Technical specification for Beidou compatible vehicle terminal communication protocol of satellite positioning system for road transport vehicles

GNSS system for operating vehicles

—General specifications for the communication protocol and data format of BD compatible vehicle terminal

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Foreword

This specification is a supplement and perfection to JT/T 808-2011 "Communication Protocol and Data Format of Satellite Positioning System for Road Transport Vehicles". Compared with JT/T 808-2011, the main technical changes are as follows:

-Modified the description of 5.2 "Maintenance of Connection" in communication connection;

—— Modified the flow description of 7.8.1 "Collecting driver identity information data" in the protocol classification;

—— Added the flow description of 7.12 "Subcontracting Message" in the protocol classification;

-in the modified data format, Original 8.4 terminal registration, 8.8 setting terminal parameters, 8.12 position information reporting, 8.23 text information sending, 8.28 setting circular area, 8.36 driving record data collection command, 8.37 driving record data uploading, 8.38 driving record parameter downloading command, 8.40 driver identity information collection and reporting, 8.41 multimedia event information uploading, 8.42 multimedia data uploading, 8.43 multimedia data upload response, 8.46 storage multimedia data retrieval response, 8.49 data downlink transparent transmission, 8.50 data uplink transparent transmission and other chapters;

-In the data format, 8.4 Supplementary transmission of subcontracting request, 8.11 query of specified terminal parameters, 8.14 query of terminal attributes, 8.15 query of terminal attribute response, 8.16 distribution of terminal upgrade package, 8.17 notification of terminal upgrade result, 8.22 manual confirmation of alarm message, 8.47 request of reporting driver identity information, 8.49 batch upload of positioning data, 8.50 CAN bus data upload, 8.55 camera immediately shoots 12 commands, such as command response and 8.60 single stored multimedia data retrieval and upload command, and adjusts the affected chapters and table numbers;

—— The contents of Table A.2, Peripheral Type Number Table and Table A.3, Command Type Table in Appendix A were modified;

—— Added Appendix A, A.3.4 inquiring slave version number information, A.3.5 self-checking, A.3.6 updating slave firmware, A.3.7 inquiring peripheral attributes, A.4.1 road transport certificate IC card authentication request, A.4.2 road transport certificate IC card reading result notification, A.4.3 card pull-out notification and A.4.4 active trigger reading.

—— Modified the contents corresponding to the above modifications in the message comparison table in Appendix B..

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Terminal communication protocol and data format of satellite positioning system for road transport vehicles

1 range

This specification specifies the communication protocol and data format between Beidou compatible vehicle terminal (hereinafter referred to as terminal) and supervision/monitoring platform (hereinafter referred to as platform) of road transport vehicle satellite positioning system, including protocol foundation, communication connection, message processing, protocol classification and description and data format.

This specification is applicable to the communication between Beidou compatible vehicle terminal and platform of satellite positioning system for road transport vehicles.

2 Normative citation document

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

Code of administrative divisions of the People's Republic of China

GB/T 19056 automobile driving recorder

JT/T 415-2006 Cataloging and Coding Rules of Road Transport E-government Platform

JT/T 794 Technical Requirements for Vehicle Terminal of Satellite Positioning System for Road Transport Vehicles

3 Terms and definitions, abbreviations

3. 1 Terms and definitions

The following terms and definitions apply to this document.

3.1.1

Abnormal data communication link abnormal data communication link

The wireless communication link is disconnected or temporarily suspended (such as during a call).

3.1.2

Register

The terminal sends a message to the platform to inform that it is installed in a certain vehicle.

3.1.3

Cancel unregister

The terminal sends a message to the platform to inform it to be removed from the installed vehicle.

3.1.4

Authentication authentication

When the terminal connects to the platform, it sends a message to the platform to verify its identity.

3.1.5

Location reporting strategy

Timing, distance reporting or a combination of the two.

3.1.6

Location reporting program

Rules for determining the interval of periodic reporting according to relevant conditions.

3.1.7

Inflexion supplementary transmission additional points report while turning

When the terminal judges that the vehicle turns, it sends a position information report message. The sampling frequency shall not be less than 1Hz, and the change rate of the azimuth angle of the vehicle shall not be less than 15/s, and it shall last for at least 3 s..

3.1.8

Telephone answering strategy

Rules for terminals to automatically or manually answer incoming calls.

3.1.9

SMS text alarm SMS text alarm

When the terminal gives an alarm, it sends a text message by SMS.

3.1.10

Event item eventitem

The event item is preset by the platform to the terminal, and consists of the event code and the event name. When the driver encounters the corresponding event, he will operate the terminal and trigger the event report to be sent to the platform.

3. 2 abbreviation

The following abbreviations apply to this document.

APN-access point name gzip-a GNU free software file

compression program (GNU Zip) LCD-liquid crystal

display.

RSA—— An asymmetric cryptographic algorithm (developed by Ron Rivest, Adi Shamirh and Len Adleman, named after them).

Sms-short message service TCP-transmission control protocol.

TTS-Text to Speech UDP-User Datagram Protocol VSS-

vehicle speed sensor.

4 Protocol basis

4.1 communication mode

The communication mode adopted in the protocol should comply with the relevant provisions in JT/T 794. The communication protocol adopts TCP or UDP, and the platform serves as the server and the terminal serves as the client. When the data communication link is abnormal, the terminal can communicate by SMS message.

4.2 data type

The data types used in the protocol message are shown in.表 1：

Table 1 Data types

data type	Description and requirements
BYTE	Unsigned single-byte integer (bytes, 8 bits)
WORD	Unsigned double-byte integer (word, 16 bits)
DWORD	Unsigned four-byte integer (doubleword, 32-bit)
BYTE[n]	N bytes
BCD[n]	8421 code, n bytes
STRING	GBK code, if there is no data, leave it blank.

4.3 Transmission rule

The protocol uses the network byte order of big-endian mode to

transfer words and doublewords. The agreement is as follows:

-BYTE transmission convention: transmission in the form of byte stream;

-the transmission convention of WORD: the upper eight bits are transmitted first, and then the lower eight bits are transmitted;

-the transmission convention of DWORD: the upper 24 bits are transmitted first, then the upper

16 bits, then the upper 8 bits, and finally the lower 8 bits.

4.4 Composition of messages

4.4.1 Message structure

Each message consists of an identification bit, a message header, a message body and a check code. The message structure is shown in Figure 1:

Identification bit	Message header	Message body	Check code	Identification bit

Fig. 1 message structure diagram

4. 4. 2 Identification bit

It is expressed by 0x7e. If 0x7e appears in the check code, message header and message body, it should be escaped. The escape rules are defined as follows:

0x7e <————> 0x7d is followed by 0x02；;

0x7d <————> 0x7d is followed by 0x01. The escape

process is as follows:

When sending a message: message encapsulation-> calculate and fill the check code-> escape;

When receiving a message: escape and restore-> verify the check code-> parse the message.

Example:

Sending a packet with the content of 0x30 0x7e 0x08 0x7d 0x55 is encapsulated as follows: 0x7e 0x307d 0x02 0x08 0x7d 0x01 0x55 0x7e.

4. 4. 3 Message header

See the message header for details.表 2：

Table 2 Message Header Contents

Start byte	field	data type	Description and requirements
0	Message ID	WORD	
2	Message body attribute	WORD	The structure diagram of message body attribute format is shown in Figure 2.
four	Terminal mobile phone number	BCD[6]	According to the installed mobile phone number of the terminal itself. If the mobile phone number is less than 12 digits, the digits will be supplemented first, the mainland mobile phone number will be supplemented with the digit 0, and Hong Kong, Macao and Taiwan will supplement the digits according to its area code.
10	Message serial number	WORD	Cyclic accumulation starts from 0 in the sending order.
12	Message package encapsulation item		If that relevant identification bit in the message body attribute determine the message subcontracting proces, The item has content, otherwise there is no item.

The structure diagram of message body attribute format is shown in Figure 2:

15	14	13	12	11	10	nine	eight	seven	six	five	four	three	2	one	0
reserve		subcontract	Data encryption mode			Message body length									

Fig. 2 Structure diagram of message body attribute format

Data encryption method:

——bit10~bit12 are data encryption identification bits;

-When these three bits are all 0, it means that the message body is not encrypted;

-When the 10th bit is 1, it means that the message body is encrypted by RSA algorithm;

-other reservations. subcontract

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When the 13th bit in the attribute of the message body is 1, it means that the message body is a long message, and it is sent by subcontracting, specifically subcontracting the letter.

The information is determined by the package item of the message packet; If the 13th bit is 0, there is no packet encapsulation item field in the message header. See for the contents of message package encapsulation items.表 3：

Table 3 Contents of Package Items in Message Packets

Start byte	field	data type	Description and requirements
0	Total number of messages	WORD	The total number of packages after subcontracting this message.
2	Packet serial number	WORD	Starting from 1

4.4.4 check code

The check code refers to the exclusive OR of the next byte from the message header until the previous byte of the check code, occupying one byte.

5 Communication connection

5.1 Establishment of connection

The daily data connection between the terminal and the platform can adopt TCP or UDP. After the terminal is reset, it should establish a connection with the platform as soon as possible, and immediately send a terminal authentication message to the platform for authentication.

5.2 Maintenance of connection

After successful connection establishment and terminal authentication, the terminal should periodically send a terminal heartbeat message to the platform without normal data packet transmission, and the platform will send a platform general response message to the terminal after receiving it. The sending period is specified by the terminal parameters.

5.3 Disconnection of connection

Both the platform and the terminal can actively disconnect according to the TCP protocol, and both parties should actively judge whether the TCP connection is disconnected. Method for platform to judge TCP connection disconnection;

-judging that the terminal actively disconnects according to the TCP protocol;

-A terminal with the same identity establishes a new connection, indicating that the original connection has been disconnected;

-No message sent by the terminal is received within a certain period of time, such as terminal heartbeat. Method for terminal to judge TCP connection disconnection;

-judging that the platform is actively disconnected according to the TCP protocol;

-The data communication link is disconnected;

—— The data communication link is normal, and no reply has been received after the number of retransmissions has reached.

6 Message processing

6.1 TCP and UDP message processing

6.1.1 Message sent by the main platform

All messages sent by the main platform require the terminal to reply, and the reply can be divided into general reply and special reply, which is determined by each specific functional protocol. The sender should resend the message after waiting for the reply timeout. The response timeout and the number of retransmissions are specified by the platform parameters, and the formula for calculating the response timeout after each retransmission is shown in Formula (1):

$$TN+1=TN \times (N+1) \quad \text{.....(1)}$$

Where:

TN+1-the response timeout after each
retransmission; TN-the previous response timeout;
N-number of retransmissions.

6. 1. 2 Message sent by the terminal owner

6. 1. 2. 1 Data communication link is normal.

When the data communication link is normal, all messages sent by the main terminal require platform response, which is divided into general response and special response, which is determined by each specific functional protocol. After the terminal waits for the reply timeout, it should resend the message. The response timeout and the number of retransmissions are specified by the terminal parameters, and the response timeout after each retransmission is calculated according to Formula (1). For the critical alarm message sent by the terminal, if the response has not been received after the number of retransmissions, it should be saved. In the future, you should send the saved critical alarm message before sending other messages.

6. 1. 2. 2 Abnormal data communication link

When the data communication link is abnormal, the terminal should save the location information reporting message to be sent. After the data communication link returns to normal, send the saved message immediately.

6.2 SMS message processing

When the terminal communication mode is switched to the SMS message mode of GSM network, the PDU eight-bit coding mode is adopted, and messages with a length of more than 140 bytes should be subcontracted according to the SMS service specification GSM 03.40 of GSM network.

The response, retransmission and saving mechanisms of SMS messages are the same as those in 6.1, but the response timeout and retransmission times should be handled according to the relevant settings of parameters ID0x0006 and 0x0007 in Table 10.

7 Protocol classification

7. 1 summary

The following describes the protocol by functional classification. Unless otherwise specified, TCP communication mode is adopted by default. See appendix a for the communication protocol between vehicle terminal and external equipment. See appendix b for the message comparison table of message name and message ID in the agreement.

7. 2 Terminal management protocol

7. 2. 1 Terminal registration/cancellation

When the terminal is unregistered, it should register first. After successful registration, the terminal will obtain and save the authentication code, which will be used when the terminal logs in. Before the vehicle needs to be removed or replaced, the terminal should cancel the corresponding relationship between the terminal and the vehicle.

