MiCODUS DATA PROTOCOL

For MV55G/MV55G PRO/MV66

V 1.0

1. Scope

This specification stipulates the communication protocol and data format between the on-board terminal of the satellite positioning system of road transport vehicles and the monitoring platform, including protocol basis, communication connection, message processing, protocol classification, description, and data format.

2. Way of communication

The communication protocol adopts TCP or UDP, the platform serves as the server, and the terminal serves as the client. When the data communication link is abnormal, the terminal can use SMS messages to communicate.

3. Abbreviations

The following abbreviations are applied to this document.

APN-- access point name
GZIP-- GNU zip
LCD-- liquid crystal display
SMS-- short message service
TCP-- transmission control protocol
TTS-- text to speech
UDP-- user datagram protocol
VSS-- vehicle speed sensor

4. Type of Data

Table 1: The data types used in protocol

Data Type	Description & Requirements
BYTE	Unsigned single byte integers (byte, 8)
WORD	Unsigned two-byte integers (word, 16 bytes)
DWORD	Unsigned four-byte integer (double-word, 32 bytes)

BYTE[n]	N byte
BCD[n]	8421 code，n byte
STRING	GBK encoding, if there is no data, leave blank

5. Transmission rules

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

The agreement is as follows:

——Byte (BYTE) transmission agreement: transmitted in the form of byte stream;

——The word (WORD) transmission agreement: first transmit the high 8 bits, and then transmit the low 8 bits;

——The transmission convention of double word (DWORD): first transmit the high 24 bits, then transmit the high 16 bits, and then transmit the high 8 bits, the lower 8 bits are passed last.

6. Composition of the message

6.1 Message structure

Each message is composed of identification bit, message header, message body and check code. The message structure diagram is shown in **Table 2**.

Table 2： Message Structure Diagram

Flag bit	Message header	Message body	Check code	Flag bit

6.2 Flag

It is represented by 0x7e. If 0x7e appears in the check code, message header and message body, it needs to be escaped. The escape rules are defined as follows:

0x7e <———> 0x7d followed by a 0x02

0x7d <———> 0x7d followed by a 0x01

The escaping process is as follows:

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

When receiving a message: escape and restore --> verify the check code --> parse the message.

Example:

To send a data packet whose content is 0x30 0x7e 0x08 0x7d 0x55, it will be encapsulated as follows: 0x7e 0x30 7d 0x02 0x08 0x7d 0x01 0x55 0x7e

6.3 Message header

The content of the message header is detailed in **Table 3**.

Table 3: Message Header Content

Start Byte	Field	Data Types	Description & Requirements
0	Message ID	WORD	
2	Message Body Properties	WORD	The message body attribute format structure diagram is shown in ***Table 4***
4	Terminal ID No.	BCD[6]	Convert according to the ID number of the terminal itself, if the ID number is less than 12 digit, then add the number 0 in front of the ID number
10	Message Serial No.	WORD	Circularly accumulate from 0 in the order of sending
12	Message Packet Encapsulation Item		If the relevant identification bit in the message body attribute determines the message packet processing, then the item has content, otherwise there is no item.

6.4 Message body attribute format

Table 4: Message Body attribute format structure

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved		**Subcontract or (SUB-PACK)**	Data Encryption			Message Body Length									

Data Encryption Way:

----------bit10~bit12 is data encryption identity bit；
----------message body not encrypted when those three are 0；
----------Message body encrypted by RSA algorithm when the bit 10th
----------Others reserved
(P.S.:bit 15 as multimedia data identification, means all data package included 8 bits identifies in front. This is only for **WEB TRACK®**)

Sub-pack:

Message body is a long message when the 13th bit of message body property is 1, should make sub-package sending process, specific message determined by message sub-pack item; Message header without message sub-pack item field if the 13th bit is 0.

Table 5: Message package pack item contents

Start byte	Field	Data Type	Description & Requirements
0	Message Package Total No.	WORD	Total No. of packets after messages sub-packed
2	Packet sequence No.	WORD	Starting from 1

6.5 Checksum

Checksum means starting from the message header, with the latter byte XOR, until the byte before checksum, occupies one byte.

