Version：V1.71

Confidential

GPS Tracker
Communication Protocol

Content

1.Commucation introduction

1.1 Introduction

It defines the instructions of GPS vehicle tracker platform. The reference interface protocol is only applicable for the platform and server transfer.

1.2 Compatibility

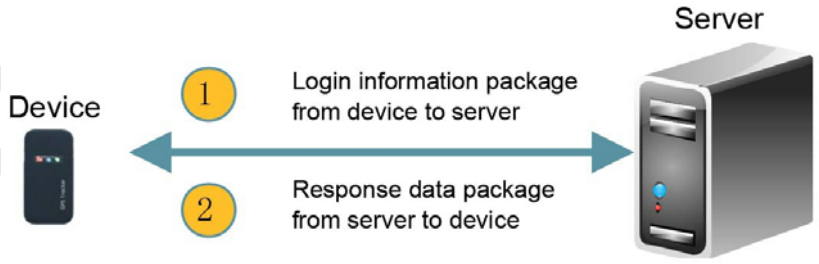
Applicable platform version is the versions after GT02A and it is not compatible for early versions.

2. Terms/Meanings

Terms/ Abbreviation	Meanings
CMPP	China Mobile Peer to Peer
GPS	Global Positioning System
GSM	Global System for Mobile Communication
GPRS	General Packet Radio Service
TCP	Transport Control Protocol
LBS	Location Based Services
IMEI	International Mobile Equipment Identity
MCC	Mobile Country Code
MNC	Mobile Network Code
LAC	Location Area Code
Cell ID	Cell Tower ID
UDP	User Datagram Protocol
SOS	Save Our Ship/Save Our Souls
CRC	Cyclic Redundancy Check
NITZ	Network Identity and Time Zone,
GIS	Geographic Information System

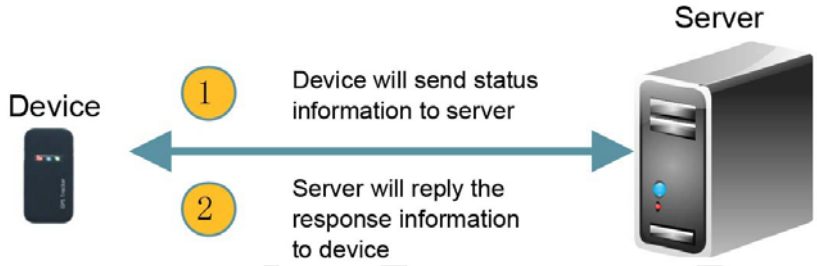
3. Basic Rules

3.1. After power on, device will send login information package by default and wait confirmation from the server.



3.2. After the establishment of the normal connection and changing the GPS information, device will send GPS/LBS Merged Information or GPS information package and LBS information package to the server at scheduled time intervals. The server can set default protocol via commands.

3.3. To ensure the effectiveness of the connection, the device will send state information to server during fixed interval and the server will reply the response information package to confirm.



4. Data package format

Communication transfer is asynchronous mode in byte. It transfers serial data stream of every uncertain length data package between device and server.
Data package length: (10+N) Byte

Format	Start Bit	Package Length	Protocol number	Information content	Information serial number	error checking	Stop Bit
Length(Byte)	2	1	1	N	2	2	2

4.1 Start Bit

Fixed value, hexadecimal number 0x78 0x78。

4.2 Package Length

Length= protocol number + Information content+ 3.5 Information serial number + error checking, (5+N) Byte in all, as the information Content is uncertain length data.

4.3 Protocol number

Refer to different “information content” and correspond to the protocol number.

Type	Value
Login Information	0x01

GPS Information	0x10
LBS Information	0x11
GPS/LBS Merged Information	0x12
Status Information	0x13
Satellite SNR Information	0x14
Information About Strings	0x15
GPS/LBS/Status Merged Information	0x16
LBS/Checking Location Via Phone Number Information	0x17
LBS Complete Information	0x18
Server send command to device	0x80

4.4 Information serial number:

After turning on the device, it will send the first item of GPRS data (including heartbeat package and GPS/LBS data package); the serial number of this item is "1". After that, the serial number will be added on by 1 automatically at every sending process (including heartbeat package and GPS/LBS data package).

