	Text, file, catalog, No	Product version	Secret, level
		V 1.1	secret
	Project name: GQ021T monitoring unit		There are 14 pages in total

The GQ021T communication protocol

To make,	Wei Xinghui	Date: 2021-09-10
Review, batch		date:

Revised records

Day, period	release version	Described, described	For,
2021-03-03	1.0	first draft	
2021.9.10	1.1	Add busoff to the 0x163 message and report the battery voltage	

Eyes, record

1 Physical interface and communication mode

1.1 The physical definition of the protocol

1.1.1 physical interface

The physical layer enables the electrical connection between the charging device and the BMS in the network. The physical layer using this standard shall comply with the provisions of international standards ISO 11898-1, SAE1939-11. The standard charging equipment for communication with the BMS shall use a CAN interface independent of the powertrain control system. The communication rate between the charging device and the BMS should be 500kbps.
The data link layer provides reliable data transfer between physical connections. The data frame format between the charger and the BMS of this standard meets the provisions of the CAN Bus Version 2.0B.

1.1.2 communication mode

Communication shall be sent proactively. Power supply status is sent regularly and feedback after calibration parameters.

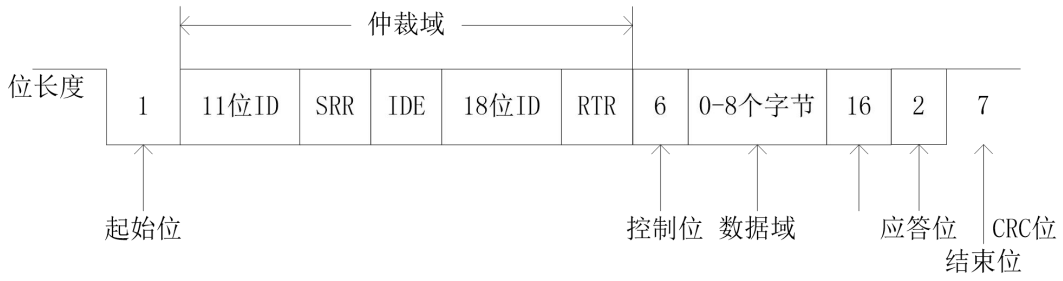
1.2 CAN Bus Data Link Layer communication protocol

1.2.1 communication mode

This protocol supports primary and event-triggered communication mode. See "Communication Mode" section for detailed transmission process.

1.2.2 basic format

CAN Data Basic Format (Extended frames are used in this protocol)



The arbitration domain includes:
The 29-bit identifier + SRR bit + IDE bit + extended frame format RTR bit
RTR= Remote Transport Requirements

SRR= Inin remote Requirements
IDE= Identifier Extensions
Control domain: Number of data figures
CRC: cyclic redundancy check code
Response position
Frame end bit

The definition of CAN messages includes the assignment of frame identifiers and the assignment of frame data. The CAN frame identifier specifies the destination address and the source address of the message, and can set the transmission priority of the message. The CAN frame data partially transmits the application layer protocol.

This protocol uses only CAN messages in extended frame format, not remote frames in extended frame format.

The following CAN frame format is defined as the SU monitoring CAN communication frames, which is mainly used for the communication between the SU. The detailed frame format is as follows:

Table 2.1 The S U Communication Frame

r a m e r e e t o p n o w a l l y D				ID28	ID27	ID26	ID25	ID24
				P(priority)			0	0
	ID 23	ID 22	ID 21	ID 20	ID 19	ID 18	ID 17	ID 16
	PGN (Command Number)							
	ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8
	PS (8) (destination address)							
	ID 7	ID 6	ID 5	ID 4	ID 3	ID 2	ID 1	ID 0
	SA (8) (Source address)							
	SRR=1		IDE=1		RTR=0	DLC=8		
r a m e	Byte0		Byte1				Application layer protocol area	
	Byte2		Byte3					
	Byte4		Byte5					

ount ccupy		
	Byte6	Byte7

1.3 data format

1.3.1 Basic data format

All the data is transmitted in 16 decimal system, and the whole data is transmitted to 8 bits higher and then 8 bits lower.

1.4 encode table

1.4.1 Encoding allocation

The highest CMD bit is directional, SU issues 0, and SM uploads 1.
See Table A10 for the equipment type encoding allocation table (CMD)

Table A10 CMD encodes the assignment table

order number	definition	PGN	content
internal command			
1	Calibrate the control command	E0H	Calibration control
2	Query calibration parameters	E1H	Returns the query content
3	Set calibration parameters	E2H	Set parameter content
4	Set up / query the parameter response	E3H	Returns the calibration parameter
5	Mode block current	E4H	Returns the module current
6	Trigger software download	E8H	Software download triggered, issued three times, enter the download mode, valid within 3S
7	SD	E9H	Software download, multi-frame transfer
8	Software download	E7H	Software download results

	results		
9	Manufacturer information	D0H	Get manufacturer information
10	Aging mode	D1H	Set the aging mode
11	Software version query	D2H	Get the software version
12	Power barcode query	D3H	Returns the power barcode
13	Power barcode setting	D4H	Setup is successful
14	Simulation query	D8H	Return the analog amount
15	Alarm query	D9H	Returns the alarm
16	CP query	DAH	Returns the CC / CP information

1.5 Multi-frame transmission

Multiframe transfer was performed using SAJ1939-21

2 Customer communication commands are defined in detail

2.1 Control command 1

frame ID		0x110	sending node		VCU
data format		Moto (High Bytes in Front)	Send cycle		20ms
position	Bit	name	resolution ratio	offset	parameter declaration
Byte0	0→7				
Byte1	0→7				
Byte2	0→7				
Byte3	0→7				
Byte4	0→7				
Byte5	0→7				
Byte6	0→7				
Byte7	0→7	Heart rate	1	0	

2.2 Control command 2

frame ID		0x111	sending node		VCU
data format		Moto (High Bytes in Front)	Send cycle		50ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	4→7				
	2→3	DCDC enable	1	0	1-No Power 2-Enabling
	0→1				
Byte1	0→7				
Byte2	4→7				
	2→3	Quick-charge contactor instruction	1	0	1-Disconnected, and 2-Closed
	0→1	Slow-charge contactor instruction	1	0	1-Disconnected, and 2-Closed
Byte3	0→7				
Byte4	7	HCM adhesion detection instruction	1	0	0-Unactivated 1-activation
	6	The HCM shuts down the hibernation command	1	0	0-Unactivated 1-activation
	4→5	Air-conditioning contactor instructions	1	0	1-Disconnected, and 2-Closed
	2→3	The PTC contactor instruction	1	0	1-Disconnected, and 2-Closed
	0→1	Main positive contactor instruction	1	0	1-Disconnected, and 2-Closed
Byte5	0→7				
Byte6	0→7				
Byte7	0→7				

2.3 Control command 4

frame ID		0x131	sending node		BMS
data format		Moto (High Bytes in Front)	Send cycle		50ms
position	Bit	name	resolution ratio	offset	parameter declaration
Byte0	2→7				

