OBD Smart Communication Samples

V4.41

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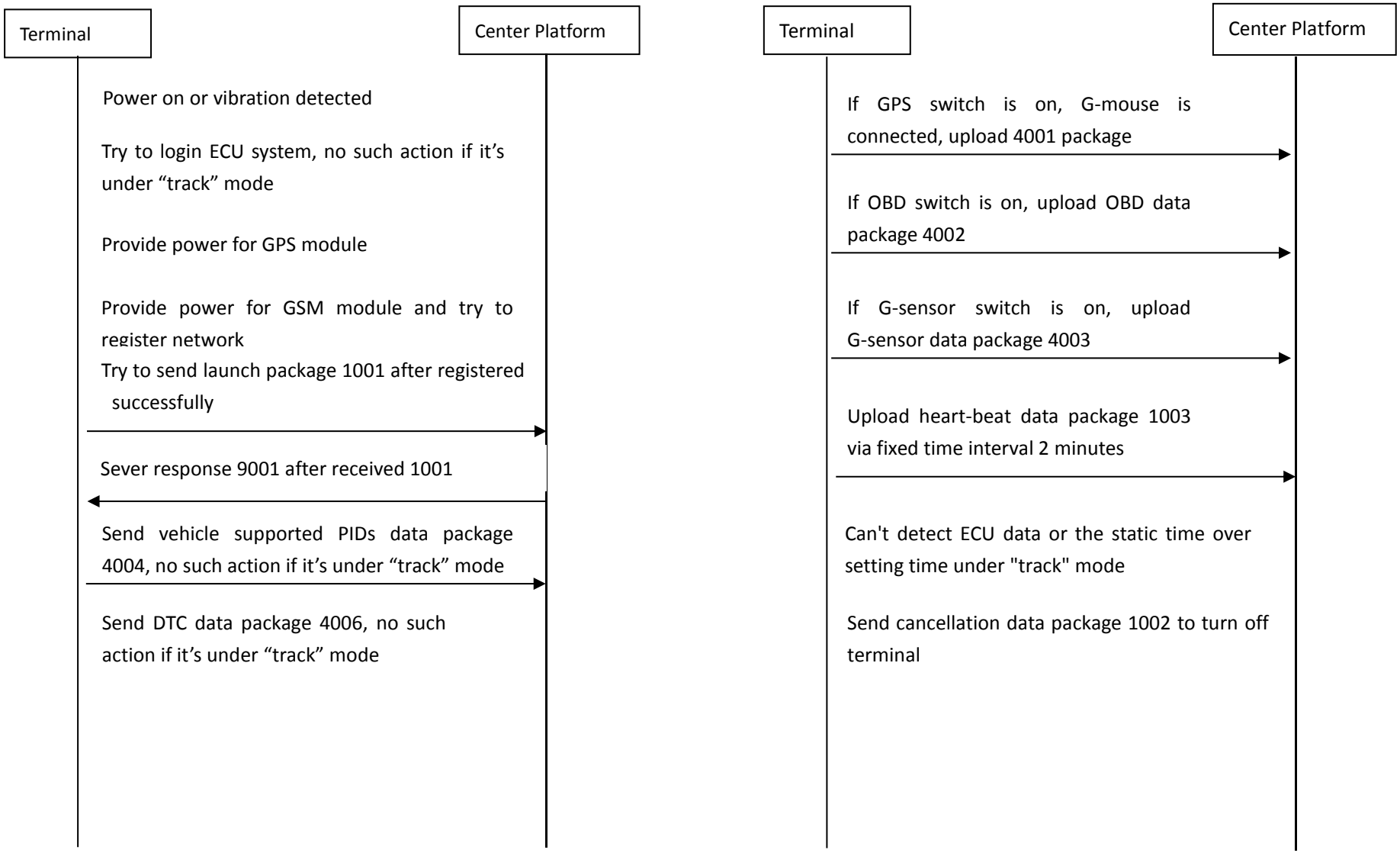
2017-11-08

Catalog

I Communication flow



II Protocol package format for download upload:

Head + Length + protocol version + Device ID + command type + parameters list + CRCchecksum + tail of package

Head: 2 bytes， the same with upload&download, firmed as"0x40 0x40;

Length: 2 bytes, the length of whole package is calculated from head to tail. It is expressed with little-endian mode, for example, the length is 500 bytes, it should be written to hex string for "F401".

