

GPRS Communication Protocol Between GPS Tracker and Server

Version 1.45

GT30

GT30X

GT60

VT300

VT310

Change Version	Reason of Change	Date
V1.00	Initial Document	2005-6-25
V1.01	Addition of Alarms	2006-10-8
V1.02	Addition of Output Control Addition of Stats in GPRS String	2007-1-26
V1.03	Add command 4107/4207/4126/4130/4131/4132/9016 VT310 integrated Change 4116 Delete 9014	2008-7-10
V1.04	Add 5114 Add AD of VT310	2008-12-2
V1.05	Add Power-cut Alarm Add Buzzer Control for GT60	2009-02-04
V1.06	Add 9001 to get SN and IMEI Add 5101/5115/5199	2009-3-18
V1.07	Add 4136	2009-08-03
V1.45	Change 4136 Add 4902/5503	2009-09-15

I Command Format

Command format of GPRS packets are as follows:

From server to tracker:

@@<L (2 bytes)><ID (7 bytes)><command (2 bytes)><parameter><checksum (2 bytes)>\r\n

From tracker to server:

\$\$<L (2 bytes)><ID (7 bytes)><command (2 bytes)><data><checksum (2 bytes)>\r\n

Note:

Do NOT input '<' and '>' when writing a command.

All multi-byte data complies with the following sequence: High byte prior to low byte.

The size of a GPRS packet (including data) is about 100 bytes

Item	Specification
@@	2 bytes. It means the header of packet from server to tracker. It is in ASCII code (Hex code: 0x40)
\$\$	2 bytes. It is the header of packet from tracker to server, It is in ASCII code (Hex code: 0x24)
L	2 bytes. It means the length of the whole packet including the header and ending character and it is in hex code
ID	7 bytes, ID must be digit and not over 14 digits, the unused byte will be stuffed by 'f' or '0xff'. It is in the format of hex code. For example, if ID is 13612345678, then it will be shown as follows: 0x13, 0x61, 0x23, 0x45, 0x67, 0x8f, 0xff. If all 7 bytes are 0xff, it is a broadcasting command. ID is in hex code
command	2 bytes. The command code is in hex code. Please refer to the command list below.
data	Min 0 byte and max 100 bytes. See Annex 1 for description of 'data'.
checksum	2 bytes. It indicates CRC-CCITT (default is 0xffff) checksum of all data (not including CRC itself and the ending character). It is in hex code. For example: 24 24 00 11 13 61 23 45 67 8f ff 50 00 05 d8 0d 0a 0x05d8 = CRC-CCITT (24 24 00 11 13 61 23 45 67 8f ff 50 00)
\r\n	2 bytes. It is the ending character and in hex code (0x0d,0x0a in hex code)

II Command List

Command	Definition
0x4000	Login Confirmation
0x5000	Login
0x4101	Track on Demand
0x4102	Track by Interval
0x4103	Authorization
0x4104	Reserved
0x4105	Speeding Alarm
0x4106	Movement Alarm
0x4107	Geo-fence (Out)
0x4207	Geo-fence (In)
0x4108	Extended Settings
0x4109	Reserved
0x4110	Initialization
0x4111	Reserved
0x4112	Reserved
0x4113	Sleep Mode
0x4114	Output Control (limited to 10km/h)
0x5114	Output Control (limited to 20km/h)
0x4115	Output Control (unlimited)
0x4116	Triggered Alarms
0x4126	Power Down
0x4130	Listen (Voice Wiretapping)
0x4131	Log by Interval
0x4132	Time Zone
0x4136	Veer Report
0x4902	Reboot GPS
0x5199	Heartbeat
0x5503	Format
0x9000	Reserved
0x9001	Get SN & IMEI
0x9002	Read Interval
0x9003	Read Authorization
0x9016	Read Logged Data
0x9955	Position Report
0x9999	Alarms

III Command Details

1. Login – 0x5000

Command:	\$\$<L><ID><0x5000><checksum><\r\n>
Description:	After tracker is properly setup, it will apply for a GPRS connection by sending this login command every 30 seconds to the server until the server confirms its login.
Example:	24 24 00 11 12 34 56 FF FF FF FF 50 00 8B 9B 0D 0A
Note:	Tracker ID here is 123456 and same for the following examples.

2. Login Confirmation – 0x4000

Command:	@@<L><ID><0x4000><Flag><checksum>\r\n
Description:	Server sends this command back to the tracker to confirm tracker's login.
Note:	Flag (1 byte) = 0x00, login fails and will try again. = 0x01, login succeeded.
Example:	40 40 00 11 12 34 56 FF FF FF FF 40 00 44 C9 0D 0A

3. Track on Demand – 0x4101

Command:	@@<L><ID><0x4101><checksum>\r\n
Description:	Get the current location of the tracker
Example:	40 40 00 11 12 34 56 FF FF FF FF 41 01 67 D9 0D 0A
Response:	\$\$<L><ID><0x9955><data><checksum>\r\n
Example:	24 24 00 60 12 34 56 FF FF FF FF 99 55 30 33 35 36 34 34 2E 30 30 30 2C 41 2C 32 32 33 32 2E 36 30 38 33 2C 4E 2C 31 31 34 30 34 2E 38 31 33 37 2C 45 2C 30 2E 30 30 2C 2C 30 31 30 38 30 39 2C 2C 2A 31 43 7C 31 31 2E 35 7C 31 39 34 7C 30 30 30 30 7C 30 30 30 2C 30 30 30 30 69 62 0D 0A
Note:	See Annex 1 for description of 'data'.

