

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

GNSS system for operating vehicles

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

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Item number

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preamble

This specification is a supplement and improvement of JT/T 808-2011 "Road Transport Vehicle satellite positioning System terminal communication protocol and data format", compared with JT/T 808-2011, except for editorial modifications, the main technical changes are as follows:

- The description of 5.2 "Maintenance of connection" in communication connection has been modified;
- Modified the description of the process in 7.8.1 "Collecting driver identity Information Data" in the protocol classification; -- added the process description of 7.12 "Subcontracting message" in the protocol classification;

-- Modified the data format, Original 8.4 Terminal registration, 8.8 Setting terminal parameters, 8.12 Location information reporting, 8.23 text message delivery, 8.28 Setting circular area, 8.36 Command for collecting driving record data, 8.37 Command for uploading driving record data, 8.38 Command for transmitting driving record parameters, 8.40 Driver identity information collection and reporting, 8.41 Multimedia Event Information Upload, 8.42 Multimedia Data Upload, 8.43 multimedia data upload response, 8.46 Storage multimedia data retrieval response, 8.49 Data downlink transparent transmission, 8.50 Data uplink transparent transmission, etc.

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

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

-- Added Appendix A, A.3.4 Querying slave version number information, A.3.5 Slave self-test, A.3.6 Slave Firmware Update, A.3.7 Querying peripheral properties, A.4.1 Road Transport License IC card authentication Request, A.4.2 Road Transport License IC card reading result Notification, A.4.3 Card withdrawal Notification, A.4.4 Actively trigger the communication protocol instructions between the terminal host and peripherals such as reading IC cards;

- Modified the contents corresponding to the above modifications in the message mapping table in Appendix B. These specifications are put forward by the Ministry of Transport of the People's Republic of China.

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

Road transport vehicle satellite positioning system

Terminal communication protocol and data format

1 Scope

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

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

2 Normative citation documents

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

GB/T 2260 Administrative Division code of the People's Republic of China
GB/T 19056 Vehicle driving Recorder

JT/T 415-2006 Road Transport e-government Platform cataloging code Rules JT/T 794 Road transport vehicle satellite positioning system on-board terminal Technical requirements

3 Terms and definitions and acronyms

3.1 Terms and definitions

The following terms and definitions apply to this document.

3.1.1

abnormal data communication link The wireless communication link is disconnected or temporarily suspended (for example, during a call).

3.1.2

Sign up for the register

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

3.1.3

unregister

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

3.1.4

authentication

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

3.1.5

location reporting strategy Timing, distance reporting, or a combination of both.

3.1.6

location reporting program A rule that determines the interval between periodic reports based on relevant conditions.

3.1.7

additional points report while turning. Additional points report while turning

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

3.1.8

answering strategy Rules for answering a call automatically or manually on the terminal.

3.1.9

SMS text alarm A text message is sent by SMS when the terminal alarms.

3.1.10

event item Event Item

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

3.2 Abbreviations and abbreviations

The following abbreviations apply to this document.

APN——接入点名称(access point name)

GZIP——一个GNU自由软件的文件压缩程序(GNUzip)

LCD——液晶显示屏(liquid crystal display)

RSA——一种非对称密码算法(由Ron Rivest、Adi Shamirh、Len Adleman开发,取名来自三者的名字)

SMS——短消息服务(short message service)

TCP——传输控制协议(transmission control protocol)

TTS - text to speech (text to speech)
 UDP - user datagram protocol (VSS) - vehicle speed sensor

4 Basis of the protocol

4.1 Means of communication

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

4.2 Data Types

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

Table 1 Data types

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

4.3 Transmission rules

The protocol uses big-endian network byte order to pass word and double word. The convention is as follows:

- BYTE transmission conventions: transfer bytes in byte stream mode;
- WORD transmission convention: pass the high eight bits first, then pass the low eight bits;
- Double word (DWORD) transmission convention: first pass the high 24 bits, then pass the high 16 bits, then pass the high eight bits, and finally pass the low eight bits.

4.4 The composition of the message

4.4.1 message structure

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



Figure 1 Message structure diagram

4.4.2 identification bit

The value is 0x7e. If 0x7e appears in the check code, message header, or message body, it needs to be escaped. Escape rules are defined as follows:

0x7e <————> 0x7d 后紧跟一个 0x02;

0x7d <————> 0x7d 后紧跟一个 0x01。

转义处理过程如下:

发送消息时: 消息封装——>计算并填充校验码——>转义;

接收消息时: 转义还原——>验证校验码——>解析消息。

示例:

发送一包内容为 0x30 0x7e 0x08 0x7d 0x55 的数据包, 则经过封装如下: 0x7e 0x30 7d 0x02 0x08 0x7d 0x01 0x55 0x7e。

4.4.3 message header

The contents of the header are shown in Table 2:

Table 2 Header contents

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

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

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

Figure 2 Message body attribute format structure diagram

Data encryption method:

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

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

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

Subcontracting:

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

The information is determined by the package item of the message; If the 13th bit is 0, there is no packet wrapper field in the message header. The contents of the message packet wrapper are shown in Table 3:

Table 3 Contents of message packet package items

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

4.4.4 check code

The check code starts from the header of the message and takes up one byte until the last byte of the check code.

5 Communication connection

5.1 Establishment of the connection

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

5.2 Connection maintenance

After the connection is established and terminal authentication is successful, the terminal sends a heartbeat message to the platform periodically if no normal data packet transmission is performed. After receiving the heartbeat message, the platform sends a general response message to the platform. The sending period is specified by terminal parameters.

5.3 Disconnection of the connection

Both the platform and terminal can disconnect the connection based on the TCP protocol. Both parties should proactively determine whether the TCP connection is down. The platform determines whether the TCP connection is disconnected by:

- According to the TCP protocol to determine the terminal active disconnection;
- A terminal with the same identity establishes a new connection, indicating that the original connection has been disconnected; -- Does not receive any message from the terminal within a certain period of time, such as the terminal heartbeat. Method for the terminal to determine if the TCP connection is down:
- According to the TCP protocol to judge the platform active disconnection;
- The data communication link is disconnected;
- The data communication link is normal, but no response is received after the number of retransmission times is reached.

6 Message processing

6.1 TCP and UDP message handling

6.1.1 is the message sent by the main platform

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

$$T_{N+1}=T_N \times (N+1) \dots\dots\dots (1)$$

In Equation:

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

6.1.2 Indicates the message sent by the main terminal

6.1.2.1 The data communication link is normal

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

6.1.2.2 The data communication link is abnormal

If the data communication link is abnormal, the terminal must save the location report message to be sent. After the data communication link recovers, the terminal sends the saved message immediately.

6.2 SMS message processing

When the terminal communication mode is switched to the SMS message mode on the GSM network, the PDU octet encoding mode is adopted. For messages longer than 140 bytes, sub-contract processing should be carried out according to GSM 03.40, the SMS service standard of the GSM network.

The response, retransmission and saving mechanism of SMS messages are the same as 6.1, but the response timeout time and retransmission times should be processed according to the relevant Settings of parameters ID0x0006 and 0x0007 in Table 10.

7 Protocol Classification

7.1 Overview

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

7.2 Terminal management protocols

7.2.1 Terminal registration/deregistration

If a terminal is not registered, it must be registered first. After successful registration, the terminal obtains the authentication code and saves it. The authentication code is used during login. Before the vehicle needs to be removed or replaced, the terminal should be deregistered to cancel the corresponding relationship between the terminal and the vehicle.

If the terminal chooses to send terminal registration and terminal deregistration messages by SMS, the platform shall send the terminal Register response by SMS to reply to the terminal registration, and the platform general response by SMS to reply to the terminal deregistration.

7.2.2 Terminal Authentication

A terminal must be authenticated immediately after it is registered and connected to the Platform. Before the authentication is successful, the terminal must not send other messages.

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

7.2.3 Set and query terminal parameters

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

7.2.4 Terminal Control

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

7.3 Location, alarm protocol

7.3.1 location information reporting

The terminal periodically sends a location report based on the preset parameters.

According to the parameter control, the terminal can send the position information report message when judging the vehicle turning.

7.3.2 Position information query

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

7.3.3 Temporary location tracking control

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

7.3.4 Terminal Alarm

When the terminal determines that the alarm conditions are met, it sends the position information reporting message and sets the corresponding alarm mark in the position reporting message. The platform can respond to the platform general response message for alarm processing.

Each alarm type is described in the body of the location information report message. The alarm sign is maintained until the alarm condition is lifted. After the alarm condition is lifted, the position information reporting message should be sent immediately to clear the corresponding alarm sign.

7.4 information protocol

7.4.1 text message delivery

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

7.4.2 Event setup and reporting

The platform sends event setting messages to terminal storage, and the driver can enter the event list interface to make a selection when encountering corresponding events, and the terminal will send an event report message to the platform.

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

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

7.4.3 Questions

The platform sends a question sending message, and sends the question with candidate answer to the terminal. The terminal will display the question immediately, and the terminal will send a question answering message to the platform after the driver selects the question.

Question delivery message, the terminal needs to reply to the terminal general response message.

7.4.4 Information on demand

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

Select VoD/cancel the corresponding information service through the menu, and then the terminal will send the information VOD/cancel message to the platform. After the information service is on demand, it will receive information service messages from the platform regularly, such as news, weather forecast, etc.

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

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

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

7.5 Telephone protocol

7.5.1 Call back

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

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

7.5.2 Set up the phone book

The platform sets the phone book for the terminal by sending a message to set the phone book, which requires the terminal to reply to the terminal universal reply message.