	0→1	OBC instruct	1	0	1-Shutdown, 2-Enable
Byte1	0→7				
Byte2	0→7	charging voltage	0.1	0	
Byte3	0→7				
Byte4	0→7	charging current	0.1	-1000A	
Byte5	0→7				
Byte6	0→7				
Byte7	0→7				

2.4 Control command 5

frame ID		0x63B	sending node		BMS
data format		Moto (High Bytes in Front)	Send cycle		100ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	0→7				
Byte1	0→7				
Byte2	0→7	CP duty cycle	1	0	
Byte3	0→7	CP frequency	10	0	
Byte4	0→7				
Byte5	0→7	CC resistance	1	0	
Byte6	0→7				
Byte7	0→7				

2.5 DCDC state 1

frame ID		0x240	sending node		DCDC
data format		Moto (High Bytes in Front)	Send cycle		100ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	6→7				
	4→5	Fault grade	1	0	0-Normal grade 1-1 low micro Classes 2 - 2 are medium, and grades 3 - 3 are severe
	0→3	DCDC running state	1	0	0-Initialization 1-Self-Pass 2-High pressure on top 3-Enabled

					5-Fault, 6-shutdown
Byte1	7				
	6	Communication failure	1	0	0-Normal, 1-fault
	5	Output overflow	1	0	0-Normal, 1-fault
	4	Self-inspection fault	1	0	0-Normal, 1-fault
	3	Overtemperature failure	1	0	0-Normal, 1-fault
	2	Enter overpressure	1	0	0-Normal, 1-fault
	1	Input under pressure	1	0	0-Normal, 1-fault
	0	Output overpressure	1	0	0-Normal, 1-fault
Byte2	0→7	output voltage	0.1V	0	
Byte3	0→7	Output current value	1A	0	
Byte4	0→7	temperature scale	1℃	-40℃	
Byte5	0→7				
Byte6	0→7	version number	0.01	0	
Byte7	0→7	Heart rate	1	0	

2.6 HCM state 1

frame ID		0x160	sending node		HCM
data format		Moto (High Bytes in Front)	Send cycle		100ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	7	Charging wake up state	1	0	0-Unactivated 1-activation
	6	ON file status	1	0	0-Unactivated 1-activation
	4→5	Fault grade	1	0	0-Normal grade 1-1 low micro Classes 2 - 2 are medium, and grades 3 - 3 are severe
	0→3	HCM running state	1	0	0-Initialization 1-Self-inspection pass, on high pressure 2-High pressure already on, waiting for enabling 3-already enabled 5-Failure, unable to run 6-shutdown
Byte1	7	Air-conditioning contactor status	1	0	0-Disconnect, 1-Closed
	6	PTC contactor status	1	0	0-Disconnect, 1-Closed

	5	Pre-charge contactor status	1	0	0-Disconnect, 1-Closed
	4	Main positive contactor status	1	0	0-Disconnect, 1-Closed
	0→3	HCM pre-charge state	1	0	0-Open circuit 1-Pre-charge process 2-Pre-charge completed, 3-Pre-charge fault 4-Pre-charge and locking, 5-normal drive
Byte2	7	BMS communication failure	1	0	0-Normal, 1-fault
	6	VCU communication failure	1	0	0-Normal, 1-fault
	4→5	Low voltage power supply failure	1	0	0-Normal, 1-Under-pressure 2-Overpressure 3-Sampling fault
	3	High voltage interlock fault	1	0	0-Normal, 1-fault
	2	Self-inspection fault	1	0	0-No,1-Yes
	1	Quick-charge contactor status	1	0	0-Disconnect, 1-Closed
	0	Slow-charge contactor state	1	0	0-Disconnect, 1-Closed
Byte3	6→7	Air-conditioning contactor fault	1	0	0-Normal, 1-adhesive 2-Open the way
	4→5	PTC contactor fault	1	0	0-Normal, 1-adhesive 2-Open the way
	2→3	Pre-charge contactor fault	1	0	0-Normal, 1-adhesive 2-Open the way
	0→1	Main positive contactor is faulty	1	0	0-Normal, 1-adhesive 2-Open the way
Byte4	5→7				
	4	Open cover fault	1	0	0-Normal, 1-fault
	2→3	Slow-charge contactor fault	1	0	0-Normal, 1-adhesive 2-Open the way
	0→1	Fast-charge contactor fault	1	0	0-Normal, 1-adhesive 2-Open the way
Byte5	0→7				
Byte6	0→7	version number	0.01	0	
Byte7	0→7	Heart rate	1	0	

2.7 HCM state 2

frame ID		0x161	sending node		HCM
data format		Moto (High Bytes in Front)	Send cycle		20ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	0→7	Main positive contactor	0.1V	0	
Byte1	0→7				
Byte2	0→7	Main positive pre-charge contact	0.1V	0	
Byte3	0→7				
Byte4	0→7	Copositive contactor	0.1V	0	
Byte5	0→7				
Byte6	0→7	busbar voltage	0.1V	0	
Byte7	0→7				

2.8 HCM state 3

frame ID		0x162	sending node		HCM
data format		Moto (High Bytes in Front)	Send cycle		20ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	0→7	Slow charge contactor	0.1V	0	
Byte1	0→7				
Byte2	0→7	Fast charge contactor	0.1V	0	
Byte3	0→7				
Byte4	0→7	Upper contactor	0.1V	0	
Byte5	0→7				
Byte6	0→7	PTC contactor	0.1V	0	
Byte7	0→7				

2.9 HCM state 4

frame ID		0x163	sending node		HCM
data format		Moto (High Bytes in Front)	Send cycle		20ms
byte	Bit	name	resolution	offset	parameter declaration

			ratio		
Byte0	0→7	Battery voltage	0.1V	0	
Byte1	0→7				
Byte2	0→7	/	/	/	
Byte3	0→7				
Byte4	0→7	/	/	/	
Byte5	0→7				
Byte6	0→7	/	/	/	
Byte7	0→7	Busoff state			0 Normal, and at 1busoff

2.10 OBC state 1

frame ID		0x370	sending node		OBC
data format		Moto (High Bytes in Front)	Send cycle		100ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	6→7				
	4→5	Fault grade	1	0	0-Normal grade 1-1 low micro Classes 2 - 2 are medium, and grades 3 - 3 are severe
	0→3	running state	1	0	0-Initialization 1-Self-Pass 2-High pressure on top 3-Enabled 5-Fault, 6-shutdown
Byte1	4→7				
	3	Output overflow	1	0	0-Normal, 1-fault
	2	OBC lack of phase	1	0	0-Normal, 1-fault
	1	PFC overvoltage	1	0	0-Normal, 1-fault
	0	PFC undervoltage	1	0	0-Normal, 1-fault
Byte2	7	Self-inspection fault	1	0	0-Normal, 1-fault
	6	Communication timeout	1	0	0-Normal, 1-fault
	5	hardware malfunction	1	0	0-Normal, 1-fault
	4	Enter overVoltage	1	0	0-Normal, 1-fault
	3	Input under Voltage	1	0	0-Normal, 1-fault
	2	Output overVoltage	1	0	0-Normal, 1-fault
	1	Output underVoltage	1	0	0-Normal, 1-fault
	0	Overtemperature failure	1	0	0-Normal, 1-fault
Byte3	0→7	temperature scale	1℃	-40℃	
Byte4	0→7				

