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Ningbo AUX Solar Import & Export Co., Ltd.

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Hybrid inverter and BMS communication protocol

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Ningbo AUX Solar Import & Export Co., Ltd.

CATALOGUE

CATALOGUE	1
Foreword.....	3
Hybrid inverter and BMS communication protocol.....	1
1 Scope.....	1
2 Normative references.....	1
3 Terms and Definitions	1
3.1 Frame	1
3.2 CAN Data Frame	1
3.3 Messages.....	1
3.4 Identifier	1
3.5 Standard Frame	2
3.6 Extended Frame.....	2
3.7 Parameter Group.....	2
3.8 Parameter Group Number	2
3.9 Suspect Parameter Number	2
3.10 Protocol Data Unit (PDU).....	2
3.11 Priority	2
3.12 Transport Protocol.....	2
3.13 Seven Octet Binary Time (CP56time2a)	2
3.14 Inverter.....	2
3.15 BMS.....	3
4 General.....	3
4.1 The communication network between the inverter and the BMS adopts the CAN2.0B communication protocol.....	3
4.2 During operation, the inverter monitors the status of the BMS in real time, and at the same time controls the opening and closing of the internal switching devices of the BMS.....	3
4.3 The CAN communication network between the inverter and the BMS should consist of nodes such as the inverter and the BMS.....	3
4.4 The data transmission in this part adopts the format of sending low byte first.....	3
4.5 The destination address of the message sent by the inverter uses the BMS broadcast address, and the BMS does not need to send back a response message.....	3
4.6 The communication timeout between the inverter and the BMS is judged by monitoring the remote control, heartbeat, telemetry, telesignaling and other messages sent by the other party. The timeout judgment time is based on the "communication timeout time" in the fixed value setting.	3
4.7 The physical layer adopted by this agreement shall comply with the physical layer provisions of ISO 11898-1:2003 and SAE J1939-11:2006. The communication rate between the inverter and the BMS should be 500 kbit/s.....	3

5	Inverter and BMS interaction process	3
5.1	Main interaction process	3
5.2	Control Interaction Process	4
6	Packet Classification	4
6.1	General	4
6.2	Command Frame	5
6.3	Data Frame	5
7	Message format and content	6
7.1	Information query Frame 1	6
7.2	Information Query Frame 2	12
7.3	Sleep wake control frame	14
7.4	Charge and discharge control frame	14
7.5	Communication fault barrier frame	15

Foreword

This standard is drafted according to the rules given in GB/T 1.1-2009 "Guidelines for Standardization Work Part 1: Standard Structure and Writing".

This standard was proposed by Shenzhen R&D Center of Ningbo AUX Solar Technology Co., Ltd.

This standard is drafted and interpreted by the Monitoring Software Development Office of Shenzhen R&D Center of Ningbo AUX Solar Technology Co., Ltd.

This standard is under the jurisdiction of the Monitoring Software Development Office of Shenzhen R&D Center of Ningbo AUX Solar Technology Co., Ltd.

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Hybrid inverter and BMS communication protocol

1 Scope

This section defines the physical layer, data link layer, interaction flow, packet classification, packet format, and content of the communication between the inverter and the battery management system (BMS) based on the Control Area Network (CAN).

This part applies to the communication between Hybrid inverter (hereinafter referred to as the inverter) and the BMS.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated reference documents, the latest version (including all amendments) applies to this document.

IEC 60870-5-101(Transmission Protocols-Companion Standard for Basic Telecontrol Tasks)

ISO 11898-1:2003(Road vehicle – Control area network (CAN) Part 1: Data link layer and physical signaling)

SAE J1939-11:2006(Recommended practice for serial control and communication vehicle network Part 11: Physical layer–250K bits/s, twisted shielded pair)

SAE J1939-21:2006(Recommended practice for serial control and communication vehicle network Part 21: Data link layer)

3 Terms and Definitions

The following terms and definitions defined in GB/T 19596 apply to this document.

3.1 Frame

A series of data bits that make up a complete message.

3.2 CAN Data Frame

The ordered bit fields necessary to make up the CAN protocol for transmitting data start with the start of frame (SOF) and end with the end of frame (EOF).