4.5 Information content

Connect to different application. Correspond to the "protocol number" and confirm the specific content.

4.5.1.1 Login Information Package

Format	Information Content
	Device ID
Length	8

Login Information Package is used to confirm whether the connection is normal and submit device ID to server.

4.5.1.2 Device ID

It uses 15 digits IMEI number of device as the device ID.

For example, the IMEI number is 123456789012345, and the device ID is 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45.

4.5.1.3 Server Response

e.g.:

Device->Server (here the device ID is 123456789012345)

0x78 0x78	0x0D	0x01	0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45	0x00 0x01	0x8C 0xDD	0x0D 0x0A
Start Bit	Length	Protocol NO.	Device ID	Serial NO.	CRC Verify	Stop Bit

Server-> Device: (the response protocol NO. is the same with the protocol NO. Sending by device)

0x78 0x78	0x05	0x01	0x00 0x01	0xD9 0xDC	0x0D 0x0A
Start Bit	Length	Protocol NO.	Serial NO.	CRC Verify	Stop Bit

4.5.2 GPS information package

Format	Content						
	Date&Time	GPS information					Reserved extend byte
		GPS info length/ Number of satellites involved in locating	Latitude	Longitude	Speed	Status/ Course	
Length (Byte)	6	1	4	4	1	2	N

4.5.2.2 Date&Time

Format	Year	Month	Day	Hour	Minute	Second
Length(Byte)	1	1	1	1	1	1

For example: 15:50:23 on March 23, 2010.

The value is 0x0A 0x03 0x17 0x0F 0x32 0x17

4.5.2.3 GPS info length/ Number of satellites involved in locating

1 byte converts to binary 8 bit, the first 4 bit means GPS info length, the late 4 bit means number of satellite involved in locating.

Note: The length includes 1 byte occupied by itself.

For example: 0x9C means GPS information length is 9 bytes, the number of satellite involved in locating is 12.

4.5.2.4 Latitude

Occupy 4 bytes, representing the latitude value. Number range is from 0 to 162000000, which represents the range form 0° to 90° .Unit: 1/500 second

Conversion method:

A Convert the latitude (degrees, minutes) data from GPS module into a new form which represents the value only in minutes;

B Multiply the converted value by 30000, and then transform the result to hexadecimal number

For example22° 32.7658′, (22×60+32.7658) ×30000=40582974, then convert it to hexadecimal number 0x02 0x6B 0x3F 0x3E

4.5.2.5 Longitude

Occupy 4 bytes, representing the longitude value of location data. Number ranges from 0 to 324000000, representing the range form 0° to 180° .Unit: 1/500 seconds, Conversion method is the same as latitude's.

4.5.2.6 Speed

Occupy 1 bytes, representing the speed of the device; ranges from 0 to 255, Unit: kilometer/hour.

4.5.2.7 Status/Course

Occupy 2 bytes; representing the moving direction of the device; ranges from 0-360; unit: degree, regards due north as 0 degree; clockwise.

One byte is composed of eight binary. In the first byte, the first six binary represents status. The last two binary and the whole eight binary in the second byte (10 binary in total) represents course

The first byte						The second byte									
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
No definition	No definition	Real time /Different GPS	GPS located or not	East longitude/ West longitude	South latitude/ North latitude	Course									

0: South latitude 1: North latitude

0: East longitude 1: West longitude

0: GPS has not located 1: GPS has located

0: Real time GPS 1: Different GPS

Note: The status information refers to the status in a certain time

For example: 0x05 0x4C convert to binary 00001010 1001100, representing GPS has located、 real time GPS、north longitude、east latitude、Course 332°

4.5.2.8 Reserved bit

It is blank at present, reserved for extendibility.

4.5.2.9 Server response

No need to respond server.

