Communication Protocol

Version	modify the content		Revision	Approval	Revision time	
V1.0	initial version		Jason	POP	2023-01-28	

1. CAN communication protocol:

1), Baud rate: 500KHZ

2), Frame format: extended frame, data frame

3), BMS is the slave, the host computer or inverter is the host

4), slave address 0x1FFFC

5), data transmission little endian mode

6), command format:

Host sends:

CB-ID				DATA
ID28-ID14	**ID13-ID8**	**ID7-ID0**	**DLC**	Byte0-Byte7:0x00
Slave fixed address	function code	initial address	8	
0x1FFFC	Reference data comparison table	index		
0x1FFFCxxx				

Slave response data content:

CB-ID				DATA
ID28-ID14	**ID13-ID8**	**ID7-ID0**	**DLC**	Return 8-bit data
Slave fixed address	function code	initial address	8	
0x1FFFCxxx	Reference data comparison table	index		
0x1FFFCxxx				

2. Function code:

Function code reference table 0x01

data definition	byte	unit	ID0-ID7
total voltage	Uint32	mV	0x00
total current	int32	mA, the positive number is the charging current, and the negative number is the discharge current.	
full charge capacity	Uint32	AH	0x01
The remaining capacity	Uint32	AH	
SOC	Uint8	%	0x02
SOH	Uint8	%	
Cycles	Uint16	--	
reserve	Uint16	--	
reserve	Uint16	--	
reserve	Uint16	--	0x03
Maximum cell voltage	Uint16	mV	
Minimum cell voltage	Uint16	mV	
Cell differential voltage	Uint16	mV	
maximum temperature	Uint16	Kelvin (0xBA5 - 2731)/10 = 25℃	0x04
lowest temperature	Uint16	Kelvin	
Cell temperature difference	Uint16	Kelvin	
system status	Uint16	Bit0: Charging MOSFET switching status	

		Bit1: Discharging MOSFET switching status Bit2: Charging status Bit3: Discharging status Bit4: Idle status Bit5: Charger connection status Bit6: Load connection status Bit7: Reserved Bit8: Pre-discharge status bit Bit9: Current limit switch status Bit10: Weak current switch status Bit11-Bit15: Reserved	
reserve	Uint16	--	0x05
Alarm status A	Uint16	Bit0: Pack overvoltage alarm Bit1: Pack undervoltage alarm Bit2: Cell voltage overvoltage alarm Bit3: Cell voltage undervoltage alarm Bit4: High voltage difference alarm Bit5: Charging overcurrent alarm Bit6: Discharge overcurrent alarm Bit7: Temperature difference high alarm Bit8: Charging high temperature alarm Bit9: Charging low temperature alarm Bit10: Discharge high temperature alarm Bit11: Discharge low temperature alarm Bit12: Environmental high temperature alarm Bit13: Environmental low temperature alarm Bit14: MOS high temperature alarm Bit15: Low voltage charging prohibition alarm	
Alarm status B	Uint16	Bit0: SOC too high alarm Bit1: SOC too low alarm Bit2: NTC short circuit Bit3: NTC open circuit Bit4: Bad contact of cell sampling line Bit5-Bit15: Reserved	
Protect A	Uint16	Bit0: Pack overvoltage protection Bit1: Pack undervoltage protection Bit2: Cell voltage overvoltage protection Bit3: Cell voltage undervoltage protection Bit4: Charging overcurrent level 1 protection Bit5: Charging overcurrent level 2 protection Bit6: Discharging overcurrent 1 Level protection Bit7: Discharge overcurrent level 2 protection Bit8: Discharge overcurrent level 3 protection Bit9: Short circuit protection Bit10: Charging high temperature protection Bit11: Charging low temperature protection Bit12: Discharge high temperature protection Bit13: Discharge low temperature protection Bit14: Environmental high temperature protection Bit15: Environment Low temperature protection	
Protect B	Uint16	Bit0: MOS high temperature protection Bit1: Low voltage prohibition of charging Bit2: SOC too high protection Bit3: SOC too low protection Bit4: Pressure difference too high protection	0x06

