	Document number	Version	Confidentiality level
		V1.0.0	Internal
	Product Name		MDVR

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Network Communication Protocol

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Version	Describe	Author	Date
V1.0.0	First draft, based on JTT808-2019 and JTT1078-2016	TOM	2021-06-01
V2.0.1	Add GPS type in transparent transmission command	TOM	2022-08-16
V2.0.2	3.5.6 Upload the mobile detection and video loss status to the server in the table 3.10.3 Speed=255km/h in GPS data in the table indicates that GPS is invalid 3.17 Add power parameter configuration in the table	MA	2022-11-16
V2.0.3	3.17 Add company name parameter and installation date parameter	MA	2022-11-19
V2.0.4	3.21 File upload instructions 3.22 File upload completion notice 3.23 File upload control	MA	2023-01-12
V2.0.5	3.17 Add vehicle mileage parameter configuration	MA	2023-03-02
V2.0.6	3.24 MDVR Upload Passenger Data	MA	2023-05-06
V2.0.7	3.5.6 Add auxiliary oil quantity in the table	MA	2023-05-09
V2.0.8	3.10.6 Add 4 temperatures to the table 3.17 Add parameter configuration for sleep mode and control parameters for unlisted driving buzzer alarm switch	MA	2023-05-30
V2.0.9	3.10.6 Temperature correction	MA	2023-06-05
V2.0.10	3.10.2 Add WiFi information upload command Added Table 3.10.7	MA	2023-06-07
V2.0.11	3.10.3 Upload new fuel value data	MA	2023-08-12
V2.0.12	Add 3.25 text message distribution	MA	2023-08-24
V2.0.13	Adding CMS protocol upload stream parameters in 3.17	MA	2023-08-28
V2.0.14	Add recording switch parameters to the main and sub code streams in 3.17	MA	2023-09-06
V2.0.15	3.10.2 Modify the OBD type in the table to 0x41	MA	2023-09-15
V2.0.16	Add algorithm alarm upload 1.3.5.6 Add alarm event upload to the table	MA	2024-01-27

	2. Add secondary directory 4. Upload alarm attachments 3.3.25 Text information distribution and modification 3.17.1 Table modification		
V2.0.17	Add "MDVR Status" to Table 3.5.6 3.10.7 Add "Manufacturer type, audio format, and disk type" to the table	MA	2024-04-01
V2.0.18	Add ULV transparent data structure	HE	2024-04-07
V2.0.19	Add memory fault status to table 3.5.6	MA	2024-09-24

Content

1   Introduction

1 .1 Writing purpose

Describe the network communication interface, process, and precautions of our MDVR products and platform software as much as possible, so as to facilitate the writing of our CMS and related SDKs, and compile firmware products compatible with our equipment for third-party manufacturers.

1 .2 References

GB/T2260 Administrative Region Planning Code of the People's Republic of China

GB/T19056 Car driving recorder

JT/T808-2019 "Terminal Communication Protocol and Data Format of Satellite Positioning System for Road Transport Vehicles"

JT/T1078-2016 "Road Transport Vehicle Satellite Positioning System Vehicle Video Communication Protocol"

Include the documentation referenced in the above

1 .3 Terms and Abbreviations

GPS: Global Position System

MDVR: Mobile Digital Video Recorder, mobile digital video recorder.

CMS: Center Monitor System

Device: ie MDVR. Since they are all in-vehicle applications, they are sometimes called in-vehicle devices or in-vehicle machines.

Platform: The central server is CMS.

2   Network protocol

2 .1 type of data

Table 2.1

type of data	Illustrate
BYTE	8-bit unsigned integer
WORD	16-bit unsigned integer
DWORD	32-bit unsigned integer
BYTE[n]	N bytes
BCD[n]	8421 code, n bytes

STRING	String code character/GBK encoding

Note: Protocol data is stored in big-endian mode.

2 .2 Message structure

Each message consists of "identification bit, message header, message body, check code".

As shown in the figure:

Table 2.2

identification bit	header	message body	check code	identification bit
0x7e	Table 2.2.2	Corresponding message type	1 BYTE	0x7e

2.2.1 Identification bit

It is represented by 0x7e. If 0x7e and 0x7d appear in "check code, message header and message body", escape processing is required. Escape processing is defined as follows:

'0x7d' escapes to fixed 2 bytes '0x7d 0x01'

'0x7e' escapes to fixed 2 bytes '0x7d 0x02'

The escaping process is as follows:

When sending a message: message encapsulation → calculation and filling of the verification code → escape;

When receiving a message: Escape recovery → verify check code → parse the message.

Example: Send a packet of '0x30 0x7E 0x08 0x7d 0x55', after escaping, it will be encapsulated as follows '0x30 0x7d 0x02 0x08 0x7d 0x01 0x55'

2.2.2 Header

Table 2.2.2

start byte	field	type of data	description and requirements
0	message ID	WORD	
2	Properties	WORD	See Message Body Properties (Table 2.2.2.1)
4	Protocol version	BYTE	Protocol version number, incremented with each revision, the initial value is 1
5	Terminal phone number	BCD[10]	According to the conversion of the mobile phone number of the terminal itself after installation, if the mobile phone number is less than 12 digits, add the number 0 in front
15	Message serial number	WORD	Circular accumulation starting from 0 according to the sending order
17	Message Packet Encapsulation Item	—	If the relevant identification bit in the message body attribute determines the packet processing of the message, the item has content, otherwise there is no item.

Table 2.2.2.1 Message Body Properties

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved	Version ID	Multiple packages	Data encryption method			message body length									

Version ID：

The version before JTT808-2019 is 0, and this protocol is fixed to **1**

Multiple packages：

　　When the 13th bit in the message body attribute is 1, it indicates that the message body is a long message, which is divided into multiple packets for sending and processing, and the specific packet information is determined by the message packet encapsulation item. If bit 13 is 0, there is no packet encapsulation item field in the message header (Table 2.2.3.2).

Table 2.2.3.2

Start byte	Field	Type of data	Description
0	Total number of packages	WORD	total number of message packets
2	package serial number	WORD	start from 1

Data encryption method

　　Bit10~bit12 are data encryption identification bits. When all three bits are 0, it means that the message body is not encrypted; when bit10 is 1, it means that the message body is encrypted by the RSA algorithm. The others are reserved.

2.2.3 message body

　　The message body is the content of the protocol instruction

2.2.4 check code

　　The check code is calculated from the first byte of the message header and XORed with the next byte until the end of the last byte of the message body; the check code is one byte.

2 .3 way of communication

2.3.1 Connect the platform

　　TCP communication is used between the device and the platform. After the device establishes a connection with the platform, it actively sends a registration message; after the device receives the correct response from the platform, it sends an authentication message; after the device receives the correct response, it considers the device to connect to the platform successfully.

2.3.2　Stay connected

　　After the device is connected to the platform, it needs to send a heartbeat packet. The interval can be negotiated. The default is 30s. The platform must respond after receiving the heartbeat packet. If the heartbeat packet is not received or the response is not received within 3 times of the interval, it is considered that the connection between the device and the platform is disconnected.

2.3.3　Response method

　　For each message, both parties need to give a response. The response is divided into a general response and a proprietary response. When the response type is not specified, the general response is used.

3 Protocol command (message body)

3.1 General answer

Device side:

　　Message ID: 0x0001

　　Message Structure: Table 3.1.1

Table 3.1.1

Start byte	Field	Type of data	Describe
0	Reply serial number	WORD	Corresponding platform message serial number
2	Reply ID	WORD	Corresponding platform message ID
4	Result	BYTE	0: success; 1: failure; 2: message error; 3: not supported

Platform side：

　　Message ID: 0x8001

　　Message Structure: Table 3.1.2

Table 3.1.2

Start byte	Field	Type of data	Describe
0	Reply serial number	WORD	Corresponding device message serial number
2	Reply ID	WORD	Corresponding device message ID
4	Result	BYTE	0: success; 1: failure; 2: message error; 3: not supported

3 .2 heartbeat message

Device side：

    Message ID: 0x0002

    message structure: none

3 .3 Device registration message

Device side：

    Message ID: 0x0100

    Message Structure: Table 3.3.1

Table 3.3.1

Start byte	Field	Type of data	Describe
0	Province ID	WORD	Indicates the province where the terminal installation vehicle is located, 0 is reserved, and the platform takes the default value. The provincial ID adopts the first two digits of the six digits of the administrative division code specified in GB/T 2260.
2	County ID	WORD	Indicates the city and county where the terminal installation vehicle is located, 0 is reserved, and the platform takes the default value. The city and county ID adopts the last four digits of the six digits of the administrative division code stipulated in GB/T 2260.
4	Manufacturer ID	BYTE[11]	Local administrative division code (6 bytes) and manufacturer (5 bytes)
15	Terminal model	BYTE[30]	Manufacturer-defined model, add 0 before the number of digits is insufficient
45	Terminal ID	BYTE[30]	Manufacturer-defined ID, add 0 before the number of digits is insufficient
75	license plate color	BYTE	When the vehicle is not registered, it is marked with 0. The rest are in accordance with the provisions of JTT697.7-2014
76	license plate	STRING	Motor vehicle license plate issued by public security traffic management department

platform response message：

    Message ID: 0x8100

    Message structure: Table 3.3.2

Table 3.3.2

Start byte	Field	Type of data	Describe
0	Reply serial number	WORD	Corresponding device message serial number
2	Result	BYTE	0: successful; 1: the vehicle has been registered; 2: the vehicle is not in the database; 3: the terminal has been registered; 4: the terminal is not in the database

4	Authentication code	STRING	This field is only generated after success

3 .4 Device authentication

Device side：

    Message ID: 0x0102

    Message structure: Table 3.4

Table 3.4

Start byte	Field	Type of data	Describe
0	Authentication code length	BYTE	
1	Authentication code content	STRING	n is the length of the authentication code
n + 1	Terminal IMEI	BYTE[15]	Local administrative division code (6 bytes) and manufacturer (5 bytes)
n + 16	Firmware version number	BYTE[20]	Manufacturer-defined model, add 0 before the number of digits is insufficient

3 .5 location information report

Device side：

    Message ID: 0x0200

    Message structure: consists of a list of location basic information and location additional information items (Table 3.5.1)

Table 3.5.1

Location Basic Information (Table 3.5.2)	Location Additional Information (Table 3.5.5)

Table 3.5.2 Location Basic Information

Start byte	Field	Type of data	Describe
0	alarm sign	DWORD	Definition of alarm flags (Table 3.5.3)
4	condition	DWORD	Status Bit Definitions (Table 3.5.4)
8	latitude	DWORD	The latitude value in degrees multiplied by 10 to the 6th power is accurate to one millionth of a degree.
12	longitude	DWORD	The longitude value in degrees is multiplied by 10 to the 6th power to the nearest millionth of a degree.
16	high	WORD	Altitude, in meters.
18	speed	WORD	Unit (0.1km/h).
20	direction	WORD	0~359° , true north is 0, clockwise.
22	Time	BCD[6]	YY-MM-DD-hh-mm-ss (GMT+8 time, the time involved in this standard is in this time zone).

