

NEW OBD SMART Communication Protocol

CB212-C1005 Rev. 4.25

SinocastelTM
Make your car talk...

Sinocastel
2014.07-08

NEW OBD SMART
COMMUNICATION PROTOCOL
(CB212-C1005 [Rev. 4.25](#))

Release Approval Process

Drafted by: _____

Evaluated by: _____

Approved by: _____

Modify History Record

Modify Version	Author/Reviser	Audit	Amended content	Date
V4.00	Xueguang Li		Draft	2012-02-21
V4.01	Kuangming Kang		Modify the contents of 1.1.2.7.4.3.6.1.2.6.6.2.6.7.1.6.7.2.7.2.2	2012-5-11
V4.02	Kuangming Kang		Modify the content 4.3 "TLV description list" of the protocol	2012-6-12
V4.03	Hong Li, Kuanming Kang		<p>1.1.2.6 VSTATE definition add removing plug position, details please refer to protocol content.</p> <p>1.1.2.7 STAT_DATA definition's filed "current fuel consumption's unit change to be 0.01L, details please refer to protocol content.</p> <p>1.1.2.9 GSESOR_DATA definition 's field " X axis acceleration", " Y axis acceleration" and "Z axis acceleration" 's data type all change to be S16, length to be 2, unit: 0.015625g, range:-512~511, details please refer to protocol content.</p> <p>1.1.2.10 ALARM_DATA definition 's field "current value" 's description illustrate the crash alarm info., details please refer to protocol content.</p> <p>Add definition of 1.1.2.13 RPM_ITEM data type, details please refer to protocol content.</p> <p>Add definition of 1.1.2.14 RPM_DATA data type, details please refer to protocol content.</p> <p>At 1.2 section protocol format, change byte "protocol version " value to be "0x03", details please refer to protocol content;</p> <p>At 4.3 section TLV description list, add RFID card number parameter definition, details please refer to protocol content;</p> <p>Change 6.1 section GPS data upload part 's content, add one field" RPM data", details please refer to protocol content;</p> <p>In the 6.6 section fault message definition, change 6.6.1 section name from fault message to be passenger car fault message, details please refer to protocol content;</p> <p>Add 6.6.2 section commercial car fault message, details please refer to protocol content;</p> <p>Add 6.8 section RFID card number upload (driving behavior special protocol), details please refer to protocol content;</p> <p>Add 6.9 section screen end log in/out, details please refer to protocol content;</p> <p>In the appendix 9.2 OBD II PID definition add " commercial car PID data definition " and "commercial car diagnostic trouble code data definition", details please refer to protocol content;</p>	2012-8-9

V4.0.4	Kuanming Kang		<p>Add 5.6 section message text message receive and dispatch;</p> <p>Modify self-defining data type GPS_ITEM mistake, details please refer to GPS_ITEM blue font part;</p> <p>Modify self-defining data type REGION_ITEM mistake, details please refer to REGION_ITEM blue font part;</p> <p>Modify text message maintain command, details please refer to 9.3 section text message maintain command.</p> <p>Delete 6.9 section screen end log in/out, details please refer to protocol content;</p> <p>Change text message protocol's start/end character from "@" to be "*", details please refer to text message maintain command.</p> <p>Update commercial vehicle PID data definition; please refer to 9.2 OBDII PID definitions.</p>	2012-9-10
V4.0.5	Hong Li		<p>Update 9.2 section OBDII PID definition ---commercial vehicle PID data definition. Please refer to 9.2 OBD II PID definitions.</p>	2012-9-27
V4.0.6	Kuanming Kang		<p>At 1.1.2 section data splitting type 's VSTATE, add OBD unplug alarm position;</p> <p>At 4.3 TLV description list add OBD unplug alarm setting,; At 6.7 alarm change, add OBD unplug alarm explain. Details please refer to protocol content.</p> <p>At 4.3 section TLV description list, modify fatigue driving time threshold value's unit, from hour to minute, default set 240 minutes.</p> <p>At 4.3 section TLV description list, add "base station position swift" protocol; add 6.8 section " base station position upload" protocol, details please refer to protocol content.</p>	2012-10-15
V4.0.7	Kuangming Kang		<p>6.1.2 Section GPS data launch, modify rpm data field description ----"specially, RPM_ITEM 's value 0xFFFF show invalid RPM."</p>	2012-11-6
V4.0.8	Kuanming Kang		<p>1.1.2 section STAT_DATA, modify field "total fuel" unit to be 0.01L; Relative 4.3 section parameter grand total fuel consumption (0x1501)'s unit modify to be 0.01L;</p> <p>9.2 section OBDII commercial vehicle data PID definition upgrade to V1.0.6 version, mainly modification as following description, please refer to HD_PID data definition V1.0.6.</p> <p>Compared with the former version, modification as below:</p> <p>0x0383 algorithm modification</p> <p>0x15a0 unit modify to degF</p>	2012-11-9

			0x1b60 data type modify from U16 to float 0x1b70 data type modify from u32 to float 0x1f40 data type modify from u32 to float 0x1f50 data type from u32 to float 0x1f60 data type from u32 to float 0x1f70 data type from u32to float 0x1f80 data type from u32 to float 0x1fa0 data type from u32 to float 0x9fff modify to be 0x9fff	
V4.0.9	Kuanming Kang		At 4.3 TLV description list modify intrinsic vehicles Pending diagnostic trouble code info. To be Commercial vehicle Pending diagnostic trouble code info. Command words no change; Modify intrinsic vehicle Pending diagnostic trouble code info. To be commercial vehicle Store diagnostic trouble code info. Command word no change; besides, add commercial vehicle Pending diagnostic code info. "0x230"; Commercial vehicle Store diagnostic trouble code"0x2304".	2012-11-12
V4.10	Guoquan Li		Modify 9.3 text message command "set domain communication parameter" from "IP" to "domain". Add illustration: 4.3TLV G-Sensor maximum support package to 100. 6.3 G-Sensor data package maximum support 100. Add 6.1 GPS data package's blind area data storage format illustration, modify GPS package number, RPM number, from 1~30 to 0~30.	2012-11-22
V4.11	Jian Liao, Guoquan Li		1. Update"9.2 OBDII PID definition" commercial vehicle PID data definition to V1.0.7 version, add 0X00F7 engine operation total time, 0X00F9 engine operation total RPM.	2012-12-14
V4.12	Jianping Luo Quoquan Li		1.Update the default value and threshold range of TLV in 4.3 Change the time interval of heartbeat package to 2 minutes Change the description of STAET DATA as "UTC_Time is the last GPS data capture time "in the 6.1 Update PID data of commercial vehicle as the version V1.08, add 0x059C.0x0BFD. 0x0C47. 0x0C48. 0x0C49.0x0C4E.0x0C4F	2013-1-14
V4.13	Quoquan Li		1.Add RFID switch function of HT-196 from 0x2701 in the 4.3 TLV	2013-2-22
V4.14	Quoquan Li		1. Add TLV in the 4.3TLV list: add 0x2801 work mode: =0 means passage car, =1 means commercial vehicle, =2 means track mode, default is passage car mode. 2. Add the current value of alarm_desc in the 1.1.2 ALARM_DATA; 3. Add vehicle roll and response of roll	2013-3-14

			commands in the 9.3	
V4.15	Guoquan Li		1. Add the reserve byte description in the VSTATE data in V1.1.2	2013-3-19
V4.16	Guoquan Li		1. Add OBD II data flow definitions in English, Passenger vehicle DTC data definition, Commercial vehicle PID data definition, Commercial vehicle DTC data definition, Passenger vehicle PID data definition	2013-4-8
V4.17	Hong Li, Guoquan Li		1.Update 4.3 TLV description list, add GPS switch via distance, GPS Sampling interval via distance, GPS switch via angle, GPS sampling interval	2012-4-18
V4.18	HongLi GuoquanLi		(1) Modify the fourth byte (reserved) as hardware mode, communication module definition in STAT_DATA; (2) Modify the fifth byte (reserved) as CSQ signal strength value definition in STAT_DATA(query AT+CSQ, returned the first parameter); (3) Modify the sixth byte (reserved) as error rate definition of communication module in STAT_DATA(query AT+CS, returned the second parameter); (4) Update 9.2 OBDII data flow definition: passenger car PID(English), heavy duty PID(English), passenger car DTC(English), heavy duty DTC(English);	2013-8-14
V4.19	Hong Li Guoquan Li		(1) Add SMS setting, query work mode and replied response commands in the 9.3	2013-10-24
V4.20	HongLi GuoquanLi		(1) Add the switch of GPS data uploaded via fixed time interval under sleep mode 0x2901, fixed uploaded time interval 0x2902 in 4.3 TLV list; (2) Add GPS data uploaded definition 0x4009 via fixed time interval under sleep mode in 6.9.	2013-11-6
V4.21	HongLi GuoquanLi		(1) Add the identify tag for 213E hardware in the fourth byte(reserved) from 1.1.2 (7)STAT_DATA; (2) Update 9,2 OBD II data flow definitions; update the definition of heavy duty PID	2013-11-26

			version as V1.0.9	
V4.22	YUXIDU GUOQUAN LI		<ul style="list-style-type: none"> (1) Add "MIL" status bit in 1.1.2 VSTATE (2) Add " ignition on" "ignition off" "MIL" alarms and these canceled alarms in the 1.1.2 ALARM_DATA (3) Add" ignition on" alarm in the 4.3 TLV list; (4) Add" ignition off" alarm in the 4.3 TLV list; (5) Add" MIL" alarm in the 4.3 TLV list; (6) Add" IMEI number" in the 4.3 TLV list (7) Add "GPRS delay working time" after trip end: (8) Add "GSM delay working time" after trip end in the 4.3 TLV list.(can be handled SMS and phone etc.) (9) Add "GPS delay power on time" after trip end in the 4.3 TLV list. (10) Add "ignition on" "ignition off" "MIL" alarms flag in the 6.7. 	2013-12-27
V4.23	YXDOU GQLI		<ul style="list-style-type: none"> (1) Modify "PID capture interval (0x1202)" in the 4.3 TLV list, the range is [3,600] seconds; (2) Modify "PID capture package (0x1203) " in the 4.3 TLV list, the range is [1,20] package; (3) Modify "PID capture type (0x1204) " in the 4.3TLV list, the range is [1,15] 	2014-03-05
V4.24	YXDOU GQLI		<ul style="list-style-type: none"> (1) Modify the 4.1.3 setting response package as the successful setting numbers and TLV list. 	2014-03-11
V4.25	YXDOU GQLI		<ul style="list-style-type: none"> (1) Add" Un-lock alarm" "No swipe card alarm "status bit in the VSTATE in the 1.1.2 (2) Add "Un-lock alarm" "No swipe card alarm" in the ALARM_DATA in the 1.1.2 (3) Add 0x1019 "Un-lock alarm", 0x101A "No swipe card alarm", add the description and examples of high 4 bit 	2014-7-3

			<p>in the working mode switch 0x2801 (4) Add the alarm sign of “unlock” and “no swipe card” in the 6.7</p>	
--	--	--	--	--

Owned by Shenzhen CASTEL Company

The company all the technical documents are owned by the company, unauthorized reprint, copy, all the technical documents are in the form of an electronic version and archived by administrators, for controlled documents.