If the terminal chooses to send the messages of terminal registration and terminal cancellation via SMS, the platform should reply to the terminal registration via SMS and reply to the terminal cancellation via SMS.

7. 2. 2 Terminal authentication

After the terminal is registered, it should be authenticated immediately after establishing a connection with the platform. The terminal shall not send other messages before the authentication is

successful.

The terminal authenticates by sending the terminal authentication message, and the platform replies the platform general reply message.

7. 2. 3 Set/query terminal parameters

The platform sets the terminal parameters by sending the message of setting the terminal parameters, and the terminal replies to the general response message of the terminal. The platform inquires the terminal parameters by sending a message of inquiring the terminal parameters, and the terminal replies a message of inquiring the terminal parameters. Terminals under different network standards should support some unique parameters of their respective networks.

7. 2. 4 Terminal control

The platform controls the terminal by sending the terminal control message, and the terminal replies the terminal general reply message.

7. 3 Location and alarm protocol

7. 3. 1 Location information reporting

The terminal periodically sends the location information report message according to the parameter setting. According to the parameter control, the terminal can send a position information report message when it is judged that the vehicle is turning.

7. 3. 2 Location information query

The platform inquire that current position information of the designated vehicle-mounted terminal by sen a position information inquiry message, and the terminal replies a position information inquiry reply message.

7. 3. 3 Temporary position tracking control

The platform starts/stops location tracking by sending a temporary location tracking control message. Location tracking requires periodic reporting before the terminal stops, and reports at the time interval specified by the message. The terminal replies to the general response message of the terminal.

7. 3. 4 Terminal alarm

When the terminal judges that the alarm condition is met, it sends a position information report message, and sets corresponding alarm signs in the position report message, and the platform can perform alarm processing by replying to the platform general response message.

See the description in the message body of location information report for each alarm type. When the alarm sign is maintained until the alarm condition is released, a position information report message shall be sent immediately after the alarm condition is released, and the corresponding alarm sign shall be cleared.

7. 4 Information class protocol

7. 4. 1 Text information distribution

The platform sends a message by sending a text message, and notifies the driver in a specified way. The terminal replies to the general response message of the terminal.

7. 4. 2 Event setting and reporting

The platform sends the event list to the terminal for storage by sending the event setting message. After encountering the corresponding event, the driver can enter the event list interface for selection, and the terminal sends an event report message to the platform after selection.

The event setting message requires the terminal to reply to the general response message of the terminal. The event report message requires the platform to reply to the platform general reply message.

7. 4. 3 ask a question

The platform sends a question with candidate answers to the terminal by sending a question delivery message, and the terminal displays it immediately. After the driver selects it, the terminal sends a question response message to the platform.

When sending a message by asking questions, the terminal needs to reply to the general response message of the terminal.

7.4.4 Information on demand

The platform sends the information-on-demand menu setting message, and sends the information-on-demand item list to the terminal for storage, which can be accessed by the driver.

Select VOD/Cancel the corresponding information service through the menu, and the terminal sends an information VOD/Cancel message to the platform after selection. After the information service is requested, it will receive information service messages from the platform on a regular basis, such as news and weather forecast. The information-on-demand menu setting message requires the terminal to reply to the general response message of the terminal. Information on demand/cancellation message requires the platform to reply to the platform general reply message. The information service message requires the terminal to reply to the general response message of the terminal.

7.5 Telephone protocol

7.5.1 Telephone dialing

By sending a call back message, the platform requires the terminal to call back according to the specified phone number, and specifies whether to listen (the terminal does not turn on the speaker).

The call-back message requires the terminal to reply to the general response message of the terminal.

7.5.2 Set phone book

The platform sets the phone book for the terminal by sending the message of setting the phone book, which requires the terminal to reply to the general response message of the terminal.

7.6 Vehicle control class protocol

The platform requests the terminal to control the vehicle according to the specified operation by sending the vehicle control message. The terminal immediately replies to the general response message of the terminal after receiving it. After that, the terminal controls the vehicle and replies the vehicle control response message according to the result.

7.7 Vehicle management protocol

The platform sets the area and line of the terminal by sending messages such as setting the circular area, setting the rectangular area, setting the polygonal area and setting the route. The terminal judges whether the alarm conditions are met according to the area and line attributes. The alarm includes overspeed alarm, area/route alarm and short/long road travel time alarm, and the corresponding location additional information should be included in the location information report message.

The range of area or route ID is 1~0XFFFFFFFF. If the set ID is duplicate with the existing area or route ID of the same type in the terminal, the existing one will be updated.

The platform can also delete areas and routes saved on the terminal by deleting circular areas, deleting rectangular areas, deleting polygonal areas, deleting routes and other messages.

Setting/deleting area and route messages requires the terminal to reply to the general response message of the terminal.

7.8 Information collection protocol

7.8.1 Collecting driver identity information data

When the driver starts driving, the IC card qualification certificate is inserted into the card reading module of the terminal. After the card reading module detects the card entry through the induction switch, it sends the authentication request to the terminal through the interface. The terminal forwards the authentication request data to the road transport certificate IC card authentication center through the transparent instruction, and transmits the authentication result returned by the authentication center to the card reading module. The card reading module reads the qualification certificate information of IC card according to the authentication result and uploads the result information to the authentication center (success and failure information) and the home monitoring center (only the successful information is read) through the terminal.

When the driver finishes driving, the IC card is pulled out. After the card reading module detects the card leaving through the inductive switch, it uploads relevant information to the authentication center and the home monitoring center through the terminal.

7.8.2 Collecting data of electronic waybill

The terminal collects the data uploading platform of electronic waybill.

7.8.3 Collecting driving record data

The platform requests the terminal to upload the specified data by sending the command message of driving record data collection, and the message requires the terminal to reply to the driving record data upload message.

7.8.4 Downloading driving record parameters

The platform requests the terminal to upload the specified data by sending the command message of downloading the driving record parameters, which requires the terminal to reply to the general reply message of the terminal.

7.9 Multimedia class protocol

7.9.1 Multimedia event information upload

When the terminal takes the initiative to shoot or record due to a specific event, it should actively upload a multimedia event message after the event, which requires the platform to reply to a general reply message.

7.9.2 Multimedia data upload

The terminal sends a multimedia data upload message to upload multimedia data. Before each complete multimedia data, it is necessary to attach the position information report message body when shooting, which is called position multimedia data. The platform determines the receiving timeout according to the total number of packages. After receiving all data packets or reaching the timeout, the platform sends a multimedia data upload response message to the terminal, which confirms the receipt of all data packets or requires the terminal to retransmit the specified data packets.

7.9.3 The camera shoots immediately

The platform sends a shooting command to the terminal by sending a camera shooting command message immediately, which requires the terminal to reply to the general response message of the terminal. If real-time upload is specified, the terminal uploads the camera image/video after shooting, otherwise, the image/video is stored.

7.9.4 Recording begins

The platform sends a recording command to the terminal by sending a recording start command message, which requires the terminal to reply to the terminal general response message. If real-time upload is specified, the terminal uploads the audio data after recording, otherwise, the audio data is stored.

7.9.5 The retrieval terminal store multimedia data and extracts that multimedia data

The platform obtains the situation that the terminal stores multimedia data by sending the stored multimedia data retrieval message, which requires the terminal to reply to the stored multimedia data retrieval response message.

According to the retrieval results, the platform can request the terminal to upload the specified multimedia data by sending the stored multimedia data upload message, which requires the terminal to reply to the terminal general response message.

7.10 Universal data transmission class

Messages that are not defined in the protocol but need to be transmitted in actual use can be exchanged between uplink and downlink data by using data uplink transparent messages and data downlink transparent messages.

The terminal can use GZIP compression algorithm to compress longer messages, and use data

compression to report messages for uploading.

7. 11 Cryptographic protocol

If encrypted communication is needed between the platform and the terminal, RSA public key cryptosystem can be used. The platform informs the terminal of its own RSA public key by sending the platform RSA public key message, and the terminal replies the terminal RSA public key message, and vice versa.

7.12 Subcontracting message

When the message is sent by subcontracting, the subcontracting message shall adopt a serial number that increases continuously. For the reply to the subcontracting message, if there is no special reply instruction, the receiver can adopt one pass for all the subcontracting messages.

Use a reply, or use a general reply for each subcontracting message, and use the result field (success/failure) to tell the sender whether all subcontracting messages have been received correctly. When all the subcontracting messages are not received correctly, the receiver can request the sender to retransmit the missing subcontracting messages by using the supplementary subcontracting request command. The sender shall retransmit the packet in the retransmission packet ID list once with the original message, and the retransmitted packet is completely consistent with the original packet message.

8 data format

8.1 Terminal universal response

Message id: 0x0001. For the data format of terminal general reply message body, see. 表 4.

Table 4 Data Format of Terminal General Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	Serial number of the corresponding platform message
2	Answer ID	WORD	ID of the corresponding platform message.
four	result	BYTE	0: success/confirmation; 1: failure; 2: The message is wrong; 3: Not supported

8.2 Platform universal response

Message id: 0x8001. See for the data format of platform general reply message body. 表 5.

Table 5 Data Format of Platform General Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	Serial number of the corresponding terminal message
2	Answer ID	WORD	ID of the corresponding terminal message.
four	result	BYTE	0: success/confirmation; 1: failure; 2: The message is wrong; 3: Not supported; 4: Call the police Processing confirmation;

8.3 Terminal heartbeat

Message id: 0x0002. The message body of terminal heartbeat data is empty.

8.4 Supplementary subcontracting request

Message id: 0x8003. See for the data format of the supplementary subcontracting request message body.表 6。

Table 6 Data format of supplementary subcontracting request message body

Start byte	field	data type	Description and requirements
0	Original message serial number	WORD	The message serial number corresponding to the first packet of the original message requiring supplementary transmission.
four	Total number of retransmitted packets	BYTE	n
five	Retransmission package ID list	BYTE[2*n]	The serial numbers of retransmission packets are arranged in sequence, such as "Packet ID1 Packet ID2" ..... Package IDn".

Note: The sender of this message should promise to resend the packet in the retransmission packet ID list once with the original message, which is completely consistent with the original packet message.

8.5 Terminal registration

Message id: 0x0100.终端注册消息体数据格式
见表 7。

Table 7 Data Format of Terminal Registration Message Body

Start byte	field	data type	Description and requirements
0	Provincial ID	WORD	Indicate the province where the terminal vehicle is installed, 0 is reserved, and the platform takes the default value. The provincial ID adopts the administrative division generation specified in GB/T 2260. The first two of the six yards.
2	City and county ID	WORD	Indicate the city and county where the terminal installation vehicle is located, 0 reserved, from flat Taiwan takes the default value. City and county ID adopts the last four of the six administrative division codes specified in GB/T 2260.
four	Manufacturer ID	BYTE[5]	5 bytes, terminal manufacturer code
nine	Terminal model	BYTE[20]	20 bytes, the terminal model is defined by the manufacturer, and the number of digits is not. When sufficient, it shall be supplemented with "0X00".
29	Terminal ID	BYTE[7]	7 bytes, consisting of uppercase letters and numbers. This terminal ID is made of The manufacturer defines it by himself. If the number of digits is insufficient, it will be supplemented with "0X00".
36	License plate color	BYTE	License plate color, according to 5.4.12 of JT/T415-2006. When the card is not played, the value is 0.
37	Vehicle identification	STRING	When the license plate color is 0, it indicates the vehicle VIN； ; Otherwise, it means public. Motor vehicle number plate issued by the traffic management department of Ann.

8.6 Terminal registration response

Message id: 0x8100. For the data format of the

terminal registration response message body,
see.表 8。

Table 8 Data Format of Terminal Registration Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	Serial number of the corresponding terminal registration message
2	result	BYTE	0: success; 1: The vehicle has been registered; 2: The vehicle does not exist in the database; 3: The terminal has been registered; 4: The terminal does not exist in the database.

three	Authentication code	STRING	This field is available only after success.

8.7 Terminal cancellation

Message id: 0x0003. Terminal logout message body is empty.

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8.8 Terminal authentication

Message id: 0x0102.终端鉴权消息体数据
格式见表 9。

Table 9 Data Format of Terminal Authentication Message Body

Start byte	field	data type	Description and requirements
0	Authentication code	STRING	The terminal reports the authentication code after reconnection.