4.5.3 LBS information Package

Format	Content					
	Date&Time	LBS information				Reserved extend byte
		MCC	MNC	LAC	Cell ID	
Length(Byte)	6	2	1	2	3	N

4.5.3.1 Date& Time

The same as corresponding format in part of GPS information

4.5.3.2 MCC

Affiliated country code of mobile user is Mobile Country Code (MCC). MMC of China is 460(decimal)

Value ranges from 0x0000 to 0x03E7

MMC of China is 0x01 0xCC (460 decimal convert to hex)

4.5.3.3 MNC

China Mobile Network Code (MNC) is 0x00

4.5.3.4 LAC

Location Area Code (LAC) is included in LAI. It is composed of 2 bytes with hex code, ranges from 0x0001—0xFFFE(not include 0x0001 and 0xFFFE). One location area can contain one or more areas.

4.5.3.5 Cell ID

Cell Tower ID (Cell ID) ranges from 0x000000 to 0xFFFFFF

4.5.3.6 Reserved bit

It is blank at present, reserved for extendibility.

4.5.3.7 Server response

No need to response server

LBS Extend Information Package

Format	Content																		
	Date& Time	LBS Information																	Reserved extend byte
		MCC	MNC	LAC	MCI	MCI SS	NCI 1	NCI SS1	NCI 2	NCI SS2	NCI 3	NCI SS3	NCI 4	NCI SS4	NCI 5	NCI SS5	NCI 6	NCI SS6	
Length(Byte)	6	2	1	2	2	1	2	1	2	1	2	1	2	1	2	1	2	1	N

4.5.4.1 Date&Time

Same as last section.

4.5.4.2 MCC

Same as last section.

4.5.4.3 MNC

Same as last section.

4.5.4.4 LAC

Same as last section.

4.5.4.5 MCI (Main Cell ID)

Cell Tower ID(Cell ID), value range is 0x0000 ～ 0xFFFF。

4.5.4.6 MCISS (Main Cell ID Signal Strength)

Main estate signal strength, value range is 0x00～0xFF, 0x00 is the weakest signal, 0xFF is the strongest signal。

4.5.4.7 NCI1～6 (Near Cell ID)

Neighborhood Base Station code, there are 6 in all. Value range is 0x0000 ～ 0xFFFF。

4.5.4.8 NCISS1～6 (Near Cell ID Signal Strength)

Neighborhood Base Station signal strength is corresponding with the 6 neighborhood base station code. The range is 0x00～0xFF. It is absolute value of signal strength. It should be added negative sign when valued.

4.5.5 GPS/LBS combined information

Format	Content											
	Data&Time	GPS info						LBS info				Reserved bit
		GPS info length/ Number of satellites involved in locating	Latitude	Longitude	Speed	Course/Status	Reserved bit	MCC	MNC	LAC	Cell ID	
Length (Byte)	6	1	4	4	1	2	M	2	1	2	3	N

As for each parameter, please refer to previous explanation.

4.5.6 GPS/LBS/Status combined information

Format	Content															
		GPS info						LBS info						Status info		
	Date&Time	GPS info length/ Number of satellites involved in locating	Latitude	Longitude	Speed	Course/Status	Reserved bit	LBS length	MCC	MNC	LAC	Cell ID	Reserved bit	device information content	voltage degree	GSM signal strength degree
Length(Byte)	6	1	4	4	1	2	M	1	2	1	2	3	N	1	1	1

As for each parameter, please refer to previous explanation.

It combines GPS info/ LBS info and status info. What need to notice is that LBS info here has been increased length (includes 1 byte occupied by itself.).Server should make a response when receive package of GPS/Status combined info.

Server responds blank data package after receiving the data package from device.
Note: The serial number of data package must be the same as the one sent by device response.
For example: Server responds package to device is as follows:

0x78 0x78	0x05	0x16	0x00 0x11	0xF9 0x70	0x0D 0x0A
Start bit	Length	Protocol NO.	Serial No.	CRC check	End bit

LBS/Checking location information via phone number

Format	Content					
	LBS Information				Phone Number	Reserved extend byte
	MCC	MNC	LAC	Cell ID		
Length(Byte)	2	1	2	3	21	N

Basically same with the Format in LBS information Content, but delete Date/Time and add Phone Number for checking location.

