Road transport vehicle satellite positioning system Beidou compatible vehicle terminal communication protocol technical specification

GNSS system for operating vehicles

— General specifications for the communication protocol and data

format of BD compatible vehicle terminal

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Antecedent

This specification is a supplement and improvement to JT/T808-2011 "Road Transport Vehicle Satellite Positioning System Terminal Communication Protocol and data Format", compared with JT/T808-2011, except for editorial modifications, the main technical changes are as follows:

-- The description of 5.2 "Maintenance of connection" in communication connection has been modified;

-- Modified the description of the process in 7.8.1 "Collecting driver identity Information Data" in the protocol classification;

-- added the process description of 7.12 "Subcontracting message" in the protocol classification;

-- Modified the data format, Original 8.4 Terminal registration, 8.8 Set terminal parameters, 8.12 Location information reporting, 8.23 text message sending, 8.28 Setting circle area, 8.36 Command for collecting driving record data, 8.37 Command for uploading driving record data, 8.38 Command for transmitting driving record parameters, 8.40 driver identity information collection and reporting, 8.41 Multimedia event information uploading, 8.42 Multimedia Data Upload, 8.43 Response to Multimedia Data upload, 8.46 response to Storage multimedia data retrieval, 8.49 Data downlink transparent transmission, 8.50 data uplink transparent transmission and other chapters;

-- added the data format, 8.4 supplementary subcontracting request, 8.11 query specified terminal parameters, 8.14 query terminal attributes, 8.15 query terminal attributes response, 8.16 issue terminal upgrade package, 8.17 terminal upgrade result notification, 8.22 manual confirmation alarm message, 8.47 Report driver identity information request, 8.49 12 commands, including positioning data batch upload, 8.50 CAN bus data upload, 8.55 camera immediately shooting command response, 8.60 single storage multimedia data retrieval upload command, and adjust the affected chapters and table numbers;

-- Modified the contents of Table A.2 peripheral type number table and Table A.3 command type table in Appendix A;

-- Added Appendix A, A.3.4 Querying slave version number information, A.3.5 Slave Self-test, A.3.6 Slave Firmware Update, A.3.7 Querying peripheral properties, A.4.1 Road Transport License IC card authentication Request, A.4.2 Road Transport License IC Card reading Result Notification, A.4.3 Notice of pulling out the card, A.4.4 actively trigger the communicatio

n protocol instructions between the terminal host and peripherals such as reading the IC car d;

-- Modified the contents corresponding to the above modifications in the message mapping table in Appendix B.

These specifications are put forward by the Ministry of Transport of the People's Republ ic of China.

The drafting unit of this code: China Communications Information Center.

Road transport vehicle satellite positioning system Terminal communication protocol and data format

1 Scope

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

This specification applies to the communication between the road transport vehicle satellite positioning system Beidou-compatible vehicle terminals and platforms.

2 Normative reference documents

The following documents are essential for the application of this document. For dated references, only the dated version applies to this document. For undated citations, the most recent version (including all amendment orders) applies to this document.

GB/T 2260 Administrative Division code of the People's Republic of China

GB/T 19056 Vehicle driving Recorder

JT/T 415-2006 Code Rules for Cataloguing e-Government Platforms for Road Transport

JT/T794 Technical requirements for on-board terminal of Road Transport Vehicle satellite positioning System

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 (for example, during a call).

3.1.2

Sign up for the register

The terminal sends a message to the platform informing it that it is installed on a certain vehicle.

3.1.3

unregister

The terminal sends a message to the platform telling it to remove from the in stalled vehicle.

3.1.4

authentication Authentication

When a terminal connects to a platform, it sends a message to the platform to a uthenticate itself.

3.1.5

location reporting strategy. Location reporting Strategy

Timing, distance reporting, or a combination of both.

3.1.6

location reporting program

Determine the rules of the interval of periodic reporting according to the rele vant conditions.

3.1.7

additional points report while turning

The terminal sends a position information report message when it judges that th e vehicle is turning. The sampling frequency is not less than 1Hz, the vehicle azim uth change rate is not less than 15°/s, and the duration is at least 3s.

3.1.8

answering strategy

Rules for the terminal to answer calls automatically or manually.

3.1.9

SMS text alarm. SMS text alarm

SMS text message is sent when the terminal alarms.

3.1.10

event item Event Item

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

3.2 Abbreviations and abbreviations

The following abbreviations apply to this document.

APN - access point name

GZIP - a file compression program for GNU free software (GNUzip)

LCD - liquid crystal display (LCD)

RSA - an asymmetric cryptographic algorithm (developed by Ron Rivest, Adi Shami rh, Len Adleman, after their names)

SMS (short message service)

TCP -- transmission control protocol

TTS -- text to speech

UDP - user datagram protocol

VSS - vehicle speed sensor

4 Basis of protocol

4.1 Communication Methods

The communication mode adopted by the protocol shall comply with the relevant provisions of JT/T 794. The communication protocol shall be TCP or UDP, with the platform as the server and the terminal as the client. When the data communication link is abnormal, the terminal can use SMS message mode to communicate.

4.2 Data Types

The data types used in protocol messages are shown in Table 1:

Table 1 Data types

Data Types	Description and requirements
BYTE	Unsigned single-byte integer (bytes, 8 bits)
WORD	Unsigned double-byte integer (word, 16 bits)
DWORD	Unsigned four-byte integer (double word, 32-bit)
BYTE[n]	n bytes
BCD[n]	8421 code, n bytes
STRING	GBK code. If no data is available, set this parameter to blank

4.3 Transmission Rules

The protocol uses big-endian network byte order to pass word and double word.

The convention is as follows:

-- BYTE transmission conventions: transfer bytes in byte stream mode;

-- WORD transmission convention: pass the high eight bits first, then pass the low eight bits;

-- Double word (DWORD) transmission convention: first pass the high 24 bits, then pass the high 16 bits, then pass the high eight bits, and finally pass the low eight bits.

4.4 Composition of the message

4.4.1 Message structure

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

Id bit	Message header	Message body	Check code	Identification bits

Figure 1 Message structure diagram

4.4.2 Identification bits

0x7e is used. If 0x7e appears in the check code, message header and message body, it will be escaped. Escape rules are defined as follows:

0x7e <--------->0x7d followed by a 0x02;

0x7d <-------->0x7d followed by a 0x01.

The escape process is as follows:

When sending a message: Message encapsulation -- > Calculate and fill check code -- > Escape;

When receiving message: Escape restore -- > Verify check code -- > Parse message.

Example:

To send a packet of content of 0 x300x7e0x080x7d0x55 data, through packaging as follows: x7e x55 x7e0x307d0x020x080x7d0x01 0 0 0.

4.4.3 Message Header

The contents of the message header are detailed in Table 2:

Table 2 Contents of the message header

Starting byte	Fields	Data type	Description and requirements
0	Message ID	WORD	
2	Message body properties	WORD	See Figure 2 for the message body attribute format structure
4	Terminal phone number	BCD[6]	Convert according to the mobile phone number of the terminal itself after installation. If the mobile phone number is less than 12 digits, the number is added in the front, the mainland mobile phone number is added with the number 0, and the number of Hong Kong, Macao and Taiwan is added according to its area code.
10	The message serial number	WORD	Loop accumulates from 0 in the order sent
12	Message packet encapsulation entry		If the relevant identification bit in the message body properties determines message subcontracting, the entry has content, otherwise it does not

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

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Retain		Subcontracting	Data encryption method			Message body length									

Figure 2 Message body attribute format structure diagram

Data encryption method:

-- bit10~bit12 is the data encryption identification bit;

-- When all three bits are 0, the message body is not encrypted;

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

-- other reserved.

Subcontracting:

When the 13th bit in the message body property is 1, it means that the message body is a long message, and the subcontracting is sent to process the specific subcontracting letter

The information is determined by the package item of the message; If the 13th bit is 0, there is no packet wrapper field in the message header.

The contents of the message package are shown in Table 3:

Table 3 Contents of message packet package items

Start byte	Fields	Data type	Description and requirements
0	Total number of message packets	WORD	The total number of packets after the message is subcontracted
2	Packet serial number	WORD	Start with 1

4.4.4 Check code

The check code refers to the beginning of the message header, the same as the next byte, until the check code before the byte, occupying a byte.

5 Communication Connections

5.1 Establishment of the connection

The terminal can be connected to the platform through TCP or UDP. After the terminal is reset, the terminal should be connected to the platform as soon as possible. After the connection is established, the terminal authentication message is sent to the platform for authentication.

5.2 Maintenance of connections

After the connection is established and terminal authentication is successful, the terminal should periodically send a terminal heartbeat message to the platform when no normal data packets are transmitted. After receiving the heartbeat message, the platform sends a general response message to the terminal. The sending period is specified by the terminal parameters.

5.3 Disconnection of connection

Both the platform and the terminal can actively disconnect the connection according to the TCP protocol, and both parties should proactively determine whether the TCP connection is disconnected.

The platform determines whether the TCP connection is disconnected by:

-- According to the TCP protocol to determine the terminal active disconnection;

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

-- Does not receive any message from the terminal within a certain period of time, such as the terminal heartbeat.

Method for the terminal to determine if the TCP connection is down:

-- According to the TCP protocol to judge the platform active disconnection;

-- The data communication link is disconnected;

-- The data communication link is normal, but no response is received after the number of retransmission times is reached.

6 Message Processing

6.1 TCP and UDP message processing

6.1.1 Messages sent by the main platform

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

… (1)

In the formula:

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

6.1.2 Messages sent by the main terminal

6.1.2.1 Data communication links are normal

When the data communication link is normal, all the main messages sent by the terminal require the platform to answer, and the response is divided into general response and special response, which is determined by the specific function protocol. When the terminal waits for the response time out, it should resend the message. The response timeout period and retransmission times are specified by the terminal parameters. The response timeout period after each retransmission is calculated according to formula (1). For the key alarm message sent by the terminal, if no reply is received after reaching the number of retransmission times, it should be saved. In the future, the saved key alarm message should be sent 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 report message to be sent. After the data communication link recovers, the terminal sends the saved message immediately.

6.2 SMS message processing

When the terminal communication mode is switched to the SMS message mode of the GSM network, the PDU octet encoding mode is adopted. For messages longer than 140 bytes, sub-contract processing should be carried out in accordance with the GSM short message service specification GSM03.40.

SMS message response, retransmission and saving mechanism is the same as 6.1, but the response timeout period and retransmission times should be in accordance with the parameters ID0x0006 and 0x0007 in Table 10 related set values processing.

7 Protocol Classification

7.1 Overview

The following describes the protocols by function. If no special information is specified, TCP is used by default. The communication protocol between vehicle terminal and external device is shown in Appendix A. See Appendix B for the comparison table of message name and message ID in the protocol.

7.2 Terminal Management Protocols

7.2.1 Terminal Registration/deregistration

If a terminal is not registered, it should be registered first. After successful registration, the terminal will obtain the authentication code and save it. The authentication code is used when the terminal logs in. Before the vehicle needs t

o be removed or replaced, the terminal should be deregistered to cancel the corres ponding relationship between the terminal and the vehicle.

If the terminal chooses to send the terminal registration and terminal deregis tration messages by SMS, the platform shall send the terminal registration respons e by SMS to reply to the terminal registration, and send the platform general resp onse by SMS to reply to the terminal deregistration.

7.2.2 Terminal Authentication

The terminal shall be authenticated immediately after it is registered and con nected to the platform each time. Before the authentication is successful, the ter minal must not send other messages.

The terminal authenticates by sending a terminal authentication message, and t he platform replies to the platform general reply message.

