

Smart bms protocol V4

One、Physical interface

This protocol supports the universal protocol of the RS485 / RS232 / UART interface of the JBD smart bms, same with the host computer protocol. The baud rate is 9600BPS or other custom rates.

Two、. Frame structure

Start bit	Status bit	Command code	Length	data	check	Stop bit
0xDD	0xA5-read 0x5A-write	Register address	Represents the data length, excluding itself	When data length is 0,pass it	Check for data content + length byte + command code byte and then add 1 to the inverse, high bit first, low bit behind	0x77

Three、 Command interpretation

Command code: read 03 to read basic information and status

Read 04 Read battery cell voltage

Read 05 Read the protection board hardware version number

Host send read basic info 0x03 command

0xDD	0xA5	0x03	0	-- (null when no)	checksum	0x77
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BMS response to read basic information 0x03 command

0xDD	0x03	statut , 0 says ok	Represents the data length, excluding itself	When data length is 0,pass it	checksum	0x77
		Error then back 0x80	0		checksum	0x77

Host send: DD A5 03 00 FF FD 77

BMS response: DD 03 00 1B 17 00 00 00 02 D0 03 E8 00 00 20 78 00 00 00 00 00 10 48 03 0F 02 0B 76 0B 82 FB FF 77

Red is the byte to be checked, which is the sum of all the bytes; the last 2 are the check result, which is the result of inverting +1 for the sum of all the previous checks

Date content interpretation

Date content	byte	mark
Total voltage	2BYTE,unit 10mV , high byte first	
current	2BYTE , unit 10mA	Judging the battery charge and discharge status by current, the charge is positive and the discharge is negative.
Balance capacity	2BYTE , unit 10mAh	
Rate capacity	2BYTE , unit 10mAh	
cycle	2BYTE	
Production date	2BYTE	Use 2 bytes to transmit, such as 0x2068, where the date is the lowest 5: 0x2028 & 0x1f = 8 represents the date; month (0x2068 >> 5) & 0x0f = 0x03 represents March; the year is 2000+ (0x2068 >> 9) = 2000 + 0x10 = 2016;
Balance status	2BYTE	Each bit means each string is balanced, 0 is off, 1 is on, it means 1 ~ 16 strings
Balance status_High	2BYTE	Each bit means that each string is balanced, 0 is off, 1 is on, which means 17 ~ 32 strings, up to 32 strings are added based on V0 version
Protection status	2BYTE	Each bit represents a protection state, 0 is unprotected, 1 is protected. See Note 1:
Software version	1byte	0x10 means 1.0 version
RSOC	1byte	Represents the remaining capacity percentage
FET control status	1byte	MOS indicates status, bit0 indicates charge, bit1 indicates discharge, 0 indicates MOS off, and 1 indicates on
Battery series	1byte	Number of battery strings

number		
NTC number	1byte	NTC number
Npcs NTC	2*N , unit 0.1K , High first	Using absolute temperature transmission, 2731+ (actual temperature * 10), 0 degrees = 2731 25 degrees = 2731 + 25 * 10 = 2981

Note 1: Description of protection status

bit0 single cell overvoltage protection

bit1 single cell undervoltage protection

bit2 whole pack overvoltage protection

bit3 Whole pack undervoltage protection

bit4 charging over-temperature protection

bit5 charging low temperature protection

bit6 Discharge over temperature protection

bit7 discharge low temperature protection

bit8 charging overcurrent protection

bit9 Discharge overcurrent protection

bit10 short circuit protection

bit11 Front-end detection IC error

bit12 software lock MOS

bit13 ~ bit15 Reserved

Host send read single cell 0x04 command

0xDD	0xA5	0x04	0	-- (null when no)	checksum	0x77
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BMS response to read basic information 0x03 command

0xDD	0x04	statut , 0 says ok	Represents the data length, excluding itself	When data length is 0,pass it	checksum	0x77
		Error then back 0x80	0		checksum	0x77

Host send: DD A5 04 00 FF FC 77

BMS response: DD 04 00 1E 0F 66 0F 63 0F 63 0F 64 0F 3E 0F 63 0F 37 0F 5B 0F 65 0F 3B 0F 63 0F 63 0F 3C 0F 66 0F 3D F9 F9 77