Byte5	0→7				
Byte6	0→7	version number	0.01	0	
Byte7	0→7	Heart rate	1	0	

2.11 OBC state 2

frame ID		0x371	sending node		OBC
data format		Moto (High Bytes in Front)	Send cycle		100ms
byte	Bit	name	resolution ratio	offset	parameter declaration
Byte0	0→7	input currenton	0.1A	-1000A	
Byte1	0→7				
Byte2	0→7	input voltage	0.1V	0	
Byte3	0→7				
Byte4	0→7	output	0.1A	-1000A	
Byte5	0→7				
Byte6	0→7	output voltage	0.1V	0	
Byte7	0→7				

3 Detailed definition of the OBC internal communication command (Address: 0x49)

3.1 Query calibration parameters

SU query the calibration parameters. (ID: 0x18E1XX00)

position	data name	offset	parameter declaration
1B yte	Parameter number	/	/
2Byte	/	/	/
3Byte	/	/	/
4Byte	/	/	/
5Byte	/	/	/
6Byte	/	/	/
7Byte	/	/	/
8Byte	/	/	/

Parameter Number Table:

order number	Parameter coding	Parameter content
1	0	output K, B
2	1	input currenton K, B
3	2	Module 1 current K and B
4	3	Module 2 current K and B
5	4	Output voltage sampling K, B
6	8	Set the voltages K and B
7	6	cell voltage K, B
8	7	current-limiting K, B

3.2 set up parameters

The SU sets the calibration parameters.（ID：0x18E2XX00）

position	data name	offset	parameter declaration
1B yte	Parameter number	/	1~9 (See Parameter Number)
2Byte	continue to have	/	/
3Byte	Data K low		
4Byte	Data K high		
5Byte	Data B low	/	/
6Byte	Data B high	/	/
7Byte	continue to have	/	/
8Byte	continue to have	/	/

3.3 Set up / query the parameter feedback

Set up / query the parameter response.The SU Setup command response is made

（ID：0x18E300XX ）

positio n	data name	offset	parameter declaration
1B yte	Parameter number	/	/
2Byte	Set the results	/	0-Success, 1-Failure
3Byte	Data K low	/	8000~12000
4Byte	Data K high	/	8000~12000
5Byte	Data B low	/	-500~500
6Byte	Data B high	/	-500~500

7Byte	continue to have	/	/
8Byte	continue to have	/	/

3.4 Parameter calibration calculation method

3.4.1 Sampling voltage

The sampled voltage K value by default is 10,000, and the B value is 0

Sample voltage K value = (actual voltage / display voltage) * 10,000

Sample voltage B value of 0

3.4.2 output voltage

The output voltage K value by default is 10,000, and the B value is 0.

Output voltage K value = (actual voltage / display voltage) * 10000

Output voltage-B value of 0

3.4.3 Sampling output current

The sampling current K value is 10000 and B value is 0.

The calculation method is:

10A shows the current V11, and the actual current V12.

30A shows the current V21, and the actual current V22.

K = ((V22-V12) / (V21-V11)) *10000。

B = ((V11 * New K / original K) V12) * 100.

3.4.4 Flow limiting point (input voltage: 240V)

The default value of the flow restriction point K is 10000, and the B value is 0

Flow limit point K value = (set flow limit point / actual flow limit point) * 10000

Flow limit point, with a B value of 0

3.4.5 Battery voltage

The battery voltage K value by default is 10,000, and the B value is 0.

Battery voltage K value = (actual voltage / display voltage) * 10,000

Battery voltage, B, value of 0

3.5 Query module current

Host Query OBC command (ID: 0x18E4E800)

Query the module current response.The SU Setup command response is made (ID: 0x18E400F3)

position	data name	resolution ratio	offset	scope
1B yte	Number of modules	/	/	1~5 (Default: 3)
2Byte	Frame index	/	/	1
3Byte	Module 1 current is low	/	/	Amplification 100
4Byte	Module 1 current High	/	/	
5Byte	Module 2 current is low	/	/	Amplification 100
6Byte	Module 2 current is high	/	/	
7Byte				
8Byte				

3.6 Software download trigger.

Software download triggered, issued three times, enter the download mode,

valid within 3S
（ID：0x18E800XX ）

position	data name	offset	parameter declaration
1B yte		/	/
2Byte		/	/
3Byte		/	/
4Byte		/	/
5Byte		/	/
6Byte	‘U ’	/	/
7Byte	‘1’	/	Single chip machine position number
8Byte	‘2’	/	

3.7 SD

Software download, PGN for 0XE9. Multiple frame transfer, up to 30K.

Within-frame definition:

address	content	remarks
00，01	PA	This frame starts address within the BIN
02，03	DL	This frame transfers the BIN data length
04	frame number	0-Frame 10xff-Last Frame, Other-Frame Number
05~261	BIN data	Up to 256 bytes, front fixed 256 bytes, final frame by actual length.

3.8 Software download results

Software download Results,

（ID：0x18E700XX ）。

position	data name	offset	parameter declaration
1B yte	Software download results	/	0-Success Other-failed
2Byte	/	/	/
3Byte	/	/	/
4Byte	/	/	/
5Byte	/	/	/
6Byte	/	/	/

7Byte	/	/	/
8Byte	/	/	/

3.9 Manufacturers' information query 1

Host query command (ID: 0x18D0XX00)

DC / DC controller response information: (ID: 0x18D000XX)

position	data	parameter declaration
1Byte	X	The A SC II code
2Byte	X	
3Byte	X	
4Byte	X	
5Byte	X	
6Byte	X	
7Byte	X	
8Byte	X	

3.10 Manufacturers' information query 2

Host Setup Command (ID: 0x18D1XX00)

Response Information: (ID: 0x18D100XX)

position	data	parameter declaration
1Byte	X	PIC16F1938 Model Name (ASCII code)
2Byte	X	
3Byte	X	
4Byte	X	
5Byte	X	
6Byte	X	
7Byte	X	
8Byte	X	

3.11 Aging mode setting

Host machine to set up the OBC command (ID: 0X1CFFFF00)

Response Information: (ID: 0X1CFF00FF)

position	data name	parameter declaration
1Byte	'V '	ASCII a sign or object indicating number
2Byte	'A '	
3Byte	'P '	
4Byte	'E '	
5Byte	'L '	
6Byte	'0'	
7Byte	'0'	
8Byte		'0': Normal mode '1': Aging mode

