**General JT/T808 Protocol**

**V1.1**

1. **Protocol Basis**

**1.1 Communication Way**

**The communication method adopted by the protocol should comply with the relevant regulations in JT/T 794. The communication protocol adopts TCP, the platform serves as the server and the terminal serves as the client. The customized or extended part of the content is marked in bold red in this agreement document.**

**1.2 Data Type**

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

Table 1 Data Type

|  |  |
| --- | --- |
| Data Type | Description and requirements |
| BYTE | Unsigned single byte integer ( Byte，8 Digital ) |
| WORD | Unsigned double byte integer( Byte，16 Digital) |
| DWORD | Unsigned four-byte integer( Double Byte，32 Digital) |
| BYTE[n] | n byte |
| BCD[n] | 8421 Code，n byte |
| STRING | GBK encoding, using 0 terminator, if there is no data, put a 0 terminator |

**1.3 Transmission rules**

The protocol uses big-endian network byte order to transfer words and double words.

The agreement is as follows:

—— Byte (BYTE) transmission convention: according to byte stream transmission;

——The transmission convention of WORD: first transfer the high eight bits, and then transfer the low eight bits;

——The transmission convention of DWORD: first transfer the high 24 bits, then transfer the high 16 bits, then transfer the high eight bits, and finally transfer the low eight bits.

**1.4 The composition of the message**

**1.4.1 Message Structure**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| identification bits | message header | message body | check code | identification bits |

Figure 1 Message Structure

**1.4.2** Identification Bits

Using Ox7e means that if 0x7e appears in the check code, message header, and message body, it must be escaped. The escape rules are defined as follows:

0x7e<——>0x7d is followed by a 0x02;

0x7d<——>0x7d is followed by a 0x01;

The escaping process is as follows:

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

When receiving a message: Escape and restore——>Verify check code——>Analyze the message.

Example:

Send a data packet whose content is 0x30 0x7e 0x08 0x7d 0x55, and the package is as follows: 0x7e 0x30 7d 0x02 0x08 0x7d 0x01 0x55 0x7e.

**1.4.3** Message Header

The content of the message header is shown in Table 2:

**Table 2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Start byte** | **Number Field** | **Data Type** | **Description & Requirements** |
| 0 | Message ID | WORD |  |
| 2 | Message body attributes | WORD | The structure diagram of the message body attribute format is shown in Figure 2 |
| 4 | Terminal phone number | BCD[6] | This field is the terminal device number affixed to the shell of the device, a total of 11 digits, and the device number is uploaded with 0 in front of it. For example: 138081234567, data upload 0138081234567 |
| 10 | Message serial number | WORD | Cyclically accumulate from 0 in the sending order |
| 12 | Message package encapsulation item |  | If the relevant flag in the message body attribute determines that the message is subpackaged, then this item has content, otherwise there is no item |

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

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

Data encryption method:

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

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

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

——Other reservations.

Subcontract:

When the 13th bit in the message body attribute is 1, it means that the message body is a long message, and the packet is sent. The specific subpackage information is determined by the message package encapsulation item; if the 13th bit is 0, there is no message package encapsulation in the message header Item field.

The contents of the message package encapsulation items are shown in Table 3

**Table 3**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Total number of message packs | WORD | The total number of packets after the message is subpackaged |
| 2 | Packet sequence number | WORD | Start from 1 |

**1.4.4 Check code**

The check code refers to the XOR from the beginning of the message to the next byte until the previous byte of the check code, which occupies one byte.