Table 3.5.3 Definition of alarm flags

Bit	Definition	Handling instructions
0	1: Emergency Alarm (SOS)	Triggered after the alarm switch is touched, and cleared after receiving the response
1	1: Overspeed alarm	The flag is maintained until the alarm condition is released
2	1: Fatigue driving	The flag is maintained until the alarm condition is released JT/T808-201115 / 33
4	1: GNSS module failure	The flag is maintained until the alarm condition is released
5	1: GNSS antenna not connected or	The flag is maintained until the alarm condition is

	cut off	released
6	1: GNSS antenna short circuit	The flag is maintained until the alarm condition is released
8	1: The main power supply of the terminal is powered off	The flag is maintained until the alarm condition is released
14	1: Fatigue driving warning	The flag is maintained until the alarm condition is released
18	1: Cumulative driving overtime on the day	The flag is maintained until the alarm condition is released
19	1: Overtime parking	The flag is maintained until the alarm condition is released
29	1: Collision alarm	The flag is maintained until the alarm condition is released

Note: The functions corresponding to the unspecified data bits are not supported

Table 3.5.4 Definition of Status Bits

Bit	Status
0	0 Acc off; 1 Acc on
1	0 is not located; 1 is located
2	0 north latitude; 1 south latitude
3	0 east longitude; 1 west longitude
13	0: Door 1 closed; 1: Door 1 open (front door) (right front door of passenger car)
14	0: Door 2 closed; 1: Door 2 open (middle door)
15	0: Door 3 closed; 1: Door 3 open (rear door) (right rear door of passenger car)
16	0: Door 4 closed; 1: Door 4 open (driver's seat door) (left front door of passenger car)
18	0: GPS satellites are not used for positioning; 1: GPS satellites are used for positioning.
19	0: Do not use Beidou satellites for positioning; 1: Use Beidou satellites for positioning.
20	0: GLONASS satellites are not used for positioning; 1: GLONASS satellites are used for positioning.
21	0: Do not use Galileo satellites for positioning; 1: Use Galileo satellites for positioning.
22	0: The vehicle is in a stopped state; 1: The vehicle is in a running state

Note: The functions corresponding to the unspecified data bits are not supported

Table 3.5.5 Location Additional Information

Field	Type of data	Describe
Additional information ID	BYTE	1~255
Additional information length	BYTE	
Additional information	indefinite length	Additional Information ID (Table 3.5.6)

Table 3.5.6 Additional Information IDs

Additional information ID	Additional information length	describe
0x01	4	Mileage, DWORD, unit 0.1km, corresponding to the odometer reading on the vehicle
0x02	2	Fuel quantity, WORD, unit 0.1L, corresponding to the reading of the fuel gauge on the vehicle
0x03	2	Speed obtained by the tachograph, WORD, 0.1km/h
0x14	4	Video related alarm, expressed in bit,

			bit0 indicates video loss alarm, and the flag is maintained until the alarm condition is lifted bit4 indicates abnormal driving behavior alarm, and the sign is maintained until the alarm condition is lifted
0x15	4		Video signal loss alarm state, DWORD, set by bit, bit0-bit31 respectively represents the 1st to the 32nd logical channel, the corresponding bit is 1, it means that the video signal loss occurs in the change logic channel
0x17	2		Memory fault alarm status: WORD, Set by bit, bit0-bit11 represent the 1st to 12th memory respectively. If the corresponding bit is 1, it indicates that the memory has malfunctioned
0x18	5		Abnormal driving is represented by bit, bit34 is motion detection alarm, 0 is none, 1 is yes
0x25	4		Extended Vehicle Signal Status Bits (Table 3.5.7)
0x2A	2		IO Status Bits (Table 3.5.8)
0x30	1		BYTE, wireless communication network signal strength
0x31	1		BYTE, the number of GNSS positioning stars
0xEC	2		(Auxiliary) Fuel quantity, WORD, unit: 0.1L
0xE4	16		Temperature 1 Word range: -40 ° to below 80 ° C with the same temperature Humidity 1 Word range: 0% to below 100% humidity is the same Temperature 2 Humidity 2 Temperature 3 Humidity 3 Temperature 4 Humidity 4
0x64			Advanced driving assistance system alarm information, defined in Table 3.5.9
0x65			Driver status monitoring system alarm information, defined in Table 3.5.10
0x67			Blind spot monitoring system alarm information, defined in Table 3.5.11
0xEF	13		MDVR status, defined in Table 3.5.13

Table 3.5.7 Extended vehicle signal status bits

Bit	status
9	0 air conditioner off; 1 air conditioner on

Note: The functions corresponding to the unspecified data bits are not supported

Table 3.5.8 IO Status Bits

Bit	status
8	Corresponding device IoInput1
9	Corresponding device IoInput2
10	Corresponding device IoInput3
11	Corresponding device IoInput4

12	Corresponding device IoInput5
13	Corresponding device IoInput6
14	Corresponding device IoInput7
15	Corresponding device IoInput8

Note: The functions corresponding to the unspecified data bits are not supported

Table 3.5.9 Advanced Driving Assistance Alarm Information Data Format

Starting Byte	field	Length	Describe
0	Alarm ID	DWORD	According to the order of alarms, loop accumulation starts from 0, without distinguishing between alarm types.
4	Flag Status	BYTE	0x00: Not available, default to 0
5	Alarm/Event Type	BYTE	0x01: Forward collision alarm 0x02: Lane departure warning 0x03: Car distance too close alarm 0x04: Pedestrian collision alarm
6	Alarm level	BYTE	0x01: First level alarm
9	Deviation type	BYTE	0x01: Left deviation 0x02: Right deviation Only valid when alarm type is 0x02
12	Speed	BYTE	Unit: Km/h. Range 0-250
13	elevation	WORD	Altitude, in meters (m)
15	latitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10, accurate to one millionth of a degree
19	longitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10, accurate to one millionth of a degree
23	Date Time	BCD[6]	YY-MM-DD-hh-mm-ss （GMT+8时间）
29	Vehicle status	WORD	See Table 3.5.4
31	Alarm identification number	BYTE[16]	The definition of alarm identification number is shown in Table 3.5.12

Table 3.5.10 Alarm Information Data Format of Driving Status Monitoring System

Starting Byte	field	Length	Describe
0	Alarm ID	DWORD	According to the order of alarms, loop accumulation starts from 0, without

			distinguishing between alarm types.
4	Flag Status	BYTE	0x00: Not available, default to 0
5	Alarm/Event Type	BYTE	0x01: Fatigue driving alarm 0x02: Responding to phone calls and reporting to the police 0x03: Smoking alarm 0x04: distracted driving alarm 0x05: Driver abnormal alarm 0x06: Seat belt not fastened 0x0A: occlusion 0x11: Driver change event 0x1F: Infrared blocking
6	Alarm level	BYTE	0x01: First level alarm 0x02: Level 2 alarm
7	Fatigue level	BYTE	Range 1-10. The larger the value, the more severe the fatigue level, and it is only effective when the alarm type is 0x01
8	reserve	BYTE[4]	reserve
12	Speed	BYTE	Unit: Km/h. Range 0-250
13	elevation	WORD	Altitude, in meters (m)
15	latitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10, accurate to one millionth of a degree
19	longitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10, accurate to one millionth of a degree
23	Date Time	BCD[6]	YY-MM-DD-hh-mm-ss （GMT+8 time）
29	Vehicle status	WORD	See Table 3.5.4
31	Alarm identification number	BYTE[16]	The definition of alarm identification number is shown in Table 3.5.12

Table 3.5.11 Blind Zone Monitoring System Alarm Definition Data Format

Starting Byte	field	Length	Describe
0	Alarm ID	DWORD	According to the order of alarms, loop accumulation starts from 0, without distinguishing between alarm types.

4	Flag Status	BYTE	0x00: Unavailable
5	Alarm/Event Type	BYTE	0x01: Rear approach alarm 0x02: Left rear approach alarm 0x03: Right rear approach alarm
6	Speed	BYTE	Unit: Km/h. Range 0-250
7	elevation	WORD	Altitude, in meters (m)
9	latitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10, accurate to one millionth of a degree
13	longitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10, accurate to one millionth of a degree
17	Date Time	BCD[6]	YY-MM-DD-hh-mm-ss （GMT+8 Time）
23	Vehicle status	WORD	See Table 3.5.4
25	Alarm identification number	BYTE[16]	The definition of alarm identification number is shown in Table 3.5.12

Table 3.5.12 Alarm Identification Number Format

Starting Byte	field	Length	Describe
0	Termination ID	BYTE[7]	7 bytes, composed of uppercase letters and numbers
7	time	BCD[6]	YY-MM-DD-hh-mm-ss （GMT+8 time）
13	Serial Number	BYTE	The serial number of alarms at the same time point, accumulated in a loop from 0
14	Number of attachments	BYTE	Indicates the number of attachments corresponding to this alarm
15	reserve	BYTE	

Table 3.5.13 MDVR Status

Starting Byte	field	Length	Describe
0	Camera	BYTE[6]	Every 3 digits represent the status of one camera BIT0-BIT2: Camera 1 BIT3-BIT5: Camera 2 BIT45-BIT47: Camera 16 0: Normal (the camera is normal and the

			audio and video data stream is stored in memory) 1: Not recorded (camera normal) 2: Not enabled 3: Abnormal (camera not connected or other hardware malfunction) 4-7: Reserved
6	IPC	BCD[3]	Every 3 represents the status of one IPC camera BIT0-BIT2: IPC Camera 1 BIT3-BIT5: IPC Camera 2 BIT21-BIT23: IPC Camera 8 0: Normal (IPC camera is normal and audio and video data is stored in memory) 1: Not recorded (IPC camera normal) 2: Not enabled 3: Abnormal (IPC camera not connected or other hardware malfunction) 4-7: Reserved
9	Main memory	WORD	BIT0-BIT3: Main memory 1 BIT4-BIT7: Main memory 2 BIT8-BIT11: Main memory 3 BIT12-BIT15: Main memory 4 0x00: Normal 0x01: Not enabled 0x02: Not inserted 0x03-0x0F: Reserved
11	Reserved	BYTE	
12	Network status	BYTE	BIT0-BIT3: represents the network standard 0x00: Unknown, default 3G 0x01:3G 0x02:3G 0x03: 4G 0x04: 5G 0x05-0x08: Reserved 0x09: WIFI 0x0A: Wired

