

**描述:**

本 BMS 采用 CAN2.0B 标准(29 位扩展帧格式), 默认波特率为 250K, BMS 默认地址为 0x0B 本协议引用标准无

**CAN ID**

表 1: 29 ID 位标识符定义

Bit 28-26	Bit 25	Bit 24-18	Bit 17-11	Bit 10-5	Bit 4-0
3	1	7	7	6	5
优先级	请求/应答	Receiver 目标地址	Sender 源地址	功能码	序列号
111	0	0000100	0000011	000011	00000

表 2: ID 定义说明

序号	名称	位长度	说明	
1	优先级 (0,7)	3	数据发送优先级	0x00:一级故障警告(最高级) 0x01:二级故障警告(次级) 0x02:超限告警(安全级) 0x03-8:预留
3	请求/响应	1	0 请求 1 应答	
5	目标地址	7	目标设备接收地址	
6	源地址	7	当前发送的设备地址	
7	功能码	5	不同功能	0x03:读寄存器 0x10:写寄存器
8	序列号	6	连续传送数据时序例 ID	连续发送数据序列 ID

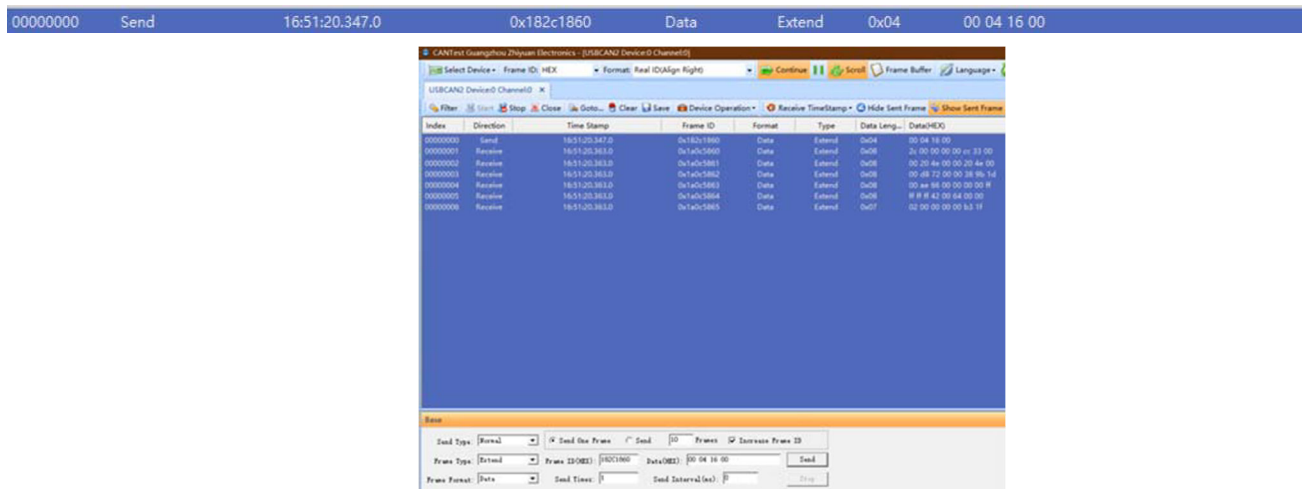
CAN 报文格式读

CANID(29Bit)	数据起始地址(2Byt)	数据长度	数据内容(n..)	CRC16 校验(2 Byt)
0x182C1860	00 04	16 00	空	4F 85

例：读取电池信息

CANID 0x182C1860 数据起始地址 0x0400 数据长度 0x0016

CAN 发送数据格式为 CANID 0x182C1860 数据长度 6 数据内容 00 04 16 00 4F 85



The screenshot shows the CANalyzer interface. The top status bar indicates a message with CAN ID 0x182c1860, Data, Extended format, 0x04 length, and data content 00 04 16 00. The main window displays a list of messages, with the selected message highlighted in blue. The message details at the bottom show: Send Type: Normal, Frame ID: 0x182C1860, Data Length: 04, and Data: 00 04 16 00.

BMS 回复格式

CANID	数据长度(1Byte)	数据内容(最大 253)	CRC16 校验(2Byte)
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00000001	Receive	16:51:20.363.0	0x1a0c5860	Data	Extend	0x08	2c 00 00 00 00 cc 33 00
00000002	Receive	16:51:20.363.0	0x1a0c5861	Data	Extend	0x08	00 20 4e 00 00 20 4e 00
00000003	Receive	16:51:20.363.0	0x1a0c5862	Data	Extend	0x08	00 d8 72 00 00 38 9b 1d
00000004	Receive	16:51:20.363.0	0x1a0c5863	Data	Extend	0x08	00 ae 66 00 00 00 00 ff
00000005	Receive	16:51:20.363.0	0x1a0c5864	Data	Extend	0x08	ff ff ff 42 00 64 00 00
00000006	Receive	16:51:20.363.0	0x1a0c5865	Data	Extend	0x07	02 00 00 00 00 b3 1f