3.12 Software version query

Host software version query command (ID: 0x18D2XX00)

Response Information: (ID: 0x18D200XX)

position	data name	parameter declaration
1Byte	0x10	Pre-level software version V1.0
2Byte	0x10	Backlevel software version V1.0
3Byte	0x10	1938 Software version V1.0
4Byte	0x00	Hardware version No. V0.0
5Byte	0	Software minor version number 0
6Byte		
7Byte		
8Byte		

3.13 Hardware version settings

Host machine to set up the OBC command (ID: 0x18D2XX 00)

position	data name	parameter declaration
1Byte	'H '	

2Byte	‘D ’	
3Byte	‘V ’	
4Byte	‘E ’	
5Byte	‘R ’	
6Byte		
7Byte		
8Byte	0x10	Hardware version V1.0

Response Information: (ID: 0x18D200XX)

position	data name	parameter declaration
1Byte	0x10	Pre-level software version V1.0
2Byte	0x10	Backlevel software version V1.0
3Byte	0x10	1938 Software version V1.0
4Byte	0x00	Hardware version No. V0.0
5Byte	0	Software minor version number 0
6Byte		
7Byte		
8Byte		

3.14 Power barcode query

The host software version query command (ID: 0x18D3xx 00) xx is the power address

Response information: (ID: 0x18D300xx) xx is the power address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Barcode (ASCII)	Our 22-bit bar code (ASCII) is not enough to be empty
3Byte	Barcode (ASCII)	
4Byte	Barcode (ASCII)	

5Byte	Barcode (ASCII)	
6Byte	Barcode (ASCII)	
7Byte	Barcode (ASCII)	
8Byte	Barcode (ASCII)	

3.15 Power barcode setting

The host software version setting command (ID: 0x18D4xx 00) xx is the power address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Barcode (ASCII)	Our 22-bit bar code (ASCII) is not enough to space
3Byte	Barcode (ASCII)	
4Byte	Barcode (ASCII)	
5Byte	Barcode (ASCII)	
6Byte	Barcode (ASCII)	
7Byte	Barcode (ASCII)	
8Byte	Barcode (ASCII)	

Response information: (ID: 0x18D400xx) xx is the power address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Set the results	0-Success, 1-Failure
2~8Byte	continue to have	

3.16 Simulation query 1

The upper computer analog quantity query command (ID: 0x18D7xx 00)

XX is the power address

Response information: (ID: 0x18D700xx) XX is the power address

position	data name	parameter declaration
Byte 0	input voltage	0.1V/BIT
Byte 1		

Byte 2	input currenton	0.01A/BIT
Byte 3		
Byte 4	cell voltage	0.1V/BIT
Byte 5		
Byte 6	output	0.01A/BIT
Byte 7		

3.17 Status query

The upper computer analog query DC / DC command (ID: 0x18D9xx 00) XX is the power address

Response information: (ID: 0x18D900xx) XX is the power address

position	data name	parameter declaration
1Byte	page number	0-8
2Byte	Module number	
3Byte	Data 1	Bytes = Page Number * 6 + 1
4Byte	Data 2	Bytes = Page Number * 6 + 2
5Byte	Data 3	Bytes = Page Number * 6 + 3
6Byte	Data 4	Bytes = Page Number * 6 + 4
7Byte	Data 5	Bytes = Page Number * 6 + 5
8Byte	Data 6	Bytes = Page Number * 6 + 6

position	data name	parameter declaration
Byte 1	input voltage	0.1V/BIT
Byte 2		
Byte 3	input currenton	0.01A/BIT
Byte 4		
Byte 5	output voltage	0.1V/BIT

Byte 6		
Byte 7	output	0.01A/BIT
Byte 8		
Byte 9	cell voltage	0.1V/BIT
Bytes 10		
Bytes 11	maximum output current	0.01A/BIT
Bytes 12		
Bytes 13	Fan duty cycle	1%/BIT
Bytes 14	ambient temperature	1℃ / BIT, -40 offset
Bytes 15	Radiator temperature	1℃ / BIT, -40 offset
Bytes 16	MOS temperature	1℃ / BIT, -40 offset
Bytes 17	Front-level status (8 bits lower)	Bit0: 1 AC;0 DC Bit1: Input overpressure Bit2: Enter the underpressure Bit3: PFC overpressure Bit4: PFC underpressure Bit5: Front-grade over-temperature alarm Bit6:0 half-load; 1 Full-load Bit7: No one for the input
Bytes 18	Front-level status (8-bit high)	Bit0: Primary overtemperature protection Bit1:NC Bit2:NC Bit3: Communication was timed out Bit4:NC Bit5:NC Bit6: The PFC turns it off

		Bit7: DC turns off
Bytes 19	Alarm status (8 bits lower)	Bit0: Output overpressure Bit1: Output underpressure Bit2: Output overflow Bit3: Over-temperature protection Bit4: Drop Bit5: Module failure Bit6: The battery is not in place Bit7: A fan failure
Byte 20	Alarm status (8-bit high)	Bit0-1: The charging stage Bit2: Bit3: Bit4: Bit5: Bit6: Communication has timed out Bit7: On and off the machine
Bytes 21	Switch amount status	Bit0: Module 1 has failed Bit1: Module 2 has failed Bit2: Module 3 has failed Bit3: Module 4 has failed Bit4: Bit5: Bit6: Backstage power shutdown Bit7: Front-stage shutdown
Bytes 22	Shutdown status	Bit0: Secondary shutdown Bit1: The battery is not turned off in place

		Bit2: Output overpressure Bit3: Signal FG turns off Bit4: Over-temperature shutdown Bit5: mode of charging Bit6: fan shut off Bit7: reset and shutdown
Bytes 23	Protocol shutdown status	Bit0: Remote control shutdown Bit1: An abnormal charging process Bit2: A CP exception Bit3: Connector overtemperature Bit4: Communication was timed out Bit5: In the self-test Bit6:NC Bit7:NC
Bytes 24	Switch process	0x00
Bytes 25	CC state	The 0-CC is disconnected The 1-CC semi-connection is made 2-10A 3-16A 4-32A 5-63A 6-Other
Bytes 26	CP duty cycle	0-100, 1%
Bytes 27	Protocol switch amount	Bit0: Electronic lock Bit1: Wake-up Bit2: linkage Bit3: A fan failure Bit4: Bit5: Bit6: Bit7:

Bytes 28	Control 1938 status (low 8-bit)	Bit0-2: Charging mode Bit3: A fan failure Bit4:14V switch machine Bit5-7:
Bytes 29	Control 1938 status (high 8-bit)	Bit0: Calibration mode Bit1-3: Calibration No Bit4-6: Bit7: switch on and off the machine
Bytes 30		
Bytes 31	Connector temperature 1	1℃, -40
Bytes 32	Connector temperature 2	1℃, -40
Bytes 33	CP voltage	0.1V
Bytes 34	Normal voltage	0.1V
Bytes 35	CC, CP status (Low bytes)	Bit0: The S3 is turned on Bit1: The CC is disconnected Bit2: CC semi-connection Bit3: The gun was drawn Bit4: Communication was timed out Bit5: Charge charging Bit6: Sleeps dormant Bit7: CP frequency error
Bytes 36	CC, CP status (High bytes)	Bit0: The S2 is closed Bit1: Over-temperature alarm Bit2:12V is often abnormal Bit3: Bit4: Bit5: Bit6:

		Bit7:
Bytes 37	Set the voltage	0.1V
Bytes 38		
Bytes 39	Set current	0.01A
Bytes 40		
Bytes 41	CP frequency	0.0625
Bytes 42		

4 Detailed definition of the DC / DC internal communication command (Address: 0x98)

4.1 Query calibration parameters

SU query the calibration parameters.(ID: 0x18E1XX00) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Parameter number	/	/	/
2Byte	/	/	/	/
3Byte	/	/	/	/
4Byte	/	/	/	/
5Byte	/	/	/	/
6Byte	/	/	/	/
7Byte	/	/	/	/
8Byte	/	/	/	/

Parameter Number Table:

order number	Parameter coding	Parameter content
1	1	Module 1 current K and B
2	2	Module 2 current K and B
3	3	Module 3 current K and B
4	4	Module 4 has the current K and B

5	5	Module 5 current K and B
6	6	Output voltage sampling K, B
7	7	Output voltage is set at the settings K, B
8	8	ambient temperature K, B
9	9	current-limiting K, B

4.2 set up parameters

The SU sets the calibration parameters.(ID: 0x18E2XX00) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Parameter number	/	/	1~9 (See Parameter Number)
2Byte	continue to have	/	/	/
3Byte	Data K low	/	/	/
4Byte	Data K high	/	/	/
5Byte	Data B low	/	/	/
6Byte	Data B high	/	/	/
7Byte	continue to have	/	/	/
8Byte	continue to have	/	/	/

4.3 Set up / query the parameter feedback

Set up / query the parameter response.The SU Setup command response is made

(ID: 0x18E300XX) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Parameter number	/	/	/
2Byte	Set up the result (0-Success 1-failure)	/	/	/
3Byte	Data K low	/	/	8000~12000
4Byte	Data K high	/	/	8000~12000
5Byte	Data B low	/	/	-500~500
6Byte	Data B high	/	/	-500~500
7Byte	continue to have	/	/	/
8Byte	continue to have	/	/	/

4.4 Parameter calibration calculation method

4.4.1 Sampling voltage

The sampled voltage K value by default is 10,000, and the B value is 0

Sample voltage K value = (actual voltage / display voltage) * 10,000

Sample voltage B value of 0

4.4.2 output voltage

The output voltage K value by default is 10,000, and the B value is 0.

Output voltage K value = (actual voltage / display voltage) * 10000

Output voltage-B value of 0

4.4.3 Sampling output current

Set the single module calibration mode first to make the single module work.

The sampling current K value is 10000 and B value is 0.

The calculation method is:

10A shows the current V11, and the actual current V12.

30A shows the current V21, and the actual current V22.

K = ((V22-V12) / (V21-V11)) *10000。

B = ((V11 * New K / original K) V12) * 100.

4.4.4 Limit the flow point

The default value of the flow restriction point K is 10000, and the B value is 0

Flow limit point K value = (set flow limit point / actual flow limit point) * 10000

Flow limit point, with a B value of 0

4.5 Query module current

The Host Query OBC command (ID: 0x18E4XX 00) XX is the power address
Query the module current response.The SU Setup command response is made (ID: 0x18E400F3) XX is the power address

position	data name	resolution ratio	offset	scope
1B yte	Number of modules	/	/	1~5 (Default: 3)
2Byte	Frame index	/	/	1
3Byte	Module 1 current is low	/	/	Amplification 100
4Byte	Module 1 current High	/	/	
5Byte	Module 2 current is low	/	/	Amplification 100
6Byte	Module 2 current is high	/	/	
7Byte	Module 3 The current is low	/	/	Amplification 100
8Byte	Module 3 current is high	/	/	

4.6 Software download trigger.

Software download triggered, issued three times, enter the download mode, valid within 3S
(ID: 0x18E800XX) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	software release	/	/	/
2Byte	Software compilation year	/	/	/
3Byte	Software compilation month	/	/	/
4Byte	Software compilation day	/	/	/
5Byte	Bytes number (8 bits high)	/	/	/
6Byte	Bytes number (8 bits lower)	/	/	/

7Byte	/	/	/	/
8Byte	/	/	/	/

4.7 SD

Software download, PGN for 0XE9. Multiple frame transfer, up to 30K.
Within-frame definition:

address	content	remarks
00, 01	PA	This frame starts address within the BIN
02, 03	DL	This frame transfers the BIN data length
04	frame number	0-Frame 10xff-Last Frame, Other-Frame Number
05~261	BIN data	Up to 256 bytes, front fixed 256 bytes, final frame by actual length.

4.8 Software download results

Software download Results,
（ID：0x18E700XX ）。The XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Software download results	/	/	0-Success Other-Failure
2Byte	/	/	/	/
3Byte	/	/	/	/
4Byte	/	/	/	/
5Byte	/	/	/	/
6Byte	/	/	/	/
7Byte	/	/	/	/
8Byte	/	/	/	/

4.9 Manufacturer information query

The Host Query OBC command (ID: 0x18D0XX 00) XX is the power address

OBC Controller response information: (ID: 0x18D000XX) XX is the power address

position	data	parameter declaration

1Byte		AIIC code 5 bytes, no data to fill in empty bytes 0x20
2Byte		
3Byte		
4Byte		
5Byte		A\B\C …(0x20 space character)
6Byte		
7Byte		
8Byte		

4.10 Aging mode setting

Host machine to set up the OBC command (ID: 0x 1CFFFF00)
Response Information: (ID: 0x1CFF00FF)

position	data name	parameter declaration
1Byte	'V '	ASCII
2Byte	'A '	ASCII
3Byte	'P '	ASCII
4Byte	'E '	ASCII
5Byte	'L '	ASCII
6Byte	'0'	ASCII
7Byte	'0'	ASCII
8Byte	Setup mode	ASCII '1': Aging mode '0': Normal mode

4.11 Power version query

The upper computer gets the OBC command (ID: 0x18D2XX 00) XX as the power address
Response information: (ID: 0x18D200XX) XX is the power address

position	data name	parameter declaration

1Byte	0x10	Pre-level software version V1.0
2Byte	0x10	Backlevel software version V1.0
3Byte	0x10	1938 Software version V1.0
4Byte	0x00	Hardware version No. V0.0
5Byte	0	Software version 0
6Byte		
7Byte		
8Byte		