7.2.3 Setting/Querying Terminal Parameters

The platform sets terminal parameters by sending a message to set terminal parameters, and the terminal replies to the terminal general reply message. The platform queries the terminal parameters by sending the query terminal parameters message, and the terminal replies the query terminal parameters reply message. Terminals under different network standards should support some parameters unique to their respective networks.

7.2.4 Terminal control

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

7.3 Position, alarm class protocol

7.3.1 Location information reporting

The terminal periodically sends a location information report based on the parameters.
According to the parameter control, the terminal can send the position information report message when judging the vehicle turning.

7.3.2 Querying Location Information

The platform queries the location information of the specified vehicle terminal by sending a location information query message, and the terminal replies to the location information query response message.

7.3.3 Temporary location tracking control

The platform starts/stops the position tracking by sending a temporary position tracking control message. The position tracking requires the terminal to stop the periodic report before and report at the time interval specified by the message. The terminal replies to the terminal general reply message.

7.3.4 Terminal alarm

When the terminal determines that the alarm conditions are met, it sends the position information reporting message, sets the corresponding alarm sign in the position reporting message, and the platform can respond to the platform general response message for alarm processing.
Each alarm type is described in the body of the location information report message. The alarm sign is maintained until the alarm condition is lifted. After the alarm condition is lifted, the position information reporting message should be sent immediately to clear the corresponding alarm sign.

7.4 Information protocol

7.4.1 Text message delivery

The platform sends a message by sending text information to notify the driver in a specified way. Terminal reply Terminal general reply message.

7.4.2 Event setting and reporting

The platform sends the event setting message to the terminal storage, and the driver can enter the event list interface to select the event after encountering t

he corresponding event, and the terminal will send the event report message to the platform.

Event setting message, the terminal needs to reply to the terminal general response message.

Event reporting message, requires the platform to reply to the platform general response message.

7.4.3 Asking Questions

The platform sends the question with the candidate answer to the terminal by sending the question sending message. The terminal displays the question immediately, and the terminal sends the question answering message to the platform after the driver selects it.

When sending a message, the terminal needs to reply to a general reply message.

7.4.4 Message on Demand

The platform sends the information on demand menu setting message, the information on demand item list to the terminal storage, the driver can pass

Select VoD/cancel the corresponding information service through the menu, and then the terminal will send the information VOD/cancel message to the platform.

After the information service is on demand, it will receive information service messages from the platform regularly, such as news, weather forecast, etc.

Information on demand menu Settings message, the terminal needs to reply to the terminal general reply message.

Message on demand/cancel message, need the platform to reply to the platform general response message.

Information service message, need the terminal to reply to the terminal general response message.

7.5 Telephone-type protocols

7.5.1 Call Back

By sending a call back message, the platform requires the terminal to call back at the specified phone number and specify whether to follow the listening mode (the terminal does not turn on the speaker).

The call back message requires the terminal to reply to the terminal general answer message.

7.5.2 Setting up the phone book

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

7.6 Vehicle control class protocol

By sending a vehicle control message, the platform requires the terminal to control the vehicle according to the specified operation. The terminal immediately replies to the terminal general reply message after receiving it. Then the terminal controls the vehicle and replies the vehicle control response message according to the result.

7.7 Vehicle management agreements

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 polygon area, setting the route, etc. The terminal determines whether the alarm conditions are met according to the attributes of the area and line. The alarm includes speeding alarm, entering and leaving the area/route alarm and insufficient/too long driving time alarm of the section. The corresponding position additional information should be included in the location information reporting message.

The region or route ID ranges from 1 to 0XFFFFFFFF. If the set ID is the same as an existing area or route ID of the same type in the terminal, the existing area or route ID is updated.

The platform can also delete the saved area and route on the terminal by deleting the circular area, deleting the rectangular area, deleting the polygon area, deleting the route and other messages.

Setting/deleting area and route messages requires the terminal to reply to the terminal universal reply message.

7.8 Information collection class protocol

7.8.1 Collecting driver identity information data

When the driver starts to drive, the IC card qualification certificate is inserted into the terminal's reading card module, the reading card module detects the card through the sensor switch, and sends the authentication request to the terminal through the transparent transmission command to forward the authentication request data to the road transport license IC card certification center, and the certification results returned by the certification center to the reading card module. The card reading module reads the IC card qualification certificate information according to the certification results and upload the result information to the certification center (success and failure information) and the ownership monitoring center (only read the successful information) through the terminal.

When the driver finishes driving, the IC card is pulled out, the card reading module detects the card leaving through the induction switch, and the relevant information is uploaded to the certification center and the ownership monitoring center through the terminal.

7.8.2 Collection of electronic waybill data

The terminal collects electronic waybill data upload platform.

7.8.3 Collecting driving record data

The platform requires the terminal to upload the specified data by sending a command message for collecting driving record data, and the message requires the terminal to reply to the message of uploading driving record data.

7.8.4 Downuploading driving record parameters

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

7.9 Multimedia protocols

7.9.1 Uploading Multimedia Event Information

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

7.9.2 Multimedia data Upload

The terminal sends a multimedia data upload message and uploads multimedia data. Before each complete multimedia data, the location information reporting message body needs to be attached when recording, which is called location multimedia data. The platform determines the receiving timeout period according to the total number of packets. After receiving all packets or reaching the timeout period, the platform sends the multimedia data upload response message to the terminal, which confirms the receipt of all packets or requires the terminal to retransmit the specified packets.

7.9.3 The camera takes an instant shot

The platform sends an immediate camera shooting command message to the terminal, which requires the terminal to reply to the terminal general reply message. 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 starts

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

7.9.5 Retrieve and extract multimedia data stored by the terminal

The platform obtains information about the storage of multimedia data by sending a retrieval message for multimedia data storage, which requires the terminal to reply to the retrieval reply message for multimedia data storage.

According to the search results, the platform can send the storage multimedia data upload message, requiring the terminal to upload the specified multimedia data, the message requires the terminal to reply to the terminal general reply message.

7.10 General Data transmission class

Messages that are not defined in the protocol but need to be transmitted in actual use can be used for upstream and downstream data exchange using data up-pass messages and data down-pass messages.

Terminals can use GZIP compression algorithm to compress long messages, and use data compression to report and upload messages.

7.11 Encryption protocols

RSA public key cryptography system can be used for encrypted communication between the platform and the terminal. The platform informs the terminal of its own RSA public key by sending the platform RSA public key message, and the terminal replies to the terminal RSA public key message, and vice versa.

7.12 Subcontracting message

When a message is sent by subcontracting, the subcontracting message shall be in a continuously increasing serial number.

For response to subcontracting messages, if there is no specific response instruction, the receiver may adopt one general response for all subcontracting messages, or one general response for each subcontracting message, and use the result field (success/failure) to inform the sender whether all subcontracting messages were received correctly. When not all subcontracting messages have been received correctly, the receiver may use a supplementary Subcontracting request command to require the sender to retransmit the missing subcontracting message. The sender shall retransmit the subcontract in the retransmission packet ID list once with the original message, and the retransmission subcontract is exactly the same as the original subcontract message.

8 Data Format

8.1 Terminal General Answer

Message ID: 0x0001.

The data format of the terminal general reply message body is shown in Table 4.

Table 4 Data format of terminal general reply message body

Start byte	Fields	Data type	Description and requirements
0	Answering serial number	WORD	The serial number of the corresponding platform message
2	Reply ID	WORD	The ID of the corresponding platform message
4	Results	BYTE	0: Successful/confirmed; 1: failure; 2: The message is incorrect; 3: The message is not supported

8.2 Platform Universal Response

Message ID: 0x8001.

Table 5 shows the data format of the platform generic reply message body.

Table 5 Data format of platform general reply message body

Start byte	Fields	Data type	Description and requirements
0	Answering serial number	WORD	The serial number of the corresponding terminal message
2	Reply ID	WORD	The ID of the corresponding terminal message
4	RESULTS	BYTE	0: Successful/confirmed; 1: failure; 2: The message is incorrect; 3: it is not supported. 4: alarm processing confirmed;

8.3 Terminal heartbeat

Message ID: 0x0002.

The terminal heartbeat data message body is empty.

8.4 Retransmit the subcontract request

Message ID: 0x8003.

See Table 6 for the data format of the body of the supplementary subcontract request message.

Table 6 Data format of supplementary subcontract request message body

Start byte	Fields	Data type	Description and requirement
0	Original message serial number	WORD	Word Specifies the serial number of the first packet of the original message
4	The total number of retransmitted packets	BYTE	n
5	List of retransmit packet ids	BYTE[2*n]	Byte [2 * n] Retransmit packet serial numbers in order, such as "packet ID1 packet ID2... Packet IDn.

Note: The recipient of this message agrees to resend the subcontract in the retransmission packet ID list once with the original message, exactly as the original subcontract message.

8.5 Terminal Registration

Message ID: 0x0100.

The format of the terminal registration message body data is shown in Table 7.

Table 7 Data format of terminal registration message body

Start byte	fields	Data type	Description and requirements
0	Provincial Domain ID	WORD	Indicates the province where the terminal installation vehicle is located, 0 is retained, and the default value is taken by the platform. The provincial ID shall be the first two of the six digits of the administrative division code specified in GB/T 2260.
2	City/County ID	WORD	Indicate the city and county where the terminal installation vehicle is located, with 0 retained and the default value taken by the platform. The city and county ID shall be the last four of the six digits of the administrative division code specified in GB/T 2260.
4	Manufacturer ID	BYTE[5]	5 bytes, encoded by the terminal manufacturer
9	Terminal model number	BYTE[20]	20 bytes, this terminal model is defined by the manufacturer, when the number of bits is insufficient, followed by "0X00".
29	Terminal ID	BYTE[7]	7 bytes, consisting of uppercase letters and numbers, this terminal ID is defined by the manufacturer, followed by "0X00" when the number of bits is insufficient.
36	License Plate color	BYTE	License plate color, according to JT/T415-2006 5.4.12. When not on the plate, the value is 0.
37	Vehicle identification	STRING	When the license plate color is 0, it indicates the vehicle VIN; Otherwise, it indicates the motor vehicle number plate issued by the public security traffic management department.

8.6 Terminal registration response

Message ID: 0x8100.

The data format of the terminal registration reply message body is shown in Table 8.

Table 8 Data format of terminal registration reply message body

Start byte	Fields	Data type	Description and requirements

0	Answering serial number	WORD	The serial number of the corresponding terminal registration message
2	result	BYTE	0: successful; 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

3	Authentication code	STRING	This field is only available after success

8.7 Terminal Logout

Message ID: 0x0003.

Terminal logout message body is empty.

8.8 Terminal authentication

Message ID: 0x0102.

Table 9 shows the data format of the terminal authentication message body.

Table 9 Data formats of the terminal authentication message body

Start byte	Fields	Data type	Description and requirements
0	Authentication Code	STRING	Authentication code reported after a terminal reconnects

8.9 Setting Terminal parameters

Message ID: 0x8103.

Set the terminal parameter message body data format as shown in Table 10.

