

Software board general protocol V4

One, physical interface

This protocol supports RS485/RS232/UART interface of Jiabaida software board General protocol, consistent with the host computer protocol, The baud rate is 9600BPS Or other customer customized rates.

2. Frame structure

Start bit	stateBit	Command code	length	Data content	check	Stop bit
0xDD	0xA5-read 0xA5-write	Register address	Indicates the length of the data, not including itself	Data content, if the length is 0, skip here	For dataParagraph content+lengthbyte+Command codebyteThe checksum is then inverted and added 1, with the high bit in front and the low bit in the back	0x77

Three, command explanation

Command code: read 03 to read basic information and status

Read 04 read battery cell voltage

Read 05 to read the hardware version number of the protection board

The host sends the command to read basic information 0x03

0xDD	0xA5	0x03	0	- (empty if not available)	checksum	0x77
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BMS responds to read basic information 0x03 command

0xDD	0x03	Status, 0 means correct	Indicates the length of the data, excluding itself, the length is 0 when the response is written	Data content, if the length is 0, skip here	checksum	0x77
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	Error 0x80	0		checksum	0x77
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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 checked byte, which is the sum of all bytes; the latter 2 are the check results, which is the result of the inverse +1 of the sum of all the previous checks

Data content explanation

Data content	Byte size	instruction
Total voltage	2BYTE, unit 10mV, high byte first, the same below	
Current	2BYTE, unit 10mA	The current is used to judge the battery's charge and discharge status, charging is positive and discharging 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 date is the lowest 5: 0x2028&0x1f = 8 means the date; month (0x2068>>5)&0x0f = 0x03 means March; the year is 2000+ (0x2068>>9) = 2000 + 0x10 =2016;
Equilibrium	2BYTE	Each bit represents the balance of each string, 0 is closed, 1 is open, which means 1~16 strings
Equilibrium_High	2BYTE	Each bit means each string is balanced, 0 means off, 1 means on, 17~32 strings, and up to 32 strings are supported Added on the basis of 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 version 1.0
RSOC	1byte	Indicates the percentage of remaining capacity
FET control	1byte	MOS indicates status, bit0 means charging, bit1 means discharging, 0 means MOS is off, 1 means on

status		
Number of battery strings	1byte	Number of battery strings
Number of NTC N	1byte	Number of NTC
N NTC content	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 monomer overvoltage protection	Bit4 charging over temperature protection	bit9 discharge overcurrent protection
bit1 monomer undervoltage protection	bit5 charging low temperature protection	bit10 short circuit protection
bit2 The whole group of overvoltage protection	bit6 discharge over-temperature protection	bit11 Front-end detection IC error
bit3 whole group undervoltage protection	bit7 discharge low temperature protection	bit12 software lock MOS
	bit8 charging overcurrent protection	bit13~bit15 reserved

The host sends the read cell voltage 0x04 command

0xDD	0xA5	0x04	0	- (empty if not available)	checksum	0x77
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BMS responds to read basic information 0x03 command

0xDD	0x04	Status, 0 means correct	Indicates the length of the data, excluding itself, the length is 0 when the response is written	Data content, if the length is 0, skip here	checksum	0x77
		Error 0x80	0		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 checked byte, which is the sum of all bytes; the latter 2 are the check results, which is the result of the inverse +1 of the sum of all the previous checks

Data content explanation

Data length	The data length is the number of battery strings N multiplied by 2
First string cell voltage	2Byte, unit mV, high order first
Second string cell voltage	2Byte, unit mV, high order first
The third string of cell voltage	2Byte, unit mV, high order first
Nth string cell voltage	2Byte, unit mV, high order first

The host sends the instruction to read the hardware version number of the protection board 0x05, which can support up to 31 characters, and write the model through the device model of the host computer

0xDD	0xA5	0x05	0	- (empty if not available)	checksum	0x77
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BMS responds to read basic information 0x03 command

0xDD	0x04	Status, 0 means correct	Indicates the length of the data, excluding itself, the length is 0 when the response is written	Data content, if the length is 0, skip here	checksum	0x77
		Error 0x80	0		checksum	0x77

Data content explanation

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 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

Red is the checked byte, which is the sum of all bytes; the latter 2 are the check results, which is the result of the inverse +1 of the sum of all the previous checks

Four, control MOS instructions

HostsendControl MOSinstruction

Start bit	stateBit	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 command

0xDD	0xe1	0x00	0x00	-	Checksum_HChecksum_L	0x77
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Note: The verification calculation method is consistent with other methods. Where XX represents the state of the control MOS.

XX value	MOS action
0x00	Release the software to close the MOS tube action
0x01	The software closes the charging MOS, and the software closes the discharging MOS.
0x02	The software closes the discharging MOS, and the software closes the charging MOS.
0x03	The software closes the charge and discharge MOS at the same time
Do not write values beyond the self-range	

Example: send from the hostDD 5A E1 02 00 02 FF 1B 77 means that the software closes the discharge MOS;

five,Protocol data description:

The host sends the read cell voltage 0x04 command, BMS return data description:

DD-frame header, starting byte 04-command code, read cell voltage 00-status code, non-zero is error, 0 is correct 22-data short length, 34 data, indicating battery pack There are 17 strings, one string of 2 data 0EC8-the first cell voltage 37840EC8-the second cell voltage 37440ECB-the third cell voltage 0ECF-the fourth cell voltage 0ECA-the fifth Section 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 the command to read basic information 0x03, BMS return data description:

DD --start 03 --name code 00 --status code 1F --data length 19DF - total voltage = 6623 = 66.23V, the unit is 10mV F824 --Total current = 63524, the highest bit is 1, which is discharge, current value = 65536-63524 = 2012, the unit is 10mA, so the final current is -20.12A 0DA5 - remaining capacity = 3493, unit 10mAH, the final remaining capacity value is 34930mAH 0FA0 --Nominal capacity=4000, because the unit is 10mAH, all final capacity is 40,000mAH 0002 --The number of cycles. 2 times 2491 - production date 0000 - balance low 0000 - balance high 0000 - protection status 12 - software version 57 - remaining capacity percentage 8703 - MOS status 11 - number of battery strings 1704 - temperature probes Number 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

Bluetooth UUID

SERVICE UUID: 0000ff00-0000-1000-8000-00805f9b34fb

write characteristic UUID: 0000ff02-0000-1000-8000-00805f9b34fb

read characteristic UUID: 0000ff01-0000-1000-8000-00805f9b34fb");

six,revise history

Version name	instruction
V0 version	First draft
V1 version	Compatible with 30 series protection boards, increase the balanced high 16 bits
V2 version	Add the instruction to read the hardware version number, corresponding to the device type in the parameter setting

V3 version	Add BMS return data description
V4 version	Add verification instructions and add instructions to control MOS