



Communication Protocol			
Version/Status	Person Responsible	Release Date	Remark
1.0/First Draft	LAN	2023-4-10	Initial Release



Tel: +86 158 1732 3917

Email: cherry@cmbatteries.com

CMB Headquarters:
Rm.1216 ,
Baoshan Times Bldg,
Minqiang Community,
Minzhi St.,Longhua Dist.,
Shenzhen,
Guangdong,China

CMB Facotry:
8 Floor,5 Building
Qinggu Intelligent
Manufacturing
Park,Tangxia Town
Dongguan
Guangdong,China

Artificial Person:	LAN
Reviewed By:	WANG





1. Communication Parameters

It is the CAN2.0 communication standard, using 11byte standard frame format, and the transmission rate is 500kbps.

Adopt the master-slave query mode, the PC software is the master and the battery is the slave. The data check method adopts CRC-16 check method (there is a routine later).

Data transmission: high byte first, low byte last.

The host sends the identifier (ID) remote frame command, the BMS responds to the corresponding data frame data according to the identifier (ID), and the host sends the remote frame without data.



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CAN2.0B The standard frame format is as follows :

		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Byte1	Fame info.	FF	RTR	X	X	DLC			
Byte2	ID1	X	X	X	X	X	ID.10	ID.9	ID.8
Byte3	ID2	ID.7	ID.6	ID.5	ID.4	ID.3	ID.2	ID.1	ID.0
Byte4	Date1	DATE							
Byte5	Date2	DATE							
Byte6	Date3	DATE							
Byte7	Date4	DATE							
Byte8	Date5	DATE							
Byte9	Date6	DATE							
Byte10	Date7	DATE							
Byte11	Date8	DATE							



2. Frame Format

CAN2.0B The standard frame format is as follows:

		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Byte1	Frame info.	FF	RTR	X	X	DLC			
Byte2	ID1	X	X	X	X	X	ID.10	ID.9	ID.8
Byte3	ID2	ID.7	ID.6	ID.5	ID.4	ID.3	ID.2	ID.1	ID.0
Byte4	Date1	DATE							
Byte5	Date2	DATE							
Byte6	Date3	DATE							
Byte7	Date4	DATE							
Byte8	Date5	DATE							
Byte9	Date6	DATE							
Byte10	Date7	DATE							
Byte11	Date8	DATE							



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Standard frame ID(11bit)										
ID.10	ID.9	ID.9	ID.9	ID.9	ID.9	ID.9	ID.9	ID.9	ID.9	ID.9
Adress					Command					
0x00-0x0F					0x00-0x7F					

(Adress)	ID	Description
0x00	0x000-0x07F	Default 0x00 when there is only one battery
0x01		
0x02		
0x03		
0x04		
0x05		
0x0F		



3. Frame Parse



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ID	Frame content	Bytes	Element	Unit	Unit
0x00	Total voltage/ current/ Remaining capacity	Byte0~1	Total Volt	10mV	Unsigned,high byte first
		Byte2~3	Total current	10mV	Sign type,charge+, discharge-
		Byte4~5	Remaining capacity	10mV	
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x01	Full charge capacity/cycle times/SOC	Byte0~1	full capccity	10mAh	Unsigned,high byte first
		Byte2~3	cycle times		Unsigned
		Byte4~5	SOC	%	Unsigned, SOC=Remaining capacity/full,charge capacity
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x02	Balance status/ protection status	Byte0~1	Cell1~16	bit	Corresponding to the Balanced bit,1=on,0=off
		Byte2~3	Cell17~32	bit	
		Byte4~5	Protection sign	bit	1=protected,0=unprotect edsee=Table1
		Byte6~7	CRC		Byte0~Byte5: CRC-16calibration
0x03	MOS Status/ Production date Software version	Byte0~1	MOS status	bit	CHG/DISG MOS status, see Table 2
		Byte2~3	Production Date		
		Byte4~5	software version		
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x04	Number of Battery strings/ CBC protection/ temperature	Byte0	configuration	S	Unsigned number,the Single cell voltage Greater than the string Number is set to 61001.For Example,for 16 battery Packs,1-16 is the normal Value,17-32 strings are Set to 61001
		Byte1	CBC protection		1:CBC protection occur 0:noraml
		Byte2~3	max. temp	°C	Unsigned number , (Temp+40)*10.
		Byte4~5	min. temp	°C	Unsigned number , (Temp+40)*10.
		Byte6~7	CRC		Byte0~Byte5 : CRC-16 calibration
0x05	Reserved instruction	Byte0~1	0	/	Reserved bit, default 0
		Byte2~3	0	/	Reserved bit, default 0
		Byte4~5	0	/	Reserved bit, default 0
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration



