BMS: CAN BUS COMMUNICATION SPECIFICATION

1. Communication Specification

The principle for data link layer.

Communication speed for bus line: 250Kbps.

The provision for data link layer: Refer to the related regulation of CAN2.0B and J1939.
Use and redefine 29 identifiers of CAN extended frame. The distribution of 29 identifiers are listed below:

IDENTIFIER 11BYTES											SRR	IDE	IDENTIFIER EXTENSION 18BYTES															
PRIORITY			R	DP	PDU FORMAT(PF)						SRR	IDE	PF		PDU SPECIFIC(PS)								SOURCE ADDRESS(SA)							
3	2	1	1	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
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

Herein, Priority has 3 digits and there can be 8 priorities. R is generally fixed as 0. DP is fixed as 0 at present. 8-digit PF is the code for message. 8-digit PS refers to destination address or array extension. 8-digit SA refers to the source address for sending messages.

›There is a name and an address for every node which accesses to the network. The name is used for nodes identification and address arbitration. The address is used for data communication to node.
›Every node has at least one function. Multiple nodes might have the same function or one node might have multiple functions.

CAN Network Address Distribution

Obtain the node address of CAN Bus from the definition of J1939 Standard：

Node Name	SOURCE ADDRESS(SA)
Motor Controller	239(0xEF)
Battery Management System（BMS）	244(0xF4)
Charger Control System（CCS）	229(0xE5)
Charger Control System2（CCS2）	230(0xE6)
Broadcast Address（BCA）	80(0x50)

Message Format

Message1: (ID: 0x1806E5F4)

OUT	IN	ID				Cycle Time (ms)
BMS	CCS	P	R	DP	PF	1000
		6	0	0	6	
Data						
Position	**Data Name**					
BYTE1	Max Allowable Charging Terminal Voltage High Byte(VOL_SET_H)	0.1V/byte offset:0 e.g. Vset=3201, its corresponding 320.1V				
BYTE2	Max Allowable Charging Terminal Voltage Low Byte (VOL_SET_L)					
BYTE3	Max Allowable Charging Current High Byte (VOL_SET_H)	0.1A/byte offset:0 e.g. Iset=582, its corresponding 58.2A				
BYTE4	Max Allowable Charging Current Low Byte (VOL_SET_L)					
BYTE5	Control	0: Charger is open and on charge. 1:Battery protection, the charger closes its output.				
BYTE6	Reserved					
BYTE7	Reserved					
BYTE8	Reserved					

Message 10: (ID: 0x1806E6F4) new added message(only available for charging station)

OUT	IN	ID				Cycle Time(ms)
BMS	CCS	P	R	DP	PF	1000
		6	0	0	6	
Data						
Position	**Data Name**					
BYTE1	Max Allowable Charging Terminal Voltage High Byte (VOL_SET_H)	0.1V/byte offset:0 e.g. Vset=3201, its corresponding 320.1V				

BYTE2	Max Allowable Charging Terminal Voltage Low Byte (VOL_SET_L)	
BYTE3	Max Allowable Charging Current High Byte (CUR_SET_H)	0.1A/byte offset:0 e.g. Iset=582, its corresponding 58.2A
BYTE4	Max Allowable Charging Current Low Byte (CUR_SET_L)	
BYTE5	Control (CONTROL_FLG)	0: Charger is open and on charge. 1:Battery protection, the charger closes its output.
BYTE6	Max Allowable Discharging Current (DISCUR_MAX)	10A/byte offset:0 e.g. Iset=2, its corresponding 20A
BYTE7	Reserved	
BYTE8	page=1	=1

Message 11: (ID: 0x1806E6F4) new added message(only available for charging station)

OUT	**IN**	**ID**				**Cycle Time(ms)**
BMS	CCS	P	R	DP	PF	1000
		6	0	0	6	
Data						
Position	**Data Name**					
BYTE1	Battery Nominal AH High Byte (AH_marker_H)	0.1AH/byte				
BYTE2	Battery Nominal AH Low Byte (AH_marker_L)					
BYTE3	Battery Actual AH High Byte (AH_actual_H)	0.1AH/byte				
BYTE4	Battery Actual AH Low Byte (AH_actual_L)					
BYTE5	Single Battery Max Protection Voltage High Byte (VOL_CELL_OV_protect_H)	1mV /byte				

BYTE6	Single Battery Max Protection Voltage Low Byte (VOL_CELL_OV_protect_L)	
BYTE7	Battery Numbers (BATTER_NUM)	1-255 0: Invalid Information, refer to page 5.
BYTE8	page=2	=2