7. Communication connection

7.1 Connection establish

Daily connection of data between terminal and platform is using TCP or UDP, terminal should connect platform as soon as possible after it is reset, and send terminal authentication message immediately after connected successfully.

7.2 Connection Maintenance

After Connection established and terminal authentication successes, terminal should send heartbeat messages to platform periodically, and platform should reply to those messages, the reply should with platform common reply messages. Period decided by terminal parameters.

7.3 Disconnection

Platform and terminal can disconnect initiatively according to TCP protocol, both of them should determine initiatively that whether TCP disconnected.

Method of platform determine TCP disconnected:

—determine terminal disconnected initiatively according to TCP protocol;
—The terminal with same identity establishes a new connection, means the original one has
disconnected.
—Not received message from terminal within a certain period of time, such as heartbeat.

Method of terminal determine TCP disconnected:

—Judge platform disconnect initiatively according to TCP Protocol.
—Data communication link disconnected;
—Data communication link normal, not receive response after reach the number of retransmissions.

7.4 Data communication link error

When data communication link is error, terminal should save the location messages and reports. Those saved messages will send out as soon as data communication link is ok.

8. Data Format

8.1 Terminal Universal Response【0001】

Message ID: 0x0001

Terminal common response message body data format shown as **Table 6**.

Table 6: Terminal Common Response Message Body Data Format

Start Byte	Field	Data Type	Description and Requirements
0	Answer Serial No.	WORD	Platform message corresponding serial number.
2	Answer ID	WORD	Platform message corresponding ID
4	Result	BYTE	0：Success/Confirm; 1:Failed 2: Message Error 3：Not support
Example: 7e000100050120300000090002a00ab8103001f7e			
Explanation			
7e			
0001			Message ID
0005			Message body length
012030000009			Device ID
002a			Message serial number
00ab			Reply serial number
8103			Answer ID
00			Result
1f			Check
7e			

8.2 Platform Universal Response【8001】

Message ID: 0x8001

Platform Common Answer message body data format shown as **Table 7**.

Table 7: Platform common answer message body data format

Start Byte	Field	Data Type	Description and Requirements
0	Answer Serial No.	WORD	Terminal message corresponding serial number.
2	Answer ID	WORD	Terminal message corresponding ID
4	Result	BYTE	0：Success/Confirm; 1:Failed 2: Message Error 3：Not support 4: Alert processing confirm

8.3 Terminal Heartbeat【0002】

Message ID: 0x0002

Terminal heartbeat data message body is null.

Table 8: Heartbeat data explanation

Example: 7e00020000012030000090072687e	
Explanation	
7e	
0002	Message ID
0000	Message body length
012030000009	Device ID
0072	Message serial number
68	Check
7e	

8.4 Terminal Registration【0100】

Message ID: 0x0100

Terminal registration message body data format is shown in **Table 9**.

Table 9: Terminal registration message body data format

Start Byte	Field	Data Type	Description and Requirements
0	Provincial ID	WORD	Indicate which province the terminal vehicle is in, 0 reserved, platform uses default value. GB/T2260 stipulated 6 administrative divisions, and provincial ID uses the first 2 digitals.
2	City & Prefecture ID	WORD	Indicate which city the terminal vehicle is in, 0 reserved, platform uses default value. GB/T2260 stipulated 6 administrative divisions, and city/prefecture ID uses the last 6 digitals.
4	Manufacturer ID	BYTE[5]	5 bytes, terminal manufacturer number

9	Terminal Models	BYTE[8]	8 bytes, terminal model number is defined by manufacturer, fill with space if it is less than 8. (P.S: additional information required 20 bytes, if less than 20, fill with 0x00 on the back)
29	Terminal ID	BYTE[7]	7 bytes, comprised with capital letters and numbers, terminal ID is defined by manufacturer, if less than 8, fill with 0x00 on the back)
36	License Plate Color	BYTE	License plate number, in accordance with 5.4.12 JT/T415-2006, if the vehicle don't have license plate yet, use value 0
37	License Plate	STRING	Vehicle license plate issued by Public security traffic management department (P.S.: additional information required if car plate color is 0, vehicle VIN number should indicated here)