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0x06	Reserved instruction	Byte0~1	0	/	Reserved bit, default 0
		Byte2~3	0	/	Reserved bit, default 0
		Byte4~5	0	/	Reserved bit, default 0
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x07	CELL1~CELL3 Volt	Byte0~1	CELL1 V	mV	Unsigned,high byte first
		Byte2~3	CELL2 V	mV	Unsigned, high byte first
		Byte4~5	CELL3 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x08	CELL4~CELL6 Volt	Byte0~1	CELL4 V	mV	Unsigned,high byte first
		Byte2~3	CELL5 V	mV	Unsigned, high byte first
		Byte4~5	CELL6 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5: CRC-16calibration
0x09	CELL7~CELL9 Volt	Byte0~1	CELL7 V	mV	Unsigned,high byte first
		Byte2~3	CELL8 V	mV	Unsigned, high byte first
		Byte4~5	CELL9 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0A	CELL10~CELL12 Volt	Byte0~1	CELL10 V	mV	Unsigned,high byte first
		Byte2~3	CELL11 V	mV	Unsigned, high byte first
		Byte4~5	CELL12 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0B	CELL13~CELL15 Volt	Byte0~1	CELL13 V	mV	Unsigned,high byte first
		Byte2~3	CELL14 V	mV	Unsigned, high byte first
		Byte4~5	CELL15 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0C	CELL16~CELL18 Volt	Byte0~1	CELL16 V	mV	Unsigned,high byte first
		Byte2~3	CELL17 V	mV	Unsigned, high byte first
		Byte4~5	CELL18 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0D	CELL19~CELL21 Volt	Byte0~1	CELL19 V	mV	Unsigned,high byte first
		Byte2~3	CELL20 V	mV	Unsigned, high byte first
		Byte4~5	CELL21 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0E	CELL22~CELL24 Volt	Byte0~1	CELL22 V	mV	Unsigned,high byte first
		Byte2~3	CELL23 V	mV	Unsigned, high byte first
		Byte4~5	CELL24 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration



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0x06	Reserved instruction	Byte0~1	0	/	Reserved bit, default 0
		Byte2~3	0	/	Reserved bit, default 0
		Byte4~5	0	/	Reserved bit, default 0
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x07	CELL1~CELL3 Volt	Byte0~1	CELL1 V	mV	Unsigned,high byte first
		Byte2~3	CELL2 V	mV	Unsigned, high byte first
		Byte4~5	CELL3 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x08	CELL4~CELL6 Volt	Byte0~1	CELL4 V	mV	Unsigned,high byte first
		Byte2~3	CELL5 V	mV	Unsigned, high byte first
		Byte4~5	CELL6 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5: CRC-16calibration
0x09	CELL7~CELL9 Volt	Byte0~1	CELL7 V	mV	Unsigned,high byte first
		Byte2~3	CELL8 V	mV	Unsigned, high byte first
		Byte4~5	CELL9 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0A	CELL10~CELL12 Volt	Byte0~1	CELL10 V	mV	Unsigned,high byte first
		Byte2~3	CELL11 V	mV	Unsigned, high byte first
		Byte4~5	CELL12 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0B	CELL13~CELL15 Volt	Byte0~1	CELL13 V	mV	Unsigned,high byte first
		Byte2~3	CELL14 V	mV	Unsigned, high byte first
		Byte4~5	CELL15 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0C	CELL16~CELL18 Volt	Byte0~1	CELL16 V	mV	Unsigned,high byte first
		Byte2~3	CELL17 V	mV	Unsigned, high byte first
		Byte4~5	CELL18 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0D	CELL19~CELL21 Volt	Byte0~1	CELL19 V	mV	Unsigned,high byte first
		Byte2~3	CELL20 V	mV	Unsigned, high byte first
		Byte4~5	CELL21 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x0E	CELL22~CELL24 Volt	Byte0~1	CELL22 V	mV	Unsigned,high byte first
		Byte2~3	CELL23 V	mV	Unsigned, high byte first
		Byte4~5	CELL24 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration

0x0F	CELL25~CELL27 Volt	Byte0~1	CELL25 V	mV	Unsigned,high byte first
		Byte2~3	CELL26 V	mV	Unsigned, high byte first
		Byte4~5	CELL27 V	mV	Unsigned, high byte first



Driver initialization flag



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		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x10	CELL28~CELL30 Volt	Byte0~1	CELL28 V	mV	Unsigned,high byte first
		Byte2~3	CELL29 V	mV	Unsigned, high byte first
		Byte4~5	CELL30 V	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5:CRC-16 calibration
0x11	CELL31~CELL32 Volt	Byte0~1	CELL31 V	mV	Unsigned,high byte first
		Byte2~3	CELL32 V	mV	Unsigned, high byte first
		Byte4~5	0	mV	Unsigned, high byte first
		Byte6~7	CRC		Byte0~Byte5: CRC-16calibration

Table 1 (protection parameters)

bit 0	Single cell over voltage protection	bit 8	Charge under temp. protection
bit 1	Single cell over voltage protection	bit 9	Discharge over temp. protection
bit 2	Total volt over voltage protection	bit 10	Over voltage protection
bit 3	Total volt over voltage protection	bit 11	Reversed
bit 4	Charge over current protection	bit 12	SOC under protection
bit 5	Discharge over current protection	bit 13	MOS High temperature protection
bit 6	Charge over temp. protection	bit 14	Single pack over voltage protection (for serial and parallel machine)
bit 7	Discharge over temp. protection	bit 15	Single package low voltage protection(for serial and parallel machine)

Table 2 (MOS and other switch status)

bit 0	Driver initialization flag (0:successful initialization, 1:not initialized)	bit 8	Heating
bit 1	pre-CHG MOSFET	bit 9	Cooling
bit 2	CHG MOSFET	bit 10	Reversed
bit 3	DISG MOSFET	bit 11	Reversed
bit 4	pre-CHG RELAY	bit 12	Reversed
bit 5	CHG RELAY(different ports)	bit 13	Reversed
bit 6	DISG RELAY(different ports)	bit 14	Reversed
bit 7	MAIN RELAY (same port)	bit 15	Reversed