		Bit5: Temperature difference too high protection Bit6-Bit15: Reserved	
BMS failure	Uint16	Bit0: Charging MOS damaged Bit1: Discharging MOS damaged Bit2: RS485 communication abnormality Bit3: Internal BQ76952 communication abnormality Bit4: Internal SH367309 communication abnormality Bit5: BQ76952 initialization error Bit6: SH367309 initialization error Bit7: EEPROM writing failure Bit8: Parallel ID overlap Bit9:-Bit15: reserved	
Number of charging overcurrents	Uint16	--	
Discharge overcurrent times	Uint16	--	
Chassis ID	Uint8*8	The next 8 bytes are HEX	0x07
Balance battery status	Uint32	Bit0:0: No balancing, Bit: Turn on balancing, the same of other bits.	0x08
reserve	Uint16		
Number of cells	Uint16	--	
Cell 1 Voltage	Uint16	mV	0x09
Cell 2 Voltage	Uint16	mV	
Cell 3 Voltage	Uint16	mV	
Cell 4 Voltage	Uint16	mV	
Cell 5 Voltage	Uint16	mV	0x0A
Cell 6 Voltage	Uint16	mV	
Cell 7 Voltage	Uint16	mV	
Cell 8 Voltage	Uint16	mV	
Cell 9 Voltage	Uint16	mV	0x0B
Cell 10 Voltage	Uint16	mV	
Cell 11 Voltage	Uint16	mV	
Cell 12 Voltage	Uint16	mV	
Cell 13 Voltage	Uint16	mV	0x0C
Cell 14 Voltage	Uint16	mV	
Cell 15 Voltage	Uint16	mV	
Cell 16 Voltage	Uint16	mV	

Function code reference table 0x02

data definition	byte	unit	ID0-ID7
Temperature quantity	Uint16	--	0x00
MOS temperature 1	Uint16	Kelvin (0xBA5 - 2731)/10 = 25℃	
MOS temperature 2	Uint16	Kelvin	
Environment temperature	Uint16	Kelvin	
TS1 temperature	Uint16	Kelvin	0x01
TS2 temperature	Uint16	Kelvin	
TS3 temperature	Uint16	Kelvin	
TS4 temperature	Uint16	Kelvin	
TS5 temperature	Uint16	Kelvin	0x02
TS6 temperature	Uint16	Kelvin	
TS7 temperature	Uint16	Kelvin	
TS8 temperature	Uint16	Kelvin	
Highest Cell voltage chassis	Uint16	Chassis serial number	0x03
Highest cell voltage address	Uint16	--	
Lowest Cell voltage chassis	Uint16	Chassis serial number	
Minimum cell voltage address	Uint16		
Maximum temperature chassis	Uint16	Chassis serial number	0x04
maximum temperature address	Uint16	--	

Lowest temperature chassis	Uint16	Chassis serial number	
lowest temperature address	Uint16	--	

3. Example:

Host sends:

ID number: 0x1FFFC101 Data content: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00

CB-ID				DATA
ID28-ID14	**ID13-ID8**	**ID7-ID0**	**DLC**	Byte0: 0x00
Slave fixed address	function code	initial address	8	Byte1: 0x00
0x1FFFC	000001b	0x01		Byte2: 0x00
				Byte3: 0x00
0x1FFFC101				Byte4: 0x00
				Byte5: 0x00
				Byte6: 0x00
				Byte7: 0x00

Data content returned from the slave:

ID number: 0x1FFFC101 Data content: 0x50 0xC3 0x00 0x00 0x46 0x69 0x00 0x00

CB-ID				DATA
ID28-ID14	**ID13-ID8**	**ID7-ID0**	**DLC**	Byte0: 0x50 Byte1: 0xC3 Byte2:
Slave fixed address	function code	initial address	8	0x00 Byte3: 0x00 Byte4: 0x46
0x1FFFC	000001b	0x01		Byte5: 0x69 Byte6: 0x00 Byte7:
				0x00
0x1FFFC101				

Explanation of data content: Full capacity: 0x0000C350 = 50000mAH Remaining capacity: 0x00006946 = 26950mAH