8.9 Set terminal parameters

Message id: 0x8103. See for setting the data format of terminal parameter message body.表 10。

Table 10 Data Format of Terminal Parameter Message Body

Start byte	field	data type	Description and requirements
0	Total parameters	BYTE	
one	Parameter item list		See for the format of parameter items.表 11

Table 11 Data Format of Terminal Parameter Item

field	data type	Description and requirements
Parameter ID	DWORD	See for definition and description of parameter ID.表 12
Parameter length	BYTE	
parameter value		If it is a multi-valued parameter, multiple parameter items with the same ID are used in the message, such as dispatching center electricity. Telephone number

Table 12 Definition and explanation of each parameter item of terminal parameter setting

Parameter ID	data type	Description and requirements
0x0001	DWORD	Terminal heartbeat sending interval, in seconds (s)
0x0002	DWORD	TCP message response timeout, in seconds (s)
0x0003	DWORD	TCP message retransmission times

0x0004	DWORD	UDP message response timeout, in seconds (s)

Parameter ID	data type	Description and requirements
0x0005	DWORD	UDP message retransmission times
0x0006	DWORD	SMS message response timeout, in seconds (s)
0x0007	DWORD	Number of SMS message retransmissions
0x0008-0x000F		reserve
0x0010	STRING	Main server APN, wireless communication dial-up access point. If the network standard is CDMA, it is PPP dial number
0x0011	STRING	Main server wireless communication dialing user name
0x0012	STRING	Main server wireless communication dialing password
0x0013	STRING	Primary server address, IP or domain name
0x0014	STRING	Backup server APN, wireless communication dial-up access point
0x0015	STRING	Backup server wireless communication dialing user name
0x0016	STRING	Backup server wireless communication dialing password
0x0017	STRING	Backup server address, IP or domain name
0x0018	DWORD	Server TCP port
0x0019	DWORD	Server UDP port
0x001A	STRING	The IP address or domain name of the main server authenticated by IC card of road transport certificate.
0x001B	DWORD	TCP port of road transport certificate IC card authentication main server
0x001C	DWORD	UDP port of road transport certificate IC card authentication main server
0x001D	STRING	The road transport certificate IC card authenticates the IP address or domain name of the backup server, and the port is the same as that of the main server.
0x001E-0x001F		reserve
0x0020	DWORD	Location reporting strategy, 0: regular reporting; 1. Fixed-distance report; 2. Timing and distance reporting
0x0021	DWORD	Location reporting scheme, 0: According to ACC status; 1: According to the login status and ACC status, Judge the login status first, and then according to the ACC status if logging in.
0x0022	DWORD	Time interval for reporting driver's failure to log in, in seconds (s), > 0
0x0023-0x0026	DWORD	reserve
0x0027	DWORD	Report interval during hibernation, in seconds (s), > 0.
0x0028	DWORD	Time interval for reporting emergency alarm, in seconds (s), > 0
0x0029	DWORD	Default time reporting interval, in seconds (s), > 0

Parameter ID	data type	Description and requirements
0x002A-0x002B	DWORD	reserve
0x002C	DWORD	Default distance reporting interval in meters (m), > 0
0x002D	DWORD	Distance interval for reporting driver's failure to log in, in meters (m), > 0
0x002E	DWORD	Reporting distance interval when sleeping, in m, > 0.
0x002F	DWORD	Interval of reporting distance in case of emergency alarm, in m, > 0.
0x0030	DWORD	Angle of supplementary transmission of inflection point, < 180
0x0031	WORD	Radius of electronic fence (illegal displacement threshold), in meters.
0x00032-0x003F		reserve
0x0040	STRING	Telephone number of monitoring platform
0x0041	STRING	Reset the phone number, which can be used to call the terminal to reset the terminal.
0x0042	STRING	Restore the phone number set by the factory. You can use this phone number to call the terminal to restore the terminal. Factory settings
0x0043	STRING	Monitoring platform SMS phone number
0x0044	STRING	Receiving SMS text alarm number of terminal
0x0045	DWORD	Terminal telephone answering strategy, 0: automatic answering; 1: Answer automatically when ACC is on, and hand when ACC is OFF. Dynamic answering
0x0046	DWORD	The longest call time at a time, in seconds (s), where 0 means no call, and 0xFFFFFFFF means. Unlimited
0x0047	DWORD	The longest call time in the current month, in seconds (s), 0 means no call, and 0xFFFFFFFF means. Unlimited
0x0048	STRING	Monitor phone numbers
0x0049	STRING	Supervision platform privileged SMS number
0x004A-0x004F		reserve
0x0050	DWORD	Alarm mask word, corresponding to the alarm sign in the location information report message, with corresponding bit of 1. The correspond alarm is shielded.
0x0051	DWORD	The alarm sending text SMS switch corresponds to the alarm mark in the position information reporting message, If the corresponding bit is 1, a text SMS will be sent when the corresponding alarm occurs.
0x0052	DWORD	The alarm shooting switch corresponds to the alarm sign in the position information reporting message, and the corresponding bit is 1, the camera shoots when the corresponding alarm is given.
0x0053	DWORD	The alarm shooting storage mark corresponds to the alarm mark in the position information reporting message and If the bit is 1, the photos taken during the corresponding alarm are stored, otherwise, they are uploaded in real time.

0x0054	DWORD	Key sign, corresponding to the alarm sign in the location information reporting message, with the corresponding bit of 1. The corresponding alarm is the key alarm.

Parameter ID	data type	Description and requirements
0x0055	DWORD	Maximum speed, in kilometers per hour (km/h)
0x0056	DWORD	Overspeed duration, in seconds (s)
0x0057	DWORD	Continuous driving time threshold, in seconds (s)
0x0058	DWORD	Cumulative driving time threshold of the day, in seconds (s)
0x0059	DWORD	Minimum rest time, in seconds (s)
0x005A	DWORD	Maximum parking time, in seconds (s)
0x005B	WORD	Overspeed warning difference, unit is 1/10km/h.
0x005C	WORD	Fatigue driving warning difference, in seconds (s), > 0
0x005D	WORD	Collision alarm parameter setting: B7-b0: collision time, in 4 ms; B15-b8: collision acceleration, with the unit of 0.1g The setting range is 0-79, and the default value is. 10。
0x005E	WORD	Rollover alarm parameter setting: Rollover angle, unit 1 degree, default is 30 degrees.
0x005F-0x0063		reserve
0x0064	DWORD	Timing photo control, see.表 13
0x0065	DWORD	Control of fixed-distance photography, see.表 14
0x0066-0x006F		reserve
0x0070	DWORD	Image/video quality, 1-10,1 is the best.
0x0071	DWORD	Brightness, 0-255
0x0072	DWORD	Contrast, 0-127
0x0073	DWORD	Saturation, 0-127
0x0074	DWORD	Chromaticity, 0-255
0x0075-0x007F		
0x0080	DWORD	Vehicle odometer reading, 1/10km
0x0081	WORD	ID of the province where the vehicle is located
0x0082	WORD	City ID where the vehicle is located.
0x0083	STRING	Motor vehicle license plate issued by the public security traffic management department
0x0084	BYTE	License plate color, according to 5.4.12 of JT/T415-2006.

Parameter ID	data type	Description and requirements
0x0090	BYTE	The GNSS positioning mode is defined as follows: Bit0 0,0: disable GPS positioning, 1: enable GPS positioning; Bit1 1,0: Disable Beidou positioning, 1: Enable Beidou positioning; Bit2 2,0: disable GLONASS positioning, 1: enable GLONASS positioning; Bit3 3,0: Disable Galileo positioning, 1: Enable Galileo positioning.
0x0091	BYTE	The baud rate of GNSS is defined as follows: 0x00：4800； 0x01：9600； 0x02：19200； 0x03：38400； 0x04：57600； 0x05：115200。
0x0092	BYTE	The output frequency of GNSS module positioning data in detail is defined as follows: 0x00：500ms； 0x01：1000ms (default); 0x02：2000ms； 0x03：3000ms； 0x04：4000ms。
0x0093	DWORD	The frequency of GNSS module's detailed positioning data acquisition, in seconds, is 1 by default.
0x0094	BYTE	GNSS module detailed positioning data upload mode: 0x00, stored locally, not uploaded (default); 0x01, uploaded at intervals; 0x02, uploaded at intervals; 0x0B, upload according to the accumulated time, and automatically stop uploading after reaching the transmission time; 0x0C, upload according to the cumulative distance, and automatically stop uploading after reaching the distance; 0x0D, upload according to the cumulative number of articles, and automatically stop uploading after reaching the number of uploaded articles.
0x0095	DWORD	Settings for uploading detailed positioning data of GNSS module: when the uploading mode is 0x01, the unit is seconds; When the uploading method is 0x02, the unit is meters; When the upload mode is 0x0B, the unit is seconds; When the uploading method is 0x0C, the unit is meters; When the upload method is 0x0D, the unit is.
0x0100	DWORD	CAN bus channel 1 acquisition time interval (ms), 0 means no acquisition.
0x0101	WORD	CAN bus channel 1 upload time interval (s), 0 means no upload.
0x0102	DWORD	CAN bus channel 2 acquisition time interval (ms), 0 means no acquisition.
0x0103	WORD	CAN bus channel 2 upload time interval (s), 0 means no upload.
0x0110	BYTE[8]	CAN bus ID separate acquisition settings: Bit63-bit32 indicates the acquisition time interval (ms) of this ID, and 0 indicates no acquisition; Bit31 stands for CAN channel number, 0: CAN 1, 1: CAN 2; Bit30 indicates the frame type, 0: standard frame, 1: extended frame;

		Bit29 indicates the data acquisition mode, where 0 is the original data and 1 is the calculated value of the acquisition interval; Bit28-bit0 represents the CAN bus ID.
0x0111-0x01FF	BYTE[8]	Used for separate collection settings of other CAN bus ID.

Parameter ID	data type	Description and requirements
0xF000-0xFFFF		User Defined

Table 13 Definition of Timing Photographing Control Bit

place	definition	Description and requirements
0	Camera Channel 1 Timing Camera Switch Flag	0: Not allowed; 1: Allow
one	Camera channel 2 timing camera switch sign	0: Not allowed; 1: Allow
2	Camera channel 3 timing camera switch sign	0: Not allowed; 1: Allow
three	Camera Channel 4 Timing Camera Switch Sign	0: Not allowed; 1: Allow
four	Camera channel 5 timing camera switch sign	0: Not allowed; 1: Allow
5-7	reserve	
eight	Camera channel 1 timing photo storage flag	0: storage; 1: Upload
nine	Camera channel 2 regularly takes pictures and stores the flag.	0: storage; 1: Upload
10	The camera channel 3 regularly takes pictures to store the flag.	0: storage; 1: Upload
11	The camera channel 4 regularly takes pictures to store the flag.	0: storage; 1: Upload
12	The camera channel 5 regularly takes pictures to store the flag.	0: storage; 1: Upload
13-15	reserve	
16	Timed time unit	0: second, when the value is less than 5 seconds, the terminal will treat it as 5 seconds; 1: 1.
17-31	Timing interval	Execute after receiving parameter settings or restarting.

Table 14 Definition of Control Bits for Fixed Distance Photographing

place	definition	Description and requirements
0	Camera Channel 1 Fixed Distance Camera Switch Sign	0: Not allowed; 1: Allow
one	Camera Channel 2 Fixed Distance Camera Switch Sign	0: Not allowed; 1: Allow
2	Camera Channel 3 Fixed Distance Camera Switch Sign	0: Not allowed; 1: Allow
three	Camera Channel 4 Fixed Distance Camera Switch Sign	0: Not allowed; 1: Allow
four	Camera Channel 5 Fixed-distance Camera Switch Sign	0: Not allowed; 1: Allow
5-7	reserve	

eight	Camera channel 1 fixed-distance photography storage mark	0: storage; 1: Upload
nine	Camera channel 2 fixed-distance photography storage mark	0: storage; 1: Upload

10	Camera channel 3 fixed-distance photography storage mark	0: storage; 1: Upload
11	Camera channel 4 fixed-distance photography storage mark	0: storage; 1: Upload
12	The camera channel 5 takes pictures at a fixed distance and stores signs.	0: storage; 1: Upload
13-15	reserve	
16	Fixed distance unit	0: meter, when the value is less than 100 meters, the terminal will be treated as 100 meters; 1: km.
17-31	Fixed distance interval	Execute after receiving parameter settings or restarting.