			0x0B-0x0F: reserved
			BIT4-BIT7: Reserved

3 .6   Bulk location information reporting

Device side：
    Message ID: 0x0704
    Message structure: Table 3.6.1

Table 3.6.1

Start byte	Field	Type of data	Describe
0	number of data items	WORD	Greater than 0
2	type of data	BYTE	0: Batch report for normal position 1: Supplementary report for blind area
3	location reporting data item	–	Table 3.6.2

Table 3.6.2 Location Data Items

Start byte	Field	Type of data	Describe
0	data body length	WORD	data body length n
2	data body	BYTE[n]	See 3.5 Location Information Reporting

3. 7 Multimedia event upload

Device side：
    Message ID: 0x0800
    Message Structure: Table 3.7.1

Table 3.7.1

Start byte	Field	Type of data	Describe
0	multimedia data ID	DWORD	Greater than 0
4	Multimedia Type	BYTE	0: Image; 1: Audio; 2: Video
5	multimedia format	BYTE	0: JPEG; others reserved
6	event coding	BYTE	0: The platform issues an instruction; 1: Timing action; other reservations
7	channel ID	BYTE	

3. 8 Multimedia data upload

Device side：
    Message ID: 0x0801
    Message structure: Table 3.8.1

Table 3.8.1

Start byte	Field	Type of data	Describe
0	multimedia data ID	DWORD	Greater than 0
4	Multimedia Type	BYTE	0: Image; 1: Audio; 2: Video
5	multimedia format	BYTE	0: JPEG; others reserved
6	event coding	BYTE	0: The platform issues an instruction; 1: Timing action; other reservations
7	channel ID	BYTE	
8	location information	BYTE[28]	0x200 message body, only contains basic location information, no additional information

36	multimedia packet		

platform response message：

message ID: 0x8800

Message Structure: Table 3.8.2

Table 3.8.2

Start byte	Field	Type of data	Describe
0	multimedia data ID	DWORD	>0, no subsequent fields if all packets are received
4	Total number of retransmitted packets	BYTE	n
5	List of retransmission packet IDs	BYTE[2*n]	The sequence numbers of the retransmission packets are arranged in order, such as "packet ID1 packet ID2...packet IDn".

Note: The response to this message should use the 0x0801 message to retransmit the sub-packet in the retransmission ID list once, which is exactly the same as the original sub-packet message.

3. 9 Collect and report driver identity information

Device side：

message ID: 0x0702

Message Structure: Table 3.9.1

Table 3.9.1

Start byte	Field	Type of data	Describe
0	status	BYTE	0x01: The IC card of the qualification certificate is inserted (the driver goes to work); 0x02: The IC card of the qualification certificate is pulled out (the driver gets off work).
1	Time	BCD[6]	Card insertion/removal time, YY-MM-DD-hh-mm-ss; The following fields are only valid and populated when the status is 0x01.
7	Card reading result	BYTE	0x00: IC card reading is successful; 0x01: Card reading failed because the card key authentication failed; 0x02: Card reading failed because the card has been locked; 0x03: Card reading failed because the card was pulled out; 0x04: Card reading failed due to data verification error. The following fields are only valid when the IC card read result is equal to 0x00.
8	Driver's name length	BYTE	n
9	driver name	STRING	
9 + n	Qualification certificate code	STRING	The length is 20 digits, if it is insufficient, 0x00 is added.
29 + n	The length of the name of the issuing authority	BYTE	m
30 + n	Issuing agency name	STRING	
30 + n + m	Certificate validity	BCD[4]	YYYYMMDD
34 + n + m	identification	STRING	The length is 20 digits, if it is insufficient,

	number		0x00 is added.

3. 10 Data transparent transmission

Device side：
        message ID: 0x0900
        Message structure: Table 3.10.1
Platform side：
        message ID: 0x8900
        Message structure: Table 3.10.1

Table 3.10.1

Start byte	Field	Type of data	Describe
0	Transparent message type	BYTE	Message Type (Table 3.10.2)
1	Transparent data	—	

Table 3.10.2 Transparent message types

message type	description and requirements
0xF0-0xFF	User-defined transparent message
0xF0	Transparent transmission of gps data (data structure table 3.10.3)
0xF1	GPS Data Transmission (Data Structure Table 3.10.6)
0x41	Obd data transmission (data structure table 3.10.5) Data in string format starting with $OBD-RT: Reference example data: $OBD-RT,28.3,629,20,0.00,23.00,74,0.00,99.99,15.58,15,4.50,5534.00,0,0,0\r\n
0xA1	CMS Private, WiFi Information (Data Structure 3.10.7)

Table 3.10.3 Data structure of GPS transparent transmission message

Start byte	Field	Type of data	Describe
0	Transmission type	BYTE	0: real-time upload of ordinary data; 1: Common data supplementary transmission; 2: real-time upload of alarm data; 3: Supplementary transmission of alarm data;
1	alarm sign	DWORD	Definition of alarm flags (Table 3.5.3)
5	state	DWORD	Status Bit Definitions (Table 3.5.4)
9	latitude	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one millionth of a degree.
13	longitude	DWORD	The latitude value in degrees is multiplied by 10 to the sixth power, accurate to one millionth of a degree.
17	high	WORD	Altitude, in meters.
19	speed	WORD	Unit (0.1km/h).
21	direction	WORD	0~359, true north is 0, clockwise.
23	time	HEX[6]	YY-MM-DD-hh-mm-ss(GMT+8 time, the time involved in this standard is in this time zone).
29	mileage	DWORD	Unit: 0.1km
33	oil quantity	WORD	Unit: 0.1L
35	vehicle status	DWORD	

39	network signal value	BYTE	0-100
40	number of satellites	BYTE	
41	driver's status	BYTE	0x00: Indicates status,no driver; 0x01: Indicates status,have driver; 0x02: Indicates event,The IC card of the qualification certificate is inserted (the driver goes to work); 0x03: Indicates event,The IC card of the qualification certificate is pulled out (the driver gets off work).
42	driver's name	BYTE[32]	
74	driver's license number	BYTE[24]	
98	card num	BYTE[8]	
106	driving time	DWORD	Unit: min
110	Other alarm	BYTE	Other of alarm flags (Table 3.11.4)
111	historical speed count	BYTE	N-1 (Number of GPS uploaded according to menu configuration-1). For example: the device menu is set to 30, here it is equal to 29
112	historical speed value	WORD[n-1]	Unit (0.1km/h). For example, the menu sets 30 speed values, and here 29 speed values before the 30th second are passed. The speed of 255km/h indicates that the GPS is invalid
112+2*n	Fuel real-time value	WORD	
114+2*n	Average fuel value	WORD	

Table 3.10.4 Alarm Flag Bit Definition

Bit	Definition	Handling instructions
0	1: Rest alarm	The flag is maintained until the alarm condition is released
1	1: Fatigue driving	The flag is maintained until the alarm condition is released
2	1: Fuel alarm	Set the flag bit to 1 when triggered only, and then to 0
3	1: The Watch dog mechanism is triggered, and an alarm is triggered after the device restarts	Set the flag bit to 1 when triggered only, and then to 0
4	1: 4G module cannot detect and triggers an alarm after network recovery	Set the flag bit to 1 when triggered only, and then to 0

Table 3.10.5 Message structure of OBD data transmission

Data serial number	The name of the data	Unit and Remarks
0	$OBD-RT	
1	The battery voltage	V
2	Speed of engine	rpm
3	The speed	km/h

4	Throttle degrees	%
5	Load of engine	%
6	Cooling fluid temperature	℃
7	The instantaneous fuel consumption	(idle speed)：L/h (driving)：L/100km Judging by the speed of the current idle state or driving state
8	The average fuel consumption	L/100km
9	This driving distance	km
10	Total mileage	km
11	Fuel consumption this time	L
12	Cumulative fuel consumption	L
13	Current number of fault codes	
14	Number of rapid accelerations	Times
15	Times of rapid deceleration	Times

Table 3.10.6   GPS transparent message data structure

Starting Byte	field	data type	describe
0	Data type	BYTE	0: Real time upload of ordinary data; 1: Ordinary data supplementary transmission; 2: Real time upload of alarm data; 3: Supplementary transmission of alarm data;
1	Alarm Flag	DWORD	Definition of Alarm Flag Bits (Table 3.5.3)
5	Status	DWORD	Status bit definition (Table 3.5.4)
9	Latitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10 to the nearest millionth of a degree.
13	Longitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10 to the nearest millionth of a degree.
17	Height	WORD	Altitude, in meters.
19	Speed	WORD	Unit (0.1km/h).
21	Direction	WORD	0~359,正北为0，顺时针。
23	Time	HEX[6]	YY-MM-DD-hh-mm-ss(GMT+8 time, all subsequent times referred to in this standard use this time zone).
29	mileage	DWORD	Unit: 0.1km
33	Fuel sensor status	BYTE	bit0：fuel-LIGO bit1：fuel-LIGO-EUP bit2：fuel-UL212-EUP 0: Fuel sensor not connected 1: Fuel sensor already connected
34	Device Differences	BYTE	

35	Fuel	WORD	Smooth height, Unit:mm
37	Signal strength	BYTE	0~99% >30 Best
38	Software Code	BYTE	0: Normal 3: Weak signal 6: Refueling alarm 9: Fuel theft alarm
39	valid signal	BYTE	>30 Best
40	Tangent angle	BYTE	Unit: degrees <5 Best
41	Firmware version	WORD	For example, 4230; 4: Hardware version, 230: Firmware version
43	temperature	WORD	For example, 628; (628-400) * 0.1 ℃=22.8 ℃
45	Check Code	BYTE	CheckSum
46	Fuel 2	DWORD	
50	Vehicle status	DWORD	
54	Network signal value	BYTE	0-100
55	Number of satellites	BYTE	
56	Login status	BYTE	0x00: indicates status, no driver logged in; 0x01: indicates the status, with a driver logged in; 0x02: Refers to the event where the IC card of the employment qualification certificate is inserted (the driver works); 0x03: Refers to the event where the IC card of the employment qualification certificate is removed (the driver is off duty).
57	Driver's name	BYTE[32]	
89	Driver's license number	BYTE[24]	
113	Card number	BYTE[8]	
121	driving time	DWORD	Unit:min
125	Other alarms	BYTE	Definition of Alarm Flag Bits (Table 3.10.4)