4.12 Hardware version settings

Host machine to set up the OBC command (ID: 0x18D2XX 00)

position	data name	parameter declaration
1Byte	'H '	
2Byte	'D '	
3Byte	'V '	
4Byte	'E '	
5Byte	'R '	
6Byte		
7Byte		
8Byte	0x10	Hardware version V1.0

Response Information: (ID: 0x18D200XX)

position	data name	parameter declaration
1Byte	0x10	Pre-level software version V1.0
2Byte	0x10	Backlevel software version V1.0
3Byte	0x10	1938 Software version V1.0
4Byte	0x00	Hardware version No. V0.0

5Byte	0	Software minor version number 0
6Byte		
7Byte		
8Byte		

4.13 Power barcode query

The host software version query OBC command (ID: 0x18D3xx 00) XX is the power supply address
Response information: (ID: 0x18D300xx) XX is the power supply address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Barcode (ASCII)	Our 22-bit bar code (ASCII) is not enough to be empty
3Byte	Barcode (ASCII)	
4Byte	Barcode (ASCII)	
5Byte	Barcode (ASCII)	
6Byte	Barcode (ASCII)	
7Byte	Barcode (ASCII)	
8Byte	Barcode (ASCII)	

4.14 Power barcode setting

The host software version sets the OBC command (ID: 0x18D4xx 00) XX as the power supply address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Barcode (ASCII)	Our 22-bit bar code (ASCII) is not enough to space
3Byte	Barcode (ASCII)	
4Byte	Barcode (ASCII)	
5Byte	Barcode (ASCII)	

6Byte	Barcode (ASCII)	
7Byte	Barcode (ASCII)	
8Byte	Barcode (ASCII)	

Response information: (ID: 0x18D400xx) XX is the power supply address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Set up the result (0-Success 1-failure)	
2~8Byte	continue to have	

4.15 Simulation query

The host analog query DC / DC command (ID: 0x18D8xx 00) XX is the power supply address

Response information: (ID: 0x18D800xx) XX is the power supply address

position	data name	parameter declaration
Byte 0	input voltage	0.1V/BIT
Byte 1		
Byte 2	output voltage	0.01V/BIT
Byte 3		
Byte 4	output	0.01A/BIT
Byte 5		
Byte 6	ambient temperature	1℃ / BIT, -40 offset
Byte 7	Radiator temperature	1℃ / BIT, -40 offset

4.16 Status query

The upper computer analog query DC / DC command (ID: 0x18D9xx 00) XX is the power supply address

Response information: (ID: 0x18D900xx) XX is the power supply address

position	data name	parameter declaration

1Byte	page number	0-8
2Byte	Module number	
3Byte	Data 1	Bytes = Page Number * 6 + 1
4Byte	Data 2	Bytes = Page Number * 6 + 2
5Byte	Data 3	Bytes = Page Number * 6 + 3
6Byte	Data 4	Bytes = Page Number * 6 + 4
7Byte	Data 5	Bytes = Page Number * 6 + 5
8Byte	Data 6	Bytes = Page Number * 6 + 6

position	data name	parameter declaration
Byte 1	Post-level alarm	Bit0: Enter the protection Bit1: Input overpressure Bit2: Enter the underpressure Bit3: Module failure Bit4: Sleeps dormant Bit5: Over-temperature protection Bit6: A fan failure Bit7: Short circuit in time Bit8: Output overpressure Bit9: Short-circuit Bit10: Output underpressure Bit11:NC Bit12: Module current Bit13:NC Bit14: NC Bit15: NC
Byte 2		
Byte 3	switching value	Bit0:, Module 1 has failed

		Bit1: Module 2 has failed Bit2: Module 1 overpressure Bit3: DC awakening Bit4: A fan failure Bit5: Front-stage shutdown Bit6: EN Enable Bit7: High-voltage interlock
Byte 4	Shutdown quantity	Bit0: Control the shutdown Bit1: Output overpressure Bit2: Front-stage shutdown Bit3: Short-circuit Bit4: Overtemperature Bit5: abnormal normal electricity Bit6: High-voltage interlock is abnormal Bit7: The reset
Byte 5	controlled quantity	Bit0: The CAN instruction was received Bit1: The CAN is shut-off Bit2: The EN is shut-off Bit3: Communication was timed out Bit4: CAN control Bit5: Bit6: Bit7:
Byte 6		
Byte 7	The former level alarm	Bit0: 1 AC;0 DC Bit1: Input overpressure Bit2: Enter the underpressure
Byte 8		

		Bit3: PFC overpressure Bit4: PFC underpressure Bit5: Front-grade over-temperature alarm Bit6:0 half-load; 1 Full-load Bit7: No one for the input Bit8: Primary overtemperature protection Bit9:NC Bit10:NC Bit11: Communication was timed out Bit12:NC Bit13:NC Bit14: The PFC is shut-off Bit15: The DC is shut-off
Byte 9	input voltage	0.1V/Bit
Bytes 10		
Bytes 11	output voltage	0.01V/Bit
Bytes 12		
Bytes 13	output	0.01V/Bit
Bytes 14		
Bytes 15	ambient temperature	1℃ / BIT, -40 offset
Bytes 16	Radiator temperature	1℃ / BIT, -40 offset
Bytes 17	Normal voltage	0.1V/Bit
Bytes 18		

5 Detailed definition of the HCM internal communication command (address: 0x1E)

5.1 Query calibration parameters

SU query the calibration parameters.(ID: 0x18E1XX00) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Parameter number	/	/	/
2Byte	/	/	/	/
3Byte	/	/	/	/
4Byte	/	/	/	/
5Byte	/	/	/	/
6Byte	/	/	/	/
7Byte	/	/	/	/
8Byte	/	/	/	/

Parameter Number Table:

order number	Parameter coding	Parameter content
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	

5.2 set up parameters

The SU sets the calibration parameters.(ID: 0x18E2XX00) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Parameter number	/	/	1~9 (See Parameter Number)

2Byte	continue to have	/	/	/
3Byte	Data K low	/	/	/
4Byte	Data K high	/	/	/
5Byte	Data B low	/	/	/
6Byte	Data B high	/	/	/
7Byte	continue to have	/	/	/
8Byte	continue to have	/	/	/

5.3 Set up / query the parameter feedback

Set up / query the parameter response.The SU Setup command response is made

(ID: 0x18E300XX) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Parameter number	/	/	/
2Byte	Set up the result (0-Success 1-failure)	/	/	/
3Byte	Data K low	/	/	8000~12000
4Byte	Data K high	/	/	8000~12000
5Byte	Data B low	/	/	-500~500
6Byte	Data B high	/	/	-500~500
7Byte	continue to have	/	/	/
8Byte	continue to have	/	/	/

5.4 Parameter calibration calculation method

5.5 Software download trigger.

Software download triggered, issued three times, enter the download mode, valid within 3S

(ID: 0x18E800XX) XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	software release	/	/	/
2Byte	Software compilation year	/	/	/
3Byte	Software compilation month	/	/	/
4Byte	Software compilation day	/	/	/

5Byte	Bytes number (8 bits high)	/	/	/
6Byte	Bytes number (8 bits lower)	/	/	/
7Byte	/	/	/	/
8Byte	/	/	/	/

5.6 SD

Software download, PGN for 0XE9. Multiple frame transfer, up to 30K.
Within-frame definition:

address	content	remarks
00, 01	PA	This frame starts address within the BIN
02, 03	DL	This frame transfers the BIN data length
04	frame number	0-Frame 10xff-Last Frame, Other-Frame Number
05~261	BIN data	Up to 256 bytes, front fixed 256 bytes, final frame by actual length.