3.3 Messages

One or more CAN data frames with the same parameter group number.

3.4 Identifier

Identification part of the CAN arbitration domain.

3.5 Standard Frame

A CAN data frame defined in the CAN bus using an 11-bit identifier.

[SAE-J1939-21, Definition 5.1]

3.6 Extended Frame

A CAN data frame defined in the CAN bus using a 29-bit identifier.

[SAE-J1939-21, Definition 5.1]

3.7 Parameter Group

A collection of parameters is conveyed in a message. The parameter group includes: command, data, request, reply and negative reply, etc.

3.8 Parameter Group Number

A 24-bit value used to uniquely identify a parameter group. The parameter group number includes: reserved bits, data page, PDU format field (8 bits), group extension field (8 bits).

[SAE-J1939-21, Definition 5.1.2]

3.9 Suspect Parameter Number

The application layer describes the signal through parameters, and assigns a 19-bit value to each parameter.

3.10 Protocol Data Unit (PDU)

A specific CAN data frame format.

[SAE-J1939-21, Definition 5.2]

3.11 Priority

In a 3-bit field in the identifier, set the arbitration priority of the transmission process, the highest priority is level 0, and the lowest priority is level 7.

[SAE-J1939-21, Definition 5.2.1]

3.12 Transport Protocol

Part of the data link layer, a mechanism provided for transmitting data in PGNs of 9 bytes or more.

[SAE-J1939-21, Definition 5.10]

3.13 Seven Octet Binary Time (CP56time2a)

Time contains year, month, day, hour, minute, second, millisecond.

[IEC 60870-5-101, Definition 7.2.6.18]

3.14 Inverter

Convert the mains AC into DC to charge and store the storage battery. When the mains power fails, the DC stored in the battery is converted into 220 volts AC for use by household appliances.

3.15 BMS

Intelligently manage and maintain each battery unit, prevent the battery from overcharging and overdischarging, prolong the service life of the battery, and monitor the status of the battery.

4 General

4.1 The communication network between the inverter and the BMS adopts the CAN2.0B communication protocol.

4.2 During operation, the inverter monitors the status of the BMS in real time, and at the same time controls the opening and closing of the internal switching devices of the BMS.

4.3 The CAN communication network between the inverter and the BMS should consist of nodes such as the inverter and the BMS.

4.4 The data transmission in this part adopts the format of sending low byte first.

4.5 The destination address of the message sent by the inverter uses the BMS broadcast address, and the BMS does not need to send back a response message.

4.6 The communication timeout between the inverter and the BMS is judged by monitoring the remote control, heartbeat, telemetry, telesignaling and other messages sent by the other party. The timeout judgment time is based on the "communication timeout time" in the fixed value setting.

4.7 The physical layer adopted by this agreement shall comply with the physical layer provisions of ISO 11898-1:2003 and SAE J1939-11:2006. The communication rate between the inverter and the BMS should be 500 kbit/s.