126	Number of historical speeds	BYTE	n
127	speed value	WORD[n]	Unit (0.1km/h), previous speed
127+2*n	temperature	WORD[4]	Temperature 1-4, unit 0.1 ° range -40 ° to 80 ° The first code represents positive and negative values, 0 represents negative values, and 1 represents positive values The temperature values for the 2nd to 4th codes are 0.1 degrees Celsius. Example of HEX data calculation: 00E3=>negative, 14 * 16+3=227, at -22.7 degrees 10E2=>positive, 14 * 16+2=226, at+22.6 degrees
135+2*n	Other statuses	DWORD	Definition of Status Bits (Table 3.10.8)

Table 3.10.7

Starting Byte	field	data type	describe
0	Network	BYTE	0: Wired 1: Wifi 2: 3G/4G
1	Network name length	BYTE	When it is a wifi type, fill in the length of the specific network name, otherwise it is 0
2	Network Name	BYTE[n]	When it is a WiFi type, enter the specific network name, and fill in the blank for other network types
2+n	Manufacturer type	BYTE	Default: 70
2+n+1	Audio type	BYTE	10：G711A 12：AAC_8K
2+n+1+1	Disk type	BYTE	0: Invalid 1: SD card 2: Hard disk 3: SSD

Table 3.10.8 Definition of Status Bits

bit	status
0	Recording CH1:0 indicates no recording status, 1 indicates recording status
1	Recording CH2:0 indicates no recording status, 1 indicates recording status
2	Recording CH3, 0 indicates no recording status, 1 indicates recording status
3	Recording CH4, 0 indicates no recording status, 1 indicates recording status
4	Video loss CH1:0 indicates normal, 1 indicates video loss
5	Video loss CH2:0 indicates normal, 1 indicates video loss
6	Video loss CH3:0 indicates normal, 1 indicates video loss
7	Video loss CH4:0 indicates normal, 1 indicates video loss
8	Disk status: 0 indicates presence of a disk, 1 indicates absence of a disk
9	IO input1: 0 indicates not triggered, 1 indicates triggered
10	IO input1: 0 indicates not triggered, 1 indicates triggered
11	IO input3:0 indicates not triggered, 1 indicates triggered

12	IO input4:0 indicates not triggered, 1 indicates triggered
13	IO input5: 0 indicates not triggered, 1 indicates triggered
14	IO input6:0 indicates not triggered, 1 indicates triggered
15	IO input7:0 indicates not triggered, 1 indicates triggered
16	IO input8:0 indicates not triggered, 1 indicates triggered
17	IO input8,0 indicates not triggered, 1 indicates triggered

Table 3.10.9 ULV transparent message data structure

Starting Byte	field	data type	describe
0	Message type	BYTE	ULV transparent data, fixed 0xf3
1	data type	BYTE	0: Vehicle information (Table 3.10.10) Other: Keep
2	Customer ID	BYTE	0: Standard universal; Other: Customized by the customer, not currently used

Table 3.10.10 ULV Transmission Vehicle Information Data Structure

Starting Byte	field	data type	describe
0	data type	BYTE	0: Real time upload of regular data; 1: Ordinary data supplementary transmission; 2: Real time upload of alarm data; 3: Alarm data supplementary transmission;
1	Alarm Flag	DWORD	Alarm Flag Definition (Table 3.5.3)
5	state	DWORD	Status bit definition (Table 3.5.4)
9	latitude	DWORD	Multiply the latitude value in degrees by 10 to the 6th power, accurate to one millionth of a degree.
13	longitude	DWORD	Multiply the latitude value in degrees by 10 to the 6th power, accurate to one millionth of a degree.
17	Latitude direction	BYTE	N: North latitude; S: South latitude
18	Longitude direction	BYTE	W: West longitude; E: East longitude
19	height	WORD	Altitude, measured in meters.
21	speed	WORD	Unit (0.1km/h).
23	direction	WORD	0-359, due north is 0, clockwise.
25	time	HEX[6]	YY-MM-DD-hh-mm-ss (GMT+8 time, this time zone is used for all subsequent times in this standard).

31	mileage	DWORD	Unit: 0.1km
35	Number of satellites	BYTE	
36	Additional information items	n	Table 3.10.11

Table 3.10.11 Vehicle Information Additional Information Item Data Structure

Starting Byte	field	data type	describe
0	Additional item ID	BYTE	0: Driver information (see Table 3.10.12 for additional data structure) 1: Historical speed (see Table 3.10.13 for additional data structure) 2: Oil volume (see Table 3.10.14 for additional data structure) 3: Temperature and humidity information (see Table 3.10.15 for additional data structure) 4: Network information (see Table 3.10.16 for additional data structures) 5: Video status (see Table 3.10.17 for additional data structure) 6: IO input status (see Table 3.10.18 for additional data structures) 7: Disk status (see Table 3.10.19 for additional data structures)
1	Data length	BYTE	n
2	Additional data	n	

Table 3.10.12 Driver Information Data Structure

Starting Byte	field	data type	describe
0	Driver's name	BYTE[32]	
32	Driver's license number	BYTE[24]	
56	Login status	BYTE	0: Not logged in; 1: Login available; 2: Swipe your card to work; 3: Swipe card after work
57	Continuous driving time	DWORD	Unit (min)

Table 3.10.13 Historical Speed Information Data Structure

Starting	field	data type	describe

Byte			
0	Number of speeds	BYTE	n
1	Speed value	BYTE[n]	Km/h

Table 3.10.14 Fuel Information Data Structure

Starting Byte	field	data type	describe
0	Fuel sensor type	BYTE	Temporarily fixed to 0
1	Fuel value	WORD[4]	//The unit is determined by the fuel sensor used, please fill in the numerical value here

Table 3.10.15 Structure of Temperature and Humidity Information Data

Starting Byte	field	data type	describe
0	Temperature value	WORD[4]	Unit (0.1 ℃)
8	Humidity value	WORD[4]	

Table 3.10.16 Network Information Data Structure

Starting Byte	field	data type	describe
0	Network connection method	BYTE	0:wired; 1:wifi; 2:xg; other:unknown
1	Signal value	BYTE	range(0~100)

Table 3.10.17 Video Status Data Structure

Starting Byte	field	data type	describe
0	Video loss status	DWORD	bit0:chn0; bit1:chn1; ...
4	Recording status	DWORD	bit0:chn0; bit1:chn1; ...

Table 3.10.18 IO Input Status Data Structure

Starting	field	data type	describe

Byte			
0	IO input status	BYTE	bit0:io_0; bit1:io_1; ...

Table 3.10.19 Disk Status Data Structure

Starting Byte	field	data type	describe
0	Number of hard drives	BYTE	Number of valid HDDs (0 indicates unsupported, maximum of 2)
1	Total hard disk capacity	DWORD[2]	Unit (MB)
9	Remaining capacity of hard drive	DWORD[2]	Unit (MB)
17	Number of SD cards	BYTE	Number of valid Sd (0 indicates unsupported, maximum of 2)
18	Total capacity of SD card	DWORD[2]	Unit (MB)
26	SD card remaining capacity	DWORD[2]	Unit (MB)

3. 11 Real-time audio and video preview request

Platform side：

message ID: 0x9101

Message structure: Table 3.11.1

Table 3.11.1

Start byte	Field	Type of data	Describe
0	Server IP length	BYTE	length n
1	Server IP address	STRING	IP address of the audio and video server to be connected
1 + n	TCP port	WORD	
3 + n	UDP port	WORD	
5 + n	channel number	BYTE	start from 1
6 + n	type of data	BYTE	0: Audio and video; 1: Video; 2: Intercom; 3: Monitor
7 + n	Stream type	BYTE	0: main stream; 1: sub stream

The platform sends this message when it needs to preview audio and video. After receiving this message, the device will give a general response, and then establish a new connection with the designated video server. The previous communication connection remains unchanged, video data transmission see 3.13

3. 12 Real-time audio and video preview transmission control

Platform side：
    message ID: 0x9102
    Message structure: Table 3.12.1

Table 3.12.1

Start byte	Field	Type of data	Describe
0	channel number	BYTE	start from 1
1	Control instruction	BYTE	0: Turn off the audio and video transmission command 1: switch stream 2: Pause sending stream 3: Resume the stream transmission before the pause 4: Turn off the intercom
2	Turn off audio and video types	BYTE	0: Turn off the audio and video of the corresponding channel 1: Turn off the audio of the corresponding channel and keep the video 2: Turn off the video of the corresponding channel and keep the audio
3	switch stream	BYTE	0: main stream; 1: sub stream

3. 13 Audio and video data transmission

Device side：

    When the device receives a video request from the platform, it uses the specified packet format (Table 3.13.1) to transmit data in the newly established connection. This packet format is extended on the basis of the IETF RFC 3550 RTP protocol.

Table 3.13.1 Video Transmission Packets

Start byte	Field	Type of data	Describe
0	frame header	DWORD	Fixed to 0x30316364
4	V	2 bits	fixed at 2
	P	1 bit	fixed at 0
	X	1 bit	fixed at 0
	C	4 bits	fixed at 1
5	M	1 bit	Flag bit to confirm whether it is a complete data boundary
	PT	7 bits	Load Type (Table 3.13.2)
6	package serial number	WORD	The initial value is 0. Each time an RTP packet is sent, the sequence number is incremented by 1.
8	SIM card number	BCD[6]	Terminal SIM card number
14	channel number	BYTE	start from 1
15	type of data	4 bits	0000: Video I frame 0001: Video P frame 0010: Video B frame 0011: Audio frame 0100: Transparent transmission other reservations
	Multi-packet processing flags	4 bits	0000: Atomic packet, not splittable 0001: The first packet in multi-packet processing

			0010: The last packet when processing multiple packets 0011: Intermediate package when processing multiple packages
16	timestamp	BYTE[8]	Identifies the time (ms) corresponding to the current audio and video data packet, non-audio and video data does not have this field
24	I frame interval	WORD	Time interval (ms) between adjacent I frames in video data, non-video frames do not have this field
26	frame interval	WORD	The time interval (ms) between adjacent frames in the video data, non-video frames do not have this field
28	data body length	WORD	
30	data body	BYTE[n]	The length of the data body does not exceed 950 bytes

Table 3.13.2 Load Types

load type	load name	describe
6	G.711A	audio
7	G.711U	audio
8	G.726	audio
91	Transparent transmission	audio
98	H.264	video
99	H.265	video

