Communication protocol version information between monitoring platform and BMS

Version	Date Description		author
	V20191124 First draft		
	V20200325 Update some description information, change 0xA10 to 0XD2, dedicated charger switch indicator make		
	V20200325	Determine the baud rate of the transmitted data to 115200	
	V20200329 Updated and optimized the instruction table and redefined the data identification code		
	V20200329 adds a command to read all data at once.		
	V20200427	Write ID and factory date for explanation	
	V20200429	Add 0xb7 address software version number	
	V20200429	Detailed description of the address 0x8b 0x8c	
	V20200508	Optimize the address 0x84 and change the unit from 0.1A to 0.01A	
	V20200512 0x81 Address name to redefine the temperature inside the battery box		
	V20200512	Redefine the name of 0xA0 0xA1	
	V20200512	Add the alarm bit at address 0x8B	
	V20200526 Added restart system flag 0xBB		
	V20200615	Added 0xB8 to identify version change V2.0	
	V20200713	Add 0xBC logo to restore factory initialization version change V2.1	
		Add 309 fault information	
	V20200825	Add 0xBE 0xBF	
V2.4	20201204	Add 0xC0 to redefine the current field data	echo
V2.5	20201217	Add necessary fields to report	echo

Contents

1 Overview This

specification defines the communication protocol between the monitoring platform and the battery terminal, defines the message format and transmission method, communication method, etc.

2 Reference standard

communication uses TCP transmission in 2G GPRS, GAT1 in 4G, SOCKET interface, RS232TTL serial port, content custom communication format, baud rate 115200. 3 Network topology

This protocol is BMS, GPS,

Bluetooth terminal, PC host computer and terminal point-to-point or bus mode. 4 Protocol content 4.1

Communication rules During

the communication process,

the device has active reporting frames and passive response frames. For details, refer to the communication data format. The interval between each packet is at least 100MS, and the longest reply packet does not

Scheduled broadcast, if in sleep mode, send activation information to the control end to activate BMS and then communicate.

4.2 Frame Format

A frame is the basic unit for transmitting information. It includes the start character, length, command word, transmission type, information field, end mark, and checksum. The specific format is shown in Table 1.

As shown. If there is no mandatory content in the data unit, the low byte is on the right and the high byte is on the left. When sending, the high byte is sent first and then the low byte.

Table 1 Frame format

Serial number	Frame Unit	Length Notes	
1	STX	2	Start frame: 0x4E(78"N") 0x57(87"W")
2	LENGTH	2	Frame length
3	BMS terminal number	4	4-byte ID
4	command	1	Refer to the command word description,
5	word frame source	1	0.BMS, 1.Bluetooth, 2.GPS, 3.PC host computer
6	Transport Type	1	0. Read data, 1. Response frame 2. BMS actively uploads
7	Frame Information Element	N	Information field BMS setting data identification code
8	Record number	4	The upper 1 byte is a random code and has no meaning (reserved for encryption), and the lower 3 bytes are Record number
9	End mark	1	0X68
10	Checksum	4	Accumulate checksum (the upper two bytes are used for CRC and are not enabled yet, fill in 0, the lower two bytes are used for Bytes are used for cumulative verification)

4.2.1 The frame start character

field is two bytes. The first byte is 0x4e and the second byte is 0x57.

4.2.2 Length field

L: Two bytes, including all data bytes excluding the first two characters, including the checksum and length field itself.

4.2.3 BMS terminal number ()

Four bytes in total: FF FF FF FF The highest 8 bits are the management standby number, and the lower 24 bits are the terminal number

, (The highest byte is reserved as 00 by default, and the lower three bytes are the dimension ID number)

4.2.4 Command Word Description One byte that defines

the transmission function of this frame.

Command code	command item	Remark
0x01	Activate command,	When the BMS is in sleep mode, the control terminal needs to send an activation command to communicate with the BMS. After replying, proceed with other operations.
0X02	Write instruction	Configure BMS parameter instructions,

0X03 Read instruction		Read BMS identification code data,
0x05 Password instruction		When you want to modify the parameters, you can only change them after the command is correct.
0x06 Read all data		Read all the data of the identification code table at one time

4.2.5 Frame source description

1 byte. Relative to the sender and receiver, 0. BMS, 1. Bluetooth, 2. GPS, 3. PC host computer

4.2.6 Transmission Type

1 byte: 0 represents a request frame, 1 represents a response frame, and 2 represents an active report.