5.7 Software download results

Software download Results,
（ID：0x18E700XX ）。The XX is the power supply address

position	data name	resolution ratio	offset	scope
1B yte	Software download results	/	/	0-Success Other-Failure
2Byte	/	/	/	/
3Byte	/	/	/	/
4Byte	/	/	/	/
5Byte	/	/	/	/
6Byte	/	/	/	/
7Byte	/	/	/	/
8Byte	/	/	/	/

5.8 Manufacturers' information query 1

Host query command (ID: 0x18D0XX00)

DC / DC controller response information: (ID: 0x18D000XX)

position	data	parameter declaration
1Byte	X	The A SC II code

2Byte	X	
3Byte	X	
4Byte	X	
5Byte	X	
6Byte	X	
7Byte	X	
8Byte	X	

5.9 Manufacturers' information query 2

Host Setup Command (ID: 0x18D1XX00)

Response Information: (ID: 0x18D100XX)

position	data	parameter declaration
1Byte	X	Model Name (ASCII code)
2Byte	X	
3Byte	X	
4Byte	X	
5Byte	X	
6Byte	X	
7Byte	X	
8Byte	X	

5.10 Aging mode setting

The upper computer sets the OBC command (ID: 0x 1CFFFF00) XX as the power supply address

Response information: (ID: 0x1CFF00FF) XX is the power supply address

position	data name	parameter declaration
1Byte	'V '	ASCII
2Byte	'A '	ASCII
3Byte	'P '	ASCII
4Byte	'E '	ASCII

5Byte	‘L ’	ASCII
6Byte	‘0’	ASCII
7Byte	‘0’	ASCII
8Byte	Setup mode	ASCII ’1’: Aging mode ’0’: Normal mode

5.11 Power version query

The upper computer gets the HCM command (ID: 0x18D2XX 00) XX as the power address

Response information: (ID: 0x18D200XX) XX is the power address

position	data name	parameter declaration
1Byte	0x10	Pre-level software version V1.0
2Byte	0x10	Backlevel software version V1.0
3Byte	0x10	1938 Software version V1.0
4Byte	0x00	Hardware version No. V0.0
5Byte	0	Software version 0
6Byte		
7Byte		
8Byte		

5.12 Hardware version settings

Host Set HCM command (ID: 0x18D2XX 00)

position	data name	parameter declaration
1Byte	‘H ’	
2Byte	‘D ’	
3Byte	‘V ’	
4Byte	‘E ’	
5Byte	‘R ’	

6Byte		
7Byte		
8Byte	0x10	Hardware version V1.0

Response Information: (ID: 0x18D200XX)

position	data name	parameter declaration
1Byte	0x10	Pre-level software version V1.0
2Byte	0x10	Backlevel software version V1.0
3Byte	0x10	1938 Software version V1.0
4Byte	0x00	Hardware version No. V0.0
5Byte	0	Software minor version number 0
6Byte		
7Byte		
8Byte		

5.13 Power barcode query

The host software version query HCM command (ID: 0x18D3xx 00) XX is the power address

Response information: (ID: 0x18D300xx) XX is the power address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Barcode (ASCII)	Our 22-bit bar code (ASCII) is not enough to be empty
3Byte	Barcode (ASCII)	
4Byte	Barcode (ASCII)	
5Byte	Barcode (ASCII)	
6Byte	Barcode (ASCII)	
7Byte	Barcode (ASCII)	

8Byte	Barcode (ASCII)	

5.14 Power barcode setting

The host software version sets the OBC command (ID: 0x18D4xx 00) XX as the power address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Barcode (ASCII)	Our 22-bit bar code (ASCII) is not enough to space
3Byte	Barcode (ASCII)	
4Byte	Barcode (ASCII)	
5Byte	Barcode (ASCII)	
6Byte	Barcode (ASCII)	
7Byte	Barcode (ASCII)	
8Byte	Barcode (ASCII)	

Response information: (ID: 0x18D400xx) XX is the power address

position	data name	parameter declaration
1Byte	Page Number (1~4)	The last frame was 0x84
2Byte	Set up the result (0-Success 1-failure)	
2~8Byte	continue to have	

5.15 Contactor status settings / query

The host software version sets the OBC command (ID: 0x18D8xx 00) XX as the power address

position	data name	parameter declaration
1Byte	C	Clear when sending "CLEAR, other value query
2Byte	L	
3Byte	E	
4Byte	A	
5Byte	R	
6Byte		

7Byte		
8Byte		

Response information: (ID: 0x18D800xx) XX is the power address

position	data name	parameter declaration
1Byte	Current contactor fault	Bit0-1:, Main positive contactor fault 0-Normal, 1-adhesive, 2-open circuit Bit2-3: Pre-charging contactor fault Bit4-5: defrosting PTC relay failure Bit6-7:, Fast charge contactor fault Bit8-9:, Slow charge contactor fault Bit10-11: Auxiliary control loop positive contactor fault Bit12-13: precharge contactor of auxiliary control circuit Bit14-15:NC
2Byte		
3Byte	Historical contactor fault	Bit0-1:, Main positive contactor fault 0-Normal, 1-adhesive, 2-open circuit Bit2-3: Pre-charging contactor fault Bit4-5: defrosting PTC relay failure Bit6-7:, Fast charge contactor fault Bit8-9:, Slow charge contactor fault Bit10-11: Auxiliary control loop positive contactor fault Bit12-13: precharge contactor of auxiliary control circuit Bit14-15:NC
4Byte		
5Byte	Contactor status	Bit0: Main positive contactor state feedback 0-open 1-close Bit1: the feedback of the

		precharge Contactor status Bit2: defrosting PTC contactor status feedback Bit3: Fast charge contactor status feedback Bit4: Slow-charge Contactor state feedback Bit5: The positive contactor state of the auxiliary control circuit Bit6: Pre-charge contactor state of the auxiliary control circuit Bit7:NC
6Byte		
7Byte		
8Byte		

5.16 Status query

The host analog volume query HCM command (ID: 0x18D9xx 00) XX is the power address