3. 14 Query the list of audio and video resources

Platform side：

message ID: 0x9205

Message structure: Table 3.14.1

Table 3.14.1

Start byte	Field	Type of data	Describe
0	channel number	BYTE	start from 1
1	Starting time	BCD[6]	YYMMDDHHMMSS
2	End Time	BCD[6]	YYMMDDHHMMSS
13	alarm sign	64 bits	0 means to search all resources, others are reserved
21	Resource Type	BYTE	0: audio and video; 1: audio; 2: video; 3: audio or video
22	Stream type	BYTE	0: all code streams; 1: main code stream; 2: sub code stream
23	memory type	BYTE	0: All memory

device response：

message ID: 0x1205

Message structure: Table 3.14.2

Table 3.14.2

Start byte	Field	Type of data	Describe

0	serial number	WORD	The serial number corresponding to the query command
1	Total resources	DWORD	The number of resources that meet the query requirements
2	List of resources		See the data structure (Table 3.14.3)

Table 3.14.3 List of resources

Start byte	Field	Type of data	Describe
0	channel number	BYTE	start from 1
1	Starting time	BCD[6]	YYMMDDHHMMSS
2	End Time	BCD[6]	YYMMDDHHMMSS
13	alarm sign	64 bits	0 means to search all resources, others are reserved
21	Resource Type	BYTE	0: audio and video; 1: audio; 2: video
22	Stream type	BYTE	1: Main stream; 2: Sub stream
23	memory type	BYTE	0: All memory
24	File size	DWORD	Unit (byte)

3. 15 Audio and video playback request

Platform side：

message ID: 0x9201

Message structure: Table 3.15.1

Table 3.15.1

Start byte	Field	Type of data	Describe
0	Server IP length	BYTE	length n
1	Server IP address	STRING	IP address of the audio and video server to be connected
1 + n	TCP port	WORD	
3 + n	UDP port	WORD	
5 + n	channel number	BYTE	start from 1
6 + n	type of data	BYTE	0: audio and video; 1: audio; 2: video; 3: audio or video
7 + n	Stream type	BYTE	0: Main stream; 1: Substream; 0 when transmitting audio
8 + n	memory type	BYTE	0: All memory
9 + n	Playback method	BYTE	0: normal playback 1: Fast forward playback 2: keyframe fast rewind playback 3: Keyframe playback
10 + n	Fast forward or rewind multiples	BYTE	Valid when playback mode is 1 or 2 0: invalid 1:1 times 2: 2 times 3: 4 times 4: 8 times 5: 16 times When the playback mode is 0, the multiplier is 0xff, and the data is sent at the fastest speed to download the video quickly

| 11 + n | Starting time | BCD[6] | YYMMDDHHMMSS |
| 17 + n | End Time | BCD[6] | YYMMDDHHMMSS |

The platform sends this message when it needs to play back the audio and video of the device. After receiving this message, the device will give a general response, and then establish a new connection with the designated video server. The previous communication connection remains unchanged, video data transmission see 3.13

3. 16 Audio and video playback control
Platform side：
> Message ID: 0x9202
> Message structure: Table 3.16.1

Table 3.16.1

Start byte	Field	Type of data	Describe
0	channel number	BYTE	start from 1
1	playback control	BYTE	0: Start playback 1: Pause playback 2: End playback 3: Fast forward playback 4: Keyframe fast rewind playback 5: Drag playback 6: Keyframe playback
2	Fast forward or rewind multiples	BYTE	Valid when playback mode is 3 or 4 0: invalid 1:1 times 2: 2 times 3: 4 times 4: 8 times 5: 16 times
3	Drag playback position	BCD[6]	YYMMDDHHMMSS, valid when playback mode is 5

3. 17 ULV parameter configuration network protocol description
Platform "get/set" parameters
> Message ID: 0xB050.
> The format of the message body data is shown in Table 3.17.1

Table 3.17.1 Message Body Data Format

Start Byte	Field	Data Type	Description
0	Type	DWORD	Not used yet, just fill in 0
4	parameter length	DWORD	
8	string parameter	BYTE[]	

Device replies with "get/set" parameters

Message ID: 0xB051.

The format of the message body data is shown in Table 3.17.2

Table 3.17.2 Message body data format

Start Byte	Field	Field Data Type	Description
0	Reply serial number	WORD	Corresponding serial number
2	parameter length	DWORD	
6	string parameter	BYTE[]	Reply "parameters"

Description: String parameters are transmitted in json, and "get and set" are distinguished by "keywords"

Generic "keywords":

CmdType: Command type (Get/Set), see Table 3.17.3

ParamType: Parameter type, this "keyword" is used to distinguish different types of parameter configurations, see Table 3.17.4

Other "keywords": other "keywords" are the specific parameters of ParamType, see the corresponding example

Table 3.17.3 Command Keywords (CmdType)

Keywords	the value of the keyword	Describe
CmdType	Get	get parameters
	Set	Setting parameters

Table 3.17.4 Parameter type keyword (ParamType)

Keywords	the value of the keyword	Describe
ParamType	GenDevInfo	Set MDVR basic information, see corresponding example
	GenDateTime	Set the system time, see the corresponding example
	GenDst	Set daylight saving time, see the corresponding example
	GenStartUp	Set the power configuration parameters, see the corresponding example
	GenUser	Set the administrator account password, see the corresponding example
	VehBaseInfo	Set vehicle and driver information, see corresponding example
	VehPosition	Set GPS information parameters, see the corresponding example
	VehMileage	Set the vehicle mileage, see the corresponding example
	RecAttr	Set the recording attribute parameters, see the

		corresponding example
	RecStream_M	Set the main code stream, see the corresponding example
	RecStream_S	Set the sub-code stream, see the corresponding example
	ReCamAttr	Set camera attribute parameters, see the corresponding example
	ReCapAttr	Set the image capture interval, see the corresponding example
	AlmIoIn	Set IO alarm input parameters, see the corresponding example
	AlmSpd	Set the speed limit information parameter, see the corresponding example
	AlmGsn	Set the Gsensor alarm, see the corresponding example
	Driving	Set fatigue driving parameters, see corresponding examples
	NetWired	Set wired network parameters, see the corresponding example
	NetWifi	Set WiFi parameters, see the corresponding example
	NetXg	Set 4G parameter configuration, see the corresponding example
	NetCms	Set cms parameters, see the corresponding example
	NetFtp	Set ftp parameters, see the corresponding example
	PerUart	Set the serial port configuration parameters, see the corresponding example
	PerIoOutput	Set IO output configuration parameters, see the corresponding example

Get Parameter Example

{
    "CmdType" : "Get",
    "ParamType" : "VehBaseInfo"
}

Note: ParamType values are shown in Table 3.17.4

Example of setting parameters

1.Device information

{
    "CmdType":"Set",

```
    "ParamType":"GenDevInfo",
    "DevId":"901234567893",
    "DevName":"MDVR1"
}
```

DevId: string, the maximum device ID is 31 characters

DevName: string, the maximum length of device name is 31 characters

2. System time

```
{
    "CmdType":"Set",
    "ParamType":"GenDateTime",
    "DateFormat":0,
    "DateTime":"2022/12/06 14:55:43",
    "GpsSync":1,
    "NtpSync":"1,1",
    "TimeFormat":0,
    "Zone":"20,0"
}
```

DateFormat: integer, date display mode 0: MMDDYY 1: YYMMDD 2: DDMMYY

DateTime: string, "year/month/day hour: minute: second"

GpsSync: integer, GPS timing switch, 0: off, 1: on

NtpSync: string, "Ntp timing switch, Ntp timing server", Ntp timing switch, 0: off, 1: on;
Ntp timing server, 0: time.windows.com 1: pool.ntp.org

TimeFormat: integer, time display mode 0:24 hours 1:12 hours

Zone: string, "time zone, offset time", time zone 0-24 means 25 time zones from West 12 to East 12, 0: West 12, 1: West 11, 12:0 time zone, 13: East 1, 24: East 12; Offset time, 0:+0 minutes 1:+15 minutes 2:+30 minutes 3:+45 minutes

3.Daylight Saving Time

```
{
    "CmdType":"Set",
    "ParamType":"GenDst",
    "Enable":1,
    "Mode":0,
    "OffsetTime":0,
    "StartTime":"0,0,00:00:00",
    "EndTime":"0,0,00:00:00"
}
```

Enable: enable switch, 0: off, 1: on

Mode: mode, 0: date mode, 1: week mode

OffsetTime: offset time, 0:1 hour

StartTime: start time, date mode "month, day, hour: minute: second", week mode "month, day of week, hour: minute: second"

Month: 0: January 11: December: 0: the first 30: 31

Week: 0: Sunday 6: The first one on Saturday: 0: The first one 3: the fourth 4: the last

EndTime: end time, date mode "month, day, hour: minute: second", week mode "month, day of week, hour: minute: second"

Month: 0: January 11: December: 0: the first 30: 31

Week: 0: Sunday 6: The first one on Saturday: 0: The first one 3: the fourth 4: the last

4.Switch on/off

```
{
    "CmdType":"Set",
    "ParamType":"GenStartUp",
    "Mode":0,
    "DelayTime":10,
    "RunTime":"06:00:00,23:00:00",
    "PwrProtect":"1,90",
    "RebootTime":"0,00:00:00"
    "WakeUpInteval":10
}
```

Mode: mode 0: ACC mode 1: timing mode

DelayTime: delay time min max 9999min

RunTime: power-on time "power-on time, power-off time"

PwrProtect: level protection (0.1V) "enable switch, voltage threshold"

Enable switch: 0 close, 1 open voltage threshold: 360 maximum and 70 minimum

RebootTime: timed restart "enable switch, restart time"

Enable switch: 0 off, 1 on Restart time: hours, minutes and seconds

WakeUpInternal: Wake up interval in sleep mode, min, maximum 255 min

5.User settings

```
{
    "CmdType":"Set",
    "ParamType":"GenUser",
    "Enable":1,
    "User_00":{"Name":"Admin","Password":"888888"},
    "User_01":{"Name":"Guest","Password":"000000"}
}
```

Enable: enable switch 0 off 1 on

Password: Up to 8 digits of password

Note: Do not change the user name and user order

6.Vehicle information

```
{
    "CmdType":"Set",
    "ParamType":"VehBaseInfo",
    "ShortName":0,
    "CarPlate":"B65324",
```

```
    "PhoneNum":"123123",
    "Company":"ULV-BW",
    "AssemblyDate":"2021/12/25",
    "DriverLic":"123456789abcdef",
    "DriverName":"Ni Heng Suai"
}
```