1. **Data Format**

**2.1 Terminal general response【0001】**

Message ID: 0x0001。

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

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Reply serial number | WORD | The serial number of the corresponding platform message |
| 2 | Reply ID | WORD | The ID of the corresponding platform message |
| 4 | Result | BYTE | 0：Success/confirmation；1：Fail；2：Error；  3：not support |

**2.2 Platform general response【8001】**

Message ID：0X8001。

The data format of the platform general response message body is shown in Table 5.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Reply serial number | WORD | The serial number of the corresponding terminal message |
| 2 | Reply ID | WORD | The ID of the corresponding terminal message |
| 4 | Result | BYTE | 0：Success/confirmation；1：Fail；2：Error；  3：not support 4：Alarm processing confirmation |

**2.3 Terminal heartbeat【0002】**

Message ID：0X0002.

The terminal heartbeat data message body is empty.

The platform replies to a general response

**2.4 Terminal registration【0100】**

Message ID：0X0100。

The data format of the terminal registration message body is shown in Table 6.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | State ID | WORD | Indicate the province where the vehicle is installed on the terminal, 0 is reserved, and the default value is taken by the platform. The provincial ID adopts the first two of the six administrative division codes specified in GB/T 2260. |
| 2 | City ID | WORD | Indicate the city and county where the vehicle is installed on the terminal, 0 is reserved, and the platform takes the default value. The city/county area ID adopts the six last four digits of the administrative division code specified in GB/T 2260. |
| 4 | Manufacturer ID | BYTE[5] | Five bytes, terminal manufacturer code. |
| 9 | Terminal Model | BYTE[8] | Eight bytes, this terminal model is defined by the manufacturer, the number of digits is not eight, and the space is filled. |
| 17 | Terminal ID | BYTE[7] | Seven bytes, composed of uppercase letters and numbers, this terminal ID is defined by the manufacturer. |
| 21 | Color of Car Plate | BYTE | The color of the license plate, in accordance with 5.4.12 of JT/T 415-2006, the value is 0 when it is not on the license plate |
| 25 | Car Plate | STRING | Motor vehicle license plate issued by the public security traffic management department |

**2.5 Terminal registration response【8100】**

Message ID：0x8100。

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

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Reply serial number | WORD | The serial number of the corresponding terminal registration message |
| 2 | Result | BYTE | 0：Success；1：Vehicle has been registered；2：No such vehicle in the database；3：The terminal has been registered；4：No such terminal in the database |
| 3 | Authentication code | STRING | This field is only available after success |

The terminal will go through the registration process again every time it is reset, and the platform needs to respond to the registration message at any time.

**2.7 Terminal authentication【0102】**

Message ID：0x0102.

The data format of the terminal authentication message body is shown in Table 8-1.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Filed | Data Type | Description & Requirements |
| 0 | Authentication code | STRING | Report the authentication code after the terminal reconnects |

**Table 8-2 Platform response terminal authentication message body data format**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Reply serial number | WORD | The serial number of the corresponding terminal message |
| 2 | Reply ID | WORD | 0x0102:Terminal authentication message ID |
| 4 | Result | BYTE | 0：Success/confirmation；1：Fail |

**2.8 Set terminal parameters【8103】**

Message ID：0x8103

The data format of the message body for setting terminal parameters is shown in Table 9.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Total number of parameters | BYTE |  |
| 1 | List of parameter items |  | The parameter item format is shown in Table 10 |

**Table 10 Data format of terminal parameter item**

|  |  |  |
| --- | --- | --- |
| Number Field | Data Type | 描述及要求 |
| Parameter ID | DWORD | Parameter ID definition and description are shown in Table 11 |
| Parameter Length | BYTE |  |
| Parameter value |  | If it is a multi-value parameter, multiple parameter items with the same ID are used in the message, such as the telephone number of the dispatch center |