5 Inverter and BMS interaction process

5.1 Main interaction process

For the main interaction process, see Figure 1

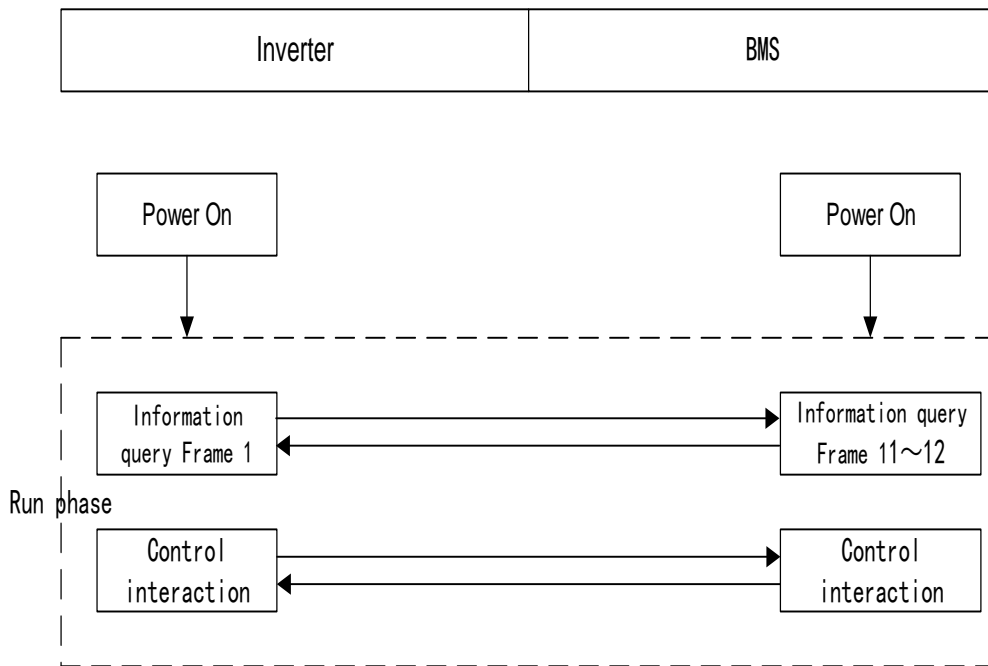


Figure 1. Main flow chart of interaction between inverter and BMS

5.2 Control Interaction Process

Control interaction flow, see Figure 2.

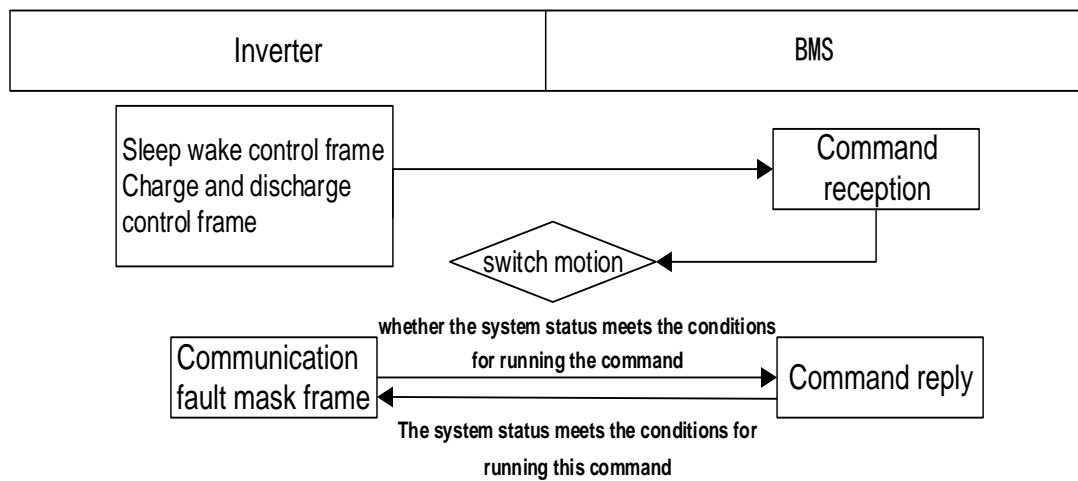


Figure 2 Flow chart of interaction between inverter and BMS control

6 Packet Classification

6.1 General

This part of the message is divided into types according to: command frame, data frame.

The data length of the message is 8 bytes, if the actual data is less than 8 bytes, it will be sent as 8 bytes, and the unused part is set to 00H.

6.2 Command Frame

The command frame includes information query frame 1, information query frame 2, sleep and wake up control frame, charge and discharge control frame and communication fault shielding frame, and the format of the command frame should conform to Table 1.

Table 1 Classification of command frames

Message description	CAN ID (Hex)	Data length (Byte)	Data type	Message cycle (ms)	Remarks
Information query Frame 1	0x4200	8	BIN	1000	The inverter is sent to the BMS
Information query Frame 2	0x4200	8	BIN	aperiodic message	The inverter is sent to the BMS
Sleep wake control frame	0x8200	8	BIN	aperiodic message	The inverter is sent to the BMS
Charge and discharge control frame	0x8210	8	BIN	aperiodic message	The inverter is sent to the BMS
Communication fault mask frame	0x8240	8	BIN	aperiodic message	The inverter is sent to the BMS

6.3 Data Frame

The data frame includes Information response frame 1 to information response frame 15, and the data frame format should conform to Table 2.