ShortName: abbreviation of provincial capital of Chinese license plate, 0: None 1: Beijing 2: Tianjin 3: Ji 4: Jin 5: Inner 6: Liao 7: Ji 8: Black 9: Shanghai 10: Su 11: Zhe 12: Wan 13: Min 14: Gan 15: Lu 16: Yu 17: E 18: Xiang 19: Yue 20: Gui 21: Qiong 22: Yu 23: Chuan 24: Gui 25: Yun 26: Zang 27: Shan 28: Gan 29: Qing 30: Xin 31: Hong Kong 32: Macao 33: Taiwan

CarPlate: license plate number, up to 10 characters

PhoneNum: phone number, up to 16 characters

DriverName: Driver name, up to 25 characters

DriverLic: Driver license number, up to 15 characters

Company: company name, up to 32 characters

AssemblyDate: installation date, "MM/DD/YY"

7.Vehicle positioning

```
{
    "CmdType":"Set",
    "ParamType":"VehPosition",
    "GpsBatchNum":5,
    "GpsUpInterval":3
}
```

GpsBatchNum: the number of GPS batch uploads, up to 30

GpsUpInterval: GPS interval (s), maximum 255

8.Vehicle mileage

```
{
    "CmdType":"Set",
    "ParamType":"VehMileage",
    "BaseV":12
}
```

BaseV: vehicle mileage (km)

9.Recording Properties

```
{
    "CmdType":"Set",
    "ParamType":"RecAttr",
    "Duration":30,
    "Encrypt":"0,0",
    "FileFormat":0,
    "Mode":0,
    "PreDuration":10,
```

```
    "SaveDays":0,
    "StreamType":0,
    "VencFormat":1
}
```

Duration: duration of video file (min), minimum 5, maximum 99

Encrypt: video encryption, "enable switch, password", enable switch, 0 off, 1 on, password up to 31 digits

FileFormat: video file format, 0: asf

Mode: recording mode, 0: boot recording 1: alarm recording 2: timing recording

PreDuration: Pre-delayed recording duration (s), maximum 10

SaveDays: the number of days to save the alarm video file, up to 99

StreamType: video stream, 0: main stream 1: sub-stream 2: dual stream

VencFormat: video encoding format, 0: H264 1: H265

10.Main code stream

```
{
    "CmdType":"Set",
    "ParamType":"RecStream_M",
    "Chn_00":{"Enable":1,"FrmRate":15,"Qp":2,"Res":4},
    "Chn_01":{"Enable":1,"FrmRate":15,"Qp":2,"Res":4},
    "Chn_02":{"Enable":1,"FrmRate":15,"Qp":2,"Res":4},
    "Chn_03":{"Enable":1,"FrmRate":15,"Qp":2,"Res":4}
}
```

Enable: enable switch 0 off 1 on

FrmRate: frame rate

Qp: picture quality, 0: excellent 1: good 2: good 3: general

Res: resolution, 0: CIF 1: D1 2:960H 3:720P 4:1080N 5:1080P

Audio: Recording switch 0 off 1 on

11.Sub-code stream

```
{
    "CmdType":"Set",
    "ParamType":"RecStream_S",
    "Chn_00":{"Enable":1,"FrmRate":15,"Qp":2,"Res":0},
    "Chn_01":{"Enable":1,"FrmRate":15,"Qp":2,"Res":0},
    "Chn_02":{"Enable":1,"FrmRate":15,"Qp":2,"Res":0},
    "Chn_03":{"Enable":1,"FrmRate":15,"Qp":2,"Res":0}
}
```

Enable: enable switch 0 off 1 on

FrmRate: frame rate

Qp: picture quality, 0: excellent 1: good 2: good 3: general

Res: resolution, 0: CIF 1: D1 2:960H 3:720P 4:1080N 5:1080P

Audio: Recording switch 0 off 1 on

12.Camera Properties

```
{
   "CmdType":"Set",
   "ParamType":"ReCamAttr",
   "Chn_00":{"Direction":0,"Enable":1,"FrmRate":0,"Mode":0,"Res":4,"Type":0},
   "Chn_01":{"Direction":0,"Enable":1,"FrmRate":0,"Mode":0,"Res":4,"Type":0},
   "Chn_02":{"Direction":0,"Enable":1,"FrmRate":1,"Mode":0,"Res":5,"Type":0},
   "Chn_03":{"Direction":0,"Enable":1,"FrmRate":1,"Mode":0,"Res":5,"Type":0}
}
```

Direction: direction, 0: normal 1: mirror 2: flip 3: mirror flip

Enable: enable switch 0 off 1 on

FrmRate: frame rate, 0:25 frames, 1:30 frames

Mode: mode, 0: automatic mode 1: manual mode

Res: resolution, 0: CIF 1: D1 2:960H 3:720P 4:1080N 5:1080P

Type: Type, 0: AHD 1: CVI 2: TVI 3: CVBS

13.Photo capture

```
{
   "CmdType":"Set",
   "ParamType":"ReCapAttr",
   "Enable":0,
   "SaveDays":30,
   "Inteval":60,
   "ChnMask":255,
   "UploadEn":0
}
```

Enable: enable switch 0 off 1 on

SaveDays: save time (day), minimum 1, maximum 99

Inteval: capture interval (s), minimum 10, maximum 65535

ChnMask: capture channel mask. A bit value of 1 means that the channel is enabled for capture.

bit0: 1 channel bit1: 2 channel

UploadEn: upload enable switch, 0: off 1: on

14.IO input alarm

```
{
   "CmdType":"Set",
   "ParamType":"AlmIoIn",
   "Chn_00":{
      "En":0,
      "LnkBz":"0,0",
      "LnkCap":"0,0",
      "LnkIoOut":"0,0,0",
      "LnkPopup":"0,0,0",
```

```
      "LnkRec":"0,255",
      "Thr":0,
      "Type":0
  },
  "Chn_01":{
      "En":0,
      "LnkBz":"0,0",
      "LnkCap":"0,0",
      "LnkIoOut":"0,0,0",
      "LnkPopup":"0,0,0",
      "LnkRec":"0,255",
      "Thr":0,
      "Type":0
  },
  "Chn_02":{
      "En":0,
      "LnkBz":"0,0",
      "LnkCap":"0,0",
      "LnkIoOut":"0,0,0",
      "LnkPopup":"0,0,0",
      "LnkRec":"0,255",
      "Thr":0,
      "Type":0
  },
  "Chn_03":{
      "En":0,
      "LnkBz":"0,0",
      "LnkCap":"0,0",
      "LnkIoOut":"0,0,0",
      "LnkPopup":"0,0,0",
      "LnkRec":"0,255",
      "Thr":0,
      "Type":0
  }
}
```

En: enable switch, 0: off 1: on

Thr: trigger level, 0: low level 1: high level

Type: type, 0: default 1: air conditioning 2: SOS 3: front door 1 4: front door 2 5: middle door 6: rear door 7: reverse 8: left turn 9: right turn

LnkBz: buzzer configuration, the first parameter represents the enable switch, and the second parameter represents the number of drop-down options in the drop-down box

LnkCap: snapshot configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

LnkIoOut: IO output configuration, the first parameter represents the enable switch, the second parameter represents the state of the second parameter in the IO out configuration, and the third parameter represents the state of the third parameter in the IO out configuration

LnkPopup: single-channel amplification configuration, the first parameter represents the enable switch, the second parameter represents the channel, and the third parameter represents the duration, in seconds

LnkRec: alarm recording configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

15.Speed alarm

```
{
    "CmdType":"Set",
    "ParamType":"AlmSpd",
    "MaxSpd":{  //Speed Alarm
        "En":0,      //Enable switch, 0: Off 1: On
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":120 //Speed threshold (km/h)
    },
    "MinSpd":{  //Low speed alarm
        "En":0,
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":30 //Speed threshold (km/h)
    },
    "Parking":{   //Parking timeout alarm
        "En":0,
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":120 //Parking duration threshold (s), maximum 9999
    }
}
```

LnkBz: buzzer configuration, the first parameter represents the enable switch, and the second parameter represents the number of drop-down options in the drop-down box

LnkCap: snapshot configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

LnkIoOut: IO output configuration, the first parameter represents the enable switch, the second parameter represents the state of the second parameter in the IO out configuration, and the third parameter represents the state of the third parameter in the IO out configuration

LnkPopup: single-channel amplification configuration, the first parameter represents the enable switch, the second parameter represents the channel, and the third parameter represents the duration, in seconds

LnkRec: alarm recording configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

16.Gsensor alarm

```
{
    "CmdType":"Set",
    "ParamType":"AlmGsn",
    "Mode":0,
    "X":{
        "En":0,     //Enable switch, 0: Off 1: On
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":30 //Threshold (0.01g), maximum 9999, minimum 5
    },
    "Y":{
        "En":0,
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":30
    },
    "Z":{
        "En":0,
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":30
```

```
    }
}
```

LnkBz: buzzer configuration, the first parameter represents the enable switch, and the second parameter represents the number of drop-down options in the drop-down box

LnkCap: snapshot configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

LnkIoOut: IO output configuration, the first parameter represents the enable switch, the second parameter represents the state of the second parameter in the IO out configuration, and the third parameter represents the state of the third parameter in the IO out configuration

LnkPopup: single-channel amplification configuration, the first parameter represents the enable switch, the second parameter represents the channel, and the third parameter represents the duration, in seconds

LnkRec: alarm recording configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

Mode: alarm mode, 0 represents scene mode, 1 represents value mode

17.Driving status alarm

```
{
    "CmdType":"Set",
    "ParamType":"Driving",
    "MinRest":15,
    "PreTired":{ //Fatigue warning
        "En":0,     //Enable switch, 0: Off 1: On
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":120 //Driving duration threshold (min), maximum 9999
    },
    "Tired":{          //Fatigue alarm
        "En":0,
        "LnkBz":"0,0",
        "LnkCap":"0,0",
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":180       //Driving duration threshold (min), maximum 9999
    },
    "TimeOut":{ //Driving overtime alarm
        "En":0,
        "LnkBz":"0,0",
        "LnkCap":"0,0",
```

```
        "LnkIoOut":"0,0,0",
        "LnkPopup":"0,0,0",
        "LnkRec":"0,255",
        "Thr":240 //Driving duration threshold (min), maximum 9999
    },
  "LogoutAlarmEN":0 //When not logged in, if the vehicle has speed and the buzzer sounds, 0:
does not sound 1: sounds
}
```