Example:

7e0100002d012030000009000000022044e37303434344d4c3530305f45445f4754323548000000000000303030303030303902d4c14230333032315a7e

Explanation

7e	
0100	Message ID
002d	Message body length
012030000009	Device ID
0000	Message Serial Number
0022	Provincial ID
044e	City and county ID
3730343434	Manufacturer ID
4d4c3530305f45445f4754323548000000000000	Terminal model
30303030303039	Terminal ID
02	License plate color
d4c1423033303231	Vehicle identification
5a	Check
7e	

8.5 Terminal Registration Reply【8100】

Message ID:0x8100

Terminal registration reply message body data format shown as **Table 10**

Table 10: Terminal registration reply message body data format

Start Byte	Field	Data Type	Description and Requirement
0	Answer Serial Number	WORD	Corresponding terminal registration message serial number
2	Result	BYTE	0：Success; 1: Vehicle registered; 2: Vehicle not in database: 3: Terminal registered; 4: Vehicle not in database;
3	Authentication Code	STRING	The field only exist if successes
Example: 7e8100000a012030000009263a0000005f4754323548008c7e			
Explanation			
7e			
8100			Message ID
000a			Message body length
012030000009			Device ID
263a			Message Serial Number
0000			Reply serial number
005f475432354800			Result
8c			Check
7e			

8.6 Terminal Logout 【0003】

Message ID: 0x0003

Terminal logout message body is null.

8.7 Terminal Authentication【0102】

Message ID: 0x0102

Terminal authentication message data format is shown in **Table 11**.

Table 11: Terminal Authentication message body data format

Start Byte	Field	Data Type	Description and Requirement
0	Authentication Code	STRING	Terminal reconnect and upload authentication code
Example: 7e0102000601203000000900015f47543235481f7e			
Explanation			
7e			
0102			Message ID

0006	Message body length
012030000009	Device ID
0001	Message Serial Number
5f4754323548	Authentication code
1f	Check
7e	

8.8 Terminal Parameter Setting【8103】

Message ID:0x8103

Set Terminal parameter message body data format shown as **Table 12.**

Table 12: Terminal parameter message body data format

Start Byte	Field	Data Type	Description and Requirement
0	Total Parameters	BYTE	
1	Number of pack parameters		Parameter format shown in ***Table 13***

Table 13: Terminal parameter data format

Field	Data Type	Description and Requirement
Parameter ID	DWORD	Parameter ID definition and description shown in ***Table 14***
Parameter Length	BYTE	
Parameter Value		If it is a multi-value parameter, the message will use many parameter entries with the same ID, such as dispatch center phone number.
Example: 7e8103000a01203000000900a701000000030040000000c0e7e		
Explanation		
7e		
8103		Message ID
000a		Message body length
012030000009		Device ID
00a7		Message Serial Number
01		Total number of setting parameters
00000030		Parameter ID
04		Parameter value length

0000000c	Parameter value
0e	Check
7e	

Table 14: Terminal settings of each parameters definition and explain

Parameter ID	Data Type	Description and Requirement
0x0001	DWORD	Terminal heartbeat time interval, in seconds (s)
0x0022	STRING	Time interval for the terminal to report location data, in seconds (s)
0x0027	DWORD	Reporting interval when ACC is OFF
0x0040	STRING	Center control number
0x004a	STRING	SOS number (separate each number with a comma)
0xFF1A	WORD	Rapid acceleration alarm setting The first byte (alarm type): 0x00: Close, 0x01: Server only, 0x02: Server+SMS, 0x03: Server+Call, 0x04: Server+SMS+Call, Default: 0x02 The second byte (alarm threshold value): 5-60km/h, Unit: km/h
0xFF1B	WORD	Rapid deceleration alarm setting The first byte (alarm type): 0x00: Close, 0x01: Server only, 0x02: Server+SMS, 0x03: Server+Call, 0x04: Server+SMS+Call, Default: 0x02 The second byte (alarm threshold value): 5-60km/h, Unit: km/h
0xFF1C	WORD	Sharp turn alarm setting The first byte (alarm type): 0x00: Close, 0x01: Server only, 0x02: Server+SMS, 0x03: Server+Call, 0x04: Server+SMS+Call, Default: 0x02 The second byte (alarm threshold value): 15-90 degree, Unit: degree