Table 10 Data format of terminal parameter message body

Start byte	Fields	Data type	Description and requirements
0	Total parameters	BYTE	
1	List of parameter items		Table 11 shows the format of parameter items

Table 11 Data format of terminal parameter items

Fields	Data type	Description and requirements
Parameter ID	DWORD	Parameter ID is defined and described in Table 12
Parameter length	BYTE	
Parameter values		If a multi-valued parameter is used, multiple parameter items with the same ID are used in the message, such as the dispatch center phone number

Table 12 Terminal Parameter Settings Each parameter item is defined and described

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	Number of TCP message retransmissions
0x0004	DWORD	UDP message response timeout, in seconds (s)

Parameter ID	Data type	Description and requirements
0x0005	DWORD	Number of UDP message retransmission times
0x0006	DWORD	SMS message response timeout, in seconds (s)
0x0007	DWORD	Number of SMS message retransmissions
0x0008-0x000F		Retain
0x0010	STRING	Primary server APN, dial-up access point for wireless communications. If the network standard is CDMA, the point is a PPP dial-up number
0x0011	STRING	Primary server dial-up user name for wireless communications
0x0012	STRING	Primary server dial-up password for wireless communication
0x0013	STRING	Primary server address, IP or domain name
0x0014	STRING	Backup server APN, dial up access point for wireless communications
0x0015	STRING	Backup server dial-up user name for wireless communications
0x0016	STRING	Backup server dial-up password for wireless communication
0x0017	STRING	Backup server address, IP or domain name
0x0018	DWORD	Server TCP port
0x0019	DWORD	Server UDP port
0x001A	STRING	Road Transport Certificate IC card authentication master server IP address or domain name
0x001B	DWORD	Road Transport Certificate IC card authentication master server TCP port
0x001C	DWORD	Road transport card IC card authentication master server UDP port
0x001D	STRING	Road transport certificate IC card authentication backup server IP address or domain name, the port is the same as the primary server
0x001E-0x001F		Retain
0x0020	DWORD	Position reporting strategy, 0: regular reporting; 1: fixed distance reporting; 2: timing and distance reporting
0x0021	DWORD	Position reporting scheme, 0: according to ACC status; 1: According to login status and ACC status, first determine the login status, if login then according to ACC status
0x0022	DWORD	Driver not logged in reporting interval, in seconds (s), >0
0x0023-0x0026	DWORD	Reserved
0x0027	DWORD	Reporting interval at hibernation, in seconds (s), >0
0x0028	DWORD	Report time interval for 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 reporting interval, in meters (m), >0
0x002D	DWORD	Driver not logged in to report distance interval, in meters (m), >0
0x002E	DWORD	Report distance intervals at dormancy, in meters (m), >0
0x002F	DWORD	Report distance interval in meters (m) for emergency alarm, >0
0x0030	DWORD	Inflection point pass Angle, <180
0x0031	WORD	Electronic fence radius (illegal displacement threshold) in meters
0x00032-0x003F		Reserve
0x0040	STRING	Monitor platform phone number
0x0041	STRING	Reset the phone number. You can use this phone number to dial the terminal phone to reset the terminal
0x0042	STRING	Restore factory Settings phone number, you can use this phone number to call the terminal phone to restore the terminal factory Settings
0x0043	STRING	Monitor platform SMS phone numbers
0x0044	STRING	Receiving terminal SMS text alarm number
0x0045	DWORD	Terminal phone answering policy, 0: auto answering; 1: Automatic answer when ACC is ON, manual answer when OFF
0x0046	DWORD	Maximum call time per call, in seconds (s), where 0 is no call allowed and 0xFFFFFFFF is no limit
0x0047	DWORD	Maximum call duration of the month, in seconds (s), where 0 means no call allowed and 0xFFFFFFFF means no limit
0x0048	STRING	Listening for phone numbers
0x0049	STRING	Policing Platform privilege SMS numbers
0x004A-0x004F		Retain
0x0050	DWORD	Alarm shield word, corresponding to the alarm sign in the location information reporting message, the corresponding bit is 1, the corresponding alarm is shielded
0x0051	DWORD	Alarm send text SMS switch, corresponding to the alarm flag in the location information reporting message, the corresponding bit is 1, the text SMS is sent when the alarm is generated
0x0052	DWORD	Alarm shooting switch, corresponding to the alarm sign in the position information reporting message, the corresponding bit is 1, the corresponding alarm when the camera shoots
0x0053	DWORD	The alarm shooting storage mark corresponds to the alarm mark in the location information reporting message. If the corresponding bit is 1, the photo taken during the corresponding alarm will be stored, otherwise it will be uploaded in real time

0x0054	DWORD	Key mark, which corresponds to the alarm mark in the location information reporting message, and the corresponding bit is 1 for the corresponding alarm

Parameter ID	Data type	Description and requirements
0x0055	DWORD	Top speed, in kilometers per hour (km/h)
0x0056	DWORD	Duration of overdrive, in seconds (s)
0x0057	DWORD	Continuous driving time threshold, in seconds (s)
0x0058	DWORD	Cumulative driving time threshold for the day, in seconds (s)
0x0059	DWORD	Minimum rest time, in seconds (s)
0x005A	DWORD	Maximum parking time, in seconds (s)
0x005B	WORD	Speed alarm warning difference, in 1/10Km/h
0x005C	WORD	Fatigue driving warning difference, in seconds (s), >0
0x005D	WORD	Collision alarm parameter Settings: b7-b0: collision time, unit 4ms; b15-b8: collision acceleration, unit 0.1g, setting range: 0-79, default is 10.
0x005E	WORD	Rollover alarm parameter Settings: Rollover Angle, in 1 degree, defaults to 30 degrees.
0x005F-0x0063		Retain
0x0064	DWORD	Timer photo control, see Table 13
0x0065	DWORD	Range-taking control, see Table 14
0x0066-0x006F		Retain
0x0070	DWORD	Image/video quality, 1-10, 1 is best
0x0071	DWORD	Brightness, 0-255
0x0072	DWORD	Contrast, 0-127
0x0073	DWORD	Saturation, 0-127
0x0074	DWORD	Chroma, 0-255
0x0075-0x007F		
0x0080	DWORD	Vehicle odometer reading, 1/10km
0x0081	WORD	The provincial domain ID of the vehicle
0x0082	WORD	ID of the municipality where the vehicle is located
0x0083	STRING	A motor vehicle license plate issued by the traffic management department of public security
0x0084	BYTE	License plate color, according to JT/T415-2006 5.4.12

Parameter ID	Data type	Description and requirements
0x0090	BYTE	GNSS positioning mode, defined as follows: bit0, 0: disable GPS positioning, 1: enable GPS positioning: bit1, 0: disable Beidou positioning, 1: enable Beidou positioning; bit2, 0: disable GLONASS positioning, 1: enable GLONASS positioning; bit3, 0: disable Galileo positioning, 1: enable Galileo positioning.
0x0091	BYTE	GNSS Baud rate, defined as follows: 0x00: 4800; 0x01: 9600; 0x02: 19200; 0x03: 38400; 0x04: 57600; 0x05:115200.
0x0092	BYTE	The GNSS module locates the data output frequency in detail, defined as follows: 0x00: 500ms; 0x01:1000ms (default); 0x02: 2000ms; 0x03: 3000ms; 0x04: 4000ms.
0x0093	DWORD	GNSS module detailed positioning data acquisition frequency, in seconds, default is 1.
0x0094	BYTE	GNSS module detailed positioning data upload method: 0x00, local storage, no upload (default value); 0x01, upload at intervals; 0x02, upload by distance interval; 0x0B, upload according to the accumulated time, and automatically stop uploading when the transmission time is reached; 0x0C, upload according to the accumulated distance, automatically stop uploading after reaching the distance; 0x0D: uploads according to the accumulated number, uploads stop automatically when the number of uploads is reached.
0x0095	DWORD	GNSS module detailed positioning data upload Settings: When the upload mode is 0x01, the unit is second; If the upload mode is 0x02, the unit is meters; If the upload mode is 0x0B, the unit is second; If the upload mode is 0x0C, the unit is meters; If the upload mode is 0x0D, the unit is strips.
0x0100	DWORD	CAN bus channel 1 Collection interval (ms), 0 indicates no collection
0x0101	WORD	CAN bus channel 1 Upload interval (s). 0 indicates that no upload is performed
0x0102	DWORD	CAN bus channel 2 Collection interval (ms), 0 indicates no collection
0x0103	WORD	CAN bus channel 2 Upload interval (s), 0 indicates no upload
0x0110	BYTE[8]	CAN bus ID separate collection Settings: bit63-bit32 indicates the ID collection interval (ms), 0 indicates no collection; bit31 indicates the CAN channel number, 0: CAN1, 1: CAN2; bit30 indicates the frame type, 0: standard frame, 1: extended frame: bit29 represents the data collection method, 0: original data, 1: the calculated value of the collection interval; bit28-bit0 indicates the CAN bus ID.
0x0111-0x01FF	BYTE[8]	Used for other CAN bus ids to collect Settings separately

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

Table 13 Timer photo control bit definition

position	Definition	Description and Requirements
0	Camera Channel 1 Timed photo switch sign	0: Not allowed; 1: allowed
1	Camera channel 2 Timed photo switch sign	0: Not allowed: 1: Allowed
2	Camera channel 3 Timed photo switch sign	0: cannot be allowed. 1: allowed
3	Camera channel 4 Timed photo switch sign	0: Not allowed; 1: allowed
4	Camera channel 5 Timed photo switch sign	0: Not allowed; 1: allowed
5-7	Reserve	
8	Camera Channel 1 Take timed photos to store signs	0: Store; 1: Upload
9	Camera Channel 2 Timed photo store logo	0: Store; 1: Upload
10	Camera Channel 3 Timed photo store logo	0: Store; 1: Upload
11	Camera Channel 4 Timed photo store logo	0: Store; 1: Upload
12	Camera Channel 5 Timed photo store logo	0: Store; 1: the upload
13-15	reserve	
16	Timed time units	0: seconds, when the value is less than 5 seconds, the terminal is processed by 5 seconds; 1: minutes.
17-31	Timed time intervals	Execute after receiving parameter Settings or restarting

Table 14 Range photo control bit definition

position	Definition	Description and Requirements
0	Camera Channel 1 Range camera switch sign	0: Not allowed; 1: allowed
1	Camera Channel 2 Range photo switch sign	0: Not allowed; 1: allowed
2	Camera channel 3 Range photo switch sign	0: Not allowed; 1: allowed
3	Camera Channel 4 Range photo switch sign	0: cannot be allowed. 1: allowed
4	Camera Channel 5 Range photo switch sign	0: Not allowed; 1: allowed
5-7	Reserve	
8	Camera Channel 1 Take photos at a distance to store the logo	0: storage; 1: Upload

9	Camera Channel 2 Take photos at a distance to store the logo	0: Store; 1: Upload

10	Camera Channel 3 Take photos at a distance to store the logo	0: Store; 1: Upload
11	Camera Channel 4 Range photo to store logo	0: Store; 1: Upload
12	Camera Channel 5 Range photo to store logo	0: Store; 1: Upload
13-15	Keep	
16	Set distance unit	0: meters, when the value is less than 100 meters, the terminal is processed by 100 meters; 1: km.
17-31	Set distance intervals	Perform after receiving parameter Settings or restarting

8.10 Querying Terminal parameters

Message ID: 0x8104.

Query terminal parameter message body is empty.

8.11 Querying specified Terminal parameters

Message ID: 0x8106.

Query the specified terminal parameters message body data format is shown in Table 15, the terminal uses 0x0104 instruction answer.

Table 15 Queries the specified terminal parameter message body data format

Start byte	Fields	Data type	Description and requirements
0	Total parameters	BYTE	The total number of arguments is n
1	List of parameter ids	BYTE[4*n]	Parameter order, such as "Parameter ID1 Parameter ID2..... Parameter IDn ".

8.12 Querying the Terminal parameter response

Message ID: 0x0104.

Query terminal parameters reply message body data format is shown in Table 16.

