

BMS—CAN Communication protocol specification

Communication specification:

The Bus communication rate is 250Kbps

Timeout range: 150mS

The provisions of data link layer mainly refer to relevant provisions of CAN2.0B and J1939

29 bit identifier of can extension frame is used and redefined. The following is the allocation table of 29 bit identifier:

28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
3	2	1	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
Prior			R		PF								PS								SA							

Among them: priority is priority, accounting for 3 bits; R is reserved bit, accounting for 1 bit; SA is the source address of sending message, accounting for 8 bits; PS is the target address, accounting for 8 bits; PF is the message type, accounting for 8 bits.

Can network address assignment table:

Node name	address
BMS	0x11, 0x12, 0x13……
PC or client	1(0x1)
Broadcast address (BA)	3(0x03)

Where: BMS address is the address of the dial switch, plus the offset, the offset is 11h.

Modification record		
date	name	content
2016-12-16	wang	Initial finalization

1、Query BMS information message format

message 1.1: PC circularly sends and queries BMS battery cell voltage information

OUT	IN	ID			Cycle (mS)
PC or client	BMS 1、 2、 3.....	Prior	R	PF	500
		4	0	42H	
data					
position	Data name				

BMS Return data message

OUT	IN	ID			cycle(ms)
BMS 1、 2、 3.....	PC or Client	Prior	R	PF	trigger
		4	0	42H	
data					
position	Data name				
BYTE1	BMS x serial number n high byte		2Byte		
BYTE2	BMS x serial number n low byte				
BYTE3	(3 * n + 1) Cell voltage high byte		Cell voltage: mV		
BYTE4	(3 * n + 1)cell voltage low byte				
BYTE5	(3 * n + 2)		Cell voltage : mV		
BYTE6	(3 * n + 2)cell voltage low byte				
BYTE7	(3 * n + 3)cell voltage high byte		Cell voltage : mV		
BYTE8	(3 * n + 3)cell voltage low byte				
.					
.					
.					

message1.2: PC circularly sends and queries BMS temperature information

OUT	IN	ID			cycle(ms)
PC or Client	BMS 1、 2、 3.....	Prior	R	PF	500
		4	0	43H	
data					

BMS return data message

OUT	IN	ID			cycle(ms)
BMS 1、 2、 3.....	PC or Client	Prior	R	PF	trigger
		4	0	43H	
data					
position	Data name				
BYTE1	BMS xserial number n high byte				

BYTE2	BMS xserial number n low byte	
BYTE3	(3 * n + 1) temperature high byte	temperature : 0.1K , 25.5℃: 25.5 * 10 + 2730 = 2985 (0.1K)
BYTE4	(3 * n + 1) temperature low byte	
BYTE5	(3 * n + 2) temperature high byte	temperature : 0.1K , -20.0℃: -20.0 * 10 + 2730 = 2530 (0.1K)
BYTE6	(3 * n + 2) temperature low byte	
BYTE7	(3 * n + 3) temperature high byte	temperature : 0.1K , (undefined temeture is 0x8000, Second to last temperature is MOStemperature, first to last temperature is environment temperature)
BYTE8	(3 * n + 3) temperature low byte	
.		
.		
.		

message1.3: PC circularly sends and queries BMS battery system information

OUT	IN	ID			cycle(ms)
PC or Client	BMS 1、 2、 3.....	Prior	R	PF	500
		2	0	44H	

BMSreturn data message

OUT	IN	ID			cycle(ms)
BMS 1、 2、 3.....	PC or Client	Prior	R	PF	trigger
		2	0	44H	
data					
position	Data name				
BYTE1	BMS x cell number high byte		2Byte, cell number		
BYTE2	BMS x cell number low byte				
BYTE3	BMS x total voltage high byte		0.01V		
BYTE4	BMS x total voltage low byte				
BYTE5	BMS x current high byte		0.1A (signed int)		
BYTE6	BMS x current low byte				
BYTE7	BMS x cycle number high byte		0~65535		
BYTE8	BMS x cycle number low byte				

message1.4: PC circularly sends and queries bmswarn quantity information

OUT	IN	ID			cycle(ms)
PC or Client	BMS 1、 2、 3.....	Prior	R	PF	250
		1	0	45H	
数 据					

BMSreturn data message

OUT	IN	ID	cycle(ms)
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BMS 1、2、3.....	PC or Client	Prior	R	PF	trigger
		1	0	45H	
data					
BYTE 1	BMS x protect state1		1Byte (hex)		
BYTE 2	BMS x protect state2		1Byte (hex)		
BYTE 3	BMS x indicate state		1Byte (hex)		
BYTE 4	BMS x control state		1Byte (hex)		
BYTE 5	BMS x fault state		1Byte (hex)		
BYTE 6	Receive		1Byte		
BYTE 7	BMS x warn state1		1Byte (hex)		
BYTE 8	BMS x warn state 2		1Byte (hex)		

Protect state1

BIT	indicate	remark
7	receive	
6	Short circuit	1: Short circuit protect 0: null
5	Above discharge current protect	1: Above discharge current protect 0: null
4	Above charge current protect	1: Above charge current protect 0: null
3	Below total voltage protect	1: below total voltage protect 0: null
2	Above total voltage protect	1: above total voltage protect 0: null
1	Below cell voltage protect	1: below cell voltage protect 0: null
0	Above cell voltage protect	1: above cell voltage protect 0: null