8.10 Query terminal parameters

Message id: 0x8104. The message body for querying terminal parameters is empty.

8.11 Query the specified terminal parameters

Message id: 0x8106.查询指定终端参数消息体数据格式见表 15，终 The terminal responds with 0x0104 instruction.

Table 15 Query the specified terminal parameter message body data format

Start byte	field	data type	Description and requirements
0	Total parameters	BYTE	The total number of parameters is n.
one	Parameter ID list	BYTE[4*n]	Parameters are arranged in sequence, such as "Parameter ID1 Parameter ID2. Parameters" IDn”。

8.12 Query terminal parameter response

Message id: 0x0104. For the data format of the query terminal parameter response message body, see.表 16 。

Table 16 Data Format of Query Terminal Parameter Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	The serial number of the corresponding terminal parameter query message
2	Number of response parameters	BYTE	
three	Parameter item list		See Table 10 for the format and definition of parameter items.

8.13 Terminal control

Message id: 0x8105.终端控制消息体数据格式见表 17。

Table 17 Data Format of Terminal Control Message Body

Start byte	field	data type	Description and requirements
0	command word	BYTE	See for the description of terminal control command words. 表 18
one	command parameter	STRING	See the description below for the format of command parameters, and half-angle is used between each field "; ",each STRING field is encoded by GBK first. Make up the message after management.

Table 18 Description of Terminal Control Command Words

command word	command parameter	Description and requirements
one	See for the format of command parameters.表 19	Wireless upgrade. Parameters are separated by semicolons. The instructions are as follows: "URL address; Dial point name; Dialing user name; Dialing password; Address; TCP port; UDP port; Manufacturer ID; hardware Version; Firmware version; Time limit for connecting to the specified server ",if a parameter has no value, it will be empty.
2	See for the format of command parameters.表 19	Control the terminal to connect to the designated server. Parameters are separated by semicolons. The control instructions are as follows: "Connection control; Supervision platform authentication code; Dial point name; Dialing user name; Dialing password; Address; TCP port; UDP port; Time limit for connecting to the specified server ",if a parameter has no value, then Empty, if the connection control value is 1, there is no subsequent parameter.
three	without	Terminal shutdown
four	without	Terminal reset
five	without	The terminal is restored to factory settings.
six	without	Turn off data communication
seven	without	Turn off all wireless communications.

Table 19 Format of Command Parameters

field	data type	Description and requirements
Connection control	BYTE	0: Switch to the designated supervision platform server, and enter the emergency state after connecting to the server. In this state, only the supervision platform that issues control instructions can send control fingers including short messages. Order; 1. Switch back to the original default monitoring platform server and return to normal state.
Dial point name	STRING	Generally, it is the server APN, the wireless communication dial-up access point. If the network standard is CDMA, this value is. Dial the number for PPP connection.
Dialing user name	STRING	Server wireless communication dialing user name
Dial	STRING	Server wireless communication dialing password

password		
address	STRING	Server address, IP or domain name
TCP port	WORD	Server TCP port
UDP port	WORD	Server UDP port

Manufacturer ID	BYTE[5]	Terminal manufacturer code
Supervision platform authentication code	STRING	The authentication code issued by the supervision platform is only used for authentication after the terminal is connected to the supervision platform. The terminal Connect back to the original monitoring platform and use the original authentication code.
Hardware version	STRING	The hardware version number of the terminal is determined by the manufacturer.
Firmware version	STRING	The firmware version number of the terminal is determined by the manufacturer.
URL address	STRING	Full URL address
Connect to the specified service Device time limit	WORD	Unit: minute (min), and a value other than 0 indicates that the terminal receives an instruction to upgrade or connect to the specified server. Before the expiration of the validity period, the terminal should be connected back to the original address. A value of 0 means that the specified server is always connected.

8.14 Query terminal properties

Message id: 0x8107. The message body for querying terminal properties is empty.

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8.15 Query terminal attribute response

Message id: 0x0107.查询终端属性应答消息体

数据格式见表 20。

Table 20 Data Format of Query Terminal Attribute Response Message Body

Start byte	field	data type	Description and requirements
0	Terminal type	WORD	Bit0 0,0: not applicable to passenger vehicles, 1: applicable to passenger vehicles; bit1 0: not applicable to dangerous goods vehicles, 1: applicable to dangerous goods vehicles; bit2 0: not applicable to ordinary freight vehicles, 1: applicable to ordinary freight vehicles; Bit3 3,0: not applicable to rental vehicles, 1: applicable to rental vehicles; bit6 0: does not support hard disk video recording, 1: supports hard disk video recording; bit7，0 : all-in-one machine, 1: split machine.
2	Manufacturer ID	BYTE[5]	5 bytes, terminal manufacturer code.
seven	Terminal model	BYTE[20]	20 bytes, the terminal model is defined by the manufacturer. If the number of digits is insufficient, Completes "0X00" later.
27	Terminal ID	BYTE[7]	7 bytes, composed of uppercase letters and numbers, this terminal ID is provided by the manufacturer. Self-defined, when the number of digits is insufficient, it will be supplemented with "0X00".
forty-two	Terminal SIM card ICCID	BCD[10]	ICCID number of terminal SIM card
fifty-two	Terminal hardware version number length	BYTE	n

53	Terminal hardware version number	STRING	
53+n	Terminal firmware version number length	BYTE	m
54+n	Terminal firmware version number	STRING	

54+n+m	GNSS module properties	BYTE	Bit0 0,0: does not support GPS positioning, 1: supports GPS positioning; Bit1 1,0: Beidou positioning is not supported, and 1: Beidou positioning is supported; Bit2 2,0: GLONASS positioning is not supported, 1: GLONASS positioning is supported; Bit3 3,0: Galileo positioning is not supported, and 1: Galileo positioning is supported.
55+n+m	Communication module attribute	BYTE	Bit0 0,0: does not support GPRS communication, 1: supports GPRS communication; Bit1 1,0: does not support CDMA communication, 1: supports CDMA communication; Bit2 2,0: does not support TD-SCDMA communication, 1: supports TD-SCDMA communication; Bit3 3,0: does not support WCDMA communication, 1: supports WCDMA communication; Bit4 4,0: does not support CDMA2000 communication, and 1: supports CDMA2000 communication. Bit5 5,0: does not support TD-LTE communication, 1: supports TD-LTE communication; Bit7 7,0: Other communication modes are not supported, and 1: Other communication modes are supported.

8.16 Issue terminal upgrade package

Message id: 0x8108. For the data format of the message body of the terminal upgrade package, see.表 21。对该命令终端使 Confirm whether it is received correctly with general reply.

To upgrade package data.

Table 21 Data Format of Message Body of Terminal Upgrade Package

Start byte	field	data type	Description and requirements
0	Upgrade type	BYTE	0: terminal, 12: road transport card IC card reader, 52: Beidou Satellite positioning module
one	Manufacturer ID	BYTE[5]	Manufacturer number
six	Version number length	BYTE	n
seven	version number	STRING	
7+n	Upgrade packet length	DWORD	The unit is BYTE.
11+n	Upgrade data packet		

8.17 Terminal upgrade result notification

Message id: 0x0108. The terminal uses this command to notify the monitoring center after the upgrade is completed and reconnected. Number of message bodies of terminal upgrade result notification

据格式见表 22。

Table 22 Data format of terminal upgrade result notification message body

Start byte	field	data type	Description and

			requirements
0	Upgrade type	BYTE	0: terminal, 12: road transport card IC card reader, 52: Beidou Satellite positioning module
one	Upgrade result	BYTE	0: Success, 1: Failure, 2: Cancel

8.18 Location information reporting

Message id: 0x00200. The message body of location information report consists of basic location information and a list of additional location information items. The message structure diagram is shown in Figure 3.

Show:

Basic position information List of location additional information items

Fig. 3 Structure diagram of location report message

The list of location additional information items is composed of various location additional information items or not, and is determined according to the length field in the message header.

See for the data format of basic location information.表 23。

Table 23 Location Basic Information Data Format

Start byte	field	data type	Description and requirements
0	Alarm sign	DWORD	See for the definition of alarm flag bit.表 24
four	condition	DWORD	See for the definition of status bits.表 25
eight	latitude	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
12	longitude	DWORD	The longitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
16	elevation	WORD	Altitude, in meters (m)
18	speed	WORD	1/10km/h
20	direction	WORD	0-359, due north is 0, clockwise
21	time	BCD[6]	YY-MM-DD-hh-mm-ss(GMT+8 time, referred to later in this standard) And the time adopts this time zone)

Table 24 Definition of Alarm Flag Bit

place	definition	Processing instructions
0	1: Emergency alarm, triggered by touching the alarm switch.	Clear after receiving the reply
one	1. Overspeed alarm	The flag is maintained until the alarm condition is released.
2	1. Fatigue driving	The flag is maintained until the alarm condition is released.
three	1. Danger warning	Clear after receiving the reply
four	1: GNSS module failure.	The flag is maintained until the alarm condition is released.
five	1: GNSS antenna is not connected or cut.	The flag is maintained until the alarm condition is released.
six	1: GNSS antenna short circuit	The flag is maintained until the alarm condition is released.
seven	1: Terminal main power supply undervoltage	The flag is maintained until the alarm condition is released.
eight	1: Power failure of terminal main power supply	The flag is maintained until the alarm condition is

		released.

place	definition	Processing instructions
nine	1: Terminal LCD or monitor failure	The flag is maintained until the alarm condition is released.
10	1: TTS module failure	The flag is maintained until the alarm condition is released.
11	1: Camera failure	The flag is maintained until the alarm condition is released.
12	1. Road transport card IC card module failure	The flag is maintained until the alarm condition is released.
13	1. Overspeed warning	The flag is maintained until the alarm condition is released.
14	1. Fatigue driving warning	The flag is maintained until the alarm condition is released.
15-17	reserve	
18	1. Cumulative driving overtime on that day.	The flag is maintained until the alarm condition is released.
19	1. Overtime parking	The flag is maintained until the alarm condition is released.
20	1: Access area	Clear after receiving the reply
21	1. Access routes	Clear after receiving the reply
22	1. The driving time of the road section is insufficient/too long	Clear after receiving the reply
23	1. Route deviation alarm	The flag is maintained until the alarm condition is released.
24	1: Vehicle VSS fault	The flag is maintained until the alarm condition is released.
25	1. Abnormal vehicle fuel quantity	The flag is maintained until the alarm condition is released.
26	1: The vehicle is stolen (through the vehicle alarm)	The flag is maintained until the alarm condition is released.
27	1. Illegal vehicle ignition	Clear after receiving the reply
28	1. Illegal displacement of vehicles	Clear after receiving the reply
29	1. Collision warning	The flag is maintained until the alarm condition is released.
30	1. Rollover warning	The flag is maintained until the alarm condition is released.
31	1: Illegal door opening alarm (when the terminal has no area, it is not Judge illegal opening the door)	Clear after receiving the reply

Note: In case of alarm and early warning, the location information should be reported immediately.

Table 25 Status Bit Definitions

place	condition
0	0: ACC off; 1: ACC on
one	0: Not located; 1. Positioning

2	0: north latitude; 1: South latitude

place	condi tion
three	0: East longitude; 1. West longitude
four	0: operational status; 1. Shutdown status
five	0: Latitude and longitude are not encrypted by the security plug-in; 1: Latitude and longitude have been encrypted by the security plug-in.
6-7	reserve
8-9	00: empty car; 01: half a year; 10: reservation; 11: Full load (It can be used for empty and heavy passenger cars and empty and full freight cars, manual input or sensor acquisition.)
10	0: Vehicle oil circuit is normal; 1: Vehicle oil circuit is disconnected
11	0: Vehicle circuit is normal; 1: Vehicle circuit is disconnected
12	0: the door is unlocked; 1: Lock the door
13	0: the door is closed; 1: Door 1 is open (front door)
14	0: door 2 closed; 1: Door 2 is open (middle door)
15	0: door 3 closed; 1: Door 3 open (back door)
16	0: door 4 closed; 1: Door 4 is open (driver's seat door)
17	0: the door is 5 off; 1: Door 5 open (custom)
18	0: GPS satellite is not used for positioning; 1. Use GPS satellites for positioning.
19	0: Beidou satellite is not used for positioning; 1. Use Beidou satellite for positioning
20	0: GLONASS satellite is not used for positioning; 1. Use GLONASS satellite for positioning.
21	0: Galileo satellite is not used for positioning; 1. Using Galileo satellite for positioning
22-31	reserve

Note: If the status changes, the location information should be reported immediately.