Protocol version: 1bytes; Current version is V4, fixed as "0x04".

Device ID: 20 bytes, that is device ID, to distinguish different device, bytes normally our device is 19bytes, for example: the device ID "cyjmnj2160132100560", then in hex string is"63796A6D6E6A323136303133323130303536 3000";

Command type: 2 bytes, to distinguish type of data package， for example, login package"0x10 0x01";

Parameters list: Different command type depends on different parameters; there is possibility for no command here.

CRCchecksum: 2bytes, it means sum of checksum included from Head to Command parameter, please refer to V4.18 OBD SMART communication protocol.

Tail of package: 2bytes, same with upload& download, fixed as“0x0D 0x0A”;

III Upload package example

1 Login Package

Raw data package	40407F0004313030313131323532393938370000000000000001001C1F06952FDF069529C9111000000000000698300000C0000000000036401014C00030001190A0D04121A1480D60488C5721800000000AF4944445F3231364730325F532056312E322E31004944445F3231364730325F482056312E322E31000000DF640D0A			
Data package decode	Field	Length (byte)	Data decode	Note
4040	Protocol header	2		
7F00	Protocol length	2	Low to high front, the length is = 127 byte	
04	Version	1	Current protocol version is 04	
313030313131323532393938370000000000000	Device ID	20	ASC as “1001112529987”	
1001	Command type	2	Login package	
C1F06952FDF069529C9111000000000698300000C	Parameter1	34	stat_data data: C1F06952: the latest ACC ON time, means 2013 -10-25- 12:17:05	

00000000000036401014C000300			FDF06952: UTC time, means 2013 -10-25- 12:18:08 9C911100: total mileage, unit is meter, means 0x0011919C=1151388 00000000: current trip mileage, unit is meter, means 0 meter 69830000: total fuel consumption, unit is 0.01L, 0x00008369=33641, So 33641*0.01=336.41 0C00: current trip fuel consumption, unit is 0.01, 0x000C=12, so 12*0.01=0.12 00000000 036401014C000300 vehicle state reserved bytes decode: current fuel consumption: 2bytes, low to high, 0x000C=12, unit"0.01litre"， so 12*0.01=0.12 liter; Vehicle state：4bytes，please refer to protocol for details， because here is all 00，so decode "null"; Reserved bytes: 8bytes, please refer to communication protocol for details，normally the first bytes will be used， here is 0x03,decode： "passenger car CAN11 OBD protocol"	
01190A0D04121A1480D60488C5721800000000AF	Parameter2	20	Gpsdata: The first bytes"01" stands for there is 1 GPS package behind Followed 19 bytes is GPS data; 19 0A 0D 04 12 1A 1480D604 88C57218 0000 0000 AF 25 10 13 04 16 26 0x04D68014 0x1872C588 0x0000 0x0000 0xAF day month year hour minute second latitude longitude speed direction sign decode: "13 years10months 25days"	

			"4hours16minutes26seconds" "22.54621" ----- 0x04D68014=81166356, 81166356/3600000= 22.54621 "113.93746"------ 0x1872C588=410174856, 410174856/3600000=113.93746 "0km/h"----0x0000 = 0cm/second, so 0km/h "0degree" ----0x0000 =0degree, due north direction， clockwise direction is 0~359degree "east longitude north latitude 3d position with 10 satellite"----0xAFfrom high to low is:10101111， Bit0 is 1, means east longitude Bit1 is 1, means north latitude Bit2, bit3 is 11, means 3D location Bit4~bit7 is 1010, means 10 satellites	
4944445F3231364730325F532056312E322E3100	Parameter 3	20	Software version, character string code, ASC character string is"IDD_216G02_S V1.2.1"	
4944445F3231364730325F482056312E322E3100	Parameter 4	20	Hardware version, character string code, ASC character string is "IDD_216G02_H V1.2.1"	
0000	Parameter 5	2	The flag of modified parameters numbers， if the parameters modified by the PC TOOL before, it will show how many parameters items modified， if the parameter numbers not as 0, following the detail flag list, 2 bytes for each parameter, refer to TLV list in the communication protocol.	
DF64	CRC checksum	2bytes	please refer to CRC algorithm in communication protocol	
0D0A	Tail of package	2bytes	Tail of package	