7.6 Vehicle control protocol

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

7.7 Vehicle management protocol

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

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

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

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

7.8 information collection class protocol

7.8.1 collect driver identity information data

When the driver starts to drive, insert the IC card qualification certificate into the reading card module of the terminal. The reading card module detects the card through the sensing switch, and sends the authentication request to the terminal through the interface. The terminal forwards the authentication request data to the road transport license IC card certification center through the transparent transmission command, and transmits the authentication result returned by the certification center to the reading card module. Read card module root according to the certification results read IC card qualification certificate information and through the terminal will be the result information uploaded to the certification center (success and failure information) and ownership monitoring center (only read successful information).

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

7.8.2 collect electronic waybill data

Terminal collection electronic waybill data upload platform.

7.8.3 collect driving record data

The Platform sends a command message of driving record data collection to require terminals to upload specified data, and the message requires terminals to reply to the message of uploading driving record data.

7.8.4 Upload driving record parameters down

The platform requires terminals to upload specified data by sending a command message for transmitting driving record parameters. In this message, terminals need to reply to a general reply message.

7.9 Multimedia protocols

7.9.1 Multimedia event information upload

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

7.9.2 Multimedia data upload

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

7.9.3 The camera takes the picture immediately

The platform sends a command message for the camera to shoot immediately and sends the command to the terminal. The terminal needs to reply to this message with a general reply message. If real-time upload is specified, the terminal uploads the camera image/video after shooting, otherwise the image/video is stored.

7.9.4 Recording starts

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

7.9.5 Retrieves and extracts multimedia data stored by the terminal

The Platform obtains information about the multimedia data stored on the terminal by sending a multimedia data storage retrieval message, which requires the terminal to reply to the multimedia data storage retrieval reply message.

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

7.10 General Data transfer class

Messages that are not defined in the protocol but need to be transmitted in actual use can be exchanged using upstream transparent messages and downstream transparent messages.

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

7.11 Encryption protocols

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

7.12 Subcontracting message

When a message is sent as a subcontract, the subcontract message shall be in an increasing serial number.

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

8 Data Format

8.1 Terminal General Answer

Message ID: 0x0001.

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

Table 4 Data format of terminal general reply message body

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------------|-----------|---|
| 0 | Answer serial number | WORD | Serial number of the corresponding platform message |
| 2 | Response ID | WORD | The ID of the corresponding platform message |
| 4 | RESULTS | BYTE | 0: Success/confirmation; 1: failure; 2: The message is incorrect; 3: The message is not supported |

8.2 Platform Common Reply

Message ID: 0x8001.

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

Table 5 Data format of platform general reply message body

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------------|-----------|--|
| 0 | Answer serial number | WORD | Serial number of the corresponding terminal message |
| 2 | Response ID | WORD | ID of the corresponding terminal message |
| 4 | RESULTS | BYTE | 0: Success/confirmation; 1: failure; 2: The message is incorrect; 3: it is not supported. 4: alarm processing confirmed; |

8.3 Terminal heartbeat

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

8.4 Retransmit the subcontract request

Message ID: 0x8003.

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

Table 6 Data format of supplementary subcontract request message body

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------------------------------|-----------|--|
| 0 | Original message serial number | WORD | Specifies the serial number of the first packet of the original message that needs to be retransmitted |
| 4 | Total number of retransmitted packets | BYTE | n |
| 5 | List of retransmit packet ids | BYTE[2*n] | The sequence number of the retransmission packets is listed in sequence, for example, ID1 ID2..... Packet IDn " |

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

8.5 Terminal Registration

Message ID: 0x0100.

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

Table 7 Data format of terminal registration message body

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------------|-----------|---|
| 0 | Provincial domain ID | WORD | Indicates the province where the terminal is installed. 0 is reserved and the platform uses the default value. The provincial ID shall be the first two of the six digits of the administrative division code specified in GB/T 2260. |
| 2 | City and county ID | WORD | Indicates the city and county where the terminal is installed. The value 0 is retained and the platform uses the default value. The city and county ID shall be the last four of the six digits of the administrative division code specified in GB/T 2260. |
| 4 | Manufacturer ID | BYTE[5] | 5 bytes, terminal manufacturer code |
| 9 | Terminal model | BYTE[20] | 20 bytes, this terminal model is defined by the manufacturer, the number of bits is not When the number is sufficient, add "OX00". |
| 29 | Terminal ID | BYTE[7] | 7 bytes, consisting of uppercase letters and numbers, this terminal ID is numbered If the number of bits is insufficient, the terminal ID is followed by "OX00". |
| 36 | License plate color | BYTE | License plate color, according to JT/T415-2006 5.4.12. When not on the plate, the value is 0. |
| 37 | Vehicle signage | STRING | When the license plate color is 0, it indicates the vehicle VIN; Otherwise, it indicates the motor vehicle number plate issued by the public security traffic management department. |

8.6 Terminal Registration response

Message ID: 0x8100.

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

Table 8 Data format of terminal registration reply message body

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------------|-----------|--|
| 0 | Answer serial number | WORD | Serial number of the corresponding terminal registration message |
| 2 | RESULTS | BYTE | 0: successful; 1: the vehicle has been registered; 2: the vehicle does not exist in the database. 3: The terminal has been registered. 4: the terminal does not exist in the database |

| | | | |
|---|---------------------|--------|--|
| 3 | Authentication code | STRING | This field is available only after success |
|---|---------------------|--------|--|

8.7 Terminal logout

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

8.8 Terminal authentication

Message ID: 0x0102.
Table 9 shows the data format of the terminal authentication message body.

Table 9 Data formats of the terminal authentication message body

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------------|-----------|---|
| 0 | Authentication Code | STRING | The authentication code is reported after the terminal reconnects |

8.9 Set terminal parameters

Message ID: 0x8103.
Set the terminal parameter message body data format as shown in Table 10.

Table 10 Data format of terminal parameter message body

| Start byte | Fields | Data type | Description and requirements |
|------------|-------------------------|-----------|--|
| 0 | Parameter total | BYTE | |
| 1 | List of parameter items | | Table 11 shows the format of parameter entries |

Table 11 Data format of terminal parameter items

| fields | Data type | Description and requirements |
|------------------|-----------|--|
| Parameter ID | DWORD | Table 12 shows the definition and description of parameter ID |
| Parameter length | BYTE | |
| Parameter value | | If a multi-valued parameter is used, multiple parameter items with the same ID are used in the message, such as the dispatch center phone number |

Table 12 Terminal parameter Settings each parameter definition and description

| Parameter ID | Data type | Description and requirements |
|--------------|-----------|---|
| 0x0001 | DWORD | Terminal heartbeat sending interval, in seconds (s) |
| 0x0002 | DWORD | TCP message response timeout, in seconds (s) |
| 0x0003 | DWORD | Number of TCP message retransmission times |
| 0x0004 | DWORD | UDP message response timeout period, expressed in seconds |

| Parameter ID | Data type | Description and requirements |
|---------------|-----------|---|
| 0x0005 | DWORD | UDP message retransmission times |
| 0x0006 | DWORD | Timeout duration of SMS message response, in seconds (s) |
| 0x0007 | DWORD | Number of SMS message retransmission times |
| 0x0008-0x000F | | reserve |
| 0x0010 | STRING | Primary server APN, dial access point for wireless communication. If the network standard is CDMA, the point is a PPP dial-up number |
| 0x0011 | STRING | Primary server dial-up user name for wireless communication |
| 0x0012 | STRING | Primary server dial-up password for wireless communication |
| 0x0013 | STRING | Primary server address, IP or domain name |
| 0x0014 | STRING | Backup server APN, dial-up access point for wireless communication |
| 0x0015 | STRING | User name for dialing up wireless communication on the backup server |
| 0x0016 | STRING | Wireless dial-up password of the backup server |
| 0x0017 | STRING | IP address or domain name of the backup server |
| 0x0018 | DWORD | Server TCP port |
| 0x0019 | DWORD | Server UDP port |
| 0x001A | STRING | Road transport card IC card authentication master server IP address or domain name |
| 0x001B | DWORD | Road transport certificate IC card authentication master server TCP port |
| 0x001C | DWORD | Road transport card IC card authentication master server UDP port |
| 0x001D | STRING | Road transport card IC card authentication backup server IP address or domain name, the port is the same as the main server |
| 0x001E-0x001F | | reserve |
| 0x0020 | DWORD | Position reporting strategy, 0: regular reporting; 1: fixed distance reporting; 2: timing and distance reporting |
| 0x0021 | DWORD | Position reporting scheme, 0: according to ACC status; 1: According to login status and ACC status, first determine the login status, if login then according to ACC status |
| 0x0022 | DWORD | The driver does not log in to report the interval, the unit is seconds (s), >0 |
| 0x0023-0x0026 | DWORD | reserve |
| 0x0027 | DWORD | The unit is second (s). The unit is >0. The unit |
| 0x0028 | DWORD | is second (s). The unit is >0 |
| 0x0029 | DWORD | The default time reporting interval, in seconds (s), is >0 |

