GNSS system for operating vehicles—
General specifications for the communication protocol and data format of BD compatible vehicle terminal

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Preface

This specification is a complement and improvement of JT/T 808-2011 'T*erminal communication protocol and data format of road transport vehicle satellite positioning system*'. Compared with JT/T 808-2011, the main changes are as follows:

--The description of 5.2 'connection maintenance' in the communication connection is modified;

--The process description of 7.8.1 'collect the identity information data of driver' in the protocol classification is modified;

--The process description of 7.12 'sub-package messages' in the protocol classification is added;

--The content of the original chapter 8.4 'terminal registration', 8.8 'terminal parameters setting', 8.12 'location information reporting', 8.23 'text information sending', 8.28 'circle area setting', 8.36 'driving record data acquisition command', 8.37 'driving record data upload', 8.38 'driving record parameters request command', 8.40 'identity information of driver reported', 8.41 'multimedia event information upload', 8.42 'multimedia data upload', 8.43 'multimedia data upload response', 8.46 'storage multimedia data retrieval response', 8.49 'data downlink pass-through' and 8.50 'data uplink pass-through', etc in the data format is modified.

--Added 12 commands in the data format of 8.4 'sub-package requests', 8.11 'query the specified terminal parameter', 8.14 'query terminal attribute', 8.15 'query terminal attribute response', 8.16 'terminal upgrade package sending', 8.17 'notification of terminal upgrade result', 8.22 'manually confirm alarm message', 8.47 'report the driver's identity information request', 8.49 'location data batch upload', 8.50 'CAN bus data upload', 8.55 'camera immediately taken command response', 8.60 'single storage multimedia data retrieval and upload order, etc. The influenced chapter and table numbers are also adjusted.

--The contents of table A.2 'peripheral type number table', A.3 'command type table' in appendix A are modified.

--Added terminal host and peripheral communication protocol instructions of A.3.4 'query slave version number information', A.3.5 'slave self-check', A.3.6 'slave firmware update', A.3.7 'query peripheral attribute', A.4.1 'road transport certification IC card certificate request', A.4.2 'road transport certification IC card reading result notification', A.4.3 'card drawing notification', A.4.4 'active trigger reading IC card', etc in appendix A.

--The above changes correspond to the above changes in the table of information contrast in appendix B is modified.

This specification is submitted by the ministry of transport of the People's Republic of China. The drafting unit of this specification: China traffic communication information center.

The terminal communication protocol and data format of the road transport vehicle satellite positioning system

1. Scope

The specification provides 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 supervising/monitoring platform (hereinafter referred to as the platform). Including protocol base, communication connection, message processing, protocol classification, illustration and data format.

This specification is applicable to the communication between the road transport vehicle satellite positioning system beidou compatible vehicle terminal and platform.

2. Normative documents reference

The following documents are essential for the application of this document. Reference file that has a date, only the date that is indicated is applicable to this document. The latest version (including all of the modifications) of the undated reference file is applicable to this document.

GB/T 2260 Code of administrative division of the People's Republic of China

GB/T 19056 Vehicle tachograph

JT/T 415-2006 Road transport e-government platform cataloging encoding rules

JT/T 794 Vehicle terminal technical requirements for road transport vehicle satellite positioning system

3. Terms, definitions and abbreviations

3.1 Terms and definitions

The following terms and definitions are applied to this document.

3.1.1

Abnormal data communication link

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

3.1.2

Register

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

3.1.3

Logout

The terminal sends message to the platform informing to remove it from the installed vehicle.

3.1.4

Authentication

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

3.1.5

Location reporting strategy

Timing/distance interval reporting or both.

3.1.6

Location reporting program

The rules of periodic reporting interval are determined according to relevant conditions.

3.1.7

Additional points report while turning

The terminal reports the location information when it is judged that the vehicle is changing direction. Sampling frequency is not less than 1Hz, car azimuth rate not less than 15°/s, and continues for at least more than 3s.

3.1.8

Answering strategy

The rules of answering incoming calls automatically or manually.

3.1.9

SMS text alarm

When terminal alarm, send text message by SMS.

3.1.10

Event item

Event items are preset by the platform to the terminal, which consists of event encoding and event names. The driver operates the terminal when encounters the corresponding event, and the trigger event report is sent to the platform.

3.2 Abbreviations

The following abbreviations are applied to this document.

APN-- access point name

GZIP-- GNU zip

LCD-- liquid crystal display

RSA-- An asymmetric cryptographic algorithm (developed by Ron Rivest, Adi Shamirh and Len Adleman, RSA named from the first letter of the three people's name).

SMS-- short message service

TCP-- transmission control protocol

TTS-- text to speech

UDP-- user datagram protocol

VSS-- vehicle speed sensor

4. Protocol basis

4.1 Communication way

The communication way of this protocol should comply with the relevant provisions of JT/T 794. Communication protocol is either TCP or UDP, the platform serves as the server and the terminal as the client. When the data communication link is abnormal, the terminal can communicate by SMS message.

4.2 Data type

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

Table 1: data type

Data type	Descriptions and requirements
BYTE	No symbol single byte integer (bytes, 8 bits)
WORD	No symbol double byte integer (word, 16 bits)
DWORD	No symbol four-byte integer (double word, 32 bits)
BYTE[n]	n bytes
BCD[n]	8421 code, n bytes
STRING	GBK encode, if no data, set blank

4.3 Transmission rules

The protocol uses the network byte sequence of big-endian to deliver the word and double word. The transmission agreement is as follow:

--BYTE: transmitted in the form of byte stream;

--WORD: transmit the high 8 bits first, then the low 8 bits;

--DWORD: transmit the high 24 bits first, then the high 16 bits, at last the low 8 bits.

4.4 Constitution of messages

4.4.1 Message structure

Each message is made up of flag bit, header, message body and check code, the message structure diagram is shown in figure 1:

Flag bit	Header	Message body	Check code	Flag bit

Figure 1: message structure diagram

4.4.2 Flag bit

Use 0x7e to represent, if 0x7e appears in the check code, header and message body, it is to be escaped. The escape rules are defined as follows:

0x7e←→0x7d follows by a 0x02;

0x7d←→0x7d follows by a 0x01.

The escape process is as follows:

When sending message: message encapsulation→ calculate and fill the check code→ escape;

When receiving message: escape restore→ validate check code→ message parse.

e.g.:

Sending a data package of 0x30 0x7e 0x08 0x7d 0x55, the package is encapsulated as follows: 0x7e 0x30 7d 0x02 0x08 0x7d 0x01 0x55 0x7e.

4.4.3 Header

The header content is shown in table 2:

Table 2: Header content

Starting byte	Field	Data type	Descriptions and requirements
0	Message ID	WORD	
2	Message body attribute	WORD	See figure 2 for the message body attribute format structure diagram.
4	Terminal	BCD[6]	Converse according to the terminal's own mobile phone

	phone number		number after installation. Add number in the front if the mobile phone number is less than 12 bits, the mainland phone number add 0, and the Hong Kong, Macao and Taiwan is based on their domain code.
10	Message serial number	WORD	Loop accumulates from 0 according to sending sequence.
12	Message package encapsulation item		If the relevant identification bit in the message body attribute determines the message sub-packageing, this item has content, otherwise it is not.

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

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserve		Sub-package	Data encryption way			Length of the message body									

Figure 2: message body attribute format structure diagram

Data encryption way:

--bit 10~bit 12 is data encryption identification bit;

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

--When the tenth bit is 1, indicates the message body is encrypted by the RSA algorithm;

--Others reserved.

Sub-package:

When the 13th bit in the message body attribute is 1, indicates the message body is a long message, sub-package delivery. The specific sub-packageing information is determined by the message package encapsulation item. If the 13th bit is 0, there's no message package encapsulation item field in the message header.

The message package encapsulation item is shown in table 3:

Table 3: message package encapsulation item

Starting byte	Field	Data type	Descriptions and requirements
0	Total number of packages	WORD	The total number of packages after sub-packageing
2	Package No.	WORD	Starting from No.1

4.4.4 Check code

The check code refers to a byte from the beginning of the header, exclusive or with the next byte until the previous byte of the check code.

5. Communication connection

5.1 Connection startup

Data daily connections between terminals and platforms can be either TCP or UDP. Terminal should connect with the platform as soon as it reset, and then send terminal authenticate message to the platform for authentication immediately after the connection is established.

5.2 Maintenance of connection

After connection establishment and terminal authentication succeed and in the absence of normal data packages, the terminal should periodically send a terminal heartbeat message to the platform, the platform receives and sends the platform general reply message to the terminal. The sending period is specified by the terminal parameter.

5.3 Connection disconnected

Both the platform and the terminal can be disconnected according to the TCP protocol, and both platform and terminal should actively judge whether the TCP connection is disconnected.

Method of the platform determining the connection is disconnected:

--According to the TCP protocol, the terminal active disconnects is determined;

--A new connection is established from the same identity terminal indicating that the original connection has disconnected;

--Not receiving the message from the terminal within a certain amount of time, such as the terminal heartbeat.

Method of the terminal determining the connection is disconnected:

--According to the TCP protocol, the terminal active disconnects is determined;

--The data communication link is disconnected;

--The data communication link is normal, after reaching the retransmission times it still hasn't received a response.

6. Message processing

6.1 TCP and UDP message processing

6.1.1 Messages mainly send from the platform

All the messages mainly send from the platform require terminal responses. The responses are divided into general responses and specific responses, which are decided by the specific functions. After the sender waiting timeout should resend the message. The response timeout period and resend times are specified by the platform parameters. Formula of calculating the response timeout period after resend is shown in formula (1):

$$T_{N+1}=T_N\times(N+1) \qquad \text{……(1)}$$

In the formula:

T_{N+1}--Timeout period after each resend;

T_N--The previous response timeout period;

N--Resend times.

6.1.2 Messages mainly send from the terminal

6.1.2.1 The data communication link is normal

When the data communication link is normal, all the messages mainly send from the terminal require platform responses. The responses are divided into general responses and specific responses, which are decided by the specific functions. After the terminal is waiting timeout should resend the message. The response timeout period and resend times are specified by the platform parameters. The timeout period after resend is calculating according to formula (1). The key alarm message sent form the terminal will be stored if it is not received after the resend times is reached. Before sending other messages, it will send the stored key alarm message.

6.1.2.2 The data communication link is abnormal

When the data communication link is abnormal, the terminal should store the location information report that needs to be sent.

6.2 SMS message dispose

When the terminal communication mode is switched to the SMS message mode from GSM network, the PDU eight bit encoding method is adopted. For messages that more than 140 bytes should be sub-packageed according to the SMS service specification of GSM network.

The response, resend and store mechanism of SMS messages is the same as 6.1 while response timeout period and resend times should according to parameter ID0x0006 and 0x0007 related set values in table 10.

7. Protocol classification

7.1 Introduction

The protocol is described by functional classification as follow. If there's no special mention, the TCP communication is the default. The communication protocol between the vehicle terminal and the external equipment is shown in appendix A. The message comparison table of the message name and message ID in the protocol is shown in appendix B.

