



# Communication Protocol of BMS CAN 2.0

Data are calculated according to TCVN 7888: 2014

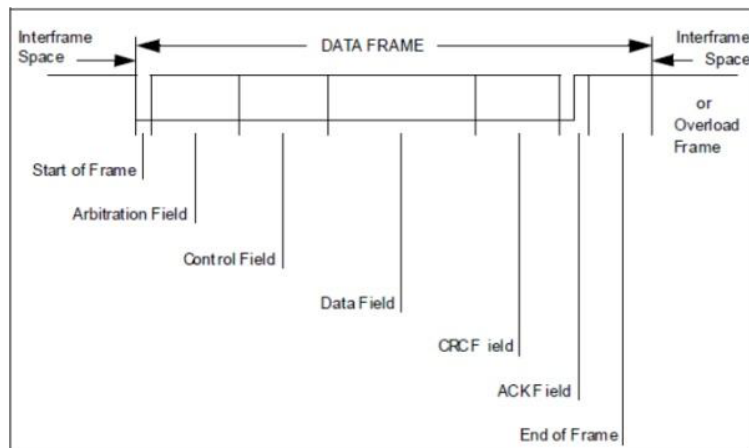
Based on machinery specification and method of installation, actual working load of pile should be resulted from short-term standard bearing capacity multiplied by "Execution fator".

## 1. Summary

This manual defines BMS system CAN communication protocol.

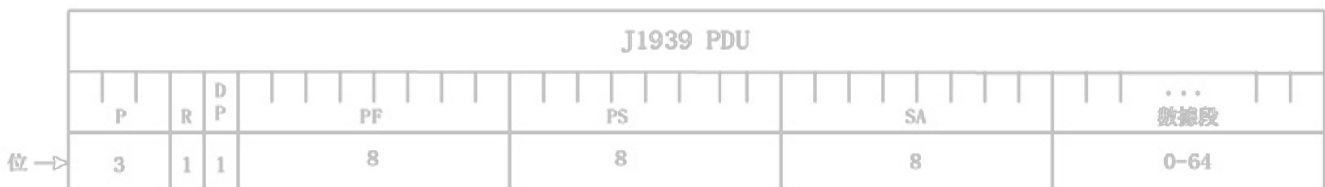
## 2. Physical Interface

The physical link layer interface of this protocol is CAN bus, The message format follows the CAN2.0 specification, All message are in the CAN extension frame format as following :



## 3. Protocol Date Unit ( PDU )

The protocol date unit of this protocol follows the J1939 protocol , PDU consists of seven parts , that is: Priority , Reserved bit , Date Page , PDU format , Specific PDU ( can be used as the target address 、 group extension or specialization. ) , Source address and date field , as following :



Define: P is the priority, R is reserved bit, DP is date Page, PF is PDU format, PS is specific PDU , SA is the source address.

Provision of this agreement :

PF is the protocol message command code.

PS is the target address.

SA is the source address.

Baud communication rate is 250K

High byte first Low byte later



#### 4. The Content of Protocol

##### 4.1 Operation parameters 1 ID: 0x180150F1

The sending node : BMS; The receiving node : Coordination controller; Cycle of sending : 200ms ; Data length : 8 Byte :

Address	Description	Length	factor	Note
0~1	Cell Max voltage	2Byte	0.001V	High byte first Low byte later
2~3	Cell Min voltage	2Byte	0.001V	High byte first Low byte later
4	SOC	1Byte	1%	
5	SOH	1Byte	1%	
6	NA	1Byte		1-255
7	High voltage relay status	1Byte		0: Disconnect 1: Connect

##### 4.2 Operation parameters 2 ID: 0x180250F1

The sending node : BMS ; receiving node : Coordination controller; Cycle of sending : 200ms ; Data length : 8 Byte :

Address	Description	Length	factor	Note
0~1	BAT Total voltage	2Byte	0.1V	High byte first Low byte later
2~3	BAT Total Current	2Byte	0.1A	
4~5	Charge Max current	2Byte	0.1A	
6~7	Discharge Max current	2Byte	0.1A	



#### 4.3 Operation parameters 3 ID: 0x180350F1

The sending node : BMS ; Receiving node : Coordination controller; Cycle of sending : 200ms ; Data length : 8 Byte ;