See for the format of location additional information item.表 26.

Table 26 Format of Location Additional Information Items

field	data type	Description and requirements
Additional information ID	BYTE	1-255
Additional information length	BYTE	
overhead information		See for definition of additional information.表 27

Table 27 Definition of Additional Information

Additional information ID	Additional information length	Description and requirements
0x01	four	Mileage, DWORD, 1/10km, corresponding to the odometer reading on the vehicle.
0x02	2	Fuel quantity, WORD, 1/10L, corresponding to the fuel gauge reading on the vehicle.
0x03	2	Speed obtained by driving record function, WORD, 1/10km/h.
0x04	2	Need to manually confirm the ID of the alarm event, WORD, counting from 1.
0x05-0x10		reserve
0x11	1 or 5	See for additional information of overspeed alarm.表 28
0x12	six	See for additional information about alarm in and out area/route.表 29
0x13	seven	See for additional information of insufficient/excessive driving time alarm. 表 30
0x14-0x24		reserve
0x25	four	Extended vehicle signal status bit, as defined in.表 31
0x2A	2	IO status bits, as defined in.表 32
0x2B	four	Analog, bit0-15, AD0；；bit16-31，AD1。
0x30	one	BYTE, signal strength of wireless communication network
0x31	one	BYTE, number of GNSS positioning satellites
0xE0	Subsequent information length	Subsequent custom information length
0xE1-0xFF		Custom area

Table 28 Data format of overspeed alarm additional information message body

Start byte	field	data type	Description and requirements
0	Location type	BYTE	0: No specific location; 1: circular area; 2: rectangular area; 3: Polygonal area; 4: Road section
one	Area or road section ID	DWORD	If the location type is 0, this field is not available.

Table 29 Data Format of Additional Information Message Body of Incoming Area/Route Alarm

Start byte	field	data type	Description and requirements
0	Location type	BYTE	1: circular area; 2: rectangular area; 3: Polygonal area; 4: Route
one	Area or line ID	DWORD	
five	direction	BYTE	0: enter; 1: Out

Table 30 Data format of additional information message body of insufficient/excessive route travel time alarm

Start byte	field	data type	Description

			and requirements

0	Road section ID	DWORD	
four	Road travel time	WORD	The unit is seconds (s)
six	result	BYTE	0: insufficient; 1: Too long

Table 31 Extended Vehicle Signal Status Bits

place	definition
0	1: Low beam signal
one	1: High beam signal
2	1: Right turn signal
three	1: Left turn signal
four	1. Brake signal
five	1: Reverse signal
six	1: Fog light signal
seven	1. Profile light
eight	1: Horn signal
nine	1: Air conditioning status
10	1. Neutral signal
11	1: Retarder works
12	1. ABS work
13	1: The heater works
14	1: Clutch status
15-31	reserve

Table 32 IO status bits

place	definition
0	1: Deep sleep state
one	1: Sleep state
2-15	reserve

8.19 Location information query

Message id: 0x8201.

The message body of location information query is empty.

8.20 Location information query response

Message id: 0x0201.位置信息查询应答消息体数
据格式见表 33。

Table 33 Data Format of Location Information Query Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	The serial number of the corresponding location information query message
2	Location information reporting		See 8.12 for location information reporting.

8.21 Temporary position tracking control

Message id: 0x8202.临时位置跟踪控制消息体数
据格式见表 34。

Table 34 Data Format of Temporary Position Tracking Control Message Body

Start byte	field	data type	Description and requirements
0	time span	WORD	The unit is seconds (s), and 0 stops tracking. Stop tracking without a successor field
2	Location tracking validity period	DWORD	The unit is seconds (s). After the terminal receives the position tracking control message, Before the expiration of the validity period, the location report is sent according to the time interval in the message.

8.22 Manual acknowledgement alarm message

Message ID: 0x8203 See for the data format of manual confirmation alarm message body.表 35.

Table 35 Data Format of Manual Confirmation Alarm Message

Start byte	field	data type	expla in
0	Alarm message serial number	WORD	Serial number of alarm message to be manually confirmed, with 0 indicating all alarm types. news
2	Manually confirm the alarm type	DWORD	See definition.表 36

Table 36 Definition of Manual Confirmation Alarm Type

place	defin ition
0	1: Confirm the emergency alarm;
1-2	reserve

three	1. Confirm the danger warning;

4-19	reserve
20	1: Confirm the alarm in and out of the area;
21	1: Confirm the incoming and outgoing route alarm;
22	1. Confirm that the driving time of the road section is insufficient/give an alarm during the process;
23-26	reserve
27	1. Confirm the vehicle illegal ignition alarm;
28	1. Confirm the illegal displacement alarm of the vehicle;
29-31	reserve

8.23 Text information distribution

Message id: 0x8300.文本信息下发消息体
数据格式见表 37。

Table 37 Text Message Body Data Format

Start byte	field	data type	Description and requirements
0	sign	BYTE	See for the meaning of text information flag bits.表 38
one	Text information	STRING	The maximum length is 1024 bytes, encoded by GBK.

Table 38 Meaning of Text Information Flags

place	sign
0	1. Urgent
one	reserve
2	1. Terminal display
three	1. Terminal TTS broadcast reading
four	1. Advertising screen display
five	0: central navigation information, 1: CAN fault code information.
6-7	reserve

8.24 Event setting

Message id: 0x8301.事件设置消息体数据
格式见表 39。

Table 39 Event Setting Message Body Data Format

Start byte	field	data type	Description and requirements

0	Setting type	BYTE	0: Delete all existing events of the terminal, and there are no subsequent bytes after this command; 1: Update the event; 2: Additional events; 3: Modify the event; 4: Delete specific events, and then there is no need to bring event content in the event items.
one	Set total	BYTE	
2	Event item list		See for the data format of event item composition.表 40

Table 40 Event Item Composition Data Format

Start byte	field	data type	Description and requirements
0	Event ID	BYTE	If the terminal already has an event with the same ID, it will be overwritten.
one	Event content length	BYTE	Byte length of subsequent event content field
2	Event content	STRING	Event content, encoded by GBK

8.25 Event report

Message id: 0x0301.事件报告消息体数据
格式见表 41。

Table 41 Data Format of Event Report Message Body

Start byte	field	data type	Description and requirements
0	Event ID	BYTE	

8.26 Issue questions

Message id: 0x8302.提问下发消息体数据
格式见表 42。

Table 42 Data Format of Question Delivery Message Body

Start byte	field	data type	Description and requirements
0	sign	BYTE	See for the definition of question issuing flag bit.表 43
one	Question content length	BYTE	Question field byte length
2	question	STRING	Question text, encoded by GBK, with length of N.
2+N	Candidate answer list		See for the composition of candidate answer messages.表 44

Table 43 Definition of Question Distribution Flag Bit

place	sign

0	1. Urgent

one	reserve
2	reserve
three	1. Terminal TTS broadcast reading
four	1. Advertising screen display
5-7	reserve

Table 44 Composition of Question Delivery Candidate Answer Messages

Start byte	field	data type	Description and requirements
0	Answer ID	BYTE	
one	Answer content length	WORD	Byte length of answer content field
three	Answer content	STRING	Answer content, encoded by GBK

8.27 Question response

Message id: 0x0302.提问应答消息体数据
格式见表 45。

Table 45 Data Format of Question Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	The serial number of the corresponding question sending message
2	Answer ID	BYTE	Answer ID attached to the question distribution.

8.28 Information on demand menu settings

Message id: 0x8303.信息点播菜单设置消息体数据格式见表 46
。

Table 46 Information on Demand Menu Settings Message Body Data Format

Start byte	field	data type	Description and requirements
0	Setting type	BYTE	0: delete all information items of the terminal; 1: Update the menu; 2: Add menu; 3: Modify the menu
one	Total number of information items	BYTE	
2	Information item list		See for the data format of information items on demand.表 47

Table 47 Data Format of Information Items on Demand

Start byte	field	data type	Description and

			requirements

0	Information type	BYTE	If the terminal already has an information item of the same type, it will be overwritten.
one	Information name length	WORD	Byte length of information name field
three	Information name	STRING	After GBK coding processing

8.29 Information on demand/cancellation

Message id: 0x0303. Message on demand/retrieval 消消息体数据格式见表 48。

Table 48 Message on Demand/Cancel Message Body Data Format

Start byte	field	data type	Description and requirements
0	Information type	BYTE	
one	On-demand/ cancellation sign	BYTE	0: Cancel; 1: On-demand

8.30 information service

Message id: 0x8304.信息服务消息体数据格式见表 49

。

Table 49 Information Service Message Body Data Format

Start byte	field	data type	Description and requirements
0	Information type	BYTE	
one	Information length	WORD	
three	Information content	STRING	GBK coded

8.31 Telephone dialing

Message id: 0x8400.电话回拨消息体数据格式见表 50

。

Table 50 Data Format of Telephone Callback Message Body

Start byte	field	data type	Description and requirements
0	sign	BYTE	0: ordinary call; 1. Monitoring
one	telephone number	STRING	The maximum length is 20 bytes

8.32 Set phone book

Message id: 0x8401. See for setting the phone book message body data format.表 51。

Table 51 sets the phone book message body data format.

Start byte	field	data type	Description and requirements

0	Setting type	BYTE	0: Delete all stored contacts on the terminal; 1: means updating the phone book (deleting all the contacts in the terminal and adding the contacts in the message); 2: indicates adding a telephone book; 3: means to modify the phone book (with contacts as the index)
one	Total number of contacts	BYTE	
2	Contact item		For the data format of phone book contact items, see.表 52

Table 52 Phone Book Contact Item Data Format

Start byte	field	data type	Description and requirements
0	sign	BYTE	1: incoming call; 2: exhale; 3: Incoming/outgoing calls
one	Number length	BYTE	
2	telephone number	STRING	Length n
2+n	Contact length	BYTE	
3+n	contacts	STRING	GBK coded

8.33 Vehicle control

Message id: 0x8500 车辆控制消息体数据
格式见表 53。

Table 53 Data Format of Vehicle Control Message Body

Start byte	field	data type	Description and requirements
0	Control sign	BYTE	For the data format of control instruction flag bit, see.表 54

Table 54 Data Format of Control Instruction Flag Bit

place	sign
0	0: the door is unlocked; 1: Lock the door
1-7	reserve

8.34 Vehicle control response

Message id: 0x00500.车辆控制应答消息
体数据格式见表 55。

Table 55 Data Format of Vehicle Control Response Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	Serial number of the corresponding vehicle control message
2	Position information report message body		Judging whether the control is successful or not according to the corresponding status bits.

8. 35 Set a circular area

Message id: 0x8600.设置圆形区域消息体

数据格式见表 56。

Note: This message protocol supports periodic time range. If you want to limit 8:30-18:00 every day, the start/end time is set to 00-00-08-30-00/00-00-18-00-00, and so on.

Table 56 sets the message body data format of circular area.

Start byte	field	data type	Description and requirements
0	Set properties	BYTE	0: Update area; 1: Additional area; 2: Modify the region
one	Total area	BYTE	
2	Regional term		See for the data format of regional item content in circular area.表 57

Table 57 Area Item Content Data Format of Circular Area

Start byte	field	data type	Description and requirements
0	Area ID	DWORD	
four	Regional attribute	WORD	See for the definition of regional attributes.表 58
six	Latitude of central point	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
10	Longitude of center point	DWORD	The longitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
14	radius	DWORD	The unit is meters (m), and the road section is from this inflection point to the next inflection point.
18	starting time	BCD[6]	YY-MM-DD-hh-mm-ss, if the area attribute 0 bit is 0, it is not available. field
24	end time	BCD[6]	YY-MM-DD-hh-mm-ss, if the area attribute 0 bit is 0, it is not available. field
30	maximum speed	WORD	Km/h, if the area attribute 1 is 0, this field is not available.
32	Overspeed duration	BYTE	The unit is seconds (s) (similar expression, the same as before), if the regional attribute If bit 1 is 0, there is no such field.