Table 16 Query terminal parameter response message body data format

Start byte	Fields	Data type	Description and requirements
0	Answering serial number	WORD	The serial number of the corresponding terminal parameter query message
2	Number of response parameters	BYTE	
3	List of parameter items		Table 10 lists the format and definitions of parameter entries

8.13 Terminal Control

Message ID: 0x8105.

The data format of the terminal control message body is shown in Table 17.

Table 17 Data format of terminal control message body

Start byte	Fields	Data type	Description and requirements
0	Command Words	BYTE	The terminal control command word is described in Table 18
1	Command Parameters	STRING	For details about the command parameter format, see the following description. Half Angle is used between each field. Separated, each STRING field is processed by GBK code before composing a message

Table 18 Description of Terminal control command words

Command words	Command parameters	Description and requirements
1	Table 19 shows the format of the command parameters	Wireless upgrade. Parameters are separated by half-corner semicolons. The instructions are as follows: "URL address; Dial point name; Dial-up user name; Dial-up password; Address; TCP port; UDP port; Manufacturer ID; Hardware version; Firmware version; Connection to the specified server duration ", blank if a parameter has no value
2	Table 19 shows the format of the command parameters	The control terminal connects to the specified server. Parameters are separated by half-corner semicolons. The control instructions are as follows: "Connect control; Monitor platform authentication code; Dial point name; Dial-up user name; Dial-up password; Address; TCP port; UDP port; Connection to the specified server ", if a parameter has no value, blank, if the connection control value is 1, no subsequent parameter
3	There is no	Terminal off
4	There is no	Terminal reset
5	There is no	Restore the terminal to factory Settings
6	There is no	Turn off data communication
7	There is no	Turn off all wireless communications

Table 19 Format of command parameters

Fields	Data type	Description and requirements
Connection control	BYTE	0: Switch to the specified supervisory platform server and enter the emergency state after connecting to the server. In this state, only the supervisory platform that issues control commands can send control commands including SMS; 1: switch back to the original default monitoring platform server and restore the normal state.
Dial point name	STRING	Generally, the value is a server APN, a dial-up access point for wireless communication. If the network standard is CDMA, the value is a PPP connection dial-up number
Dial-up user name	STRING	Server dial-up user name for wireless communications

Dial-up password	STRING	Server dial-up password for wireless communication
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
Regulatory platform authentication code	STRING	The authentication code issued by the monitoring platform is used for authentication only after the terminal connects to the monitoring platform. The original authentication code is still used when the terminal connects to the original monitoring platform
Hardware Version	STRING	Hardware version number of the terminal, as specified by the manufacturer
Firmware version	STRING	Firmware version number of the terminal, as specified by the manufacturer
URL address	STRING	Full URL address
Connect to the specified server time limit	WORD	Unit: minutes (min), the value is not 0 indicates that the terminal should be connected back to the original address before the expiration of the validity period after the terminal receives the upgrade or connects to the specified server instruction. If the value is 0, it means that the terminal is always connected to the specified server

8.14 Querying Terminal Properties

Message ID: 0x8107.

Query Terminal properties message body is empty.

8.15 Querying the response to Terminal Properties

Message ID: 0x0107.

Query terminal properties reply message body data format is shown in Table 20.

Table 20 Query the data format of the terminal property reply message body

Start byte	Fields	Data type	Description and requirements
0	Terminal Type	WORD	bit0, 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 general cargo vehicles, 1: applicable to general cargo vehicles; bit3, 0: not applicable to rental vehicles, 1: applicable to rental vehicles: bit6, 0: hard disk recording is not supported, 1: hard disk recording is supported; bit7, 0: all-in-one, 1: split.
2	Manufacturer ID	BYTE[5]	5 bytes, encoded by the terminal manufacturer.
7	Terminal model number	BYTE[20]	20 bytes, this terminal model is defined by the manufacturer, when the number of bits is insufficient, followed by "OXOO".
27	Terminal ID	BYTE[7]	7 bytes, consisting of capital letters and numbers, this terminal ID is defined by the manufacturer, followed by "OXOO" when the number of bits is insufficient.
42	Terminal SIM card ICCID	BCD[10]	Terminal SIM card ICCID number
52	Terminal hardware version number length	BYTE	n
53	Terminal hardware version number	STRING	

53+n	Length of terminal firmware version number	BYTE	m
54+n	Terminal firmware version number	STRING	

54+n+m	GNSS module properties	BYTE	bit0, 0: does not support GPS positioning, 1: supports GPS positioning; bit1, 0: does not support Beidou positioning, 1: supports Beidou positioning; bit2,0: does not support GLONASS positioning, 1: supports GLONASS positioning; bit3,0: does not support Galileo positioning, 1: supports Galileo positioning.
55+n+m	Communication Module Properties	BYTE	bit0, 0: does not support GPRS communication, 1: supports GPRS communication; bit1, 0: does not support CDMA communication, 1: supports CDMA communication; bit2,0: does not support TD-SCDMA communication, 1: supports TD-SCDMA communication. bit3, 0: does not support WCDMA communication, 1: supports WCDMA communication; bit4,0: does not support CDMA2000 communication, 1: supports CDMA2000 communication. bit5, 0: does not support TD-LTE communication, 1: supports TD-LTE communication; bit7, 0: does not support other communication methods, 1: supports other communication methods.

8.16 Delivering the Terminal Upgrade Package

Message ID: 0x8108.

Table 21 shows the data format of the message body of the delivered terminal upgrade packet. The command terminal uses the general reply to confirm whether the upgrade packet data is correctly received.

Table 21 Data format of the message body of the delivery terminal upgrade packet

Start byte	Fields	Data type	Description and requirements
0	Type of upgrade	BYTE	0: terminal, 12: Road transport certificate IC card reader, 52: Beidou satellite positioning module
1	Manufacturer ID	BYTE[5]	Manufacturer number
6	Version number length	BYTE	n
7	Version number	STRING	
7+n	Upgrade packet length	DWORD	In BYTE
11+n	Upgrade packet		

8.17 Terminal Upgrade Result Notification

Message ID: 0x0108.

After the terminal is upgraded and reconnected, use this command to notify the monitoring center. Table 22 shows the data format of the notification body of the terminal upgrade result.

Table 22 Data formats of terminal upgrade result notification body

Start byte	Fields	Data type	Description and requirements
0	Type of upgrade	BYTE	0: terminal, 12: Road transport certificate IC card reader, 52: Beidou satellite positioning module
1	Upgrade results	BYTE	0: success, 1: failure, 2: cancel

8.18 Reporting Location information

Message ID: 0x0200.

The body of the location information report message is composed of the basic information of the location and the list of additional information of the location. The message structure diagram is shown in Figure 3:

Basic location information	Location List of additional information items

Figure 3 Location report message structure diagram

The list of location additional information items is composed of each location additional information item, or no, according to the length field in the message header.

The data format of the basic location information is shown in Table 23.

Table 23 Data formats of basic location information

Starting byte	Fields	Data type	Description and requirements
0	Alarm signs	DWORD	Alarm flag bits are defined in Table 24
4	Status	DWORD	The status bits are defined in Table 25
8	Latitude	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
12	Longitude	DWORD	The value of longitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
16	Elevation	WORD	Altitude, in meters (m)
18	Speed	WORD	1/10km/h
20	Direction	WORD	0-359, with true north being 0, clockwise
21	Time	BCD[6]	YY-MM-DD-hh-mm-ss (GMT+8 time, the subsequent time in this standard is used in this zone)

Table 24 Definition of alarm flag bit

position	Definition	Processing instructions
0	1: Emergency alarm, trigger after touching the alarm switch	Clear after receiving the response
1	1: Speed alarm	Sign maintained until alarm condition is lifted
2	1: Tired driving	Sign maintained until alarm condition is lifted
3	1: Danger warning	Clear after receiving response
4	1: The GNSS module is faulty	The flag remains until the alarm condition is lifted
5	1: GNSS antenna not connected or cut	The sign remains until the alarm condition is lifted

6	1: The GNSS antenna is short-circui ted	Sign maintained until alarm condition is lifted
7	1: The terminal main power supply i s under voltage	The sign is maintained until the alarm co ndition is lifted
8	1: The terminal main power supply i s off	The sign remains until the alarm conditio n is lifted

position	Definition	Processing instructions
9	1: The terminal LCD or monitor is faulty	The sign is maintained until the alarm condition is lifted
10	1: The TTS module is faulty	The sign is maintained until the alarm condition is lifted
11	1: The camera is faulty	Sign maintained until alarm condition is lifted
12	1: The road transport license IC card module is faulty	The sign is maintained until the alarm condition is lifted
13	1: Speed warning	Sign maintained until alarm condition is lifted
14	1: Fatigue driving warning	Sign maintained until alarm condition lifted
15-17	Retain	
18	1: Accumulated driving overtime for the day	Sign maintained until alarm condition is lifted
19	1: Overtime parking	Sign maintained until alarm condition is lifted
20	1: Enter and exit the area	Clear when you receive an answer
21	1: In and out routes	Clear on response
22	1: Insufficient/too long driving time on the section	Clear after receiving the reply
23	1: Route deviation alarm	Sign maintained until alarm condition is lifted
24	1: Vehicle VSS failure	Sign maintained until alarm condition is lifted
25	1: The vehicle oil level is abnormal	The sign is maintained until the alarm condition is lifted
26	1: Vehicle stolen (through vehicle alarm)	Sign maintained until alarm condition is lifted
27	1: The vehicle is illegally ignited	Clear after receiving response
28	1: The vehicle is unlawfully displaced	Clear after receiving response
29	1: Collision warning	Sign maintained until alarm condition is lifted
30	1: Rollover warning	The sign remains until the alarm condition is lifted
31	1: illegal door opening alarm (when the terminal does not set the area, do not judge illegal door opening)	Clear after receiving the response

Note: Alarm and warning should be reported immediately location information

Table 25 Definition of status bits

position	Status
0	0: ACC off; 1: ACC is on
1	0: unpositioned; 1: positioned
2	0: north latitude; 1: south latitude

position	Status
3	0: East Longitude; 1: West longitude
4	0: Operation status: 1: outage status
5	0: latitude and longitude are not encrypted by secret plug-in; 1: the latitude and longitude have been encrypted by the secret plug-in
6-7	Retain
8-9	00: Empty car; 01: half load; 10: reserved; 11: Fully loaded (Can be used for empty passenger cars, heavy vehicles and trucks empty, full load state, manual input or sensor acquisition)
10	0: the vehicle oil circuit is normal; 1: the vehicle oil circuit is disconnected
11	0: The vehicle circuit is normal; 1: The vehicle circuit is disconnected
12	0: Door unlocked; 1: The door is locked
13	0: Door 1 closed; 1: Door 1 opens (front door)
14	0: Door 2 closed; 1: Door 2 opens (middle door)
15	0: Door 3 closes; 1: Door 3 opens (back door)
16	0: Door 4 closed; 1: Door 4 open (driver's seat door)
17	0: Door 5 closed; 1: Door 5 opens (custom)
18	0: No GPS satellite is used for positioning; 1: GPS satellite is used for positioning
19	0: no Beidou satellite is used for positioning; 1: the Beidou satellite is used for positioning
20	0: GLONASS satellite is not used for positioning; 1: GLONASS satellite is used for positioning
21	0: Did not use Galileo satellite for positioning; 1: Positioning using Galileo satellites
22-31	Retain

Note: Status changes must be reported immediately

The format of the location additional information item is shown in Table 26.