8.9 Query Terminal Parameters【8104】

Message ID: 0x8104

Query terminal parameter message body blank, terminal use 0x0104 command as response

8.10 Query terminal parameter response【0104】

Message ID: 0x0104

Query terminal parameter response message body data format shown as ***Table 15***

Table 15 Query terminal parameter response message body data format

Start Byte	Field	Data Type	Description and Requirements
0	Response Serial No.	WORD	Corresponding terminal data query message serial No.
2	Response Parameter Quantity	BYTE	
3	Parameter Item List		Parameter item list and definition is in ***Table 13***

Example:

**7E01040084019172682757004B00400D0000000104000000B40000001005434D4E455400
000013111313135393536302E666C657370692E67770000000180400007B1E0000002204000
0012C00000027040000012C000000300400000006000000320203E80000003404000000000
0000005504000000640000005704000000000000005904000000000000000800400000000B
A7E**

7E	
0104	Message ID
0084	Message body length
019172682757	Device ID
004B	undefined
0040	undefined
0D	undefined
00000001	Message ID: Heartbeat Interval
04	Length of Data
000000B4	Heartbeat Interval Value
00000010	Message ID: APN
05	Length of Data
434D4E4554	APN information
00000013	Message ID: IP Address
11	Length of Data
313135393536302E666C657370692E6777	IP address information
00000018	Message ID: Port Number

04	Length of Data
00007B1E	Port number content
00000022	Message ID: Upload interval when ACC is ON
04	Length of Data
0000012C	Upload interval value
00000027	Upload interval when ACC is OFF
04	Length of Data
0000012C	Upload interval value
00000030	Message ID: Angle of corner supplementary transmission
04	Length of Data
00000006	Angle value
00000032	Message ID: Low external voltage threshold
02	Length of Data
03E8	Low voltage value
00000034	Message ID: Mileage
04	Length of Data
00000000	Mileage value
00000055	Message ID: Overspeed threshold
04	Length of Data
00000064	Overspeed threshold value
00000057	undefined
04	
00000000	
00000059	undefined
04	
00000000	
00000080	undefined
04	
00000000	
BA	
7E	

8.11 Terminal Control【8105】

Message ID: 0x8105

Terminal control message body data format is in **Table 16**

Table 16: Terminal control message body data format

Start Byte	Field	Data Type	Description and Requirements
0	Command word	BYTE	Terminal Control Command description in ***Table 17***
1	Command Parameter	STRING	Command parameter format please check following table. Half-width “；” is used between each field, each STRING field will disposed with GBK code before message composition.
Example: 7e8105000101702868982300101l0e7e			
Explanation			
7e			
8105			Message ID
0001			Parameter value length
017028689823			Device ID
0011			Message Serial Number
12			Parameter ID
0c			Check
7e			

Table 17: Terminal control command additional section 8105

Command Word	Command Parameters	Description
0x11	Blank	ARM
0x12	Blank	DISARM

8.10 Location Information Report【0200】

Location information message body is composed with location basic information and additional item list, message structure as shown in **Table 18**.

Table 18: Location report message structure list

Basic location information	Location additional message items list

Location additional message item list is combinated with various location additional information items,it can be blank, blank or not is determined by message header

length field.

Location basic information data format shown in **Table 19**.