Table 58 Definition of Regional Attributes of Regions

place	sign
0	1. According to time
one	1. Speed limit
2	1. Enter the area and give an alarm to the driver.
three	1: Enter the area and give an alarm to the platform.

four	1. Give an alarm to the driver when leaving the area.

five	1: Give an alarm to the platform when leaving the area.
six	0: north latitude; 1: South latitude
seven	0: East longitude; 1. West longitude
eight	0: Allow to open the door; 1: Do not open the door
9-13	reserve
14	0: enter the area to open the communication module; 1: Turn off the communication module when entering the area.
15	0: GNSS detailed positioning data will not be collected when entering the area; 1. Enter the area to collect GNSS detailed positioning data.

8.36 Delete circular area

Message id: 0x8601.删除圆形区域消息体
数据格式见表 59。

Table 59 Delete message body data format of circular area

Start byte	field	data type	Description and requirements
0	Number of regions	BYTE	The number of areas contained in this message is not more than 125, but more than 125. It is suggested to use multiple messages, and 0 means to delete all circular areas.
one	Region ID1	DWORD	
	……	DWORD	
	Regional IDn	DWORD	

8.37 Set a rectangular area

Message id: 0x8602.设置矩形区域消息体
数据格式见表 60。

Table 60 sets the message body data format of rectangular area.

Start byte	field	data type	Description and requirements
0	Set properties	BYTE	0 : Update area; 1 : Additional area; 2 : modify area
one	Total area	BYTE	
2	Regional term		For the data format of regional items in rectangular areas, see.表 61

Table 61 Region Item Data Format of Rectangular Region

Start byte	field	data type	Description and requirements
0	Area ID	DWORD	
four	Regional attribute	WORD	See for the definition of regional attributes.表 58
six	Latitude of upper	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one million.

	left point		One-tenth degree

10	Longitude of upper left point	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
14	Latitude of lower right point	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
18	Longitude of lower right point	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one million. One-tenth degree
22	starting time	BCD[6]	Time range setting in the same circle area
28	end time	BCD[6]	Time range setting in the same circle area
34	maximum speed	WORD	The unit is kilometers per hour (km/h), if the regional attribute 1 is 0, then There is no such field.
36	Overspeed duration	BYTE	The unit is seconds (s), and this field is not available if bit 1 of the area attribute is 0.

8.38 Delete rectangular area

Message id: 0x8603.删除矩形区域消息体
数据格式见表 62。

Table 62 Delete message body data format of rectangular area

Start byte	field	data type	Description and requirements
0	Number of regions	BYTE	The number of areas contained in this message is not more than 125, but more than 125. It is suggested to use multiple messages, and 0 means to delete all rectangular areas.
one	Region ID1	DWORD	
	……	DWORD	
	Regional IDn	DWORD	

8.39 Set polygon area

Message id: 0x8604. See for setting the data format of message body in polygon area.表 63
。

Table 63 sets the message body data format of polygon area.

Start byte	field	data type	Description and requirements
0	Area ID	DWORD	
four	Regional attribute	WORD	See for the definition of regional attributes.表 58
six	starting time	BCD[6]	Time range setting in the same circle area
12	end time	BCD[6]	Time range setting in the same circle area
18	maximum speed	WORD	The unit is kilometers per hour (km/h), if the regional attribute 1 is 0, then There is no such field.
20	Overspeed duration	BYTE	The unit is seconds (s), and this field is not available if bit 1 of the area attribute is 0.
21	Total vertex number of region	WORD	

23	Vertex term		See for the data format of vertex items in polygon area. 表 64

Table 64 Vertex Item Data Format of Polygon Region

Start byte	field	data type	Description and requirements
0	Vertex latitude	DWORD	The latitude value in degrees is multiplied by the sixth power of 10 to the nearest millionth degree.
four	Vertex longitude	DWORD	The latitude value in degrees is multiplied by the sixth power of 10 to the nearest millionth degree.

8.40 Delete polygon area

Message id: 0x8605.删除多边形区域消息体数据格式见表 65

。

Table 65 Delete message body data format of polygon area

Start byte	field	data type	Description and requirements
0	Number of regions	BYTE	The number of areas contained in this message is not more than 125, but more than 125. It is suggested to use multiple messages, and 0 means to delete all rectangular areas.
one	Region ID1	DWORD	
	……	DWORD	
	Regional IDn	DWORD	

8.41 Set the route

Message id: 0x8606. See for setting the data format of route message body.表 66。

Table 66 sets the route message body data format.

Start byte	field	data type	Description and requirements
0	Route ID	DWORD	
four	Route attribute	WORD	For the data format of route attributes, see.表 67
six	starting time	BCD[6]	Time range setting in the same circle area
12	end time	BCD[6]	Time range setting in the same circle area
18	Total inflection point of route	WORD	
20	Inflexion term		See for the data format of route inflection point item.表 68

Table 67 Route Attribute Data Format

place	sign
0	1. According to time
one	reserve

2	1. Route alarm to the driver
three	1. The route alarm to the platform.
four	1. Route alarm to the driver.
five	1: Give an alarm to the platform when leaving the route.
6-15	reserve

Table 68 Data format of route inflection point item

Start byte	field	data type	Description and requirements
0	Inflexion ID	DWORD	
four	Road section ID	DWORD	
eight	Inflexion latitude	DWORD	The latitude value in degrees is multiplied by the sixth power of 10 to the nearest millionth. degree
12	Longitude of inflection point	DWORD	The latitude value in degrees is multiplied by the sixth power of 10 to the nearest millionth. degree
16	Road width	BYTE	The unit is meters (m), and the road section is from this inflection point to the next inflection point.
17	Road section attribute	BYTE	For the data format of road section attributes, see.表 69
18	Road section driving too long threshold	WORD	The unit is seconds (s), and this field is not available if the 0 bit of the link attribute is 0.
20	Undertravel threshold of road section	WORD	The unit is seconds (s), and this field is not available if the 0 bit of the link attribute is 0.
22	Maximum speed of road section	WORD	The unit is kilometers per hour (km/h). If the section attribute 1 is 0, there is no such item. field
24	Overspeed duration of road section	BYTE	The unit is seconds (s), and this field is not available if 1 bit of the section attribute is 0.

Table 69 Format of Road Attribute Data

place	sign
0	1. Driving time
one	1. Speed limit
2	0: north latitude; 1: South latitude
three	0: East longitude; 1. West longitude
4-7	reserve

8.42 Delete route

Message id: 0x8607.删除路线消息体数据
格式见表 70。

Table 70 Delete route message body data format

Start byte	field	data type	Description and requirements

0	Number of routes	BYTE	The number of areas contained in this message does not exceed 125, which is more than 125 suggestions with multiple messages, 0 to delete all routes.
one	Route ID1	DWORD	
	……	DWORD	
	Route IDn	DWORD	

8.43 Driving record data acquisition command

Message id: 0x8700.行驶记录数据采集命令消息体数据格式见表 71。

Table 71 Data format of data acquisition command message body of driving recorder

Start byte	field	data type	Description and requirements
0	command word	BYTE	See GB/T 19056 for the list of command words.
one	block data		See GB/T 19056 for the format of data block content, including Complete data packet required by GB/T 19056; can be empty.

8.44 Driving record data upload

Message id: 0x00700. See for the data format of the message body of the driving record data upload.表 72。

Table 72 Data Format of Driving Record Data Upload Message Body

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	The serial number of the corresponding driving record data acquisition command message
2	command word	BYTE	Command words issued by the corresponding platform
three	block data		See GB/T 19056 for the format of data block content, including Complete data package required by GB/T 19056.

8.45 Driving record parameter download command

Message id: 0x8701.行驶记录参数下传命令消息体数据格式见表 73。

Table 73 Data Format of Parameter Downloading Command Message Body of Driving Recorder

Start byte	field	data type	Description and requirements
0	command word	BYTE	See GB/T 19056 for the list of command words.
one	block data		See GB/T 19056 for the format of data block content, including

			Complete data package required by GB/T 19056.

8.46 Electronic waybill reporting

Message id: 0x0701.电子运单上报消息体数据格式见
表 74。

Table 74 Data Format of Electronic Waybill Reporting Message Body

Start byte	field	data type	Description and requirements
0	Length of electronic waybill	DWORD	
four	Content of electronic waybill		Electronic waybill data packet

8.47 Request for reporting driver identity information

Message id: 0x8702. The message body of the request for reporting driver identity information is empty.

8.48 Driver identity information collection and reporting

Message id: 0x0702. This command will be triggered automatically after the IC card of terminal qualification certificate is inserted or pulled out. Use this instruction after receiving the 0x8702 instruction.

应答。驾驶员身份信息采集上报消息体数据格式见表 75。

Table 75 Data Format of Driver Identity Information Reporting Message Body

Start byte	field	data type	Description and requirements
0	condition	BYTE	0x01: IC card of qualification certificate is inserted (driver goes to work); 0x02: IC card of qualification certificate is pulled out (the driver is off duty).
one	time	BCD[6]	Card insertion/card withdrawal time, YY-MM-DD-HH-MM-SS; below The field is valid and populated only when the status is 0x01.
seven	IC card reading result	BYTE	0x00: IC card reading succeeded; 0x01: Card reading failed because the card key authentication failed; 0x02: Card reading failed because the card has been locked; 0x03: Card reading failed because the card was pulled out; 0x04: Card reading failed because of data verification error. The following fields are valid when the IC card reading result is equal to 0x00.
eight	Driver's name length	BYTE	n
nine	Driver's name	STRING	Driver's name
9+n	Code of qualification certificate	STRING	The length is 20 digits, which is not enough to supplement 0x00.
29+n	Name and length of license issuing agency	BYTE	m
30+n	Name of issuing	STRING	Name of license issuing agency for qualification

	agency		certificate
30+n+m	Validity period of certificate	BCD[4]	YYYYMMDD

8.49 Batch upload of positioning data

Message id: 0x0704. See for the data format of batch upload of positioning data.表 76.

Table 76 Location Data Batch Upload Data Format

Start byte	field	data type	explain
0	Number of data items	WORD	Number of location report data items contained, > 0
one	Location data type	BYTE	0: Batch report in normal position, 1: supplementary report in blind area.
2	Location report data item		See definition.表 77

Table 77 Data Format of Position Reporting Data Item

Start byte	field	data type	expla in
0	Length of position report data body	WORD	Length of position report data body, n
2	Position reporting data body	BYTE[n]	See 8.12 Location Information Reporting for the definition.

8.50 CAN bus data upload

Message id: 0x0705. See for the data format of CAN bus data upload.表 78

.

Table 78 CAN bus data upload data format

Start byte	field	data type	explain
0	Number of data items	WORD	Number of CAN bus data items contained, > 0
2	CAN bus data receiving time	BCD[5]	Article 1 Receiving time of CAN bus data, hh-mm-ss-msms
eight	CAN bus data item		See definition.表 79

Table 79 Data format of CAN bus data item

Start byte	field	data type	expla in
0	CAN ID	BYTE[4]	Bit31 stands for CAN channel number, 0: CAN 1, 1: CAN 2; Bit30 indicates the frame type, 0: standard frame, 1: extended frame; Bit29 indicates the data acquisition mode, where 0 is the original data and 1 is the average value of the acquisition interval; Bit28-bit0 represents the CAN bus ID.
four	CAN DATA	BYTE[8]	CAN data

8.51 Multimedia event information upload

Message id: 0x00800

多媒体事件消息上传数据格式见表 80。

Table 80 Data Format of Multimedia Event Message Uploading Message Body

Start byte	field	data type	Description and requirements
0	Multimedia data ID	DWORD	>0
four	Multimedia type	BYTE	0: image; 1: audio; 2: video;
five	Multimedia format coding	BYTE	0：JPEG； 1：TIF； 2：MP3； 3：WAV； 4：WMV； Other reservations
six	Event item coding	BYTE	0: The platform issues instructions; 1. Timing action; 2: robbery alarm triggered; 3: Collision rollover alarm is triggered; 4: the door is open to take pictures; 5: Take photos with the door closed; 6: the door changes from opening to closing, and the speed ranges from < 20km to over 20km; 7: take photos at a fixed distance; Other reservations
seven	Channel ID	BYTE	

8.52 Multimedia data upload

Message id: 0x0801.多媒体数据上传消息体数据格式见表 81。

Table 81 Data format of multimedia data upload message body

Start byte	field	data type	Description and requirements
0	Multimedia ID	DWORD	>0
four	Multimedia type	BYTE	0: image; 1: audio; 2: video;
five	Multimedia format coding	BYTE	0：JPEG； 1：TIF； 2：MP3； 3：WAV； 4：WMV； Other reservations
six	Event item coding	BYTE	0: The platform issues instructions; 1. Timing action; 2. Robbery alarm touch Send; 3: Collision rollover alarm is triggered; Other reservations
seven	Channel ID	BYTE	
eight	Location information reporting (0x0200) Message body	BYTE[28]	Basic information data representing the position of multimedia data
36	Multimedia data packet		

8.53 Multimedia data upload response

Message id: 0x8800.多媒体数据上传应答消息体数据格式见表 82。

Table 82 Data Format of Multimedia Data Upload Response Message Body

Start byte	field	data type	Description and

			requirements
0	Multimedia ID	DWORD	> 0, if all packets are received, there is no subsequent field.
four	Total number of retransmitted packets	BYTE	n
five	Retransmission package ID list	BYTE[2*n]	The serial numbers of retransmission packets are arranged in sequence, such as "Packet ID1 Packet ID2" ..... PackageIDn".

