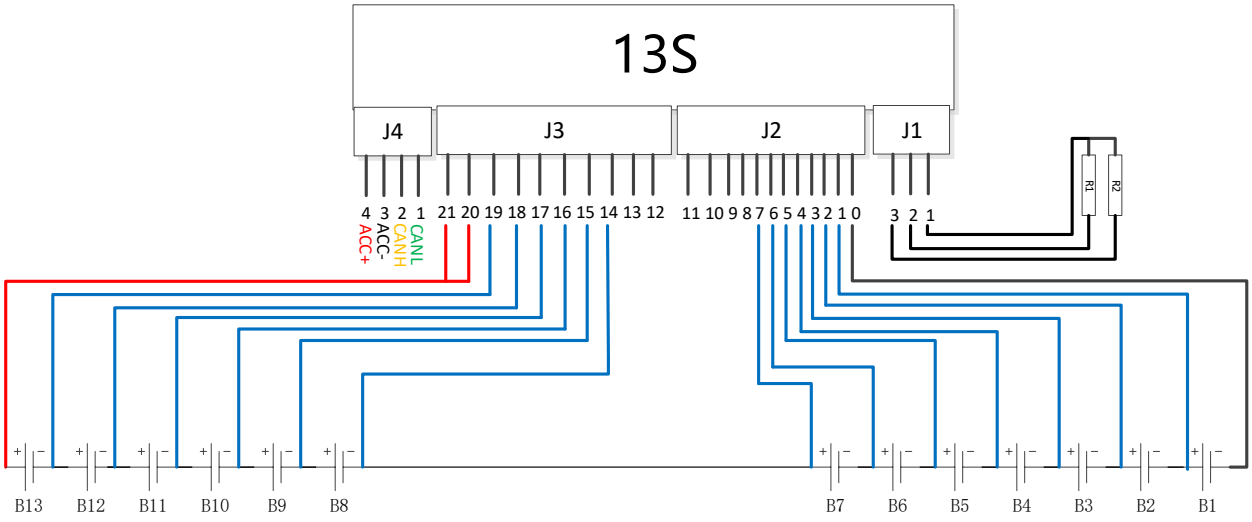
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1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