GPRS Communication Protocol
V1.00.040113

Version	Description	Date
V1.00	Basic version.	2013-04-01

Contents

I. How to parse the data packet from tracker

Data Format:

STX<ID(16 bytes)><CMD(1 byte)><LEN(1 byte)><Data><;><Checksum(2 byte)><\r\n>

Item	Specification
STX	3 bytes. It means the header of packet from tracker. It is in ASCII code (Hex code: 0x53 0x54 0x58)
ID	16 bytes. If ID less than 16 bytes, strcat with 0x20 in the end. For example, if ID is 123456789, then it will be shown as follows: 0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x20 0x20 0x20 0x20 0x20 ID is in ASCII code
CMD	1 byte. The command code is in hex code. Please refer to the command list below.
LEN	1 byte. It means the length of the Data
Data	Min 0 byte and max 100 bytes.
;	1 byte. It indicates end of the data (0x3B in hex code)
Checksum	The checksum is two hex digits representing the exclusive OR of all characters between, but not including, the "STX" and ";".
\r\n	2 byte. It indicates end of the packet(0x0D 0x0A in hex code)

CheckSum:

```
unsigned char    xor_CheckSum (const char *buf, unsigned int len)
{
        unsigned char checksum = 0;
        unsigned int i;
         for (i = 0; i < len; i++){
                checksum ^= *(buf + i);
         }
         return checksum;
}
```

Description of data:

For example:
Server receive a packet from tracker as follows:

In ASCII code:

STX123456
_}$GPRMC,063709.000,A,2238.1998,N,11401.9670,E,0.00,,250313,,,A*7F,460,01,2531,647E,11,87,1000,001001,0000,0.00,0.02,0.00,Timer;4A

In hex code:

53 54 58 31 32 33 34 35 36 20 20 20 20 20 20 20 20 20 20 02 7D 24 47 50 52 4D 43 2C 30 36 33 37 30 39 2E 30 30 30 2C 41 2C 32 32 33 38 2E 31 39 39 38 2C 4E 2C 31 31 34 30 31 2E 39 36 37 30 2C 45 2C 30 2E 30 30 2C 2C 32 35 30 33 31 33 2C 2C 2C 41 2A 37 46 2C 34 36 30 2C 30 31 2C 32 35 33 31 2C 36 34 37 45 2C 31 31 2C 38 37 2C 31 30 30 30 2C 30 30 31 30 30 31 2C 30 30 30 30 2C 30 2E 30 30 2C 30 2E 30 32 2C 30 2E 30 30 2C 54 69 6D 65 72 3B 34 41 0D 0A

$GPRMC,063709.000,A,2238.1998,N,11401.9670,E,0.00,,250313,,,A*7F

field	example	Definition
Sentence ID	$GPRMC	
UTC Time	063709.000	hhmmss.sss
Status	A	A = Valid, V = Invalid
Latitude	2238.1998	ddmm.mmmm
N/S Indicator	N	N = North, S = South
Longitude	11401.9670	dddmm.mmmm
E/W Indicator	E	E = East, W = West
Speed over ground	0.00	Knots
Course over ground		Degrees
UTC Date	250313	DDMMYY
Magnetic variation		Degrees
Magnetic variation		E = East, W = West
Checksum	7F	

460,01,2531,647E,11,87,1000,001001,0000,0.00,0.02,0.00,Timer;4A

field	Definition	
460,01	International Mobile Subscriber Identity	
2531,647E	Cell ID	
11	GSM signal strength	
87	Battery remain 87% (Max. 0 Max. 100)	
1000	1 0 0 0 Reserved 1: GPS fixed 0: GPS no fix	
01001	Digital Inputs: 0 0 1 0 0 1 1: **PSR** 0: **PSD** 1: **IN5 ON** 0: **IN5 OFF** 1: **IN4 ON** 0: **IN4 OFF** 1: **ACC ON** 0: **ACC OFF** 1: **IN2 ON** 0: **IN2 OFF** 1: **IN1 ON** 0: **IN1 OFF**	**Only for vehicle tracker**
0000	Digital Outputs: 0 0 0 0 **Output 4** **Output 3** **Output 2** **Output 1** (1: High level, 0: Low level)	
0.00	Analog Input 1 (unit: volt, range: 0.00~3.00).	
0.02	Analog Input 2 (unit: volt, range: 0.00~3.00).	
0.00	Analog Input 3 (unit: volt, range: 0.00~3.00).	
Timer	Alarm message	