Sinocastel Protocol

Catalogue	
NEW OBD SMART	1
Communication Protocol	1
CB212-C1005 Rev. 4.25	1
Sinocastel	1
NEW OBD SMART	I
Release Approval Process	I
Drafted by: _____	I
Evaluated by: _____	I
Approved by: _____	I
Modify History Record	I
Owned by Shenzhen CASTEL Company	VI
Catalogue	VII
1 Basic Protocol Format	1
1.1 Data type	1
1.1.1 Basic data type	1
1.1.2 Composite data types	3
1.2 Protocol Format	12
1.3 Protocol Interaction Mechanism Agreement	13
1.4 The communication way between the terminal and center	13
2. Command List	14
3. Communication List	16
3.1 Login	16
3.1.1 Process	16
3.1.2 Launch	16
3.1.3 Response	17
3.2 Cancellation	17
3.2.1 Process	17
3.2.2 Launch	17
3.2.3 Response	18
3.3 Heartbeat packet	18
3.3.1 Process	18
3.3.2 Launch	19
3.3.3 Response	19
4 Set Query Command	20
4.1 Set query	20
4.1.1 Process	20
4.1.2 Launch	20
4.1.3 Response	20
4.2 Query command	21
4.2.1 Process	21
4.2.2 Launch	21
4.2.3 Response	22
4.3 TLV Description List	23
5 Control Command	39
5.1 Vehicle roll	39
5.1.1 Process	39
5.1.2 Launch	39
5.1.3 Response	39
5.2 Cancel DTC information	40
5.2.1 Process	40
5.2.2 Launch	40
5.2.3 Response	40

5.3	Restore factory default	41
5.3.1	Process	41
5.3.2	Launch	41
5.3.3	Response	41
5.4	Remote switch lock (Used for GPS Tracker)	41
5.4.1	Process	41
5.4.2	Launch	41
5.4.3	Response	42
5.5	Remote voice monitoring (Used for GPS Tracker)	42
5.5.1	Process	42
5.5.2	Launch	42
5.5.3	Response	43
5.6	Text Information	43
5.6.1	Process	43
5.6.2	Launch	43
5.6.3	Response	44
6	Terminal Upload Command Automatically	45
6.1	GPS data	45
6.1.1	Process	45
6.1.2	Launch	45
6.1.3	Response	46
6.2	PID data	46
6.2.1	Process	46
6.2.2	Launch	46
6.2.3	Response	47
6.3	G-Sensor data	47
6.3.1	Process	47
6.3.2	Launch	47
6.3.3	Response	47
6.4	Support data flow type	47
6.4.1	Process	47
6.4.2	Launch	47
6.4.3	Response	48
6.5	Snapshot data	48
6.5.1	Process	48
6.5.2	Launch	48
6.5.3	Response	48
6.6	DTC info	49
6.6.1	Passage car DTC info	49
6.6.2	Commercial vehicle DTC information	49
6.7	Alarm change	51
6.7.1	Process	51
6.7.2	Launch	51
6.7.3	Response	52
6.8	Base station position upload	53
6.8.1	Process	53
6.8.2	Launch	53
6.9	Fixed time interval upload under sleep mode	53
6.9.1	Process	53
6.9.2	Launch	53
6.10	RFID card ID number upload (driving behavior special protocol)	54
6.10.1	Process	54
6.10.2	Launch	54
6.10.3	Response	54

7 Remote Upgrade Command	56
7.1 Start upgrade	57
7.1.1 Process.....	57
7.1.2 Launch.....	57
7.1.3 Response.....	57
7.2 Request upgrade package	58
7.2.1 Process.....	58
7.2.2 Launch.....	58
7.2.3 Response.....	59
8 AGPS Command	60
8.1 AGPS date request	61
8.1.1 Process.....	61
8.1.2 Launch.....	61
8.1.3 Response.....	61
8.2 Send AGPS data package	61
8.2.1 Process.....	61
8.2.2 Launch.....	61
8.2.3 Response.....	62
9 Appendix	63
9.1 CRC Calibration algorithm.....	63
9.2 OBD II Data flow Definitions.....	65
9.3 SMS Maintenance Instructions.....	65

1 Basic Protocol Format

1.1 Data type

All data format of this protocol are described as 16 hexadecimal format data flow

For the 16 hexadecimal data, using the number 0~9 and the capital letter A~F combination, start as 0x;

Example: 16 hex expression value of 10, described as: 0x0A;

For the binary representations, take 0 and 1 combined, with a lowercase "b" at the end of the expression;

Example: binary represent the value 10, described as: 00001010b

For the string, for example, can use the 16 hexadecimal to describe, it can also use double quotes as for strings;

Example 1: String: TL CASTEL, with 16 hexadecimal described as: 0x540x4c0xba0xbd0xcd0xa8

Example 2: String: TL CASTEL, with STR described as: " TL Castel"

For the data type length, using byte (byte) to describe, such as =4 represent the data takes up 4 bytes, if some types, using Len (TYPE) to describe the actual length is determined by the actual TYPE

1.1.1 Basic data type

In the following list protocols use the most basic data types, all other complex data types are composed of basic data types.

Data Type	Length(Byte)	Instruction	Example
U8	1	1byte unsigned integral type The range is 0 ~ 255	Data: 0x12 Transmission: 0x12
S8	1	1 byte unsigned integral type The range is -128~127	Data: 0x12 Transmission: 0x12
U16	2	2 byte unsigned integral type The range is 0~65535	Data: 0x1234 Transmission: 0x34 0x12
S16	2	2 byte unsigned integral type r The range is -32768~32767	Data: 0x1234 Transmission: 0x34 0x12
U32	4	4 byte unsigned integral type The range is 0~4294967295	Data: 0x12345678 Transmission: 0x78 0x56 0x34 0x12
S32	4	4 byte unsigned integral type The range is -2147483648~2147483647	Data: 0x12345678 Transmission: 0x78 0x56 0x34 0x12
STR	Indefinite length	The length of the string specified by other fields	Data: "abc" The front protocol specified length is =3, Transmission: 0x610x620x63 This field is typically used in the TLV structure
STR_Z	1~ Indefinite length	As 0x00 end of the string Minimum length is 1, which means the end mark is 0x00,	Data: "abc" Transmission: 0x61 0x62 0x63 0x00

		the maximum length is infinite	
STR_F(X)	Fixed length is specified by X	Fixed length string, if the length is insufficient, use 0x00 to complete	Data: "abc" Type is STR_F(10) Transmission: 0x61 0x62 0x63 0x00 0x00 0x00 0x00 0x00 0x00 如 If it is just 10 of the length, such as Data: "abcdefghijk" Transmission: 0x61 0x62 0x63 0x64 0x65 0x66 0x67 0x68 0x69 0x6a
DATE_TIME	4	U32 type Since January 1, 1970, 0 minute 0 second the elapsed seconds. If there is no special note, it is GMT time in this protocol.	E.g. January 1, 2012 0'clock GMT Calculate to 1970 is 1325376000(0x4EFA200), and it preserved as the transmitted data is Transmission: 0x000xA20xFF0x4E

According to the data type in the transmission protocol, if there is no special instruction, using little-ending mode to transfer characters and double word (including the list of U16, S16, U32, S32, FLOAT, TIME), agreed as follows:

Word transmission agreement: first transmit low 8 bits, (B7~B0), then transmit the high 8 bits (B15~B8);

Double words transmission agreement: first transmit the low 8 bits (B7~B0), then transmit the higher 8bits (B15~B8), then transmit the high 16 bits (B23~B16), transmit high 24bits (B31~B24) at last.

Signed integer in minus 10 hex and 16 hex conversion processes for example:

E.g. 1: -13546800 change into 4 bytes 16 hexadecimal process

1. Take 13546800 the original code: 11001110 10110101 00110000
2. Get reverse number: 11111111 00110001 01001010 11001111
3. Get complement number: 11111111 00110001 01001010 11010000

The 16 representation for: 0xFF314AD

E.g. 2: 0xFF314AD0 change into 10 hexadecimal processes

1. Take 0xFF314AD0 the original code: 11111111 00110001 01001010 11010000
2. Get reverse number: 10000000 11001110 10110101 00101111
3. Get complement number: 10000000 11001110 10110101 00110000

The 10 representation for: -13546800

1.1.1 Array data type

Array data type is composed of a plurality of the same data type composition data

This paper use the type [x] to express, and x means the length of the array.

For example, 5 U8 type of the array, use the U8 [5] representation

An array transmission mode from the first element of array begin to transmit, each element of the transmission mode transmit according to its transmission mode

As for U32 [4], corresponding to the 0x010203040x111213140x212223240x31323334

First according to the U32 transmission mode to transmit the array of the first element, and then transmit a second, the third, the fourth

Data should be

0x04 0x03 0x02 0x01 0x14 0x13 0x12 0x11 0x24 0x23 0x22 0x21 0x 34 0x33 0x32 0x31

1.1.2 Composite data types

Composite data type is composed of a plurality of basic data types

Combination data transmission mode in accordance with the order of the single base data transmission

1.1.1.1 STR_L

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	Len	String length	U8	1	The length of the string, to specify follow-up string content length, the range is 0~255
2	content	String content	S8[x]	0~ Indefinite length	The range is identified by X (1) If (1) the =0, there is no such field
Example description	Character string: "abc" Transmission: 0x03 0x61 0x62 0x63				

1.1.1.2 DATE

If there is no special note, the time in this agreement is GMT time

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	day	Date	U8	1	Range 1~31
2	month	Month	U8	1	Range 1~12
3	year	Year	U8	1	The actual year minus 2000, express from 2000 to2255 Range 0~255
Example description	Data: February 1, 2012 Transmission:0x0C0x020x01				

1.1.1.3 TIME

If there is no special note, the time in this agreement is GMT time

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	hour	Hour	U8	1	Range 0~23
2	minute	Minute	U8	1	Range 0~59
3	second	Second	U8	1	Range 0~59
Example description	Data:12:21:23 Transmission:0x0C0x150x17				

1.1.1.4 GPS_ITEM

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	date	GPS data	DATE	3	
2	time	GPS time	TIME	3	
3	lat	Latitude	U32	4	Unit: ms Range 0~90*3600000 Match with the mark latitude to use (south latitude said "+",north latitude said "-")

4	Lon	Longitude	U32	4	Unit: ms Range 0 ~ 180*3600000 Match with the mark longitude to use (east latitude said "+", west longitude said "-")
5	speed	Speed	U16	2	Unit: cm/sec Range >0
6	dir	Direction	U16	2	Unit: 1/10° Range 0~3599
7	valflag	Valflag	U8	1	Bit0: 1—east latitude, 0—west longitude Bit1: 1—north latitude, 0—south latitude Bit2-3: 00---No location 01---2D location 11---3D location Bit4-7: the number of located satellites
Example description					

1.1.1.5 GPS_DATA

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	gps_count	GPS numbers	U8	1	The GPS array number, If the GPS array number =0, means no (2) field
2	gps_array	GPS array	GPS_ITEM[x]	19 * x	X= (1) the GPS array number If (1) the =0, means no GPS data, no information of this field
Example description					

1.1.1.6 VSTATE

VSTATE from the protocol used to describe the vehicle terminal state information, U8 [4] bytes, respectively: S0-S1-S2-S3. The each initial value is 0. Each byte meaning is described as follows

byte No. (1:valid, 0invalid)	S0	S1	S2	S3
Bit7	Exhaust Emission alarm	Tamper alarm	MIL DTC Alarm	Spare
Bit6	Parking without ignition off	Crash alarm	OBD wire cut alarm	Spare
Bit5	Abrupt deceleration alarm	Emergency alarm	Power-off alarm	Spare

Bit4	Abrupt acceleration alarm	Fatigue driving	No GPS device access	Spare
Bit3	Too high temperature alarm	Sharp turn	Privacy status	Spare
Bit2	Over speed alarm	Quick lane change	Ignition condition	Spare
Bit1	Towing alarm	Power on	Illegal ignition alarm	No swipe card
Bit0	Low voltage alarm	High RPM alarm	Illegal entry alarm	Un-lock

1.1.1.7 STAT_DATA

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	last_accon_time	latest ACC ignition time	DATE_TIME	4	Latest ACC ignition time of the vehicle OBD
2	UTC_Time	Device time	DATE_TIME	4	Current time of device
3	total_trip_mileage	Mileage	U32	4	The accumulated mileage from OBD power on to (1) Unit: meter (M)
4	current_trip_mileage	Current mileage	U32	4	From (1) to the current mileage Unit: meter (M)
5	total_fuel	Total fuel consumption	U32	4	The total fuel consumption from OBD power on to (1) Unit: 0.0l (L)
6	current_fuel	Current fuel consumption	U16	2	From (1) to the current consumption Unit: 0.0l (L)
7	vstate	State package	VSTATE	Len(VSTATE)	The current state of vehicle
8	reserve	Reserve	U8[8]	8	Monitoring data from running system is 8 byte, stored in the STAT_DATA Detail as below: 1. U8, engine diagnose protocol type 1: VPW (passage car) 2: PWM (passage car) 3: CAN11 (passage car) 4: CAN29 (passage car) 5: KWP2000 (passage car) 6: KWP2000M (passage car) 7: ISO9141 (passage car)