4.5.7 Status information

Format	Content			
	Device information	Voltage degree	GSM signal strength degree	Reserved extent byte
Length(Byte)	1	1	1	N

4.5.7.1 Device information

Occupy 1 byte, representing each information of the device. Regard 1 byte as 8bits, the lowest bit is 0, the highest is 7. In the process of the data transmitting, the high one comes first and the low one follows. Each bit represents the detailed meaning as follows:

High bit							Low bit
7	6	5	4	3	2	1	0

Zeroth bit	0: Not fortified 1: Fortified
First bit	0: Low ACC 1: High ACC
Second bit	0: Not charged 1: Charged
Third bit/Fourth bit/Fifth bit	000: Normal 001: Vibration alarm 010: Cut-off alarm 011: Low-power alarm 100: SOS
Sixth bit	0: GPS has not located 1: GPS has located
Seventh bit	0: Petrol/Electricity on 1: Petrol/Electricity off

Note: The status information refers to the status in a certain time

For example: 0x4B converts to binary 01001011, which means fortified/high ACC/not charged/vibration alarm/GPS has located/petrol/electricity on.

4.5.7.2 Voltage degree

Decimal, range from 0-6

0: Lowest power and power off

1: No enough power to dial a call or send messages.

2: Low power and alarm

3: Lower power but can work normally

3~6: Work in good condition

4.5.7.3 GSM signal strength degree:

0x00: No signal

0x01: Weaker signal

0x02: Weak signal

0x03: Good signal

0x04: Strong signal

4.5.7.4 Server response

Server responds blank data package after receiving the data package of device.

Note: The serial number of data package must be the same as the one sent by device response.

For example: The status package sent from device to server is as follows:

0x78 0x78	0x08	0x13	0x4B 0x04 0x03	0x00 0x11	0x06 0x1F	0x0D 0x0A
start bit	length	Protocol NO.	information content	Serial NO.	CRC check	end bit

Server will respond to device as follows:

0x78 0x78	0x05	0x13	0x00 0x11	0xF9 0x70	0x0D 0x0A
Start bit	length	Protocol NO.	Serial NO.	CRC check	End bit

4.5.7.5 Reserved bit

It is blank at present, reserved for extendibility

4.5.8 Satellite SNR information

This package is sent after the device receiving the command from server

Format	Content							
	Number of satellites involved in locating	Satellite SNR						Reserved extend byte
		1	2	3	……	n		
Length(Byte)	1	n						N

4.5.8.1 Number of satellite involved in locating

For example: 12 satellites is 0x0C

4.5.8.2 Satellite SNR

Range: 0x00~0x63(means 0~99dBHZ)

Every satellite occupies one byte.

4.5.8.3 Reserved bit

It is blank at present, reserved for extendibility.

4.5.9 Command from server to device

Format	Content of information			
	Content-length	Server flag bits	Information content	Reserved bit
Length(Byte)	1	4	M	N

Protocol NO.: 0x80

The response command sending from device to server, whose data package format is the same as the format of "command sending from server to device", protocol NO. is different, with"0x15".

4.5.9.1 Command length

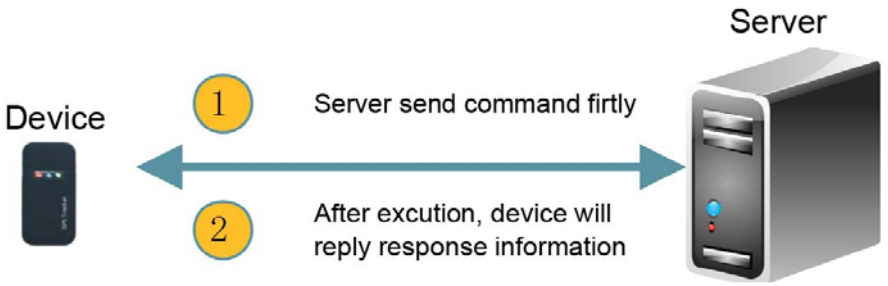
Show with byte, 0x0A, means command content occupy 10 bytes

4.5.9.2 Server flag

Left to the server for identification, device will receive data from a binary package stood in the back to return

4.5.9.3 Command content

Show with ASC II character string, command connent is compatible with sms command.