As long as 5-Bluetooth, 2-GPS, 3-PC host computer, 4-BMS initiates first, the reply is 1.

4.2.7 The upper byte of the

record number is a random code, and the lower 3 bytes are the record code

4.2.8 End Code Field

One byte 0x68

4.2.9 Checksum field

The high two bytes of CRC16 are not used temporarily, and the checksum is the cumulative sum of all data from the start character to the end mark.

4.3 Communication data format

example: GPS read (all, single) data reference

Sequence number	frame unit	length	byte
1	STX	2	Start frame: 0x4E(78"N") 0x57(87"W")
2	LENGTH	2	Frame length
3	BMS terminal number	4	4-byte ID
Command word	1	5	Frame source Reference command write instructions
1			0. Data box, 1. Bluetooth, 2. GPS, 3. PC host computer
6	Transmission Type	1	0. Read data, 1. Response frame 2. Data box actively uploads
7	Data identification code	1	Read single data and refer to (Table 5.1); read all data and fill in 0x00
8	Record number	4	The high 1 byte is a random code and has no meaning (reserved for encryption), and the low 3 bytes are the record number
9	End mark	1	0x68
10	Checksum	4	

BMS Response

Sequence	frame unit	length	
1	STX	2	Start frame: 0x4E(78"N") 0x57(87"W")

2	LENGTH	2	
3 Terminal number		4	
4 Command word		1	
5 Frame Source		1	0. Data box, 1. Bluetooth, 2. GPS, 3. PC host computer
6 Transmission Type		1	0. Read data, 1. Response frame 2. Data box actively uploads
7 **identification code + data** 1 + N			Identification code + data
8	Record number	4 The high 1 byte is a random code and has no meaning (reserved for encryption), and the low 3 bytes are the record number	
9 End mark		1	0X68
10 Checksum		4	

Example: GPS write data reference

Sequence number frame unit length byte			
1	STX	2	Start frame: 0x4E(78"N") 0x57(87"W")
2	LENGTH	2	Frame length
3 BMS terminal number 4 4			4-byte ID
Command word 1 5 Frame source			Reference command write instructions
1			0. Data box, 1. Bluetooth, 2. GPS, 3. PC host computer
6 Transmission Type 1			0. Read data, 1. Response frame 2. Data box actively uploads
7 Identification code + data 1 + N			Identification code + data
8 Record number		4 The high 1 byte is a random code and has no meaning (reserved for encryption), and the low 3 bytes are the record number	
9 End mark 1			0x68
10 Checksum 4			

BMS Response

Sequence frame unit length			
1	STX	2	Start frame: 0x4E(78"N") 0x57(87"W")
2	LENGTH	2	
3 Terminal number		4	

4 Command word		1	
5 Frame Source		1	0.BMS, 1.Bluetooth, 2.GPS, 3.PC host computer
6 Transmission Type		1	0. Read data, 1. Response frame 2. BMS actively uploads
7 Identification code		1 Write a single data reference (5.1 table);	
8	Record number	4 The high 1 byte is a random code and has no meaning (reserved for encryption), and the low 3 bytes are the record number	
9 End mark		1	0X68
10 Checksum		4	

Note on the identification code: (When reading all data, fill in 0x00 for the background data identification code)

5.1 BMS setting data identification code

use instruction	Data Label Code recognition	name	Byte	Type	
R	0x79	Single battery voltage 3*n HEX			The first byte is the battery number, and the second byte is the voltage value MV. When 0x79 is followed by a byte length data, and then every three bytes represent the power Battery voltage.
R	0x80	Read power tube temperature	2	HEX	0--140 (-40 to 100ÿ) The temperature above 100 is negative temperature, such as 10 1 is negative 1 degree (100 Benchmark)
R	0x81	Read the temperature inside the battery box	2	HEX	0--140 (-40 to 100ÿ) The part above 100 is negative temperature, same as above (100 base)
R	0x82	Read battery temperature	2	HEX	0--140 (-40 to 100ÿ) The part above 100 is negative temperature, same as above (100 base)
R	0X83	Total battery voltage	2	HEX	0.01V 3500*0.01=35.0 0v Minimum unit 10MV
R	0X84	Current data	2	Hex	10000 (10000-11000)*0.01=-10.00a(discharge) (10000-9500)*0.01=5.00a (charging) Accuracy 10MA Unit: 0.01A Note: C0:0x01 redefines 0x84 current data, unit 10MA, the highest bit is 0 indicates discharge, 1 indicates charging If the discharge is 20A, the transmitted data is 2000 (0x07D0) If charging 20A, the transmitted data is 34768 (0x87D0)
R	0X85	Remaining battery capacity	1	HEX	SOCÿ 0-100%,
R	0X86	Battery temperature sensor quantity 1		Hex	Two battery temperature sensors .
R	0X87	Battery life cycle 2		Hex	
R	0X89	Battery cycle total capacity 4 HEX			Anshi
R	0x8a	Total number of battery strings	2	HEX	