					<p>a:J939(commercial vehicle)</p> <p>b:J1708(commercial vehicle)</p> <p>0: un-know(un-know mode or track mode), the value should be cleared to 0 when reset the system</p> <p>1. U8, the ratio of OBD request successful(%), this value should be cleared to 0 when the travel starting</p> <p>2. U8, the times of input error when OBD request, it will not increase when it's up to 0xff. Clear to 0 when the travel starting</p> <p>3. U8, the times of reset, it will count, and will not increase when it's up to 0xff or checked no power for OBD and USB</p> <p>4. High 4 bit value means hardware code</p> <p>=0 means hardware216G</p> <p>=1 means hardware213G</p> <p>=2 means hardware213E</p> <p>Low 4 bit value means communication module code :</p>
--	--	--	--	--	--

					<p>=1 Quectel M35(2G module)</p> <p>=2 TELIT 865 (2G module)</p> <p>=3 TELIT CE910 (CDMA 3G)</p> <p>=4 TELIT HE910 (WCDMA 3G)</p> <p>5. U8, the signal strength of communication module, query AT+CSQ and return the first parameter</p> <p>6. U8, error-code quotient of communication module, query AT+CSQ to get the second parameter from the returned parameters</p> <p>7. U16, system states indication, this value should be as 0 when travel starting, can't be cleared to 0 in the end, need to upload</p> <p>//bit0: =0: OBD disconnected</p> <p>//bit1: =0: no RPM, =1: has RPM</p> <p>//bit2: =0: GPS normal,=1: GPS is invalid</p> <p>//bit3: =0:RTC is normal, =1: RTC is abnormal</p> <p>//bit4: =0: system voltage</p>
--	--	--	--	--	--

					is normal, =1: system voltage is abnormal //bit5: =0: Flash is normal =1: Flash is abnormal //bit6: =0: system parameter is normal, =1: system parameter is abnormal //bit7: =0: calculate mileage way, =1: query mileage way
Example description					

1.1.1.8 TLV

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	tag	Identification	U16	2	TLV data identification, can judge the subsequent data types according to the identification
2	length	Value data length	U16	2	(3) the number of bytes Range 0~960 If =0 represent there is no (3)
3	value_array	Tag the corresponding numerical	S8[length]	length	According to the different tag logo, marking the different data, specific details see TLV description list
Example description					

1.1.1.9 GSENSOR_DATA

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	x	The X axis acceleration	S16	2	The X axis acceleration Unit: 0.015625g Range: -512~ 511 The default value is 0 when there is no acceleration sensor
2	y	The Y axis acceleration	S16	2	The description is same as (1)
3	z	The Z axis acceleration	S16	2	The description is same as (1)
Example description					

1.1.1.10 ALARM_DATA

NO.	Field	Field Name	Type	Length(Byte)	Field Description
-----	-------	------------	------	--------------	-------------------

NEW OBDII SMART COMMUNICATION PROTOCOL

1	new_alarm_flag	New alarm flag	U8	1	<p>=0 end alarm =1 The new alarm It has both alarm triggered and alarm ending status (exist 0 or 1 flag) : Speeding, low voltage, high-temperature, idle engine, High RPM, Exhaust emission, fatigue driving, MIL DTC alarm; Only alarm triggered status(just flag1) : acceleration, deceleration, towing, power on, quick lane change, sharp turn, power off, geo-fence, SOS, crash, tamper, illegal entry, illegal ignition, OBD wire cut, ignition on and ignition off alarms.</p>
2	alarm_type	Alarm type	U8	1	<p>= 0x01 Over Speeding = 0x02 Low voltage = 0x03 Temperature alarm = 0x04 Abrupt acceleration = 0x05 Abrupt deceleration = 0x06 Stop running without ignition off = 0x07 Towing = 0x08 High RPM speed = 0x09 Power on alarm = 0x0A Exhaust Emission = 0x0B Quick Lane change = 0x0C Sharp turn = 0x0D Fatigue driving = 0x0E Power off = 0x0F Zone alarm = 0x10 Emergency alarm = 0x11 Collision warning = 0x12 Tamper alarm = 0x13 Illegal entry alarm = 0x14 Illegal ignition alarm =0x15 OBD wire cut alarm =0x16 ignition on =0x17 ignition off =0x18 MIL alarm =0x19 Un-lock alarm =0x1A no swipe card alarm</p>
3	alarm_desc	Current value	U16	2	The current value, according to different (2) values, representing

					<p>the different meanings of the value Parameter unit refer to the alarm threshold value (0x1001~0x1014) from 3.3TLV description list</p> <p>For abrupt acceleration and deceleration The field is divided into two types of U8 numerical A: when HT196 is not connected, the high U8 is the current speed, and the low U8 is the last second speed.</p> <p>B: when HT196 is connected, The high U8 is the current speed(unit is 0.1g), and the low U8 is fixed as 0xFF</p> <p>For the zone warning The field is divided into two U8 type value The high U8 means the sign of area warning expresses area warning sign =0x00 means entering area warning =0x01 means exiting area warning Low U8 is area code</p> <p>For the Collision warning The first byte means the direction of collision =0x00 front =0x01 back =0x02 left =0x03 right The second byte is reserve, fill with "0x00"</p>
4	Alarm_ threshold	Alarm threshold	U16	2	<p>According to different (2) values, representing the different meanings of the current value Parameter unit refer to the alarm threshold value(0x1001~0x1014) from 3.3TLV description list For the regional warning, the field is set to 0x0000</p>
Example description					

1.1.1.11 REGION_ITEM

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	region_id	zone code	U8	1	Range: 0~255
2	region_enable	zone enable	U8	1	= 0x00 Disable = 0x01 Enable
3	region_flag	Trigger zone warning sign	U8	1	= 0x00 means enter the region to trigger a warning = 0x01 means exit the region to trigger a warning
4	left_lat	The upper left corner of latitude	S32	4	Unit: ms Range: -90*360000~90*360000
5	left_long	The upper left corner of longitude	S32	4	Unit: ms Range: -180*360000 ~ 180*360000
6	right_lat	The lower right corner of latitude	S32	4	Unit: ms Range: -90*360000 ~ 90*360000
7	right_long	The lower right corner of longitude	S32	4	Unit: ms Range: -180*360000 ~ 180*360000
Example description					

1.1.1.12 REGION_DATA

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	region_count	Zone numbers	U8	1	The number of zone array If the area array number =0, means there is no (2) field
2	region_array	Zone array	REGION_ITEM[x]	19* x	X= (1) the number of zone array If (1) the =0, there is no regional data and no field information
Example description					

1.1.1.13 RPM_ITEM

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	rpm	Engine RPM	U16	2	Details please refer to 9.2 section PID data definition
Example					

1.1.1.14 RPM_DATA

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	rpm_count	RPM number	U8	1	RPM array number, If RPM array number=0,

					represent no (2) field
2	rpm_array	RPM array number	RPM_ITEM[x]	2* x	x= (1) means the number of PM array inside if (1)=0, represent no RPM data and field information
Example					

1.2 Protocol Format

Protocol for the up or down line using a uniform format,

To initiate the protocol type, the main identification is 0x00~0x7F,

For the passive receiving the responder protocol type, the main identification is 0x80~0xFF,

For each the up or down line of a specific instruction, their basic format is the same, there are differences in the local information type field (5) and the contents of the protocol field (6); the subsequent interpretation of each specific instruction, only lists the types of information and the content of the agreement field;

NO.	Field	Field Name	Type	Length(Byte)	Field Description
1	protocol_head	The protocol header	U8[2]	2	Protocol head mark, fixed =0x40x40
2	protocol_length	Protocol length	U16	2	Protocol length, = (1) + (2) + (3) + (4) + (5) + (6) + (7) + (8) of the byte length
3	protocol_version	Protocol version	U8	1	Protocol version, the current =0x03
4	obd_id	OBD number	STR_F(20)	20	Device ID: (OBDII product serial number) Length 20Byte Identifier for each terminal
5	protocol_type	Information type	U16	2	The type of information, high byte means main identification, low byte means sub identification Main identification in the 0x00~0x7F belongs to the up line protocol Main identification in the 0x80~0xFF belongs to a down line protocol Different types of information, and the data of (6) is different The field using the big-endian to transmit
6	content	Content	S8[x]	x	The contents of the

					protocol: The content is determined according to the (5) The X range is 0~65505
7	crc	Check code	U16	2	Checksum, calculated parity and include (1), (2), (3), (4), (5), (6)
8	protocol_tail	Protocol tail	U8[2]	2	Protocol end sign =0x0D 0x0A
Example description					

1.3 Protocol Interaction Mechanism Agreement

(1) This protocol shall apply to communication among the vehicle terminal, the center platform, the serial program and terminal blue-tooth. Network communication protocol type is TCP/IP; serial communication baud rate is 115200.

(1) GPS time will use the system clock (UTC_Time) to instead when GPS is not located

1.4 The communication way between the terminal and center

Take the in-vehicle device transmit data higher frequency and a larger amount of data characteristics of the business into consideration, this agreement will support GPRS load mode to complete communication process and SMS communication process.

The vehicular terminal and the center use TCP/IP communications mode, communication between the customer (device) and server (center) method to establish communication channel, used for sending information.

Various settings of channel parameter set conflict prevention measures:

The vehicle terminal, set channel priority order is: serial, Bluetooth, the center platform. When through the serial port or Bluetooth channel set the terminal parameter, the in-vehicle terminal login center platform, login command protocol data section will identify whether a serial or Bluetooth modify the parameters identification, If yes, it is need to inquiry instruction to obtain the relevant parameters, and received successfully, the conflicting instructions should be removed from a central platform cache and start to send the remaining instructions;

Take the particularity of the GPRS channel into consideration, it will lose data in this transmitting channel normally, other instruction of his agreement, if it will not response after sending 15 seconds, the instruction transmission sends fail.

2. Command List

Command list	The initiating party			Response party		
	Direction	Protocol type	The instruction meaning	Direction	Protocol type	The instruction meaning
Connection type	Up	0x1001	Login	Down	0x9001	Login response
	Up	0x1002	Cancellation			
	Up	0x1003	Heartbeat packet	Down	0x9003	Heartbeat packet response
Set/query type	Down	0x2001	Set	Up	0xA001	Setting response
	Down	0x2002	Query	Up	0xA002	Query response
Control type	Down	0x3001	Vehicle roll call	Up	0xB001	The current location information
	Down	0x3002	Erase the DTC information	Up	0xB002	Erase the DTC information response
	Down	0x3003	Restore factory default	Up	0xB003	Restore factory default response
	Down	0x3004	Remote switch lock	Up	0xB004	Remote switch lock response
	Down	0x3005	Remote voice monitoring	Up	0xB005	Remote voice monitoring response
	Down/Up	0x3006	Characters information	Down/Up	0xB006	Characters information response
Terminal upload initiatively type	Up	0x4001	GPS data			
	Up	0x4002	PID data			
	Up	0x4003	G-Sensor data			
	Up	0x4004	Support data flow			
	Up	0x4005	Snapshot data			
	Up	0x4006	DTC information of Passenger car			
	Up	0x400B	DTC information of commercial vehicle			
	Up	0x4007	Alarm change	Down	0xC007	Alarm receiving confirmation
	Up	0x4008	LBS location upload			
	Up	0x4009	GPS data is under sleeping mode			
	Up	0x400C	ID number of RFID uploading	Down	0xC00C	ID number of RFID uploading confirmation
Remote upgrade type	Down	0x5001	Start upgrade	Up	0xD001	Upgrade response
	Down	0x5002	Request an	Up	0xD002	Send the upgrade

NEW OBDII SMART COMMUNICATION PROTOCOL

			upgrade package			data packet
A-GPS type	Up	0x5101	AGPS data request			
	Down	0x5102	Send AGPS data	Up	0xD102	AGPS data receiving confirmation

Sinocastel Protocol

3. Communication List

Terminal connection commands contains terminal login, registration, heartbeat mechanism and other related commands.

3.1 Login

3.1.1 Process

The instruction is started by the terminal to initiate login packet (0x1001), the center platform to return after the login response packet (0x9001) package.

Terminal connection center for the first packet must be login package, it needs to wait for the center platform login response packet is the successful login, otherwise the other packet will be discarded and a center platform in a limited period of time (5 seconds) was the center platform closing connection.