| | | |
|-----------------|--------|--|
| 0x002A-0x002B | DWORD | reserve |
| 0x002C | DWORD | The default reporting interval, in meters (m), is >0 |
| 0x002D | DWORD | The driver did not log in to report the distance interval, in meters (m), >0 |
| 0x002E | DWORD | The distance reported at sleep, in meters (m), is >0 |
| 0x002F | DWORD | Emergency alarm reporting distance interval, the unit is m (m), >0 |
| 0x0030 | DWORD | Inflexion Angle, <180 |
| 0x0031 | WORD | Electronic fence radius (illegal displacement threshold), in meters |
| 0x0032-0x003F | | reserve |
| 0x0040 | STRING | Monitoring platform phone numbers |
| 0x0041 | STRING | Reset the phone number, you can use this phone number to dial the terminal phone to reset the terminal |
| 0x0042 | STRING | To restore factory Settings, you can use this phone number to dial the terminal phone to restore factory Settings |
| 0x0043 | STRING | Monitor platform SMS phone numbers |
| 0x0044 | STRING | Receiving terminal SMS text alarm number |
| 0x0045 | DWORD | Terminal answering policy: 0: automatically answers the phone. 1: Automatic answer when ACC is ON, manual answer when OFF |
| 0x0046 | DWORD | OxFFFFFFFF indicates the maximum call duration of a month, in seconds (s). OxFFFFFFEF indicates the maximum call duration of a month, in seconds (s). |
| 0x0047 | DWORD | Oxffffffff indicates the maximum call duration of a month No Limit |
| 0x0048 | STRING | Monitor telephone numbers |
| 0x0049 | STRING | Monitor platform privilege SMS numbers |
| 0x004A-0x004F | | reserve |
| 0x0050 | DWORD | The alarm shielding word corresponds to the alarm mark in the location information reporting message. If the corresponding bit is 1, the corresponding alarm is shielded |
| Alarm send text | DWORD | SMS switch, corresponding to the alarm sign in the location information report message, 0x0051 If the corresponding bit is 1, the text SMS alarm shooting switch is sent when the corresponding alarm is reported, which corresponds to the alarm sign in the location information reporting message, and the corresponding bit is |
| 0x0052 | DWORD | 1, the corresponding alarm camera shooting |
| 0x0053 | DWORD | The alarm shooting and storage mark corresponds to the alarm mark in the location information reporting message; if the corresponding bit is 1, the photo taken during the corresponding alarm is stored; otherwise, the key mark is uploaded in real time, and the alarm mark in the location information reporting message is corresponding; |
| 0x0054 | DWORD | if the corresponding bit is 1, the corresponding alarm is the key alarm |
| 0x0055 | DWORD | Maximum speed in kilometers per hour (km/h) |

| | | |
|----------------------|--------|---|
| 0x0056 | DWORD | Overspeed duration, in seconds (s) |
| 0x0057 | DWORD | Continuous driving time threshold, in seconds (s) |
| 0x0058 | DWORD | The cumulative driving time threshold for the day, in seconds (s) |
| 0x0059 | DWORD | Minimum rest time, in seconds (s) |
| 0x005A | DWORD | Maximum stopping time, in seconds (s) |
| 0x005B | WORD | Overspeed alarm warning difference, the unit is 1/10Km/h |
| 0x005C | WORD | Fatigue driving warning difference, in seconds (s), >0 |
| 0x005D | WORD | Collision alarm parameter Settings: b7-b0: collision time, unit 4ms; b15-b8: collision acceleration, unit 0.1g, the setting range is: 0 to 79, the default is 10 |
| 0x005E | WORD | Rollover alarm parameter setting: rollover Angle, unit 1 degree, default is 30 degrees. |
| 0x005F-0x0063 | | reserve |
| 0x0064 | DWORD | For timing photo control, see Table 13 for distance |
| 0x0065 | DWORD | photo control, see Table 14 |
| 0x0066-0x006F | | reserve |
| 0x0070 | DWORD | Image/video quality, 1-10, 1 is best |
| 0x0071 | DWORD | Brightness, 0-255 |
| 0x0072 | DWORD | Contrast ratio, 0-127 |
| 0x0073 | DWORD | Saturation, 0-127 |
| | DWORD | Chroma, 0-255 |
| 0x0074-0x0075-0x007F | | |
| 0x0080 | DWORD | Vehicle odometer reading, 1/10km |
| 0x0081 | WORD | ID of the province where the vehicle is located |
| 0x0082 | WORD | ID of the city where the vehicle is located |
| 0x0083 | STRING | A motor vehicle license plate issued by the traffic administration department of public security |
| 0x0084 | BYTE | License plate color, according to JT/T415-2006 5.4. 12 |

| | | |
|---------------|----------|--|
| 0x0090 | BYTE | The GNSS positioning mode is defined as follows: bit0, 0: GPS is disabled, 1: GPS is enabled. 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. GNSS Baud rate, defined as follows: |
| 0x0091 | BYTE | 0x00: 4800; 0x01: 9600; 0x04: 57600; 0x05: 115200 0x02: 19200; 0x03: 38400; |
| 0x0092 | BYTE | GNSS module positioning data output frequency in detail, defined as follows: 0x00: 500ms; 0x01:1000ms (default); 0x02: 2000ms; 0x03: 3000ms; 0x04: 4000ms. |
| 0x0093 | DWORD | GNSS module detailed positioning data acquisition frequency, in seconds, the default is 1. |
| 0x0094 | BYTE | GNSS module detailed positioning data upload method: 0x00, local storage, no upload (default value); 0 x 01, upload at intervals; 0x02, upload by distance interval; 0x0B, upload according to the cumulative time, automatically stop uploading after reaching the transmission time; 0x0C, upload according to the accumulated distance, automatically stop uploading after reaching the distance; 0x0D: upload according to the accumulated number, and automatically stop uploading when the number of uploads is reached. |
| 0x0095 | DWORD | GNSS module detailed positioning data upload Settings: When the upload mode is 0x01, the unit is second; If the upload mode is 0x02, the unit is meters. When the upload mode is 0x0B, the unit is second; When the upload mode is 0x0C, the unit is meter; When the upload mode is 0x0D, the unit is strips. |
| 0x0100 | DWORD | CAN bus channel 1 Collection interval (ms), 0 indicates no collection |
| 0x0101 | WORD | CAN bus channel 1 Upload interval (s). 0 indicates that no upload is performed |
| 0x0102 | DWORD | CAN bus channel 2 Collection interval (ms). 0 indicates no collection |
| 0x0103 | WORD | CAN bus channel 2 Upload interval (s). 0 indicates that no upload is performed |
| 0x0110 | BYTE [8] | CAN bus ID separately collected Settings: bit63-bit32 indicates the ID collection interval (ms),0 indicates no collection; bit31 indicates the CAN channel number, 0: CAN1, 1: CAN2; bit30 indicates the frame type, 0: standard frame, 1: extended frame; bit29 represents the data collection method, 0: original data, 1: the calculated value of the collection interval; bit28-bit0 indicates the CAN bus ID. |
| 0x0111-0x01FF | BYTE[8] | It is used to collect and set other CAN bus ids separately |
| 0xFO00-0xFFFF | | user-defined |

Table 13 Definition of timing camera control bits

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

Table 14 Definition of control bit for fixed distance photograph

| position | Definition | Description and Requirements |
|----------|--|------------------------------|
| 0 | Camera Channel 1 Range photo switch sign | 0: Not allowed; 1: allowed |
| 1 | Camera channel 2 Range photo switch sign | 0: Not allowed; 1: allowed |
| 2 | Camera channel 3 Range photo switch sign | 0: Not allowed; 1: allowed |
| 3 | Camera channel 4 Range photo switch sign | 0: Not allowed; 1: allowed |
| 4 | Camera channel 5 Range photo switch sign | 0: Not allowed; 1: allowed |
| 5 to 7 | Reserved | |
| 8 | Camera Channel 1 Take photos at a distance to store signs | 0: Store; 1: Upload |
| 9 | Camera Channel 2 Take photos at a distance to store the logo | 0: Store; 1: Upload |
| 10 | Camera Channel 3 Take photos at a distance to store signs | 0: Store; 1: Upload |
| 11 | Camera channel 4 Take pictures at range to store the logo | 0: Store; 1: Upload |

| | | |
|----------|---|--|
| 12 | Camera channel 5 Take pictures at a distance to store signs | 0: Store; 1: Upload |
| 13 to 15 | Hold | |
| 16 | Set distance units | 0: meters, when the value is less than 100 meters, the terminal is processed by 100 meters 1: km. |
| 17-31 | Set distance intervals | Perform after receiving parameter Settings or restarting |

8.10 Query terminal parameters

Message ID: 0x8104.

Query terminal parameter message body is empty.

8.11 Queries the specified terminal parameters

Message ID: 0x8106.

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

Table 15 Queries the specified terminal parameter message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------------|-----------|--|
| 0 | Parameter total | BYTE | The total number of parameters is n |
| 1 | List of parameter ids | BYTE[4*n] | The parameters are arranged in sequence, for example, ID1 Parameter ID2..... Parameter IDn " |

8.12 Queries the terminal parameter response

Message ID: 0x0104.

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

Table 16 Query terminal parameter response message body data format

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

8.13 Terminal Control

Message ID: 0x8105.