2 OBD data flow supported

original package	4040860004313030313131323532393938370000000000000004004C1F0695200F169529C9111000000000006983000000D000000040003640101 4C000300220321042105210621072 10C210D210E210F211021112113211 5211C211F21212124212E212F213021312132213321 3C21422143214421452147214921 4A214C214D214E219AE90D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2bytes		
8600	Length of package	2bytes	Low to high, length is:0x0086 = 134 bytes	
04	Version	1bytes	current version is 04	
313030313131323532393938370000000000	Device ID	20bytes	ASC code“1001112529987”	
4004	command type	2bytes	OBD data flow package supported	
C1F0695200F169529C9111000000000006983000000D000000040003640101 4C000300	parameters1	34bytes	stat_data: same decode way as login package	
22	parameters2	1bytes	number of supportive data flow, 0x22=34	
032104210521062107210C210D210E210F21102111	parameters3	34*2=68 bytes	each data flow type is 2 bytes, former“parameters2”decode 34, so “parameters3” bytes is 34*2=68 bytes；	

21132115211C211F21212124212E212F2130213121322133213C21422143214421452147214921 4A214C214D214E21			please refer to PID definition protocol for specific data flow type, e.g.: 0321 low to high, 0x2103 is “fuel system state”, 0x2104 is “calculated load” ……	
9AE9	CRCcheck sum	2bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2bytes	Tail of package	

3 DTC package for passenger car

original package	4040430004313030313131323532393938370000000000000004006C1F0695209F169529C9111000000000069830000D0000000400036401014C00030000009AF40D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 byte		
4300	Length of package	2 bytes	Low to high, length is 0x0043 = 67 bytes	
04	Version	1 byte	current version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC code“1001112529987”	

4006	command type	2 bytes	OBD trouble codes package of passenger car	
C1F0695209F169529C911 10000000006983000000D 0000000400036401014C0 00300	parameters1	34 bytes	stat_data: same with the former login package	
00	parameters2	1 byte	Stands for OBD trouble codes type, 00 is Store trouble code, 01is Pending trouble code, here decode ”Store trouble code”	
00	parameters3	1 byte	Stands for number of trouble codes， one trouble code is2bytes; Here 00 stands for no trouble codes; if there is trouble codes, following DTCs numbers*2 bytes, means the detail DTCs type list.	
9AF4	CRCcheck sum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

4 Snapshoot& freeze frame package

original package	4040B900043130303131313235323939383700000000000000004005C1F069521BF169529C9111000000000069830000 13000000040003640101 4C0003000022032104210521062107210C210D210E210F211021112113211 5211C211F2121 2124212E212F213021312132213321 3C214221432144214521472149214A214C214D214E210100643B6232E803003E 64280A3C24FE00010E010F00D5805A483C6400000000000010000E02E0000000664000005000000000A7710D0A			
package analysis	data descriptio	Length of data	data decode	remark

	n			
4040	Head of package	2 bytes		
B900	Length of package	2 bytes	Low to high, means the length is 0x00B9 =185 bytes	
04	Version	1 byte	Current version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC code is“1001112529987”	
4005	command type	2 bytes	snapshoot& freeze frame package	
C1F069521BF169529C911100000000006983000013000000040003640101 4C000300	parameters1	34 bytes	Same as former login package	
00	parameters2	1 byte	freeze frame sign, 00is snapshoot，01is freeze frame, here decode “snapshoot data”	
22	parameters3	1 byte	number of snapshoot, one OBD data is2bytes; here 0x22=34； if there is problem， then following DTCs numbers*2 bytes, means the detail DTCs type list.	
032104210521062107210C210D210E210F2110211121132115211C211F21212124212E212F213021312132213321C21422143214421452147214921 4A214C214D214E21	parameters4	34*2=68 bytes	Each data flow type is 2 bytes, former “parameters3”decode 34， so as for “parameters3” bytes is 34*2=68bytes; please refer to data flow type in PID definition, e.g.:0321 low to high, 0x2103 means “fuel system state” 0x2104 means “calculate loading value” ……	