3.1.2 Launch

Information type	0x1001				
The initiating party	Terminal initiate				
Description	The login package Connect to the terminal and send the first data packet				
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		
2	gpsdata	GPS data	GPS_DATA		The fields of the GPS_DATA value of gps_count comply with the following rules: its value is 0x01 if GPS module is connected, its value is 0x00 if no GPS module or set privacy status
3	software_ver	Software version number	STR_Z		ASCII encode, the length is no more than 32 byte (including the terminator)
4	hardware_ver	Hardware version number	STR_Z		ASCII encode, the length is no more than 32 byte (including the terminator)
5	new_param_count	The modified parameter identification number	U16	2	The number of serial port or Bluetooth to modify the parameters, if not modified =0, and field (6) is empty. The range is 0~400 Maximum modified symbol is 400
6	new_param_array	New modification parameters identification array	U16[x]	2 * x	x = new_param_count If the login package upload data includes modifying parameters identification, the center platform response the login package successfully, it should immediately issued orders inquiry revised all the numerical

					parameters in order to facilitate synchronization of data center platform
Example					

3.1.3 Response

Information type	0x9001				
The initiating party	Center platform response passively				
Description	Login response packets Center platform receives the response data after the login package. If the center platform considered it as legitimate data, it must respond, if it is illegal terminal, the platform can discard directly, and it will not reply login response packets.				
No.	English field	Field name	Type	Length (Byte)	Field description
1	ipaddress	Re-connect IP address	U8[4]	4	The default value is 0xffffffff, if you want the terminal receives the login response, reconnect to the center for the distribution of the communication server, then you need to fill out the server IP address Such as the IP address : 211.139.169.166 The use of U8 array is 0xD30x8B0xA90xA6array
2	port	Re-connect -port number	U16	2	The connected port number, fill 0 if not required
3	center_time	Center platform time	DATE_TIME	4	Response to center platform time The terminal can check the time at this time
Example					

3.2 Cancellation

3.2.1 Process

It will send a cancellation packet to the center platform when the terminal goes into sleeping mode or turn off. After send successfully, the terminal will close the TCP connection, and the center platform also will close the TCP connection after received. The terminal will close the socket connection actively.

3.2.2 Launch

Information type	0x1002				
The initiating party	Terminal initiate actively				
Description	Cancellation package Terminal will close the last data package normally before TCP connection.				

No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		
2	gpsdata	GPS data	GPS_DATA		The fields gps_count of the GPS_DATA value complies with the following rules: its value is 0x01 when GPS module is connected; its value is 0x00 when no GPS module connected or set privacy status
Example					

3.2.3 Response

None

3.3 Heartbeat packet

Maintain TCP connection between terminal and center platform

3.3.1 Process

In the login mode, if the terminal cannot receive any data from center platform more than 2minutes, it need to send the heartbeat packet initiatively, the center platform receives heartbeat packet and return heartbeat packets response to the terminal.

If you do not receive any legitimate data from center platform, the terminal sends heartbeat packet with the interval of every 2 minutes to the center platform and repeats three times, if the center platform are not responding, for this three times, the terminal will closed connection and restart to connect

The following is the terminal detection process:

(1) Terminal receives the center platform data and records the time of last receive data, assumed to be t;

(2) From the t to t+2(means: t plus 2 minutes, similarly hereinafter) within this time period, the terminal receives no legitimate data from center platform, it needs to send a heartbeat packet at the time of t+2

(3) From the t+2 to t+4 time, terminal receives any legitimate data from center platform, the t time is updated to the current time, return to step 1;

(4) From the t+4 to t+6 times, the terminal receives no legitimate data from center platform, it needs to re-send the heartbeat packet at the t+6 point in time,

(5) From the t+4 to t+6 time, terminal receives any legitimate data from center platform, at this time, the t time is updated to the current time, return to step 1;

(6) From the t+6, the terminal receives no legitimate data from center platform, the connection between terminal and central platform has been disconnected, the terminal needs to close the TCP connection and re-connect, login again.

3.3.2 Launch

Information type	0x1003				
The initiating party	Terminal initiate actively				
Description	Heartbeat packet Terminal maintain the connection of data packet				
No.	English field	Field name	Type	Length (Byte)	Field description
no	no	no	no	no	no
Example					

3.3.3 Response

Information type	0x9003				
The initiating party	Center platform response passively				
Description	Heartbeat response packets The response after center platform receives the heartbeat packet from terminal				
No.	English field	Field name	Type	Length (Byte)	Field description
no	no	no	no	no	no
Example					

4 Set Query Command

The setting commands contains all settings to the terminal, including fixed time interval, fuel consumption parameter settings and so on, the behavior mode can be adjustment by the terminal.

Query command is issued through query specified project, terminal returns to the item and set value.

Set / query command are used TLV ways to pack, so each setting and query command can contain a number of irrelevant parameters.

4.1 Set query

4.1.1 Process

Center platform send a setting command, the terminal received it and set the response items, return to set response command.

4.1.2 Launch

Information type	0x2001				
The initiating party	Terminal initiate actively				
Description	Set the instruction packet Center platform set terminal protocol The size of one setting packet cannot exceed 800Bytes, if it exceeds this size, the center platform will divide into several setting package to set automatically. Note: each setting package is complete and independent, its cmd_seq is different.				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command no.	U16	2	Command serial number, judged by the center platform This serial number is appointed by the center platform, in response to commands, terminal must be packed originally.
2	tlv_count	The number of tlv data	U8	1	A group of data packets number of (3) Range 1~255
3	tlv_array	Tlv data array	TLV[x]		x = tlv_count The setting of TLV data array
Example					

4.1.3 Response

Information type	0xA001
-------------------------	--------

The initiating party	Terminal response passively				
Description	Set response to the instruction package The response of the terminal receives the command from the center platform				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, acquires from the corresponding command of the response of the instruction setting
2	success_tag_count	The successful number of tag data packet age	U8	1	The successful identification numbers in (3) Range 0~255
3	success_tag_array	Tag data array	U16[x]	2 * x	x = success_tag_count The successful TLV identification list in the setting commands, if there is no successful instruction, it has not the field
Example					

4.2 Query command

4.2.1 Process

The center platform needs to obtain terminal specified query item setting value.

4.2.2 Launch

Information type	0x2002				
The initiating party	Center platform initiate initiatively				
Description	Inquiry terminal parameter commands packet According to the issued query platform parameters				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, Instruction sequence according to the response of the instruction set the instruction sequence acquisition
2	query_count	Query identification number	U8	1	The identification number of (3) Range 1~255
3	tag_array	tag data array	U16[x]	2 * x	x = query_count Set command failed in the identifier, if there is no failure instruction, it is not

					exist the field
Example					

4.2.3 Response

Information type	0xA002				
The initiating party	Terminal response passively				
Description	<p>Query response instruction packet</p> <p>The terminal receives the center platform of inquiry instruction, the instruction of packing the query instruction</p> <p>The size of one response package cannot exceed 800Bytes, if it exceeds this size, the terminal will sub package automatically (here is hard sub package, with a last data packet size for the 800 Bytes package, each response packet to the cmd_seq are the same) to send.</p>				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Commands serial number	U16	2	Command serial number, according to the response of the inquiry instruction corresponding to the instruction sequence number acquisition
2	resp_count	The total response packets	U8	1	
3	resp_number	The current response of the package	U8	1	The first response packet to 0x00
4	【fail_count】	Query failed identification number	U8	1	The identification number of (5) Range 1~255
5	【tag_array】	Query failed label array	U16[y]	2 * y	y = fail_count Query failed Tag array
6	【success_count】	Number of TLV packets	U8	1	(4) a group of data packets number Range 1~255
7	tlv_array	TLV data set	TLV[x]		X = success_count The success of TLV data query
Example	<p>When sub package, each response packet must take the first 3 fields,4,5,6 fields are included in the first response packet</p> <p>For example, when the response packet has 2package, the first package content structure: cmd_seq+ resp_count(0x02)+ resp_number (0x00)+ fail_count+ tag_array+ success_count+ tlv_array[1]</p> <p>the second package content structure: : cmd_seq+ resp_count(0x02)+ resp_number (0x01) + tlv_array[2]</p>				

4.3 TLV Description List

NAME (TAG_FLAG)	LEN	VALUE Description	Description/Example
Over speed alarm (0x1001)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold: U16, unit: km / h. Default value: Alarm switch: enable Alarm sound: disable Threshold range: [0,300] KM/H Default threshold: 120KM/H	
Low voltage alarm (0x1002)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold: U16, unit:0.1 volt Default value: Alarm switch: enable Alarm sound: disable Threshold range: [9,36]V Default threshold: 10.5V	
Temperature alarm (0x1003)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold: U16, unit: °C, range (-40 °C~200 °C), when set in40issued; when read it , need to subtract 40from the actual temperature Default value: Alarm switch: enable Alarm sound: disable Threshold range: [-40,200] °C	

		Default threshold: 98°C	
Hard acceleration alarm (0x1004)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, unit:0.1 g</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [0.2,0.8]g</p> <p>Default threshold: 0.4g</p>	
Hard deceleration alarm (0x1005)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, unit:0.1 g</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [0.3,1.0]g</p> <p>Default threshold: 0.6g</p>	
Parking without ignition off alarm (0x1006)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, unit: min</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [1,30]min</p> <p>Default threshold: 15min</p>	
Tow alarm (0x1007)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p>	

NEW OBDII SMART COMMUNICATION PROTOCOL

		<p>Alarm threshold: reserved,2 bytes, filled 0x0000</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: 0x0000</p> <p>Default threshold: 0x0000</p>	
High RPM speed alarm (0x1008)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, unit: RPM</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [0,10000]rpm</p> <p>Default threshold: 4500rpm</p>	
Power on alarm (0x1009)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold : reserved,2 bytes, filled 0x0000</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: 0x0000</p> <p>Default threshold: 0x0000</p>	
Exhaust Emission alarm (0x100A)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: reserved,2 bytes, filled 0x0000</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p>	

		<p>Threshold range: 0x0000</p> <p>Default threshold: 0x0000</p>	
Quick lane change alarm (0x100B)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, unit: 0.1g, default 0.5g</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [0.2,0.8]g</p> <p>Default threshold: 0.4g</p>	
Sharp turn alarm (0x100C)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, unit: 0.1g, default 0.5g</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [0.3,0.9]g</p> <p>Default threshold: 0.5g</p>	
Fatigue driving alarm (0x100D)	3	<p>Alarm switch: U8,</p> <p>Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close</p> <p>Alarm threshold: U16, : hours, default is 4hours</p> <p>Default value:</p> <p>Alarm switch: enable</p> <p>Alarm sound: disable</p> <p>Threshold range: [1,480]min</p>	

		Default threshold: 240min	
Power off alarm (0x100E)	3	<p>Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close Alarm threshold: reserved,2 bytes, filled 0x0000</p> <p>Default value: Alarm switch: enable Alarm sound: disable Threshold range: 0x0000 Default threshold: 0x0000</p>	
Zone alarm (0x100F)		<p>Alarm sound switch: U8, 0x01 open =0x00= close REGION_DATA: data type definition</p>	
Emergency alarm (0x1010)	3	<p>Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close Alarm threshold : reserved,2 bytes, filled 0x0000</p> <p>Default value: Alarm switch: enable Alarm sound: disable Threshold range: 0x0000 Default threshold: 0x0000</p>	Security alarm
Collision alarm(0x1011)	3	<p>Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close</p> <p>Bit1alarm sound = 0x01 open =0x00 close Alarm threshold : reserved,2 bytes, filled 0x0000</p> <p>Default value: Alarm switch: enable Alarm sound: disable</p>	

		Threshold range: [1.0,2.0]g Default threshold: 1.5g	
Tamper alarm (0x1012)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold : reserved,2 bytes, filled 0x0000 Default value: Alarm switch: enable Alarm sound: disable Threshold range: 0x0000 Default threshold: 0x0000	
Illegal entry alarm (0x1013)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold : reserved,2 bytes, filled 0x0000 Default value: Alarm switch: enable Alarm sound: disable Threshold range: 0x0000 Default threshold: 0x0000	
Illegal ignition alarm (0x1014)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold : reserved,2 bytes, filled 0x0000 Default value: Alarm switch: enable Alarm sound: disable Threshold range: 0x0000	

