COMMUNICATION PROTOCOL V1.0.3

Edition statement

modification time	Modified by	Version	Modify Content
2015-07-22	Jason	V1.0.1	New protocol
2015-08-10	Jason	V1.0.2	Extended Validation package, increasing electricity upload data
2015-11-03	Jason	V1.0.3	Add Blind Spots Uploading protocol
2016-01-04	Jason	V1.0.4	Add SOS,Add the number of base stations protocol
2016-03-14	Jason	V1.0.5	Add working mode protocol

CONTENTS

一. Communication protocol

Introduction

This document defines the Car GPS positioning service platform for application-layer interface protocol. Relevant interface protocol is only used for the interaction between the platform and positioning terminal.

二、Protocol No.

1. Protocol List

protocol No.	Data packet Description	Respond	Uplink or Downlink
V1	Location data packet	NO	uplink
XT	Heartbeat packet	YES	uplink
VI1	Location Request packet	YES	uplink
VI	Location Response packet	NO	Downlink
S20	Start cut-off oil&engine Data packet	YES	Downlink
V4	Instruction acknowledgment packet	NO	uplink
SF	Fortification	YES	Downlink
SF2	Fortification, version Ⅱ	YES	Downlink
CF	Disarm packet	YES	Downlink
CF2	Disarm packet, version Ⅱ	YES	Downlink
TG	Platform distributes sms	YES	Downlink
UR	Main number bind	YES	Downlink
IP	Modify IP	YES	Downlink
ST	Setting sms interception number	YES	Downlink
MP	Terminal password setting	YES	Downlink
XT/NXT	uploading interval setting	YES	Downlink
KC	Alarm Setting	YES	Downlink
CQ	Device Reboot	YES	Downlink
RESET	reset to defaults	YES	Downlink
APN	APN network access point setting	YES	Downlink
SQQ	Family Number setting	YES	Downlink
ACPC	Answer mode setting	YES	Downlink
SIMEI	IMEI setting	YES	Downlink
SLAN	language setting	YES	Downlink
CALB	monitor	YES	Downlink

PWM	the power saving mode setting	YES	Downlink
OVSP	Overspeed Setting	YES	Downlink
INFO	Query the device status	YES	Downlink
ALRM	Alarm	YES	uplink

2. Uplink&Downlink description

Description	Remark
Server-----→ Terminal	Downlink
Terminal-------→ Server	Uplink

3. Packet definition

*XX,YYYYYYYYYY,cmd,HHmmss,S,latitude,D,longitude,G,speed,direction,DDMMYY,vehicle_status, pw ,3,mcc,mnc,lac,cid, lac,cid, lac,cid #

Information Field Description:

Format	FieldName	Remark
*XX	IHDR	IHDR
YYYYYYYYYY	Terminal No.	Terminal No.
cmd	Operation name	Command names, refer to the "Protocol List"
HHmmss	Time	Automotive machine time, standard time, 8 hour time difference with GMT
S	Data valid bit	Data valid bit（A/V/B）,A representative of GPS positioning data is valid data, V indicates that the GPS data is invalid positioning data B represents Compass
latitude	latitude	latitude,format DDFF.FFFF, DD:Latitude Degree（00～90）,FF.FFFF: Latitude points（00.0000～59.9999）, Reserved four decimals
D	Latitude symbol	Latitude symbol（N: northern latitude, S: southern latitude）
longitude	longitude	longitude,formatDDDFF.FFFF,DDD: Longitude Degree（000～180）, FF.FFFF: Longitude points（00.0000～59.9999）, Reserved four decimals
G	longitude symbol	longitude symbol（E: east longitude, W: west longitude）
speed	speed	speed, range000.00～999.99 knots Reserved two decimals.The information fields maybe null,that means the speed is 0. 1Kn=1.852 km/h

direction	Azimuth	Azimuth, Due north is 0 degree, resolution is 1 degree, Clockwise direction. The information fields maybe null, that means the degree is 0
DDMMYY	day/month/year	day/month/year
vehicle_status	Terminal Status	Terminal Status, total 4 bytes, represent vehicle machine component state, vehicle component status and alarm status ...
pw	Power Capacity	device power percentage 00-99 99 means 100%
count	Base station quantity	3
mcc	Country Code	Country Code
mnc	Operator code	Operator code
lac	Base station code	District code
cidf	Base station code	District ID
lac	Base station code	District code
cidf	Base station code	District ID
lac	Base station code	District code
cidf	Base station code	District ID