0100643B6232E803003E64280A3C24FE00010E010F00D5805A483C6400000000000010000E02E0000000664000005000000000	parameters5	indefinite length	actual length is the sum of all length of data defined by former OBD data type, please refer to passenger car& commercial vehicle PID definition for details； For example: here former data type is 0x2103" fuel system state", 0x2104" calculate loading value", by PID definition, we can know the Length of dalais 2bytes&1bytes，so the former 2 bytes0x0001is"fuel system state"; followed 1 bytes0x64is "calculate loading value"	
A771	CRCcheck sum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

5 GPS data package

original package	4040590004313030313131323532393938370000000000000400101C1F06952E7F069529C91110000000006983000070000000400036401014C00030001190A0D0412041480D60488C57218000000009F01E803ED9A0D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
5900	Length of package	2 bytes	Low to high, then the length is 0x0059 = 89 bytes	
04	Version	1 byte	Current version is 04	

313030313131323532393938370000000000000	Device ID	20 bytes	ASC code is“1001112529987”	
4001	command type	2 bytes	it means the package is GPS package	
01	parameters1	1 byte	GPS signal, 00is normal GPS uploading, 01 is historical GPS uploading; here decode resend GPS data	
C1F06952E7F069529C911100000000006983000007000000040003640101 4C000300	parameters2	34 bytes	state_data Same as former login package	
01190A0D0412041480D60488C57218000000009F01E803	parameters3	23 bytes	Gpsdata: Same as former login package	
ED9A	CRCchecksum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

6 OBD PID data package

original package	4040570004313030313131323532393938370000000000000004002C1F06952F0F169529C9111000000000069830000470000000400036401014C01030078000505210C210D210F21102101073BE8030064280AEB930D0A			
package analysis	data descriptio	Length of data	data decode	remark

	n			
4040	Head of package	2 byte		
5700	Length of package	2 byte	Low to high, The length is 0x0057 = 87 bytes	
04	Version	1 byte	Current version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC ode“1001112529987”	
4002	command type	2 bytes	it means the current package is OBD PID data package	
C1F06952F0F169529C91110000000006983000047000000040003640101 4C010300	parameters1	34 bytes	stat_data: Same as former login package	
7800	parameters2	2 bytes	OBDPID collection interval, low to high, 0x0078=120 seconds	
05	parameters3	1 byte	Number of OBD PID, 0x05=5	
05210C210D210F211021	parameters4	5*2=10 bytes	Each OBD PID data is 2 bytes, former “parameters3”decode 5 bytes, so as for “parameters4” bytes is 5*2=10 bytes; Please refer to PID definition protocol for specific data flow type, for example here 0521, low to high Means “engine coolant temperature ”, 0x210C is “engine RPM” ……	

01	parameters5	1 byte	It means how many groups of PID data, here shows 1 group of PID data.	
07	parameters6	1 byte	Means the length for each group PID, hear means the length of each group is 7 bytes	
3BE8030064280A	parameters7	1*7=7 bytes	There is one group of decoded PID data former, length of data for each group is 7 bytes, so here the length of data is 7 bytes. For example, former data type 0x2105" engine coolant temperature", 0x2104C" engineer", from definition of PID, we can know that the length of data is 1 bytes and 2 bytes separately, then the former 1 bytes 0x3B is engine coolant temperature, its value is 59℃;the 2 followed bytes0x03E8 means engine RPM, its value is 1000R/M.	
EB93	CRCcheck sum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

7 Alarms data package upload

original package	4040600004313030313131323532393938370000000000000004007050000000C1F0695249F469529C911100000000006 9830000D8004000040003640101 4C04030001190A0D04201E1480D60488C5721800000000AF0101060F000F00EA1E0 D0A			
package analysis	data description	Length of data	data decode	remark