Table 19: Location basic information data format

Start Byte	Field	Data Type	Explanation
0	Alert Mark	DWORD	Alert mark bit definition is in ***Table 22***
4	Status	DWORD	Status bit definition is in ***Table 23***
8	Latitude	DWORD	Latitude value (under unit degree) multiplies the 6^{th} power of 10, accurate to millionth degree.
12	Longitude	DWORD	Longitude value (under unit degree) multiplies the 6^{th} power of 10, accurate to millionth degree.
16	Height	WORD	Altitude, unit is mile (m)
18	Speed	WORD	1/10km/h
20	Direction	WORD	0—359，north is 0, clockwise
21	Time	BCD[6]	YY-MM-DD-hh-mm-ss（GMT+8，all of the time appeared in this standard is with this time zone）
Example: **7e0200005701702868982300730000000000000030158df7906c9605f000400000000230408100617010400000000cc1438393836303242303130323137303034373235373001113101 1b32011b330110340100820 2008e57080000000000000000a000eb7e**			
Explanation			
7e			
0200			Message ID
0057			Message Body Properties
017028689823			Device ID
0073			Message Serial Number
00000000			Alarm Data
00000003			Device Status
0158df79			Latitude: 22.583835
06c9605f			Longitude: 113.905811
0004			Altitude
0000			Speed
0000			Direction
230408			Date: March 11, 2023
100617			Time: 15:20:30
01			Additional ID (Mileage)

04	Length of Data
00000000	Mileage Data
9F	Additional ID: MCC, MNC, LAC, CELLID, signal value
17	Length of Data
3436302c30302c323566622c306163323 46531322c3139	Data: 460,00,25fb,0ac24e12,19
cc	Additional ID: ICCID
14	Length of Data
383938363032423031303231373030343 7323537	ICCID Data
30	Additional ID: BYTE, Wireless communication network signal strength (Weak: Less than 15 ; Medium: 15-17; Middle upper: 18-20 ; Strong: above 20）
01	Length of Data
13	Data
31	Additional ID: BYTE, Total number of positioning satellites
01	Length of Data
00	Data
32	Additional ID: Number of GPS satellites
01	Length of Data
1b	Data
33	Additional ID: Number of BEDOU satellites
01	Length of Data
10	Data
34	Additional ID: Number of GLONASS satellites
01	Length of Data
00	Data
82	Additional ID: Battery voltage, WORD, 0.1V
02	Length of Data
8e	Data
57	Additional ID: Alarm bit
08	Length of Data
0000000000000000	Data: 0-1 byte is alarm status; Alarm bit: bit0-bit15 1 for alarm, 0 for normal 2-3 bytes are switch status, 4-7 bytes spare

A0	Additional ID: DTC information
00	No fault code is followed by a blank, and the fault data will be reported only when the fault is triggered
0D	Check
7e	

8.10.1 Start of Trip 【0202】

Message ID: 0x0202

The message body of the trip start is composed of basic location information and a list of location additional information items (same as **0200**), and a message is reported when ACC is **ON**.

The platform must reply with a general response to this message. If the platform does not reply, the terminal will send it 3 times in a row.

Please check the sample data via **Table 20**.

Table 20: Example of Travel Start Data

Example: **7e0202005501917268269400450000000000000030158e07306c960160004000000f1230111211523010400000000cc1438393836303742383130323039303136333232343001193101 0f32010f330108340100820200785708000000000000000af7e**	
Explanation	
7e	
0202	Message ID
0055	Message Body Properties
019172682694	Device ID
0045	Message Serial Number
00000000	Alarm Data
00000003	Device Status
0158e073	Latitude: 22.583835
06c96016	Longitude: 113.905811
0004	Altitude
0000	Speed
00f1	Direction

230111	Date: Jan 11, 2023
211523	Time: 21:15:23
01	Additional ID (Mileage)
04	Length of Data
00000000	Mileage Data
cc	Additional ID: ICCID
14	Length of Data
38393836303742383130323039303136333323234	ICCID data
30	Additional ID: BYTE, Wireless communication network signal strength (Weak: Less than 15 ; Medium: 15-17; Middle upper: 18-20 ; Strong: above 20）
01	Length of Data
19	Data
31	Additional ID: BYTE, Total number of positioning satellites
01	Length of Data
0f	Data
32	Additional ID: Number of GPS satellites
01	Length of Data
0f	Data
33	Additional ID: Number of BEDOU satellites
01	Length of Data
08	Data
34	Additional ID: Number of GLONASS satellites
01	Length of Data
00	Data
82	Additional ID: Battery voltage, WORD, 0.1V
02	Length of Data
0078	Data
57	Additional ID: Alarm bit
08	Length of Data
0000000000000000	Data: 0-1 byte is alarm status; Alarm bit: bit0-bit15 1 for alarm, 0 for normal 2-3 bytes are switch status, 4-7 bytes spare
Af	Check

7e	

8.10.2 End of Trip 【0203】

Message ID: 0x0203

The message body of the trip end is composed of basic location information and a list of location additional information items (same as **0200**), and a message is reported when ACC is **OFF**. The message additional information item list must contain the following additional information IDs: **0x8f, 0X90, 0X91, 0X92, 0X93, 0X94, 0X95, 0X96, 0X97.**

The platform must reply with a general response to this message. If the platform does not reply, the terminal will send it 3 times in a row.