Table 26 Format of location additional information items

Fields	Data type	Description and requirements
Additional information ID	BYTE	1-255
Additional information length	BYTE	
Additional information		Additional information is defined in Table 27

Table 27 Definitions of additional information

Additional Information ID	Length of additional information	Description and requirements
0x01	4	Mileage, DWORD, 1/10km, corresponding to the odometer reading on the car
0x02	2	Oil amount, WORD, 1/10L, corresponding to the on-board fuel gauge reading
0x03	2	Speed obtained by Ride Log function, WORD, 1/10km/h
0x04	2	Need to manually confirm the ID of the alarm event, WORD, counting from 1
0x05-0x10		Retain
0 x 11	1 or 5	Additional information of overspeed alarm is shown in Table 28
0x12	6	Enter/exit area/route alarm Additional information is shown in Table 29
0x13	7	Section under/Too long driving alarm Additional information is shown in Table 30
0x14-0x24		Retain
0x25	4	Extended vehicle signal status bits, as defined in Table 31
0x2A	2	IO status bits, as defined in Table 32
0x2B	4	Analog, bit0-15, AD0; bit16-31, AD1.
0x30	1	BYTE, wireless communication network signal strength
0x31	1	BYTE Indicates the number of GNSS positioning satellites
0xE0	Follow-up Message Length	Customize subsequent message length
0xE1-0xFF		Custom zone

Table 28 Overspeed alarm Additional information message body data format

Start byte	Fields	Data type	Description and requirements
0	Type of location	BYTE	0: No specific location; 1: circular area; 2: rectangular area; 3: Polygon area; 4: Road section
1	Zone or section ID	DWORD	If the location type is 0, this field is not available

Table 29 Enter/Exit area/Route alarm Additional information message body data format

Start byte	Fields	Data type	Description and requirements
0	Type of location	BYTE	1: Round area; 2: Rectangular area: 3: Polygonal area; 4: Route
1	Area or line ID	DWORD	
5	Directions	BYTE	0: in; 1: Out

Table 30 Route insufficient driving time/too long alarm Additional information message body data format

Start byte	Fields	Data type	Description and requirements

0	Section ID	DWORD	
4	Section travel time	WORD	In seconds (s)
6	result	BYTE	0: insufficient; 1: too long

Table 31 Extended vehicle signal status bits

position	Definition
0	1: Low light signal
1	1: high beam signal
2	1: Right turn signal signal
3	1: Left turn signal
4	1: Brake signal
5	1: Reverse gear signal
6	1: fog light signal
7	1: Outline light
8	1: Horn signal
9	1: Air conditioning status
10	1: neutral signal
11	1: Retarder working
12	1: ABS works
13	1: Heater works
14	1: Clutch condition
15-31	Retain

Table 32IO Status bits

position	Definition
0	1: Deep dormant state
1	1: hibernation state
2-15	Retain

8.19 Location Information Query

Message ID: 0x8201.

The body of the location information query message is empty.

8.20 Response to the Location query

Message ID: 0x0201.

Table 33 shows the format of the location information query response message body data.

Table 33 Location information query response message body data format

Start byte	Fields	Data type	Description and requirements
0	Answering serial number	WORD	Corresponding Location Information Serial number of the query message
2	Location information report		See 8.12 for location reporting

8.21 Temporary location tracking control

Message ID: 0x8202.

The temporary Location tracking control message body data format is shown in Table 34.

Table 34 Temporary Position tracking control message body data format

Start byte	Fields	Data type	Description and requirements
0	Time interval	WORD	In seconds (s), 0 stops tracking. No follow-up field is required to stop tracing
2	Location Tracking Expiration Date	DWORD	The unit is seconds (s). After receiving the position tracking control message, the terminal sends the position report according to the time interval in the message before the expiration time

8.22 Manually confirm the alarm message

Message ID: 0x8203

The data format of manual confirmation alarm message body is shown in Table 35.

Table 35 Data format of manual confirmation alarm message

Start byte	Fields	Data type	Instructions
0	Alarm message serial number	WORD	Serial number of the alarm message that needs to be manually confirmed. 0 indicates all the messages of the alarm type
2	Manually confirm the alarm type	DWORD	See Table 36 for definitions

Table 36 Manual confirmation alarm type definition

position	Definition
0	1: Confirm the emergency alarm;

1-2	Reserve
3	1: Confirm warning of danger;

4-19	Retain
20	1: Confirm entrance and exit area alarm;
21	1: Confirm the entry and exit route alarm;
22	1: confirm the road section driving time is insufficient/too long alarm;
23-26	Retain
27	1: Confirm vehicle illegal ignition alarm;
28	1: confirm the vehicle illegal displacement alarm;
29-31	Retain

8.23 Text message delivery

Message ID: 0x8300.

Table 37 shows the data format of the text message delivery body.

Table 37 Data formats of text message delivery body

Start byte	Fields	Data type	Description and requirements
0	Logo	BYTE	The meanings of text information flag bits are shown in Table 38
1	Text Information	STRING	The maximum value is 1024 bytes, encoded by GBK

Table and text information symbol meaning

position	Signs
0	1: Urgent
1	Reserved
2	1: Terminal monitor display
3	1: Terminal TTS broadcast read
4	1: Advertising screen display
5	0: center navigation information, 1: CAN fault code information
6-7	Retain

8.24 Event Settings

Message ID: 0x8301.

Table 39 shows the data format of the event setting message body.

Table 39 Event Settings message body data format

Start byte	Fields	Data type	Description and requirements

0	Type of setting	BYTE	0: deletes all existing events on the terminal. This command is followed by no subsequent bytes. 1: update events; 2: append events; 3: Modify event; 4: Delete certain events, and then the event item does not need to contain the event content
1	Set the total number	BYTE	
2	List of event items		The event item composition data format is shown in Table 40

Table 40 Event items compose data format

Start byte	Fields	Data type	Description and requirements
0	Event ID	BYTE	Byte: The terminal is overwritten if there are already events with the same ID
1	Event content Length	BYTE	Subsequent event content field byte length
2	Event content	STRING	Event content, encoded by GBK

8.25 Incident Report

Message ID: 0x0301.

The event report message body data format is shown in Table 41.

Table 41 Event report message body data formats

Start byte	Fields	Data type	Description and requirements
0	Event ID	BYTE	

8.26 Question delivery

Message ID: 0x8302.

Table 42 shows the format of the question delivery message body data.

Table 42 Data formats of the question delivery message body

Start byte	Fields	Data type	Description and requirement
0	Logo	BYTE	The question delivery flag bits are defined in Table 43
1	Question Content Length	BYTE	Question field byte length
2	Question	STRING	Question text, encoded by GBK, of length N
2+N	List of candidate answers		The candidate answer message composition is shown in Table 44

Table 43 Definition of question delivery flag bits

position	Signs
0	1: Emergency

1	Reserved
2	Reserve
3	1: Terminal TTS broadcast read
4	1: Advertising screen display
5-7	Retain

Table 44 Composition of a candidate answer message under question

Start byte	Fields	Data type	Description and requirements
0	Answer ID	BYTE	
1	Answer Content Length	WORD	Answer Content field byte length
3	Answer content	STRING	Answer content, encoded by GBK

8.27 Question and Answer

Message ID: 0x0302.

Table 45 shows the format of the question answer message body data.

Table 45 Data format of question and response message body

Start byte	Fields	Data type	Description and requirements
0	Answering serial number	WORD	The serial number of the message sent by the corresponding question
2	Answer ID	BYTE	The answer ID that comes with the question delivery

8.28 Information on Demand menu Settings

Message ID: 0x8303.

Information on Demand menu Settings message body data format is shown in Table 46.

Table 46 Information on demand menu sets message body data format

Start byte	Fields	Data type	Description and requirements
0	Type of setting	BYTE	0: Delete all terminal information items; 1: Update menu: 2: Add menu: 3: Modify the menu
1	Total number of information items	BYTE	
2	List of information items		Information on demand information item composition data format is shown in Table 47

Table 47 Information on demand information item composition data format

Starting byte	Fields	Data type	Description and requirements

0	Type of information	BYTE	Byte is overwritten if the terminal already has an information item of the same type
1	Length of message name	WORD	Information name field byte length
3	Message name	STRING	GBK code processing

8.29 Message on Demand/cancel

Message ID: 0x0303.

The message on Demand/Cancel message body data format is shown in Table 48.

Table 48 Message on demand/Cancel message body data formats

Start byte	Fields	Data type	Description and requirements
0	Type of information	BYTE	
1	On Demand/Cancel flag	BYTE	0: Cancel; 1: on demand

8.30 information service

Message ID: 0x8304.

The format of information service message body data is shown in Table 49.

Table 49 Information service message body data formats

Start byte	Fields	Data type	Description and requirements
0	Type of information	BYTE	
1	Message length	WORD	
3	Information Content	STRING	Encoded by GBK

8.31 Call back

Message ID: 0x8400.

Table 50 shows the format of the telephone callback message body data.

Table 50 Telephone callback message body data format

Start byte	Fields	Data type	Description and requirements
0	Logo	BYTE	0: Normal call; 1: listening
1	Phone number	STRING	The maximum value is 20 bytes

8.32 Set up your phone book

Message ID: 0x8401.

To format the phone book message body data, see Table 51.

Table 51 Sets the data format of the telephone text message body

Start byte	fields	Data type	Description and requirements

0	Type of setting	BYTE	0: Deletes all stored contacts on the terminal; 1: update the phone book (delete all existing contacts in the terminal and add contacts in the message); 2: indicates to add the phone book; 3: indicates modification of the phone book (indexed by contacts)
1	Total contacts	BYTE	
2	Contact item		The phone book contact entry data format is shown in Table 52

Table 52 Telephone book contact item data formats

Starting byte	Fields	Data type	Description and requirements
0	Logo	BYTE	1: Incoming call; 2: outgoing call; 3: Incoming/outgoing
1	Number length	BYTE	
2	Phone number	STRING	Length n
2+n	Contact length	BYTE	
3+n	Contacts	STRING	Encoded by GBK

8.33 Vehicle control

Message ID: 0x8500

The vehicle control message body data format is shown in Table 53.

Table 53 Vehicle control message body data formats

Start byte	Fields	Data type	Description and requirements
0	Control signs	BYTE	The control instruction flag bit data format is shown in Table 54

Table 54 Control instruction flag bit data format

position	Signs
0	0: Door unlocked; 1: The door is locked
1-7	reserve

8.34 Vehicle control response

Message ID: 0x0500.

The Vehicle Control answer message body data format is shown in Table 55.

Table 55 Vehicle control response message body data formats

Start byte	Fields	Data type	Description and requirements
0	Answering serial number	WORD	The serial number of the corresponding vehicle control message
2	Position information reporting message body		Determine whether the control is successful or not according to the corresponding status bit

8.35 Set the circle area

Message ID: 0x8600.

The data format for setting the circular area message body is shown in Table 56.