NEW OBDII SMART COMMUNICATION PROTOCOL

		Default threshold: 0x0000	
OBD wire cut alarm (0x1015)	3	Alarm switch: U8, Bit0 alarm enable bit = 0x01 open =0x00 close Bit1alarm sound = 0x01 open =0x00 close Alarm threshold : reserved,2 bytes, filled 0x0000 Default value: Alarm switch: enable Alarm sound: disable Threshold range: 0x0000 Default threshold: 0x0000	
Ignition on (0x1016)	3	Alarm switch: U8 bit0 alarm enable = 0x01 enable = 0x00 disable bit1 alarm beeps = 0x01 enable = 0x00 disable alarm threshold: reserved, 2 bytes, fill with 0x0000 Default value: Alarm switch: enable Alarm beeps: disable Threshold range: 0x0000 Default threshold value: 0x0000	
Ignition off (0x1017)	3	Alarm switch: U8 bit0 alarm enable = 0x01 enable = 0x00 disable bit1 alarm beep = 0x01 enable = 0x00 disable alarm threshold: reserved, 2 byte, fill with 0x0000 Default value: Alarm switch: enable Alarm beep: disable Threshold range: 0x0000 Default threshold value: 0x0000	
MIL alarm (0x1018)	3	Alarm switch: U8, bit0 alarm enable = 0x01 enable = 0x00 disable bit1 alarm enable beep = 0x01 enable =	

		<p>0x00 disable alarm threshold: reserved, 2 bytes, fill with 0x0000 Default value: Alarm switch: enable Alarm beep: disable Threshold range: 0x0000 Default threshold: 0x0000</p>	
<p>Unlock alarm (0x1019)</p>	3	<p>Alarm switch:U8, bit0 alarm enable = 0x01 enable = 0x00 disable bit1 alarm beep = 0x01 enable = 0x00 disable Threshold: reserved, 2 bytes, fill 0x0000 Default value: Alarm switch: enable Alarm beep: disable Threshold range:0x0000 Default threshold: 0x0000</p>	
<p>No swipe card alarm (0x101A)</p>	3	<p>Alarm switch: U8, bit0 alarm enable = 0x01 enable = 0x00 disable bit1 alarm beep = 0x01 enable = 0x00 disable alarm threshold: reserved,2 bytes, fill0x0000 Default value: Alarm switch: enable Alarm beep: disable Threshold range: 0x0000 Default threshold: 0x0000</p>	
<p>GPS switch via time (0x1101)</p>	1	<p>Type: U8 =0 open privacy features =1 need to upload, default enable</p>	

GPS capture interval via time (0x1102)	2	GPS data acquisition time Type: U16 Unit: Second Range: 2~600, the default value is 120s	
GPS capture package number (0x1103)	1	How many packets of GPS data acquisition to upload Type: U8 Unit: package Range: 1~30, the default value is 1	
GPS switch via distance (0x0x1104)	1	Type: U8 =0 enable =1 disable Default is disable	
GPS capture interval via distance (0x0x1105)	2	How long distance for sampling the GPS data Type: U16 Unit: M Range: [50,5000], default is 500M	
GPS switch via angle (0x0x1106)	1	Type: U8 =0 disable =1 enable Default is disable	
GPS capture interval via angel (0x0x1107)	1	How many degree for sampling the GPS data Type: U8 Unit: degree Range: [5,90], default is 10 degree	
PID upload switch (0x1201)	1	Type: U8 =0 close =1 open, default disable	
PID capture interval (0x1202)	2	Sampling PID data interval Type: U16 Unit: Second	

		Range: 3~600, the default value is 60s	
PID capture package (0x1203)	1	Collection packet PID data and upload once Type: U8 Unit: package Range: [1,20] The default value is 10	
PID capture types (0x1204)	2 * PID type number	PID type array: PID type U16, see Appendix 9.2 Range: [1,15]	When the setting up the collection condition type terminal does not support, in a query collection condition types, terminal does not support the operation type is not included in this condition type array
G-Sensor upload switch (0x1301)	1	Type: U8 =0 close =1 enabled, default is disable	
G-Sensor Sampling interval (0x1302)	2	Acquire a G-Sensor data time Type: U16 Unit: ms Range: 200~6000, the default value is 1000ms	
G-Sensor upload package number (0x1303)	1	How many packets of GPS data acquisition to upload Type: U8 Unit: package Range: 50~250, the default value is 100	
Power-saving mode (0x1401)	1	Type: U8 = 0x00 half power-saving mode (GPS module close, GSM module standby) =0x01 power-saving mode (GPS module and GSM module are closed) =0x02 no power-saving mode, the default is the whole power-saving	

NEW OBDII SMART COMMUNICATION PROTOCOL

Total fuel consumption (0x1501)	4	Set the current OBD of the vehicle total fuel consumption Type: U32 Unit: L					
Mileage accumulation (0x1502)	4	Set current vehicle OBD accumulated mileage Type: U32 Unit: meter					
Engine emission (0x1601)	1	Type: U8 Unit 0.1L					
Fuel type (0x1602)	1	Type:U8 = 0x10 Gas = 0x20 LPG = 0x30 Hybrid = 0x40 Diesel a = 0x50 Diesel b					
License number (0x1701)	License number length	Type: STR License number, not set the length, but not longer than 50bytes. Using UTF-16 code. Length is decided by the L from TLV					
Device serial number (0x1702)	20	Type: STR_F(20) Use ASCII code	The center platform cannot set, but to read; The protocol only support serial Professional edition Set				
IMEI (0x1703)	X	Type: STR_F(X), 15≤X≤20; Adopts ASCII	IMEI number is GSM module number. Just support to read via PC Tool or center platform, can't support to set				
Alarm sent via SMS at the same time (0x1801)	1	Type:U8 = 0x00close = 0x01open, default is close					
Phone book (0x1802)	23* phone number	23* phone number structure: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>ITEM</th> <th>TYPE</th> </tr> </thead> <tbody> <tr> <td>Serial number</td> <td>U8</td> </tr> </tbody> </table>	ITEM	TYPE	Serial number	U8	
ITEM	TYPE						
Serial number	U8						

NEW OBDII SMART COMMUNICATION PROTOCOL

	structure	<table border="1"> <tr> <td>Set mode</td> <td>U8</td> </tr> <tr> <td>Phone number</td> <td>STR_F(21)</td> </tr> </table> <p>Serial number: =0~4 means set 0~4 position number, only can set the 5 number temporary, and increase /decrease later according to needs Set mode: =0x00 standby =0x01 send alarm message =0x02 allow to call, and hand-free answering numbers automatically = 0x03 allow to call, and wake-up terminal equipment automatically</p> <p>Phone number: ASCII code If you need to remove the original location of the phone number, set the phone number to 0x00 directly</p>	Set mode	U8	Phone number	STR_F(21)	
Set mode	U8						
Phone number	STR_F(21)						
Device time (0x1901)	4	Type: DATE_TIME Set device time					
Set SMS maintenance key (0x1A01)	6	STR_F6. Use ASCII code					
Set the current terminal language (0x1B01)	1	Type: U8 =0x00 Chinese =0x01 English					
Set the system prompt state (0x1C01)	1	Type: U8 =0x00 no sound =0x01 sound.					
Set the time interval of engine flameout judged time -delay (0x1D01)	2	Type: U16 Unit: second Range: 5 ~ 600, default is 30s					
Set message center number (0x1E01)	21	Type: STR_F(21) Use ASCII code					
Network parameter - dial mode (0x1F01)	1	Type: U8 =0x00, using the IP dial mode					

		=0x01, using the domain name dial mode	
Network parameter-domain (0x1F02)	The length of the domain	Type: STR Indefinite length, but not longer than 50bytes Length is decided by L from TLV Use ASCII code	
Network parameter IP address (0x1F03)	16	Type: STR_F (16) Use ASCII code	
Network parameter port number (0x1F04)	2	Type: U16, 0-65535	
Network parameter -APN (0x1F05)	The APN parameter length	Type: STR Indefinite length, but not longer than 50bytes Length is decided by L from TLV Use ASCII code	
Network parameters - user name (0x1F06)	User name length	Type: STR Indefinite length, but not longer than 50bytes Length is decided by L from TLV Use ASCII code	
Network parameters - user password (0x1F07)	Password length	Type: STR Indefinite length, but not longer than 50bytes Length is decided by L from TLV Use ASCII code	
Vehicle VIN code (0x2001)	VIN code length	Type: STR Length is decided by L from TLV Use ASCII code	The Tag is read field only, cannot be set
AGPS-IP address (0x2101)	16	Type: STR_F (16) Use ASCII code	
AGPS- port number (0x2102)	2	Type: U16	
Device software version (0x2201)	Software version	Type: STR Length is decided by L from TLV	The Tag is read field only, cannot be set

	length	Use ASCII code	
Hardware version (0x2202)	Hardware version length	Type: STR Length is decided by L from TLV Use ASCII code	The Tag is read field only, cannot be set
Commercial vehicle Pending DTC info (0x2301)	2* fault number	Type: U16array Each U16type represents a type of fault Detailed definition refer to appendix 9.2	The Tag is read field only, cannot be set
Commercial vehicle Store DTC info (0x2302)	2 * fault number	Type: U16array Each U16type represents a type of fault Detailed definition refer to appendix 9.2	The Tag is read field only, cannot be set
Commercial vehicle Pending DTC info (0x2303)	4 * fault number	Type: U32 array Each U32type represents one fault type Detailed definition refer to appendix 9.2	The Tag is read field only, cannot be set
Commercial vehicle Store DTC info (0x2304)	4 * fault number	Type: U32 array Each U32 type represents one fault type Detailed definition refer to appendix 9.2	The Tag is read field only, cannot be set
Vehicle support PID type (0x2401)	2* PID number	Type: U16 array Each U16type represents one PID type Detailed definition refer to appendix 9.2	The Tag is read field only, cannot be set
RFID car number (0x2501)	x	Type: U8[x] RFID ID number, maximum length not exceed 10 E.g.: if the 5 byte in proper order is: 0B00D5F0C7 Then first byte 0x0b is manufacturer number, next 4 bytes card number is 0x00d5f0c7.	The Tag is read field only, cannot be set Driving recorder special parameter
Location Based Service (0x2601)	1	Type: U8 default set is swift off =0 swift on =1swift off	
RFID function switch of HT-196 (0x2701)	1	Function switch: U8 Bit0 function enable: =0x01 enable =0x00 disable Bit1 bit alarm sound: =0x01 enable =0x00 disable	
Work mode function switch	1	Type: U8, default is passage car It adopts high 4bit and low 4 bit to define	1. for example: set "0x01", it means it's

(0x2801)		<p>High 4 bit: =0 automatically recognition working mode =1 fixed working mode</p> <p>Low 4bit: =0 passage car =1 heavy duty =3 track</p>	<p>heavy duty mode under automatically recognition working mode, it will try to login heavy duty mode first after configured, if communicated failed, it will try to login passenger mode, if it's still failed, it will login track mode at last</p> <p>2. if set it's as automatically recognition working mode, it will login track mode directly</p>
Fixed time interval upload under sleep mode switch (0x2901)	1	<p>Type: U8 =0 Disable =1 Enable Default is enable</p>	
Fixed time interval upload under sleep mode (0x2902)	2	<p>Type: U16 Unit: minute Range: 10—1440 Default is 60 minutes</p>	
GPRS delay working time and switch after trip end (0x3001)	3	<p>Enable switch: U8, default is disable =0x00: disable =0x01: enable Delay working time: U16, range is 5~120 minutes; default is 60 minutes</p>	
GSM delay working time and switch after trip end (0x3101)	3	<p>Enable switch: U8, default is disable =0x00: disable =0x01: enable delay working time: U16, range is 5~7200 minutes; default is 720 minutes</p>	

<p>GPS delay power on time and switch after trip end (0x3201)</p>	<p>3</p>	<p>Enable switch: U8, default is disable =0x00: disable =0x01: enable Delay power on time: U16, range is 5 minutes ~ 7200 minutes; Default is 720 minutes.</p>	
---	----------	---	--

Sinocastel Protocol

5 Control Command

Control command consist OBD control and data handling, all the control commands are issued by the central platform, terminal process passively according to the command

5.1 Vehicle roll

5.1.1 Process

5.1.2 Launch

Information type	0x3001				
The initiating party	Center platform launch initiatively				
Description	Roll command Center platform needs to get the latest GPS potion from the terminal				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, used in the center platform to judge This serial number is designed by the center platform, in response to commands, terminal must be original packing.
Example					