Red is the byte to be checked, which is the sum of all the bytes; the last 2 are the check result, which is the result of inverting +1 for the sum of all the previous checks

Data content interpretation

Data lenght	Battery series N*2
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First sting battery voltage	2Byte,unit mV , high first
Second sting battery voltage	2Byte,unit mV , high first
Third sting battery voltage	2Byte,unit mV , high first
N sting battery voltage	2Byte,unit mV , high first

Host send read bms hardware version 0x05 command, Support up to 31 characters, write the model through the device model of the host computer

0xDD	0xA5	0x05	0	-- (null when no)	checksum	0x77
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BMS response to read basic information 0x03 command

0xDD	0x04	statut , 0 says ok	Represents the data length, excluding itself	When data length is 0,pass it	checksum	0x77
		Error then back 0x80	0		checksum	0x77

Data content interpretation

Data length N	Device type name length
BYTE0	The ASCII code of the first character (for example, the hardware version is LH-XXXX, then the length is 7, byte0 = 'L')
BYTE(N-1)	

Host send: DD A5 05 00 FF FB 77

BMS response: DD 05 00 0A 30 31 32 33 34 35 36 37 38 39 FD E9 77 -- Represents its hardware version number 0123456789

Red is the byte to be checked, which is the sum of all the bytes; the last 2 are the check result, which is the result of inverting +1 for the sum of all the previous checks

Four、 control MOS command

Host send control MOS command

Start bit	Status	Command	Length	data	check	Stop bit
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	bit	code				
0xDD	0X5A	0XE1	0X02	0X00 XX	CHECKSUM_H	CHECKSUM_L 0X77

BMS response to read basic information 0x03 command

0xDD	0xe1	0x00	0x00	--	Checksum_H	Checksum_L 0x77
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Note: The verification calculation method is consistent with other methods. Among them XX represents the state of controlling MOS.

XX Value	MOS action
0x00	Release the software to close the MOS tube
0x01	The software turns off the charging MOS and the software turns off the discharging MOS
0x02	The software closes the discharge MOS, and the release software closes the charge MOS
0x03	Software turns off charge and discharge MOS at the same time
Don't write values beyond the self-range	

Example: The host sends DD 5A E1 02 00 02 FF 1B 77 to indicate that the software turns off the discharge MOS;

Five、Protocol data description:

The host sends a command to read the single voltage 0x04, and the BMS returns data instructions:

DD-frame header, start byte

04-Command code, read single voltage

00-Status code, non-zero is wrong, 0 is correct

22-Short data length, 34 data, indicating that the battery pack has 17 strings and 2 strings

0EC8-Section 1 single cell voltage 3784

0EC8-Section 2 cell voltage 3744

0ECB-Section 3 cell voltage

0ECF-Section 4 cell voltage

0ECA-Section 5 cell voltage

0EC7-Section 6 cell voltage
0ECA-Section 7 cell voltage
0ECD-Section 8 cell voltage
0EC9-Section 9 cell voltage
0ECA-Section 10 cell voltage
0ECB-Section 11 cell voltage
0ECB-Section 12 cell voltage
0EC8-Section 13 cell voltage
0ECC-Section 14 cell voltage
0EC8-Section 15 cell voltage
0EC9-Section 16 cell voltage
0EC9-Section 17 cell voltage
F187 --Check code
77-End code

The host sends a command to read basic information 0x03, and the BMS returns data description:

DD --Start

03-Naming code

00-Status code

1F-data length

19DF-total voltage = 6623 = 66.23V, unit is 10mV

F824 --Total current = 63524, the highest bit is 1, for discharge, the current value = 65536-63524 = 2012, the unit is 10mA, so the final current is -20.12A

0DA5-remaining capacity = 3493, unit 10mAH, final remaining capacity value is 34930mAH

0FA0-nominal capacity = 4000, because the unit is 10mAH, all final capacity is 40000mAH

0002 --Number of cycles. 2 times

2491-Production date

0000-low balance

0000-high balance

0000-protection status

12-Software version

57-Percentage of remaining capacity 87

03 --MOS state

11-Number of battery strings 17

04-Number of temperature probes

0B98-the first temperature 2968 -2731 = 247, the unit is 0.1 °C = 24.7 °C

0BA9-the second temperature

0B96-the third temperature

0B97-the fourth temperature

F89A --Check code

77-End code