4.5.9.4 Check position information

Command format:

DWXX,000000#

Function description:

Command of acquiring position information.. Both cellphone user and sms server can acquire position information with this command.

If successful, it will reply: DWXX=Lat: <South/North latitude>, Course: < >, speed: < >, Date& time: < >

If failed, it will reply: DWXX=Command Error!

e.g:

Lat:N23d5.1708m,Lon:
E114d23.6212m,Course:120,Speed:53.02;DateTime:08-09-12 14:52:36

Meaning: North Lat 23° 5.1708', East Lon114° 23.6212', Course:120 °,speed: 53.02 Km/h, Date&time: 14:52:36 12th Sep 2008

Note : If device failed in location , it will reply : Lat:,Lon:, Course:,Speed:,DateTime:-:

4.5.9.5 Tele-cutoff(petro cutoff/ electicity cutoff)

SMS Command content:

DYD,000000#

Function description: Cut the petro or electricity supply

Response sms:

If successful, replying with: DYD=Success!

If failed, replying with: DYD=Unvalued Fix
or DYD=Speed Limit, Speed 40km/h

4.5.9.6 Restore petro and oil

Command content:

HFYD,000000#

Function description: Restore the petrol or electricity supplying

Response sms:

If successful, relying with: HFYD=Success!

If failed, replying with: HFYD=Fail!

4.5.9.7 Activate GPS on Line

SMS command format:

GPSON,<user password>#

Meaning : Start GPS locating function

Response sms:

If successful, relying with: GPSON=Success!

If failed, replying with: GPSON=Fail!

4.5.9.8 Set SOS number on Line

SMS command format:

SOS,<user password>,< Operate symbol>,<Number 1>,< Number 2>,< Number 3>,< Number 4>#

Meaning: Set SOS number

e.g.:

SOS,666666,A,13790774051,13553442881,13556286698,13525449308# (add 4 numbers at one time)

SOS,666666,A,13790774051# (add the first SOS number)

SOS,666666,A, ,13553442881# (add the second SOS number)

SOS,666666, A, , ,13556286698 # (add the third SOS number)

SOS,666666, A, , , ,13525449308# (add the fourth SOS number)

SOS,666666,A,13790774051, 13553442881#(add the first and second SOS number)

SOS,666666,A,13790774051, 13553442881, 13556286698#(add the first, second and third SOS number)

Response sms:

If successful, relying with: SOS=Success!

If failed, replying with: SOS=Fail!

4.5.9.10 Server send checking address information

Command content: ADDRESS,address information,phone number

Note: Chinese address content will be sent via GB2312 code.

4.5.9.11 eserved bit

Reserved for extending, current it is blank

4.5.10 Instruction about login data package and status package

1. If GPRS connection successful, the device will send first login data package to server. Receiving feedback package in 5 seconds will be considered as normal, it starts sending position sata(GPS,LBE information package), 3 minutes later status package follows immediately, to confirm the normal communication timely.

2. If the GPRS connection failed,device can not send login data package.When GPRS connection fails for 3 times, device will activate timed-restarting function。(Note: The restart process will activate once after 20 minutes. If device connect with server and receiving feedback data package to login data successfully in 20 minutes, the timed-restarting function will be disabled automatically.)

3. If there is no feedback package sent from server in 5 seconds, after device sends login data or status data package, it will be considered as failure to connect. In this case, device will activate the GPS data backup function,disconnect the current GPRS connection, reconnect to the server and send login data package.

4. If connection is considers as abnormal, reconnect to send login data package or status data package but not receiving feedback data package in 3 times, device will activate timed-restarting function.(Note: The restart process will activate once after 10 minutes. If device connect with server and receiving feedback data package in this 10 minutes, the timed-restarting function will be disabled automatically.)

