

## 1. Normative reference files

The following documents are essential for the application of this document. Any date - dated version is applicable to this document. The latest version of any undated reference document is applicable to this document

The first part of the ISO 11898-1:2006 road vehicle controller local area network: data link layer and physical signaling (Road Vehicles-Controller Area Network (CAN) Part 1:Data Link Layer

SAE J1939-11:2006 commercial vehicle control system local area network (CAN) communication protocol eleventh part: physical layer, 250Kbps, shielded twisted pair (Recommended Practice for a Serial Control and Communications Vehicle Network Part 11: Physical Layer,250Kbps,Twisted shielded Pair) .

## 2. Communication specification

### 2.1 Standard of execution

This protocol adopts the CAN protocol 2.0B standard

### 2.2 Protocol format

The format of message in communication protocol follows the relevant regulations in J1939-21.

### 2.3 Communication rate

The rate of communication is 250Kbps

### 2.4 Protocol data unit (PDU) format

digit	3	1	1	8	8	8	64
Abbreviatio	P	R	DP	PF	PS	SA	DATA
Definition	priority	Reservati ons	Data page	PDU FORMAT	Given PDU	source address	Data field 8 bytes

### 2.5 Message order

Message data are arranged at large ends and high bytes are in front.

## 3 CAN data signal level

Complete isolation, 5V signal level

#### 4. data format

data type	Proportionality factor	Range (actual range)	Offset	Bytes
CELLS voltage	1mV/bit	0~5000(0~5V)	0	2BYTE*16
Working & alarm state				2BYTE
balance state				2BYTE
protect temperature		-40~86°C	0	4BYTE
Gauge temperature		-40~125°C	0	2BYTE
current	1mA/bit	0~480000		4BYTE
<i>Voltage</i>	1mV/bit	0~100000	0	2BYTE
Cells Voltage difference	1mV/bit	0~65000	0	2BYTE
Number of cells		0~16	0	2BYTE
Number of cycles			0	2BYTE
SOC	1%/bit	0~100%	0	1BYTE
Design capacity		0~435000		4BYTE
<i>RemainingCapacity</i>		0~435000		4BYTE
<i>FullChargeCapacity</i>		0~435000	0	4BYTE
SOH				2BYTE
SOC error				1BYTE
Learning state				1BYTE
reservation				8BYTE
reservation				8BYTE

#### 7、 Protocol message (sent from BMS )

##### 7.1 BMS-MCU-1(ID: 0x1801D0F1)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0-byte1		Cell 1				Byte1 is high bytes, Byte0 is low bytes
Byte2-byte3		Cell 2				
Byte4-		Cell 3				

byte5						
Byte6- byte7		Cell 4				

### 7.2 BMS-MCU-2(ID: 0x1801D0F2)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0- byte1		Cell 5				Byte1 is high bytes, Byte0 is low bytes
Byte2- byte3		Cell 6				
Byte4- byte5		Cell 7				
Byte6- byte7		Cell 8				

### 7.3 BMS-MCU-3(ID: 0x1801D0F3)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0- byte1		Cell 9				Byte1 is high bytes, Byte0 is low bytes
Byte2- byte3		Cell 10				
Byte4- byte5		Cell 11				
Byte6- byte7		Cell 12				

#### 7.4 BMS-MCU-4(ID: 0x1801D0F4)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0-byte1		Cell 13				Byte1 is high bytes, Byte0 is low bytes
Byte2-byte3		Cell 14				
Byte4-byte5		Cell 15				
Byte6-byte7		Cell 16				

#### 7.5 BMS-MCU-5(ID: 0x1801D0F5)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0-byte1		Working & alarm state				See the appendix for detailed functions
Byte2-byte3		balance state				
Byte4-byte5		protect temperature 1, 2				
Byte6-byte7		protect temperature 3, 4				

### 7.6 BMS-MCU-6(ID: 0x1801D0F6)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0 Byte1		Gauge temperature				
Byte2 Byte3 Byte4 Byte5		current				Real time current, resolution of 1mA, signed integer, the highest bit 0 is positive current, it is charging current, the highest byte is negative current, it is discharge current, the maximum display value is 480000 Ma, that is, 480A. 8001d547 is 120135 ma
Byte6- byte7		voltage				Total voltage signed integer, 3170 is 12656 MV

### 7.7 BMS-MCU-7(ID: 0x1801D0F7)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0 Byte1		Cells Voltage difference				Maximum cell voltage difference, signed integer, 12 MV at 000C
Byte2		Number of cells				

Byte3						
Byte4 Byte5		Number of cycles				The signed integer 0002 is twice
Byte6		SOC				SOC percentage: 01 stands for 1%, 64 stands for 100%, no processing, directly displays as percentage, 5F stands for 95%
Byte7		reservation				

### 7.8 BMS-MCU-8(ID: 0x1801D0F8)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0~3		Design capacity				design capacity, 0006a338 is 435000 MAH, the maximum value is 435000 MAH
Byte4~7		<i>RemainingCapacity</i>				Remaining capacity 000042bd is 17085mah, the maximum value is 435000mah

### 7.9 BMS-MCU-9 (ID: 0x1801D0F9)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0~3		<i>FullChargeCapacity</i>				full charge capacity, 00018510 is 99600 MAH, the maximum value is 435000 MAH
Byte4 Byte5		SOH				SOH, battery health percentage, 0064 is 100%
Byte6		SOC error				SOC maximum error
Byte7		Learning state				Learnedstatus() battery learning status

### 7.10 BMS-MCU-10 (ID: 0x1801D0FA)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0~7		reservation				

### 7.11 BMS-MCU-11 (ID: 0x1801D0FB)

position	BIT	Data name	Proportionality factor	Range (actual range)	Offset	Remarks
Byte0~7		reservation				

Note 1: two bytes of working state indicate the meaning:

Working status and alarm indication

1. Normal standby, F000, binary is 11000000 0000
2. Charging, F001, binary is (MSB) 1111 million 0000 0001 (LSB)
3. Discharge F002, binary is 1111 0000 0000 0010
4. The discharge temperature is 0e80, and the binary is 1110 1000 0000
5. Discharge high temperature e400, binary is 1110 0100 0000 0000
6. Charging low temperature D200, binary is 1101 0010 0000 0000
7. Charging high temperature D100, binary is 1101 0001 0000 0000
8. Discharge over current 2 e080, binary is 1110 0000 1000 0000
9. Discharge over current 1 E040, binary is 1110 0000 0100000
10. Short circuit protection C020, binary is 1100 0000 0010 0000
11. Charging overcurrent D010, binary is 1101 0000 0001 0000
12. Over discharge protection E008, binary is 1110 0000 0000 1000
13. Overvoltage protection d004, binary is 1101 0000 0000 0100
14. Charge discharge and low temperature protection is ca00, binary is 1100 1010 0000 000
15. The high temperature protection of charge and discharge is C500, binary is 1100 0101 0000 0000