**Table 11: Definition and description of each parameter item of terminal parameter setting**

|  |  |  |
| --- | --- | --- |
| Parameter ID | Data Type | Description & Requirements |
| 0x0001 | DWORD | Terminal heartbeat sending interval, in seconds(s) |
| 0x0010 | STRING | Main server APN, wireless communication dial-up access point. |
| 0x0013 | STRING | Main server address, IP or domain name |
| 0x0017 | STRING | Backup server address, IP or domain name |
| 0x0018 | DWORD | Server TCP port |
| 0x0020 | DWORD | Location report strategy, 0: regular report; 1: fixed distance report; 2: regular and fixed distance report |
| 0x0027 | DWORD | Reporting time interval during sleep, in seconds (s), >0 |
| 0x0029 | DWORD | The default time reporting interval, in seconds (s), >0 |
| 0x002C | DWORD | The default distance report interval, the unit is meter (m),>0 |
| 0x0030 | DWORD | Inflection point supplementary transmission angle, <180° |
| 0x0055 | DWORD | Maximum speed in kilometers per hour (km/h) |
| 0x0056 | DWORD | Overspeed duration in seconds (s) |
| 0x0080 | DWORD | Vehicle odometer reading, 1/10km |
| 0x0081 | DWORD | Province ID where the vehicle is located |
| 0x0082 | DWORD | City ID where the vehicle is located |
| 0x0083 | STRING | Motor vehicle license plate issued by the public security traffic management department |
| 0x0084 | BYTE | The color of the license plate is in accordance with 5.4.12 of JT/T415-2006 |

**2.9 Query terminal parameters【8104】**

Message ID：0x8104

The query terminal parameter message body is empty.

**2.10 Query terminal parameter response【0104】**

Message ID：0x0104。

The data format of the query terminal parameter response message body is shown in Table 12.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Filed | Data Type | Description & Requirements |
| 0 | Reply serial number | WORD | The serial number of the corresponding terminal parameter query message |
| 2 | Number of response parameters | BYTE |  |
| 3 | List of parameter items |  | The parameter format and definition are shown in Table 10 |

**2.11 Terminal control【8105】**

Message ID：0x 8105。

The data format of the terminal control message body is shown in Table 13.

**Table 13 Terminal control message body data format**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Command word | BYTE | See Table 14 for the description of terminal control command words |
| 1 | Command parameters | STRING | The command parameter format is described later. Each field is separated by a half-width ";", and each STRING field is processed according to GBK encoding before forming a message |

**Table 14 Description of terminal control command words**

|  |  |  |
| --- | --- | --- |
| Command Byte | Command Parameter | Description & Requirement |
| **0x04** | **No** | **Terminal reset (restart)** |
| **0x05** | **No** | **Restore the factory settings of the terminal** |
| **0x17** | **No** | **Turn on voice recording** |
| **0x18** | **2 Bytes** | **Turn on continuous recording**  **Recording time, in minutes** |
| **0x19** | **No** | **Stop all recording** |
| **0x64** | **No** | **Cut off oil and electricity** |
| **0x65** | **No** | **Restore oil and electricity** |
| **0x66** | **No** | **External fortification** |
| **0x67** | **No** | **External disarm** |

**2.12 Location information report【0200】**

Message ID：0x0200。

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

|  |  |
| --- | --- |
| Basic location information | List of location additional information items |

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

The data format of basic position information is shown in Table 16.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Alarm sign | DWORD | Refer to Table 18 for the definition of alarm flag bit |
| 1 | Status | DWORD | The status bit definition is shown in Table 17 |
| 8 | latitude | DWORD | The latitude value in degrees is multiplied by 10 to the 6th power, accurate to one millionth of a degree |
| 12 | longitude | DWORD | The latitude value in degrees is multiplied by 10 to the 6th power, accurate to one millionth of a degree |
| 16 | Height | WORD | Altitude above sea level, in meters (m) |
| 18 | Speed | WORD | 1/10km/h |
| 20 | Direction | WORD | 0-359, true north is 0, clockwise |
| 21 | Time | BCD[6] | YY-MM-DD-hh-mm-ss(GMT+8 time, the time involved after this standard adopts this time zone) |