5.1.3 Response

Information type	0xB001				
The initiating party	Terminal response passively				
Description	Roll in response to the instruction Response after received the command 0x3001 from the center platform				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding the instruction sequence acquisition
2	stat_data	Statistics package	STAT_DATA		
3	gpsdata	GPS data	GPS_DATA		The fields of the GPS_DATA value of gps_count comply with the following rules: its value is 0x01 if GPS module

					connected and its value is 0x00 if there is no GPS module or set privacy status
Example					

5.2 Cancel DTC information

5.2.1 Process

5.2.2 Launch

Information type	0x3002				
The initiating party	Center platform launch initiatively				
Description	Removal DTC data				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, used for the center platform judgment This sequence number is designed by a center platform, in response to commands, terminal must be original packing.
Example					

5.2.3 Response

Information type	0xB002				
The initiating party	Terminal response passively				
Description	Response after received the command 0x3002 from the center platform				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding instruction sequence acquisition
2	flag	Success symbol	U8	1	=0 fail =1 success
Example					

5.3 Restore factory default

5.3.1 Process

5.3.2 Launch

Information type	0x3003				
The initiating party	Center platform launch initiatively				
Description	Restore to factory default values (sequence number except), remove the flash data storage				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, used for the center platform judgment This sequence number is designed by a center platform, in response to commands, terminal must be original packing.
Example					

5.3.3 Response

Information type	0xB003				
The initiating party	Terminal response passively				
Description	Response after received the command 0x3003 from the center platform				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding instruction sequence acquisition
2	flag	Success symbol	U8	1	= 0x00 fail = 0x01 success
Example					

5.4 Remote switch lock (Used for GPS Tracker)

5.4.1 Process

5.4.2 Launch

Information type	0x3004				
The initiating party	Center platform launch initiatively				

party					
Description	Remote switch lock				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding instruction sequence acquisition
2	action	Action	U8	1	= 0x00 remote open lock = 0x01 remote close lock
Example					

5.4.3 Response

Information type	0xB004				
The initiating party	Terminal response passively				
Description	Response after received the command 0x3004 from the center platform				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding instruction sequence acquisition
2	action	Lock switch action	U8	1	= 0x00 remote open lock = 0x01 remote close lock
3	flag	Success symbol	U8	1	= 0x00 fail = 0x01 success
Example					

5.5 Remote voice monitoring (Used for GPS Tracker)

5.5.1 Process

5.5.2 Launch

Information type	0x3005				
The initiating party	Center platform launch initiatively				
Description	Remote voice monitoring				
No.	English field	Field name	Type	Length (Byte)	Field description

1	cmd_seq	Command serial number	U16	2	Command serial number, used for the center platform judgment This sequence number is designed by a center platform, in response to commands, terminal must be original packing.
2	phone	Phone number	STR_F(21)	21	
Example					

5.5.3 Response

Information type	0xB005				
The initiating party	Terminal response passively				
Description	Response after received the command 0x3005 from the center platform				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding instruction sequence acquisition
2	flag	Remark of successfully or not	U8	1	=0x00 monitor success =0x01 monitor fail
Example					

5.6 Text Information

5.6.1 Process

5.6.2 Launch

Information type	0x3006				
The initiating party	Center platform or terminal response initiatively				
Description	Text message sending				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, used for center platform or terminal judgment This sequence is appointed by center platform or terminal, at response command, terminal and center platform must be packed as origin.

2	information	Information content	STR	Length is not fixed	Length is not fixed, maximum not exceed 400 bytes, international coding
Example	Message content is "North China Oil 012345ABCD", coding is "BB AA B1 B1 CA AF D3 CD 30 31 32 33 34 35 41 42 43 44"				

5.6.3 Response

Information type	0xB006				
The initiating party	Center platform or terminal response passively				
Description	Response after receiving center platform or 0x3006 command from terminal				
No.	English field	Field name	Type	Length (Byte)	Field description
1	cmd_seq	Command serial number	U16	2	Command serial number, according to the response of the instruction set corresponding instruction sequence acquisition
2	flag	Remark of successfully or not	U8	1	=0x00 received success =0x01 received fail
Example					

6 Terminal Upload Command Automatically

Terminal upload information actively and all is made with certain conditions or terminal for some specific event, upload data actively, unless specific instruction, all terminal upload instructions actively, the center platform will not in response to it.

6.1 GPS data

6.1.1 Process

6.1.2 Launch

Information type	0x4001				
The initiating party	Center platform launch initiatively				
Description	<p>GPS data package</p> <p>(1) GPS data no need to be stored when the communication is normal, if uploading is determined by the time interval and the status of switch.</p> <p>(2) When the communication is abnormal or it's under blind area, GPS data will be stored no matter if there is GPS, if GPS located, if GPS switch is enable or disable. It will upload complementary 40001 data package when the communication is normal.</p> <p>(3) The storage way of GPS data when the network is abnormal or it's under blind area as below:</p> <p>a) The number of GPS and RPM is zero in the 4001 package; also it will not have GPS and RPM data when the GPS is not connected.</p> <p>b) The date, time, longitude and latitude from the GPS data in the 4001 package same as the last valid GPS data. Speed and direction is zero, location sign as location is not valid.</p> <p>c) If GPS switch set as "close" and a) will be handled as GPS is not connected, but "privacy status" should be set as 1 from the status of VSTATE.</p>				
No.	English field	Field name	Type	Length (Byte)	Field description
1	flag	GPS data mark	U8	1	=0x00 conventional GPS data upload =0x01 GPS history data upload
2	stat_data	Statistics package	STAT_DATA		Where UTC_Time is the last GPS data acquisition time
3	gpsdata	GPS data	GPS_DATA		The GPS_ITEM number = terminal parameter in the packing number According to the parameter setting, the range is 1 ~ 30 This protocol does not need to upload if no GPS module or privacy

4	rpmdata	RPM data	RPM_DATA	RPM_ITEM number = GPS_ITEM number, range is 0 ~ 30, specially, RPM_ITEM value is 0xFFFF that means no valid RPM value.
Example				

6.1.3 Response

None

6.2 PID data

6.2.1 Process

6.2.2 Launch

Information type	0x4002				
The initiating party	Terminal launch initiatively				
Description	PID data package				
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		The time of the first group PID data collected is UTC_Time
2	collecte_interval	Capture interval	U16	2	Capture collection interval Range 2 ~ 600
3	con_type_count	PID type number	U8	1	Range: 1~10
4	con_type_array	PID type array	U16[x]	2*x	x = con_type_count PID types, detail definition refers to appendix 9.2 Special note: When the setting up collection PID type terminal does not support, during the time of upload PID data, terminal does not support the PID type is not included in this PID type array, follow-up data field is not consist of the data
5	con_group_count	PID data packets	U8	1	Range: 1 ~ 30
6	con_group_size	The length of Each packet mode data	U8	1	

7	con_data	PID data	x	x	x = con_group_count * con_group_size Detail definition refers to appendix 9.2
Example					

6.2.3 Response

None

6.3 G-Sensor data

6.3.1 Process

6.3.2 Launch

Information type	0x4003				
The initiating party	Terminal launch initiatively				
Description	G-Senser data package				
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		The time of the first group G-sensor data collected is UTC_Time
2	collecte_interval	Sampling collection interval	U16	2	G-Sensor Sampling collection interval Range:200 ~ 6000 ms
3	group_count	Gsensor array	U8	1	Range:50~250 IDD-216G support max 100 packages
4	gsensor_data	Gsensor data	GSENS OR_DATA[x]	x	x = group_count
Example					

6.3.3 Response

None

6.4 Support data flow type

6.4.1 Process

Ignition terminal upload command actively

6.4.2 Launch

Information type	0x4004				
The initiating party	Terminal launch initiatively				
Description	Support data flow				

on					
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		
2	con_type_count	Data flow number	U8	1	If = 0, then there is no (4)
3	con_type_array	Data flow type array	U16[x]	2*x	x = con_type_count Detail definition refers to appendix 9.2
Example					

6.4.3 Response

None

6.5 Snapshot data

6.5.1 Process

6.5.2 Launch

Information type	0x4005				
The initiating party	Terminal launch initiatively				
Description	Snapshot / freeze frame				
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		
2	frozen_flag	Freeze frame mark	U8	1	=0 snapshot data =1 free frame data
3	data_count	Data flow number	U8	1	If = 0, then (5), (6) no
4	data_type_array	Data flow type array	U16[x]	2*x	x = con_type_count Detail definition refers to appendix 9.2
5	data_content	Data flow array values	x	Indefinite length	The different data flow, the data length is not the same. Detail definition refers to appendix 9.2
Example					

6.5.3 Response

None

6.6 DTC info

6.6.1 Passage car DTC info

(1) Process

(2) Launch

Information type	0x4006				
The initiating party	Terminal launch initiatively				
Description	Store/Pending DTC				
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		
2	fault_flag	DTC mark	U8	1	=0 Store =1 Pending
3	fault_count	DTC number	U8	1	If = 0, then there is no (4)
4	fault_type_array	DTC array	U16[x]	2 * x	x = fault_count DTC types, the detailed definition refer to appendix 9.2
Example					

(3) Response

6.6.2 Commercial vehicle DTC information

(1) Process

(2) Launch

Information type	0x400B				
The initiating party	Terminal launch initiatively				
Description	Store/Pending DTC				
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistics package	STAT_DATA		
2	fault_flag	DTC mark	U8	1	=0 Store =1 Pending
3	fault_count	DTC number	U8	1	If = 0, then there is no (4)
4	fault_type_array	DTC array	U32[x]	4 * x	Each DTC occupy 4 bytes, the first two bytes represent DTC code, the 3rd

				<p>byte represents DTC property, the 4th byte represents DTC happen times <DTC_H><DTC_L><DTC_attr><DTC_happenTimes></p> <p>DTC_attr_BIT0---BIT4 represent FMI, FMI definition</p> <p>0: data valid but exceed normal working range - the most serious level</p> <p>1: data valid but lower than normal working range - the most serious level</p> <p>2: data instable, intermittent or incorrect</p> <p>3: voltage exceed normal value, or high power short circuit</p> <p>4: voltage lower than normal value, or low power short circuit</p> <p>5: current lower than normal value or open circuit</p> <p>6: current higher than normal value or ground short circuit</p> <p>7: mechanical system no response or exceed adjusting range</p> <p>8: abnormal frequency or pulse width or period</p> <p>9: abnormal refresh rate</p> <p>10: abnormal change rate</p> <p>11: primary cause unknown</p> <p>12: intelligent equipment or part broken</p> <p>13: exceed calibration range</p> <p>14: specific description</p> <p>15: data valid but exceed normal working range - the lowest serious level</p> <p>16: data valid but exceed normal working range - the middle serious level</p> <p>17: data valid but lower than normal working range - the lowest serious level</p> <p>18: data valid but lower than normal working range - the middle serious level</p> <p>19: receiving error network data</p> <p>20: data drifting too high</p> <p>21: data drifting too low</p> <p>22-30: assign to SAE backup</p> <p>31: existing condition</p>
--	--	--	--	---

					DTC_attr_BIT5---BIT7 retain DTC happen time is 0xff represents happen times unknown 0x00 represent no DTC code, detailed definition please refer to appendix 9.2 《HD_DTC data definition》
Example					

(3) Response

No

6.7 Alarm change**6.7.1 Process**

If the alarm terminal changes, it needs to upload alarm affection change order, center platform returns the corresponding response instructions after receiving.

Terminal uploads (every 5 seconds) the same police intelligence 3 times at most to ensure that the center platform can receive the instruction, after send 3 times , whatever the central platform response, the terminal consider the alarm has been sent completely.

When the terminal receives the instruction corresponding to alarm changes, it considers that the alarm has been sent completely.

If the center platform receives intelligence change instruction, it replies an alarm change directly in response to instruction.