Table 2 Data frame classification

Message Description	CAN ID (Hex)	Data Length (Byte)	Data Type	Message cycle (ms)	Remarks
Message reply frame 1	0x4210	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 2	0x4220	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 3	0x4230	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 4	0x4240	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 5	0x4250	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 6	0x4260	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 7	0x4270	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 8	0x4280	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query

					frame 1
Message reply frame 9	0x4290	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 10	0x42E0	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 11	0x42F0	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 12	0x4300	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 1
Message reply frame 13	0x7310	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 2
Message reply frame 14	0x7320	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 2
Message reply frame 15	0x7330	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 2
Message reply frame 16	0x8250	8	BIN	aperiodic message	The BMS replies to the inverter with a response frame for information query frame 2

7 Message format and content

7.1 Information query Frame 1

The inverter sends information query frame 1 to the BMS, and the BMS replies information reply frame 1 to information reply frame 12. The flowchart is shown in Figure 3.

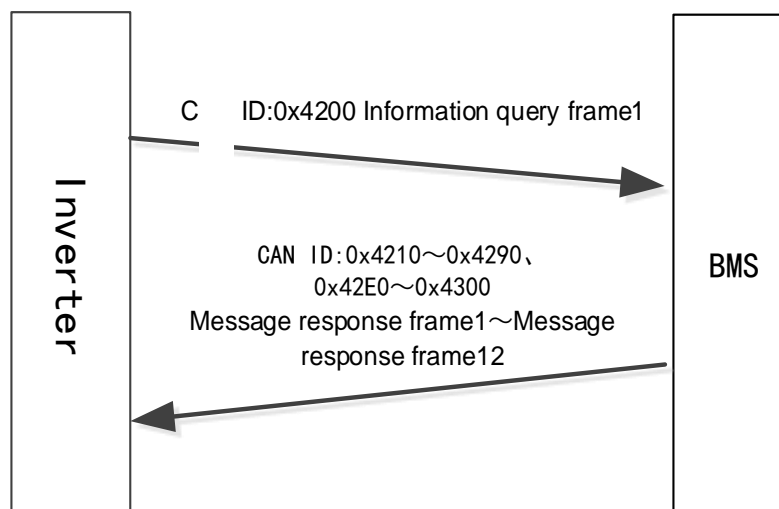


Figure 3 Interactive flow of device information query

The inverter sends information query frame 1 to the BMS, CAN ID: 0x4200, and the format conforms to Table 3.

Table 3 Information query Frame 1

Start byte or bit	Parameter Name	Data Format	Byte length	Remark
1	General information	BIN	1 Byte	0
2	Reserve	BIN	1 Byte	Fill 00H
3	Reserve	BIN	1 Byte	Fill 00H
4	Reserve	BIN	1 Byte	Fill 00H
5	Reserve	BIN	1 Byte	Fill 00H
6	Reserve	BIN	1 Byte	Fill 00H
7	Reserve	BIN	1 Byte	Fill 00H
8	Reserve	BIN	1 Byte	Fill 00H

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 1, CAN ID: 0x4210, and the format conforms to Table 4.

Table 4 Message reply frame 1

Start byte or bit	Parameter Name	Data Format	Field Length	Remark
1	Total battery voltage	BIN	2Byte	Unit: 0.1V offset: 0
3	Battery current	BIN	2Byte	Unit: 0.1A offset: -3000A
5	Master temperature	BIN	2Byte	Unit: 0.1°C offset: -100°C
7	SOC	BIN	1Byte	Unit: 1% offset: 0
8	SOH	BIN	1Byte	Unit: 1% offset: 0

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 2, CAN ID: 0x4220, and the format conforms to Table 5.