Protect state2

BIT	indicate	remark
7	Fully	1: Fully 0: null
6	low env temperature protect	1: low env temperature protect 0: null
5	high env temperature eprotect	1: high env temperature protect 0: null
4	High mos temperature protect	1: high MOSTemperature protect 0: null
3	low discharge temperature protect (cell)	1: low discharge temperature protect 0: null
2	low charge temperature protect (cell)	1: low charge temperature protect 0: null
1	high discharge temperature protect (cell)	1: high discharge temperature protect 0: null
0	high charge temperature protect (cell)	1: high charge temperature protect 0: null

Indicate state

BIT	indicate	remark
7	Heart instructions	1: ON 0: OFF
6	receive	
5	ACin	1: Acin 0: null Acin
4	Reverse connection	1: Reverse connection 0: null

3	Power supply with pack	1: PACK	0: no use
2	DFET instructions	1: ON	0: OFF
1	CFET instructions	1: ON	0: OFF
0	Limit current instructions	1: ON	0: OFF

Control state

BIT	indicate	remark	
7	receive		
6	receive		
5	LEDwarnfunction	1: unenable	0: enable
4	Limit current function	1: unenable	0: enable
3	Limit current gear	1: 5A gear	0: 10A gear
2	receive		
1	receive		
0	Buzzer function	1: enable	0: unenable

Fault state

BIT	indicate	remark	
7	receive		
6	receive	1: fault	0: null
5	Sample fault	1: fault	0: null
4	Battery fault	1: fault	0: null
3	receive		
2	NTC fault	1: fault	0: null
1	Discharge MOSfault	1: fault	0: null
0	Charge MOSfault	1: fault	0: null

Warn state1

BIT	indicate	remark	
7			
6			
5	Above Discharge curren warn	1: warn	0: null
4	Above charge current warn	1: warn	0: null
3	Below total voltage warn	1: warn	0: null
2	Above total voltage warn	1: warn	0: null
1	Below cell voltage warn	1: warn	0: null
0	Above cell voltage warn	1: warn	0: null

Warn state2

BIT	indicate	remark	
7	Low power warn	1: warn	0: null

6	High MOS temperature warn	1: warn	0: null
5	Low Env temperature warn	1: warn	0: null
4	High env temperature warn	1: warn	0: null
3	Low discharge temperature warn (cell)	1: warn	0: null
2	Low charge temperature warn (cell)	1: warn	0: null
1	High discharge temperature warn (cell)	1: warn	0: null
0	High charge temperature warn (cell)	1: warn	0: null

Message 1.5: PC Circularly send and query BMS battery capacity information

OUT	IN	ID			cycle(ms)
PC or Client	BMS 1、 2、 3.....	Prior	R	PF	500
		2	0	46H	

BMS Return data message

OUT	IN	ID			cycle(ms)
BMS 1、 2、 3.....	PC or Client	Prior	R	PF	trigger
		2	0	46H	
data					
position	Data name				
BYTE1	BMS x design capacity high byte		10mAH		
BYTE2	BMS x design capacity low byte				
BYTE3	BMS x remain capacity high byte		10mAH		
BYTE4	BMS x remain capacity low byte				
BYTE5	BMS x full capacity high byte		10mAH		
BYTE6	BMS x full capacity low byte				
BYTE7	BMS x SOC		0~100%		
BYTE8	BMS x SOH		0~100%		

Message 1.6: PC circularly sends and queries BMS equilibrium status information

OUT	IN	ID			cycle(ms)
PC or Client	BMS 1、 2、 3.....	Prior	R	PF	500
		5	0	47H	

BMS Return data message

OUT	IN	ID			cycle(ms)
BMS 1、 2、 3.....	PC or Client	Prior	R	PF	trigger
		5	0	47H	
data					

position	Data name	
BYTE1	BMS x serial number n high byte	2Byte
BYTE2	BMS x serial number n low byte	
BYTE3	(n * 48) + (1~8) cell balance state	1Byte (hex)
BYTE4	(n * 48) + (9~16) cell balance state	1Byte (hex)
BYTE5	(n * 48) + (17~24) cell balance state	1Byte (hex)
BYTE6	(n * 48) + (25~32) cell balance state	1Byte (hex)
BYTE7	(n * 48) + (33~40) cell balance state	1Byte (hex)
BYTE8	(n * 48) + (41~48) cell balance state	1Byte (hex)
	.	
	.	
	.	

Message 1.7: PC send control command

OUT	IN	ID			cycle(ms)
PC or Client	BMS 1、2、3.....	Prior	R	PF	
		1	0	99H	
data					
position	Data name				
BYTE1	BMS x Command	1Byte			
BYTE2					
BYTE3					
BYTE4					
BYTE5					
BYTE6					
BYTE7					
BYTE8					

Command Comparison table:

COMMAND	explanation
01H	Open charge mos
02H	Close charge mos
03H	Open discharge mos
04H	Close discharge mos

BMS Return data message

OUT	IN	ID			cycle(ms)
BMS 1、2、3.....	PC or Client	Prior	R	PF	trigger
		1	0	99H	

data		
position	Data name	
BYTE1	BMS x Command	1Byte
BYTE2	RTN	00: success, 01:fail, 09:other error
BYTE3		
BYTE4		
BYTE5		
BYTE6		
BYTE7		
BYTE8		

