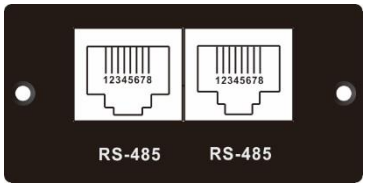
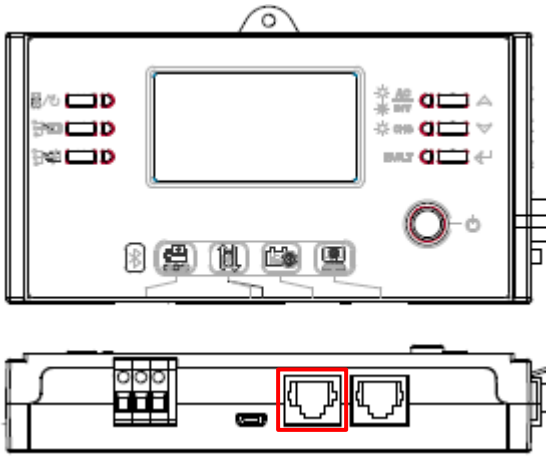
1. BMS Pin Definition

1.1 BMS Card



	Definition
PIN 4	RS485B
PIN 5	RS485A

1.2 Remote Box



	Definition
PIN 3	RS485B
PIN 5	RS485A

2. Communication parameter configuration

Baud rate	Start bit	Data bit	Parity bit	Stop bit
9600	1	8	N	1

3. Communication frame format

Device query command format

Index	1	2	3	4	5
Function	Slave ID	Command type	Start Address of data	Data Length	*CRC
Bytes	1	1	2	2	2

	BMS address	Function code	MSB	LSB	MSB	LSB	LSB	MSB

*The CRC check range is all of the bytes before the CRC field,

Command type table

Index	Command type	Description
1	0x03	Read Data
2	0x10	Write Data

BMS normal response format

Index	1	2	3		4		5	
Function	Slave ID	Command type	Data Length		Data information		CRC	
Bytes	1	1	2		Data length * 2		2	
	BMS address	Function code	MSB	LSB	MSB	LSB	LSB	MSB

BMS abnormal response format

Index	1	2	3	4
Function	Slave ID	Command type + 128	Error code	CRC
Bytes	1	1	1	2

Error code

Index	Error code	Note
1	0x01	Slave ID should be within 1~16. Slave ID error if out of range
2	0x02	Command type error if command didn’t exist,
3	0x03	CRC error

4. Command lists

4.1 Version information

Data Address	Byte Size	Parameter	Parameter Unit
0x0001	2	Protocol type	
0x0002	2	Protocol version	
0x0003	4	BMS firmware version	
0x0005	4	BMS hardware version	

4.2 BMS general status parameters inquiry

Data Address	Byte Size	Parameter ILM	Parameter Unit
0x0010	2	Number of cell: L	pcs
0x0N11	2	Cell N*20+1 voltage	0.1V
0x0N12	2	Cell N*20+2 voltage	
0x0N13	2	Cell N*20+3 voltage	
0x0N14	2	Cell N*20+4 voltage	
0x0N15	2	Cell N*20+5 voltage	
0x0N16	2	Cell N*20+6 voltage	
0x0N17	2	Cell N*20+7 voltage	
0x0N18	2	Cell N*20+8 voltage	
0x0N19	2	Cell N*20+9 voltage	
0x0N1A	2	Cell N*20+10 voltage	
0x0N1B	2	Cell N*20+11 voltage	
0x0N1C	2	Cell N*20+12 voltage	
0x0N1D	2	Cell N*20+13 voltage	
0x0N1E	2	Cell N*20+14 voltage	
0x0N1F	2	Cell N*20+15 voltage	
0x0N20	2	Cell N*20+16 voltage	
0x0N21	2	Cell N*20+17 voltage	
0x0N22	2	Cell N*20+18 voltage	
0x0N23	2	Cell N*20+19 voltage	
0x0N24	2	*Cell N*20+20 voltage	
0x0025	2	Number of temperature sensor: M	pcs
0x0N26	2	Temperature Sensor N*10+1	0.1K (Kelvin temperature)
0x0N27	2	Temperature Sensor N*10+2	
0x0N28	2	Temperature Sensor N*10+3	
0x0N29	2	Temperature Sensor N*10+4	
0x0N2A	2	Temperature Sensor N*10+5	
0x0N2B	2	Temperature Sensor N*10+6	
0x0N2C	2	Temperature Sensor N*10+7	
0x0N2D	2	Temperature Sensor N*10+8	
0x0N2E	2	Temperature Sensor N*10+9	
0x0N2F	2	Temperature Sensor N*10+10	
0x0030	2	Module charge current	0.1A
0x0031	2	Module discharge current	0.1A
0x0032	2	Module voltage	0.1V
0x0033	2	SOC	%
0x0034	4	Module total capacity	mAH