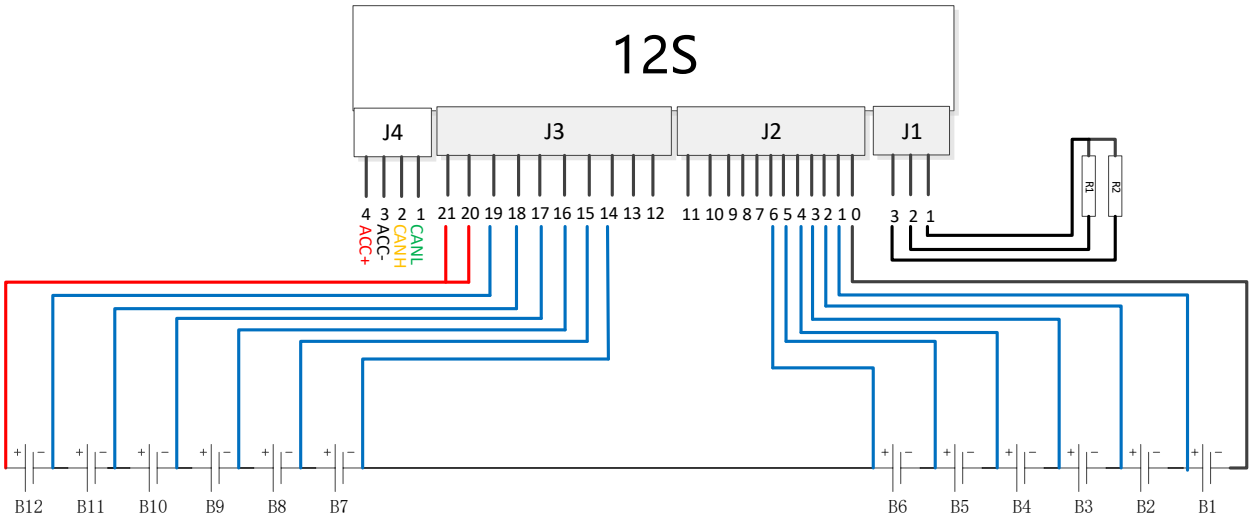
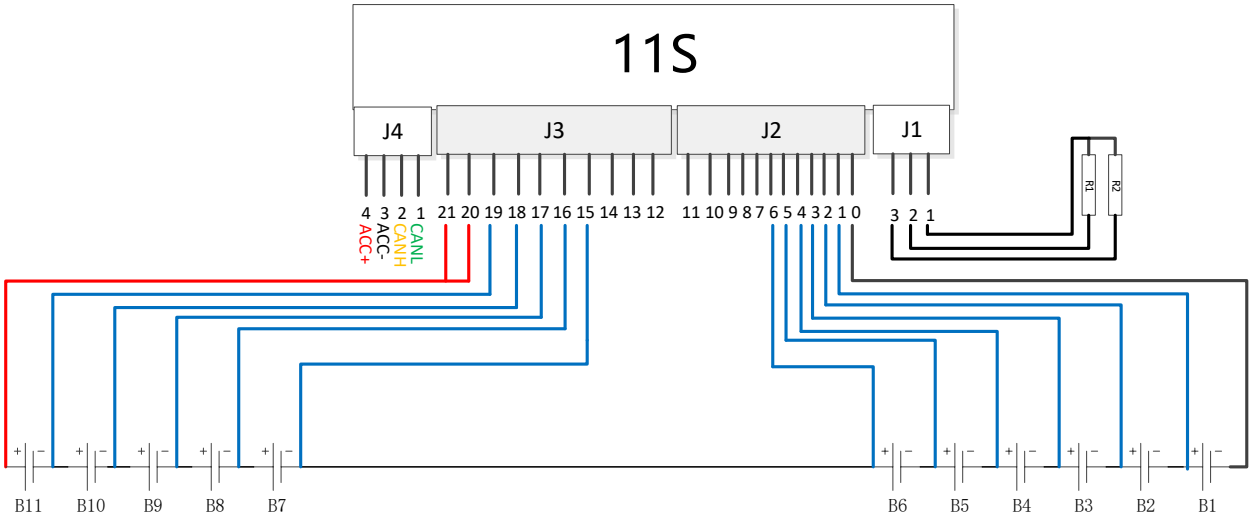