7.2 Terminal management protocol

7.2.1 Terminal registration/ logout

In the unregistered state, the terminal should be registered first. The terminal will receive the authentication code and store it after registration, the authentication code will be used when the terminal log in. Before the vehicle needs to be removed or replaced, the terminal should logout and cancels the corresponding relationship between the terminal and the vehicle.

If the terminal chooses to send the terminal registration and terminal logout by SMS, the platform should send response to the terminal registration via SMS, and send platform general response to the terminal logout by SMS.

7.2.2 Terminal authentication

After the registration of the terminal, each time after connected with the platform, should authenticate immediately. The terminal shall not send any other information before authentication success.

The terminal authentication via sending terminal authentication message, the platform responds platform general response message.

7.2.3 Set/query terminal parameters

The platform sets the terminal parameters by sending the terminal parameter message, and the terminal responds terminal general response message. The platform queries the terminal parameters by sending query terminal parameters, terminal responds query terminal parameter response message.

7.2.4 Terminal control

The platform controls the terminal by sending terminal control message, the terminal responds terminal general response message.

7.3 Location and alarm protocol

7.3.1 Location information report

The terminal will periodically send the location information report based on the parameters. According to the parameter control, the terminal can report the location information when the vehicle is turning.

7.3.2 Location information query

The platform queries the message by sending location information; query the location information of the car terminal, terminal query response message by responds location information.

7.3.3 Temporary location tracking control

The platform start/stop location tracking by sending temporary location tracking control. Location tracking requires period report at the specified time interval before the terminal stop, the terminal responds terminal general response message.

7.3.4 Terminal alarm

When the terminal determines the alarm condition is met, the location information will be reported. Set the corresponding alarm sign in the location report, the platform can be used for alarm processing by responds the platform general response message.

Each alarm type is described in the location information report message body. Alarm sign maintained to the alarm condition is removed should send location information report message immediately, to clear the corresponding alarm signs.

7.4 Information protocol

7.4.1 Text information sending

The platform sends out messages by sending text messages and notifies the driver in the specified way. The terminal responds terminal general response message.

7.4.2 Event setting and reporting

The platform sets the message by sending events, store the event list in the terminal, after encountering corresponding event, the driver can enter the event list interface to select and terminal send event report message to the platform.

Setting message by events requires the terminal to responds the terminal general response message. Event report message requires the platform to responds platform general response message.

7.4.3 Questions

The platform sends out message by sending questions, sends questions with candidate answers to the terminal and the terminal shows immediately. The terminal sends question response message to the platform after the driver selected.

Sends out question messages, requires terminal to responds terminal general response message.

7.4.4 Information on-demand

The message setting of the platform is set by sending message of menu on demand and platform send information on demand item list to the terminal for storage. Drivers can choose to select request/cancel corresponding information services via menu, after selection the terminal send request/cancel message to the platform. After the information service is requested it will receive information service message from the platform periodically such as news, weather forecast, etc. The information on-demand menu sets the message requires the terminal responds terminal

general response message. Information on-demand/cancel message requires the platform responds platform general response message. Information service message requires the terminal responds terminal general response message.

7.5 Telephone protocol

7.5.1 Call back

The platform demands the terminal to call back a designated telephone number through sending call back message and specifies whether to monitor or not (the terminal does not open the speaker).

Call back requires the terminal responds terminal general response message.

7.5.2 Set telephone directory

The platform sends setting telephone directory message to set terminal's telephone directory which requires the terminal responds terminal general response message.

7.6 Vehicle control protocol

The platform demands the terminal to control vehicle with corresponding operation via sending vehicle control message. Terminal responds terminal general response message as soon as the message received. After that terminal controls the vehicle and responds vehicle control response message according to the result.

7.7 Vehicle management protocol

The platform sets area and route of the terminal via sending: set circle area, rectangle area, polygon area, set the route message and so on. The terminal judge whether it is satisfied the alarm condition according to the attribute of area and route. The alarm includes over speed alarm, enter and exit the area/route alarm and driving time insufficient/too long alarm, the location information report message should cover additional corresponding location information.

The value range of area or route ID is 1~0XFFFFFFFF. If the set ID is repeated with a same type area or route ID which is already in the terminal, it will be update.

The platform can also delete the area and route that stored in the terminal through delete circle area, rectangle area, polygon area, route and so on.

Set/delete area and route message required the terminal responds terminal general response message.

7.8 Information collection protocol

7.8.1 Collect driver's identity information data

Insert the occupational qualification certificate IC card in to the terminal reading card module when driver starts driving, after the module detects the card through the sensor switch. The terminal forward the authentication request data to the road transport certificate IC card certification center via pass-through and pass the authentication result from the authentication center to reading card module. Reading card module read the occupational qualification certificate IC card via results of the certification, and upload the result through terminal to the certification center (both success and failure information) and attribution monitoring center (only successful information)

Pull out the IC card when driver finishes driving. The reading card module uploads relevant

information to the certification center and attribution monitoring center through terminal after it detects the card is gone via the sensor switch.

7.8.2 Collect electronic waybill data

Terminal collects electronic waybill and upload it to the platform.

7.8.3 Collect driving record data

The platform demands the terminal upload specified data through sending driving record data collection command message which requires the terminal responds driving record upload message.

7.8.4 Request driving record parameter

The platform demands the terminal upload specified data through sending driving record parameter request command message which requires the terminal responds terminal general response message.

7.9 Multimedia protocol

7.9.1 Multimedia event information uploading

The terminal active shooting or recording because of specific events should active upload multimedia event message immediately after the event happened and the message requires platform responds general response message.

7.9.2 Multimedia data upload

The terminal upload multimedia data through sending multimedia data upload message. Location data report message body while shooting and recording should be attached in the front of each complete multimedia data, which is called location multimedia data. The platform determines the receiving timeout based on the total package number, after receive the entire data package or timeout, the platform sends multimedia data upload response message to the terminal. This message confirms receive the entire data package or requires terminal resends the specified package.

7.9.3 Camera shot immediately

The platform sends shooting command through sending multimedia data upload message to the terminal. This message requires the terminal responds terminal general response message. If is assigned to be real time upload, the terminal upload image/video after shooting/camera recording, otherwise store the image/video.

7.9.4 Start recording

The platform sends recording command to the terminal through sending start recording command message which needs the terminal responds terminal general response message. If is assigned to be real time upload, the terminal upload audio data after recording, otherwise store the audio data.

7.9.5 Retrieve terminal storing and extracting multimedia data

The platform obtains the situation of the terminal stores multimedia data through sending storing and extracting multimedia data retrieve message.

According to the retrieval results, the platform can demand the terminal to upload specified multimedia data by sending storing and extracting multimedia upload message which needs the terminal to responds terminal general response message.

7.10 General data transfer

Message that undefined in the protocol but needs to be passed in the actual use can use data uplink pass-through message and data downlink pass-through message to do the up/downlink data exchange.

The terminal can compress the longer message with GZIP compression algorithm and report the message with data compression.

7.11 Encryption protocol

The RSA public key cryptosystem can be used to encrypt communication between the platform and the terminal. The platform informs the terminal of its RSA public key by sending platform RSA public key message, and the terminal responds terminal RSA public message, and vice versa.

7.12 Sub-package message

When the message is sent by sub-packageing, the sub-package messages serial number should be in continuous increments.

In response to sub-packageing messages, if there's no specific response instruction, the receiver can adopt a generic response to all sub-package messages or use a general answer for each sub-package message, the result field (success/failure) is used to tell the sender if all the sub-package messages are received correctly. When all sub-package messages are not received correctly, the receiver can demand the sender resend the missing sub-package message through the resend sub-package request command. The sender should use the original message to resend the sub-package in the resend package ID list, and the resend sub-package is identical to the original sub-package message.

8. Data format

8.1 Terminal general response

Message ID: 0x0001.

Terminal general response message body data format is shown in table 4.

Table 4: Terminal general response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	The serial number of the corresponding platform message
2	Response ID	WORD	The ID of the corresponding platform message
4	Result	BYTE	0: success/ok; 1: failure; 2: incorrect information; 3: not supporting

8.2 Platform general response

Message ID: 0x8001.

Platform general response message body data format is shown in table 5.

Table 5: Platform general response message body data format

Starting byte	Field	Data type	Descriptions and requirements

0	Response serial number	WORD	The serial number of the corresponding terminal message
2	Response ID	WORD	The ID of the corresponding terminal message
4	Result	BYTE	0: success/ok; 1: failure; 2: incorrect information; 3: not supporting; 4: alarm processing confirmation

8.3 Terminal heartbeat

Message ID: 0x0002.

Terminal heartbeat data message body is null.

8.4 Resend sub-package request

Message ID: 0x8003.

Resend sub-package request message body data format is shown in table 6.

Table 6: Resend sub-package request message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	The original message serial number	WORD	The serial number of the first package of the corresponding original message that is required to be resent
4	Total number of resend package	BYTE	n
5	Resend package ID list	BYTE[2*n]	In order of resend package sequence number, such as 'package ID1 package ID2… package IDn'

Noted: The response of this message should adopt original message to resend the sub-package of resend package ID list which is exactly the same as the original sub-package message.

8.5 Terminal registration

Message ID: 0x0100.

Terminal registration message body data format is shown in table 7.

Table 7: Terminal registration message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Province domain ID	WORD	Indicate the province where the terminal is installed, 0 is reserved, the default value is taken from the platform. The province domain ID adopts the first two of the six administrative division code specified in GB/T 2260.
2	City and county domain ID	WORD	Indicate the city and county where the terminal is installed, 0 is reserved, the default value is taken from the platform. The province domain ID adopts the last four of the six administrative division code specified in GB/T 2260.

4	Manufacturer ID	BYTE[5]	5 bytes, terminal manufacturer code
9	Terminal type	BYTE[20]	20 bytes, the terminal type is defined by the manufacturer, when the digit isn't sufficient, append '0X00'.
29	Terminal ID	BYTE[7]	7 bytes, consists of capital letters and numbers, the terminal ID is defined by the manufacturer, when the digit isn't sufficient, append '0X00'.
36	License plate color	BYTE	License plate color, according to 5.4.12 in JT/T415-2006. When the license hasn't registered, set the value as '0'.
37	VIN	STRING	When the license plate color is 0, indicates vehicle VIN (vehicle Identification Number); otherwise indicates the license plate issued by the public security traffic management department.

8.6 Terminal registration response

Message ID: 0x8100.

Terminal registration response message body data format is shown in table 8.

Table 8: Terminal registration response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	The serial number of the corresponding terminal registration message
2	Result	BYTE	0: success; 1: vehicle has already been registered; 2: there's no specified vehicle in database; 3: terminal has already been registered; 4: there's no specified terminal in database
3	The authentication code	STRING	The field is only display after success

8.7 Terminal logout

Message ID: 0x0003.

Terminal logout message body is null.

8.8 Terminal authentication

Message ID: 0x0102.

Terminal authentication message data format is shown in table 9.

Table 9: Terminal authentication message data format

Starting byte	Field	Data type	Descriptions and requirements
0	The authentication code	STRING	The terminal report authentication code after reconnect.