4. Terminal Status (alarm) analysis

vehicle_status use ASCII character represent 16 hexadecimal value, below is every byte each specific meaning of the variable, bit represent use negative logic, that is bit = 0 valid. show as below table:

FFF9FFFF FFF9FFEF=Cut-off engine FFFFFFFBFF=sos

Bit order	The first byte		The second byte		The third byte		The forth byte	
0	0	Temperature alarm	0	GPS Receiver fault alarm	0	door open	0	Theft alarm
1	0	three times password error alarm	1	Analog quantity transfinite alarm	0	Vehicle fortified status	0	robbery alarm
2	0	GPRS Occlusion alarm	0	remain→sos alarmstate	0	ACC off	0	overspeed alarm
3	0	vehicle in the cut-off oil&engine state	0	host powered by the backup battery	1	reserve	0	illegal ignition alarm
4	0	Storage battery removal state	0	Storage battery has been removed	1	reserve	0	No entry cross-border alarm
5	0	The high level sensor 1 is high	0	open circuit for GPS antenna	0	engine	0	gps antenna open circuit alarm
6	0	The high level sensor,2 is high	0	short circuit for Gps antenna	0	Custom alarm	0	gps antenna short circuit alarm
7	0	The low level sensor 1 bond strap	0	The low level sensor 2 bond strap	0	vehicle overspeed	0	No entry cross-border alarm

5. Instruction acknowledgment packet definition

*XX, YYYYYYYYYY, ack, rHHmmss, HHmmss, S, latitude, D, longitude, G, speed, direction, DDMMYY, vehicle_status, mcc, mnc, lac, cid#

Information Field Description

Format	FieldName	Remark
*XX	IHDR	IHDR
YYYYYYYYYY	Terminal No.	Terminal No./IMEI NO.
ack	Instruction acknowledgment packet	Instruction acknowledgment packet
cmd	Confirmation command	Confirmed operation command, please refer to "Protocol List"
ret	Return parameters	Return parameters confirmation
rHHmmss	Instruction time	Value of time field for the downlink instruction packet
HHmmss	time confirmation	time for acknowledgement Packet
S	Data valid bit	Data valid bit (A/V/B), A representative of GPS positioning data is valid data, V indicates that the GPS data is invalid positioning data B

		represents Compass
latitude	latitude	latitude，format DDFF.FFFF, DD：Latitude Degree（00～90）,FF.FFFF：Latitude Points（00.0000～59.9999），Reserved four decimals
D	latitude symbol	latitude symbol（N：northern latitude，S:southern latitude）
longitude	longitude	longitude，formatDDDFF.FFFF，DDD：（000～180），FF.FFFF：（00.0000～59.9999），Reserved four decimals
G	longitude symbol	longitude symbol（E：east longitude，W：west longitude）
speed	speed	speed，range000.00～999.99 knots Reserved two decimals. The information fields maybe null, that means the speed is 0。1kn=1.852km/h
direction	Azimuth	Azimuth，due north is 0 degree，resolution is 1 degree，Clockwise direction. The information fields maybe empty, that means the degree is 0
DDMMYY	day/ month/year	day/ month/year
vehicle_status	Terminal Status	Terminal Status, total 4 bytes. represent vehicle machine component state， vehicle component status and alarm status ...
mcc	Country code	Country code
mnc	Operator code	Operator code
lac	Location area code	Location area code
cid	Base station code	District ID

6. Returned parameters (ret) Acknowledgement Packet defined

ret use ASCII Characters represent 16 hex value, total two bytes

0x80-0xFF Indicates success

0x00-0x7F Indicates fail

16 hex value	Remark
0x00	Device support, but the operation failed
0x01	device does not support this operation
0x02	Beyond the index range
0x03-0x7F	The operation failed, the error message is

	undefined
0x80	Successful operation
0x81-0xFF	Successful operation, But the return result is undefined

