

Jiabaida Software Board General Protocol V4

First, the physical interface

This protocol supports the general protocol of RS485 / RS232 / UART interface of Jiabaida software board, which is consistent with the host computer protocol, and the baud rate is 9600BPS or other customized rate.

Second, the . Frame structure

Start bit	Status bit	Command code	length	Data content	check	Stop bit
0xDD	0xA5-read	The register address indicates the data length, excluding Data content, when length is 0, here			The checksum of the data segment content + length bytes + command code bytes and then add and reverse	
	0x5A-write		body	jump over	1, high is first, low is last	

Command explanation

- Command code: Read 03 Read basic information and status
- Read 04 Read battery cell voltage
- Read 05 Read the protection board hardware version number

The host sends an instruction to read basic information 0x03

0xDD	0xA5	0x03	0	-(No time and space)	checksum	0x77
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BMS responds to read basic information 0x03 instruction

0xDD	0x03	Status, 0 table	Indicates the length of the data, excluding Data content, when length is 0, here		checksum	0x77
		correct	Body, response length is 0	jump over		
		Error returns	0		checksum	0x77
		0x80				

Host sends: 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 being checked, which is the sum of all the bytes; the next two are the check result, which is the result of inverting the sum of all the previous check by +1

Data content interpretation

Data content	Byte size	Description
Total voltage	2BYTE, the unit is 10mV, the high byte is first, the same below	
Current	2BYTE, unit 10mA	The battery charge and discharge status is determined by the current. The charge is positive and the discharge is negative.
The remaining capacity	2BYTE, unit 10mAh	
Nominal capacity	2BYTE, unit 10mAh	
Cycles	2BYTE	
Production Date	2BYTE	Use 2 bytes to transmit, such as 0x2068, where the lowest date is 5: 0x2028 & 0x1f = 8 represents the date; month (0x2068 >> 5) & 0x0f = 0x03 means March; the year is 2000+ (0x2068 >> 9) = 2000 + 0x10 = 2016; Each bit indicates equalization of each string, 0 is off, 1 is on, it means 1 ~ 16 strings
Equilibrium	2BYTE	Each bit indicates equalization of each string, 0 is off, 1 is on, 17 ~ 32 strings are supported, and up to 32 strings are added based on V0 version.
Equilibrium state_high	2BYTE	Each bit represents one protected, unprotected 0, 1 occurs protective See Note 1:
Protection status	2BYTE	0x10 means version 1.0
Software version	1byte	Represents the remaining capacity percentage
RSOC	1byte	MOS indicates status, bit0 means charging, bit1 means discharging, 0 means MOS is off, 1 means on
FET control status	1byte	Battery strings
Battery strings	1byte	NTC number
NTC number N	1byte	Using absolute temperature transmission, 2731+ (actual temperature * 10), 0 degrees = 2731 25 degrees = 2731 + 25 * 10 = 2981
N NTC content	2 * N, unit is 0.1K, high first	

Note 1: Protection status description

bit0 single overvoltage protection

bit1 undervoltage protection

bit2 The entire group of overvoltage protection

bit3 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 sends command to read cell voltage 0x04

0xDD	0xA5	0x04	0	-(No time and space)	checksum	0x77
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BMS responds to read basic information 0x03 instruction

0xDD	0x04	Status, 0 table is correct	Represents the length of the data, excluding itself, and the length is 0 when the response is written.	checksum	0x77	
		0x80 on error	0	Over	checksum	0x77

Host sends: 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 being checked, which is the sum of all the bytes; the next two are the check result, which is the result of inverting the sum of all the previous check by +1

Data content interpretation

Data length	Data length is the number of battery strings N times 2
First string of cell voltages	2Byte, unit mV, high bit first
Second string of cell voltages	2Byte, unit mV, high bit first
Third string of cell voltages	2Byte, unit mV, high bit first
Nth string single voltage	2Byte, unit mV, high bit first

The host sends an instruction to read the hardware version number of the protection board, 0x05. It supports a maximum of 31 characters.

0xDD	0xA5	0x05	0	-(No time and space)	checksum	0x77
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BMS responds to read basic information 0x03 instruction

0xDD	0x04	Status, 0 table is correct	Represents the length of the data, excluding itself, the length of the data is 0 when the response is written.	checksum	0x77
		0x80 on error	0	checksum	0x77

Data content interpretation

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

Host sends: 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

Control MOS instructions

Host sends control MOS instruction

Start bit	Status bit	Command code	length	Data content	check	Stop bit
0xDD	0X5A	0XE1	0X02	0X00 XX	CHECKSUM_H CHECKSUM_L	0X77

BMS responds to read basic information 0x03 instruction

0xDD	0xe1	0x00	0x00	-	Checksum_H Checksum_L	0x77
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Note: The verification calculation method is consistent with other methods. Where XX indicates the status of the control MOS.

XX value	MOS action
0x00	Release software to close MOS tube action
0x01	The software closes the charging MOS, and the software closes the discharging MOS.
0x02	The software closes the discharge MOS, and the software closes the charge MOS
0x03	Software turns off charge and discharge MOS at the same time

Don't write values out of range

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

V. Protocol data description:

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

DD --frame header, starting byte

04-command code, read the unit voltage

00-status code, non-zero is error, 0 is correct

22-The short data length is 34 data, which means that the battery pack has 17 strings and a string of 2 data

0EC8-Section 1 unit voltage 3784

0EC8-Section 2 Unit Voltage 3744

0ECB-Section 3 Unit Voltage
0ECF-Section 4 Individual Voltage
0ECA-Section 5 Unit Voltage
0EC7-Section 6 single cell voltage
0ECA-Section 7 Cell Voltage
0ECD-Section 8 Individual Voltage
0EC9-Section 9 individual voltage
0ECA-Section 10 Individual Voltage
0ECB-Section 11 Individual Voltage
0ECB-Section 12 Individual Voltage
0EC8-Section 13 Individual Voltage
0ECC-Section 14 Individual Voltage
0EC8-Section 15 Individual Voltage
0EC9-Section 16 Individual Voltage
0EC9-Section 17 Individual Voltage
F187-Check code
77-end code

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

DD-start

03-Naming code

00-status code

1F-data length

19DF-total voltage = 6623 = 66.23V in 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 --Residual capacity = 3493 in units of 10mAH, the final remaining capacity value is 34930mAH

0FA0-Nominal capacity = 4000, because the unit is 10mAH, all final capacity is 40,000mAH

0002-Number of cycles. 2 times

2491-Production date

0000-low equilibrium

0000-balanced high

0000-Protection status
12-Software version
57-Percent of remaining capacity 87
03 --MOS status
11-Number of battery strings 17
04-Number of temperature probes
0B98-first temperature 2968 -2731 = 247, unit is 0.1 °C = 24.7 °C
0BA9-2nd temperature
0B96-3rd temperature
0B97-4th temperature
F89A-Check code
77-end code

Revision history

Version says name	Description
V0 version	First draft
V1 version	Compatible with 30-string protection board, increase balanced high 16-bit
V2 version	Add instruction to read hardware version number, corresponding to device type in parameter setting
V3 version	Added BMS return data description
V4 version	Added verification instructions and instructions for controlling MOS