8.9 Terminal parameter setting

Message ID: 0x8103.

Terminal parameter setting message body data format is shown in table 10.

Table 10: Terminal parameter setting message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Total number of parameters	BYTE	
1	Parameter item list		Parameter item format is shown in table 11

Table 11: Terminal parameter item data format

Starting byte	Data type	Descriptions and requirements
Parameter ID	DWORD	Definition and instruction of parameter ID is shown in table 12
Length of parameter	BYTE	
Value of parameter		If it is multi-valued parameter, a number of parameters of a same ID are used in the message, such as dispatch center phone number

Table 12: Terminal parameter setting definition and instruction of each parameter

Parameter ID	Data type	Descriptions and requirements
0x0001	DWORD	Terminal heartbeat sending interval, unit is second (s)
0x0002	DWORD	Time of TCP message response time-out, unit is second (s)
0x0003	DWORD	Resend time of TCP message
0x0004	DWORD	Time of UDP message response time-out, unit is second (s)
0x0005	DWORD	Resend time of UDP message
0x0006	DWORD	Time of SMS message response time-out, unit is second (s)
0x0007	DWORD	Resend time of SMS message
0x0008-0x000F		Reserve
0x0010	STRING	Main server APN, wireless communication dials access point. If the network mode is CDMA, here is PPP dial number
0x0011	STRING	User name of main server wireless communication dialing
0x0012	STRING	Password of main server wireless communication dialing
0x0013	STRING	Address, ID or domain name of main server
0x0014	STRING	Backup server APN, wireless communication dials access point
0x0015	STRING	Backup server wireless communication dials user

		name
0x0016	STRING	Backup server wireless communication dials password
0x0017	STRING	Backup server address, IP or domain name
0x0018	DWORD	Server's TCP port
0x0019	DWORD	Server's UDP port
0x001A	STRING	Road transport certificate IC card authentication main server IP address or domain name
0x001B	DWORD	Road transport certificate IC card authentication main server TCP port
0x001C	DWORD	Road transport certificate IC card authentication main server UDP port
0x001D	STRING	Road transport certificate IC card authentication backup server IP address or domain name, port is same as main server
0x001E-0x001F		Reserve
0x0020	DWORD	Strategy of position reporting, 0: timing report; 1: report at a certain distance; 2: both timing and report at a certain distance
0x0021	DWORD	Scheme of position reporting, 0: according to the status of ACC; 1: according to the status of login and ACC, check the login status first, then the status of ACC
0x0022	DWORD	Report time intervals while the driver not login, unit is second (s), >0
0x0023-0x0026	DWORD	Reserve
0x0027	DWORD	Report time intervals during dormancy, unit is second (s), >0
0x0028	DWORD	Report time intervals during emergency alarm, unit is second (s), >0
0x0029	DWORD	Report time intervals when default, unit is second (s), >0
0x002A-0x002B	DWORD	Reserve
0x002C	DWORD	Report distance interval when default, unit is meter (m), >0
0x002D	DWORD	Report distance intervals while the driver not login, unit is meter (m), >0
0x002E	DWORD	Report distance intervals during dormancy, unit is meter (m), >0
0x002F	DWORD	Report distance intervals during emergency alarm, unit is meter (m), >0
0x0030	DWORD	Angle of the inflection point, <180
0x0031	WORD	Geo-fence radius (irregular displacement threshold), unit is meter

0x0032-0x003F		Reserve
0x0040	STRING	Phone number of the monitor platform
0x0041	STRING	Phone number of reset, which can be used to call terminal to reset it
0x0042	STRING	Phone number of factory reset, which can be used to call terminal to let the terminal restore factory setting
0x0043	STRING	SMS phone number of the monitor platform
0x0044	STRING	Number of receive terminal SMS text alarm
0x0045	DWORD	Strategy of terminal phone answering, 0: automatically answer; 1: automatically answer while ACC is ON, manually answer while ACC is OFF
0x0046	DWORD	The longest calling time each time, unit is second (s), 0 stands for not allowed to call, 0xFFFFFFFF stands for not limit
0x0047	DWORD	The longest calling time each month, unit is second (s), 0 stands for not allowed to call, 0xFFFFFFFF stands for not limit
0x0048	STRING	Phone number of monitor
0x0049	STRING	SMS number of regulatory platform privilege
0x004A-0x004F		Reserve
0x0050	DWORD	Alarm blocked field, corresponding to the alarm sign in the position information report message, the corresponding alarm is blocked when the corresponding field is 1
0x0051	DWORD	Alarm sending text , SMS switch, corresponding to the alarm sign in the position information report message, the corresponding SMS text of the alarm is sent when the corresponding field is 1
0x0052	DWORD	Alarm shooting switch, corresponding to the alarm sign in the position information report message, the camera shoot when alarm when the corresponding field is 1
0x0053	DWORD	Alarm shooting storage sign, corresponding to the alarm sign in the position information report message, store the pictures shoot when alarm when the corresponding field is 1, otherwise real-time upload
0x0054	DWORD	The key sign, corresponding to the alarm sign in the position information report message, the corresponding alarm is key alarm when the corresponding field is 1
0x0055	DWORD	The highest speed, unit is km/h
0x0056	DWORD	The duration of over-speed, unit is second (s)
0x0057	DWORD	Continuous driving time limit, unit is second (s)
0x0058	DWORD	Accumulated driving time of the same day, unit is

		second (s)
0x0059	DWORD	Minimum rest time, unit is second (s)
0x005A	DWORD	Maximum parking time, unit is second (s)
0x005B	WORD	The difference between over-speed alarm and warning, unit is 1/10Km/h
0x005C	WORD	The difference between fatigue driving alarm and warning, unit is second (s), >0
0x005D	WORD	Setting of collision alarm parameters: b7-b0: collision time, unit 4ms; b15-b8: collision acceleration, unit 0.1g, setting ranges between 0 and 79, the default is 10
0x005E	WORD	Setting of rollover alarm parameters: Angle of rollover, unit 1 degree, the default is 30 degrees
0x005F-0x0063		Reserve
0x0064	DWORD	Timing shooting control, shown in table 13
0x0065	DWORD	Shooting control at a certain distance, shown in table 14
0x0066-0x006F		Reserve
0x0070	DWORD	Quality of image/video, 1-10, 1 for the best
0x0071	DWORD	Brightness, 0-255
0x0072	DWORD	Contrast, 0-127
0x0073	DWORD	Saturability, 0-127
0x0074	DWORD	Chromaticity, 0-255
0x0075-0x007F		
0x0080	DWORD	Vehicle odometer reading, 1/10km
0x0081	WORD	Province domain ID of vehicle
0x0082	WORD	City domain ID of vehicle
0x0083	STRING	Registration number of motor vehicle issued by public security traffic management department
0x0084	BYTE	The license plate color, according to 5.4.12 in JT/T415-2006
0x0090	BYTE	Definition of GNSS positioning mode is 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	Definition of GNSS baud rate is as follows: 0x00: 4800; 0x01: 9600; 0x02: 19200; 0x03: 38400; 0x04: 57600; 0x05: 115200

0x0092	BYTE	Definition of GNSS module detailed location data output frequency is as follows: 0x00: 500ms; 0x01: 1000ms (default); 0x02: 2000ms; 0x03: 3000ms; 0x04: 4000ms
0x0093	DWORD	GNSS module detailed location data collect frequency, unit is second, default is 1
0x0094	BYTE	Upload mode of GNSS module detailed location data: 0x00, local storage, do not upload (default); 0x01, upload in time interval; 0x02, upload in distance interval; 0x0B, upload in accumulative time, automatically stop uploading after reaching transmission time; 0x0C, upload in accumulative distance, automatically stop uploading after reaching a certain distance 0x0D, upload in accumulative number of data, automatically stop uploading after reaching the number of uploads
0x0095	DWORD	Upload setting of GNSS module detailed location data: when upload mode is 0x01, unit is second; when upload mode is 0x02, unit is meter; when upload mode is 0x0B, unit is second; when upload mode is 0x0C, unit is meter; when upload mode is 0x0D, unit is item
0x0100	DWORD	CAN bus channel 1 collect time interval (ms), 0 for don't collect
0x0101	WORD	CAN bus channel 1 upload time interval (s), 0 for don't upload
0x0102	DWORD	CAN bus channel 2 collect time interval (ms), 0 for don't collect
0x0103	WORD	CAN bus channel 2 upload time interval (s), 0 for don't upload
0x0110	BYTE[8]	Separate collection setting of CAN bus ID: bit63-bit32 stand for collect time interval (ms) of this ID, 0 for don't collect; bit31 for CAN channel number, 0: CAN1, 1: CAN2; bit30 is frame type, 0: standard frame, 1: extended frame; bit29 for data collection way, 0: the original data, 1: the calculated value of the collection interval; bit28-bit0 for CAN bus ID
0x0111-0x01FF	BYET[8]	For other CAN bus ID separately collect settings
0xF000-0xFFFF		User defined

Table 13: Definition of timing shooting control bit

Bit	Definition	Descriptions and requirements
0	Camera channel 1 timing shooting switch sign	0: not allowed; 1: allowed
1	Camera channel 2 timing shooting switch sign	0: not allowed; 1: allowed
2	Camera channel 3 timing shooting switch sign	0: not allowed; 1: allowed
3	Camera channel 4 timing shooting switch sign	0: not allowed; 1: allowed
4	Camera channel 5 timing shooting switch sign	0: not allowed; 1: allowed
5-7	Reserve	
8	Camera channel 1 timing shooting storage sign	0: store; 1: upload
9	Camera channel 2 timing shooting storage sign	0: store; 1: upload
10	Camera channel 3 timing shooting storage sign	0: store; 1: upload
11	Camera channel 4 timing shooting storage sign	0: store; 1: upload
12	Camera channel 5 timing shooting storage sign	0: store; 1: upload
13-15	Reserve	
16	Timing time unit	0: second, when less than 5s, terminal processed as 5s; 1: minute
17-31	Timing time interval	Execute after receiving parameter settings or restart

Table 14: Definition of certain distance shooting control bit

Bit	Definition	Descriptions and requirements
0	Camera channel 1 certain distance shooting switch sign	0: not allowed; 1: allowed
1	Camera channel 2 certain distance shooting switch sign	0: not allowed; 1: allowed
2	Camera channel 3 certain distance shooting switch sign	0: not allowed; 1: allowed
3	Camera channel 4 certain distance shooting switch sign	0: not allowed; 1: allowed
4	Camera channel 5 certain distance shooting switch sign	0: not allowed; 1: allowed
5-7	Reserve	
8	Camera channel 1 certain distance shooting storage sign	0: store; 1: upload
9	Camera channel 2 certain distance shooting storage sign	0: store; 1: upload
10	Camera channel 3 certain distance shooting storage sign	0: store; 1: upload
11	Camera channel 4 certain distance shooting storage sign	0: store; 1: upload
12	Camera channel 5 certain distance shooting storage sign	0: store; 1: upload
13-15	Reserve	

16	Certain distance unit	0: meter, when less than 100m, terminal processed as 100m; 1: kilometer
17-31	Certain distance interval	Execute after receiving parameter settings or restart

8.10 Check terminal parameter

Message ID: 0x8104.