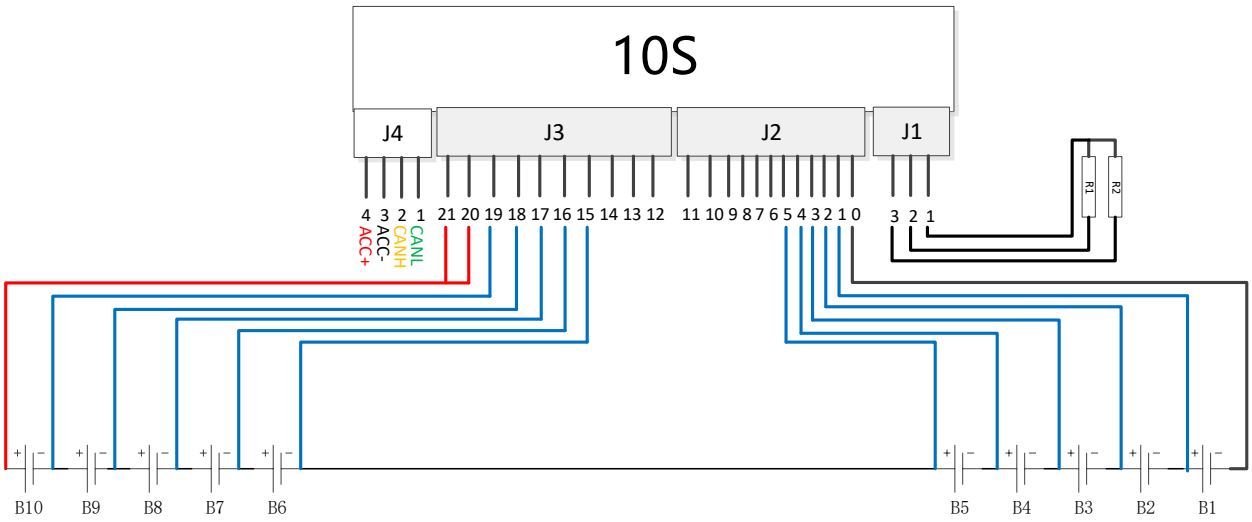
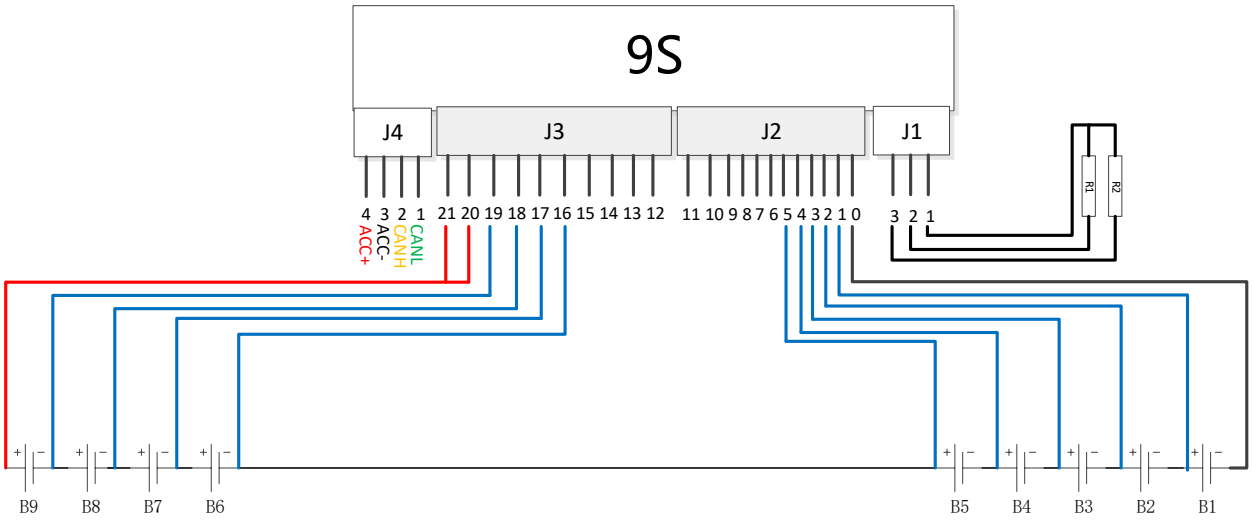
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1