三、Uplink command

1. Real-time location

LAC CID Less than 3 fill 0

*XX,YYYYYYYYYY,V1,HHmmss,S,latitude,D,longitude,G,speed,direction,DDMMYY,vehicle_status ,pw,3, mcc,mnc,lac,cid,lac,cid,lac,cid #

eg:

*HQ,353505910449999,V1,052825,A,2239.4210,N,11400.8825,E,0.00,348,180814,FFFFFFFF,90,3,460,0,9376,8532,9876,4357,0,0 #

RESPOND: NO

2. HEARTBEAT PACKET(XT)

*XX,YYYYYYYYYY,XT#

EG:

*HQ,353505910449999,XT#

RESPOND FORMAT:no

Temporarily not to do this

3. **Location request(VI1)**

*XX,YYYYYYYYYY,VI1,HHmmss,Code,latitude,D,longitude,G,speed,direction,DDMMYY,vehicle_status,mcc,mnc,lac,cid,pw,lac-cid-signal#

eg:

*HQ,353505910449999,VI1,052825,0,2239.4210,N,11400.8825,E,0.00,348,180814,FFFFFFFF,1CC,0,25FC,F48,90, 25FC-F48-10|25FC-F48-6|25FC-F48-7#

Respond: yes

Response format as follows:

*HQ,YYYYYYYYYY,VI,HHmmss,Display_Time,Code,Info_lenth,Information#

format	FieldName	Remark
Display_Time	time	Display time, unit: second, range: 5-65535, Display_Time = 0 means 65536 seconds. (Uplink On line time)
Code	Coding scheme	0：GB2312，1：unicode，Other:undefined
Info_length	Message length	Message length，0-255，0 equivalent to 256，over 256 modulo by 256，handle or LCD screen in
Information	MESSAGE	Display information,length is less than 256bytes.(128 words)

eg:

*HQ,0000000000,VI,130305,60,0,26,深圳市南山区中山立交桥附近#

response：No

4.Blind Spots Uploading(BC)

*XX,YYYYYYYYYY,BC,HHmmss,Length,Segment#

Segment:S,latitude,D,longitude,G,speed,direction,DDHHmmss,vehicle_status,mcc,mnc,lac,cid;

response： no

eg:

*HQ,353505910449999,BC,052825,138,A,2239.4210,N,11400.8825,E,0.00,348,03182512,FFFFFFFF,1CC,0,25FC,F48;A,2239.4210,N,11400.8825,E,0.00,348,03182612,FFFFFFFF,1CC,0,25FC,F48#

format	FieldName	Remark
XX	time	Display time, unit: second, range: 5-65535, Time= 0 means 65536 seconds. (Uplink On line time)
Length	Segment length	indication for the length of segment

Segment	Complement uploading information	complement uploading data, no more than 100 points, A plurality of points with a semicolon (;) separated; the contents of a single point is: S, latitude, D, longitude, G, speed, direction, DDHHmmss, vehicle_status, mcc, mnc, lac, cid; (Data valid bit, latitude, longitude identification, longitude, longitude identification, speed, direction, every second day, device status, country code, network type (operator code), location area code, base station code)

5. device alarm(ALRM)

*XX, YYYYYYYYYY, ALRM, type, HHmmss #
response: no

field	remark
type	Alarm type numeral 1-n: 1: SOS alarm 2: Low battery alarm 3: Geo-fence alarm

eg:

*HQ, 353505910449999, ALRM, 1, 052825, 0, 2239.4210, N, 11400.8825, E, 0.00, 348, 180814, FFFFFFFF, 1CC, 0, 25FC, F48, 90, 5FC-F48-10|25FC-F48-6|25FC-F48-7#

四、Downlink command

1. cut off oil-engine/recovery oil&engine(S20)

*XX, YYYYYYYYYY, S20, HHmmss, C, T#

field	remark
C	Ultimate power mode. 1 or other digits: Static cut off oil&engine, no engine

	detection,power relay always pull in , turn off the circuit
T	cut off or recovery 0 represents recovery,1 represents cut off

eg:*HQ,0000000000,S20,130305,1,1#

If vehicle does not support the power cutoff function,after received the command,return the information directly.