序号	CANID	数据地址	名称	单位	变量类型	备注
1	0x182C1860	0x0400	Current_L	mA	long	电流
2	0x182C1860	0x0401	Current_H			
3	0x182C1860	0x0402	RemainingCapacity_L	mAh	unsigned long	剩余容量
4	0x182C1860	0x0403	RemainingCapacity_H			
5	0x182C1860	0x0404	FullChargeCapacity_L	mAh	unsigned long	
6	0x182C1860	0x0405	FullChargeCapacity_H			
7	0x182C1860	0x0406	Charge Current_L	mA	unsigned long	
8	0x182C1860	0x0407	Charge Current_H			
9	0x182C1860	0x0408	ChargingVoltage_L	mV	unsigned long	
10	0x182C1860	0x0409	ChargingVoltage_H			
11	0x182C1860	0x040A	PACK Voltage_L	mV	unsigned long	
12	0x182C1860	0x040B	PACK Voltage_H			
13	0x182C1860	0x040C	BatteryVoltage_L	mV	unsigned long	
14	0x182C1860	0x040D	BatteryVoltage_H			
15	0x182C1860	0x040E	Cycle_Count	%	unsigned short	
16	0x182C1860	0x040F	AverageTimeToEmpty	min	unsigned short	见附录 1
17	0x182C1860	0x0410	AverageTimeToFull	min	unsigned short	见附录 1
18	0x182C1860	0x0411	SOC	%	unsigned short	
19	0x182C1860	0x0412	SOH	%	unsigned short	

20	0x182C1860	0x0413	BatteryStatus	Hex	unsigned short	
21	0x182C1860	0x0414	BatteryAlarm	Hex	unsigned short	
22	0x182C1860	0x0415	BatterySafety	Hex	unsigned short	
以此类推						
23	0x182C1860	0x0800	Voltage Max	mV	unsigned short	
24	0x182C1860	0x0801	Voltage Min	mV	unsigned short	
25	0x182C1860	0x0802	Voltage 1	mV	unsigned short	
26	0x182C1860	0x0803	Voltage 2	mV	unsigned short	
27	0x182C1860	0x0804	Voltage 3	mV	unsigned short	
28	0x182C1860	0x0805	Voltage 4	mV	unsigned short	
29	0x182C1860	0x0806	Voltage 5	mV	unsigned short	
30	0x182C1860	0x0807	Voltage 6	mV	unsigned short	
32	0x182C1860	0x0808	Voltage 7	mV	unsigned short	
33	0x182C1860	0x0809	Voltage 8	mV	unsigned short	
34	0x182C1860	0x080A	Voltage 9	mV	unsigned short	
35	0x182C1860	0x080B	Voltage 10	mV	unsigned short	
以此类推						
36	0x182C1860	0x0C00	Temp MAX	K	unsigned short	
37	0x182C1860	0x0C01	Temp MIN	K	unsigned short	
38	0x182C1860	0x0C02	Temp1	K	unsigned short	
39	0x182C1860	0x0C03	Temp2	K	unsigned short	
40	0x182C1860	0x0C03	Temp3	K	unsigned short	
以此类推						
41	0x182C1860	0x2800	BMS ID	HEX	12Byte	12 个字节

\*\*\*\*注意 CRC 采用的是 CRC-16/MODBUS x16+x15+x2+1; 温度转换 $^{\circ}\text{C}=(\text{值}-2731)/10$  单位  $0.1^{\circ}\text{C}$ \*\*\*\*

### 控制命令

序号	CANID	数据地址	名称	单位	变量类型	备注
1	0x182C1860	0xFC00	0x0020	Hex	unsigned short	充电 mos 开关
2	0x182C1860	0xFC00	0x0021	Hex	unsigned short	放电 mos 开关
3	0x182C1860	0xFC00	0x0041	Hex	unsigned short	BMS 重启

The screenshot displays the CANTest software interface for a USB-CAN2 Device Channel 0. The main window shows a table of received and sent CAN frames. Below the table is a configuration panel with fields for Send Type, Frame Type, Frame ID, Data, Send Times, and Send Interval.

Index	Direction	Time Stamp	Frame ID	Format	Type	Data Leng...	Data(HEX)
00000000	Send	16:57:29.651.0	0x182c1860	Data	Extend	0x04	00 08 10 00
00000001	Receive	16:57:29.665.0	0x1a0c5860	Data	Extend	0x08	20 d7 0c d1 0c d1 0c d7
00000002	Receive	16:57:29.665.0	0x1a0c5861	Data	Extend	0x08	0c d5 0c d5 0c d7 0c d5
00000003	Receive	16:57:29.665.0	0x1a0c5862	Data	Extend	0x08	0c d7 0c d5 0c 00 00 00
00000004	Receive	16:57:29.665.0	0x1a0c5863	Data	Extend	0x08	00 00 00 00 00 00 00
00000005	Receive	16:57:29.665.0	0x1a0c5864	Data	Extend	0x03	00 40 9c

Base configuration panel:  
Send Type: Normal | Send One Frame | Send | 10 Frames | Increase Frame ID  
Frame Type: Extend | Frame ID(HEX): 182C1860 | Data(HEX): 00 08 10 00 | Send  
Frame Format: Data | Send Times: 1 | Send Interval(ms): 0 | Stop