Table 5 Message reply frame 2

Start byte or bit	Parameter Name	Data Format	Field Length	Remark
1	Charging cut-off voltage	BIN	2Byte	Unit: 0.1V offset: 0
3	Discharge cut-off voltage	BIN	2Byte	Unit: 0.1V offset: 0
5	Maximum charging current	BIN	2Byte	Unit: 0.1A offset: -3000A
7	Maximum discharge current	BIN	2Byte	Unit: 0.1A offset: -3000A

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 3, CAN ID: 0x4230, and the format conforms to Table 6.

Table 6 Message reply frame 3

Start byte or bit	Parameter Name	Data Format	Field Length	Remark
1	Maximum monomer battery voltage	BIN	2Byte	Unit: 0.001V offset: 0
3	Minimum monomer battery voltage	BIN	2Byte	Unit: 0.001V offset: 0
5	Maximum monomer battery voltage number	BIN	2Byte	Unit: 1 offset: 0
7	Minimum monomer battery voltage number	BIN	2Byte	Unit: 1 offset: 0

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 4, CAN ID: 0x4240, and the format conforms to Table 7.

Table 7 Message reply frame 4

Start byte or bit	Parameter Name	Data Format	Field Length	Remark
1	Maximum monomer battery temperature	BIN	2Byte	Unit: 0.1°C offset: -100
3	Minimum monomer battery temperature	BIN	2Byte	Unit: 0.1°C offset: -100
5	Maximum monomer battery temperature number	BIN	2Byte	Unit: 1 offset: 0
7	Minimum monomer battery temperature number	BIN	2Byte	Unit: 1 offset: 0

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 5 CAN ID: 0x4250, and the format conforms to Table 8.

Table 8 Message reply frame 5

Start byte or bit	Parameter Name	Data Format	Field Length	Remark
1	Basic status	BIN	1Byte	BIT0~BIT2: 0: sleep 1: charging 2: discharge 3: standby 4~7: reserve BIT3: 0: NULL 1: Request charge BIT4: 0: NULL 1: Demand equalization BIT5~BIT7: Revered
2	Cycle period	BIN	2Byte	Unit: 1 offset: 0

4	Breakdown	BIN	1Byte	See Table 9 for specific information
5	Alarm	BIN	2Byte	See Table 10 for specific information
7	Protect	BIN	2Byte	See Table 11 for specific information

Table 9 Fault information

Start bit	Fault information
1	Voltage sensor fault
2	Temperature sensor fault
3	Internal communication failure
4	Input overvoltage failure
5	Input reverse connection failure
6	Relay detection fault
7	Battery damage (caused by battery overdischarge, etc.)
8	Other faults (see fault extension table)

Table 10 Alarm information

Start bit	Alarm information
1	Battery monomer low voltage alarm
2	Battery monomer high voltage alarm
3	Battery string low discharge voltage alarm
4	Battery string high charging voltage alarm
5	Charging low temperature alarm
6	Charging high temperature alarm
7	Discharge low temperature alarm
8	Discharge high temperature alarm
9	Battery pack charging overcurrent alarm
10	Battery pack discharge overcurrent alarm
11	Battery module low voltage alarm
12	Battery module high voltage alarm
13	Reserve
14	Reserve
15	Reserve
16	Reserve

Table 11 Protect information

Start bit	Protect information
1	Battery monomer low-voltage protection
2	Battery monomer high-voltage protection
3	Battery pack discharging low-voltage protection
4	Battery pack discharging high-voltage protection
5	Charging low temperature protection
6	Charging high temperature protection
7	Discharge low temperature protection
8	Discharge high temperature protection
9	Battery pack charging overcurrent protection
10	Battery pack discharge overcurrent protection
11	Battery module undervoltage protection
12	Battery module overvoltage protection
13	Reserve
14	Reserve
15	Reserve
16	Reserve

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 6 CAN ID: 0x4260, and the format conforms to Table 12.

Table 12 Message reply frame 6

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Maximum battery module voltage	BIN	2Byte	unit: 0.001V offset: 0
3	Minimum battery module voltage	BIN	2Byte	unit: 0.001V offset: : 0
5	Maximum battery module voltage number	BIN	2Byte	unit: 1 offset: 0
7	Minimum battery module voltage number	BIN	2Byte	unit: 1 offset: 0

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 7 CAN ID: 0x4270, and the format conforms to Table 13.