Please check the sample data via **Table 21**.

Table 21: Example of Travel Start Data

Example: **7e0203007601917268269400 3a00000000000000020158e07606c960210004000000002301112101370104000000cc1438393836303742383130323039303136333232343001 1c31010d32010d33010634010082020078570800000000000000008f0100900100910100920400000000930200009402000095020000960100970100b37e**	
Explanation	
7e	
0203	Message ID
0076	Message Body Properties
019172682694	Device ID
003a	Message Serial Number
00000000	Alarm Data
00000002	Device Status
0158e073	Latitude: 22.583835
06c96016	Longitude: 113.905811
0004	Altitude
0000	Speed
0000	Direction
230111	Date: Jan 11, 2023

210137	Time: 21:01:37
01	Additional ID (Mileage)
04	Length of Data
00000000	Mileage Data
cc	Additional ID: ICCID
14	Length of Data
38393836303742383130323039303136333323234	ICCID data
30	Additional ID: BYTE, Wireless communication network signal strength (Weak: Less than 15 ; Medium: 15-17; Middle upper: 18-20 ; Strong: above 20）
01	Length of Data
1c	Data
31	Additional ID: BYTE, Total number of positioning satellites
01	Length of Data
0d	Data
32	Additional ID: Number of GPS satellites
01	Length of Data
0d	Data
33	Additional ID: Number of BEDOU satellites
01	Length of Data
06	Data
34	Additional ID: Number of GLONASS satellites
01	Length of Data
00	Data
82	Additional ID: Battery voltage, WORD, 0.1V
02	Length of Data
0078	Data
57	Additional ID: Alarm bit
08	Length of Data
0000000000000000	Data: 0-1 byte is alarm status; Alarm bit: bit0-bit15 1 for alarm, 0 for normal 2-3 bytes are switch status, 4-7 bytes spare
8f	Additional ID: BYTE, the number of rapid accelerations in this trip

01	Length of Data
00	Data
90	Additional ID: BYTE, the number of rapid decelerations in this trip
01	Length of Data
00	Data
91	Additional ID: BYTE, the number of sharp turns in this trip
01	Length of Data
00	Data
92	Additional ID: DWORD, the mileage of the trip, unit 1/10KM
04	Length of Data
00000000	Data
93	Additional ID: WORD, the fuel consumption of this trip, unit ML
02	Length of Data
0000	Data
94	Additional ID: WORD, the average speed of the trip, unit KM/H
02	Length of Data
0000	Data
95	Additional ID: WORD, the maximum speed of the trip, unit KM/H
02	Length of Data
0000	Data
96	Additional ID: BYTE, the number of speeding times in this trip
01	Length of Data
00	Data
97	Additional ID: BYTE, the number of idles for this trip
01	Length of Data
00	Data
b3	Check
7e	

Table 22: Definition of Alarm Sign Bit

Bit	Definition	Processing specification
1	1: Overspeed alarm	Mark maintained until alert condition lifted
7	1: The terminal main power	Mark maintained until alert

	undervoltage	condition lifted
8	1: The terminal main power is turned off	Mark maintained until alert condition lifted
15	1: Low voltage alarm	Cleared after receive reply
16	1: Vibration alarm	Cleared after receive reply
28	1: Illegal displacement of vehicle	Cleared after receive reply

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

Table 23: Definition of status bit

Bit	Status
0	0: ACC OFF; 1: ACC ON
1	0: Not positioning; 1: Positioning
2	0: North latitude; 1: South latitude
3	0: East longitude; 1: West longitude
4	0: Running status; 1: Stop running status
5	0: Latitude & longitude without secret widget encryption; 1: latitude & longitude with secret widget encryption
6-7	Reserve
11	0: Vehicle power loop normal 1: Vehicle power loop disconnected
18	0: No GPS positioning; 1: GPS positioning
19	0: No Beidou positioning; 1: Beidou positioning
20	0: No GLONASS positioning; 1: GLONASS positioning
22-31	Reserve

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

Location additional information item format is shown in **Table 24**.