R	0X8b	Battery warning message	2	hex	0 position: Low capacity alarm 1 alarm 0 normal . Warning only 1 bit: MOS tube over temperature alarm 1 alarm 0 normal, alarm 2: Charging overvoltage alarm 1 alarm 0 normal, alarm 3rd position: Discharge undervoltage alarm 1 alarm 0 normal, alarm 4: Battery over temperature alarm 1 alarm 0 normal, alarm 5th position: Charging overcurrent alarm 1 alarm 0 normal , alarm 6th position: Discharge overcurrent alarm 1 alarm 0 normal, alarm 7: Battery pressure difference alarm 1 alarm 0 normal, alarm 8 bits: Battery box over temperature alarm 1 alarm 0 normal, alarm 9th position: Battery low temperature alarm 1 alarm 0 normal, alarm 10th position: Single overpressure alarm 1 alarm 0 normal, alarm 11th position: Single cell undervoltage alarm 1 alarm 0 normal, alarm 12th bit: 309_A protection 1 alarm 0 normal, alarm 13th bit: 309_B protection 1 alarm 0 normal, alarm Bit 14: Reserved Bit 15: Reserved example : 0x0001: indicates low capacity alarm value 0x0001 ----> Low capacity alarm 0x0002 ----> Power board over temperature alarm
R	0X8c	Battery status information	2		0 position charging MOS tube status 1 on 0 off This is used for upload prompt 0x0003 ----> Low capacity alarm and power board over temperature alarm The status of 1-bit discharge MOS tube is 1 on and 0 off. This is used for upload prompt. 0x000C: indicates charging overvoltage and discharging undervoltage alarm 2-position balance switch status 1 on, 0 off This is for upload prompts 3-bit battery drop 1 is normal. 0 is dropped. This is the upload prompt. 4-15: Reserved example : 00 01: Indicates that the charging MOS tube is turned on
RW	0x8e	Total voltage overvoltage protection 2 HEX 1000-15000 (10 MV) minimum unit 10MV			
RW	0x8f	Total voltage undervoltage protection 2 HEX 1000-15000			(10 MV)Minimum unit 10MV
RW	0X90	Single overvoltage protection voltage 2		Hex 1000--4500 MV,	
RW	0x91	Single overvoltage recovery voltage 2 HEX 1000-4500MV			
RW	0x92	Single overvoltage protection delay 2 HEX 1-60 seconds			
RW	0x93	Single cell undervoltage protection voltage 2		Hex 1000--4500 MV	
RW	0x94	Single undervoltage recovery voltage 2 HEX 1000-4500MV			
RW	0x95	Single-cell undervoltage protection delay 2 HEX 1-60S seconds			
RW	0x96	Battery voltage difference protection value 2		Hex	0-1000MV
RW	0x97	Discharge overcurrent protection value 2		Hex 1-1000A	
RW	0x98	Discharge overcurrent delay	2	Hex 1-60S seconds	
RW	0x99	Charging overcurrent protection value 2		Hex 1-1000A	
RW	0x9a	Charge overcurrent delay	2 HEX 1-60S		
RW	0x9b	Balanced start voltage	2	Hex 2000-4500MV	