Table 13 Message reply frame 7

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Maximum battery module temperature	BIN	2Byte	unit: 0.1°C offset: -100
3	Minimum battery module temperature	BIN	2Byte	unit: 0.1°Ce offset: -100
5	Maximum battery module temperature number	BIN	2Byte	unit: 1 offset: 0
7	Minimum battery module temperature number	BIN	2Byte	unit: 1 offset: 0

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 8 CAN ID: 0x4280, and the format conforms to Table 14.

Table 14 Message reply frame 8

Start bit	Parameter Name	Data Format	Field Length	Remark
1	No charging sign	BIN	1Byte	0xAA Valid. Other values are invalid
2	Battery pack current	BIN	1Byte	0xAA Valid. Other values are invalid
3	Reserve	BIN	1Byte	Fill 00H
4	Reserve	BIN	1Byte	Fill 00H
5	Reserve	BIN	1Byte	Fill 00H
6	Reserve	BIN	1Byte	Fill 00H
7	Reserve	BIN	1Byte	Fill 00H
8	Reserve	BIN	1Byte	Fill 00H

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 9 CAN ID: 0x4290, and the format conforms to Table 15.

Table 15 Message reply frame 9

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Fault propagation	BIN	1Byte	BIT0: Anomaly shutdown circuit BIT1: BMIC anomaly BIT2: Internal bus anomaly BIT3: Power-on self-test abnormal BIT4~BIT7: Reserve
2	Reserve	BIN	1Byte	Fill 00H
3	Reserve	BIN	1Byte	Fill 00H
4	Reserve	BIN	1Byte	Fill 00H
5	Reserve	BIN	1Byte	Fill 00H
6	Reserve	BIN	1Byte	Fill 00H
7	Reserve	BIN	1Byte	Fill 00H
8	Reserve	BIN	1Byte	Fill 00H

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 10 CAN ID: 0x42E0, and the format conforms to Table 16.

Table 16 Message reply frame 10

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Series-Number-ASCII	BIN	1Byte	
2		BIN	1Byte	
3		BIN	1Byte	
4		BIN	1Byte	
5		BIN	1Byte	
6		BIN	1Byte	
7		BIN	1Byte	
8		BIN	1Byte	

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 11 CAN ID: 0x42F0, and the format conforms to Table 17.

Table 17 Message reply frame 11

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Manufacturer-Name-ASCII	BIN	1Byte	
2		BIN	1Byte	
3		BIN	1Byte	
4		BIN	1Byte	
5		BIN	1Byte	
6		BIN	1Byte	
7		BIN	1Byte	
8		BIN	1Byte	

After receiving the information query frame 1 from the inverter, the BMS replies to the information reply frame 12 CAN ID: 0x4300, and the format conforms to Table 18.

Table 18 Message reply frame 12

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Reserve	BIN	1Byte	Fill 00H
2	Reserve	BIN	1Byte	Fill 00H
3	Reserve	BIN	1Byte	Fill 00H
4	Reserve	BIN	1Byte	Fill 00H
5	Reserve	BIN	1Byte	Fill 00H
6	Reserve	BIN	1Byte	Fill 00H
7	Reserve	BIN	1Byte	Fill 00H
8	Reserve	BIN	1Byte	Fill 00H

7.2 Information Query Frame 2

and the BMS replies information reply frame 13 to information reply frame 15. The flow chart is shown in Figure 4.