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

Table 17 Data format of terminal control message body

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------|-----------|---|
| 0 | Command Words | BYTE | Table 18 describes the terminal control command words |

| | | | |
|---|--------------------|--------|--|
| 1 | Command parameters | STRING | For details about the command parameter format, see the following description. A half Angle is used between each field. Separated, each STRING field is processed by GBK code before composing a message |
|---|--------------------|--------|--|

Table 18 Description of terminal control command words

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

Table 19 Format of command parameters

| fields | Data type | Description and requirements |
|--------------------|-----------|--|
| Connection control | BYTE | 0: Switch to the specified monitoring platform server and enter the emergency state after connecting to the server. In this state, only the monitoring platform that sends control commands can send control commands including SMS; 1: switch back to the original default monitoring platform server and restore the normal state. |
| Dial point name | STRING | Generally the server APN, wireless communication dial access point, if the network standard is CDMA, then the value Dial-up number for PPP connection |
| Dial-in username | STRING | Server wireless dial-up user name |
| Dial-up password | STRING | Server dial-up password for wireless communication |
| Address | STRING | Server address, IP or domain name |
| TCP port | WORD | Server TCP port |
| UDP port | WORD | Server UDP port |
| Manufacturer ID | BYTE[5] | Terminal manufacturer code |

| | | |
|---|--------|---|
| Monitor platform authentication codes | STRING | The authentication code issued by the monitoring platform is used for authentication only after the terminal connects to the monitoring platform. The original authentication code is still used when the terminal connects to the original monitoring platform |
| Hardware Version | STRING | The hardware version number of the terminal is determined by the manufacturer |
| Firmware version | STRING | The firmware version number of the terminal is determined by the manufacturer |
| URL address | STRING | Full URL address |
| Connect to the specified service Instrument duration | WORD | Unit: minutes (min), the value is not 0 indicates that the terminal should be connected to the original address before the expiration of the validity period after the terminal receives the upgrade or connects to the specified server instruction. If the value is 0, it means that the terminal is always connected to the specified server |

8.14 Displays terminal properties

Message ID: 0x8107. Query Terminal properties message body is empty.

8.15 Queries the response of terminal properties

Message ID: 0x0107.
Query terminal properties reply message body data format is shown in Table 20.

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

| Start byte | Fields | Data type | Description and requirements |
|------------|--|-----------|---|
| 0 | Terminal type | WORD | bit0, 0: not applicable to passenger vehicles, 1: applicable to passenger vehicles; bit1, 0: not applicable to dangerous goods vehicles, 1: applicable to dangerous goods vehicles; bit2, 0: not applicable to ordinary freight vehicles, 1: applicable to ordinary freight vehicles; bit3, 0: not applicable to rental vehicles, 1: applicable to rental vehicles; bit6, 0: hard disk recording is not supported, 1: hard disk recording is supported; bit7, 0: all-in-one, 1: split. |
| 2 | Manufacturer ID | BYTE[5] | 5 bytes, terminal manufacturer code. |
| 7 | Terminal model number | BYTE[20] | The value is 20 bytes. The terminal model is defined by the manufacturer. If the number of bits is insufficient, add 0X00. |
| 27 | Terminal ID | BYTE[7] | 7 bytes, consisting of uppercase letters and numbers, this terminal ID is made by the manufacturer If the number of bits is insufficient, the terminal ID is followed by "0X00". |
| 42 | Terminal SIM card ICCID | BCD[10] | ICCID number of the terminal SIM card |
| 52 | Terminal hardware version number length | BYTE | n |
| 53 | Terminal hardware version number | STRING | |
| 53+n | Length of terminal firmware version number | BYTE | m |
| 54+n | Terminal firmware version number | STRING | |

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

8.16 Deliver the terminal upgrade package

Message ID: 0x8108.

Table 21 shows the data format of the message body of the delivered terminal upgrade packet. Use the general response to confirm whether the command terminal has received the upgrade packet data correctly.

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

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

8.17 Terminal upgrade result notification

Message ID: 0x0108.

The terminal uses this command to notify the monitoring center after the upgrade is complete and reconnected. Table 22 shows the data format of the notification body of the terminal upgrade result.

Table 22 Data formats of terminal upgrade result notification body

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------|-----------|--|
| 0 | Upgrade type | BYTE | 0: terminal, 12: road transport card IC card reader, 52: Beidou Satellite positioning module |
| 1 | Upgrade results | BYTE | 0: succeeded, 1: failed, 2: cancelled |

8.18 Location information Report

Message ID: 0x0200.

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



Figure 3 Location report message structure diagram

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

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

Table 23 Data formats of basic location information

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

Table 24 Alarm flag bit definition

| position | Definition | Processing instructions |
|----------|---|--|
| 0 | 1: Emergency alarm, triggered after touching the alarm switch | Clear after receiving the response |
| 1 | 1: Speeding alarm | Sign maintained until alarm condition is lifted |
| 2 | 1: Tired driving | Sign maintained until alarm condition is lifted |
| 3 | 1: Hazard warning | Clear after receiving response |
| 4 | 1: The GNSS module is faulty | The flag remains until the alarm condition is lifted |
| 5 | 1:GNSS antenna missed or cut | Flag maintained until alarm condition is lifted |
| 6 | 1:GNSS antenna shorted | Sign maintained until alarm condition is lifted |
| 7 | 1: The terminal main power supply undervoltage | The sign is maintained until the alarm condition is lifted |
| 8 | 1: The terminal main power supply fails | The sign remains until the alarm condition is lifted |

| position | Definition | Processing instructions |
|----------|--|--|
| 9 | 1: Terminal LCD or display failure | The sign is maintained until the alarm condition is lifted |
| 10 | 1: The TTS module is faulty | The sign is maintained until the alarm condition is lifted |
| 11 | 1: Camera failure | Sign maintained until alarm condition is lifted |
| 12 | 1: Road transport certificate IC card module is faulty | Sign maintained until alarm condition lifted |
| 13 | 1: Speeding alert | Sign maintained until alarm condition is lifted |
| 14 | 1: Tired driving alert | Sign maintained until alarm condition lifted |
| 15 to 17 | Hold | |
| 18 | 1: Accumulated driving overtime on that day | Sign maintained until alarm condition is lifted |
| 19 | 1: Overtime parking | Sign maintained until alarm condition is lifted |
| 20 | 1: In and out of the area | Clear when you receive an answer |
| 21 | 1: In and out routes | 22 Clear after receiving an |
| 22 | 1: Short/long road sections | answer |
| 23 | 1: Route deviation alarm | The sign is maintained until the alarm condition is lifted |
| 24 | 1: Vehicle VSS failure | Sign maintained until alarm condition lifted |
| 25 | 1: The vehicle oil level is abnormal | Sign maintained until alarm condition lifted |
| 26 | 1: Vehicle theft (through vehicle immobilizer | Sign maintained until alarm condition is lifted |
| 27 | 1: Illegal ignition of vehicle | Clear after receiving a response |
| 28 | 1: The vehicle is illegally displaced | Clear after receiving response |
| 29 | 1: Collision warning | Sign maintained until alarm condition is lifted |
| 30 | 1: Rollover warning | Sign maintained until alarm condition is lifted |
| 31 | 1: illegal door opening alarm (when the terminal does not set the area, do not judge illegal door opening) | Clear after receiving the response |

Note: The location information should be reported immediately in case of alarm and early warning

Table 25 Definition of status bits

| position | Status |
|----------|--------------------------------------|
| 0 | 0: ACC off; 1: ACC is on |
| 1 | 0: not positioned; 1: positioned |
| 2 | 0: North latitude; 1: south latitude |

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

Note: Position information must be reported immediately if the status changes

Table 26 shows the format of the location additional information item.

Table 26 Format of location additional information items

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

Table 27 Definition of additional information

| Additional information ID | Length of additional information | Description and requirements |
|---------------------------|----------------------------------|---|
| 0x01 | 4 | Mileage, DWORD, 1/10km, corresponding to the odometer reading on the car |
| 0x02 | 2 | Oil amount, WORD, 1/10L, corresponding to the on-board fuel gauge reading |
| 0x03 | 2 | Speed obtained by Travel log function, WORD, 1/10km/h |
| 0x04 | 2 | Need to manually confirm the alarm event ID, WORD, count from 1 |
| 0x05-0x10 | | reserve |
| 0x11 | 1 or 5 | See Table 28 for additional information on speeding alarms |
| 0x12 | 6 | Enter/exit area/route alarm Additional information is shown in Table 29 |
| 0x13 | 7 | Section of insufficient driving time/too long alarm Additional information see Table 30 |
| 0x14-0x24 | | reserve |
| 0x25 | 4 | Extended vehicle signal status bits, as defined in Table 31 |
| 0x2A | 2 | 10 Status bits, as defined in Table 32 |
| 0x2B | 4 | Analog amount, bit0-15, ADO; bit16-31, AD1. |
| 0x30 | 1 | BYTE, wireless communication network signal strength |
| 0x31 | 1 | BYTE, number of GNSS positioning satellites |
| 0xE0 | Subsequent message length | Customize subsequent message length |
| 0xE1-0xFF | | Custom region |

Table 28 Overspeed alarm additional information message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|--------------------|-----------|--|
| 0 | Location type | BYTE | 0: No specific location; 1: circular area; 2: rectangular area; 3: polygon area; 4: Road section |
| 1 | Zone or section ID | DWORD | If the location type is 0, this field is unavailable |

Table 29 Data format of additional information message body for area/route alarm

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------|-----------|--|
| 0 | Location type | BYTE | 1: Round area; 2: rectangular area; 3: Polygon area; 4: Route |
| 4 | Zone or line ID | DWORD | |
| 5 | Directions | BYTE | 0: enter; 1: Out |

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

| Start byte | Fields | Data type | Description and requirements |
|------------|--------|-----------|------------------------------|
|------------|--------|-----------|------------------------------|

| | | | |
|---|---------------------|-------|------------------------------|
| 0 | Section ID | DWORD | |
| 4 | Section travel time | WORD | Unit: second (s) |
| 6 | RESULTS | BYTE | 0: insufficient; 1: too long |

Table 31 Extended vehicle signal status bits

| position | Definition |
|----------|----------------------------|
| 0 | 1: Low light signal |
| 1 | 1: High beam signal |
| 2 | 1: Right turn signal |
| 3 | 1: Left turn signal |
| 4 | 1: Brake signal |
| 5 | 1: Reverse gear signal |
| 6 | 1: Fog light signal |
| 7 | 1: Outline light |
| 8 | 1: Horn signal |
| 9 | 1: Air conditioning status |
| 10 | 1: neutral signal |
| 11 | 1: The retarder works |
| 12 | 1: ABS work |
| 13 | 1: Heater works |
| 14 | 1: Clutch state 15-31 |
| | Retain |

Table 32 I/O status bits

| position | Definition |
|----------|---------------------------|
| 0 | 1: Deep hibernation state |
| 1 | 1: Hibernation state |
| 2-15 | Hold |

8.19 Location information query

Message ID: 0x8201.