4040	Head of package	2 bytes		
6000	Length of package	2 bytes	Low to high，The length of 0x0060 = 96 bytes	
04	Version	1 bytes	Current version is 04.	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC code is“1001112529987”	
4007	command type	2 bytes	Means alarm changed data package	
05000000	parameters1	4 bytes	Serial Number of alarms, the number is to distinguish different alarm packages, low to high 0x00000005=5	
C1F0695200F169529C911000000000006983000000D0000000400036401014C000300	parameters2	34 bytes	stat_data: Same as former login package	
01190A0D04201E1480D60488C5721800000000AF	parameters3	20 bytes	Gpsdat data: Same as former login package	
01	parameters4	1 byte	Number of alarms triggered, here means one alarm triggered	
01060F000F00	parameters5	1*6=6 bytes	1 alarm triggered is decoded before, length of each alarm is defined as 6 bytes, so here length of data is 1*6=6 bytes; 01 06 0F00 0F00 Alarm mark alarm type current value alarm threshold value Decode: alarm mark: 1bytes, 0 means alarm end， 1 means new alarm; here 0x01	

			means a new alarm happens; alarm type: 1bytes, here 0x06 means “idle engine alarm”, please refer to protocol for specific alarm definition; current value: 2bytes, low to high, 0x000F=15, unit “minute”, it means current idle engine time is 15 minutes; alarm threshold value: 2bytes, low to high，0x000F=15,unit “minute”, Current value is up to or over alarm threshold value, so alarm happens.	
EA1E	CRCcheck sum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

8 G-Sensor data package

original package	40409C02043130303131313235323939383700000000000000004003DA2D6A52232F6A529C911100010400000F890000 4D00000004000364010 18D010300E803640500000034000500000035000500000034000500000034000500000003400 050000003400050000003400050000003400050000003400050000003400050000003400050000003500050000034 000500000034000500000034000500000034000500000034000500000034000500000034000500000034000500000 340006000000340005000000340005000000340005000000340005000000340005000000340005000000340005000 0034000500000034000500000034000500000034000500000034000500000034000500000034000500000034000500 000340005000000340005000000350005000000340005000000340005000000340005000000340005000000340005 000000340005000000340005000000350005000000340005000000340005000000340005000000340005000003400 050000003400050000003400050000003400050000003400050000003400050000003400050000003400050000034 000500000035000500000034000500000034000500000034000500000034000500000034000500000034000500000

	3400050000003500050000003400050000003400050000003400050000003400050000003400050000003400050000 0034000500000034000500000034000500000034000500000034000500000034000500000034000500000034000500 0000340005000000340005000000340005000000340005000000340005000000340005000000340005000000340005 0000003400050000003400050000003400050000003400050000003400050000003400050000003400050000003400 05000000340044630D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
9C02	Length of package	2 byte	Low to high, length is 0x02C9 = 713 bytes	
04	Version	1 byte	current protocol version is 04	
31303031313132353239393837000000000000000	Device ID	20 bytes	ASC Character means"1001112529987"	
4003	command type	2 bytes	means the package is G-sensor package	
DA2D6A52232F6A529C911100010400000F8900004D0000000400036401018D010300	parameters1	34 bytes	stat_data: Same as former login package	
E803	parameters2	2 bytes	Collection interval, low to high, unit "millisecond", 0x03E8=1000millisecond，this parameters should be integral multiple of 200 milliseconds.	
64	parameters3	1 byte	Group of Gsensor data, in one group, there is X, Y, Z, every value is 2 bytes that is length of each group defined as 6 bytes, here 0x64=100.	
0500000003400050000003	paramete	100*6=60	Former decoded 100 groups of Gsenser data, each group defined as 6 bytes.	

500050000003400050000 00340005000000340005 00000340005000000340 05000003400050000003 40005000003400050000 00340005000003500050 00000340005000003400 05000003400050000003 40005000003400050000 00340005000003400050 00000340005000003400 06000003400050000003 40005000003400050000 00340005000003400050 00000340005000003400 05000003400050000003 40005000003400050000 00340005000003400050 00000340005000003400 05000003400050000003 40005000003400050000 00350005000003400050 00000340005000003400 05000003400050000003 40005000003400050000 00340005000003500050	rs4	0bytes	so length of data is 100*6=600bytes； Gsensor list: For example, first group data: 0500 0000 3400 X Y Z unit“0.015625g” X direction value: 0x0005=5, 5*0.015625= 0.08g; Y direction value: 0x0000=0, 0*0.015625= 0g; Z direction value: 0x0034=52, 52*0.015625= 0.81g;	