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

Table 56 Setting the data format of the circular area message body

Start byte	Fields	Data type	Description and requirements
0	Setting Properties	BYTE	0: Update area; 1: append area; 2: Modify the region
1	Zone total	BYTE	
2	Zone entry		The data format for the area item content of the circular area is shown in Table 57

Table 57 Data format of the area item content of the circular area

Starting byte	Fields	Data type	Description and requirements
0	Area ID	DWORD	
4	Area Properties	WORD	Area properties are defined in Table 58
6	Center point latitude	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
10	Center point longitude	DWORD	The value of longitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
14	radius	DWORD	The unit is meters (m) and the section is from this turning point to the next turning point
18	Starting time	BCD[6]	YY-MM-DD-hh-mm-ss, if the area attribute 0 bit is 0, there is no field
24	End time	BCD[6]	YY-MM-DD-hh-mm-ss, if the area attribute 0 bit is 0, there is no field
30	Maximum speed	WORD	Km/h, no field if area property 1 bit is 0
32	Overspeed duration	BYTE	The unit is seconds (s)(similar expression, modified as before), if the area attribute 1 bit is 0, there is no field

Table 58 Region attribute definitions for regions

position	Signs
0	1: According to time
1	1: Speed limit
2	1: Enter the area to alert the driver

3	1: Enter the area alarm to the platform
4	1: Out area alarm to the driver

5	1: Out area alarm to the platform
6	0: north latitude; 1: south latitude
7	0: East longitude; 1: West longitude
8	0: Open doors allowed; 1: Forbidden to open doors
9-13	Keep
14	0: Enter the area to open the communication module; 1: the communication module is turned off in the entering area
15	0: GNSS detailed positioning data is not collected in the incoming area; 1: GNSS detailed positioning data is collected in the area

8.36 Delete the circular area

Message ID: 0x8601.

Delete the circular area message body data format is shown in Table 59.

Table 59 Deleting round area message body data formats

Start byte	Fields	Data type	Description and requirements
0	Number of SECTIONS	BYTE	The number of fields contained in this message cannot exceed 125. If more than 125| you are advised to use multiple messages. 0 indicates that all circles are deleted
1	Area ID1	DWORD	
	.....	DWORD	
	Zone IDn	DWORD	

8.37 Set the rectangular area

Message ID: 0x8602.

The data format for setting the rectangular area message body is shown in Table 60.

Table 60 Sets the data format of the rectangular area message body

Start byte	Fields	Data type	Description and requirements
0	Setting Properties	BYTE	0: Update area: 1: Append area; 2: Modify the region
1	Zone total	BYTE	
2	Zone entry		The format of the region entry data for rectangular areas is shown in Table 61

Table 61 Data formats of area items for rectangular areas

Start byte	Fields	Data type	Description and requirements
0	Area ID	DWORD	
4	Area Properties	WORD	Area properties are defined in Table 58
6	Latitude at the top left point	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree

10	Dot longitude on the upper left	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
14	Lower right point latitude	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
18	Dot longitude on the lower right	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
22	Starting time	BCD[6]	Set the time range in the same circle area
28	End time	BCD[6]	Time range set in the same circle area
34	Maximum speed	WORD	The unit is kilometers per hour (km/h), without this field if the area property 1 bit is 0
36	Duration of overdrive	BYTE	The unit is seconds (s), which is not available if the area property 1 bit is 0

8.38 Delete a rectangular area

Message ID: 0x8603.

Delete rectangular area message body data format is shown in Table 62.

Table 62 Delete rectangular area message body data format

Start byte	Fields	Data type	Description and requirements
0	Number of SECTIONS	BYTE	The number of fields contained in this message cannot exceed 125. If more than 125 fields are included, you are advised to use multiple messages. 0 indicates that all rectangular fields are deleted
1	Area ID1	DWORD	
	.....	DWORD	
	Zone IDn	DWORD	

8.39 Set the Polygon area

Message ID: 0x8604.

Setting the polygon area message body data format is shown in Table 63.

Table 63 Setting polygon area message body data format

Start byte	Fields	Data type	Description and requirements
0	Area ID	DWORD	
4	Area Properties	WORD	Area properties are defined in Table 58
6	Start time	BCD[6]	Time range set in the same circle area
12	End time	BCD[6]	Time range set in the same circle area
18	Maximum speed	WORD	The unit is kilometers per hour (km/h), without this field if the area property 1 bit is 0
20	Overspeed duration	BYTE	The unit is seconds (s), which is not available if the area property 1 bit is 0

21	Total number of vertices in the region	WORD	
23	Vertex entry		Table 64 shows the data format of vertex entries for polygon areas

Table 64 Vertex item data format of polygon area

Starting byte	Fields	Data type	Description and requirements
0	Vertex Latitude	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
4	Longitude of the vertex	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree

8.40 Delete the polygon area

Message ID: 0x8605.

Delete polygon area message body data format is shown in Table 65.

Table 65 Delete polygon area message body data format

Start byte	Fields	Data type	Description and requirements
0	Number of SECTIONS	BYTE	The number of fields contained in this message cannot exceed 125. More than 125| Multiple messages are recommended. 0 indicates that all rectangular fields are deleted
1	Area ID1	DWORD	
	.....	DWORD	
	Regional IDn	DWORD	

8.41 Set the route

Message ID: 0x8606.

Format the route message body data as shown in Table 66.

Table 66 Sets the route message body data format

Starting byte	Fields	Data type	Description and requirements
0	Route ID	DWORD	
4	Route Properties	WORD	See Table 67 for the route attribute data format
6	Start time	BCD[6]	Time range set in the same circle area
12	End time	BCD[6]	Time range set in the same circle area
18	The number of total turning points of the route	WORD	
20	Inflexion entry		The data format of route inflection point items is shown in Table 68

Table 67 Data format of route attributes

position	Signs

0	1: According to time
1	Reserve

2	Method 1 of 2: Approach route alarm to the driver
3	1: Approach route alarm to the platform
4	1: route alarm to the driver
5	1: Out route alarm to the platform
6-15	Reserve

Table 68 Route inflection point item data format

Starting byte	Fields	Data type	Description and requirements
0	Inflection point ID	DWORD	
4	Section ID	DWORD	
8	Inflection point latitude	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
12	Longitude of the inflection point	DWORD	The value of latitude in degrees multiplied by 10 to the power of 6, accurate to a millionth of a degree
16	Section width	BYTE	The unit is meters (m), and the road section is from this turning point to the next turning point
17	Section attributes	BYTE	Section attribute data format is shown in Table 69
18	Section overdrive threshold	WORD	In seconds (s), no field if section property 0 bit is 0
20	Section underdrive threshold	WORD	In seconds (s), no field if section property 0 bit is 0
22	Maximum speed of a section	WORD	The unit is kilometers per hour (km/h). If bit 1 of the road attribute is 0, this field is not available
24	Section speeding duration	BYTE	The unit is seconds (s), which is not available if bit 1 of the section property is 0

Table 69 Section attribute data format

position	Signs
0	1: Travel time
1	1: Speed limit
2	0: north latitude; 1: south latitude
3	0: East longitude; 1: West longitude
4-7	Reserve

8.42 Delete the route

Message ID: 0x8607.

Delete route message body data format is shown in Table 70.

Table 70 Delete route message body data format

Start byte	Fields	Data type	Description and requirements

0	Number of routes	BYTE	The number of fields contained in this message cannot exceed 125. If more than 125 fields are included, you are advised to use multiple messages. 0 indicates that all routes are deleted
1	Route ID1	DWORD	
	.....	DWORD	
	Route IDn	DWORD	

8.43 record data collection command

Message ID: 0x8700.

Table 71 shows the format of the message body of the travel record data acquisition command.

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

Start byte	Fields	Data type	Description and requirements
0	Command Words	BYTE	For a list of command words see the relevant requirements in GB/T 19056
1	Blocks of Data		For the format of data block content, see related content in GB/T 19056. It contains the complete data packet required by GB/T 19056 and can be empty.

8.44 Upload Driving record data

Message ID: 0x0700.

The data format of the ride log data upload message body is shown in Table 72.

Table 72 Data format of driving record data upload message body

Start byte	Fields	Data type	Description and requirement
0	Answering serial number	WORD	Serial number of the corresponding driving record data acquisition command message
2	Command word	BYTE	The command word issued by the corresponding platform
3	Block of Data		The format of the data block content is shown in GB/T 19056 and contains the complete data packet required by GB/T 19056.

8.45 Run the command for Driving record parameters

Message ID: 0x8701.

Table 73 shows the format of the message body data of the drive record parameter command down.

Table 73 Data format of command message body of driving recorder parameters

Start byte	Fields	Data type	Description and requirement

0	Command Words	BYTE	For a list of command words see the relevant requirements in GB/T 19056
1	Blocks of Data		The format of the data block content is shown in GB/T 19056 and contains the complete data packet required by GB/T 19056.

8.46 Report to electronic waybill

Message ID: 0x0701.

See Table 74 for the data format of e-waybill report message body.

Table 74 Data format of e-waybill reporting message body

Start byte	Fields	Data type	Description and requirements
0	Length of electronic waybill	DWORD	
4	Contents of electronic waybill		Electronic waybill data package

8.47 Report a request for driver identity information

Message ID: 0x8702.

Report Driver ID request message body is empty.

8.48 Collect and report Driver identity information

Message ID: 0x0702.

This command is automatically triggered after the terminal Practitioner Qualification IC card is inserted or pulled out. After receiving instruction 0x8702, answer with this instruction. The data format of driver identity information collection and reporting message body is shown in Table 75.

Table 75 Data format of driver identity information reporting message body

Start byte	Fields	Data type	Description and requirements
0	Status	BYTE	0x01: Qualification Certificate IC card inserted (driver to work); 0x02: Qualification certificate IC card pulled out (driver off work).
1	Time	BCD[6]	Insert/remove card time, YY-MM-DD-hh-mm-ss; The following fields are valid and filled only when the status is 0x01.
7	The IC card reads the result	BYTE	0x00: IC card read card successfully; 0x01: Failed to read the card because the card key authentication did not pass; 0x02: Failed to read the card because the card has been locked. 0x03: Failed to read the card because the card was pulled out. 0x04: Read the card failed because of data verification error. The following fields are valid when the IC card read result is equal to 0x00.
8	Driver Name Length	BYTE	n
9	Driver's name	STRING	Driver's name
9+n	Qualification Certificate code	STRING	Contains 20 characters and is less than 0x00.
29+n	Length of issuing agency name	BYTE	m
30+n	Name of issuing authority	STRING	Name of the organization that issued the qualification certificate
30+n+m	Certificate validity period	BCD[4]	YYYYMMDD

8.49 Upload Location data in batches

Message ID: 0x0704.

Location data Batch upload data format is shown in Table 76.

Table 76 Format of location data Bulk upload data

Starting byte	Fields	Data type	Instructions
0	Number of data items	WORD	Contains the number of location report data items, >0
1	Location data type	BYTE	0: normal position batch report, 1: blind area supplement report
2	Position report data item		See Table 77 for definitions

Table 77 Position report data item data format

Starting byte	Fields	Data type	Instructions
0	Position report data body length	WORD	Position report data body length, n
2	Position report data body	BYTE[n]	See 8.12 Location Information Reporting for definitions

8.50 CAN bus data upload

Message ID: 0x0705.

The format of CAN bus data upload is shown in Table 78.

Table 78CAN bus data upload data format

Start byte	Fields	Data type	Instructions
0	Number of data items	WORD	Number of CAN bus data items included, >0
2	CAN bus data receiving time	BCD[5]	Article 1 Receiving time of CAN bus data, hh-mm-ss-msms
8	CAN bus data item		See Table 79 for definitions

Table 79CAN bus data item data format

Start byte	fields	Data type	Instructions
0	CAN ID	BYTE[4]	bit31 indicates the CAN channel number, 0: CAN1, 1: CAN2; bit30 indicates the frame type, 0: standard frame, 1: extended frame: bit29 indicates the data collection method, 0: original data, 1: the average value of the collection interval; bit28-bit0 indicates the CAN bus ID.
4	CAN DATA	BYTE[8]	CAN data

8.51 Multimedia event information Upload

Message ID: 0x0800

The format of multimedia event message upload data is shown in Table 80.