Check terminal parameter message body is null.

8.11 Check specified terminal parameters

Message ID: 0x8106.

Check specified terminal parameters message body data format is shown in table 15, terminal use 0x0104 instructions for response.

Table 15: Check specified terminal parameters message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Total number of parameter	BYTE	Total number of parameter is n
1	Parameter ID list	BYTE[4*n]	Arrange in order of parameter, e.g. 'parameter ID1 parameter ID2……parameter IDn'

8.12 Check terminal parameter response

Message ID: 0x0104.

Check terminal parameter response message body data format is shown in table 16.

Table 16: Check terminal parameter response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Check message serial number of corresponding terminal parameter
2	Number of response parameter	BYTE	
3	Parameter item list		Parameter item format and definition is shown in table 10

8.13 Terminal control

Message ID: 0x8105.

Terminal control message body data format is shown in table 17.

Table 17: Terminal control message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Command	BYTE	Terminal control command instruction is shown in table 18
1	Command parameter	STRING	Command parameter format see below for

			details, each field is separated by a half angle ‘;’, each STRING field is processed with GBK encoding before the message is composed

Table 18: Terminal control command instruction

Command	Command parameter	Descriptions and requirements
1	Command parameter format is shown in table 19	Wireless upgrade. The parameters are separated by semicolons. Instructions are as follows: ‘URL address; dial peers name; dial-up username; dial-up password; address; TCP port; UDP port; manufacturers ID; hardware version; firmware version; time limit of connect to the specified server’, if a parameter has no value, it’s empty.
2	Command parameter format is shown in table 19	The control terminal connects to the specified server. The parameters are separated by semicolons. Instructions are as follows: ‘connection control; authentication code of monitor platform; dial peers name; dial-up username; dial-up password; address; TCP port; UDP port; time limit of connect to the specified server’, if a parameter has no value, it’s empty; if the connection control value is 1, there’s no subsequent parameter
3	null	Terminal power off
4	null	Terminal reset
5	null	Terminal factory reset
6	null	Turn off data communication
7	null	Close all wireless communication

Table 19: Command parameter format

Field	Data type	Descriptions and requirements
Connection control	BYTE	0: switch to the specified monitoring platform server, enter the emergency status after connect to the server. In this status, only the supervisory platform with the control instruction can send the control instructions including SMS; 1: switch back to the original default monitoring platform server and return to normal
Dial peers name	STRING	It is typically the server APN, wireless dial-up access point. If the network mode is CDMA, the value is the PPP connection dial number
Dial-up username	STRING	Server wireless communication dial-up username
Dial-up password	STRING	Server wireless communication dial-up password
Address	STRING	Server address, IP or domain name
TCP port	WORD	Server TCP port
UDP port	WORD	Server UDP port
Manufacturers ID	BYTE[5]	Terminal manufacturers code
Authentication code of	STRING	The authentication code issued by the regulatory

monitor platform		platform, only used for authentication after terminal connects to the regulatory platform. Terminal use original authentication code after connect to the original monitoring platform
Hardware version	STRING	The hardware version number of the terminal, is determined by the manufacturer
Firmware version	STRING	The firmware version number of the terminal, is determined by the manufacturer
URL address	STRING	Complete URL address
Time limit of connect to the specified server	WORD	Unit: minute, if the value isn't 0 indicates that the terminal should be returned to the original address before the terminal receives an upgrade or an instruction of connect to the specified server. If the value is 0 indicates connect to the specified server all the time.

8.14 Check terminal attribute

Message ID: 0x8107.

Check terminal attribute message body is null.

8.15 Check terminal attribute response

Message ID: 0x0107.

Check terminal attribute response message body data format is shown in table 20.

Table 20: Check terminal attribute response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Terminal type	WORD	bit0, 0: passenger vehicles are not applicable, 1: passenger vehicles are applicable; bit1, 0: dangerous goods vehicles are not applicable, 1: dangerous goods vehicles are applicable; bit2, 0: ordinary freight vehicles are not applicable, 1: ordinary freight vehicles are applicable; bit3, 0: rental cars are not applicable, 1: rental cars are applicable; bit6, 0: hard disk video is not supported, 1: hard disk video is supported; bit7, 0: all-in-one machine, 1: split machine
2	Manufacturers ID	BYTE[5]	5 bytes, terminal manufacturer code
7	Terminal model	BYTE[20]	20 bytes, this terminal model is determined by manufacturer, when the digit isn't sufficient, append '0X00'
27	Terminal ID	BYTE[7]	7 bytes, consists of capital letters and numbers,

			this terminal ID is determined by manufacturer, when the digit isn't sufficient, append '0X00'
42	Terminal SIM card ICCID	BCD[10]	Terminal SIM card ICCID number
52	Length of the terminal hardware version No.	BYTE	n
53	The terminal hardware version No.	STRING	
53+n	Length of the terminal firmware version No.	BYTE	m
54+n	The terminal firmware version No.	STRING	
54+n+m	GNSS module attribute	BYTE	bit0, 0: GPS positioning is not supported, 1: GPS positioning is supported; bit1, 0: Beidou positioning is not supported, 1: Beidou positioning is supported; bit2, 0: GLONASS positioning is not supported; 1: GLONASS positioning is supported; bit3, 0: Galileo positioning is not supported; 1: Galileo positioning is supported
55+n+m	Communication module attribute	BYTE	bit0, 0: GPRS communication is not supported, 1: GPRS communication is supported; bit1, 0: CDMA communication is not supported, 1: CDMA communication is supported; bit2, 0: TD-SCDMA communication is not supported, 1: TD-SCDMA communication is supported; bit3, 0: WCDMA communication is not supported, 1: WCDMA communication is supported; bit4, 0: CDMA2000 communication is not supported, 1: CDMA2000 communication is supported; bit5, 0: TD-LTE communication is not supported, 1: TD-LTE communication is supported; bit7, 0: other communication way is not supported, 1: other communication way is supported

8.16 Send down terminal update packet

Message ID: 0x8108.

Send down terminal update packet message body data format is shown in table 21. The terminal uses a general response for the command to verify that the upgrade packet data is received correctly.

Table 21: Send down terminal update packet message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Upgrade type	BYTE	0: terminal, 12: road transport certificate IC card reader, 52: Beidou satellite positioning module
1	Manufacturer ID	BYTE[5]	Manufacturer serial number
6	Length of version No.	BYTE	n
7	Version No.	STRING	
7+n	Length of upgrade packet	DWORD	Unit is byte
11+n	Upgrade packet		

8.17 Notification of terminal upgrades results

Message ID: 0x0108.

Terminal uses this command to notify monitoring center after upgrade completes and reconnects.

Notification of terminal upgrades results message body data format is shown in table 22.

Table 22: Notification of terminal upgrades results message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Upgrade type	BYTE	0: terminal, 12: road transport certificate IC card reader, 52: Beidou satellite positioning module
1	Upgrade result	BYTE	0: success, 1: failure, 2: cancel

8.18 Location information report

Message ID: 0x0200.

Location information report message body is composed of location basic information and location additional information item list, the message structure diagram is shown in figure 3:

Location basic information	Location additional information item list

Figure 3: Location report message structure diagram

Location additional information item list is composed of each location additional information items or not, it's determines by the length field in the header.

Location basic information data format is shown in table 23.

Table 23: Location basic information data format

Starting byte	Field	Data type	Descriptions and requirements
0	Alarm sign	DWORD	Definition of alarm sign bit is shown in table 24
4	Status	DWORD	Definition of status bit is shown in table 25
8	Latitude	DWORD	Unit is degree, times the sixth power of 10, accurate to one millionth degree
12	Longitude	DWORD	Unit is degree, times the sixth power of 10, accurate to one millionth degree
16	Altitude	WORD	Altitude, unit is meter (m)

18	Speed	WORD	1/10km/h
20	Direction	WORD	0-359, due north is 0, clockwise
22	Time	BCD[6]	YY-MM-DD-hh-mm-ss (GMT+8 time, the time involved in this standard is in this time zone)

Table 24: Definition of alarm sign bit

Bit	Definition	Processing specification
0	1: Emergency alarm, trigger after triggering alarm switch	Zero clearing after receive the response
1	1: Over speed alarm	The sign is maintained until the alarm condition is relieved
2	1: Driving alarm malfunction	The sign is maintained until the alarm condition is relieved
3	1: Risk warning	Zero clearing after receive the response
4	1: GNSS module malfunction	The sign is maintained until the alarm condition is relieved
5	1: GNSS antenna was not connected or cut	The sign is maintained until the alarm condition is relieved
6	1: GNSS antenna short circuited	The sign is maintained until the alarm condition is relieved
7	1: The terminal main power undervoltage	The sign is maintained until the alarm condition is relieved
8	1: The terminal main power is turned off	The sign is maintained until the alarm condition is relieved
9	1: Terminal LCD or display malfunction	The sign is maintained until the alarm condition is relieved
10	1: TTS module malfunction	The sign is maintained until the alarm condition is relieved
11	1: Camera malfunction	The sign is maintained until the alarm condition is relieved
12	1: Road transport certificate IC card module malfunction	The sign is maintained until the alarm condition is relieved
13	1: Over speed warning	The sign is maintained until the alarm condition is relieved
14	1: Fatigue driving warning	The sign is maintained until the alarm condition is relieved
15-17	Reserve	
18	1: The accumulated over speed driving time of the day	The sign is maintained until the alarm condition is relieved
19	1: Timeout parking	The sign is maintained until the alarm condition is relieved
20	1: Enter and exit the area	Zero clearing after receive the response
21	1: Enter and exit the route	Zero clearing after receive the response

22	1: The driving time of the route is not enough/too long	Zero clearing after receive the response
23	1: Off track alarm	The sign is maintained until the alarm condition is relieved
24	1: Vehicle VSS malfunction	The sign is maintained until the alarm condition is relieved
25	1: Abnormal fuel capacity of vehicle	The sign is maintained until the alarm condition is relieved
26	1: The vehicle is stolen (through vehicle burglar alarm)	The sign is maintained until the alarm condition is relieved
27	1: Illegal ignition of vehicle	Zero clearing after receive the response
28	1: Illegal displacement of vehicle	Zero clearing after receive the response
29	1: Collision warning	The sign is maintained until the alarm condition is relieved
30	1: Rollover warning	The sign is maintained until the alarm condition is relieved
31	1: Illegal open doors alarm (when the terminal not set up, it's not judged illegal open doors)	Zero clearing after receive the response

Noted: The location information should be reported as soon as alarm and warning occurs.