5. Server will not reply feedback data package to device which has not been

registered.

6. If the device has not been inserted by sim card, or the GPRS service of this sim card has not been activated, the device will restart automatically once after 21 minutes.

5. Error-checking

Device or server can judge the accuracy of data received with identifying code. Sometimes, because of the electronic noise or other interference, data will be changed a little in the transit process. In this case, identifying code can make sure the core or associated core do nothing with such kind of wrong data, which will strengthen the security and efficiency of system. This identifying code adopts CRC-ITU identifying method. The CRC-ITU value is from "Package Length' to "Information Serial Number" in the protocol (including "Package Length" and "Information Serial Number ").
If the receiver receives CRC wrong calculating information, then ignore it and discard this data package.

6. End bit

Fixed value by hexadecimal 0x0D 0x0A.

7. Appendix A: the look-up table method of CRC-ITU and C language code snippets

```
static const U16 crctab16[] =
{
    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,
    0xdecd, 0xcf44, 0xfddf, 0xec56, 0x98e9, 0x8960, 0xbbfb, 0xaa72,
    0x6306, 0x728f, 0x4014, 0x519d, 0x2522, 0x34ab, 0x0630, 0x17b9,
    0xef4e, 0xfec7, 0xcc5c, 0xddd5, 0xa96a, 0xb8e3, 0x8a78, 0x9bf1,
    0x7387, 0x620e, 0x5095, 0x411c, 0x35a3, 0x242a, 0x16b1, 0x0738,
    0xffcf, 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,
};

    // calculate 16 bits CRC of the given length data.
U16 GetCrc16(const U8* pData, int nLength)
{
U16 fcs = 0xffff; // Initialize
```

```
while(nLength>0){
fcs = (fcs >> 8) ^ crctab16[(fcs ^ *pData) & 0xff];
nLength--;
pData++;
}
return ~fcs; // Negate
}

// Check whether the 16 bits CRC of the given length data is right.
 BOOL IsCrc16Good(const U8* pData, int nLength)
{
    U16 fcs = 0xffff;    // Initialize
    while(nLength>0){
        fcs = (fcs >> 8) ^ crctab16[(fcs ^ *pData) & 0xff];
        nLength--;
        pData++;
    }
    return (fcs == 0xf0b8);  // 0xf0b8 is CRC-ITU 的"Magic Value"
}
```

8. Appendix B: Communication Protocol Data Package snippet example

The following data is intercepted from the communication between device and server. The data is hexadecimal. Send means what sending from the device. Receive means what the server replies:

Send : 78 78 0D 01 03 53 41 90 30 08 01 59 00 01 5C BC 0D 0A
Receive : 78 78 05 01 00 01 D9 DC 0D 0A
Send : 78 78 1F 12 00 00 00 00 00 00 C0 00 00 00 00 00 00 00 00 00 00 00 01 CC 00 26 6A 00 1F 40 00 02 27 69 0D 0A
Send : 78 78 08 13 10 06 04 00 03 B2 71 0D 0A
Receive : 78 78 05 13 00 03 CA E3 0D 0A
Send : 78 78 1F 12 00 00 00 00 00 00 C0 00 00 00 00 00 00 00 00 00 00 00 01 CC 00 26 6A 00 1F 40 00 04 42 5F 0D 0A
Send : 78 78 1F 12 00 00 00 00 00 00 C0 00 00 00 00 00 00 00 00 00 00 00 01 CC 00 26 6A 00 1F 40 00 05 53 D6 0D 0A
Send : 78 78 1F 12 00 00 00 00 00 00 C0 00 00 00 00 00 00 00 00 00 00 00 01 CC 00 26 6A 00 1F 40 00 06 61 4D 0D 0A
Send : 78 78 08 13 10 06 04 00 0D 5B 0F 0D 0A
Receive : 78 78 05 13 00 0D 23 9D 0D 0A
Send : 78 78 08 13 10 06 04 00 0E 69 94 0D 0A
Receive : 78 78 05 13 00 0E 11 06 0D 0A
Send : 78 78 08 13 10 06 04 00 0F 78 1D 0D 0A
Receive : 78 78 05 13 00 0F 00 8F 0D 0A

The specified meaning of above commands can be found in the protocol document.