The body of the location information query message is empty.

8.20 The response to the location query

Message ID: 0x0201.

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

Table 33 Location information query response message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|--------------------------------|-----------|---|
| 0 | Answer serial number | WORD | Corresponding Location Indicates the serial number of the query message |
| 2 | Location information reporting | | See 8.12 for location reporting |

8.21 Temporary location Tracking control

Message ID: 0x8202.

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

Table 34 Temporary Position tracking control message body data format

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

8.22 Manually acknowledge the alarm message

Message ID: 0x8203

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

Table 35 Data format of manual confirmation alarm message

| Start byte | Fields | Data type | Instructions |
|------------|---------------------------------|-----------|---|
| 0 | Alarm message serial number | WORD | Alarm message serial number that needs manual confirmation. 0 indicates all messages of this alarm type |
| 2 | Manually confirm the alarm type | DWORD | Definitions are shown in Table 36 |

Table 36 Definition of manual confirmation alarm types

| position | Definition |
|----------|--------------------------------|
| 0 | 1: Confirm emergency alarm; |
| 1 to 2 | Retain |
| 3 | 1: Confirm the danger warning; |

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

8.23 Text message delivery

Message ID: 0x8300.

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

Table 37 Data formats of text message delivery body

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

Table 38 Meaning of text message flag bits

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

8.24 Event Settings

Message ID: 0x8301.

The event Settings message body data format is shown in Table 39.

Table 39 Event Settings message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|--------|-----------|------------------------------|
|------------|--------|-----------|------------------------------|

| | | | |
|---|---------------------|------|--|
| 0 | Set type | BYTE | <p>0: deletes all existing events on the terminal. This command does not contain any subsequent bytes.</p> <p>1: update events;</p> <p>2: add event;</p> <p>3: Modify event;</p> <p>4: Delete certain events, and then the event item does not need to contain the event content</p> |
| 1 | Set the total | BYTE | |
| 2 | List of event items | | The event item composition data format is shown in Table 40 |

Table 40 Events compose the data format

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------------|-----------|---|
| 0 | Event ID | BYTE | If the terminal already has an event with the same ID, the event is overwritten |
| 1 | Event content Length | BYTE | Subsequent event content field byte length |
| 2 | Event content | STRING | Event content, encoded by GBK |

8.25 Event Report

Message ID: 0x0301.

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

Table 41 Event report message body data formats

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

8.26 Question Delivery

Message ID: 0x8302.

Table 42 shows the data format of the message body.

Table 42 Data formats of the question delivery message body

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------------------|-----------|--|
| 0 | Signs | BYTE | Table 43 describes the definition of question delivery flag bits |
| 1 | Question Content Length | BYTE | Question field byte length |
| 2 | Questions | STRING | Question text, encoded by GBK, of length N |
| 2+N | List of candidate answers | | The candidate answer message composition is shown in Table 44 |

Table 43 Definition of question delivery flag bits

| position | Signs |
|----------|-----------|
| 0 | 1: Urgent |

| | |
|--------|--------------------------------|
| 1 | Reserved |
| 2 | Reservations |
| 3 | 1: Terminal TTS broadcast read |
| 4 | 1: Advertising screen display |
| 5 to 7 | Reserved |

Table 44 Question delivery candidate answer message composition

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

8.27 Question and Response

Message ID: 0x0302.

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

Table 45 Data format of question and response message body

| Start byte | Fields | Data type | Description and requirements |
|------------|-------------------------|-----------|--|
| 0 | Answering serial number | WORD | Specifies the serial number of the message to be delivered |
| 2 | Answer ID | BYTE | The answer ID that comes with the question delivery |

8.28 Information on demand menu Settings

Message ID: 0x8303.

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

Table 46 Information on demand menu sets message body data format

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

Table 47 Information on Demand information items compose the data format

| Start byte | Fields | Data type | Description and requirements |
|------------|--------|-----------|------------------------------|
|------------|--------|-----------|------------------------------|

| | | | |
|---|---------------------|--------|---|
| 0 | Type of information | BYTE | If the terminal already has an information item of the same type, it is overwritten |
| 1 | Message name Length | WORD | Message name field byte length |
| 3 | Information name | STRING | GBK code processing |

8.29 Message on Demand/Cancel

Message ID: 0x0303.

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

Table 48 Message on Demand/cancel message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------------|-----------|------------------------------|
| 0 | Type of information | BYTE | |
| 1 | On demand/cancel sign | BYTE | 0: cancel. 1: on demand |

8.30 Information Services

Message ID: 0x8304.

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

Table 49 Information service message body data formats

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

8.31 Call back

Message ID: 0x8400.

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

Table 50 Telephone callback message body data formats

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

8.32 Sets up the phone book

Message ID: 0x8401.

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

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

| Start byte | Fields | Data type | Description and requirements |
|------------|--------|-----------|------------------------------|
|------------|--------|-----------|------------------------------|

| | | | |
|---|----------------|---|--|
| 0 | Set type | BYTE | 0: deletes all stored contacts from the terminal. 1: update the phone book (delete all existing contacts from the terminal) And append the contact in the message); 2: indicates to append the phone book; 3: indicates modification of the phone book (indexed by contacts) |
| 1 | Total contacts | BYTE | |
| 2 | Contact item | The phone book contact entry data format is shown in Table 52 | |

Table 52 Telephone book contact item data format

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------|-----------|--|
| 0 | Signs | BYTE | 1: incoming call; 2: outgoing call; 3: Incoming/outgoing |
| 1 | Number length | BYTE | |
| 2 | Phone number | STRING | The length is n |
| 2+n | Contact length | BYTE | |
| 3+n | Contacts | STRING | Encoded by GBK |

8.33 Vehicle Control

Message ID: 0x8500

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

Table 53 Vehicle control message body data formats

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

Table 54 Data format of control instruction flag bit

| | Signs |
|-----|---|
| 0 | 0: Door unlocked; 1: The door is locked |
| 1-7 | Reserved |

8.34 Vehicle control response

Message ID: 0x0500.

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

Table 55 Vehicle control response message body data formats

| Start byte | Fields | Data type | Description and requirements |
|------------|--|-----------|--|
| 0 | Answer serial number | WORD | The serial number of the corresponding 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 Set the circle area

Message ID: 0x8600.

Setting the data format of the circular area message body is shown in Table 56.

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

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

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------|-----------|---|
| 0 | Set properties | BYTE | 0: Update area; 1: Add area; 2: Modify the region |
| 1 | Area total | BYTE | |
| 2 | Zone item | | The data format for the area item content of the circular area is shown in Table 57 |

Table 57 Area entry content data format for the circular area

| Start byte | Fields | Data type | Description and requirements |
|------------|------------------------|-----------|--|
| 0 | Zone ID | DWORD | |
| 4 | Zone Properties | WORD | The region attributes are defined in Table 58 |
| 6 | Center point latitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 10 | Center point longitude | DWORD | The value of longitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 14 | Radius | DWORD | The unit is m (m), and the road section is from this turning point to the next turning point |
| 18 | Starting time | BCD[6] | YY-MM-DD-hh-mm-ss: If the 0 bit of the area attribute is 0, this field is not available |
| 24 | End time | BCD[6] | YY-MM-DD-hh-mm-ss: If the 0 bit of the area attribute is 0, this field is not available |
| 30 | Top speed | WORD | Km/h: If the area attribute bit 1 is 0, this field is not available |
| 32 | Duration of overdrive | BYTE | The unit is second (s) (similar expression, modified as before), if the area attribute 1 bit is 0, there is no field |

Table 58 Region attribute definition of region

| position | Signs |
|----------|---|
| 0 | 1: According to time |
| 1 | 1: Speed limit |
| 2 | 1: Enter the area to alert the driver |
| 3 | 1: Enter the area to alert the platform |
| 4 | 1: Exit the area to alert the driver |

| | |
|------|--|
| 5 | 1: Out of the area alarm to the platform |
| 6 | 0: North latitude; 1: south latitude |
| 7 | 0: East longitude; 1: West longitude |
| 8 | 0: Allow the door to open; 1: Forbidden to open doors |
| 9-13 | Hold |
| 14 | 0: Open the communication module in the area; 1: the communication module is turned off in the entering area |
| 15 | 0: no GNSS detailed positioning data is collected in the entering area; 1: GNSS detailed positioning data is collected in the area |

8.36 Deletes the circle area

Message ID: 0x8601.

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

Table 59 Deleting round area message body data formats

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

8.37 Sets the rectangular area

Message ID: 0x8602.

To set the rectangle area message body data format see Table 60.

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

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------|-----------|--|
| 0 | Set properties | BYTE | Zero: Update area; 1: Add area; 2: Modify the region |
| 1 | Area total | BYTE | |
| 2 | Zone item | | The format of the region entry data for rectangular areas is shown in Table 61 |

Table 61 Area entry data format of rectangular area

| Start byte | Fields | Data type | Description and requirements |
|------------|-------------------------|-----------|---|
| 0 | Zone ID | DWORD | |
| 4 | Zone Properties | WORD | The region attributes are defined in Table 58 |
| 6 | Upper left dot latitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |

| | | | |
|----|---------------------------------|--------|---|
| 10 | Dot longitude on the upper left | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 14 | Lower right point latitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 18 | Lower right point longitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 22 | Starting time | BCD[6] | Time range Set in the same circle area |
| 28 | End time | BCD[6] | Time range set in the same circle area |
| 34 | Top speed | WORD | The unit is kilometers per hour (km/h). If the area attribute bit 1 is 0, this field is not available |
| 36 | Duration of overdrive | BYTE | The unit is seconds (s). If the area attribute bit 1 is 0, there is no field |

8.38 Deletes the rectangular area

Message ID: 0x8603.