12S
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1


11S
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1


10S
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B10 B9 B8 B7 B6 B5 B4 B3 B2 B1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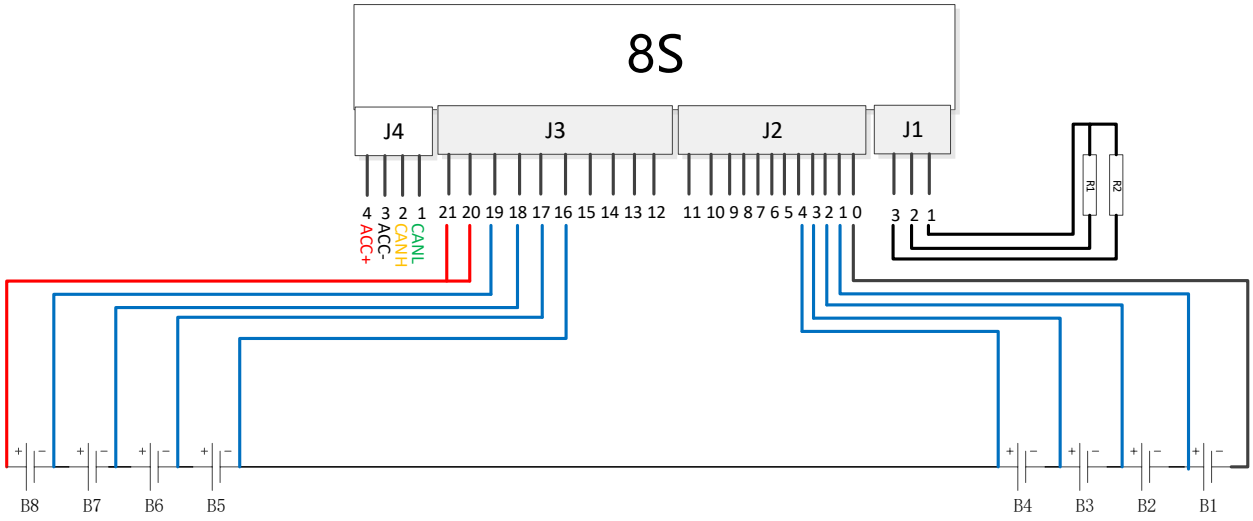
J4
J3
J2
J1
4 3 2 1 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
3 2 1
ACC+
ACC-
CANH
CANL
R1
R2
B9 B8 B7 B6 B5 B4 B3 B2 B1