9. Appendix C: Complete format of information package

A. Data package from device to server

Login data package (18 Byte)						
Info header	Content-length	Protocol number	Device ID	Information serial number	Identifying bit	End bit
2	1	1	8	2	2	2

GPS package(26+N Byte)												
Info header	data bit length	Protocol number	Information content						Information serial number	Identifying bit	End bit
			Date &time	GPS information								
				GPS information length, Number of Satellites involved in locating	latitude	Longitude	Speed	Course, status	Reserved bit			
2	1	1	6	1	4	4	1	2	N	2	2	2

LBS package (23+N Byte)											
Info header	Data bit length	Protocol number	Information content						Information srial number	Identifying bit	End bit
			Date& time	LBS information				Reserved bit			
				MCC	MNC	LAC	Cell ID				
2	1	1	6	2	1	2	3	N	2	2	2

LBS complete information package (42+N Byte)																								
start bit	Package length	Protocol number	Information content																			Information serial number	Identifying bit	End bit
			Date/time	LBS information																		Reserved bit		
				MCC	MNC	LAC	MCI	MCISS	NCI1	NCISS1	NCI2	NCISS2	NCI3	NCISS3	NCI4	NCISS4	NCI5	NCISS5	NCI6	NCISS6					
2	1	1	6	2	1	2	2	1	2	1	2	1	2	1	2	1	2	1	2	1	N	2	2	2

GPS/LBS Information package (34+M+N Byte)																		
Info header	Data bit length	Protocol number	Information content												Information serial number	Identifying bit	End bit	
			Date&time	GPS information						LBS information				Reserved bit				
				GPS information length, Number of Satellites involved in locating	Latitude	Longitude	Speed	Course, status	Reserved bit	MCC	MNC	LAC	Cell ID					
2	1	1	6	1	4	4	1	2	M	2	1	2	3	N	2	2	2	

Status package (13+N Byte)									
Info header	Data bit length	Protocol number	Information content				Information serial number	Identifying bit	End bit
			Device information content	Voltage degree	GSM signal strength degree	Reserved bit			

2	1	1	1	1	1	N	2	2	2

Satellite SNR information (11+M+N Byte)								
Info header	Data bit length	Protocol number	Information content			Information serial number	Identifying bit	End bit
			Number of Satellites involved in locating	Satellite SNR	Reserved bit			
				1 2 3 …… n				
2	1	1	1	M	N	2	2	2

Feedback information from device to server (15+M+N Byte)									
Info header	Data bit length	Protocol number	Character string content				Information serial number	Varifying bit	end bit
			Command length	Server flag	Command content	Reserved bit			
2	1	1	1	4	M	N	2	2	2

GPS、LBS status package (40+M+N+L Byte)																						
Info header	Data bit length	Protocol number	Information content																	Reserved bit	Information Serial NO.	Identifying bit	End bit
			Date& time	GPS information						LBS information						Status information						
				GPS information Number of Satellites involved in locating	latitude	Longitude	Speed	Course, status	Reserved bit	LBS length	MCC	MNC	LAC	Cell ID	Reserved bit	Device information content	Voltage degree	GSM signal strength degree				
2	1	1	6	1	4	4	1	2	M	1	2	1	2	3	N	1	1	1	L	2	2	2

B. Data package from server to device

Feedback package sending from server to device after receiving status package (10 Byte)					
Info header	Data bit length	Protocol number	Information serial number	Identifying bit	End bit
2	1	1	2	2	2

Command package sending from server to terminal (15+M+N Byte)									
Info header	Data bit length	Protocol number	Information content				Information serial number	Identifying bit	End bit
			Content length	Server flag	Command content	Reserved bit			
2	1	1	1	4	M	N	2	2	2