000003400050000003400 050000003400050000003 400050000003400050000 003400050000003400050 000003400050000003400 050000003400050000003 400050000003400050000 003400050000003500050 000003400050000003400 050000003400050000003 400050000003400050000 003400050000003400050 000003500050000003400 050000003400050000003 400050000003400050000 003400050000003400050 000003400050000003400 050000003400050000003 400050000003400050000 003400050000003400050 000003400050000003400 050000003400050000003 400050000003400050000 003400050000003400050 000003400050000003400 050000003400050000003				

4000500000034000500000034000500000034000500000034000500000034000500000034000500000003400				
4463	CRCcheck sum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

9 Set reply package

original package	404022000431303031313132353239393837000000000000000A00105000053D70D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
2200	Length of package	2 bytes	Low to high, The length is 0x0060 = 34 bytes	
04	Version	1 byte	04 current protocol versions are 04.	
3130303131313235323939383700000000000000	Device ID	20 bytes	ASC code is“1001112529987”	
A001	command	2 bytes	the package means setting reply package	

	type			
0500	parameters1	4 bytes	sequence of command, the sequence is to distinguish different setting package，low to high，0x0005=5	
00	parameters2	1 byte	Means the numbers of parameters set failed, here 0x00 means parameters set successfully, no parameters set failed; following the failed parameters list if there is parameters set failed.	
53D7	CRCcheck sum	2 bytes	Please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

10 Query response package

original package	40402A0004313030313131323532393938370000000000000A00206000100000101 1C010001C26A0D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
2A00	Length of package	2 bytes	Low to high, The length is 0x002A = 42 bytes	
04	Version	1 byte	Current protocol version is 04.	
313030313131323532393938370000000000000	Device ID	20 bytes	ASC code is “1001112529987”	

A002	command type	2 bytes	It means the package here is reply package.	
0600	parameters1	2 bytes	Command sequence, this sequence is to distinguish different, low to high, 0x0006=6	
01	parameters2	1 byte	The total response package, here 0x01 means the queried parameter data package is one	
00	parameters3	1 byte	Current query package number, the package number begins from 0, because there is only one query response package.	
00	parameters4	1 byte	Means the flag number of failed queried, here is no queried failed parameters; there are failed parameters list following if there are failed parameters.	
01	parameters5	1 byte	Means the flag numbers of successfully queried， here means queried one parameters	
011C010001	parameters6	Indefinite length	the detail actual length is for all parameters queried； 2 bytes for each parameter: 2bytes parameters flag+2bytesparameters length +parameters Detail parameters definition, refer to communication protocol: E.g: 011C 0100 01 parameters length parameters value parameters：2 bytes, low to high, 0x1C01 means “system beep status”; parameters length： 2bytes, low to high, 0x0001means just 1 byte for the following parameters. Parameters value: the length depends on the former parameters length, here is 1bytes 0x01, 0x00 means no beep, 0x01 mean beep enable, here decode “beep enable”	
C26A	CRCcheck	2 bytes	please refer to CRC algorithm in communication protocol	

	sum			
0D0A	tail of package	2 bytes	Tail of package	

11 Heartbeat package

original package	40401F000431303031313132353239393837000000000000000100303320D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
1F00	Length of package	2 bytes	Low to high, the length is 0x001F = 31 bytes	
04	Version	1 byte	Current protocol version is 04	
313030313131323532393938370000000000	Device ID	20 bytes	ASC character means“1001112529987”	
1003	command type	2 bytes	Means heartbeat package	
0332	CRCcheck sum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	tail of package	2 bytes	Tail of package	

12 Cancellation package

original package	4040550004313030313131323532393938370000000000000001002C1F0695230086A529C911100000000000F890000A6050000000000036301014CFF000001190A0D0539191480D60488C5721800000000BF8A640D0A			
package analysis	data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
5500	Length of package	2 bytes	Low to high, the length is 0x0060 = 85 bytes	
04	version	1 byte	Current protocol version is 04	
313030313131323532393938370000000000	Device ID	20 bytes	ASC code“1001112529987”	
1002	Command type	2 bytes	Means cancellation package	
C1F0695230086A529C911100000000000F890000A6050000000000036301014CFF0000	Parameters 1	34 bytes	stat_data data: Same as former login package	
01190A0D0539191480D60488C5721800000000BF	Parameters 2	20 bytes	Gpsdata data: Same as former login package	
8A64	CRC Checksum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	Tail of	2 bytes	Tail of package	