6.7.2 Launch

Information type	0x4007
The initiating party	Terminal launch initiatively
Description	If the terminal is the alarm change, such as, warning beginning, warning end, it needs to send out a warning change package The following is warning, just contain the beginning, not the end = 0x01 Over speed = 0x02 Low voltage = 0x03 High temperature warning = 0x04 Hard acceleration = 0x05 Hard deceleration = 0x06 Parking with flame out = 0x07 Towing = 0x08 High RPM speed = 0x09 Power on alarm = 0x0A Exhaust Emission = 0x0B Quick Lane channel = 0x0C Sharp turn = 0x0D Fatigue driving

	= 0x0E Power off alarm = 0x0F Zone alarm = 0x10 Emergency alarm = 0x11 Collision alarm = 0x12 Tamper alarm = 0x13 Illegal entry alarm = 0x14 Illegal ignition alarm =0x15 OBD wire cut alarm =0x16 ignition on =0x17 ignition off =0x18 MIL alarm =0x19 un-lock alarm =0x1A no swipe card alarm				
No.	English field	Field name	Type	Length (Byte)	Field description
1	alarm_num	Alarm number	U32	4	Terminal equipment custom alarm number, terminal determines the center platform in response to the instruction according to this number
2	stat_data	Statistics package	STAT_DATA		
3	gpsdata	GPS data	GPS_DATA		The fields of the GPS_DATA value gps_count complies with the following rules: its value is 0x01 if GPS module is connected and its value is 0x00 if no GPS module or set privacy status,
4	alarm_count	Alarm numbers	U8	1	The number of changed alarms, all changed alarms affection need to be listed here Including the new added or removed
5	alarm_array	Alarm information	ALARM_DATA[x]	6 * x	x = change_alarm_count
Example					

6.7.3 Response

Information type	0xC007				
The initiating party	Center platform response passively				
Description					
No.	English field	Field name	Type	Length (Byte)	Field description

1	alarm_num	Alarm number	U32	4	In response to the corresponding custom alarm number
Example					

6.8 Base station position upload

6.8.1 Process

Terminal launch initiatively, the information of base station position will send to center platform per minute after terminal start base station position function

6.8.2 Launch

Information type	0x4008				
The initiating party	Terminal launch initiatively				
Description					
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistic package	STAT_DATA		
2	location_area_code	Base station location code		U16	
3	cell_id	Base station zone Id number		U16	
Example					

6.9 Fixed time interval upload under sleep mode

6.9.1 Process

Terminal launch initiatively, the GPS data will upload to server via fixed time interval after fixed time interval upload switch and time interval set.

6.9.2 Launch

Information type	0x4009				
The initiating party	Terminal launch initiatively				
Description	Upload GPS data via fixed time interval under sleep mode				
No	English Field	Field Name	Type	Length (Byte)	Field description
1	UTC_time	Device time	DATE_TIME	4	Current device UTC time

2	gps_item	GPS data	GPS_ITEM	19	1 package GPS_ITEM data
E.g.					

6.10 RFID card ID number upload (driving behavior special protocol)

6.10.1 Process

Terminal launch initiatively, after terminal reading RFID data, actively upload RFID card number data.

6.10.2 Launch

Information type	0x400C				
The initiating party	Terminal launch initiatively				
Description					
No.	English field	Field name	Type	Length (Byte)	Field description
1	stat_data	Statistic package	STAT_DATA		
2	rfid_number	Card ID number data	U8[x]	No defined length, not exceed 10 bytes	If the order of 5 bytes is: 0B00D5F0C7 Then the 1st byte 0x0b is manufacturing number, next 4 bytes is card ID number 0x00d5f0c7
Example					

6.10.3 Response

Information type	0xC00C				
The initiating party	Center platform launch passively				
Description					
No.	English field	Field name	Type	Length (Byte)	Field description
1	rfid_number	Car number data	U8[x]	No defined length, not exceed	If the order of 5 bytes is: 0B00D5F0C7 Then the 1st byte 0x0b is manufacturing number, next 4 bytes is card number 0x00d5f0c7

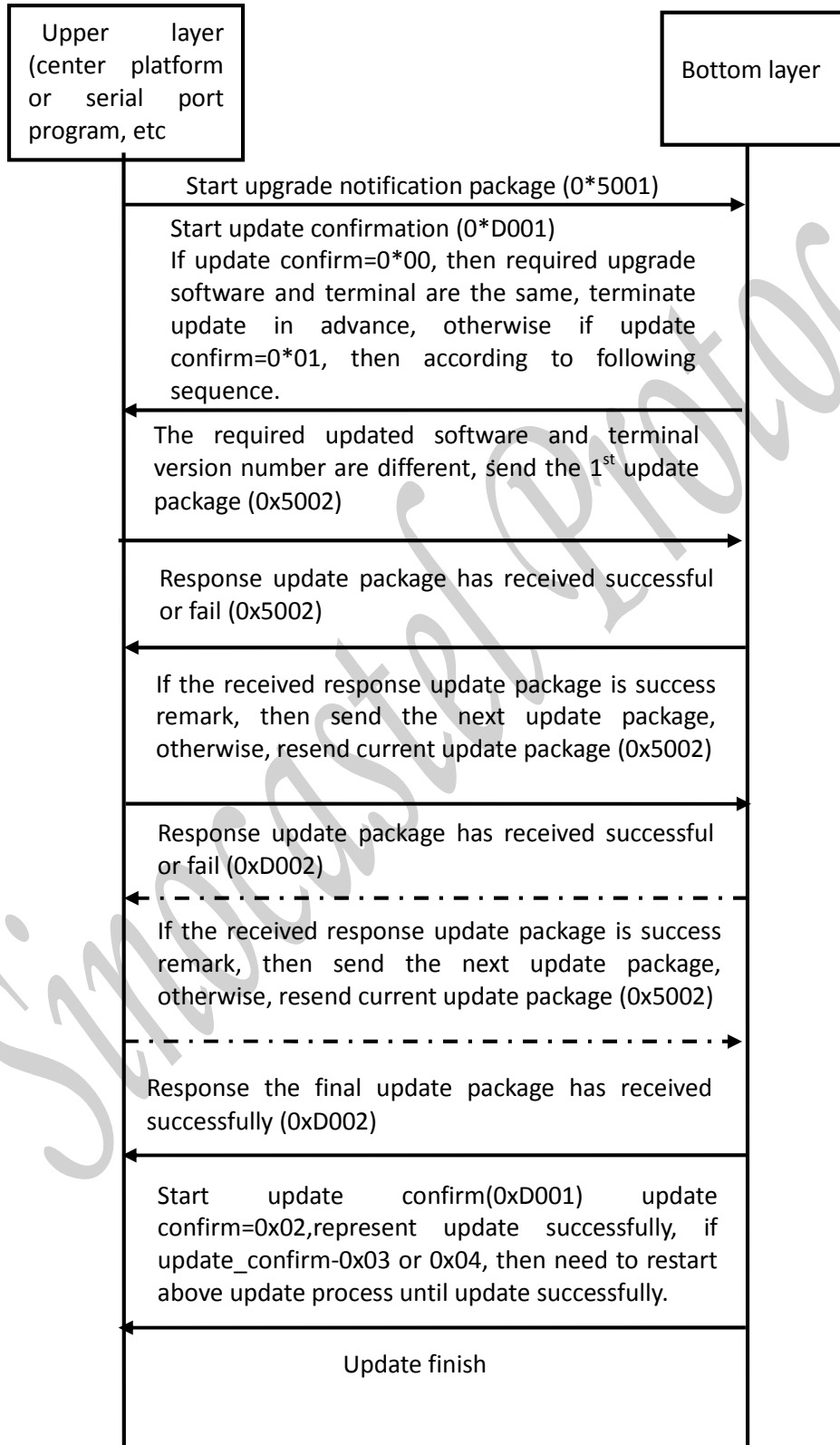
				10 bytes	
Example					

Sinocastel Protocol

7 Remote Upgrade Command

Remote upgrade in the terminal requires a software version during upgrade time.

The timing diagram as follows: (Note: the upper transmission upgrade package, if it has not received a response terminal upgrade package, then the upgrade package will be resend every 10s, repeat 3 times, if it does not receive terminal upgrade package response, can force to stop the terminate upgrade).



7.1 Start upgrade

7.1.1 Process

7.1.2 Launch

Information type	0x5001				
The initiating party	Center platform launch initiatively				
Description	Start upgrade note package				
No.	English field	Field name	Type	Length (Byte)	Field description
1	update_id	Upgrade ID	U32	4	The only upgrading signs, as a follow-up upgrade the identification number
2	soft_num	Software code	STR_F(16)	16	ASCII code
3	total_package	Total package	U16	2	Each package can save up 512Byte at most, so the total number of packets is the upgrading document in accordance with the 512 byte packet Finally, the size of an upgrading package may be less than 512Byte
4	crc_count	Crc number	U16	2	Each 32Kbyte bytes as a check code, the upgrade file is divide into 32Kbyte
5	crc	Crc array	U16[x]	2 * x	x = crc_count Check code array As the end of upgrade file integrity verification
Example					

7.1.3 Response

Information type	0xD001				
The initiating party	Terminal response passively				
Description	Begin to upgrading				
No.	English field	Field name	Type	Length (Byte)	Field description
1	update_id	Upgrade ID	U32	4	The only upgrading signs
2	soft_num	Software	STR_F(16)	16	ASCII code

		number	16)		
3	update_confirm	Upgrade confirm	U8	1	<p>= 0x00 Software codes are same, cancel upgrade</p> <p>= 0x01 Software codes are different, apply upgrade package</p> <p>= 0x02 Software upgrade succeed</p> <p>= 0x03 Software upgrade error, check failed</p> <p>= 0x04 Software upgrade error, contents error</p> <p>If update confirm=0x01, then the center platform using the 0x5002 command actively to send the 0 upgrade package</p> <p>If the terminal determines firmware upgrade successfully, upload upgrade confirmation packet initiatively, and update confirm=0x02</p>
Example					

7.2 Request upgrade package

7.2.1 Process

7.2.2 Launch

Information type	0x5002				
The initiating party	Center platform launch initiatively (when the center platform receiving terminal began to upgrade confirmation packet, sends the first upgrade package; later, the center platform receives a package upgrade confirmation packet and send a packet upgrade package)				
Description	send the specified upgrade package				
No.	English field	Field name	Type	Length (Byte)	Field description
1	update_id	Upgrade ID	U32	4	The only upgrading signs
2	package_flag	Packet flag	U8	1	=0x01 last package =0x00 other package
3	package_number	Package number	U16	2	Upgrade package number
4	package_len	Package length	U16	2	Range: 1 ~ 512 bytes
5	package_content	Package content	S8[x]	16	x = package_len range:1 ~ 512
Example					

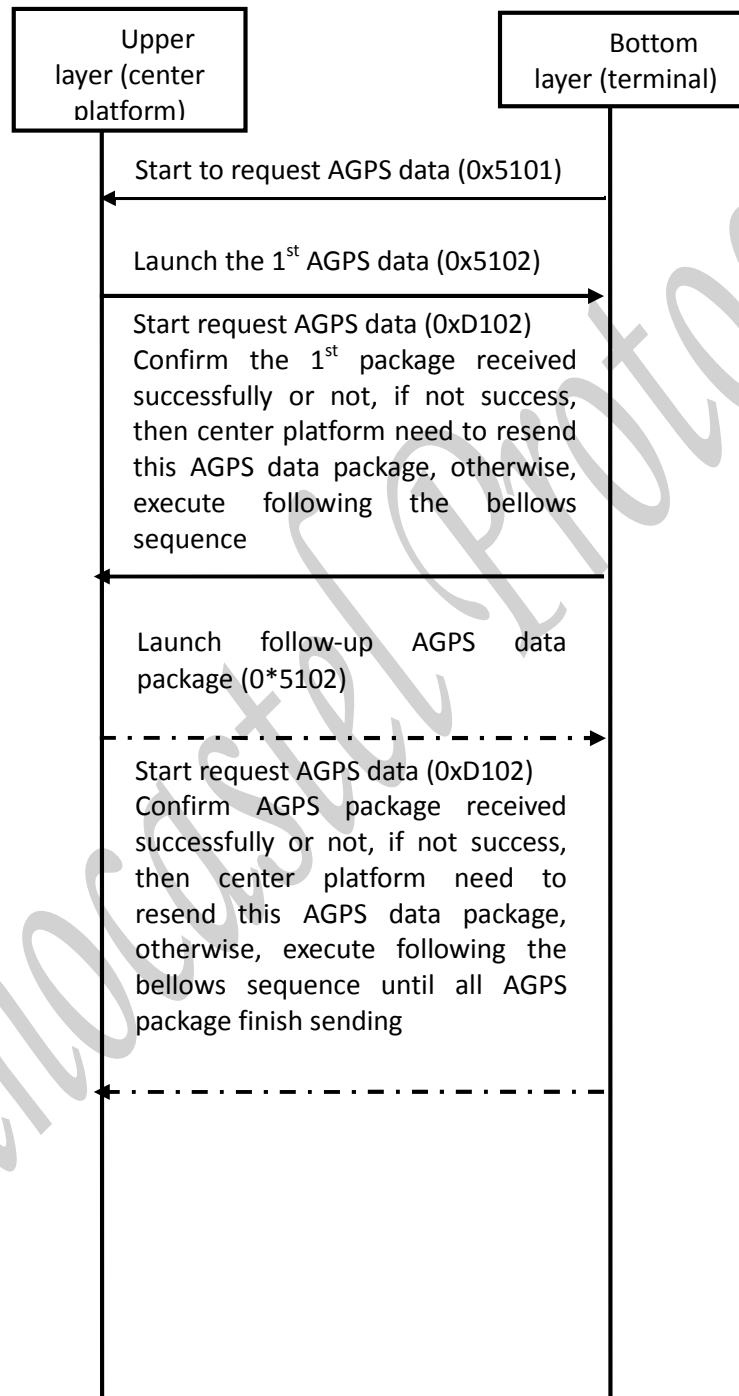
7.2.3 Response

Information type	0xD002				
The initiating party	Terminal response passively				
Description	Response to the upgrade package has received success or failure				
No.	English field	Field name	Type	Length (Byte)	Field description
1	update_id	Upgrade ID	U32	4	The only upgrading signs
2	flag	Flag	U8	1	=0x01 receiving success =0x00 receiving fail
3	package_number	Package number	U16	2	Request to upgrade package, the first package is 0
Example					

8 AGPS Command

The AGPS function is accomplished by the server to obtain the GPS chip in the last 2 hours ephemeris data, thereby supporting terminal to realize positioning quickly.