RW	0x9c Balanced start voltage difference	2	hex	10-1000 MVÿ	
RW	0x9d Active balancing switch	1	Hex 0 off or 1 on		
RW	0x9e Power tube temperature protection value 2		Hex 0--100ÿ		
RW	0x9f Power tube temperature recovery value 2		Hex 0-100ÿ		
RW	0xa0 Battery box internal temperature protection value 2		Hex 40--100ÿ		
RW	0xa1 Battery box temperature recovery value 2		Hex 40--100ÿ		
RW	0xa2 Battery temperature difference protection value 2		Hex 5-20ÿ		
RW	0xa3 Battery charging high temperature protection value 2 HEX 0-100ÿ				
RW	0xa4 Battery discharge high temperature protection value 2 HEX 0-100ÿ				
RW	0xa5 Charging low temperature protection value 2		Hex -45ÿ /+25ÿ (No reference-signed data)		
RW	0xa6 Charging low temperature protection recovery value 2		Hex -45ÿ /+25ÿ (No reference-signed data)		
RW	0xa7 Discharge low temperature protection value 2		Hex -45ÿ /+25ÿ (No reference-signed data)		
RW	0xa8 Discharge low temperature protection recovery value 2		Hex -45ÿ /+25ÿ (No reference-signed data)		
RW	0xa9	Battery string number setting 1	Hex	3-32	
RW	0xaa Battery capacity setting	4	Hex AH (Ah)		
RW	0xab Charging MOS switch 1		Hex 0 Close 1 Open		
RW	0xac Discharge MOS tube switch 1		Hex 0 Close 1 Open		
RW	0xad	Current calibration	2	Hex 100MA-20000MA	
RW	0xae	Protection board address	1	Hex is reserved for use in cascading.	
RW	0xaf	Battery Type	1 HEX 0: Lithium iron phosphate,	1: Three yuan,	2: Lithium Titanate
RW	0xb0 Sleep wait time		2	Hex second data, for reference only.	
RW	0xb1	Low capacity alarm value	1	Hex 0--80%	
RW	0xb2 Modify parameter password		1 0	Hex is temporarily used as a reference, and a fixed password is used.	
RW	0xb3 Dedicated charger switch 1			Hex 0 off or 1 on	
RW	0Xb4	Device ID code	8 characters	Example 60300001 (60-nominal voltage level: defined by voltage level, e.g. 60 means 60V Series 48 is a 48V series; 3 - Material system: defined by the system of battery materials, such as iron Lithium code is 1, manganese oxide code is 2, ternary code is 3; 00001-production serial number: according to the manufacturer The manufacturer produces the Nth group of the model in the month, and the number is N (for example: a certain model The first group of numbers, then N is 00001)) Character	
RW	0Xb5	Date of manufacture	4 characters	Example 2004-Year of production: Take the last two digits of the actual year of production; List the products produced in 2020 Battery, Year Code 20; Production month: January to December;	character

RW	0xb6 System working time		4 HEX factory reset, unit:		
R	0xb7	Software version number	15 characters NW_1_0_0_200428		
RW	0xb8 Whether to start current calibration 1 HEX 1: Start calibration 0: Close calibration				
RW	0xb9	Actual battery capacity	4 HEX AH (Ah)		
RW	0xBA	Manufacturer ID naming	2 4 characters		Column: "BT3072020120000200521001" *Product Name: BT for Battery *Material system: Iron lithium code 1; manganese oxide code 2; ternary code 3 * Voltage level: 48V series use 48; 60V series use 60; 72V series use 72 *Capacity level: 20AH specification uses 20 *Cycle life: 400 cycles are marked with 04, 1200 cycles are marked with 1 2 *Manufacturer code: English code of the low-speed vehicle battery manufacturer. If the English code is insufficient, Four digits, padded with character 0 *Year of production: The last two digits of the actual year of production; the year of production of batteries in 2019 is listed. Code "19" *Production month: January to December *Production date: 01-31 *Production serial number: The Nth group of this model produced on the manufacturer's production date. The number is N (for example, the first group of a certain model is 001)
W	0xBB	Restart the system	1 HEX 1: Restart the system		
W	0xBC Restore factory settings 1 HeX 1: Restore (restore only the factory default parameters)				
W	0xBD Remote upgrade flag		1 HeX 1 Start (wait for the logo to reply when sending the file)		
W	0xBE Battery low voltage turns off GPS 2			Hex unit: mv (turn off power to GPS when low voltage is detected)	
W	0xBF Battery low voltage recovery GPS 2			Hex unit: mv (turn on the power to the GPS when the recovery voltage value is detected)	
R	0xC0	Protocol version number	1	Hex	Default value: 0x00 0x01: Redefine 0x84 current data, unit 10MA, the highest bit is 0 to indicate discharge, 1 means charging If the discharge is 20A, the transmitted data is 2000 (0x07D0) If charging 20A, the transmitted data is 34768 (0x87D0)

ÿNoteÿ

1. All fields from 0x79 to 0xb9 marked with R or RW should be reported. For the old versions that have been shipped but not reported, try to upgrade. If it is inconvenient to upgrade, please contact Contact our technical support, Tel: 13755639263/13480924112
2. 0xBA Manufacturer ID naming. This field is mainly used for battery swap cabinets. If there is a need for a battery swap cabinet, this field must be added.