	package			

IV Down-line data package samples

1 Login response package

original package	4040290004313030313131323532393938370000000000000009001FFFFFFFF0000C1DE7952A5DD0D0A			
package analysis	Data description	Length of data	data decode	Remark
4040	Head of package	2 bytes		
2900	Length of package	2 bytes	Low to high, the length is 0x0029 = 41 bytes	
04	version	1 byte	Current protocol version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC character is “1001112529987”	
9001	Command type	2 bytes	Means heartbeat package	
FFFFFFFF	Parameters 1	4 bytes	The IP address for re-connecting the server E.g.: IP“211.139.196.166”, means“0x0D 0x8B 0xC4 0XA6”, it means the parameters is not valid if all are OxFF for IP address	
0000	Paramete	2 bytes	The port for re-connecting server	

	rs 2		Low to high, the port 20011 should be“0x2B 0x4E”, it means the parameters is not valid if the port is 0	
C1DE7952	Parameters3	4 bytes	UTC time of server send the response package Low to high, Same as former login package	
A5DD	CRC checksum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	Tail of package	2 bytes	Tail of package	

2 Alarm response package

original package	4040230004313030313131323532393938370000000000000C0070100000045A70D0A			
package analysis	Data description	Length of data	data decode	Remark
4040	Head of package	2 bytes		
2300	Length of package	2 bytes	Low to high, the length is 0x0023 = 35 bytes	
04	version	1 byte	Current version is 04	
313030313131323532393938370000000000000	Device ID	20 bytes	ASC character is “1001112529987”	
C007	Command type	2 bytes	Means alarm response package	

01000000	Parameters1	4 bytes	Alarm number Low to high, means different alarms Here the alarm serial number is “1”	
45A7	CRC checksum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	Tail of package	2 bytes	Tail of package	

3 Roll-call package

original package	4040210004313030313131323532393938370000000000000030010100316 60D0A			
package analysis	Data description	Length of data	data decode	Remark
4040	Head of package	2 bytes		
2100	Length of package	2 bytes	Low to high, length is 0x0021 = 33 bytes	
04	version	1 bytes	Current version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC code “1001112529987”	
3001	Command type	2 bytes	Means roll-call package	
0100	paramete	2 bytes	Command serial number	

	rs 1		Low to high, means different down-line commands Here the serial number of the command is“1”	
3166	CRC checksum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	Tail of package	2bytes	Tail of package	

4 Heartbeat reply package

original package	40401F000431303031313132353239393837000000000000009003CFBE0D0A			
package analysis	Data description	Length of data	data decode	remark
4040	Head of package	2 bytes		
1F00	Length of package	2 bytes	Low to high, the length is 0x001F = 31 bytes	
04	version	1 byte	the current protocol version is 04	
313030313131323532393938370000000000	Device ID	20 bytes	ASC code“1001112529987”	
9003	Command type	2 bytes	this is reply of heartbeat package	
CFBE	CRC checksum	2 bytes	please refer to CRC algorithm in communication protocol	

0D0A	Tail of package	2 bytes	Tail of package	

5 Command package of parameters setting

original package	4040320004313030313131323532393938370000000000000020010100030111010001021102007800031101000 14DA50D0A			
package analysis	Data description	Length of data	data decode	Remark
4040	Head of package	2 bytes		
3200	Length of package	2 bytes	Low to high, the length is 0x0032 =50 bytes	
04	version	1 byte	Current version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC code“1001112529987”	
2001	Command type	2bytes	parameters setting command package	
0100	parameters 1	2 bytes	command sequence low to high, means different down-line commands sequence of command here is “1”	
03	parameters 2	1 byte	number of parameters set Parameters here number of parameters set is 3.	