LnkBz: buzzer configuration, the first parameter represents the enable switch, and the second parameter represents the number of drop-down options in the drop-down box

LnkCap: snapshot configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

LnkIoOut: IO output configuration, the first parameter represents the enable switch, the second parameter represents the state of the second parameter in the IO out configuration, and the third parameter represents the state of the third parameter in the IO out configuration

LnkPopup: single-channel amplification configuration, the first parameter represents the enable switch, the second parameter represents the channel, and the third parameter represents the duration, in seconds

LnkRec: alarm recording configuration, the first parameter represents enable switch, the second parameter represents channel mask, bit0:1 channel, bit1:2 channel, Bit value 0 means unchecked, 1 means checked

18.Wired network

```
{
    "CmdType":"Set",
    "ParamType":"NetWired",
    "Enable":0,
    "IP":"192.168.0.108",
    "SubMask":"255.255.255.0",
    "Gateway":"192.168.0.254",
    "DNS1":"114.114.114.114",
    "DNS2":"0.0.0.0",
    "DhcpEn":0
}
```
Enable: enable switch, 0: off 1: on
DhcpEn: DHCP enable switch, 0: Off 1: On

19.WiFi

```
{
    "CmdType":"Set",
    "ParamType":"NetWifi",
    "Enable":0,
    "Mode":1,
```

```
    "Pwd":"12345678",
    "SSID":"w1234",
    "DhcpEn":1,
    "EncryptType":0
}
```

Enable: enable switch, 0: off 1: on

Mode: mode, 0: Sta automatic 1: Sta manual 2: AP

SSID: SSID, maximum 31 bits

Pwd: password, maximum 31 digits

DhcpEn: DHCP enable switch, 0: Off 1: On

EncryptType: encryption method, 0: None 1: WEP 2: WPA/WPA2-PSK 3: WPA-PSK 4: WPA2-PSK 5: UNKNOW

20.3G/4G

```
{
    "CmdType":"Set",
    "ParamType":"NetXg",
    "Enable":1,
    "Mode":0,
    "APN":"3gnet",
    "CenterNum":"*99#",
    "User":"",
    "Pwd":"",
    "AuthType":0
}
```

Enable: enable switch, 0: off 1: on

Mode: mode, 0: hybrid network 1:2G 2:3G_ WCDMA 3:3G_ EVDO 4:3G_ TD_ SCDMA 5:4G_ LTE

APN: APN, maximum 31 bits

CenterNum: center number, up to 15 digits

User: User name, maximum 15 digits

Pwd: password, maximum 15 digits

AuthType: authentication method, 0: no authentication 1: CHAP 2: PAP

21.Cms platform

```
{
    "CmdType":"Set",
    "ParamType":"NetCms",
    "Server_00":{"Enable":1,"Protocol":2,"ServersAddr":"120.79.58.1:6608","VisitType":0},
    "Server_01":{"Enable":0,"Protocol":0,"ServersAddr":"120.79.58.1:6608","VisitType":0}
}
```

Enable: enable switch, 0: off 1: on

Protocol: protocol type, 0: none, 1: cmsv6, 2: jt808_ 2019, 3:jt808_ two thousand and thirteen

VisitType: ip access or domain name access, 0: ip 1: domain name

22.FTP

```
{
    "CmdType":"Set",
    "ParamType":"NetFtp",
    "Enable":1,
    "ServersAddr":"120.79.58.1:2121",
    "User":"admin",
    "Pwd":"cmsserverv6"
}
```

Enable: enable switch, 0: off 1: on
User: User name, maximum 16 digits
Pwd: password, maximum 16 bits

23.Serial port configuration

```
{
    "CmdType":"Set",
    "ParamType":"PerUart",
    "Uart_00":{"BaudRate":0,"DataBit":0,"DevType":0,"Enable":0,"IntfType":0,"StopBit":0,"Verify":0},
    "Uart_01":{"BaudRate":0,"DataBit":0,"DevType":0,"Enable":0,"IntfType":1,"StopBit":0,"Verify":0},
    "Uart_02":{"BaudRate":0,"DataBit":0,"DevType":0,"Enable":0,"IntfType":2,"StopBit":0,"Verify":0},
    "Uart_03":{"BaudRate":0,"DataBit":0,"DevType":0,"Enable":0,"IntfType":3,"StopBit":0,"Verify":0}
}
```

Enable: enable switch, 0: off 1: on
IntfType: interface type, 0: RS232_ 1 1:RS232_ 2 2:RS485_ 1 3:RS485_ 2 4:ttyUSB1 5:ttyUSB2
DevType: peripheral type, 0: None 1: rfid-R21S 2: pcTool-VN 3: fuel 4: Tranmission 5: rfid-147 6: Screen-YX 7: TempHmii 8: rfid-988 9: rfid F-PROT 10: LED Panel 11: rfid-W2193 12: Tpms-TDS100 13:rfid-W2193_ 2 14:fuel-LIGO 15:fuel-LIGO-EUP 16:fuel-UL212-EUP
BaudRate: Baud rate, 0:1200 1:2400 2:4800 3:9600 4:19200 5:38400 6:57600 7:115200
DataBit: data bit, 0:8 1:7 2:6 3:5
StopBit: stop bit, 0:1 1:2
Verify: check bit, 0: none 1: odd check 2: even check

24.IO output

```
{
    "CmdType":"Set",
    "ParamType":"PerIoOutput",
    "IoOut_1":0,
    "IoOut_2":0
}
```

IoOut_ 1: IO output 1 mode, 0: alarm linkage 1: control switch
IoOut_ 2: IO output 2 mode, 0: alarm linkage 1: control switch

25.CMS protocol upload stream

```
{
    "CmdType":"Set",
    "ParamType":"OtherParam",
    "CmsUploadStream":0
}
```

CmsUploadStream: CMS protocol upload stream type, 0: upload main stream 1: upload sub stream

3.18 MDVR upload number of passengers

Message ID: 0x1005.

Packet type: Signaling data packet.

The terminal device counts the passengers getting on and off the bus through video analysis, and sends the counting results to the platform. The data format of the message body is shown in Table 3.18.

Table 3.18 Format of passenger data uploaded by terminal

Start byte	Field	Type of data	Describe
0	Start time	BCD[6]	YY-MM-DD-HH-MM-SS
6	End time	BCD[6]	YY-MM-DD-HH-MM-SS
12	Number of people get on	WORD	Number of people get on from the start time to the end time
14	Number of people get off	WORD	Number of people get off from the start time to the end time

3. 19 The server queries the vehicle information

Platform side：

   Message ID: 0xB040

   The message body is empty

device response：

   Message ID:0x4040

   The message body data format is shown in Table 3.19.1

   Table 3.19.1 Format of message body data

Start byte	Field	Type of data	Describe
0	Answer the serial number	WORD	Specifies the serial number to be delivered
2	Number of parameters	BYTE	
3	Parameter list		

Field	Type of data	Describe
The parameter ID	DWORD	See the following table for parameter

		ids	
Parameter length	BYTE		

The list of parameters

Start byte	Field	Type of data	Describe
0x01	The manufacturer ID	BTYE[5]	
0x02	Terminal type	BYTE[20]	
0x03	Version	BYTE[40]	Firmware version(BYTE[20]) Hardware version(BYTE[20])
0x04	Audio load type	BTYE	See table 3.13.2
0x05	The channel information	BYTE[12]	The number of channels(DWORD) Video loss status (DWORD) By bit (1: lost 0: normal) Video Recording Status (DWORD) by bit (1: video recording)
0x06	Hard disk information	BYTE[4+8*N]	Number of Hard Disks (DWORD) Total Capacity of Disk A1 (DWORD) Disk A1 Remaining Capacity (DWORD) Disk A2 Total capacity (DWORD) Disk A2 Remaining Capacity (DWORD) Units (MB)
0x07	The wireless network	BYTE[18]	Network type (BYTE) (0:2G; 1:3G-EVDO; 2:3G-WCDMQA 3:TD_CMDMA; 4:TD_LED; 5:FDD) Network address (BYTE[16]) Network quality (BYTE) 0-100
0x08	WiFi network Status	BTYE[33]	Hotspot name (BYTE[16]) Network address (BYTE[16]) Network quality (BYTE) 0-100
0x09	IMEI	BYTE[15]	
0x0A	Hard disk type	BYTE	1:SD card 2: hard disk 3:SSD

3.20 Terminal control

Message ID:0x8105

Example:7e 81 05 40 01 01 00 00 00 00 90 12 34 56 78 98 00 04 74 b4 7e

Command word	parameter	describe
0x70	None	Disconnect the oil
0x71	None	Recovery oil
0x72	None	Disconnect the circuit

0x73	None	Recovery circuit
0x74	None	Restart the device

3.21 File upload instructions

Message ID: 0x9206.

Message type: signaling data message.

The platform sends a text upload command to the terminal, and the terminal replies to the general response and uploads the file to the specified path of the target FTP server through FTP. See Table 3.21.1 for message body data format.

Table 3.21.1 File Upload Instruction Data Format

Start byte	Field	Data type	Describe
0	Server address length	BYTE	Length k
1	server address	STRING	FTP server address
1+k	port	WORD	FTP server port number
3+k	User name length	BYTE	Length l
4+k	user name	STRING	FTP user name
4+k+l	Password length	BYTE	Length m
5+k+l	password	STRING	FTP password
5+k+l+m	File upload path length	BYTE	Length n
6+k+l+m	File upload path	STRING	File upload path
6+k+l+m+n	Logical channel number	BYTE	Start at 1
7+k+l+m+n	Start time	BCD[6]	YY-MM-DD-HH-MM-SS
13+k+l+m+n	End time	BCD[6]	YY-MM-DD-HH-MM-SS
19+k+l+m+n	Alarm sign	64BITS	Not used temporarily, fill in 0
27+k+l+m+n	Audio and video resource type	BYTE	0: audio and video, 1: audio, 2: video, 3: video or audio
28+k+l+m+n	Stream type	BYTE	0: main code stream or sub-code stream, 1: main code stream, 2: sub-code stream
29+k+l+m+n	Storage location	BYTE	0: main storage or disaster recovery storage, 1: main storage, 2: disaster recovery storage
30+k+l+m+n	Task execution conditions	BYTE	Bit0: WIFI, when it is 1, it means it can be downloaded under WIFI;

			Bit1: LAN, if it is 1, it means it can be downloaded when connecting to the LAN; Bit2: 3G/4G, when it is 1, it means it can be downloaded when 3G/4G is connected

3.22 File upload completion notice

Message ID: 0x1206.

Message type: signaling data message.