;	End of the data	
4A	Checksum	
\r\n	End of packet	

Alarm message:

keyword	Definition	
Timer	Tracking by interval, depend on your setting for GPRS interval	
SOS	SOS alarm	
Help	Just for personal tracker	
Over Speed	Over speed alarm	
Low Battery	Low battery	
Cur Loc	Track on demand	
Geo1 In	Geo-fence 1 alarm for tracker move in the preset scope.	
Geo1 Out	Geo-fence 1 alarm for tracker move out the preset scope.	
Geo2 In	Geo-fence 2 alarm for tracker move in the preset scope.	
Geo2 Out	Geo-fence 2 alarm for tracker move out the preset scope.	
VIB	Vibration alarm	
GPS Lost	When GPS no fix, device generates this alarm.	
GPS Regained	When GPS fix again, device generates this alarm.	
Store	The GPRMC data get from memory (Built-in 4Mbytes Flash for data logger)	
PSR	External power regained	
PSD	External power disconnected	
IN1 ON	**When the inputs status changed, tracker will send these alarms to server.**	**Only for vehicle tracker**
IN1 OFF		
IN2 ON		
IN2 OFF		
ACC ON		
ACC OFF		
IN4 ON		
IN4 OFF		
IN5 ON		
IN5 OFF		

II. How to set device by server

Data format: (all of the data in ASCII code)

<$><,><Device ID><,><Command><,><parameter>,<parameter>…..<;><Checksum><\r\n>

Item	Specification
$	1 byte. It means the header of packet from tracker
Device ID	Max. 16bytes
command	4 byte. Please refer to the command list below.
parameter	Please refer to command details
;	1 byte. It indicates end of the data
Checksum	The checksum is two hex digits representing the exclusive OR of all characters between, but not including, the "$" and ";"
\r\n	2 byte. It indicates end of the packet

Command list:

Command	Definition
0013	Set GPRS Interval
0015	Track on demand

0016	Track by distance
0017	Track by angle
0020	Set authorized number
0021	Set SOS number
0022	Set help number
0023	Set SMS interval
0024	Set SMS format
0025	Enable/Disable beeper
0030	Set over speed alarm
0031	Set power saving mode
0032	Set vibrate alarm
0033	Set Geofence
0035	Clear datalogger
0040	Query information of the device, include IMEI, firmware and hardware version
0050	Output control (Just for vehicle tracker)

action	response
Set parameter	Success: <$><,><device id><,><command><,><OK><;><checksum><\r\n> Fail: <$><,><device id><,><command><,><ERROR><;><checksum><\r\n>
Query setting	<$><,><device id><,><command><,><parameters><;><checksum><\r\n>

Note: Assume the device ID is 123456

1. Set GPRS interval

Command:	$,123456,0013,interval;<Checksum><\r\n>
Description:	Set GPRS Interval
Note:	Interval must be 5 to 65535 (unit: sec), default value: 30
Example:	➢ **Change the GPRS Interval to 60 secs.** In ASCII code: $,123456,0013,60;2F In hex code: 24 2C 31 32 33 34 35 36 2C 30 30 31 33 2C 36 30 3B 32 46 0D 0A ➢ **Query this setting** $,123456,1013;04 Reponse: $,123456,1013,60;2E

2. Track on demand

Command:	$,123456,0015;<Checksum><\r\n>
Description:	Get the current location
Note:	
Example:	In ASCII code: $,123456,0015;03

	In hex code: 24 2C 31 32 33 34 35 36 2C 30 30 31 35 3B 30 33 0D 0A Reponse: STX123456 _j$GPRMC,042054.000,A,2232.7595,N,11404.7498,E,3.10,312.22,130511,,,A*61,460,00,27B3,0E59,25,98,1000,Cur Loc;1B

3. Track by distance

Command:	$,123456,0016,distance;<Checksum><\r\n>
Description:	Set the minimum distance for sending GPRS packets.
Note:	distance: minimum distance, range:0~65535, unit is meter
Example:	In ASCII code: $,123456,0016,100;03