Table 80 Data formats of multimedia event message upload message body

Start byte	Fields	Data type	Description and requirements
0	Multimedia Data ID	DWORD	>0
4	Multimedia Types	BYTE	0: Image; 1: audio; 2: video;
5	Multimedia format encoding	BYTE	0: JPEG: 1: TIF: 2: MP3; 3: WAV; 4: WMV; Other reservations
6	Event item coding	BYTE	0: The platform issues commands; 1: timing action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; 4: the door opens to take photos; 5: The door is closed to take photos; 6: the door changes from open to close, the speed from <20 km to more than 20 km; 7: take pictures at fixed distance; Other reservations
7	Channel ID	BYTE	

8.52 Multimedia Data Upload

Message ID: 0x0801.

The format of multimedia data upload message body data is shown in Table 81.

Table 81 Data format of multimedia data upload message body

Start byte	Fields	Data type	Description and requirements
0	Multimedia ID	DWORD	>0
4	Multimedia Types	BYTE	0: Image; 1: audio; 2: video;
5	Multimedia format encoding	BYTE	0: JPEG; 1: TIF; 2: MP3; 3: WAV; 4: WMV; Other reservations
6	Event item coding	BYTE	0: command issued by the platform: 1: timed action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; Other reservations
7	Channel ID	BYTE	
8	Location Information Report (0x0200) message body	BYTE[28]	Represent location basic information data for multimedia data
36	Multimedia data Package		

8.53 Multimedia Data Upload Response

Message ID: 0x8800.

Table 82 shows the format of the multimedia data upload reply message body.

Table 82 Data format of multimedia data upload reply message body

Start byte	fields	Data type	Description and requirements

0	Multimedia ID	DWORD	>0, no subsequent fields if all packets are received
4	Total number of retransmitted packets	BYTE	n
5	List of retransmit packet ids	BYTE[2*n]	Byte [2 * n] Retransmit packet serial numbers in order, such as "packet ID1 packet ID2... Packet IDn ".

Note: this message should be agreed to adopt 0 x0801 will retransmission pac ket ID in the list of the subcontract resend once, exactly the same as that of original subcontract message.

8.54 Camera Shoot Now command

Message ID: 0x8801.

Camera Take Immediately command message body data format is shown in Tabl e 83.

Table 83 Camera instant Shot command message body data format

Start byte	Fields	Data type	Description and requirements
0	Channel ID	BYTE	>0
1	Shot command	WORD	0 means stop shooting; 0xFFFF for recording; Ot hers indicate the number of photos taken
3	Photo interval/reco rding time	WORD	Seconds, 0 means take a picture at the smallest interval or record all the way
5	Save logo	BYTE	1: Save; 0: real-time upload
6	Resolution.	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];
7	Image/video quality	BYTE	1-10, with 1 being the least mass loss and 10 b eing the most compression ratio
8	Brightness	BYTE	0-255
9	Contrast	BYTE	0-127
10	Saturation	BYTE	0-127
11	Chroma	BYTE	0-255
"If the terminal does not support the resolution required by the system, take the closest resolu tion and upload it			

8.55 Camera immediately shoot command answer

Message ID: 0x0805.

See Table 84 for the format of the Camera Take Immediately command reply message body data. This command is used to answer the camera take immediate ly command 0x8801 issued by the monitoring center.

Table 84 Format of camera Immediately shoot command response data

Start byte	Fields	Data type	Description and requirements
0	Answering serial nu mber	WORD	A message sequence number corresponding to the platform camera taking the command immediatel y
2	Results	BYTE	0: successful; 1: failure; 2: The channel is n ot supported.

			The following fields are only valid if the result =0.
3	Number of Multimedia ids	WORD	n, the number of successful multimedia shots

4	List of multimedia ids	BYTE[4*n]	

8.56 Storing multimedia Data for Retrieval

Message ID: 0x8802.

Store multimedia data Retrieve message body data format is shown in Table 85.
Note: The start time and end time are set to 00-00-00-00-00-00-00 if the time range is not specified.

Table 85 Storing multimedia data Search message body data format

Start byte	Fields	Data type	Description and requirements
0	Types of multimedia	BYTE	0: Image: 1: audio; 2: video;
1	Channel ID	BYTE	0 means to retrieve all channels for that media type;
2	Event entry encoding	BYTE	0: The platform issues commands; 1: timing action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; Other reservations
3	Starting time	BCD[6]	YY-MM-DD-hh-mm-ss
9	End time	BCD[6]	YY-MM-DD-hh-mm-ss

8.57 Store multimedia data retrieval response

Message ID: 0x0802.

The format of the stored multimedia data retrieval reply message body data is shown in Table 86.

Table 86 Storage multimedia data retrieval response message body data format

Start byte	Fields	Data type	Description and requirements
0	Answer serial number	WORD	Serial number of the corresponding multimedia data retrieval message
2	The total number of multimedia data items	WORD	The total number of multimedia data items that meet the search criteria
4	Search Terms		The data format of multimedia search terms is shown in Table 87

Table 87 Data formats of multimedia search terms

Start byte	Fields	Data type	Description and requirements
0	Multimedia ID	DWORD	>0
4	Multimedia Types	BYTE	0: Image; 1: audio; 2: video
5	Channel ID	BYTE	
6	Event item encoding	BYTE	0: The platform issues commands; 1: timing action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; Other reservations

7	Location Information Report (0x0200) message body	BYTE[28]	Basic information data representing the location of the beginning moment of the shooting or recording

8.58 Command for storing multimedia data upload

Message ID: 0x8803

Table 88 shows the format of the message body for storing multimedia data upload command.

Table 88 Storage multimedia data upload command message body data format

Start byte	Fields	Data type	Description and requirements
0	Types of multimedia	BYTE	0: Image; 1: audio; 2: video
1	Channel ID	BYTE	
2	Event item encoding	BYTE	0: command issued by the platform: 1: timed action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; Other reservations
3	Starting time	BCD[6]	YY-MM-DD-hh-mm-ss
9	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

The recording Start command message body data format is shown in Table 89.

Table 89 Data format of recording start command message body

Start byte	Fields	Data type	Description and requirements
0	Recording commands	BYTE	0: Stop recording: 0x01: Start recording;
1	Recording time	WORD	The unit is second (s). 0 indicates that recording is ongoing
3	Save flag	BYTE	0: Live upload: 1: Save
4	Audio sampling rate	BYTE	0: 8K; 1: 11K; 2: 23K; 3: 32K; Other reservations

8.60 Single store multimedia data retrieval upload command

Message ID: 0x8805

The format of the single storage multimedia data retrieval upload command message body is shown in Table 90.

Table 90 Single storage multimedia data retrieval upload command message body data format

Start byte	Fields	Data type	Description and requirements
0	Multimedia ID	DWORD	>0
4	Remove logo	BYTE	0: reserved; 1: delete;

8.61 Data downlink transparent transmission

Message ID: 0x8900.

Table 91 shows the data format of the downlink transparent message body.

Table 91 Data format of downlink transparent message body

Start byte	Fields	Data type	Description and requirements
0	Transparent message types	BYTE	The passthrough message types are defined in Table 93
1	Transparent message content		

8.62 Transparent Uplink Transmission

Message ID: 0x0900.

Data Uplink transparent message body data format see.

Table 92 Data formats of uplink transparent message body

Start byte	Fields	Data type	Description and requirements
0	Transparent message types	BYTE	The passthrough message types are defined in Table 93
1	Transparent message content		

Table 93 Transparent message type Definition table

Transparent message types	Definitions	Description and Requirements
GNSS module detailed positioning data	0x00	GNSS module location data in detail
Road transport certificate IC card information	0x0B	Road transport card IC card information upload message is 64Byte, down message is 24Byte. Road transport card IC card authentication transparent transmission timeout time is 30s. No retransmission after timeout.
Serial port 1 Transmit transparently	0x41	Serial port 1 Pass messages through
Serial port 2 pass transparently	0x42	Serial port 2 Pass messages through
User-defined transparent message	0xF0-0xFF	User-defined Transparent message

8.63 Data compression Report

Message ID: 0x0901.

Data compression Table 94 shows the data format of the reported message body.

Table 94 Data compression Data format of the reported message body

Starting byte	Fields	Data type	Description and requirements
0	Compressed message Length	DWORD	
4	Compressed message body		The compressed message body is the message to be compressed after the GZIP compression algorithm

8.64 Platform RSA public key

Message ID: 0x8A00.

Platform RSA public key message body data format is shown in Table 95.

Table 95 Platform RSA public key message body data format

Start byte	fields	Data type	Description and requirements
0	e	DWORD	e in Platform RSA public key {e,n}
4	n	BYTE[128]	n in RSA public key {e,n}

8.65 Terminal RSA public key

Message ID: 0x0A00.

Table 96 shows the data format of the terminal RSA public key message body.

Table 96 Data format of terminal RSA public key message body

Start byte	Fields	Data type	Description and requirement
0	e	DWORD	Terminal the e in RSA public key {e,n}
4	n	BYTE[128]	n in RSA public key {e,n}

Attached A

(Normative Appendix)

Communication protocol between vehicle terminal and external equipment

A.1 Equipment

A.1.1 Hosts

The host should conform to JT/T 794.

A.1.2 Slave

Slave machine includes various point-to-point serial communication external devices, such as scheduling display screen, intelligent peripherals, oil level detection device, collision rollover detection device, etc.

A.2 Communication protocols

A.2.1 Frame Format Definition

The frame format followed by all communication between slave and host is shown in Table A.1.

Table A.1 Frame formats

Identification Bits	Check code	Version number	Manufacturer number	Peripheral type number	Command type	User data	Identification bits
1 byte	1 byte	2byte	2byte	1byte	1 byte	n byte	1 byte

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

a) Identifier bit: 0x7e is used. If 0x7e appears in the check code, message header, and message body, it needs to be escaped. Escape rules are defined as follows:

0x7e <-------->0x7d followed by a 0x02;

0x7d <-------> 0x7d followed by a 0x01;

The escape process is as follows:

When sending a message: Message encapsulation -- > Calculate and fill check code -- > Escape;

When receiving message: escape restore -- > Verify check code -- > parse message;

Example 1:

Sending a packet with the contents 0x30 0x7e 0x08 0x7d 0x55 is encapsulated as follows: 0x7e 0x30 0x7d 0x020x08 0x7d 0x01 0x55 0x7e;

b) Verification code: The sum from the manufacturer number to the user data in turn, and then take the lower 8 bits of the sum as the verification code;

Example 2:

If the 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, which is used for the peripheral interface driver of the host to distinguish which peripheral sends the data; Peripheral type number is shown in Table A.2;

f) Command type: peripherals and host for a variety of data interaction information types, command types are divided into general protocol and proprietary protocol two categories: general protocol mainly includes the slave machine and host basic, necessary, common some information interaction types; Proprietary protocols define the unique information interaction types of peripherals and the host; The command types are shown in Table A.3;

g) User data: refers to the data of peripherals interacting with the host that is customized by specific service functions except for the above parts;

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

Table A.2 Peripherals type number table

Peripheral Types	Number
Industry information terminal	0x01
Dispatch display	0x02
In-car navigation display	0x03
Oil level detector	0x04
Acceleration detector	0x05
Burglar Alarm	0x06
Interface expander	0x07
Load detector	0x08
Passenger Flow Detector	0x09
Universal sensor	0x0A
Road Transport License IC card reader	0x0B
Custom	0xF0-0xFF

Table A.3 Command types

Protocol Types	Type of business function	Type of command
General protocol for peripherals	Power-on instructions/answers	0x01
	Link Poll/Answer	0x02
	Control/answer from electromechanical source	0x03
	Query slave version number information	0x04
	Slave self-check/answer	0x05
	Slave firmware update/answer	0x06
	Reserved	0x07-0x3F
Dedicated protocol	Road transport Certificate IC card authentication Request/response	0x40

	Road Transport Card IC card read result Notification /reply	0 x 41
	Card pull out notification/answer	0x42
	Active trigger read IC card/answer	0x43
	Various proprietary functional business protocols for slave peripherals	0x44-0xFF

A.2.2 Rules for adding peripheral protocols

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

a) Send and reply protocols of the same function use the same command type;

b) For peripherals with many command types, when adding new command types, try to adopt the variable parameter method to reduce the command type occupation.