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

Table 62 Delete rectangular area message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------|-----------|---|
| 0 | Number of zones | BYTE | The number of regions contained in this message cannot exceed 125. If more than 125 regions are included, multiple messages are recommended. 0 indicates that all rectangular regions are deleted |
| 1 | Zone ID1 | DWORD | |
| | | DWORD | |
| | Regional IDn | DWORD | |

8.39 Sets the polygon area

Message ID: 0x8604.

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

Table 63 Setting polygon area message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|--------------------------------------|-----------|---|
| 0 | Zone ID | DWORD | |
| 4 | Zone Properties | WORD | The region attributes are defined in Table 58 |
| 6 | Start time | BCD[6] | Set the time range in the same circle area |
| 12 | End time | BCD[6] | Set the time range in the same circle area |
| 18 | Maximum speed | WORD | The unit is kilometers per hour (km/h). If the area attribute bit 1 is 0, this field is not available |
| 20 | Duration of overdrive | BYTE | The unit is seconds (s). If the area attribute bit 1 is 0, there is no field |
| 21 | Total number of vertices in the zone | WORD | |
| 23 | Vertex item | | Table 64 shows the data format of vertex entries for polygon areas |

Table 64 Vertex item data format for polygon area

| Start byte | Fields | Data type | Description and requirements |
|------------|------------------|-----------|---|
| 0 | Vertex latitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 4 | Vertex longitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |

8.40 Deletes the polygon area

Message ID: 0x8605.

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

Table 65 Delete polygon area message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------|-----------|---|
| 0 | Number of zones | BYTE | The number of regions contained in this message cannot exceed 125. If more than 125 regions are included, multiple messages are recommended. 0 indicates that all rectangular regions are deleted |
| 1 | Zone ID1 | DWORD | |
| | | DWORD | |
| | Regional IDn | DWORD | |

8.41 Set the route

Message ID: 0x8606.

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

Table 66 Sets the route message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|---|-----------|---|
| 0 | Route ID | DWORD | |
| 4 | Route Attributes | WORD | The format of route attribute data is shown in Table 67 |
| 6 | Starting time | BCD[6] | Set the time range in the same circle area |
| 12 | End time | BCD[6] | Set the time range in the same circle area |
| 18 | Total number of inflexion points of the route | WORD | |
| 20 | Inflexion term | | The data format of route inflexion point items is shown in Table 68 |

Table 67 Route attribute data format

| position | Signs |
|----------|----------------------|
| 0 | 1: According to time |
| 1 | Reserved |

| | |
|------|---|
| 2 | 1: Approach route alarm to the driver |
| 3 | 1: Approach route alarm to the platform |
| 4 | 1: Exit route alarm to the driver |
| 5 | 1: Out route alarm to the platform |
| 6-15 | Reserved |

Table 68 Data format of route inflection point item

| Start byte | Fields | Data type | Description and requirements |
|------------|---|-----------|---|
| 0 | Inflection point ID | DWORD | |
| 4 | Section ID | DWORD | |
| 8 | Inflection point latitude | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 12 | Longitude of the inflection point | DWORD | The value of latitude in degrees is multiplied by 10 to the power of 6, accurate to one millionth of a degree |
| 16 | Section width | BYTE | The unit is m (m), and the road section is from this turning point to the next turning point |
| 17 | Section properties | BYTE | The format of road attribute data is shown in Table 69 |
| 18 | Section driving over the long threshold | WORD | The unit is second (s). If the 0 bit of the road attribute is 0, this field is not available |
| 20 | Section driving under threshold | WORD | The unit is second (s). If the 0 bit of the road attribute is 0, this field is not available |
| 22 | Section maximum speed | WORD | The unit is kilometers per hour (km/h). If bit 1 of the road attribute is 0, this field is not available |
| 24 | Section speeding duration | BYTE | The unit is second (s). If bit 1 of the link property is 0, this field is not available |

Table 69 section attribute data format

| position | Signs |
|----------|--------------------------------------|
| 0 | 1: Travel time |
| 1 | 1: Speed limit |
| 2 | 0: North latitude; 1: south latitude |
| 3 | 0: East longitude; 1: West longitude |
| 4 to 7 | Reserved |

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

| Start byte | Fields | Data type | Description and requirements |
|------------|--------|-----------|------------------------------|
|------------|--------|-----------|------------------------------|

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

8.43 command for collecting driving record data

Message ID: 0x8700.

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

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

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

8.44 Upload of driving record data

Message ID: 0x0700.

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

Table 72 Data format of driving record data upload message body

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

8.45 Run the command to upload driving record parameters

Message ID: 0x8701.

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

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

| Start byte | Fields | Data type | Description and requirements |
|------------|----------------|-----------|---|
| 0 | Command word | BYTE | For the list of command words, see GB/T 19056 |
| 1 | Blocks of Data | | The format of the data block content is shown in GB/T 19056 and contains the complete data packet required by GB/T 19056. |

8.46 Electronic waybill report

Message ID: 0x0701.

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

Table 74 Data format of e-waybill reporting message body

| Start byte | Fields | Data type | Description and requirements |
|------------|-----------------------------|-----------|---------------------------------|
| 0 | Electronic waybill length | DWORD | |
| 4 | Electronic waybill contents | | Electronic waybill data package |

8.47 Report a request for driver identity information

Message ID: 0x8702.

Report Driver ID request message body is empty.

8.48 Driver identity information collection and report

Message ID: 0x0702.

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

Table 75 Data format of driver identity information reporting message body

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

8.49 Location data is uploaded in batches

Message ID: 0x0704.

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

Table 76 Format of location data Bulk upload data

| Start byte | Fields | Data type | Instructions |
|------------|----------------------------|-----------|--|
| 0 | Number of data items | WORD | The number of reported data items is >0 |
| 1 | Location data type | BYTE | 0: normal position batch report, 1: blind area supplement report |
| 2 | Position report data items | | See Table 77 for definitions |

Table 77 Location reporting data item data format

| Start byte | Fields | Data type | Instructions |
|------------|----------------------------------|-----------|---|
| 0 | Position report data body length | WORD | Position report data body length, n |
| 2 | Position report data body | BYTE[n] | See the definition in 8.12 Location Information Reporting |

8.50 CAN bus data upload

Message ID: 0x0705.

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

Table 78 CAN bus data upload data format

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

Table 79 Data format of CAN bus data items

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

8.51 Multimedia Event Information Upload

Message ID: 0x0800

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

Table 80 Data formats of multimedia event message upload message body

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

8.52 Multimedia Data Upload

Message ID: 0x0801.

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

Table 81 Data format of multimedia data upload message body

| Start byte | Fields | Data type | Description and requirements |
|------------|--|-----------|---|
| 0 | Multimedia ID | DWORD | > 0 |
| 4 | Types of multimedia | BYTE | 0: image; 1: audio; 2: video; |
| 5 | Multimedia Format Coding | BYTE | 0: JPEG; 1: TIF; 2: MP3; 3: WAV; 4: WMV; Other reservations |
| 6 | Event item coding | BYTE | 0: The platform sends commands. 1: timing action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; Other reservations |
| 7 | Channel ID | BYTE | |
| 8 | Location information Reporting (0x0200) message body | BYTE[28] | Indicates the basic information about the location of multimedia data |
| 36 | Multimedia Packets | | |

8.53 Reply to multimedia data upload

Message ID: 0x8800.

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

Table 82 Data format of multimedia data upload reply message body

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------------------------------|-----------|---|
| 0 | Multimedia ID | DWORD | >0: If all packets are received, no subsequent fields are displayed |
| 4 | Total number of retransmitted packets | BYTE | n |
| 5 | List of retransmit packet ids | BYTE[2*n] | The sequence number of the retransmission packets is listed in sequence, for example, ID1 ID2..... Packet IDn. |

Note: The recipient of this message agrees to resend the subcontract in the retransmission packet ID list with message 0x0801, exactly the same as the original subcontract message.

8.54 Camera shoot now command

Message ID: 0x8801.

Table 83 shows the format of the message body of the camera immediately shooting command.

Table 83 Data format of the camera instant Shot command message body

| Start byte | Fields | Data type | Description and requirements |
|------------|-------------------------------|-----------|---|
| 0 | Channel ID | BYTE | > 0 |
| 1 | Shooting command | WORD | 0 means stop shooting; 0xFFFF means recording; Other means filming Number of views |
| 3 | Photo interval/recording time | WORD | Seconds, 0 indicates the minimum interval for taking pictures or recording all the time |
| 5 | Save signs | BYTE | 1: Save; 0: real-time upload |
| 6 | Resolution ① | BYTE | 0x01:320*240; 0x02:640*480; 0x03:800*600; 0x04:1024*768; 0x05:176*144; [Qcif]; 0x06:352*288; [Cif]; 0x07:704*288; [HALF D1]; 0x08:704*576; [D1]; |
| 7 | Image/video quality | BYTE | 1-10, with 1 representing minimum mass loss and 10 representing maximum compression ratio |
| 8 | Brightness | BYTE | 0-255 |
| 9 | Contrast | BYTE | 0-255 |
| 10 | Saturation | BYTE | 0-127. |
| 11 | Chroma | BYTE | 0-255. |

If the terminal does not support the resolution required by the system, take the closest resolution to shoot and upload

8.55 Camera Take immediately command answer

Message ID: 0x0805.