Note: The sender of this message should promise to resend the packet in the retransmission packet ID list once with 0x0801 message, which is completely consistent with the original packet message.

8.54 The camera immediately shoots the command.

Message id: 0x8801.摄像头立即拍摄命令消息体数据
格式见表 83。

Table 83 Data Format of Camera Immediate Shooting Command Message Body

Start byte	field	data type	Description and requirements
0	Channel ID	BYTE	>0
one	Shooting command	WORD	0 means stop shooting; 0xFFFF means video recording; Other representative beats Number of photos
three	Photo interval/video recording time	WORD	Seconds, 0 means taking pictures at minimum intervals or recording all the time.
five	Save mark	BYTE	1: save; 0: Real-time upload
six	Resolution a	BYTE	0x01:320*240； 0x02:640*480； 0x03:800*600； 0x04:1024*768; 0x05:176*144; [Qcif]; 0x06:352*288; [Cif]; 0x07:704*288; [HALF D1]; 0x08:704*576; [D1];
seven	Image/video quality	BYTE	1-10, where 1 represents the minimum mass loss and 10 represents the maximum compression ratio.
eight	brightness	BYTE	0-255
nine	contrast	BYTE	0-127
10	saturability	BYTE	0-127
11	chrominance	BYTE	0-255
If terminal A does not support the resolution required by the system, take the closest resolution and upload it.			

8.55 The camera immediately shoots the command response.

Message id: 0x0805.摄像头立即拍摄命令应答消息体数据格式见表 84. This command is used to respond to the camera issued by the monitoring center.

Head shooting command 0x8801 immediately.

Table 84 Data Format of Camera Immediate Shooting Command Response

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	The message serial number corresponding to the platform camera's immediate shooting command.
2	result	BYTE	0: success; 1: failure; 2: The channel is not supported. The following fields are valid when the result =0.
three	Number of multimedia ids	WORD	N, the number of multimedia successfully shot.

four	Multimedia ID list	BYTE[4*n]	

8.56 Storage multimedia data retrieval

Message id: 0x8802.存储多媒体数据检索消息体数据格式见表85。 Note: Set the start time/end time to 00-00-00- 00-00-00, regardless of the time range.

Table 85 stores the multimedia data retrieval message body data format.

Start byte	field	data type	Description and requirements
0	Multimedia type	BYTE	0: image; 1: audio; 2: video;
one	Channel ID	BYTE	0 means to retrieve all channels of this media type;
2	Event item coding	BYTE	0: The platform issues instructions; 1. Timing action; 2. Robbery alarm touch Send; 3: Collision rollover alarm is triggered; Other reservations
three	starting time	BCD[6]	YY-MM-DD-hh-mm-ss
nine	end time	BCD[6]	YY-MM-DD-hh-mm-ss

8.57 Store multimedia data retrieval response

Message id: 0x0802. See for the data format of the multimedia data retrieval response message body.表86。

Table 86 stores the multimedia data retrieval response message body data format.

Start byte	field	data type	Description and requirements
0	Response serial number	WORD	The serial number of the corresponding multimedia data retrieval message
2	Total number of multimedia data items	WORD	The total number of multimedia data items that meet the retrieval conditions
four	Search item		See for the data format of multimedia retrieval items.表87

Table 87 Multimedia Search Item Data Format

Start byte	field	data type	Description and requirements
0	Multimedia ID	DWORD	>0
four	Multimedia type	BYTE	0: image; 1: audio; 2: Video
five	Channel ID	BYTE	
six	Event item coding	BYTE	0: The platform issues instructions; 1. Timing action; 2. Robbery alarm touch Send; 3: Collision rollover alarm is triggered; Other reservations
seven	Location information reporting (0x0200) Message body	BYTE[28]	Basic position information data indicating the starting time of shooting or recording.

8.58 Store multimedia data upload command

Message id: 0x8803 存储多媒体数据上传命令消息体

数据格式见表 88。

Table 88 stores the multimedia data upload command message body data format.

Start byte	field	data type	Description and requirements
0	Multimedia type	BYTE	0: image; 1: audio; 2: Video
one	Channel ID	BYTE	
2	Event item coding	BYTE	0: The platform issues instructions; 1. Timing action; 2. Robbery alarm touch Send; 3: Collision rollover alarm is triggered; Other reservations
three	starting time	BCD[6]	YY-MM-DD-hh-mm-ss
nine	end time	BCD[6]	YY-MM-DD-hh-mm-ss
15	Delete flag	BYTE	0: reserved; 1: delete;

8.59 Recording start command

Message id: 0x8804 录音开始命令消息体数据格式见表 89。

Table 89 Data Format of Recording Start Command Message Body

Start byte	field	data type	Description and requirements
0	Recording command	BYTE	0: Stop recording; 0x01: Start recording;
one	Recording time	WORD	The unit is seconds (s), and 0 means recording all the time.
three	Save mark	BYTE	0: real-time upload; 1: Save
four	camcorder	BYTE	0：8K； 1：11K； 2：23K； 3：32K； Other reservations

8.60 Single storage multimedia data retrieval upload command

Message id: 0x8805 单条存储多媒体数据检索上传命令消息体数据格式见表 90。

Table 90 Data format of message body of single stored multimedia data retrieval and upload command

Start byte	field	data type	Description and requirements
0	Multimedia ID	DWORD	>0
four	Delete flag	BYTE	0: reserved; 1: delete;

8.61 Data downlink transparent transmission

Message ID： 0x8900.数据下行透传消息体数据格式见表 91。

Table 91 Data Format of Data Downlink Transparent Message Body

Start byte	field	data type	Description and requirements
0	Transparent message type	BYTE	See for the definition of transparent message types.表 93
one	Transparent message content		

8. 62 Data uplink transparent transmission

Message ID： 0x0900. For the data format of data uplink transparent transmission message body, see.

.

Table 92 Data Format of Data Uplink Transparent Message Body

Start byte	field	data type	Description and requirements
0	Transparent message type	BYTE	See for the definition of transparent message types.表 93
one	Transparent message content		

Table 93 Transparent Message Type Definition Table

Transparent message type	definition	Description and requirements
Detailed positioning data of GNSS module	0x00	Detailed positioning data of GNSS module
IC card information of road transport certificate	0x0B	The upload message of road transport certificate IC card information is 64Byte, and the download message is 24Byte。 The timeout of IC card authentication and transparent transmission of road transport certificate is 30s. After the timeout, do not resend.
Serial port 1 transparent transmission	0x41	Serial port 1 transparent transmission message
Serial port 2 transparent transmission	0x42	Serial port 2 transparent message
User defined transparent transmission	0xF0-0xFF	User-defined transparent message

8.63 Data compression report

Message id: 0x0901.数据压缩上报消息体数据格式见表 94。

Table 94 Data Format of Message Body of Data Compression Report

Start byte	field	data type	Description and requirements
0	Compressed message length	DWORD	
four	Compressed message body		The compressed message body is a message that needs to be compressed, and it is compressed by GZIP algorithm. After the news

8.64 Platform RSA public key

Message id: 0x8a00. Platform RSA public key 消息体数据格式见表 95

。

Table 95 Platform RSA Public Key Message Body Data Format

Start byte	field	data type	Description and requirements
0	e	DWORD	E in platform RSA public key {e,n}

four	n	BYTE[128]	N in RSA public key {e,n}

8.65 Terminal RSA public key

Message id: 0x0a00. Terminal RSA public key 消息体数据格式见表 96

。

Table 96 Data Format of RSA Public Key Message Body of Terminal

Start byte	field	data type	Description and requirements
0	e	DWORD	E in terminal RSA public key {e,n}
four	n	BYTE[128]	N in RSA public key {e,n}

Attachment a

(Normative Appendix)

Communication Protocol

between Vehicle Terminal and

External Equipment

A.1 equipment

A.1.1 host machine

The host computer shall conform to JT/T 794.

A.1.2 From the machine

Slaves include various point-to-point serial communication external devices, such as dispatching display screen, intelligent peripherals, fuel quantity detection device, collision rollover detection device, etc.

A.2 protocol

A.2.1 Frame format definition

See Table A.1 for the frame formats followed by all communication between the slave and the master.

Table A.1 frame format

Identification bit	check code	version number	Manufacturer number	Peripheral type number	Command type	user data	Identification bit
1 byte	1 byte	2byte	2byte	1byte	1 byte	n byte	1 byte

The contents of table A.1 are described as follows:

a) Identification bit: expressed by 0x7e. If 0x7e appears in the check code, message header and message body, it should be escaped. The escape rules are defined as follows:

0x7e <————> 0x7d is followed by 0x02；;

0x7d <————> 0x7d is followed by 0x01；; The escape process is as follows:

When sending a message: message encapsulation-> calculate and fill the check code-> escape; When receiving a message: escape and restore-> verify the check code-> parse the message;

Example 1:

Sending a packet with the content of 0x30 0x7e 0x08 0x7d 0x55 is encapsulated as follows: 0x7E0x300x7d 0x02 0x080x7d 0x010x550x7e;

b) Check code: the cumulative sum accumulated from the manufacturer's number to the user's data in turn, and then the lower 8 digits of the accumulation are taken as the check code;

Example 2:

If the cumulative sum is 0x1388, the check code is 0x88；;

c) Version number: identifies the communication protocol version;

d) Manufacturer number: the manufacturer code of the peripheral slave;

e) Peripheral type number: a unique type number corresponding to each peripheral, and the

peripheral interface driver used for the host is different from the data sent by which peripheral;
See Table A.2； for peripheral type numbers;

f) Command type: the information type of data interaction between peripheral and host, which can be divided into two categories: general protocol and proprietary protocol: general protocol mainly includes some basic, necessary and common information interaction types between slave and host; Proprietary protocols define the unique types of information interaction between various peripherals and the host; See table A.3； for command types;

g) User data: refers to the content customized by specific business functions except the above parts in the data of interaction between peripheral and host;

h) The data of communication frame is represented by big-endian.

Table A.2 Number Table of Peripheral Types

Peripheral type	number
Industry information terminal	0x01
Dispatching display screen	0x02
Vehicle navigation display screen	0x03
Oil quantity detector	0x04
Acceleration detector	0x05
burglar alarm	0x06
Interface expander	0x07
Load detector	0x08
Passenger flow detector	0x09
Universal sensor	0x0A
IC card reader for road transport certificate	0x0B
customize	0xF0-0xFF

Table A.3 command type table

Protocol type	Business function type	Command type
Peripheral general protocol	Power-on indication/response	0x01
	Link inquiry/response	0x02
	Slave power supply control/response	0x03
	Query slave version number information	0x04
	Slave self-test/response	0x05
	Slave firmware update/reply	0x06

	reserve	0x07-0x3F
Special protocol	Road transport certificate IC card authentication request/response	0x40

	Notification/response of reading result of IC card of road transport certificate	0x41
	Card Pull-out Notification/Response	0x42
	Active trigger IC card reading/response	0x43
	Proprietary function service protocols of various slave peripherals.	0x44-0xFF

A. 2. 2 Adding rules of peripheral protocols

The addition and modification of peripheral protocols shall follow the following rules:

a) The sending and responding protocols of the same function use the same command type;

b) For peripherals with many command types, when adding new command types, try to reduce the occupation of command types by using variable parameters.