A.3 Description of General Protocols

A.3.1 Slave Electrical Instructions

See Table A.4 for instructions on slave power.

Table A.4 Instructions for slave power on board

Steps	Type of command	Description	User data	Data direction
1	01H	Power-on indication Answer	There is no	downgoing
2	01H	Power-on indication	There is no	Up

A.3.2 Peripheral Link Inquiry

Peripheral link polling instructions are shown in Table A.5.

Table A.5 Table of peripheral link poll instructions

Steps	Type of command	Description	User data	Data direction
1	02H	Link polling	Link maintenance time High byte first, low byte last; The high byte is in minutes (min) and the low byte is in seconds (s); It is recommended that the link polling time be 15s-30s. If the link times out, the master deregisters the slave	Uplink
2	02H	Link poll response	There is no	downgoing

A.3.3 Control from electrical power source

Instructions for slave power control are shown in Table A.6.

Table A.6 Slave power control instruction tabl

e

Steps	Type of command	Description	User data	Data direction
1	03H	Control from electrical power source	Control type: 0x00 -- Slave exits power saving mode; 0x01 -- Slave enters power saving mode	Downlink
2	03H	Control the response from the electromechanical source	Answer type: 0x01 -- Operation successful; 0x02 -- Operation failed (the slave machine because Unable to enter power saving mode or exit power saving under special circumstances Mode)	Up

A.3.4 Querying Slave Version Information

See Table A.7 for instructions for querying slave version information.

Table A.7 Instructions for querying slave version number information

Steps	Type of command	Description	User data	Data direction
1	04H	Example Query the version of a slave computer	There is no	downgoing
2	04H	Query slave version number information answer	Slave version number, WORD For example, 0x0207, indicates version 2.07	Going Up

A.3.5 Slave self-check

Instructions for slave self-test are shown in Table A.8.

Table A.8 Table of instructions for slave self-check

Steps	Type of command	Description	User data	Data direction
1	05H	Self check from machine	Self-check slave type, BYTE, as defined in Table A.2	Downlink
2	05H	Self-test results information	Self-test slave type, BYTE, as defined in Table A.2	Uplink
			Self-test results, BYTE 0x01: Self-test successful; 0x02: Self-test failed.	

Note: The timeout time of this instruction is 1s. If there is no response, it can be sent up to three times.

After receiving the self-test failure, the terminal will set the corresponding alarm sign and make voice prompt or screen display.

A.3.6 Slave Firmware Update

See Table A.9 for slave firmware update instructions.

Table A.9 Slave Firmware Update instruction table

Steps	Command type	Description	User data	Data direction

1	06H	Update slave Module FirmWare	Total packet number of messages, WORD	Downlink
			Packet serial number, WORD, starting at 1	
			Packet data, with a maximum length of 256 bytes	
2	06H	Confirmation information	Package serial number, WORD	Up
			Answer result, BYTE	

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

Note: The timeout period of this command is 1s. If there is no response, the maximum number of times is three.

A.3.7 Querying Peripheral Properties

See Table A.10 for instructions to query peripheral properties.

Table A.10 Query Peripheral Property instruction table

Steps	Type of command	Description	User data	Data direction
1	07H	Query peripheral properties	There is no	downgoing
2	07H	Example Query peripheral attribute response	Peripheral manufacturer number, 5 BYTE	Up
			Peripheral hardware version number, 3 BYTE	
			Peripheral software version number, 3 BYTE	

Note: Example version number, 0x010B02 indicates v1.12.2.

This instruction has a timeout period of 1s and can be resent up to three times if there is no response.

A.4 Description of Dedicated protocols

A.4.1 Road Transport License IC card authentication request

When the module detects that there is a card 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 road transport card IC card authentication request uplink command is automatically triggered.

Road transport card IC card certification request instruction is shown in Table A.11.

Table A.11 Road transport license IC card certification request instruction table

Steps	Type of command	Description	User data	Data direction
1	40H	IC card authentication request	Status bit, BYTE, 0x00: IC card read successfully; 0x01: The IC card is not inserted; 0x02: IC card failed to read the card; 0x03: Non-qualification IC card; 0x04: IC card is locked.	Up
			Data area (valid when status bit =0x00), basic card information and authent	

			ication information (64 bytes)	
2	40H	IC card authentication request answer	IC card authentication request response result, BYTE 0x00: Authentication request successfully completed; 0x01: Terminal is offline; 0x02: Terminal passthrough authentication center times out without response; 0x03: Terminal confirms receipt of message (IC card authentication please	Downlink

			Find the card when the result =0x01-0x04).	
			Data area (IC card authentication request response result =0x00 valid), IC card authentication request return verification data (24 bytes).	

Note: When the instruction is upstream and the status bit of the IC card authentication request is 0x00, the timeout time is 35S, and when the rest of the status and downlink, the timeout time is 1s. If there is no response, the maximum number of times is three.

A. When the status bit is 0x00, the terminal sends 64 bytes of basic card 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 circumstances.

a. When the IC card authentication request response result returned by the terminal to the card reading module is 0x00, the card reading module begins to read the card information, and then automatically starts 41H instruction to feedback the result to the terminal, the terminal voice prompts the driver the corresponding result, and uses the command 0x0702 to send the driver's identity information to the certification center and monitoring platform after reading the card successfully;

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

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

d. When the answer result of IC card authentication request returned by the terminal to the card reading module is 0x03, the process ends and the terminal voice prompts the driver with the corresponding result.

B. When the status bit of the terminal is not 0x00, the process ends and the voice prompts the driver with the corresponding result.

A.4.2 Road Transport License IC card reading result notification

Road transport license IC card reading result notification instruction is shown in Table A.12.

Table A.12 Road Transport license IC card reading result notification instruction table

procedure	Type of command	Description	User data	Data direction
1	41H	IC card read result notification	IC card read result, BYTE 0x00: The IC card reads the card successfully, and subsequent data is available; 0x01: Failed to read the card because the card key authentication failed. 0x02: Failed to read the card because the card has been locked. 0x03: Failed to read the card because the card was pulled out. 0x04: Read the card failed because of data verification error.	Going Up

			Data area (valid when IC card reads 0x00), driver identification information, see Table A.13.	
2	41H	Driver identification information received confirmation	There is no	downgoing

Note: This command has a timeout time of 1s, and can be sent up to three times if there is no response.

A. When the terminal receives the IC card reading result is 0x00, use the command 0x0702 to send the driver identity information to the authentication center and the home platform;

B. When the IC card read result is not 0x00, the terminal ends the process and voice prompts the driver to the corresponding result.

Table A.13 Driver Identity Information Table

Starting byte	Fields	Data type	Description and requirements
0	Driver name Length	BYTE	Length n
1	Driver's name	STRING	Driver's name

1+n	Qualification certificate number	STRING	The length is 20 characters
21+n	Length of issuing agency name	BYTE	Length m
22+n	Name of issuing authority	STRING	Name of the organization that issued the qualification certificate
22+n+m	Id validity period	BCD[4]	YYYYMMDD

A.4.3 Card Removal Notification

See Table A.14 for card Pull out notification instructions.

Table A.14 Card pull out notification instruction table

Steps	Type of command	Description	User data	Data direction
1	42H	Card pull out notification	There is no	Up
2	42H	Card pull out notification received confirmation	There is no	downgoing

Note: The timeout period of this command is 1s. If there is no response, the command can be sent up to three times.

The terminal uses the command 0x0702 to send the driver off-duty information to the certification center and monitoring platform when it receives the card withdrawal notification.

A.4.4 Actively trigger to read the IC card

See Table A.15 for active trigger reading IC card instructions.

Table A.15 Active trigger read IC card instruction table

Steps	Type of command	Description	User data	Data direction
1	43H	Active trigger read IC card	There is no	downgoing
2	43H	Active trigger read IC card confirmation information	There is no	Up

Note: This command has a timeout of 1s, and can be sent up to three times if there is no response. This command is used for terminal roll call, terminal offline or terminal upload IC card authentication information timeout, etc. After receiving this command, the card reading module automatically triggers 40H command to re-read the card.

Attached B

(Normative Appendix)

Message comparison table

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

Table B.1 Message comparison table

Serial Number	Message body name	Message ID	Serial number	Message body name	Message ID
1	Terminal Universal Reply	0x0001	24	Event Settings	0x8301
2	Platform Universal Answer	0x8001	25	Incident Report	0x0301
3	Terminal Heartbeat	0x0002	26	Question down	0x8302
4	Catch-up subcontracting request	0x8003	27	Question Answering	0x0302
5	Terminal Registration	0x0100	28	Info On Demand menu Settings	0x8303
6	Terminal Registration Answer	0x8100	29	Message on Demand/Cancel	0x0303
7	Terminal Logout	0x0003	30	Information Services	0x8304
8	Terminal Authentication	0x0102	31	Call back	0x8400
9	Set Terminal parameters	0x8103	32	Set up Phone Book	0x8401
10	Query terminal parameters	0x8104	33	Vehicle Control	0x8500
11	Query the terminal parameter response	0x0104	34	Vehicle Control Response	0x0500
12	Terminal Control	0x8105	35	Set the circle area	0x8600
13	Query the specified terminal parameters	0x8106	36	Delete circular area	0x8601
14	Querying Terminal Properties	0x8107	37	Set Rectangular area	0x8602
15	Query the terminal property response	0x0107	38	Delete Rectangular area	0x8603
16	Deliver the terminal upgrade package	0x8108	39	Set polygon area	0x8604
17	Terminal upgrade result notification	0x0108	40	Delete polygon area	0x8605
18	Location Info Reporting	0x0200	41	Set the route	0x8606
19	Location Information Query	0x8201	42	Delete Route	0x8607
20	Location information Query response	0x0201	43	Travel recorder data acquisition Command	0x8700
21	Temporary location Tracking Control	0x8202	44	Travel recorder data upload	0x0700
22	Manually confirm the alarm message	0x8203	45	Ride recorder parameters down command	0x8701

23	Text message to deliver	0x8300	46	Electronic waybill report	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 for upload	0x8803
48	Report a request for driver ID information	0x8702	59	Record Start Command	0x8804
49	Locate data bulk upload	0x0704	60	Single store multimedia data retrieval upload command	0x8805
50	CAN bus data upload	0x0705	61	Data downlink transparent transmission	0x8900
51	Multimedia event information Upload	0x0800	62	Uplink transparent transmission	0x0900
52	Multimedia Data Upload	0x0801	63	Data Compression Escalation	0x0901
53	Multimedia Data Upload answer	0x8800	64	Platform RSA Public Key	0x8A00
54	Camera Shoot Now command	0x8801	65	Terminal RSA Public Key	0x0A00
55	Camera immediately shot command answer	0x0805	66	Platform downlink message reserved	0x8F00~0x8FFF
56	Store multimedia data retrieval	0x8802	67	Terminal uplink message reserved	0x0F00~0x0FFF
57	Store multimedia data retrieval responses	0x0802			