Table 25: Definition of status bit

Bit	Status
0	0: ACC off; 1: ACC on
1	0: Not positioning; 1: Positioning
2	0: North latitude; 1: South latitude
3	0: East longitude; 1: West longitude
4	0: Running status; 1: Stop running status
5	0: Latitude and longitude are not encrypted by secret plug-ins; 1: Latitude and longitude are encrypted by secret plug-ins
6-7	Reserve
8-9	00: Empty load; 01: Half load; 02: Reserve; 3: Full load (It can be used for empty/heavy passenger car and empty/full load status of the truck, manual input or sensor acquisition)
10	0: Vehicle oil line is normal; 1: Vehicle oil line disconnect
11	0: Vehicle circuit is normal; 1: Vehicle circuit disconnect
12	0: Vehicle door unlocked; 1: Vehicle door locked
13	0: Door 1 close; 1: Door 1 open (front door)
14	0: Door 2 close; 1: Door 2 open (middle door)
15	0: Door 3 close; 1: Door 3 open (back door)
16	0: Door 4 close; 1: Door 4 open (door of driver's seat)

17	0: Door 5 close; 1: Door 5 open (user-defined)
18	0: No GPS positioning; 1: GPS positioning
19	0: No Beidou positioning; 1: Beidou positioning
20	0: No GLONASS positioning; 1: GLONASS positioning
21	0: No Galileo positioning; 1: Galileo positioning
22-31	Reserve

Noted: The location information should be reported as soon as status changes.

Location additional information item format is shown in table 26.

Table 26: Location additional information item format

Field	Data type	Descriptions and requirements
Additional information ID	BYTE	1-255
Length of additional information	BYTE	
Additional information		Definition of additional information is shown in table 27

Table 27: Definition of additional information

Additional information ID	Length of additional information	Descriptions and requirements
0x01	4	Mileage, DWORD, 1/10km, corresponding to the odometer reading of the car
0x02	2	Fuel capacity, WORD, 1/10L, corresponding to the fuel gauge of the car
0x03	2	Speed from the driving record function, WORD, 1/10km/h
0x04	2	Alarm event ID needs manual confirmation, WORD, count from 1
0x05-0x10		Reserve
0x11	1 or 5	Over speed alarm additional information is shown in table 28
0x12	6	Enter and exit the area/route alarm additional information is shown in table 29
0x13	7	The driving time of the route is not enough/too long alarm additional information is shown in table 30
0x14-0x24		Reserve
0x25	4	Expand vehicle signal status bit, definition is shown in table 31
0x2A	2	I
0x2B	4	Analog, bit0-15, AD0 bit16-31, AD1
0x30	1	BYTE, strength of wireless communication network signal
0x31	1	BYTE, GNSS positioning satellite number
0xE0	Length of the subsequent information	Length of the subsequent custom information
0xE1-0xFF		Custom area

Table 28: Over speed alarm additional information message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Location type	BYTE	0: No specific position; 1: Circle area; 2: Rectangle area; 3: Polygon area; 4: Route
1	Area or route ID	DWORD	There's no this field if location type is 0

Table 29: Enter and exit the area/route alarm additional information message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Location type	BYTE	1: Circle area; 2: Rectangle area; 3: Polygon area; 4: Route
1	Area or route ID	DWORD	
5	Direction	BYTE	0: In 1: Out

Table 30: The driving time of the route is not enough/too long alarm additional information message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Route ID	DWORD	
4	Driving time of the route	WORD	Unit is second (s)
6	Result	BYTE	0: Not enough; 1: Too long

Table 31: Expand vehicle signal status bit

Bit	Definition
0	1: Low beam signal
1	1: High beam signal
2	1: Right indicator signal
3	1: Left indicator signal
4	1: Brake signal
5	1: Reverse signal
6	1: Fog light signal
7	1: Outline marker lamps
8	1: Trumpet signal
9	1: Air-conditioner status
10	1: Neutral gear signal
11	1: Retarder operation

12	1: ABS operation
13	1: Heater operation
14	1: Clutch status
15-31	Reserve

Table 32: IO status bit

Bit	Definition
0	1: Deep dormancy
1	1: Dormancy
2-15	Reserve

8.19 Location information query

Message ID: 0x8201.

Location information query message body is null.

8.20 Location information query response

Message ID: 0x0201.

Location information query response message body data format is shown in table 33.

Table 33: Location information query response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Serial number of corresponding location information query message
2	Location information report		Location information report is shown in 8.21

8.21 Temporary location tracking control

Message ID: 0x8202.

Temporary location tracking control message body data format is shown in table 34.

Table 34: Temporary location tracking control message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Time interval	WORD	Unit is second (s), stop tracking if is 0 which does not need to carry a subsequent field
2	Location tracking validity	DWORD	Unit is second (s), after received location tracking control message, terminal sends location report according to the time interval from the message before validity

8.22 Manually confirm alarm message

Message ID: 0x8203

Manually confirm alarm message body data format is shown in table 35.

Table 35: Manually confirm alarm message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Alarm message serial number	WORD	Alarm message serial number needs to be confirmed manually, 0 for all messages of

			this type of alarm
2	Manually confirm alarm type	DWORD	Definition is shown in table 36

Table 36: Definition of manually confirm alarm type

Bit	Definition
0	1: Confirm emergency alarm
1-2	Reserve
3	1: Confirm risk warning
4-19	Reserve
20	1: Confirm enter and exit area alarm
21	1: Confirm enter and exit route alarm
22	1: Confirm driving time of route not enough/too long alarm
23-26	Reserve
27	1: Confirm vehicle illegal ignition alarm
28	1: Confirm vehicle illegal displacement alarm
29-31	Reserve

8.23 Send down text information

Message ID: 0x8300.

Send down text information message body data format is shown in table 37.

Table 37: Send down text information message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Sign	BYTE	Definition of text information sign bit is shown in table 38
1	Text information	STRING	The maximum is 1024 bytes, coded by GBK

Table 38: Definition of text information sign bit

Bit	Sign
0	1: Emergency
1	Reserve
2	1: Display by terminal displayer
3	1: Terminal TTS reading
4	1: Display by advertising screen
5	0: Central navigation information; 1: CAN fault code information
6-7	Reserve

8.24 Event setting

Message ID: 0x8301.

Event setting message body data format is shown in table 39.

Table 39: Event setting message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Setting type	BYTE	0: Delete all existing events from the

			terminal, this command does not carry a subsequent byte; 1: Upgrade events; 2: Append events; 3: Modify events; 4: Delete specific events, there's no need to carry event content in the follow event item
1	Total number of setting	BYTE	
2	Event item list		Composition of event item data format is shown in table 40

Table 40: Composition of event item data format

Starting byte	Field	Data type	Descriptions and requirements
0	Event ID	BYTE	Overwritten if the terminal has an event with a same ID
1	Length of event content	BYTE	Byte length of subsequent event content field
2	Event content	STRING	Event content, coded by GBK

8.25 Event report

Message ID: 0x0301.

Event report message body data format is shown in table 41.

Table 41: Event report message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Event ID	BYTE	

8.26 Question sends down

Message ID: 0x8302.

Question sends down message body data format is shown in table 42.

Table 42: Question sends down message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Sign	BYTE	Definition of question sends down sign bit is shown in table 43
1	Length of the question	BYTE	Byte length of question field
2	Question	STRING	Question text, coded by GBK, length is N
2+N	List of candidate answer		Composition of candidate answer message is shown in table 44

Table 43: Definition of question sends down sign bit

Bit	Sign
0	1: Emergency
1	Reserve

2	Reserve
3	1: Terminal TTS reading
4	1: Display by advertising screen
5-7	Reserve

Table 44: Composition of question sends down candidate answer message

Starting byte	Field	Data type	Descriptions and requirements
0	Answer ID	BYTE	
1	Length of answer content	WORD	Byte length of answer content field
3	Answer content	STRING	Answer content, coded by GBK

8.27 Question response

Message ID: 0x0302.

Question response message body data format is shown in table 45.

Table 45: Question response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Serial number of corresponding question sends down message
2	Answer ID	BYTE	Answer ID comes with question sends down

8.28 Information on-demand menu setting

Message ID: 0x8303.

Information on-demand menu setting message body data format is shown in table 46.

Table 46: Information on-demand menu setting message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Setting type	BYTE	0: Delete all information item of terminal; 1: Upgrade menu; 2: Append menu; 3: Modify menu
1	Total number of information item	BYTE	
2	List of information item		Composition of information on-demand information item data format is shown in table 47

Table 47: Composition of information on-demand information item data format

Starting byte	Field	Data type	Descriptions and requirements
0	Information type	BYTE	Overwritten if the terminal has same type of information item
1	Length of information name	WORD	Byte length of information name field
3	Information name	STRING	Coded by GBK

8.29 Information on-demand/cancels

Message ID: 0x0303.

Information on-demand/cancels message body data format is shown in table 48.

Table 48: Information on-demand/cancels message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Information type	BYTE	
1	on-demand/cancel sign	BYTE	0: Cancel; 1: On-demand

8.30 Information service

Message ID: 0x8304.

Information service message body data format is shown in table 49.

Table 49: Information service message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Information type	BYTE	
1	Information length	WORD	
3	Information content	STRING	Coded by GBK

8.31 Call back

Message ID: 0x8400.

Call back message body data format is shown in table 50.

Table 50: Call back message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Sign	BYTE	0: Ordinary calls; 1: Monitoring
1	Phone number	STRING	The maximum is 20 bytes

8.32 Phone book setting

Message ID: 0x8401.

Phone book setting message body data format is shown in table 51.

Table 51: Phone book setting message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Setting type	BYTE	0: Delete all the contacts that stored in the terminal; 1: Update phone book (delete all the contacts in the terminal, and append contacts from the message); 2: Append phone book; 3: Modify phone book (indexed with contact)
1	Total number of contacts	BYTE	
2	Contact item		Phone book contact item data format is shown in table 52

Table 52: Phone book contact item data format

Starting byte	Field	Data type	Descriptions and requirements
0	Sign	BYTE	1: Incoming call; 2: Outgoing call; 3: Incoming/outgoing call
1	Length of numbers	BYTE	
2	Phone numbers	STRING	Length is n
2+n	Length of contacts	BYTE	
3+n	Contacts	STRING	Coded by GBK

8.33 Vehicle control

Message ID: 0x8500

Vehicle control message body data format is shown in table 53.

Table 53: Vehicle control message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Control sign	BYTR	Control command sign bit data format is shown in table 54

Table 54: Control command sign bit data format

Bit	Sign
0	0: Car doors unlocked; 1: Car doors locked
1-7	Reserve

8.34 Vehicle control response

Message ID: 0x0500.

Vehicle control response message body data format is shown in table 55.

Table 55: Vehicle control response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Serial number in corresponding to the vehicle control message
2	Location information report message body		Determine whether the control is successful or not according to the corresponding status bit

8.35 Setting circle area

Message ID: 0x8600.