报文 12：（ID: 0x1806E6F4）新加的报文（此部分只适用于充电站）

Message 12: (ID: 0x1806E6F4) new added message(only available for charging station)

OUT	**IN**	**ID**				**Cycle Time(ms)**
BMS	CCS	P	R	DP	PF	1000
		6	0	0	6	
Data						
Position	**Data Name**					
BYTE1	Single Battery Max Voltage High Byte (VOL_CELL_MAX_H)					1mV /byte
BYTE2	Single Battery Max Voltage Low Byte (VOL_CELL_MAX_L)					
BYTE3	Single Battery Min Voltage High Byte (VOL_CELL_MIN_H)					1mV /byte
BYTE4	Single Battery Min Voltage Low Byte (VOL_CELL_MIN_L)					
BYTE5	Single Battery Min Protection Voltage High Byte (VOL_CELL_ULV_protect_H)					1mV /byte
BYTE6	Single Battery Min Protection Voltage Low Byte (VOL_CELL_ULV_protect_L)					
BYTE7	Battery State （BATTER_STATE）					Byte0：over-voltage mark, Byte1:under-voltage mark. Normal:0x00
BYTE8	page=3					=3

Message 13: (ID: 0x1806E6F4) new added message(only available for charging station)

OUT	IN	ID				Cycle Time(ms)
BMS	CCS	P	R	DP	PF	1000
		6	0	0	6	
Data						
Position	**Data Name**					
BYTE1	Battery Pack Total Voltage High Byte (VOL_BATTER_H)	0.1V/byte				
BYTE2	Battery Pack Total Voltage Low Byte (VOL_BATTER_L)					
BYTE3	Actual Charging Current High Byte (CUR_CHARGE_H)	0.1A/byte offset:0 Max byte means mark. 0: charging; 1: discharging				
BYTE4	Actual Charging Current Low Byte (CUR_CHARGE_L)					
BYTE5	Present soc (SOC)	0-100				
BYTE6	Battery Max Temperature (TEMPERATURE_MAX)	1 degree/byte, offset 100. eg: 0:-100 degree, 125: 25degree				
BYTE7	Battery Min Temperature (TEMPERATURE_MIN)	1 degree/byte, offset 100. eg: 0:-100 degree, 125: 25degree				
BYTE8	页 page=4	=4				

Message 14: (ID: 0x1806E6F4) new added message(only available for charging station)

OUT	IN	ID				Cycle Time(ms)
BMS	CCS	P	R	DP	PF	1000
		6	0	0	6	
Data						
Position	**Data Name**					
BYTE1	Battery Numbers High Byte (BATTER_NUM_H)	0: Invalid Information				

BYTE2	Battery Numbers Low Byte (BATTER_NUM _L)	
BYTE3		
BYTE4		
BYTE5		
BYTE6		
BYTE7		
BYTE8	page=5	=5

Message 2: (ID: 0x18FF50E5)

OUT	**IN**	**ID**				**Cycle Time(ms)**
CCS	BCA	P	R	DP	PF	1000
		6	0	0	0xFF	
Data						
Position	**Data Name**					
BYTE1	Output Voltage High Byte	0.1V/byte offset:0 e.g. Vout=3201, its corresponding 320.1V				
BYTE2	Output Voltage Low Byte					
BYTE3	Output Current High Byte	0.1A/byte offset:0 e.g. Iout=582, its corresponding 58.2A				
BYTE4	Output Current Low Byte	Max byte means mark. 0: charging; 1: discharging				
BYTE5	Status Flags					
BYTE6	Reserved					
BYTE7	Reserved					
BYTE8	Reserved					

STATUS	Mark	Description
Byte0	Hardware Failure	0: Normal. 1: Hardware Failure
Byte1	Temperature of Charger	0: Normal. 1: Over temperature protection
Byte2		0: Input voltage is normal. 1. Input voltage is wrong, the charger will stop

	Input Voltage	working.
Byte3	Stating State	0: The charger detects the voltage of the battery and enter into starting state. 1: The charger stays closed (to prevent reverse polarity)
Byte4	Communication State	0: Communication is normal. 1: Communication receive time-out.
Byte5		
Byte6		
Byte7		

Operation Mode

1. BMS send operating information (Message 1) and (Message 10+Message 11+Message 12) to charger at fixed intervals of one second. After receiving the message, the charger will work under the Voltage and Current in Message. If the Message is not received within five seconds, then it will enter into communication error state and the output will be closed.

2. The charger send broadcast message (Message 2) at intervals of one second. The display meter can show the status of the charger according to up-to-date information.