A. 3 General protocol description

A. 3. 1 Slave electric indication

See Table A.4 for the instructions of the slave machine.

Table A.4 slave power-on indicator table

step	Command type	describe	user data	Data direction
one	01H	Power-on indication response	without	go down
2	01H	Power-on indication	without	go upstream

A. 3. 2 Peripheral link inquiry

Refer to Table A.5 for peripheral link inquiry instructions.

Table A.5 Peripheral Link Inquiry Instruction Table

step	Command type	describe	user data	Data direction
one	02H	Link inquiry	Link maintenance time The high-order byte comes first, and the low-order byte comes last; The unit of high byte is minutes (min) and the unit of low byte is seconds (s); It is suggested that the link polling time is 15s-30s； ; Link timeout After that, the master will cancel the registration information of the slave.	go upstream
2	02H	Link inquiry response	without	go down

A. 3. 3 Slave power supply control

See Table A.6 for the slave power supply control instructions.

Table A.6 slave power supply control indicator table

step	Command type	describe	user data	Data direction
one	03H	Slave power supply control	Control type: 0x00-the slave exits the power saving mode; 0x01-Slave enters power saving mode.	go down
2	03H	Slave power supply control response	Response type: 0x01-Operation successful; 0x02-operation failed (slave machine because Special circumstances can't enter or exit the power saving mode)	go upstream

A. 3. 4 Query slave version number information

Refer to Table A.7 for instructions on inquiring slave version number information.

Table A.7 instruction table for inquiring slave version number information

step	Command type	describe	user data	Data direction
one	04H	Query slave version number information	without	go down
2	04H	Answer to query slave version number information	Slave version number, such as WORD: 0x0207, indicating version 2.07.	go upstream

A. 3. 5 Slave self-check

See table A.8 for the slave self-inspection instructions.

Table A.8 slave self-check instruction table

step	Command type	describe	user data	Data direction
one	05H	Slave self-check	Self-inspection slave type, BYTE, as defined in Table A.2.	go down
2	05H	Self-checking result information	Self-inspection slave type, BYTE, as defined in Table A.2.	go upstream
			Self-check result, BYTE 0x01: Self-check succeeded; 0x02: Self-test failed.	

Note: The timeout of this instruction is 1s. If there is no response, it will be retransmitted at most three times. After receiving the failure of self-test, the terminal sets the corresponding alarm sign, and makes voice prompt or screen display.

A. 3. 6 Slave firmware update

See Table A.9 for the update instruction of slave firmware.

Table A.9 slave firmware update instruction table

step	Command type	describe	user data	Data direction
one	06H	Update slave module FirmWare	Total number of messages, WORD	go down
			Package serial number, WORD, starting from 1.	
			Packet data, the maximum length is 256 bytes.	
			Package serial number, WORD	

2	06H	Confirmation information	Response result, BYTE	go upstream

			0: correct; 1: Not the firmware program, the upgrade is terminated; 2: resend (after three times, terminate this upgrade).	

Note: The timeout of this instruction is 1s. If there is no response, it will be retransmitted at most three times.

A. 3. 7 Query peripheral properties

Refer to Table A.10 for the instruction of inquiring peripheral attributes.

Table A.10 Instruction Table for Inquiring Peripheral Attributes

step	Command type	describe	user data	Data direction
one	07H	Query peripheral properties	without	go down
2	07H	Query peripheral attribute response	Peripheral manufacturer number, 5 BYTE	go upstream
			Peripheral hardware version number, 3 BYTE	
			Version number of peripheral software, 3 BYTE	

Note: Example of version number, 0x010B02 stands for v1.12.2.

The timeout of this instruction is 1s. If there is no response to retransmission, it will be retransmitted at most three times.

A. 4 Special protocol description

A. 4. 1 Road transport certificate IC card authentication request

When the module detects that a card is inserted, and after the module is reset or re-powered, and the physical card number of the IC card in the card slot is inconsistent with the card number read last time, the uplink command of the road transport certificate IC card authentication request is automatically triggered.

See Table A.11 for the instruction of road transport certificate IC card authentication request.

Table A.11 road transport certificate IC card authentication request instruction table

step	Command type	describe	user data	Data direction
one	40H	IC card authentication request	Status bit, BYTE, 0x00 : IC card reading succeeded; 0x01: IC card is not inserted; 0x02: IC card reading failed; 0x03: IC card with non-qualification certificate; 0x04: IC card is locked.	go upstream
			Data area (valid when status bit =0x00), card base This information and authentication information (64 bytes)	
2	40H	IC card authentication	Response result of IC card authentication request, BYTE 0x00: the authentication request was successfully	go down

		request response	completed; 0x01: The terminal is not online; 0x02: The terminal transparent authentication center did not respond after timeout; 0x03: The terminal confirms the receipt of the information (IC card authentication, please	

			Find the card reading result =0x01-0x04).	
			Data area (valid when the response result of IC card authentication request =0x00), and the verification data returned by IC card authentication request (24 Bytes).	

Note: when the instruction goes up and the status bit of the IC card authentication request is 0x00, the timeout time is 35S, and when it goes down in other states, the timeout time is 1s. If there is no response, it will be retransmitted at most three times.

A. When the status bit is 0x00, the terminal sends 64 bytes of card basic information and authentication information to the authentication center, and returns 1 or 25 bytes of result information to the card reading module according to different situations. A. When the response result of the IC card authentication request returned by the terminal to the card reader module is 0x00, the card reader module starts to read the card information, and then automatically

Start the 41H command to feed back the result to the terminal, and the terminal prompts the driver with the corresponding result by voice, and sends the driver's identity information to the authentication center and the monitoring platform by using the 0x0702 command after the card reading is successful;

b. When the response result of the IC card authentication request returned by the terminal to the card reading module is 0x01, wait for 20 minutes, and use the 43H command to actively trigger the card reading module to read the IC card;

c. When the response result of the IC card authentication request returned by the terminal to the card reader module is 0x02, the card reader module retransmits it three times for 40H. After three unsuccessful attempts, the terminal ends the process, and voice prompts the driver for corresponding results;

d. When the response result of the IC card authentication request returned by the terminal to the card reading module is 0x03, the process is ended, and the terminal voice prompts the driver to bear the corresponding fruit.

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B. When the status bit of the terminal is not 0x00, the process ends and the driver is prompted by voice.

A. 4. 2 Notice of reading result of IC card of road transport certificate

See Table A.12 for the instructions for notifying the reading result of IC card of road transport certificate.

Table A.12 Instruction Table for Reading Results of IC Card of Road Transport Certificate

step	Command type	describe	user data	Data direction
one	41H	IC card reading result notification	IC card reading result, BYTE 0x00: the IC card was successfully read, and there are subsequent data at this time; 0x01: Card reading failed because the card key authentication failed; 0x02: Card reading failed because the card has been locked; 0x03: Card reading failed because the card was pulled out; 0x04: Card reading failed because of data verification error.	go upstream
			Data area (when the reading result of IC card is 0x00)), the driver's identity information, as shown in table A.13.	
2	41H	The driver's identity information is confirmed.	without	go down

Note: The timeout of this instruction is 1s. If there is no response, it will be retransmitted at most three times. A, when the terminal receives the reading result of IC card as 0x00, it uses 0x0702 command to send driver identity information to authentication center and home platform; B. When the terminal receives the reading result of the IC card as non-0x00, it ends the process and prompts the driver with voice.

Table A.13 Driver Identity Information Table

Start byte	field	data type	Description and requirements
0	Driver's name length	BYTE	Length n
one	Driver's name	STRING	Driver's name

1+n	Qualification certificate number	STRING	The length is 20 bits
21+n	Name and length of license issuing agency	BYTE	Length m
22+n	Name of issuing agency	STRING	Name of license issuing agency for qualification certificate
22+n+m	Validity period of certificate	BCD[4]	YYYYMMDD

A. 4. 3 Card withdrawal notification

See Table A.14 for the instruction of card withdrawal notice.

Table A.14 Card Pull-out Notification Instruction Table

step	Command type	describe	user data	Data direction
one	42H	Card withdrawal notification	without	go upstream
2	42H	Card pull-out notification received confirmation.	without	go down

Note: The timeout of this instruction is 1s. If there is no response, it will be retransmitted at most three times. When the terminal receives the card withdrawal notice, it uses the.

0x0702 command sends driver's off-duty information to certification center and monitoring platform.

A. 4. 4 Active trigger reading IC card

See table A.15 for the instruction of reading IC card by active triggering.

Table A.15 Active Trigger Reading IC Card Instruction Table

step	Command type	describe	user data	Data direction
one	43H	Active trigger reading IC card	without	go down
2	43H	Actively trigger reading confirmation information of IC card.	without	go upstream

Note: The timeout of this instruction is 1s. If there is no response, it will be retransmitted at most three times. This command is used for terminal roll call, terminal off-line or terminal uploading IC card authentication information overtime. After receiving this command, the card reading module will automatically trigger a 40H command to read the card again.

Attached record b

(normative

appendix)

message

comparison table

See table B.1 for the message comparison table of terminal communication protocol.

Table B.1 message comparison table

serial number	Message body name	Message ID	serial number	Message body name	Message ID
one	Terminal universal response	0x0001	24	Event setting	0x8301
2	Platform universal response	0x8001	25	Event report	0x0301
three	Terminal heartbeat	0x0002	26	Issue questions	0x8302
four	Supplementary subcontracting request	0x8003	27	Question response	0x0302
five	Terminal registration	0x0100	28	Information on demand menu settings	0x8303
six	Terminal registration response	0x8100	29	Information on demand/cancellation	0x0303
seven	Terminal cancellation	0x0003	30	information service	0x8304
eight	Terminal authentication	0x0102	31	Call back	0x8400
nine	Set terminal parameters	0x8103	32	Set phone book	0x8401
10	Query terminal parameters	0x8104	33	Vehicle control	0x8500
11	Query terminal parameter response	0x0104	34	Vehicle control response	0x0500
12	Terminal control	0x8105	35	Set a circular area	0x8600
13	Query the specified terminal parameters	0x8106	36	Delete circular area	0x8601
14	Query terminal properties	0x8107	37	Set a rectangular area	0x8602
15	Query terminal attribute response	0x0107	38	Delete rectangular area	0x8603
16	Issue terminal upgrade package	0x8108	39	Set polygon area	0x8604
17	Terminal upgrade result notification	0x0108	40	Delete polygon area	0x8605
18	Location information reporting	0x0200	41	Set the route	0x8606
19	Location information query	0x8201	forty-two	Delete route	0x8607
20	Location information query response	0x0201	43	Data acquisition command of driving recorder	0x8700
21	Temporary position tracking control	0x8202	forty-four	Data upload of driving recorder	0x0700

22	Manual acknowledgement alarm message	0x8203	45	Parameter download command of driving recorder	0x8701
23	Text information distribution	0x8300	46	Electronic waybill reporting	0x0701

serial number	Message body name	Message ID	serial number	Message body name	Message ID
47	Driver identity information collection and reporting	0x0702	58	Store multimedia data upload	0x8803
48	Request for reporting driver identity information	0x8702	59	Recording start command	0x8804
forty-nine	Batch upload of positioning data	0x0704	60	Single store multimedia data retrieval Pass orders	0x8805
50	CAN bus data upload	0x0705	61	Data downlink transparent transmission	0x8900
51	Multimedia event information upload	0x0800	62	Data uplink transparent transmission	0x0900
fifty-two	Multimedia data upload	0x0801	63	Data compression report	0x0901
53	Multimedia data upload response	0x8800	64	Platform RSA public key	0x8A00
54	The camera immediately shoots the command.	0x8801	65	Terminal RSA public key	0x0A00
55	The camera immediately shoots the command response.	0x0805	66	Platform downlink message reservation	0x8F00~0x8FFF
fifty-six	Storage multimedia data retrieval	0x8802	67	Terminal uplink message reservation	0x0F00~0x0FFF
57	Store multimedia data retrieval response	0x0802			