4. PC software

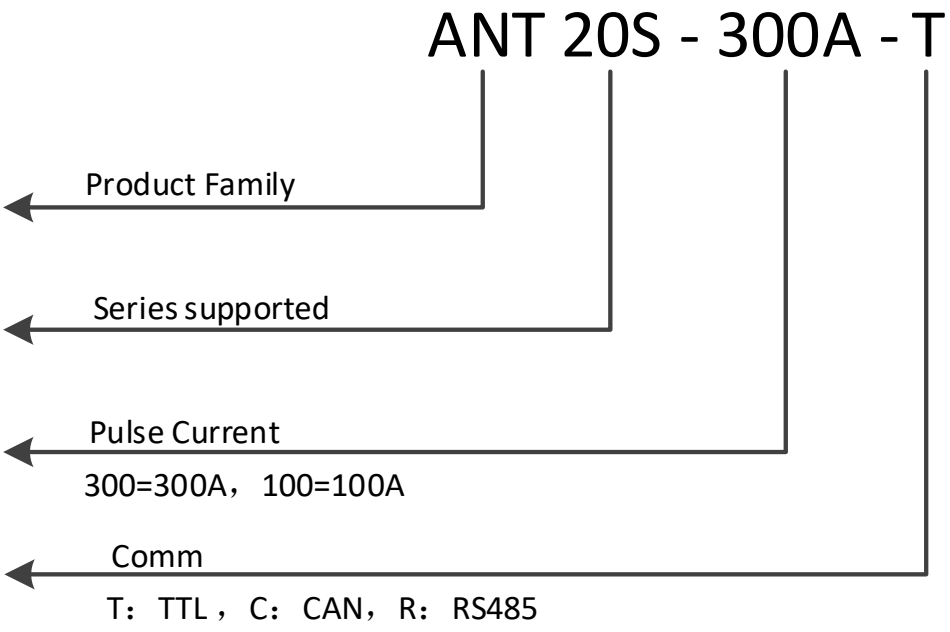
5. APP

BMS 控制

BMS 系统参数设置

BMS 实时状态

6. Part Number definition

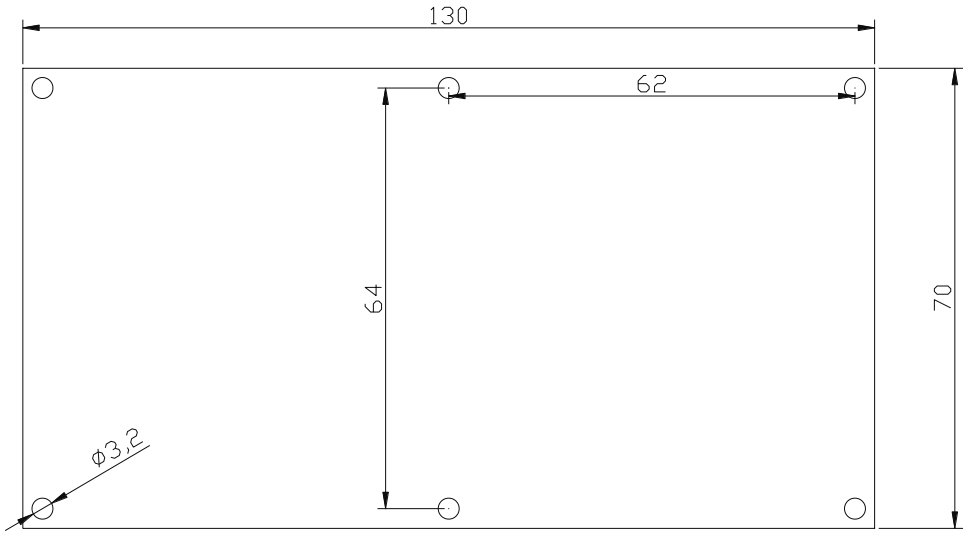


Remark： Pulse current support for 300A and 80A

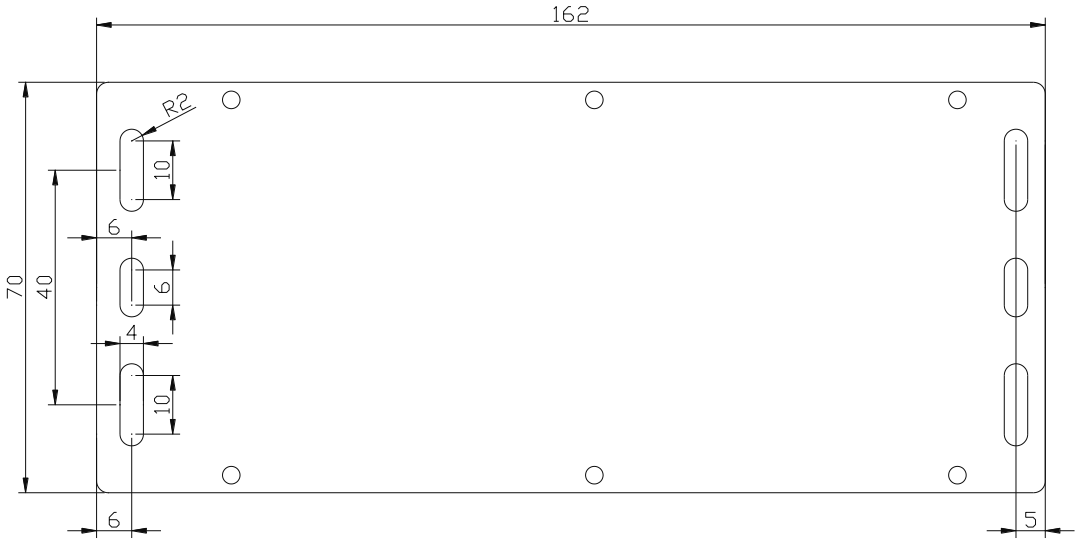
Example: ANT20S-300A-C means 20S pulse current 300A， CAN port

ANT20S-80A-T means 20S pulse current 80A， TTL port

7. Structure



Default without fixing hole



With fixing hole for option