**Table 17 Status bit definition**

|  |  |
| --- | --- |
| Bit | Status |
| 0 | 0: ACC Off；1:ACC On |
| 1 | 0: Un-Position；1: Positioned |
| 2 | 0: north latitude；1: south latitude |
| 3 | 0: East longitude；1: West longitude |
| 4-5 | Reserve |
| 6 | **0: Disarm 1：Fortify** |
| 7-9 | Reserve |
| 10 | Oil circuit status：0: normal；1: Disconnected |
| 11 | **Power-off state：0: Main Power Normal:1: Main Power Disconnected** |
| 12-31 | Reserve |

**Table 18 Definition of alarm flag bit**

|  |  |  |
| --- | --- | --- |
| Bit | Definition | Processing instructions |
| 0 | 1:Emergency alarm (SOS alarm) | Cleared after receiving the response |
| 1 | 1：Overspeed Alarm | The flag is maintained until the alarm condition is removed |
| 2 | 1：Fatigue driving | The flag is maintained until the alarm condition is removed |
| 3-6 | Reserve |  |
| 7 | 1：Terminal main power supply undervoltage | The flag is maintained until the alarm condition is removed |
| 8 | 1：Main power disconnection alarm | The flag is maintained until the alarm condition is removed |
| 9-14 | Reserve |  |
| 15 | **Low battery alarm (wireless device)** | Cleared after receiving the response |
| 16 | **Vibration Alarm** | Cleared after receiving the response |
| 17-18 | Reserve |  |
| 19 | 1：Overtime parking | The flag is maintained until the alarm condition is removed |
| 20-27 | Reserve |  |
| 28 | 1：Illegal vehicle displacement | Cleared after receiving the response |
| 29~31 | Reserve |  |

See Table 19 for the format of location additional information items.

**Table 19 Location Additional Information Item Format**

|  |  |  |
| --- | --- | --- |
| Number Field | Data Type | Description & Requirements |
| Additional Information ID | BYTE | 1-255 |
| Additional Information Length | BYTE |  |
| Additional Information |  | Additional information is defined in Table 20 |

**Table 20 Definition of additional information**

|  |  |  |
| --- | --- | --- |
| Additional Information ID | Additional Information Length | Description & Requirements |
| **0x01** | **4** | **Mileage, DWORD, 1/10km, local accumulated mileage of the terminal** |
| **0x2B** | **4** | **The two-channel fuel consumption data adopts the reported data as the Changrun fuel consumption protocol data** |
| **0x30** | **1** | **Network signal strength CSQ value 0-31** |
| **0x31** | **1** | **The number of GPS satellites, the signal value is greater than 25dB The number of satellites** |
| **0x51** | **16** | **16 bytes, 2 bytes for a group temperature, a total of 8 channels of temperature** |
| **0x52** | **1** | **Forward and reverse (0: unknown; 1: forward (empty) 2: reverse (heavy); 3: stop)** |
| **0x53** | **1+n\*8** | **2G base station data**  **0x53 1+n\*8 Base station data: The first byte is the number of base stations, followed by n base station data;**  **Base station data: 0-1 MCC;**  **2 MNC; 3-4 LAC; 5-6 CELLID; 6 signal strength** |
| **0x54** | **1+n\*7** | **Wifi data: the number of wifi in the first byte, followed by n wifi data; WIFI data: 0-5 wifiMac; 6 signal strength** |
| **0x56** | **2** | **Internal battery level**  **Byte 1, power level 0-10**  **Byte 2, reserved** |
| **0x5D** | **1+n\*10** | **4G base station data**  **The first byte is the number of base stations, followed by n base station data;**  **0x5D 1+n\*10 Base station data: 0-1 MCC; 2 MNC; 3-4 LAC; 5-8 CELLID; 9 signal strength** |
| **0x61** | **2** | **Main power supply voltage value, unit 0.01V** |
| **0xF1** | **20** | **ICCID, the terminal will report once every time the terminal completes the platform authentication.** |
| **0xF3** | **1** | **Armed/disarmed state, 0x00 is disarmed, 0x01 is armed** |

**2.13 Location information query【8201】**

Message ID: 0x8201。

The location information query message body is empty.