Setting circle area message body data format is shown in table 56

Noted: This message protocol

Table 56: Setting circle area message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Setting attribute	BYTE	0: Upgrade area; 1: Append area; 2: Modify area
1	Total number of	BYTE	

	areas		
2	Area item		Content of circle area's area item data format is shown in table 57

Table 57: Content of circle area's area item data format

Starting byte	Field	Data type	Descriptions and requirements
0	Area ID	DWORD	
4	Area attribute	WORD	Definition of area attribute is in table 58
6	Latitude of central point	DWORD	The unit of latitude is degree, times the sixth power of 10, accurate to one millionth degree
10	Longitude of central point	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
14	Radius	DWORD	Unit is meter (m), route is the turning point to the next turning point
18	Starting time	BCD[6]	YY-MM-DD-hh-mm-ss, this field is null if the 0 bit of the area attribute is 0
24	Ending time	BCD[6]	YY-MM-DD-hh-mm-ss, this field is null if the 0 bit of the area attribute is 0
30	Maximum speed	WORD	Km/h, this field is null if the 1 bit of the area attribute is 0
32	Over speed duration	BYTE	Unit is second(s) (similar expression in the area, same modify as before), this field is null if the 1 bit of the area attribute is 0

Table 58: Definition of area's area attribute

Bit	Sign
0	1: Area time
1	1: Speed limit
2	1: Alert to driver when enter the area
3	1: Alert to the platform when enter the area
4	1: Alert to driver when exit the area
5	1: Alert to the platform when exit the area
6	0: North latitude; 1: South latitude
7	0: East longitude; 1: West longitude
8	0: Open doors allowed; 1: Open doors forbidden
9-13	Reserve
14	0: Open communication module when enter the area; 1: Close communication module when enter the area
15	0: Not collect GNSS detailed location data when enter the area; 1: Collect GNSS detailed location data when enter the area

8.36 Delete circle area

Message ID: 0x8601.

Delete circle area message body data format is shown in table 59.

Table 59: Delete circle area message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Number of areas	BYTE	The number of areas in this message is no more than 125. Multiple messages are recommended if more than 125. 0 stands for delete all the circle areas
1	Area ID1	DWORD	
	……	DWORD	
	Area IDn	DWORD	

8.37 Setting rectangle area

Message ID: 0x8602.

Setting rectangle area message body data format is shown in table 60.

Table 60: Setting rectangle area message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Setting attribute	BYTE	0: Upgrade area; 1: Append area; 2: Modify area
1	Total number of areas	BYTE	
2	Area item		Rectangle area's area item data format is shown in table 61

Table 61: Rectangle area's area item data format

Starting byte	Field	Data type	Descriptions and requirements
0	Area ID	DWORD	
4	Area attribute	WORD	Definition of area attribute is in table 58
6	Latitude of top left point	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
10	Longitude of top left point	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
14	Latitude of bottom right point	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
18	Longitude of bottom right point	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
22	Starting time	BCD[6]	Same as the time range setting of circle area
28	Ending time	BCD[6]	Same as the time range setting of circle area

34	Maximum speed	WORD	Unit is km/h, this field is null if the 1 bit of area attribute is 0
36	Over speed duration	BYTE	Unit is second (s), this field is null if the 1 bit of area attribute is 0

8.38 Delete rectangle area

Message ID: 0x8603.

Delete rectangle area message body data format is shown in table 62.

Table 62: Delete rectangle area message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Number of areas	BYTE	The number of areas in this message is no more than 125. Multiple messages are recommended if more than 125. 0 stands for delete all the circle areas
1	Area ID1	DWORD	
	……	DWORD	
	Area IDn	DWORD	

8.39 Setting polygon area

Message ID: 0x8604.

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

Table 63: Setting polygon area message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Area ID	DWORD	
4	Area attribute	WORD	Definition of area attribute is in table 58
6	Starting time	BCD[6]	Same as the time range setting of circle area
12	Ending time	BCD[6]	Same as the time range setting of circle area
18	Maximum speed	WORD	Unit is km/h, this field is null if the 1 bit of area attribute is 0
20	Over speed duration	BYTE	Unit is second (s), this field is null if the 1 bit of area attribute is 0
21	Total vertex number of the area	WORD	
23	Vertex item		Vertex item of polygon area data format is shown in table 64

Table 64: Vertex item of polygon area data format

Starting byte	Field	Data type	Descriptions and requirements
0	Vertex latitude	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
4	Vertex longitude	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth

			degree

8.40 Delete 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

Starting byte	Field	Data type	Descriptions and requirements
0	Number of areas	BYTE	The number of areas in this message is no more than 125. Multiple messages are recommended if more than 125. 0 stands for delete all the circle areas
1	Area ID1	DWORD	
	……	DWORD	
	Area IDn	DWORD	

8.41 Setting route

Message ID: 0x8606.

Setting route message body data format is shown in table 66.

Table 66: Setting route message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Route ID	DWORD	
4	Route attribute	WORD	Route attribute data format is shown in table 67
6	Starting time	BCD[6]	Same as the time range setting of circle area
12	Ending time	BCD[6]	Same as the time range setting of circle area
18	Total number of the route's turning point	WORD	
20	Turning point item		Turning point item of route data format is shown in table 68

Table 67: Route attribute data format

Bit	Sign
0	1: Area time
1	Reserve
2	1: Alert to driver when enter the route
3	1: Alert to the platform when enter the route
4	1: Alert to driver when exit the route
5	1: Alert to the platform when exit the route
6-15	Reserve

Table 68: Turning point item of route data format

Starting byte	Field	Data type	Descriptions and requirements

0	Turning point ID	DWORD	
4	Route ID	DWORD	
8	Turning point latitude	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
12	Turning point longitude	DWORD	The unit of longitude is degree, times the sixth power of 10, accurate to one millionth degree
16	Width of the route	BYTE	Unit is meter (m), route is the turning point to the next turning point
17	Route attribute	BYTE	Route attribute data format is in table 69
18	The threshold of route driving time too long	WORD	Unit is second (s), this field is null if the 0 bit of area attribute is 0
20	The threshold of route driving time not enough	WORD	Unit is second (s), this field is null if the 0 bit of area attribute is 0
22	Maximum speed of the route	WORD	Unit is km/h, this field is null if the 1 bit of area attribute is 0
24	Over speed duration of the route	BYTE	Unit is second (s), this field is null if the 1 bit of area attribute is 0

Table 69: Route attribute data format

Bit	Sign
0	1: Driving time
1	1: Speed limit
2	0: South latitude; 1: North latitude
3	0: East longitude; 1: West longitude
4-7	Reserve

8.42 Delete route

Message ID: 0x8607.

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

Table 70: Delete route message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Number of route	BYTE	The number of routes in this message is no more than 125. Multiple messages are recommended if more than 125. 0 stands for delete all the circle routes
1	Route ID1	DWORD	
	……	DWORD	
	Route IDn	DWORD	

8.43 Driving record data collect command

Message ID: 0x8700.

Driving record data collect command message body data format is shown in table 71.

Table 71: Driving record data collect command message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Command	BYTE	Command list please see the relevant requirements in GB/T 19056
1	Data block		Data block content format please see the relevant content in GB/T 19056, including complete data packet required in GB/T 19056, can be null

8.44 Driving record data upload

Message ID: 0x0700.

Driving record data upload message body data format is shown in table 72.

Table 72: Driving record data upload message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Serial number in corresponding to the driving record data collect command message
2	Command	BYTE	In corresponding to the command sent by the platform
3	Data block		Data block content format please see the relevant content in GB/T 19056, including complete data packet required in GB/T 19056

8.45 Driving record parameter send down command

Message ID: 0x8701.

Driving record parameter send down command message body data format is shown in table 73.

Table 73: Driving record parameter send down command message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Command	BYTE	Command list please see the relevant requirements in GB/T 19056
1	Data block		Data block content format please see the relevant content in GB/T 19056, including complete data packet required in GB/T 19056

8.46 Electronic waybill report

Message ID: 0x0701.

Electronic waybill report message body data format is shown in table 74.

Table 74: Electronic waybill report message body data format

Starting byte	Field	Data type	Descriptions and requirements

0	Length of electronic waybill	DWORD	
4	Content of electronic waybill		Data packet of electronic waybill

8.47 Report driver's identity information request

Message ID: 0x8702.

Report driver's identity information request message body is null.

8.48 Driver's identity information collects report

Message ID: 0x0702.

The instruction is automatically triggered after the occupational qualification certificate IC card of the terminal is inserted or pulled out. Use this instruction to response after received the 0x8702 instruction. Driver's identity information collects report message body data format is shown in table 75.

Table 75: Driver's identity information collects report message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Status	BYTE	0x01: The occupational qualification certificate IC card insert (driver on duty); 0x02: The occupational qualification certificate IC card pulled out (driver off duty)
1	Time	BCD6[6]	Time of insert/pull out IC card, YY-MM-DD-hh-mm-ss; the following fields are valid and filled only when the status is 0x01
7	IC card reading result	BYTE	0x00: IC card reading is successful; 0x01: Reading card failure, the reason is card key authentication failed; 0x02: Reading card failure, the reason is the card is locked; 0x03: Reading card failure, the reason is the card has been pulled out; 0x04: Reading card failure, the reason is data validation error. The following fields are valid only when IC card reading result is 0x00
8	Length of driver's name	BYTE	n
9	Driver's name	STRING	Name of the driver
9+n	Occupational qualification certificate code	STRING	Length is 20 bits, append 0x00 when not enough
29+n	Length of license issuing agency's	BYTE	m

	name		
30+n	License issuing agency's name	STRING	License issuing agency's name of the occupational qualification certificate
30+n+m	Validity of the certificate	BCD[4]	YYYYMMDD

8.49 Positioning data batch upload

Message ID: 0x0704.

Positioning data batch upload data format is shown in table 76.

Table 76: Positioning data batch upload data format

Starting byte	Field	Data type	Illustration
0	Numbers of data item	WORD	Including numbers of location report data item, >0
1	Type of location data	BYTE	0: Normal location batch report; 1: Blind area report
2	Location report data item		Definition is shown in table 77

Table 77: Location report data item data format

Starting byte	Field	Data type	Illustration
0	Length of location report data body	WORD	Length of location report data body, n
2	Location report data body	BYTE[n]	Definition is shown in 8.18 location information report

8.50 CAN bus data uploading

Message ID: 0x0705.

CAN bus data uploading data format is shown in table 78.

Table 78: CAN bus data uploading data format

Starting byte	Field	Data type	Illustration
0	Number of data item	WORD	Contained number of CAN bus data items, >0
2	Reception time of CAN bus data	BCD[5]	CAN bus data reception time of the first data, hh-mm-ss-msms
8	CAN bus data item		Definition is shown in table 79

Table 79: CAN bus data item data format

Starting byte	Field	Data type	Illustration
0	CAN ID	BYTE[4]	bit31 is CAN channel number, 0: CAN1, 1: CAN2; bit30 is the frame type, 0: Standard frame, 1: Extended frame; bit29 is data collect way, 0: Original data, 1: The average of the collection interval

			bit28-bit0 is CAN bus ID
4	CAN DATA	BYTE[8]	CAN data

8.51 Multimedia event information uploading

Message ID: 0x0800.

Multimedia event information uploading data format is shown in table 80.

Table 80: Multimedia event information uploading data format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia data ID	DWORD	>0
4	Multimedia type	BYTE	0: Image; 1: Audio; 2: Video
5	Multimedia format code	BYTE	0: JPEG; 1: TIF; 2: MP3; 3: WAV; 4: WMV; others reserve
6	Event item code	BYTE	0: Platform sends down command; 1: Timing action; 2: Robbery alarm triggered; 3: Collision rollover alarm triggered; 4: Door open photos; 5: Door close photos; 6: Doors from open to close, speed from <20km to over 20km; 7: Fixed distance photos; Others reserve
7	Channel ID	BYTE	

8.52 Multimedia data upload

Message ID: 0x0801.