AGPS data acquisition timing diagram as follows: (Note: the upper send AGPS packets, if it has not received a response packet terminal, then resend the AGPS package at interval 10s again, repeat 3 times, if it still not received the response package terminal, it can be forced to stop the AGPS data update).



8.1 AGPS date request

8.1.1 Process

8.1.2 Launch

Information type	0x5101				
The initiating party	Terminal response initiatively				
Description	send local GPS data to receive AGPS data				
No.	English field	Field name	Type	Length (Byte)	Field description
1	gps_item	GPS info	GPS_ITEM	19	
Example					

8.1.3 Response

None


8.2 Send AGPS data package

8.2.1 Process

After receiving the terminal transmits AGPS data request packet, then the center platform send AGPS packets initiatively. And determine a packet of data terminal receiving success, and then it will send a packet data.

8.2.2 Launch

Information type	0x5102				
The initiating party	Center platform launch initiatively				
Description	Send AGPS data				
No.	English field	Field name	Type	Length (Byte)	Field description
1	agps_count	All package number	U8	1	
2	agps_seq	Package sequence	U8	1	The first package sequence is 0x00
3	agps_data	Agps data			A-GPS data: The format "0xB5 0x62 0x0B ... " is a package, send a packet once , detailed AGPS data refers to the following document page 126th

					 u-blox5_protocol_specification.pdf
Example					

8.2.3 Response

Information type	0xD102				
The initiating party	Terminal response passively				
Description	send local GPS data to receive AGPs data				
No.	English field	Field name	Type	Length (Byte)	Field description
1	agps_seq	Package sequence	U8	1	
2	rec_flag	Receive flag	U8	1	=0x01 received success =0x00 received fail
Example					

9 Appendix

9.1 CRC Calibration algorithm

```

const u16 FCS_START = 0xffff;
const u16 FCS_FINAL = 0xf0b8;
const u16 FCSTAB[256] = {
    0x0000, 0x1189, 0x2312, 0x329b, 0x4624, 0x57ad, 0x6536, 0x74bf,
    0x8c48, 0x9dc1, 0xaf5a, 0xbed3, 0xca6c, 0xdbe5, 0xe97e, 0xf8f7,
    0x1081, 0x0108, 0x3393, 0x221a, 0x56a5, 0x472c, 0x75b7, 0x643e,
    0x9cc9, 0x8d40, 0xbfdb, 0xae52, 0xdaed, 0xcb64, 0xf9ff, 0xe876,
    0x2102, 0x308b, 0x0210, 0x1399, 0x6726, 0x76af, 0x4434, 0x55bd,
    0xad4a, 0xbcc3, 0x8e58, 0x9fd1, 0xeb6e, 0xfae7, 0xc87c, 0xd9f5,
    0x3183, 0x200a, 0x1291, 0x0318, 0x77a7, 0x662e, 0x54b5, 0x453c,
    0xbdcb, 0xac42, 0x9ed9, 0x8f50, 0xfbef, 0xea66, 0xd8fd, 0xc974,
    0x4204, 0x538d, 0x6116, 0x709f, 0x0420, 0x15a9, 0x2732, 0x36bb,
    0xce4c, 0xdfc5, 0xed5e, 0xfcd7, 0x8868, 0x99e1, 0xab7a, 0xbaf3,
    0x5285, 0x430c, 0x7197, 0x601e, 0x14a1, 0x0528, 0x37b3, 0x263a,
    0xdec d, 0xcf44, 0xfddf, 0xec56, 0x98e9, 0x8960, 0xbbfb, 0xaa72,
    0x6306, 0x728f, 0x4014, 0x519d, 0x2522, 0x34ab, 0x0630, 0x17b9,
    0xef4e, 0xfec7, 0xcc5c, 0xdd5, 0xa96a, 0xb8e3, 0x8a78, 0x9bf1,
    0x7387, 0x620e, 0x5095, 0x411c, 0x35a3, 0x242a, 0x16b1, 0x0738,
    0xffc, 0xee46, 0xdcdd, 0xcd54, 0xb9eb, 0xa862, 0x9af9, 0x8b70,
    0x8408, 0x9581, 0xa71a, 0xb693, 0xc22c, 0xd3a5, 0xe13e, 0xf0b7,
    0x0840, 0x19c9, 0x2b52, 0x3adb, 0x4e64, 0x5fed, 0x6d76, 0x7cff,
    0x9489, 0x8500, 0xb79b, 0xa612, 0xd2ad, 0xc324, 0xf1bf, 0xe036,
    0x18c1, 0x0948, 0x3bd3, 0x2a5a, 0x5ee5, 0x4f6c, 0x7df7, 0x6c7e,
    0xa50a, 0xb483, 0x8618, 0x9791, 0xe32e, 0xf2a7, 0xc03c, 0xd1b5,
    0x2942, 0x38cb, 0x0a50, 0x1bd9, 0x6f66, 0x7eef, 0x4c74, 0x5dfd,
    0xb58b, 0xa402, 0x9699, 0x8710, 0xf3af, 0xe226, 0xd0bd, 0xc134,
    0x39c3, 0x284a, 0x1ad1, 0x0b58, 0x7fe7, 0x6e6e, 0x5cf5, 0x4d7c,
    0xc60c, 0xd785, 0xe51e, 0xf497, 0x8028, 0x91a1, 0xa33a, 0xb2b3,
    0x4a44, 0x5bcd, 0x6956, 0x78df, 0x0c60, 0x1de9, 0x2f72, 0x3efb,
    0xd68d, 0xc704, 0xf59f, 0xe416, 0x90a9, 0x8120, 0xb3bb, 0xa232,
    0x5ac5, 0x4b4c, 0x79d7, 0x685e, 0x1ce1, 0x0d68, 0x3ff3, 0x2e7a,
    0xe70e, 0xf687, 0xc41c, 0xd595, 0xa12a, 0xb0a3, 0x8238, 0x93b1,
    0x6b46, 0x7acf, 0x4854, 0x59dd, 0x2d62, 0x3ceb, 0x0e70, 0x1ff9,
    0xf78f, 0xe606, 0xd49d, 0xc514, 0xb1ab, 0xa022, 0x92b9, 0x8330,
    0x7bc7, 0x6a4e, 0x58d5, 0x495c, 0x3de3, 0x2c6a, 0x1ef1, 0x0f78
};
/*****
* Functional Description: CRC control code
* input parameters: fcs: previous CRC16 code
                    Src: this time participates in the operation data, single byte
* output parameters: None
* the return value : CRC control code
*****/
u16 GetFcs(u16 fcs, u8 src)
{
    u16 xor = 0;

```

```

    u16 irestult = 0;
    xor = fcs;
    xor ^= src;
    irestult = (((fcs) >> 8) ^ FCSTAB[xor & 0x00ff]);
    return irestult;
}
/*****
*Functional description: CRC check
* input parameters: psrc: to check data
                    ilen: data length
* output parameters: None
* the return value: 0:success
                    -1: failed
*****/
s16 CRC_CheckCrc(u8 *psrc, u16 ilen)
{
    u16 crc = 0;
    s16 irestult = 0;;
    crc = FCS_START;
    while(ilen-- != 0)
    {
        crc = GetFcs(crc,*psrc);
        psrc++;
    }
    if (FCS_FINAL != crc)
    {
        irestult = -1;
    }
    else
    {
        irestult = 0;
    }
    return irestult;
}
/*****
*Functional description: CRC check code
* input parameters: psrc: to check data buffer pointer
                    ilen: data length
* output parameters: None
* the return value: check code
*****/
u16 CRC_MakeCrc(u8 * psrc, u16 ilen)
{
    u16 crc = 0;
    crc = FCS_START;
    while(ilen-- > 0)
    {
        crc = GetFcs(crc,*psrc++);
    }
    crc ^= FCS_START;





```

```

    return crc;
}

```

9.2 OBD II Data flow Definitions

- 1) Passenger vehicle PID data definition: 
PIDs for Passenger Car (Rev)
- 2) Passenger vehicle DTC data definition : 
DTCs for Passenger Car (Rev)
- 3) Commercial vehicle PID data definition: 
PIDs for Commercial Vehicle
- 4) Commercial vehicle DTC data definition: 
DTCs for Commercial Vehicle

9.3 SMS Maintenance Instructions

7bit, 8bit, ucs2 SMS code format all need support, SMS is mainly done for remote maintenance, so only relates to the network communication parameters setting and reading. The message content is text format. Vehicle terminal default SMS maintenance key is the device last 6 ASCII character, the key is only allowed to pass through the serial port software to change. SMS command format is defined as follows: SMS (There are two ways of SMS communication parameter setting: the IP address and domain name setting method. The terminal needs to restart a dial-up connection to the center after setting, terminal dialing method depends on the short message communication parameters setting mode)

1. Set IP parameters

SecretKey#set gprs#APN,User>Password,IP,Port

E.g. *123456#set gprs#cmnet,,172.18.2.106,8008*

It means set the network parameters of the device via secret key 123456. IP set as 172.18.2.106, port as 8008 and APN as cmnet, username and password is empty

2. Set IP parameters response

set gprs#ok: success

set gprs#fail: failed

3. Get IP parameters

SecretKey#get gprs#

E.g. *123456#get gprs#*

4. Get IP parameters response:

get gprs#APN,User>Password,IP,Port

5. Set domain parameters

SecretKey#set domain#APN,User>Password,IP,Port

E.g. *123456#set domain#cmnet,,www.uuroad.com,8008*

It means set the network parameters of the device via secret key 123456. Set domain as www.uuroad.com,8008 , port as 8008 and APN as cmnet, username and password is empty

6. Set domain parameters response

set domain#ok: success

set domain#fail: failed

7. Get domain parameters

SecretKey#get domain#

E.g. *123456#get domain#*

8. Get domain parameters response

get domain#APN,User>Password,domain,Port

9. Get position in sleep mode

SecretKey#position#

The device will report GPS info to server on receiving this command.

10. Read current location response

***position#http://maps.google.com/?q=latitude, longitude ***

Note: there is blank before the end of *

E.g. *position#http://maps.google.com/?q=38.870941,-77.056114 *

11. Set work mode

SecretKey #set workmode#mode

Note: mode is “passenger”、“heavyduty” or “tracker”

E.g. *123456#set workmode#tracker*

12. Get work mode response

set workmode#ok/fail

E.g.: *set workmode#fail*

13. Query work mode

SecretKey #get workmode#

14. Query work mode response

get workmode#mode

Mode is “passenger”, “heavyduty” or “tracker”

E.g. *get workmode#tracker*