*HQ,2020916012,V4,S20,00,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028, 220902,FFFFFBFF, 460,000,27A6,0F70#

Finally is completely power off, and according to the C provision way to keep power off, after complete power off then return information

*HQ,2020916012,V4,S20,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,F7FFFBFF, 460,000,27A6,0F70#

:Method of recovery oil&engine,downlink

*HQ,0000000000,S20,130305,1,0#

Return information

*HQ,2020916012,V4,S20,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFBFF, 460,000,27A6,0F70#

2. Response to location request(CR)

*HQ,YYYYYYYYYY,CR#

response: yes

*HQ,YYYYYYYYYY,V4,CR#

after received the command,device will upload one location data immediately.

3. Fortification(SF)

*HQ,YYYYYYYYYY,SF#

eg:

*HQ,135790246811221,SF#

response: yes

Response format is as follows

*HQ,135790246811221,V4,SF,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

4. Fortification(SF2)

*HQ,YYYYYYYYYY,SF2,HHmmss#
eg:
*HQ,135790246811221,SF2,HHmmss#
response： yes
Response format is as follows
*HQ,135790246811221,V4,SF2,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

5. Disarming(CF)

*HQ, YYYYYYYYYY,CF#
eg:
*HQ,135790246811221,CF #
response： yes
Response format is as follows
*HQ,135790246811221,V4,CF,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFBFF,mcc,mnc,lac,cid#

6. Disarming(CF2)

*HQ, YYYYYYYYYY,CF2,HHmmss#
eg:
*HQ,135790246811221,CF2,130305#
response：yes
Response format is as follows
*HQ,135790246811221,V4,CF2,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFBFF,mcc,mnc,lac,cid#

7. Main Number Bind(UR)

*HQ, YYYYYYYYYY,UR,NUM_LIST#
eg:
*HQ,135790246811221,UR,15014333333，1343333333，0，0，0#
response： yes

field	remark
NUM_LIST	Binding number list,multiple numbers separated by |, supports a maximum of six numbers, the first one is the main number, the rest is frequently used numbers (family number)

response format

*HQ, YYYYYYYYYY,V4,UR#

8. Sever setting(IP)

*HQ,135790246811221,IP,INDEX,IP,PORT,YM, HHmmss#

format	fieldname	remark
IP	IP	IP address (32bit)
INDEX	digits	1 or 2 is priority number.1 is for IP priority.2 for domain priority
IP	IP	Use 0 instead (abandoned)
PORT	port No.	Port number is 16 hexadecimal
YM	domain	domain

eg:
*HQ,135790246811221,IP,1,00000000,1a7c,www.gps588.com，130305#
response： yes

Response format is as follows:

*HQ,135790246811221,V4,IP,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFBFF,mcc,mnc,lac,cid#

9. Terminal password setting(MP)

*XX,YYYYYYYYYY,MP,msg,HHmmss#

msg is the content of sending includes fields as follows:

field	remark
Old_password	Terminal old password (6 digits)
New_password	Terminal new password (6 digits)

eg:

*HQ,353505910449999,MP,000000,123456#

response: yes

Response format is as follows:

Modify the password is correct then return information

*HQ,135790246811221,V4,MP,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

Modify the password is error:

*HQ,135790246811221,V4,MP,03,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

Ret error field definition

Hexadecimal value	**remark**
03	Operation fails, the original password is not correct
04	Operation fails, the original password is beyond range

10. Interval settings(XT/NXT)

*XX,YYYYYYYYYY,[XT/NXT],seconds#

field	remark
XT	Terminal driving packets upload interval
NXT	Terminal resting packets upload interval

seconds	Corresponding to the time interval of upload data packets while driving [5,3600],static range[10,7200]units:SEC(s)

eg:

*HQ,353505910449999,NXT,10#

respond: yes

Response format is as follows:

*HQ,135790246811221,V4,NXT#

11. Alarm setting(KC)

*XX,YYYYYYYYYY,KC,key,Type #

field	remark
Type Key,	Alarm Type: 1 SMS, 2 Phone Key values, 0, SOS button, key 1,1key, 2,2 key

eg:

*HQ,353505910449999,KC,0,1 #

response: yes

response format is as follows:

*HQ,135790246811221,V4,KC#

12. Device reboot(CQ)

*XX,YYYYYYYYYY,CQ#

eg:

*HQ,353505910449999,CQ#

response: yes

*HQ,135790246811221,V4,CQ #

13. reset to defaults(RESET)

*XX,YYYYYYYYYY,RESET,HHmmss#

eg:

*HQ,353505910449999,RESET，130305#

response： yes

response format is as follows:

*HQ,135790246811221,V4,RESET,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid #

14. Network access point(APN)

*XX,YYYYYYYYYY,APN,Name,User,PWD#

field	remark
Name	Local operators APN name
User	Access network operators corresponding account
PWD	The operator password

Eg: SPAIN APN:

*HQ,353505910449999,APN,zap.vivo.com.br,vivo,vivo#

response： yes

Response format is as follows:

*HQ,135790246811221,V4,APN,#

15. Answer mode(ACPC)

After closing the answer mode, the device can not receive calls

*HQ,YYYYYYYYYY,ACPC,OPERATION#

eg:

*HQ,135790246811221,ACPC,1#

response： yes

field	remark
OPERATION	1, open the answer mode 0, close the answer mode (off by default)

response format is as follows:

*HQ,135790246811221,V4,ACPC#

16. IMEI setting

*HQ,YYYYYYYYYY,SIMEI,NUM,130305#

eg:

*HQ,135790246811221,SIMEI,135790246811221130305#

response: yes

field	remark
NUM	IMEI NUMBER 15 digits

response format is as follows:

*HQ,135790246811221,V4,SIMEI,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

17. language setting(SLAN)

*HQ,YYYYYYYYYY,SLAN,lan,HHmmss#

eg:

*HQ,135790246811221,SLAN,en,130305#

response: yes

field	remark
lan	International language simple code cn Simplified Chinese, en English

response format is as follows:

*HQ,135790246811221,V4,SLAN,80,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

18. audiomonitor(CALB)

Starts the Listener, the device will take the initiative to call the phone number bound

*HQ,YYYYYYYYYY,CALB,HHmmss#

eg:

*HQ,135790246811221,CALB,HHmmss#
response： yes
response format is as follows:
*HQ,135790246811221,V4,CALB,130305,050316,A,2212.8745,N,11346.6574,E,14.28,028,220902,FFFFFFFF,mcc,mnc,lac,cid#

19. Query device information(INFO)

*HQ,YYYYYYYYYY,INFO#
response： yes

field	remark
operationList	use , to show the value of equipment information to query list

Display the information list

VOL	electric quantity percentage 00-99
IP	domain,ip and port for the binding server eg： 219.148.126，8169
UPF	Uploading data frequency, format:travel Upload time | resting upload time if there is no static uploading time,should be null units:second
PWM	running mode refer to "power saving mode",mode No.
SOS	family number， multiple values among use, separated the corresponding array according to the Settings order，no value is null eg：13510060482，0，0，0，0
ALM	Alarm mode, respectively SOS keyboard, 1 key, 2 key Alarm mode
APN	Apn name currently used,APN name in NVRAM

response format is as follows:

*HQ,135790246811221,V4,INFO,80 ,

132.44.55.33,8090,60,1,13578882828,0,0,0,0,1,cmnet,0，50#

operationList： operating value for Server downlink

result：According to the results of operation List combined, multiple values separated by (,)

eg:

*HQ,135790246811221,INFO#

20. working mode setting(WMOD)

*HQ,YYYYYYYYYY,WMOD,TYPE,TIME1,TIME2#

eg:

TYPE 0,1,2

*HQ,135790246811221,1,0,0#

*HQ,135790246811221,2,30,30#

interpretation：the device off after finished setting, after 30 minutes, automatic on, restart,working for 30 minutes, and then enter a dormant state.

Every 24 hours a loop

Respond： yes

field	remark
TIME1	Device start to work after the current time how many minutes
TIME2	device enters the shutdown state after how long working time

备注：remark