4. Track by angle

Command:	$,123456,0017,angle;<Checksum><\r\n>
Description:	Set the minimum angle for sending GPRS packets.
Note:	angle: minimum angle, range:0~360, unit is degree
Example:	In ASCII code: $,123456,0017,20;03

5. Set authorized number

Command:	$,123456,0020,No.,phone number,ABCDEFGHI;<Checksum><\r\n>
Description:	Set authorized number and alarm.
Note:	No.: must be 1 to 3 Phone number: Phone number be authorized(max. 16 bytes) A : SOS alarm B : Help alarm (Just for GT68/69/88/89) C : Call for SMS D : SMS Tracking E : Low battery alarm F : No GPS signal alarm G : geofence alarm H : Over speed alarm I : Surveillance mode (1: enable alarm; 0: disable alarm)
Example:	➢ **Set fisrt authorized number, and just enable SOS alarm.** ASCII code: $,123456,0020,1,13800000000,100000000;13 Hex code: 24 2C 31 32 33 34 35 36 2C 30 30 32 30 2C 31 2C 31 33 38 30 30 30 30 30 30 30 30 2C 31 30 30 30 30 30 30 30 30 3B 31 33 0D 0A Reponse: $,123456,0020,OK;2D ➢ **Query the first authorized number.** ASCII code: $,123456,1020,1;19 Hex code:

	24 2C 31 32 33 34 35 36 2C 31 30 32 30 2C 31 3B 31 39 0D 0A Reponse: ASCII code: $,123456,1020,1,13800000000,100000000;12 Hex code: 24 2C 31 32 33 34 35 36 2C 31 30 32 30 2C 31 2C 31 33 38 30 30 30 30 30 30 30 30 2C 31 30 30 30 30 30 30 30 30 3B 31 32 0D 0A ➢ **Delete the first authorized number.** ASCII code: $,123456,0020,1;18 Hex code: 24 2C 31 32 33 34 35 36 2C 30 30 32 30 2C 31 3B 31 38 0D 0A Reponse: $,123456,0020,OK;2D

6. Set SOS number

Command:	$,123456,0021,phone number;<Checksum><\r\n>
Description:	Set SOS phone number
Note:	Phone number must be less than 17 bytes (max. 16 bytes).
Example:	➢ **Set SOS phone number as 13800000000** ASCII code: $,123456,0021,13800000000;12 Hex code: 24 2C 31 32 33 34 35 36 2C 30 30 32 31 2C 31 33 38 30 30 30 30 30 30 30 30 3B 31 32 0D 0A Reponse: $,123456,0021,OK;2C ➢ **Query the SOS phone number** ASCII code: $,123456,1021;05 Hex code: 24 2C 31 32 33 34 35 36 2C 31 30 32 31 3B 30 35 0D 0A Response: $,123456,1021,13800000000;13 ➢ **Delete the SOS phone number** ASCII code: $,123456,0021,;28 Hex code: 24 2C 31 32 33 34 35 36 2C 30 30 32 31 2C 3B 32 38 0D 0A Reponse: $,123456,0021,OK;2C

7. Set Help number

Command:	$,123456,0022,phone number;<Checksum><\r\n>

Description:	Set Help phone number
Note:	Phone number must be less than 17 bytes (max. 16 bytes).
Example:	➢ **Set Help phone number as 13800000000** $,123456,0022,13800000000;11 Reponse: $,123456,0022,OK;2F ➢ **Query the Help phone number** $,123456,1022;06 Reponse: $,123456,1022,13800000000;10 ➢ **Delete the Help phone number** $,123456,0022,;2B Reponse: $,123456,0022,OK;2F

8. Set SMS interval

Command:	$,123456,0023,interval;<Checksum><\r\n>
Description:	Set SMS Interval
Note:	Interval must be 0 to 65535 (unit: minute)
Example:	➢ If you want to device send a SMS to you every 30 mins, pls refer to **3. Set authorized number** **enable "SMS Tracking" and** send this command to device as follows: $,123456,0023,30;29 Reponse: $,123456,0023,OK;2E ➢ **Query this setting** $,123456,1023;07 Reponse: $,123456,1023,30;28