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

Table 84 Format of Camera Take Immediately command response data

| Start byte | Fields | Data type | Description and requirements |
|------------|--------------------------|-----------|--|
| 0 | Answer serial number | WORD | The message serial number of the command that the platform camera takes immediately |
| 2 | RESULTS | BYTE | 0: successful; 1: failure; 2: The channel is not supported. The following fields are only valid if the result =0. |
| 3 | Number of multimedia ids | WORD | n: indicates the number of multimedia shots successfully captured |

| | | | |
|---|------------------------|-----------|--|
| 4 | List of multimedia ids | BYTE[4*n] | |
|---|------------------------|-----------|--|

8.56 Store multimedia data retrieval

Message ID: 0x8802.

Store multimedia data Retrieve message body data format is shown in Table 85.

Note: The start time and end time are set to 00-00-00-00-00-00 if the time range is not specified.

Table 85 Storing multimedia data Search message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------------|-----------|---|
| 0 | Types of multimedia | BYTE | 0: image; 1: audio; 2: video; |
| 1 | Channel ID | BYTE | 0 indicates that all channels for this media type are retrieved |
| 2 | Event item coding | BYTE | 0: The platform sends the command; 1: timing action; 2: robbery alarm touch Send out; 3: collision rollover alarm triggered; Other reservations |
| 3 | Starting time | BCD[6] | YY-MM-DD-hh-mm-ss |
| 9 | End time | BCD[6] | YY-MM-DD-hh-mm-ss |

8.57 Stores the multimedia data retrieval response

Message ID: 0x0802.

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

Table 86 Storage multimedia data retrieval response message body data format

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

Table 87 multimedia search item data format

| Start byte | Fields | Data type | Description and requirements |
|------------|---|-----------|--|
| 0 | Multimedia ID | DWORD | > 0 |
| 4 | Types of multimedia | BYTE | 0: image; 1: audio; 2: video |
| 5 | Channel ID | BYTE | |
| 6 | Event item coding | BYTE | 0: The platform sends commands. 1: timing action; 2: robbery alarm touch Send; 3: collision rollover alarm triggered; Other reservations |
| 7 | Location information reporting (0x0200) message body | BYTE[28] | Represents the basic information data of the location at the beginning of the shooting or recording |

8.58 Commands for uploading multimedia data

Message ID: 0x8803

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

Table 88 Storage multimedia data upload command message body data format

| Start byte | Fields | Data type | Description and requirements |
|------------|---------------------|-----------|---|
| 0 | Types of multimedia | BYTE | 0: image; 1: audio; 2: video |
| 1 | Channel ID | BYTE | |
| 2 | Event item coding | BYTE | 0: The platform sends commands. 1: timing action; 2: robbery alarm trigger; 3: collision rollover alarm trigger; Other reservations |
| 3 | Starting time | BCD[6] | YY-MM-DD-hh-mm-ss |
| 9 | End time | BCD[6] | YY-MM-DD-hh-mm-ss |
| 15 | Remove signs | BYTE | 0: reserved. 1: delete; |

8.59 Record the start command

Message ID: 0x8804

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

Table 89 Data format of recording start command message body

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

8.60 command for retrieving and uploading multimedia data

Message ID: 0x8805

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

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

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

8.61 Downlink transparent transmission of data

Message ID: 0x8900.

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

Table 91 Data format of downlink transparent message body

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

8.62 Upstream transparent transmission

Message ID: 0x0900.

Data Uplink transparent message body data format see.

Table 92 Data formats of uplink transparent message body

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

Table 93 Transparent message type definition table

| Transparent message type | Definitions | Description and Requirements |
|--|-------------|---|
| GNSS module detailed positioning data | 0x00 | GNSS module detailed positioning data |
| Road transport certificate IC card information | 0x0B | The road transport card IC card information upload message is 64 bytes, and the downlink message is 24 bytes. Road transport card IC card authentication transparent transmission timeout time is 30s. No retransmission after timeout. |
| Serial port 1 Transmit transparently | 0x41 | Serial port 1 transparently transmits messages |
| Serial port 2 pass transparently | 0x42 | Serial port 2 transparently transmits messages |
| User-defined transparent message | 0xFO-0xFF | User-defined transparent messages |

8.63 Data compression reported

Message ID: 0x0901.

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

Table 94 Data compression Data format of the reported message body

| Start byte | Fields | Data type | Description and requirements |
|------------|-------------------------|-----------|--|
| 0 | Compress message length | DWORD | |
| 4 | Compressed message body | | The compressed message body is the message to be compressed after the GZIP compression algorithm |

8.64 RSA public key for platform

Message ID: 0x8A00.

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

Table 95 Platform RSA public key message body data format

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

8.65 Terminal RSA public key

Message ID: 0x0A00.

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

Table 96 Data format of terminal RSA public key message body

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

Attachment A

(规范性附录)

车载终端与外接设备通讯协议

A.1 Equipment

A.1.1 host

Host shall conform to JT/T 794.

A.1.2 Slave

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

A.2 Communication protocol

A.2.1 Frame format definition

All communications between A slave and a host follow the frame format shown in Table A.1.

Table A.1 Frame formats

| Identification bit | Check code | Version number | Manufacturer number | Peripheral type number | Command type | User data | Identification bits |
|--------------------|------------|----------------|---------------------|------------------------|--------------|-----------|---------------------|
| 1 byte | 1 byte | 2byte | 2byte | lbyte | 1 byte | n byte | 1 byte |

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

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

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

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

The escape process is as follows:

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

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

Example 1:

Sending a packet with the contents 0x30 0x7e 0x08 0x7d 0x55 is encapsulated as follows: 0x7e 0x30 0x7d 0x02 0x08 0x7d 0x01 0x55 0x7e;

- b) Check code: The sum from the manufacturer number to the user data, and then take the lower 8 digits of the sum as the check code;

Example 2:

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

- c) Version number: identifies the communication protocol version;
- d) Manufacturer number: the manufacturer code of the peripheral slave;
- e) Peripheral type number: a unique type number corresponding to each peripheral, which is used for the peripheral interface driver of the host to distinguish which peripheral sends the data; Peripheral type number is shown in Table A.2;

- f) Command type: peripherals and host for a variety of data interaction information types, command types are divided into general protocol and proprietary protocol two categories: general protocol mainly includes the slave machine and host basic, necessary, common some information interaction types; Proprietary protocols define the unique information interaction types of peripherals and the host; The command types are shown in Table A.3;
- g) User data: refers to the data of peripherals interacting with the host that is customized by specific service functions except for the above parts;
- h) the data of the communication frame is represented by big-endian.

Table A.2 Peripherals type number table

| Peripheral type | Number |
|---------------------------------------|-----------|
| Industry information terminal | 0x01 |
| Dispatch display | 0x02 |
| Car navigation display | 0x03 |
| Oil level detector | 0x04 |
| Acceleration detector | 0x05 |
| Burglar alarm | 0x06 |
| Interface extender | 0x07 |
| Load detector | 0x08 |
| Passenger flow detector | 0x09 |
| Universal sensor | 0x0A |
| Road transport license IC card reader | 0x0B |
| Custom | 0xF0-0xFF |

Table A.3 Command Type table

| Protocol type | Type of business function | Type of command |
|------------------------------------|--|--|
| Universal protocol for peripherals | Power-on instruction/answer | 0x01 |
| | Link query/answer | 0x02 |
| | Control/answer from electromechanical source | 0x03 |
| | Query slave version number information | 0x04 |
| | Slave self-check/answer | 0x05 |
| | Slave firmware update/answer | 0x06 |
| | reserve | 0x07-0x3F |
| | Private protocol | Road transport Certificate IC card authentication Request/response |

| | | |
|--|--|-----------|
| | Road transport card IC card reading result notification/response | 0x41 |
| | Card removal notification/answer | 0x42 |
| | Active trigger read IC card/answer | 0x43 |
| | Various proprietary functional service protocols for slave peripherals | 0x44-0xFF |

A.2.2 Rules for adding peripheral protocols

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

- a) Send and reply protocols of the same function use the same command type;
- b) For peripherals with many command types, when adding new command types, try to adopt the variable parameter method to reduce the command type occupation.

A.3 General Protocol Description

A.3.1 indicates the secondary power

See Table A.4 for instructions on slave power.

Table A.4 Instructions for slave power on board

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

A.3.2 Peripheral link Inquiry

See Table A.5 for peripheral link polling instructions.

Table A.5 Table of peripheral link poll instructions

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|---------------------|---|----------------|
| 1 | 02H | Link polling | Link maintenance time The high byte comes first and the low byte comes last. The unit of the high byte is minute (min) and the unit of the low byte is second (s). It is recommended that the link polling time be 15s-30s. If the link times out, the master deregisters the slave | Uplink |
| 2 | 02H | Link query response | There is no | downgoing |

A.3.3 Slave power source control

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

Table A.6 Slave power control instruction table

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|--|--|----------------|
| 1 | 03H | Control from electromechanical source | Control type: 0x00 -- Slave exits power saving mode; 0x01 -- Slave goes into power saving mode | Downlink |
| 2 | 03H | Control the response from the electromechanical source | Answer type: 0x01 -- Operation succeeded; 0x02 -- Operation failure (Slave cannot enter power saving mode or exit power saving mode due to special circumstances) | Up |

A.3.4 Queries the version number of the slave

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

Table A.7 Instructions for querying slave version number information

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

A.3.5 Slave self-test

See Table A.8 for instructions on slave self-test.