Address	Description	Length	factor	Note
0	Max voltage group num	1Byte		1-255
1	Max voltage box num	1Byte		1-255
2	Max voltage cell num	1Byte		1-255
3	Max temp group num	1Byte		1-255
4	Max temp box num	1Byte		1-255
5	Max temp	1Byte	1°C	-30~80
6	NA	1Byte		
7	NA	1Byte		

#### 4.4 Operation parameters 4 ID: 0x180450F1

The sending node : BMS ; Receiving node : Coordination controller; Cycle of sending : 200ms ; Data length : 8 Byte ;

Address	Description	Length	factor	Note
0	Max voltage group num	1Byte		1-255
1	Max voltage box num	1Byte		1-255
2	Max voltage cell num	1Byte		1-255
3	Max temp group num	1Byte		1-255
4	Max temp box num	1Byte		1-255
5	Max temp	1Byte	1°C	-30~80
6	NA	1Byte		
7	NA	1Byte		



#### 4.5 Battery status parameter ID: 0x180650F1

The sending node : BMS ; The receiving node : Coordination controller ;Cycle of sending : 200ms ; Data length : 8 Byte ;

Address	Description	Length	factor	Note
0	Battery status	1Byte		0 : wait 1:charging and discharge disable 2 : charging disable 3 : discharging disable 4: charging 5:discharging
1	System Status	1Byte		System Status
2	Warning1 flag 1	1Byte		Warning1/ Warning2 flag 1
3	Warning1 flag 2	1Byte		Warning1/ Warning2 flag 2
4	NA	1Byte		
5	NA	1Byte		
6	CRC16_L	1Byte		CRC check for 0~5 bytes
7	CRC16_H	1Byte		

#### 4.6 Battery status parameter ID: 0x180750F1

The sending node : BMS ; The receiving node : Coordination controller ;Cycle of sending : 200ms ; Data length : 8 Byte ;

Address	Description	Length	factor	Note
0	Warning2 flag 1	1Byte		Warning1/ Warning2 flag 1
1	Warning2 flag 2	1Byte		Warning1/ Warning2 flag 2
2	Protection3 flag 1	1Byte		Protection3 flag 1
3	Protection3 flag 2	1Byte		Protection3 flag 2
4	NA	1Byte		
5	NA	1Byte		
6	CRC16_L	1Byte		CRC check for 0~5 bytes
7	CRC16_H	1Byte		



#### 4.7 HBI/PCS/PBD status ID: 0x1801F150

Sending node : Coordination controller ; Receiving node : BMS Cycle of sending : 500ms ; Data length : 8 Byte ;

Address	Description	Length	factor	Note
0	Heartbeat	1Byte		1~255
1	HBI/PCS/PBD status	1Byte		0 : Initial 1 : Ready 2 : Charging 3 : Discharging 4 : Fault
2~3	BAT Power	2Byte	1kW	Signed number; positive means discharge, negative means charging
4~5	Reserved	2Byte		
6	CRC16_L	2Byte		CRC check for 0~5 bytes
7	CRC16_H	1Byte		

#### System Status

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
System ready	Charge finished	Discharge finished	First alarm status	level 2 alarm status	level 3 fault status	Reserved	Reserved

Description:

Logic 1 means the event is true; logic 0 means the event is false;

#### Warning1 / Warning2 flag 1 :

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
Temperature high	Temperature low	Great temperature difference	Total voltage high	Total voltage low	Cell voltage high	Cell voltage low	Great cell voltage difference

#### Warning1 / Warning2 flag 2 :

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
high Charge current	high Discharge current	SOC high	SOC low	Low insulation resistance	Reserved	Reserved	Reserved



**Protection3 flag 1 :**

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
Temperature high	Temperature low	Great temperature difference	Total voltage high	Total voltage low	Cell voltage high	Cell voltage low	Cell voltage different max

**Protection3 flag 2 :**

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
high Charge current	high Discharge current	Charge short circuit	Discharge short circuit	Battery Open-circuit	Data acquisition failure	Master-slave board communication failure	Main communication failure


Description:

- 1) Logic 1 means the event is true; logic 0 means the event is false;
- 2) The higher the fault level, the more serious the fault (level 3) is.
- 3) The first level alarm is not processed. Specific information of level 2 alarm and level 3 fault will only be displayed by PCS.
- 4) Only according to the level 2 alarm and level 3 protection in the system status identification, do the shutdown processes.



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