**2.14 Location information query response【0201】**

Message ID: 0x0201。

The data format of the location information query response message body is shown in Table 24.

**Table 24: Data format of location information query response message body**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Reply serial number | WORD | The serial number of the corresponding location information query message |
| 2 | Location information report |  | For location information report, see 8.12 |

**2.16 Bulk upload of positioning data (refill data)【0704】**

See Table 26 for the data format of the message body of the positioning data bulk upload.

**Table 26 The data format of the message body of the positioning data bulk upload**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Number of data items | WORD | The number of location report data items included, >0 |
| 1 | Location data type | BYTE | 0: Normal position batch report; 1: Blind spot supplementary report |
| 2 | Location report data item |  | For definition, see Table 27 of Location Report Data Item |

**Table 27 Data format of location report data item**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Location report data length | WORD | Position data body length, n |
| 2 | Location report data body | BYTE[n] | Report in the same position in format, see 2.13 for definition |

**2.17 Text information issuance【8300】**

Message ID: 0x8300。

The data format of the message body sent by the text information is shown in Table 28.

**Table 28 Data format of the message body sent by the text information**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Sign | BYTE | The text information flag bit **[fixed to 0x02]** see Table 29 for the meaning |
| 1 | Text Information | STRING | The maximum length is 1024 bytes, encoded by GBK |

**Table 29 Meaning of text information flags**

|  |  |
| --- | --- |
| Bit | Sign |
| 0 | 1：Emergency |
| 1 | Reserve |
| 2 | 1：Transparent transmission of text |
| 3 | 1：Terminal TTS broadcast |
| 4 | 1：Advertising screen display |
| 5-7 | Reserve |

**2.18 Report text information【6006】**

Message ID: 0x6006。

The data format of the text information report message body is shown in Table 30. (8300 issued by the platform, 6006 answered by the terminal)

**Table 30: Text information report message body data format**

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Sign | BYTE | Fixed as 0x00 |
| 1 | Text Information | STRING | The maximum length is 1024 bytes, encoded by GBK |

**2.19 Recording related**

**The recording format currently uses the AMR file format, voice control and continuous recording control through the 0x8105 command.**

Multimedia data upload

Message ID: 0x0801。

The data format of the multimedia data upload message body is shown in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Multimedia ID | DWORD | >0 |
| 4 | Multimedia Type | BYTE | 0: image; 1: audio; 2: video |
| 5 | Multimedia format encoding | BYTE | 0: JPEG; 1: TIF; 2: MP3; 3: WAV; 4: WMV; other reserved |
| 6 | Event item coding | BYTE | 0: Command issued by the platform; 1: Timed action; 2: Robbery alarm triggered; 3: Collision rollover alarm triggered; other reserved |
| 7 | Channel ID | BYTE |  |
| 8 | Multimedia data packet |  |  |

Only the first data packet contains the 8 bytes of "Multimedia ID—Channel ID", the subsequent packets are directly multimedia data, and each packet carries a maximum of 1000 bytes of multimedia data, and the last packet is subject to the actual file.

The platform uses a general response to reply to each multimedia data packet.

Multimedia data upload result

Message ID: Ox8800。

The data format of the multimedia data upload response message body is shown in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Start Byte | Number Field | Data Type | Description & Requirements |
| 0 | Multimedia ID | DWORD | >0 |
| 4 | Total number of retransmitted packets | BYTE |  |
| 5 | Retransmission packet ID list |  | No more than 125 items, no such field means that all data packets have been received |

After the platform has processed all media packages, it needs to send this message to the terminal to report that the file has been received or the corresponding package needs to be retransmitted.

If the terminal does not receive this message within 5 seconds, it will automatically exit the current file upload process.