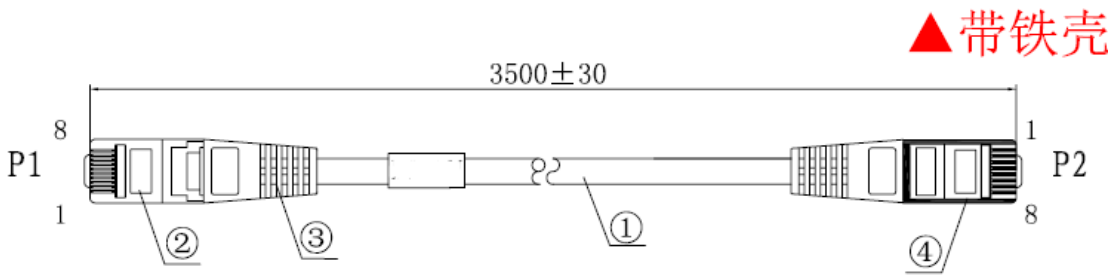


# **Inverter and BMS 485 communication Protocol**

***Sandy***

*2020/02/19*

# 1. Communication cable



Here is internal connection between P1 and P2.

P2	Definition
PIN 3	RS485N
PIN 5	RS485P

# 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

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	Parameter Unit
0x0010	2	Number of cell: M	pcs
0x0011	2	Cell1 voltage	0.1V
0x0012	2	Cell2 voltage	
0x0013	2	Cell3 voltage	
0x0014	2	Cell4 voltage	
0x0015	2	Cell5 voltage	
0x0016	2	Cell6 voltage	
0x0017	2	Cell7 voltage	
0x0018	2	Cell8 voltage	
0x0019	2	Cell9 voltage	
0x001A	2	Cell10 voltage	
0x001B	2	Cell11 voltage	
0x001C	2	Cell12 voltage	
0x001D	2	Cell13 voltage	
0x001E	2	Cell14 voltage	
0x001F	2	Cell15 voltage	
0x0020	2	Cell16 voltage	
0x0021	2	Cell17 voltage	
0x0022	2	Cell18 voltage	
0x0023	2	Cell19 voltage	
0x0024	2	*Cell20 voltage	
0x0025	2	Number of temperature sensor: N	pcs
0x0026	2	Temperature Sensor 1	0.1K (Kelvin temperature)
0x0027	2	Temperature Sensor 2	
0x0028	2	Temperature Sensor 3	
0x0029	2	Temperature Sensor 4	
0x002A	2	Temperature Sensor 5	
0x002B	2	Temperature Sensor 6	
0x002C	2	Temperature Sensor 7	
0x002D	2	Temperature Sensor 8	
0x002E	2	Temperature Sensor 9	
0x002F	2	Temperature Sensor 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
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0x0040	2	Number of cell: M	
0x0041	2	Cell 1/2 voltage state	00H: normal 01H: below lower limit 02H: above higher limit F0H: other error
0x0042	2	Cell 3/4 voltage state	
0x0043	2	Cell 5/6 voltage state	
0x0044	2	Cell 7/8 voltage state	
0x0045	2	Cell 9/10 voltage state	
0x0046	2	Cell 11/12 voltage state	
0x0047	2	Cell 13/14 voltage state	
0x0048	2	Cell 15/16 voltage state	
0x0049	2	Cell 17/18 voltage state	
0x004A	2	Cell 19/20 voltage state	
0x0050	2	Number of temperature sensor: N	
0x0051	2	BMS Temperature1/2 state	00H: normal 01H: below lower limit 02H: above higher limit F0H: other error
0x0052	2	BMS Temperature3/4 state	
0x0053	2	BMS Temperature5/6 state	
0x0054	2	BMS Temperature7/8 state	
0x0055	2	BMS Temperature9/10 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		

\*Bit 5 & 4: Set when SOC is very low, like 5~9%, device needs charge immediately until this flag disappear.

\*Bit 3: Set when BMS needs device fully charged.