Bottom status bar: Send Time(s): 0.001 | Send Frames: 1 | Receive Frames: 5 | Clear

## 附录 1:

### BatteryStatus 状态位

ACT	HEAT	CC_Offset	CAL_EN	PACK_CHG	WCS_KEY	LED	COCV
RTA	INIT	SLEEP	FC	FD	IR	CC	CF

- Bit0 CF: 1; //容量自修正学习
- Bit1 CC:1; //循环计数
- Bit2 IR:1; //内阻更新
- Bit3 FD: 1; // 电池放空
- Bit4 FC: 1; // 电池充满
- Bit5 Sleep: 1; // IR= 1 内阻计算成功 0
- Bit6 INIT:1; //AFE 数据读取
- Bit7 RTA:1; //剩余时间
- Bit8 COCV:1; //OCV 容量修正
- Bit9 LED: LED 容量打开指示
- Bit10 WCS\_KEY:1; 弱电开关 1:ON 0:OFF
- Bit11 PACK\_CHG:1; 保留
- Bit12 CAL\_EN:1; //校准使能
- Bit13 CC\_Offset:1; //校准 CC 偏移量
- Bit14 HEAT:1; //通讯数据读取中
- Bit15 ACT:1; //程序激活

### BatteryAlarm 状态位

ALERT	P_DSG	REVC	REVC	CHG_UT	CHG_OT	OCC	COV
REVC	REVC	DSG_UT	RCA	DSG_OT	SCD	OCD	CUV

- Bit0 CUV: 1; // 单节电池欠压
- Bit1 OCD: 1; // 放电过流
- Bit2 SCD: 1; // 电池短路
- Bit3 DSG\_OT: 1; // 放电过温保护
- Bit4 RCA: 1; // 剩余容量保护
- Bit5 DSG\_UT: 1; //放电低温保护
- Bit6 REVC:2;保留
- Bit8 COV: 1; // 单节电池过压
- Bit9 OCC: 1; // 充电过流
- Bit10 CHG\_OT: 1; //充电过温保护
- Bit11 CHG\_UT: 1; // 充电低温保护
- Bit12 REVC:1;保留
- Bit13 REVC:1; 保留
- Bit14 P\_DSG:1; 保留
- Bit15 ALERT:1; 保留

## 附录 2:

## BatterySafety 状态位

ALERT	P_DSG	REVC	REVC	CHG_UT	CHG_OT	OCC	COV
REVC	REVC	DSG_UT	RCA	DSG_OT	SCD	OCD	CUV

- Bit0 CUV : 1; // 单节电池欠压
- Bit1 OCD : 1; // 放电过流
- Bit2 SCD : 1; // 电池短路
- Bit3 DSG\_OT : 1; // 放电过温保护
- Bit4 RCA : 1; // 剩余容量保护
- Bit5 DSG\_UT : 1; // 放电低温保护
- Bit6 REVC:2;保留
- Bit8 COV : 1; // 单节电池过压
- Bit9 OCC : 1; // 充电过流
- Bit10 CHG\_OT : 1; // 充电过温保护
- Bit11 CHG\_UT : 1; // 充电低温保护
- Bit12 REVC:1;保留
- Bit13 REVC1:1; 保留
- Bit14 P\_DSG:1; 保留
- Bit15 ALERT :1; 保留

## AFE 状态

SLEEP	WAKE_FLG	CBEN	AFE_WDT	TWI	CHGING	DSGING	CHGR
LOAD	CFLG	TFLG	VFLG	ALARM	PCHG_FET	DSG_FET	CHG_FET

- Bit0 CHG\_FET: 1; // 充电 MOS
- Bit1 DSG\_FET: 1; // 放电 MOS
- Bit2 PCHG\_FET: 1; // 预充
- Bit3 ALARM: 1; // 中断
- Bit4 VFLG: 1; // 电压中断
- Bit5 TFLG: 1; // 温度中断
- Bit6 CFLG: 1; // 电流中断
- Bit7 LOAD: 1; // 负载检测
- Bit8 CHGR: 1; // 充电器检测
- Bit9 DSGING: 1; // 放电状态
- Bit10 CHGING: 1; // 充电状态
- Bit11 TWI: 1; // 通讯
- Bit12 AFE\_WDT: 1; // 看门狗
- Bit13 CBEN: 1; // 均衡开启
- Bit14 WAKE\_FLG:1;
- Bit15 SLEEP: 1; // 休眠模式

## AFE 保护

REVC	REVC	REVC	REVC	REVC	REVC	REVC	OTC
UTC	OTD	UTD	ODC1	OCC	UV	SCD	COV

Bit0 COV: 1; // 过压

Bit1 SCD: 1; // 短路

Bit2 UV: 1; // 欠压

Bit3 OCC: 1; // 充电过流

Bit4 ODC1: 1; // 放电过流

Bit5 ODC2: 1; // 放电过流

Bit6 UTD: 1; // 放电低温

Bit7 OTD: 1; // 放电高温

Bit8 UTC: 1; // 充电低温

Bit9 OTC: 1; // 充电高温