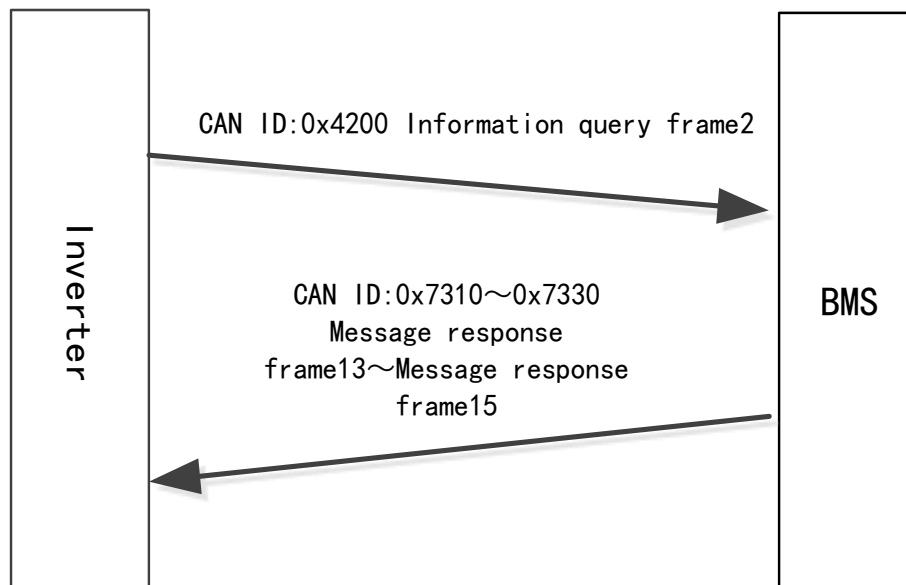


Figure 4 Information query Frame 2

The inverter sends information query frame 2 to the BMS, CAN ID: 0x4200, and the format conforms to Table 19.

Table 19 Information query Frame 2

Start bit	Parameter Name	Data Format	Field Length	Remark
1	System equipment information	BIN	1 Byte	2: System equipment information

2	Reserve	BIN	1 Byte	Fill 00H
3	Reserve	BIN	1 Byte	Fill 00H
4	Reserve	BIN	1 Byte	Fill 00H
5	Reserve	BIN	1 Byte	Fill 00H
6	Reserve	BIN	1 Byte	Fill 00H
7	Reserve	BIN	1 Byte	Fill 00H
8	Reserve	BIN	1 Byte	Fill 00H

After receiving the information query frame 2 from the inverter, the BMS replies to the information reply frame 13 CAN ID: 0x7310, and the format conforms to Table 20.

For example, the hardware version is V2.1 and the software version is V1.2.

Table 20 Message reply frame 13

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Hardware version	BIN	1Byte	BIT0~BIT7 0: invalid; 1:A version; 2:B version; other: reserve
2	Reserve	BIN	1Byte	unit: 1 offset: 0
3	Hardware version -V	BIN	1Byte	0x02
4	Hardware version -R	BIN	1Byte	0x01
5	Software version -V (Major)	BIN	1Byte	0x01
6	Software version -V (Minor)	BIN	1Byte	0x02
7	Develop the main version	BIN	1Byte	unit: 1 offset: 0
8	Develop the minor version	BIN	1Byte	unit: 1 offset: 0

After receiving the information query frame 2 from the inverter, the BMS replies to the information reply frame 14 CAN ID: 0x7320, and the format conforms to Table 21.

Table 21 Message reply frame 14

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Total number of batteries	BIN	2Byte	unit: 1 offset: 0
3	Number of battery modules in series	BIN	1Byte	unit: 1 offset: 0
4	Number of batteries in a module	BIN	1Byte	单位: 1 offset: 0
5	voltage platform	BIN	2Byte	unit: 1V offset: 0
7	AH number	BIN	2Byte	unit: 1AH offset: 0

After receiving the information query frame 2 from the inverter, the BMS replies to the information reply frame 15 CAN ID: 0x7330, and the format conforms to Table 22.

Table 22 Message reply frame 15

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Manufacturer name	BIN	1Byte	'A'
2	Manufacturer name	BIN	1Byte	'U'
3	Manufacturer name	BIN	1Byte	'X'
4	Manufacturer name	BIN	1Byte	'S'
5	Manufacturer name	BIN	1Byte	'O'
6	Manufacturer name	BIN	1Byte	'L'
7	Manufacturer name	BIN	1Byte	Fill 00H
8	Manufacturer name	BIN	1Byte	Fill 00H

7.3 Sleep wake control frame

The inverter actively sends to the BMS to control the state of the BMS, CAN ID : 0x8200, and the format conforms to Table 23.