Response information: (ID: 0x18D900xx) XX is the power address

position	data name	parameter declaration
1Byte	page number	0-8
2Byte	Module number	
3Byte	Data 1	Bytes = Page Number * 6 + 1
4Byte	Data 2	Bytes = Page Number * 6 + 2
5Byte	Data 3	Bytes = Page Number * 6 + 3
6Byte	Data 4	Bytes = Page Number * 6 + 4
7Byte	Data 5	Bytes = Page Number * 6 + 5
8Byte	Data 6	Bytes = Page Number * 6 + 6

position	data name	parameter declaration
Byte 1	Post-level alarm	Bit0-2: High-voltage circuit working state 0-Open 1-Precharging 2-Precharg Finish 3-Prechage Fault 4-Precharge lock 5-Normal drive Bit3: Communication failure Bit4-5: Power supply voltage fault 0-Normal 1-OVP 2-UVP Bit6-7: High-voltage loop interlock fault 0-Normal 1-Fault 2-Drive Fault Bit8-9: HCM overtemperature 0-Normal, 1-down, 2-shutdown Bit10-11: Working enabling state 0-Disable 1-Enable 2-Error indiction Bit12: The loop interlocking status is 0-Disconnect 1-connect Bit13: Low-voltage electrical feedback of 0-not 1-allow under HCM Bit14: Emergency and high-voltage power notification Bit15: Self-test status
Byte 2		
Byte 3	switching value	Bit0: Emergency shutdown signal Bit1: Electric power capacity on the auxiliary control

		circuit Bit2:, The PTC enables the? Bit3: Power on the main circuit Bit4:, ON gear on the power Bit5:, OBC on the power Bit6:, CAN on power Bit7: Fast-charge activation
Byte 4	Relay status	Bit0: Main positive contactor state feedback 0-open 1-close Bit1: the feedback of the precharge Contactor status Bit2: defrosting PTC contactor status feedback Bit3: Fast charge contactor status feedback Bit4: Slow-charge Contactor state feedback Bit5: The positive contactor state of the auxiliary control circuit Bit6: Pre-charge contactor state of the auxiliary control circuit Bit7:NC
Byte 5	Relay fault	Bit0-1: Main positive contactor fault 0-Nofault 1-DriverFault 2-Welded Bit2-3: Pre-charging contactor fault
Byte 6		

		Bit4-5: defrosting PTC relay failure Bit6-7:, Fast charge contactor fault Bit8-9:, Slow charge contactor fault Bit10-11: Auxiliary control loop positive contactor fault Bit12-13: precharge contactor of auxiliary control circuit Bit14-15:NC
Byte 7	control command	B it0: Main positive contactor state feedback 0-open 1-close B it1: the feedback of the precharge Contactor status B it2: defrosting PTC contactor status feedback B it3: Fast charge contactor status feedback B it4: Slow-charge Contactor state feedback B it5: The positive contactor state of the auxiliary control circuit B it6: Pre-charge contactor state of the auxiliary control circuit B it7: BMS negative pole contactor state B it8: Low-voltage power request after OBC charging ends
Byte 8		

		B it9: Whether the whole vehicle conditions are allowed for charging B it10: The VCU sends a lower low-voltage power request to the HCM B it11: The reset B it12: Sleep B it13: Busoff B it14: Active discharge B it15:
Byte 9	The VCU issues the HV voltage	0.1V/Bit
Bytes 10		
Bytes 11	HV voltage	0.1V/Bit
Bytes 12		
Bytes 13	Main drive voltage	0.1V/Bit
Bytes 14		
Bytes 15	Auxiliary drive voltage	0.1V/Bit
Bytes 16		
Bytes 17	PTC voltage	0.1V/Bit
Bytes 18		
Bytes 19	Fast charging voltage	0.1V/Bit
Byte 20		
Bytes 21	Slow charging voltage	0.1V/Bit
Bytes 22		
Bytes 23	Interface temperature	1, -40℃
Bytes 24	flow path	1
Bytes 22	Normal voltage	0.1V/Bit
Bytes 23		
Bytes 24	Circuit working state	B it0-3: High-voltage circuit

		0-Open 1-Precharging 2-Precharg Finish 3-Prechage Fault 4-Precharge lock 5-Normal drive B it4-7: Auxiliary circuit

5.17 Contactor test command

The host analog volume query HCM command (ID: 0x18DE xx 00) XX is the power address

position	data name	parameter declaration
1Byte	'H '	ASCII
2Byte	'V '	ASCII
3Byte	'A '	ASCII
4Byte	'P '	ASCII
5Byte	'E '	ASCII
6Byte	'L '	ASCII
7Byte	Test mark	'F' test pattern Other: Normal mode
8Byte	Contactor command	B it0: Principal positive B it1: Main and positive pre-charge B it2:PTC B it3: Fast charge B it4: Slow charge B it5: Auxiliary B it6: Auxiliary and positive precharge B it7: Reserved 0-Disconnect, 1-Closed

5.18 Standard and quantitative query / setting

The host analog volume query HCM command (ID: 0x18DF xx 00) XX is

the power address

Response information: (ID: 0x18DF 00xx) XX is the power address

position	data name	parameter declaration
1Byte	parameter values	1: Auxiliary and positive pre-charge time 2: Auxiliary positive on the electricity judgment time 3: Main and positive pre-charge time 4: The main power is judging the time 5: Main and current waiting time 6: The main power is judging the time 7: Auxiliary waiting time 8: Judgment time under auxiliary correction
2Byte	Read for 0x55 / write for 0xAA	
3Byte	Symbol 0x55 / Unsigned 0xAA	Default: Unsigned
4Byte	obligate	
5Byte	numeric value	Low in the front
6Byte		
7Byte		
8Byte		

6 Fault Diagnosis, (UDS)

ECU abbreviation	The Physical Request ID	Physical response ID	Function Request ID	Security algorithm mask
DCDC	0x18DA98F9	0x18DAF998	0x18DBFFF9	0
HCM	0x18DA1EF9	0x18DAF91E	0x18DBFFF9	0

DID ID	name	length (byte)	coded format	Read / write

F189	Geely ECU Software Version Number Geely's commercially defined ECU software version number	8	ASCII	R
F187	ECU Part Number ECU Geely BOM Part No	21	ASCII	R
F18A	ECU Supplier Identification Code ECU Supplier ID	6	ASCII	R
F1A2	Vehicle Manufacturing Date in Geely‘s production line The whole vehicle was produced on Geely's commercial production line	4	BCD	R/W
020F	State of ECU Controller status	1	Hex(Signed)	R
F190	VINDataIdentifier VIN a sign or object indicating number	17	ASCII	R/W
F212	Vehicle name Model name	1	Hex(Unsigned)	R
F193	Supplier ECU Hardware Version Number Vendor-defined ECU hardware version number	16	ASCII	R
F195	Supplier ECU Software Version Number Supplier-defined ECU software version number	16	ASCII	R
F180	BootSoftwareIdentification Guide software identifies information	16	ASCII	R
F197	SystemName The ECU controller name	8	ASCII	R
F18C	ECUSerialNumberDataIdentifier ECU, serial number	24	ASCII	R
F199	ApplicationDataFingerprintIdentifier software brush write date	4	BCD	R