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

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|------------------------------|--|----------------|
| 1 | 05H | Slave self-check | Self-check slave type, BYTE, as defined in Table A.2 | Downlink |
| 2 | 05H | Self-test result information | Self-check slave type, BYTE, as defined in Table A.2 Self-test result, BYTE 0x01: Self-check successful; 0x02: Self-test failed. | UP |

Note: This command timeout time is 1s, if there is no response, the maximum multiple three times.

After receiving the self-test failure, the terminal sets the corresponding alarm sign, and makes voice prompt or screen display.

A.3.6 Slave firmware update

See Table A.9 for slave firmware update instructions.

Table A.9 Slave Firmware Update instruction table

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|------------------------------|---|----------------|
| N | 06H | Update slave module FirmWare | Total packet number of messages, WORD Package serial number, WORD, starting at 1 Packet data with a maximum length of 256 bytes | Downlink |
| 2 | 06H | Confirmation information | Package serial number, WORD Answer result, BYTE | Up |

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

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

A.3.7 Queries peripheral properties

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

Table A.10 Query Peripheral Property instruction table

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

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

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

A.4 Special protocol description

A.4.1 road transport certificate IC card certification request

When the module detects that there is a card inserted, and after the module is reset or powered on again, and the physical card number of the IC card in the card slot is different from the card number read last time, the uplink command of the road transport card IC card authentication request is automatically triggered.

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

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

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|---------------------------------------|---|----------------|
| 1 | 40H | IC card authentication request | Status bits, BYTE, 0x00: IC card read successfully; 0x01: The IC card is not inserted; 0x02: IC card failed to read card; 0x03: Non-qualification IC card; 0x04: The IC card is locked. Data area (valid when status bit =0x00), basic card information and authentication information (64 bytes) | Up |
| 2 | 40H | IC card authentication request answer | IC card authentication request response result, BYTE 0x00: Authentication request successfully completed; 0x01: Terminal is not online; 0x02: Terminal Passthrough Authentication Center timeout no response; 0x03: Terminal confirms receipt of message (IC card authentication please | downlink |

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

Note: When the command is upstream and the status bit of the IC card authentication request is 0x00, the timeout period is 35S. When the status of the IC card authentication request is in other states and the status of the IC card authentication request is 1s, the timeout period is 1s. If there is no response, the command is sent a maximum of three times.

- A. When the status bit is 0x00, the terminal sends 64 bytes of basic card information and authentication information to the authentication center, and returns 1 or 25 bytes of result information to the card reading module according to different circumstances.
- a. When the IC card authentication request response result returned by the terminal to the card reading module is 0x00, the card reading module begins to read the card information, and then automatically starts 41H instruction to feedback the result to the terminal, the terminal voice prompts the driver the corresponding result, and uses the command 0x0702 to send the driver's identity information to the certification center and monitoring platform after reading the card successfully;
 - b. When the answer result of IC card authentication request returned by the terminal to the card reading module is 0x01, wait 20 minutes, and use 43H command to actively trigger the card reading module to read the IC card;
 - c. When the answer result of IC card authentication request returned by the terminal to the card reader module is 0x02, the card reader module resends the IC card for 40H for three times. After three unsuccessful times, the terminal ends the process, and the voice prompts the driver to the corresponding result;
 - d. When the answer result of IC card authentication request returned by the terminal to the card reading module is 0x03, the process ends and the terminal voice prompts the driver to get the corresponding result.
- B. When the status bit of the terminal is not 0x00, the process is ended and the voice prompts the driver with the corresponding result.

A.4.2 road transport license IC card read result notification

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

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

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|----------------------------------|--|----------------|
| 1 | 41H | IC card read result notification | IC card read result, BYTE0x00: IC card read successfully, at this time there is subsequent data; 0x01: Failed to read the card because the card key authentication did not pass; 0x02: Failed to read the card because the card has been locked; 0x03: Failed to read the card because the card was pulled out. 0x04: Read the card failed because of data verification error. Data area (valid when IC card reads 0x00), driver identification information, see Table A.13. | Going Up |
| 2 | 41H | Driver ID received confirmation | There is no | downgoing |

Note: The timeout period of this instruction is 1s, if there is no response, the maximum number of times to send three.

- A. When the terminal receives the IC card reading result is 0x00, use the command 0x0702 to send the driver identity information to the authentication center and the home platform; B. When the IC card read result is not 0x00, the terminal ends the process and voice prompts the driver to the corresponding result.

Table A.13 Driver Identity Information Table

| Start byte | Fields | Data type | Description and requirements |
|------------|--------------------|-----------|------------------------------|
| 0 | Driver name Length | BYTE | The length is n |
| 1 | Driver's name | STRING | Driver's name |

| | | | |
|--------|----------------------------------|--------|---|
| 1+n | Qualification certificate number | STRING | The value contains 20 characters |
| 21+n | Length of issuing agency name | BYTE | The length is m |
| 22+n | Name of issuing authority | STRING | Name of the license issuing institution |
| 22+n+m | Id validity period | BCD[4] | YYYYMMDD |

A.4.3 Card pull out notification

See Table A.14 for the Card Pull out notification instructions.

Table A.14 Card pull out notification instruction table

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

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

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

A.4.4 actively triggers to read the IC card

Active trigger read IC card instructions are shown in Table A.15.

Table A.15 Active trigger read IC card instruction table

| procedure | Type of command | Description | User data | Data direction |
|-----------|-----------------|--|-------------|----------------|
| 1 | 43H | Active trigger to read the IC card | There is no | downgoing |
| 2 | 43H | Actively triggers reading IC card confirmation information | There is no | Up |

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

This command is used for the terminal roll call, the terminal is not online or the terminal uploads the IC card authentication information timeout, etc. After receiving the command, the card reading module will automatically touch 40H command to re-read the card.

Attached B
(Normative Appendix)

Message comparison table

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

Table B.1 Message comparison table

| Serial number | Message body name | Message ID | Serial number | Message body name | Message ID |
|---------------|---|------------|---------------|--|---------------|
| 1 | Terminal Universal Reply | 0x0001 | 24 | Event Settings | 0x8301 |
| 2 | Platform Universal Answer | 0x8001 | 25 | Incident Reports | 0x0301 |
| 3 | Terminal heartbeat | 0x0002 | 26 | Question down | 0x8302 |
| 4 | Follow-up subcontract request | 0x8003 | 27 | Question Response | 0x0302 |
| 5 | Terminal Registration | 0x0100 | 28 | Information on Demand menu Settings | 0x8303 |
| 6 | Terminal registration response | 0x8100 | 29 | Message on demand/cancel | 0x0303 |
| 7 | Terminal logout | 0x0003 | 30 | Information Services | 0x8304 |
| 8 | Terminal Authentication | 0x0102 | 31 | Call back | 0x8400 |
| 9 | Set Terminal parameters Query | 0x8103 | 32 | Set Phone book | |
| 10 | terminal parameters | 0x8104 | 33 | Vehicle control | 0x8401~0x8500 |
| 11 | Query the terminal parameter response | 0x0104 | 34 | Vehicle control response set | 0x0500 |
| 12 | Terminal Control | 0x8105 | 35 | circular area | 0x8600 |
| 13 | Query the specified terminal parameters | 0x8106 | 36 | Delete the circular area | 0x8601 |
| 14 | Query terminal properties | 0x8107 | 37 | Set up rectangular area | 0x8602 |
| 15 | Query the terminal property response | 0x0107 | 38 | Delete rectangular area | 0x8603 |
| 16 | Deliver the terminal upgrade package | 0x8108 | 39 | Set up the polygon area | 0x8604 |
| 17 | Terminal upgrade result notification | 0x0108 | 40 | Delete the polygon locale | 0x8605 |
| 18 | Location information Report | 0x0200 | 41 | route | 0x8606 |
| 19 | location information queries | 0x8201 | 42 | Deleting Routes | 0x8607 |
| 20 | Location information query response | 0x0201 | 43 | Travel recorder data acquisition command | 0x8700 |
| 21 | Temporary location tracking control | 0x8202 | 44 | travel recorder data upload | 0x0700 |
| 22 | Confirm the alarm message manually | 0x8203 | 45 | Ride recorder parameters down command | 0x8701 |
| 23 | Text message down | 0x8300 | 46 | Electronic waybill to report | 0x0701 |

| Serial number | Message body name | Message ID | Serial number | Message body name | Message ID |
|---------------|--|------------|---------------|---|-----------------------------|
| 47 | Driver identity information collection and reporting | 0x0702 | 58 | Store multimedia data for upload | 0x8803 |
| 48 | Report a request for driver identification information | 0x8702 | 59 | Recording Start Command | 0x8804 |
| 49 | Locate data to upload in bulk | 0x0704 | 60 | Single store multimedia data retrieval upload command | 0x8805 |
| 50 | CAN bus data upload | 0x0705 | 61 | Downlink transparent transmission | 0x8900 |
| 51 | Multimedia event information upload | 0x0800 | 62 | Uplink transparent transmission | 0x0900 |
| 52 | Multimedia data Upload | 0x0801 | 63 | Data compression Reporting | 0x0901 |
| 53 | Multimedia data upload answer | 0x8800 | 64 | Platform RSA Public Key | 0x8A00 |
| 54 | Camera immediately shoot command | 0x8801 | 65 | Terminal RSA Public Key | 0x0A00 |
| 55 | Camera immediately shoot command answer | 0x0805 | 66 | Platform downlink message retained | 0x0000-0x0000-0x0000-0x0000 |
| 56 | Store multimedia data retrieval | 0x8802 | 67 | The uplink message of the terminal is reserved | |
| 57 | Store multimedia data retrieval responses | 0x0802 | | | |