Table 24: Location additional information item format

Field	Data type	Descriptions and requirements
Additional information ID	BYTE	1-255

Length of additional information	BYTE	
Additional information		Definition of additional information is shown in ***Table 25***

Table 25: Definition of additional information

Additional information ID	Length of additional information	Descriptions and requirements
0x01	4	Mileage, DWORD, 1/10km, corresponding to the odometer reading of the car
0xCC	20	ICCID
0x80	1	Instantaneous speed BYTE km/h
0x81	2	Engine speed WORD rpm （Revolutions Per minute）
0x82	2	Battery voltage, WORD, 0.1V
0x83	1	Engine load BYTE %
0x84	1	Coolant temperature BYTE -40 ℃
0x85	2	Instant fuel consumption WORD ML/H
0x86	1	Intake air temperature BYTE -40 ℃
0x87	2	Air flow WORD g/s
0x88	1	Absolute pressure of intake manifold BYTE kpa
0x89	1	Throttle position BYTE %
0x8A	2	Fuel pressure metering WORD kpa
0x8B	17	VIN code
0x8C	4	Total mileage, DWORD 0.1km
0x8D	2	Recharge mileage WORD km

0x8F	1	Number of rapid acceleration for the trip BYTE
0x90	1	Number of rapid deceleration of the stroke BYTE
0x91	1	Number of sharp turns for the trip BYTE
0x92	4	Mileage of the trip, DWORD 1/10KM
0x93	2	Fuel consumption for this trip，WORD ML
0x94	2	Average speed of the trip WORD KM/H
0x95	2	Maximum speed of the trip WORD KM/H
0x96	1	Number of overspeed BYTE
0x97	1	Number of idling times BYTE
0x9F	N	Base station information, the format is as below table
0xA0	N	Fault code information as below table
0x30	1	BYTE, strength of wireless communication network signal
0x31	1	BYTE, GNSS positioning satellite number
0x32	1	BYTE, number of GPS satellites
0x33	1	BYTE, number of BEIDOU satellites
0x34	1	BYTE, number of GLONASS satellites
0x9F	15	BYTE, Base station information (***Table 26***)
0x57	8	ACC Alarm (***Table 27***) Bytes 0-1: Alarm status (Alarm bits: bit0-bit15, 1: Alarm, 0:Normal);

		Bytes 2-3: Alarm switch status Bytes 4-7: Backup

Table 26: Base Station Information

Field	Data type	Descriptions and requirements
MCC	STRING	Country code
Delimiter	STRING	,
MNC	STRING	Operator Code
Delimiter	STRING	,
LAC of connecting base station	STRING	Connected base station
Delimiter	STRING	One byte, fixed as ', '
CELLID of connecting base station	STRING	
Delimiter	STRING	One byte, fixed as ', '
Signal strength of connecting base stations	STRING	

Table 27: 0X57 Alarm Flag Bit Definition

Bit	Definiton	Description
8	ACC ON	
9	ACC OFF	

9. The message comparison table of the terminal communication protocol is shown in Table 28

Table 28: Message Comparison Table

Serial number	Message Body Name	Message ID
1	Terminal universal response	0x0001
2	Platform universal response	0x8001
3	Terminal heartbeat	0x0002
5	Terminal registration	0x0100
6	Terminal registration response	0x8100
7	Terminal deregistration	0x0003
8	Terminal authentication	0x0102
9	Set terminal parameters	0x8103

10	Query terminal parameters	0x8104
11	Query terminal parameters response	0x0104
13	Query specified terminal parameters	0x8106
18	Location information report	0x0200
19	Location information query	0x8201
20	Location information query response	0x0201
62	Data downlink transparent transmission	0x8900
63	Data uplink transparent transmission	0x0900