*If the parameter doesn't exist, return 0x0000

4.3 BMS warning information inquiry

Data Address	Byte Size	Parameter	Note
0x0N40	2	Number of cell: L	
0x0N41	2	Cell N*20+1/ N*20+2 voltage state	00H: normal 01H: below lower limit 02H: above higher limit F0H: other error
0x0N42	2	Cell N*20+3/ N*20+4 voltage state	
0x0N43	2	Cell N*20+5/ N*20+6 voltage state	
0x0N44	2	Cell N*20+7/ N*20+8 voltage state	
0x0N45	2	Cell N*20+9/ N*20+10 voltage state	
0x0N46	2	Cell N*20+11/ N*20+12 voltage state	
0x0N47	2	Cell N*20+13/ N*20+14 voltage state	
0x0N48	2	Cell N*20+15/ N*20+16 voltage state	
0x0N49	2	Cell N*20+17/ N*20+18 voltage state	
0x0N4A	2	Cell N*20+19/ N*20+20 voltage state	
0x0050	2	Number of temperature sensor: M	
0x0N51	2	BMS Temperature N*10+1/ N*10+2 state	00H: normal 01H: below lower limit 02H: above higher limit F0H: other error
0x0N52	2	BMS Temperature N*10+3/ N*10+4 state	
0x0N53	2	BMS Temperature N*10+5/ N*10+6 state	
0x0N54	2	BMS Temperature N*10+7/ N*10+8 state	
0x0N55	2	BMS Temperature N*10+9/ N*10+10 state	
0x0060	2	Module charge voltage state	00H: normal 01H: below lower limit 02H: above higher limit F0H: other error
0x0061	2	Module discharge voltage state	
0x0062	2	Cell charge voltage state	
0x0063	2	Cell discharge voltage state	
0x0064	2	Module charge current state	
0x0065	2	Module discharge current state	
0x0066	2	Module charge temperature state	
0x0067	2	Module discharge temperature state	
0x0068	2	Cell charge temperature state	
0x0069	2	Cell discharge temperature state	

*If the parameter didn't exist, return 0x0000

4.4 BMS charger and discharge information inquiry

Data Address	Byte Size	Parameter	Parameter Unit
0x0070	2	Charge voltage limit	0.1V
0x0071	2	Discharge voltage limit	0.1V
0x0072	2	Charge current limit	0.1A
0x0073	2	Discharge current limit	0.1A
0x0074	2	Charge, discharge status	

Charge, discharge status:

Bit	Content	Note
7	Charge enable	1: yes 0: request stop charge
6	Discharge enable	1: yes 0: request stop discharge
5	Charge immediately	1: request: 0: no request
4	Charge immediately2	1: request: 0: no request
3	Full charge request	1: request: 0: no request
2		
1		
0		

0x0075	4	Run time to empty	S

*Bit 5: Set when SoC is very low, like 5~9%, device need charge immediately until this flag disappear.
*Bit 4: Set when SoC is low, like 10~14%, it will be better that device charge immediately until this flag disappear.
*Bit 3: Set when BMS need device fully charged.