When all files are notified to FTP upload, the terminal reports this instruction to notify the platform. See Table 3.22.1 for message body data format.

Table 3.22.1 Data format of file upload completion notification

Start byte	Field	Data type	Describe
0	Response serial number	WORD	The serial number of the corresponding platform file upload message
2	Result	BYTE	0: Success; 1: Failed

3.23 File upload control

Message ID: 0x9207.

Message type: signaling data message.

The platform notifies the terminal to suspend, continue or cancel all files being transferred. See Table 3.23.1 for message body data format.

Table 3.23.1 File Upload Control Data Format

Start byte	Field	Data type	Describe
0	Response serial number	WORD	The serial number of the corresponding platform file upload message
2	Upload control	BYTE	0: Pause; 1: Continue; 2: Cancel

3.24. MDVR Upload Passenger Data

Message ID: 0x0D03.

Message type: Signaling data message.

The terminal device counts passengers boarding and alighting through video analysis, identifies the station through GPS, and sends the counting results to the platform. The message body data format is shown in Table 3.24.1.

Table 3.24.1 Format of Passenger Flow Data Uploaded by Terminal Equipment

Start byte	Field	Data type	Describe
0	Alarm Flag	DWORD	Definition of Alarm Flag Bits (Table 3.5.3)
4	status	DWORD	Status bit definition (Table 3.5.4)

8	Latitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10 to the nearest millionth of a degree.
12	Longitude	DWORD	Multiply the latitude value in degrees by the 6th power of 10 to the nearest millionth of a degree.
16	Height	WORD	Altitude, in meters.
18	Speed	WORD	Unit (0.1km/h).
20	Direction	WORD	0-359, due north is 0, clockwise.
22	Time	BCD[6]	YY-MM-DD-hh-mm-ss (GMT+8 time, this time zone is used for subsequent references in this standard).
28	Line number	DWORD	
32	Business type	BYTE	Fill in 0 by default
33	Station serial number	BYTE	
34	Distance from the station	DWORD	Unit: meters
38	Collection type	BYTE	Default fill in 0x12
39	Information Item List	BYTE[n]	See Table 3.24.2 Passenger Count Data

Table 3.24.2 Passenger Count Data

Start byte	Field	Data type	Describe
0	0x0000	BYTE	Passenger ID, starting from 0, 0,1,2
4	0x0001	WORD	Accumulated number of people getting on
9	0x0002	WORD	Accumulated number of people getting off
14	0x0003	BYTE	Door status, 0x00-Open 0x01-Close
18	0x0004	WORD	Door opening and closing times, for reference only
23	0x0005	DWORD	Data accumulation count, clear 0 after power failure
30	0x0006	WORD	Number of passengers boarding at the previous station
35	0x0007	WORD	Number of people getting off at the previous station
40	0x0008	BYTE	Fault information, 1-fault, 0-normal

3.25 Text information distribution

Message ID: 0x8300.

The format of message body data for text information distribution is shown in Table 3.25.1

Table 3.25.1 Text Information Distribution Message Body Data Format

Starting Byte	field	data type	describe
0	sign	BYTE	Meaning of text information marker bit (Table 3.25.2), default to fill in 09
1	Text Type	BYTE	1=notification, 2=service, default to 1
2	text information	STRING	Up to 1024 bytes, GBK encoded

Table 3.25.2 Meaning of Text Information Flag Bits

bit	sign
0~1	10: Urgent; Default fill in 10

3	1: Terminal TTS playback and reading; Fill in 1 by default
---	Other reservations

4   Alarm attachment upload

4 .1Alarm attachment upload command

Message ID: 0x9208.

Message type: signaling data message.

After receiving the alarm/event information with attachments, the platform issues an attachment upload command to the terminal. The format of the command message body data is shown in Table 4.1.

Table 4.1 File Upload Instruction Data Format

Starting Byte	field	data type	describe
0	Attachment server IP address length	BYTE	Length k
1	Attachment server IP address	STRING	Server IP Address
1+k	Attachment server port （TCP）	WORD	Server port number when using TCP transmission
3+k	Attachment server port （UDP）	WORD	Server port number when using UDP transmission
5+k	Alarm identification number	BYTE[16]	The definition of alarm identification number is shown in Table 3.5.12
21+k	Alarm number	BYTE[32]	The unique number assigned by the platform to the alarm
53+k	reserve	BYTE[16]	

After receiving the alarm attachment upload command issued by the platform, the terminal sends a universal response message to the platform.

4 .2 Vehicle status data record file

The vehicle status data recording file is a binary file, which records the vehicle status data in the form of continuous data blocks. The data format of the data blocks is shown in Table 4.2.

Table 4.2 Vehicle Status Data Block Data Format

Starting Byte	field	data type	describe
0	Total number of data blocks	DWORD	Record the total number of data blocks in the file

4	Current block number	DWORD	The sequence number of the current data block in the record file
8	reserve	BYTE[55]	
63	check bit	BYTE	The accumulated sum from the first character to the character before the checksum, and then take the lower 8 digits of the accumulated sum as the checksum

4 .3 Alarm attachment information message

Message ID: 0x1210.

Message type: signaling data message.

The terminal connects to the attachment server according to the attachment upload command and sends an alarm attachment information message to the server. The message body data format is shown in Table 4.3.

Table 4.3.1 Alarm Attachment Information Message Data Format

Starting Byte	field	data type	describe
0	Termination ID	BYTE[7]	7 bytes, consisting of uppercase letters and numbers, this terminal ID is defined by the manufacturer. If there are not enough digits, add "0x00" after it
7	Alarm identification number	BYTE[16]	The definition of alarm identification number is shown in Table 3.5.12
23	Alarm number	BYTE[32]	The unique number assigned by the platform to the alarm
55	information type	BYTE	0x00: Normal alarm file information 0x01: Supplementary transmission of alarm file information
56	Number of attachments	BYTE	Number of attachments associated with alarms
57	Attachment Information List		See Table 4.3.2

After receiving the alarm attachment information message uploaded by the terminal, the attachment server sends a universal response message to the terminal. If the terminal abnormally disconnects from the attachment server during the process of

uploading alarm attachments, it is necessary to resend the alarm attachment information message when restoring the link. The attachment files in the message are those that were not uploaded or completed before the disconnection

Table 4.3.2 Alarm Attachment Message Data Format

Starting Byte	field	data type	describe
0	File name length	BYTE	Length k
1	file name	STRING	File Name String
1+k	file size	DWORD	The current file size

The naming convention for file names is:

〈File Type〉_〈Channel Number〉_〈Alarm Type〉_〈Serial Number〉_〈Alarm Number〉〈 Suffix name〉

The field definition is as follows:

File type: 00- Image; 01- Audio; 02- Video; 03- Text; 04- Other.

Channel numbers: 0-37 represent the video channels defined in Table 2 of the JT/T 1076 standard.

64 represents the video channel of the ADAS module.

65 represents the video channel of the DSM module.

If the attachment is not related to the channel, fill in 0 directly.

Alarm type: A code composed of the peripheral ID and the corresponding module alarm type, for example, the forward collision alarm is represented as "6401".

Serial number: used to distinguish file numbers of the same channel and type.

Alarm Number: The unique number assigned by the platform to an alarm.

Suffix name: Image file is jpg or png, audio file is wav, video file is h264, and text file is bin.

After receiving the alarm attachment information command reported by the terminal, the attachment server sends a universal response message to the terminal.

4 .4 File information upload

Message ID: 0x1211.

Message type: signaling data message.

After sending an alarm attachment information command to the attachment server and receiving a response, the terminal sends an attachment file information message to the attachment server. The format of the message body data is shown in Table 4.4.

Table 4.4 Attachment File Information Message Data Format

Starting Byte	field	data type	describe
0	File name length	BYTE	The file name length is l
1	File name	STRING	File name
1+l	File type	BYTE	0x00: Image

			0x01: Audio
			0x02: Video
			0x03: Text
			0x04: Other
2+l	file size	DWORD	The current size of the uploaded file.

After receiving the attachment file information instruction reported by the terminal, the attachment server sends a universal response message to the terminal.

4 .5 File data upload

Message type: Bitstream data message.

After sending file information upload instructions to the attachment server and receiving a response, the terminal sends file data to the attachment server. The payload packet format is defined in Table 4.5.

Table 4.5 Definition of File Stream Load Packet Format

Starting Byte	field	data type	describe
0	Frame header identifier	DWORD	Fixed to 0x30 0x31 0x63 0x64
4	File name	BYTE[50]	File name
54	Data Offset	DWORD	The data offset of the current transfer file
58	Length	DWORD	The length of load data
62	Data body	BYTE[n]	The default length is 64K, and if the file is less than 64K, it will be the actual length

When the attachment server receives the file stream reported by the terminal, it does not need to respond.

4 .6 File upload completion message

Message ID: 0x1212.

Message type: signaling data message.

When the terminal completes a file data transmission to the attachment server, it sends a file transmission completion message to the attachment server. The format of the message body data is shown in Table 4.6.

Table 4.6 Message Body Data Structure of File Sending Completion

Starting Byte	field	data type	describe
0	File name length	BYTE	1
1	File name	STRING	File name
1+k	File type	BYTE	0x00: Image

			0x01: Audio
			0x02: Video
			0x03: Text
			0x04: Other
2+k	file size	DWORD	The current size of the uploaded file.

4 .7 File upload completion message response

Message ID: 0x9212.

Message type: signaling data message.

When the attachment server receives the file upload completion message reported by the terminal, it sends a file upload completion message response to the terminal. The response data structure is shown in Table 4.7.1.

Table 4.7.1 File Upload Completion Message Response Data Structure

Starting Byte	field	data type	describe
0	File name length	BYTE	l
1	File name	STRING	file name
1+l	file type	BYTE	0x00: Image 0x01: Audio 0x02: Video 0x03: Text 0x04: Other
2+l	Upload results	BYTE	0x00: Completed 0x01: Additional transmission required
3+l	Number of supplementary data packets	BYTE	The number of data packets that need to be retransmitted is 0 when there is no retransmission
4+l	List of supplementary data packets		See Table 4.7.2

Table 4.7.2 Supplementary Data Packet Information Data Structure

Starting Byte	field	data type	describe
0	Data Offset	DWORD	The offset of the data that needs to be transferred in the file
1	Length	DWORD	The length of data that needs to be supplemented

If there is any data that needs to be supplemented, the terminal should upload the file data for data supplementation. After the supplementation is completed, the file upload completion message should

be reported until the file data is sent.

After sending all the files, the terminal actively disconnects from the attachment server.