9. Set SMS format

Command:	$,123456,0024,format;<Checksum><\r\n>
Description:	Set SMS format
Note:	Format vaue is 1 or 0 1: Tracker send SMS with goole map link to authorized num. 0: Tracker send SMS with longitude and latitude to authorized num.
Example:	➢ **Set google map link** $,123456,0024,1;1C Reponse: $,123456,0024,OK;29 ➢ **Query this setting** $,123456,1024;00 Reponse: $,123456,1024,1;1D

10. Set beep

Command:	$,123456,0025,beep;<Checksum><\r\n>
Description:	Enable/disable beeper (Only for personal tracker GT89)
Note:	beep vaue is 1 or 0 1: enable beeper, when press button or incaming call, device will goes beep beep beep. 0: disable beeper
Example:	➢ **Enable beeper** $,123456,0025,1;1D Reponse: $,123456,0025,OK;28 ➢ **Disable beeper** $,123456,0025,0;1C Reponse: $,123456,0025,OK;28

11. Set over speed alarm

Command:	$,123456,0030,speed;<Checksum><\r\n>
Description:	Set over speed alarm
Note:	Speed = 0; disable this alarm Speed must be less than 200 (unit: Km/h)
Example:	➢ **Set speed limited as 100Km/hr** $,123456,0030,100;19 Reponse: $,123456,0030,OK;2C ➢ **Query this setting** $,123456,1030;05 Reponse: $,123456,1030,100;18

12. Set power saving mode

Command:	$,123456,0031,mode;<Checksum><\r\n>
Description:	Set power saving mode
Note:	Mode = 1: enable Mode = 0: disable
Example:	➢ **Enable power saving mode** $,123456,0031,1;18 Reponse: $,123456,0031,OK;2D ➢ **Query this setting** $,123456,1031;04 Reponse: $,123456,1031,1;19

13. Set vibrate alarm

Command:	$,123456,0032,mode;<Checksum><\r\n>
Description:	Set vibrate alarm
Note:	Mode = 1: enable Mode = 0: disable
Example:	➢ **Enable vibrate alarm** $,123456,0032,1;1B Reponse: $,123456,0032,OK;2E ➢ **Query this setting** $,123456,1032;07 Reponse: $,123456,1032,1;1A

14. Set geofence

Command:	$,123456,0033,No.,name, latitude,longitude,radius;<Checksum><\r\n>
Description:	Set Geofence
Note:	No.: Must be 1 or 2, it means that can be set 2 geofence alarm Name: The max length of the name is 10 bytes Longitude: ddd.dddddd (unit: degree) Latitude: ddd.dddddd (unit: degree) Radius: xxx.xx (unit: Km)
Example:	➢ **Set firt geofence** $,123456,0033,1,Geo1,22.123456,114.123456,5.0;79 No.: 1 Name: Geo1 Lat: 22.123456 Lng: 114.123456 Radius: 5.0 Km Reponse: $,123456,0033,OK;2F ➢ **Query this setting** $,123456,1033,1;1B Reponse: $,123456,1033,1,Geo1, 22.123455,114.123450, 5.00;6D

15. Query info.

Command:	$,123456,0040;<Checksum><\r\n>
Description:	Query information of the device, include IMEI, firmware and hardware version
Note:	
Example:	Command: $,123456,0040;03 Reponse: $,123456,0040,IMEI:012207002520523,FW-GT-89A-V5.0.0.55,HW90010;28

16. Output control

Command:	$,123456,0050,channel,on;<Checksum><\r\n>
Description:	This command is to control the outputs status of tracker.(Just for vehicle tracker)

Note:	Channel: must be 1 to 4 On = 1, open output, it can drive a relay. On = 0, close output.
Example:	$,123456,0050,1,1;02 Above command will open output1 Reponse: $,123456,0050,OK;2A $,123456,0050,2,1;3A Above command will open output2 Reponse: $,123456,0050,OK;2A

17. Clear datalogger

Command:	$,123456,0035;<Checksum><\r\n>
Description:	Clear all datalogger in tracker
Note:	
Example:	Command: $,123456,0035;03