Table 23 Sleep wake control frame

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Sleep wake control	BIN	1 Byte	BIT0~BIT7 0x55: Control device enters the sleep state 0xAA: Control the device to exit the sleep state 其他: invalid
2	Reserve	BIN	1 Byte	Fill 00H
3	Reserve	BIN	1 Byte	Fill 00H
4	Reserve	BIN	1 Byte	Fill 00H
5	Reserve	BIN	1 Byte	Fill 00H
6	Reserve	BIN	1 Byte	Fill 00H
7	Reserve	BIN	1 Byte	Fill 00H
8	Reserve	BIN	1 Byte	Fill 00H

7.4 Charge and discharge control frame

The inverter actively sends to the BMS to control the state of the BMS, CAN ID : 0x8210, and the format conforms to Table 24.

Table 24 Charge and discharge control frame

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Charge command	BIN	1 Byte	0xAA Valid. Other values are invalid
2	Discharge command	BIN	1 Byte	0xAA Valid. Other values are invalid

3	Reserve	BIN	1 Byte	Fill 00H
4	Reserve	BIN	1 Byte	Fill 00H
5	Reserve	BIN	1 Byte	Fill 00H
6	Reserve	BIN	1 Byte	Fill 00H
7	Reserve	BIN	1 Byte	Fill 00H
8	Reserve	BIN	1 Byte	Fill 00H

7.5 Communication fault barrier frame

The inverter is actively sent to the BMS to shield the communication failure of the BMS. The BMS responds to frame 16 of the BMS message based on whether the inverter responds or not, CAN ID : 0x8240. The flow chart is shown in Figure 5.

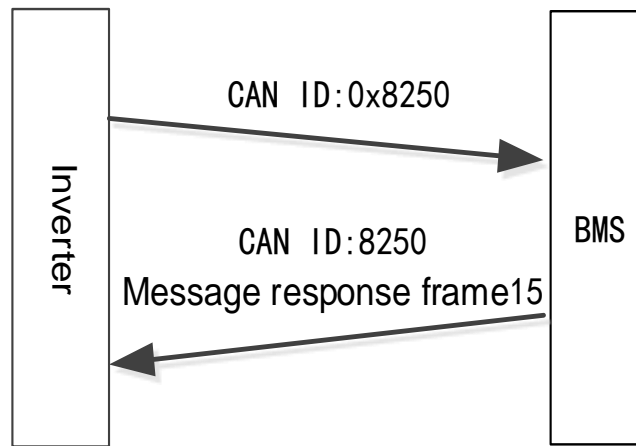


Figure 5 Communication fault barrier frame

The format of the communication fault shielding frame sent by the inverter conforms to Table 25.

Table 25 Communication fault barrier frame

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Deliver the "Block external communication faults" command	BIN	1 Byte	0xAA Valid. Other values are invalid
2	Reserve	BIN	1 Byte	Fill 00H
3	Reserve	BIN	1 Byte	Fill 00H
4	Reserve	BIN	1 Byte	Fill 00H
5	Reserve	BIN	1 Byte	Fill 00H
6	Reserve	BIN	1 Byte	Fill 00H
7	Reserve	BIN	1 Byte	Fill 00H
8	Reserve	BIN	1 Byte	Fill 00H

After receiving the communication fault shield frame sent by the inverter, the BMS replies to the message reply frame 16, CAN ID : 0x8250, and the format conforms to Table 26.

Table 26 Message response frame 16

Start bit	Parameter Name	Data Format	Field Length	Remark
1	Whether the system status meets the conditions for running the command	BIN	1Byte	0xAA: Confirm to,implement immediately Others: Do not execute this order
2	Reserve	BIN	1Byte	unit: 1 offset: 0
3	Reserve	BIN	1Byte	unit: 1 offset: 0
4	Reserve	BIN	1Byte	unit: 1 offset: 0
5	Reserve	BIN	1Byte	unit: 1 offset: 0
6	Reserve	BIN	1Byte	单位: 1 offset: 0
7	Reserve	BIN	1Byte	unit: 1 offset: 0
8	Reserve	BIN	1Byte	unit: 1 offset: 0