Multimedia data upload message body data format is shown in table 81.

Table 81: Multimedia data upload message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia ID	DWORD	>0
4	Multimedia type	BYTE	0: Image; 1: Audio; 2: Video
5	Multimedia format code	BYTE	0: JPEG; 1: TIF; 2: MP3; 3: WAV; 4: WMV; others reserve
6	Event item code	BYTE	0: Platform send down command; 1: Timing action; 2: Robbery alarm triggered; 3: Collision rollover alarm triggered; others reserve
7	Channel ID	BYTE	
8	Location information report (0x0200) message body	BYTE[28]	Represents the location basic information data of multimedia data
36	Multimedia data packet		

8.53 Multimedia data upload response

Message ID: 0x8800.

Multimedia data upload response message body data format is shown in table 82.

Table 82: Multimedia data upload response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia ID	DWORD	>0, no subsequent field if all packets are received
4	Total number of resend packet	BYTE	n
5	Resend packet ID list	BYTE[2*n]	Arranged according to the serial number of the resend packet

8.54 Camera immediately taken command

Message ID: 0x8801.

Camera immediately taken command message body data format is shown in table 83.

Table 83: Camera immediately taken command message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Channel ID	BYTE	>0
1	Taken command	WORD	0 for stop taking pictures; 0xFFFF for record; others for numbers of photo
3	Taken interval/recording time	WORD	Second, 0 stands for take photos at minimum intervals or recording
5	Saving sign	BYTE	1: Store; 0: Real-time upload
6	Resolution [a]	BYTE	0x01: 320*240; 0x02: 640*480; 0x03: 800*600; 0x04: 1024*768; 0x05: 176*144;[Qcif]; 0x06: 352*288; [Cif]; 0x07: 704*288; [HALF D1]; 0x08: 704*576; [D1]
7	Quality of image/video	BYTE	1-10, 1 for minimum quality loss, 10 for maximum compression ratio
8	Brightness	BYTE	0-255
9	Contrast	BYTE	0-127
10	Saturation	BYTE	0-127
11	Chroma	BYTE	0-255
[a] If the terminal does not support the resolution required by the system, the nearest resolution is taken and uploaded.			

8.55 Camera immediately taken command response

Message ID: 0x0805.

Camera immediately taken command response message body data format is shown in table 84. This command is used to respond to the camera immediately taken command 0x8801 sent by the monitoring center.

Table 84: Camera immediately taken command response message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Message serial number of the corresponding platform camera immediately taken command
2	Result	BYTE	0: Successful; 1: Failure; 2: Channel not support. The following fields are valid only when the result=0
3	Number of multimedia ID	WORD	n, the number of taken photo successful multimedia
4	List of multimedia ID	BYTE[4*n]	

8.56 Retrieve of store multimedia data

Message ID: 0x8802.

Retrieve of store multimedia data message body data format is shown in table 85.

Noted: The start/end time is set to 00-00-00-00-00-00 if not according to the time interval.

Table 85: Retrieve of store multimedia data message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia type	BYTE	0: Image; 1: Audio; 2: Video
1	Channel ID	BYTE	0 stands for all channel of retrieve this type of media
2	Event item code	BYTE	0: Platform send down command; 1: Timing action; 2: Robbery alarm triggered; 3: Collision rollover alarm triggered; others reserve
3	Starting time	BCD[6]	YY-MM-DD-hh-mm-ss
9	Ending time	BCD[6]	YY-MM-DD-hh-mm-ss

8.57 Response of store multimedia data retrieves

Message ID: 0x0802.

Response of store multimedia data retrieves message body data format is shown in table 86.

Table 86: Response of store multimedia data retrieves message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Response serial number	WORD	Serial number of corresponding multimedia data retrieve message
2	Total item number of multimedia data	WORD	Total item number of multimedia data that meet the retrieve condition
4	Retrieve item		Multimedia retrieve item data format is shown in table 87

Table 87: Multimedia retrieve item data format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia ID	DWORD	>0
4	Multimedia type	BYTE	0: Image; 1: Audio; 2: Video
5	Channel ID	BYTE	
6	Event item code	BYTE	0: Platform send down command; 1: Timing action; 2: Robbery alarm triggered; 3: Collision rollover alarm triggered; others reserve
7	Location information report (0x0200) message body	BYTE[28]	Represents the location basic information data of the initial moment of shooting or recording

8.58 Store multimedia data upload command

Message ID: 0x8803.

Store multimedia data upload command message body data format is shown in table 88.

Table 88: Store multimedia data upload command message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia type	BYTE	0: Image; 1: Audio; 2: Video
1	Channel ID	BYTE	
2	Event item code	BYTE	0: Platform send down command; 1: Timing action; 2: Robbery alarm triggered; 3: Collision rollover alarm triggered; others reserve
3	Starting time	BCD[6]	YY-MM-DD-hh-mm-ss
9	Ending time	BCD[6]	YY-MM-DD-hh-mm-ss
15	Delete sign	BYTE	0: Reserve; 1: Delete

8.59 Sound record start command

Message ID: 0x8804.

Sound record start command message body data format is shown in table 89.

Table 89: Sound record start command message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Sound record command	BYTE	0: Stop sound record; 0x01: Start sound record
1	Sound record time	WORD	Unit is second (s), 0 is sound recording all the time
3	Store sign	BYTE	0: Real-time upload; 1: Store
4	Audio sampling rate	BYTE	0: 8K; 1: 11K; 2: 23K; 3: 32K; others reserve

8.60 Single storage multimedia data retrieval uploads command

Message ID: 0X8805.

Single storage multimedia data retrieval uploads command message body data format is shown in table 90.

Table 90: Single storage multimedia data retrieval uploads command message body data

format

Starting byte	Field	Data type	Descriptions and requirements
0	Multimedia ID	DWORD	>0
4	Delete sign	BYTE	0: Reserve; 1: Delete

8.61 Data downlink pass-through

Message ID: 0x8900.

Data downlink pass-through message body data format is shown in table 91.

Table 91: Data downlink pass-through message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Pass-through message type	BYTE	Definition of pass-through message type is shown in table 93
1	Pass-through message content		

8.62 Data uplink pass-through

Message ID: 0x0900.

Data uplink pass-through message body data format is shown table 92.

Table 92: Data uplink pass-through message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	Pass-through message type	BYTE	Definition of pass-through message type is shown in table 93
1	Pass-through message content		

Table 93: Definition of pass-through message type

Pass-through message type	Definition	Descriptions and requirements
GNSS module detailed location data	0x00	GNSS module detailed location data
Road transport certificate IC card information	0x0B	Road transport certificate IC card information upload message is 64 bytes; send down message is 24 bytes. The road transport certificate IC card authenticates the pass-through timeout period is 30s. Will not resend after timeout.
Serial port 1 pass-through	0x41	Serial port 1 pass-through message
Serial port 2 pass-through	0x42	Serial port 2 pass-through message
User-defined pass-through	0xF0-0xFF	User-define pass-through message

8.63 Data compression report

Message ID: 0x0901.

Data compression report message body data format is shown in table 94.

Table 94: Data compression report message body data format

Starting byte	Field	Data type	Descriptions and requirements

0	Length of compression message	DWORD	
4	Compression message body		Compression message body is message that needs to be compressed through the GZIP compression algorithm

8.64 The RSA public key of platform

Message ID: 0x8A00.

The RSA public key of platform message body data format is shown in table 95.

Table 95: The RSA public key of platform message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	e	DWORD	e of {e, n} from platform RSA public key
4	n	BYTE[128]	n of {e, n} from platform RSA public key

8.65 The RSA public key of terminal

Message ID: 0x0A00.

The RSA public key of terminal message body data format is shown in table 96.

Table 96: The RSA public key of terminal message body data format

Starting byte	Field	Data type	Descriptions and requirements
0	e	DWORD	e of {e, n} from terminal RSA public key
4	n	BYTE[128]	n of {e, n} from terminal RSA public key

Appendix A

(Normative appendix)
Communication protocol of vehicle terminal and peripherals

A.1 Device

A.1.1 Host

Host should conform to J/T 794.

A.1.2 Slave machine

The slave machine includes a variety of point-to-point serial communication peripherals, such as dispatching display screen, intelligent peripherals, oil measuring device, collision detection device, etc.

A.2 Communication protocol

A.2.1 Definition of frame format

See table A.1 for the frame format for all communication between the host and slave machine.

Table A.1: Frame format

Identify bit	Check code	Version number	Vendor number	Peripherals type number	Command type	User data	Identify bit
1 byte	1 byte	2 byte	2 byte	1 byte	1 byte	n byte	1 byte

Illustration of table A.1's content is as follows:

a) Identify bit: use 0x7e to express. It should be escaped if 0x7e appears in check code, header and message body, the escape rules are defined as follows:

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

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

Escape process is as follows:

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

When receiving messages: escape undo --> verify check code --> parse the message;

Example 1:

Send a data packet which content is 0x30 0x7e 0x08 0x7d 0x55, it's encapsulated as follows: 0x7e 0x30 0x7d 0x02 0x08 0x7d 0x01 0x55 0x7e;

b) Check code: Take the lower 8 bits of cumulative sum from vendor number to user data as the check code;

Example 2:

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

c) Version number: Identifies the version of communication protocol;

d) Vendor number: The manufacturer code of the peripheral slave machine;

e) Peripherals type number: Each peripheral has a unique type number. The peripheral interface driver of host is used to distinguish data sent by what kind of peripheral. Peripherals type number is shown in table A.2;

f) Command type: The information type of various data interaction between peripherals and host. The command type is divided into general protocol and proprietary protocol: general protocol mainly includes the basic, necessary and common types of information interaction between slave

machine and host; proprietary protocol defines specific information interaction type between each type of peripherals and host. Command type is shown in table A.3;

g) User data: Refers to the specific business function customized content of interaction between peripherals and host except the above;

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

Table A.2 Peripherals type number

Peripherals type	Number
Industry information terminal	0x01
Dispatching display screen	0x02
Car navigation display screen	0x03
Fuel capacity detector	0x04
Acceleration detector	0x05
Burglar alarm	0x06
Interface expander	0x07
Load detector	0x08
Passenger flow detector	0x09
General sensor	0x0A
Road transport certificate IC card reader	0x0B
User defined	0xF0-0xFF

Table A.3: Command type

Protocol type	Function type	Command type
Peripherals general protocol	Power on indication/response	0x01
	Link polling/response	0x02
	Slave machine power control/response	0x03
	Check the slave machine version number information	0x04
	Slave machine self-check/response	0x05
	Slave machine firmware update/response	0x06
	Reserve	0x07-0x3F
Proprietary protocol	Road transport IC card certification request/response	0x40
	Road transport IC card reading result notice/response	0x41
	Card pulled out notice/response	0x42
	Initiative trigger IC card reading/response	0x43
	Proprietary functional business protocols of various peripherals of the slave machine	0x44-0xFF

A.2.2 Append rules of peripherals protocol

Append and modify of peripherals protocol should follows:

a) Protocol use the same command type for the same function to send and to respond

b) For peripherals that with more command types, when append new command type, try to minimize the use of command types by using variable parameters.