011101000102110200780 00311010001	parameters 3	indefinite length	parameters list The length is the sum of all parameters Please refer to TVL parameters definition in protocol. here 3 parameters set, so the 3 parameters are: 0111010001 021102007800 0311010001 Parameters 1 Parameters 2 Parameters 3 0x1101:GPS upload switch 0x1102:GPS collection upload interval 0x1103:GPS number of package 0x0001: 1bytes length of parameter is 1 byte 0x0002: length of parameter is 2 bytes 0x0001: 1bytes length of parameter is 1 byte 0x01:GPS switch on 0x0078:GPS package collection interval 120seconds 0x0001: collect 1 gps package and then upload	
4DA5	CRC checksum	2 bytes	please refer to CRC algorithm in communication protocol	
0D0A	Package tail	2 bytes	Package tail	

6 Command package for parameters query

original package	4040280004313030313131323532393938370000000000000002002020003011102110311869 80D0A			
package analysis	Data	Length of	data decode	remark

	description	data		
4040	head of package	2bytes		
2800	length of package	2 bytes	Low to high, the length is 0x0032 =50 bytes	
04	version	1 bytes	the current protocol version is 04	
313030313131323532393938370000000000000000	Device ID	20 bytes	ASC code “1001112529987”	
2002	Command type	2 bytes	the package here is command for parameters query	
0200	parameters 1	2 bytes	sequence of command low to high, means different down-line commands sequence of command here is “2”	
03	parameters 2	1 bytes	number of queried parameters number of queried parameters is 3	
011102110311	parameters 3	2*N bytes	parameters list the length is double of queried parameters 3 parameters queried here 0111 0211 0311 parameters 1 parameters 2 parameters 3 0x1101:GPS upload switch 0x1102:GPS package collection interval 0x1103:GPS number of collected package	
8698	CRC checksum	2 bytes	please refer to CRC algorithm in communication protocol	

0D0A	Package tail	2 bytes	Package tail	

7 Upgrade request response package

original package	4040340004313030313131323532393938370000000000000D0010000000494444 5F323133473032000000000000017E8C0D0A			
package analysis	Description	data	Data decode	note
4040	head	2 byte		
3400	length	2 byte	low to high, the length 0x0034=52 bytes	
04	Version	1 byte	current protocol type is 04	
31303031313132353239393837000000000000	Device ID	20 byte	ASC code means “1001112529987”	
D001	Command type	2 byte	Upgrade request response package	
00000000	parameter 1	4 byte	Upgrade ID: reserved, fill 4 bytes 0x00.	
4944445F323133473032000000000000	parameter 2	16 byte	Software :ASCII, current this parameters is not used for the device	
01	parameter 3	1 byte	Upgrade request confirmation flag： Upgrading request confirmed = 0x00 Firmware version are the same, terminate update process = 0x01 Firmware versions are different, continue update process = 0x02 Update successfully = 0x03 Update failed, CRC error	

			= 0x04 Update failed, payload error 1, platform or tool is usually determined by the serial terminal to reply to this flag is to continue to upgrade; When this flag is 1, platform or serial Tool will start to send the upgrading package, if the flag is not 1, it will not be upgraded. 2, after finish sending the upgrading packages, through the terminal to reply to this flag determines whether the device receive the upgrade package success or not; When this flag is 2, it mean the device received the upgrading packages successfully (in fact, it's not finished upgrading at this time, the device will be reset automatically late, then it will take the upgrading package to the flash, don't power on during this time)	
7E8C	CRC code	2 byte	please refer to CRC algorithm in communication protocol	
0D0A	Package tail	2 byte	Package tail	

8 Upgrade response package

original package	4040260004313030313131323532393938370000000000000D00200000000010000F7140D0A			
package analysis	Description	length	Data decode	note
4040	head	2 byte		
3400	length	2 byte	low to high, the length 0x0034=52 bytes	
04	version	1 byte	It means current protocol version is 04	

31303031313132353239393837000000000000000	Device ID	20 byte	ASC means “1001112529987”	
D002	Command type	2 byte	It’s upgrading response package	
00000000	parameter 1	4 byte	Upgrading ID: it’s reserved, fill 4 bytes 0x00	
01	parameter 2	1 byte	The receiving flag of upgrading package: =0x01 means received successfully =0x00 means received failed The device reply 0x01, then the server or serial Tool will continue to send the next upgrading data package, or it will re-send the current upgrading package.	
0000	parameter 3	2 byte	Current upgrading package serial number: low to high, start from 0, e.g.: the total upgrading packages are 400, then the serial number from 0 to 399	
F714	CRC	2 byte	please refer to CRC algorithm in communication protocol	
0D0A	Package tail	2 byte	Package tail	