A.3 Definition of general protocol

A.3.1 Slave machine power on indication

Slave machine power on indication is shown in table A.4.

Table A.4: Slave machine power on indication

Process	Command type	Description	User data	Data direction
1	01H	Power on indication response	Null	Downlink
2	01H	Power on indication	Null	Uplink

A.3.2 Peripherals link polling

Peripherals link polling command is shown in table A.5.

Table A.5: Peripherals link polling command

Process	Command type	Description	User data	Data direction
1	02H	Link polling	Link maintain time The higher byte is in the front and the lower byte is in the rear; unit of the higher byte is minute, lower byte is second; recommend link polling time is 15s-30s; after link timeout, the host will cancel the information of slave machine	Uplink
2	02H	Link polling response	Null	Downlink

A.3.3 Slave machine power control

Slave machine power control command is shown in table A.6.

Table A.6: Slave machine power control command

Process	Command type	Description	User data	Data direction
1	03H	Slave machine power control	Control type: 0x00 -- slave machine exit power saving mode; 0x01 -- slave machine enter power saving mode	Downlink
2	03H	Slave machine power control response	Response type: 0x01 --	Uplink

A.3.4 Check version number information of slave machine

Check version number information of slave machine command is shown in table A.7.

Table A.7: Check version number information of slave machine command

Process	Command type	Description	User data	Data direction
1	04H	Check slave machine version number information	Null	Downlink
		Check slave machine	Slave machine version number,	Uplink

		version number information response	WORD e.g.: 0x0207 stands for 2.07 version	

A.3.5 Slave machine self-check

Slave machine self-check command is shown in table A.8

Table A.8: Slave machine self-check command

Process	Command type	Description	User data	Data direction
1	05H	Slave machine self-check	Type of self-check slave machine, BYTE, according to the definition in table A.2	Downlink
2	05H	Result information of self-check	Type of self-check slave machine, BYTE, according to the definition in table A.2	Uplink

Noted: Timeout time of this command is 1s, maximum resend 3 times if no response. After the terminal receives the self-check failure, set corresponding alarm sign, and voice prompt or screen display.

A.3.6 Slave machine firmware update

Slave machine firmware update command is shown in table A.9.

Table A.9: Slave machine firmware update command

Process	Command type	Description	User data	Data direction
1	06H	Update slave machine firmware module	Total packet of message, WORD	Downlink
			Packet No., WORD, start from 1	
			Packet data, maximum length is 256 bytes	
2	06H	Confirm information	Packet No., WORD	Uplink
			Response result, BYTE 0: Correct; 1: Not this firmware program, stop upgrade; 2: Resend (after 3 times, terminate this upgrade)	

Noted: Timeout time of this command is 1s, maximum resend 3 times if no response.

A.3.7 Check peripheral attribute

Check peripheral attribute command is shown in table A.10.

Table A.10: Check peripheral attribute command

Process	Command type	Description	User data	Data direction
1	07H	Check peripheral attribute	Null	Downlink
2	07H	Check	Peripheral manufacturer number, 5 BYTE	Uplink

		peripheral attribute response	Peripheral hardware version number, 3 BYTE	
			Peripheral software version number, 3 BYTE	

Noted: Version number example, 0x010B02 stands for v1.12.2.

Timeout time of this command is 1s, maximum resend 3 times if no response.

A.4 Definition of proprietary protocol

A.4.1 Road transport certificate IC card authentication request

When a card is detected and the module is reset or re-energized as well as the IC card number in the slot is inconsistent with the card number read last time, the module will trigger the road transport certificate IC card authentication request uplink command automatically.

Road transport certificate IC card authentication request command is shown in table A.11.

Table A.11: Road transport certificate IC card authentication request command

Process	Command type	Description	User data	Data direction
1	40H	IC card authentication request	Status bit, BYTE, 0x00: IC card reading success; 0x01: IC card not inserted; 0x02: IC card reading failure; 0x03: Not occupational qualification certificate IC card 0x04: IC card is locked	Uplink
			Data zone (valid when status bit=0x00), card basic information and authenticate information (64 bytes)	
2	40H	IC card authentication request response	Result of IC card authentication request response, BYTE 0x00: Successfully complete the authentication request; 0x01: The terminal is not online; 0x02: The terminal authenticate center timeout with no response; 0x03: The terminal confirm message is received (when IC card request reading result= 0x01-0x04)	Downlink
			Data zone (valid when result of IC card authentication request response=0x00, IC card authenticate request return check data which is 24 bytes)	

Noted: Timeout time is 35s when this command is uplink and status bit of IC card authenticate request is 0x00; timeout time is 1s when other status and downlink. Maximum resend 3 times if no response.

A. When status bit is 0x00, the terminal send 64 bytes' card basic information and authentication information to the authenticate center, and return result information of 1 or 25 byte to the reading module according to different situation.

a. When the IC card authenticate request response result is 0x00 which returned by the terminal to the reading module, reading module starts reading card information, and enable 41H command feedback result to the terminal automatically. The terminal remind corresponding result to the driver by voice prompt, and use 0x0702 command send driver's identity information to the authenticate center and monitoring platform after reading success;

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

c. When the IC card authenticate request response result is 0x02 which returned by the terminal to the reading module, the reading module resend 40H 3 times. After 3 unsuccessful attempts, the terminal will end the process and remind corresponding result to the driver by voice prompt;

d. When the IC card authenticate request response result is 0x03 which returned by the terminal to the reading module, end the process and the terminal remind corresponding result to the driver by voice prompt.

B. End the process when terminal at status bit is not 0x00, and remind corresponding result to the driver by voice prompt.

A.4.2 Road transport certificate IC card reading result notification

Road transport certificate IC card reading result notification command is shown in table A.12.

Table A.12: Road transport certificate IC card reading result notification command

Process	Command type	Description	User data	Data direction
1	41H	IC card reading result notification	IC reading result, BYTE 0x00: IC card reading success, and is followed by subsequent data; 0x01: Card reading failed, because of card key authentication failed; 0x02: Card reading failed, because the card is locked; 0x03: Card reading failed, because the card has been pulled out; 0x04: Card reading failed, because of data check error	Uplink
			Data zone (valid when IC card reading result is 0x00), Driver's identity information is shown in A.13	
2	41H	Driver's identity information received confirm	Null	Downlink

Noted: Timeout time of this command is 1s, maximum resend 3 times if no response.

A. The terminal use 0x0702 command send driver's identity information to the authenticate center and the corporation platform when received the IC card reading result is 0x00.

B. The terminal ends the process when received the IC card reading result is not 0x00. Remind corresponding result to the driver by voice prompt.

Table A.13 Driver's identity information

Starting byte	Field	Data type	Descriptions and requirements
0	Length of the driver's name	BYTE	Length is n
1	Driver's name	STRING	Name of the driver
1+n	occupational qualification certificate number	STRING	Length is 20 bits
21+n	Length of issuing institution name	BYTE	Length is n
22+n	Name of issuing institution	STRING	Name of certificate issuing institution
22+n+m	Validity of certificate	BCD[4]	YYYYMMDD

A.4.3 Card pulls out notification

Card pulls out notification command is shown in table A.14.

Table A.14: Card pulls out notification command format

Process	Command type	Description	User data	Data direction
1	42H	Card pulls out notification	Null	Uplink
4	42H	Receive confirm of card pulls out notification	Null	Downlink

Noted: Timeout time of this command is 1s, maximum resend 3 times if no response. The terminal use 0x0702 command send driver off duty information to authenticate center and monitoring platform when receive card pulls out notification.

A.4.4 Active trigger reading IC card

Active trigger reading IC card command is shown in table A.15.

Table A.15: Active trigger reading IC card command

Process	Command type	Description	User data	Data direction
1	43H	Active trigger reading IC card	Null	Downlink
2	43H	Active trigger reading IC card confirm information	Null	Uplink

Noted: Timeout time of this command is 1s, maximum resend 3 times if no response. This command is used for terminal roll call, terminal not online or terminal upload IC card authentication information timeout, etc. Reading module will trigger 40H command automatically after receives this order.

Appendix B

(Normative appendix)
Message collate format

Message collate format of terminal communication protocol is shown in table B.1.

Table B.1 Message collate

No.	Message body name	Message ID	No.	Message body name	Message ID
1	Terminal general response	0x01	35	Setting circle area	0x8600
2	Platform general response	0x8001	36	Delete circle area	0x8601
3	Terminal heartbeat	0x0002	37	Setting rectangle area	0x8602
4	Resend sub-package request	0x8003	38	Delete rectangle area	0x8603
5	Terminal registration	0x0100	39	Setting polygon area	0x8604
6	Terminal registration response	0x8100	40	Delete polygon area	0x8605
7	Terminal logout	0x0003	41	Setting route	0x8606
8	Terminal authentication	0x0102	42	Delete route	0x8607
9	Terminal parameter setting	0x8103	43	Driving record data collect command	0x8700
10	Check terminal parameter	0x8104	44	Driving record data upload	0x0700
11	Check terminal parameter response	0x0104	45	Driving record parameter send down command	0x8701
12	Terminal control	0x8105	46	Electronic waybill report	0x0701
13	Check specified terminal parameters	0x8106	47	Driver’s identity information collects report	0x0702
14	Check terminal attribute	0x8107	48	Report driver’s identity information request	0x8702
15	Check terminal attribute response	0x0107	49	Positioning data batch upload	0x0704
16	Send down terminal update packet	0x8108	50	CAN bus data uploading	0x0705
17	Notification of terminal upgrades results	0x0108	51	Multimedia event information uploading	0x0800
18	Location information report	0x0200	52	Multimedia data upload	0x0801
19	Location information query	0x8201	53	Multimedia data upload response	0x8800
20	Location information query response	0x0201	54	Camera immediately taken command	0x8801
21	Temporary location tracking control	0x8202	55	Camera immediately taken command response	0x0805
22	Manually confirm alarm message	0x8203	56	Retrieve of store multimedia data	0x8802
23	Send down text information	0x8300	57	Response of store multimedia data retrieves	0x0802

24	Event setting	0x8301	58	Store multimedia data upload command	0x8803
25	Event report	0x0301	59	Sound record start command	0x8804
26	Question sends down	0x8302	60	Single storage multimedia data retrieval uploads command	0x8805
27	Question response	0x0302	61	Data downlink pass-through	0x8900
28	Information on-demand menu setting	0x8303	62	Data uplink pass-through	0x0900
29	Information on-demand/cancels	0x0303	63	Data compression report	0x0901
30	Information service	0x8304	64	The RSA public key of platform	0x8A00
31	Call back	0x8400	65	The RSA public key of terminal	0x0A00
32	Phone book setting	0x8401	66	Platform downlink message reserve	0x8F00~0x8FFF
33	Vehicle control	0x8500	67	Platform uplink message reserve	0x0F00~0x0FFF
34	Vehicle control response	0x0500			