4. Track by Interval – 0x4102

Command:	@@<L><ID><0x4102><Interval(2 bytes in hex code)><checksum>\r\n
Description:	Set time interval for automatic timed report (GPRS tracking).
Note:	Interval is in unit of 10 seconds. =0x00 0x00, stop tracking by interval. Max time interval = 65535*10 seconds.
Example:	40 40 00 13 12 34 56 FF FF FF FF 41 02 00 0A 36 19 0D 0A Above command will set 10 (0x00 0x0A)*10=100s as tracking interval.
Response:	\$\$<L><ID><0x5100><Flag (1byte)> <Interval (2 bytes)><checksum>\r\n
Note:	Flag =0x00, failure response. =0x01, success response. Once the interval successfully set, the tracker will send the following position report to the

server at the interval specified:
 \$\$<L><ID><0x9955><data><checksum>\r\n

5. Authorization – 0x4103

Command:	@@<L><ID><0x4103><button no (1 byte)><phone no for SMS><phone no for call><checksum>\r\n
Description:	Set authorized phone number for buttons (inputs)
Note:	<p>button no is in hex code. It supports up to 3 buttons.</p> <p>If button no</p> <ul style="list-style-type: none"> = 0x01, set authorized phone number for SOS button (input1); = 0x02, set authorized phone number for Button B (input2); = 0x03, set authorized phone number for Button C (input3). <p>phone no for SMS: Authorized phone number for receiving SMS.</p> <p>phone no for call: Authorized phone number for receiving phone call.</p> <p>phone no is 16 bytes in ASCII. If the phone number is less than 16 bytes, the blank byte(s) should be stuffed by '0x00'. For example:</p> <p>If the authorized number is 1234567890, then it should be written as follows: 0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x30 0x00 0x00 0x00 0x00 0x00 0x00</p> <p>If all 16 bytes data are 0x00, the authorized number is invalid.</p>
Example:	<p>40 40 00 32 12 34 56 FF FF FF FF 41 03 01 38 38 38 38 38 38 38 38 00 00 00 00</p> <p>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 99 68 0D 0A</p> <p>Above command will set '8888888888' as authorized phone number for SOS button.</p>
Response:	\$\$<L><ID><0x4103><Flag><checksum>\r\n
Note:	<p>Flag</p> <ul style="list-style-type: none"> =0x00, failure response. =0x01, success response.

6. Speeding Alarm – 0x4105

Command:	@@<L><ID><0x4105><speed (1 byte in hex code)><checksum>\r\n
Description:	Set speeding alarm for the tracker. When the tracker is over this preset speed limit, SMS alarms will be sent to the authorized phone number for SOS button and GPRS alarms will be sent to the server every 30 seconds until the tracker' speed is lower than this speed limit.
Note:	<p>speed</p> <ul style="list-style-type: none"> =0x00, cancel speeding alarm; =0x01, speed limit is set to 10km/h; =0x02, speed limit is set to 20km/h; =0x0A, speed limit is set to 100km/h; =0x14, speed limit is set to 200km/h; <p>Max speed limit is 200km/h.</p>
Example:	40 40 00 12 12 34 56 FF FF FF FF 41 05 0B C0 14 0D 0A

	Above command will set speed limit: 110km/h.
Response:	\$\$<L><ID><0x4105><Flag><checksum>\r\n
Note:	If Flag =0x00, failure response. =0x01, success response.

7. Movement Alarm – 0x4106

Command:	@@<L><ID><0x4106><area (1byte in hex code)><checksum>\r\n
Description:	When the tracker moves out of a preset square scope, three SMS alarms and three GPRS alarms will be sent to the authorized phone number for SOS button and the server every 30 seconds.
Note:	area =0x00, cancel movement alarm function =0x01, it is set in a square with current location as center and with side length=2x30m; =0x02, it is set in a square with current location as center and with side length=2x50m; =0x03, it is set in a square with current location as center and with side length=2x100m; =0x04, it is set in a square with current location as center and with side length=2x200m; =0x05, it is set in a square with current location as center and with side length=2x300m; =0x06, it is set in a square with current location as center and with side length=2x500m; =0x07, it is set in a square with current location as center and with side length=2x1000m; =0x08, it is set in a square with current location as center and with side length=2x2000m.
Example:	40 40 00 12 12 34 56 FF FF FF FF 41 06 04 64 A8 0D 0A Above command will set a square with current location as center and with side length=2x200m.
Response:	\$\$<L><ID><0x4106><Flag><checksum>\r\n
Note:	Flag =0x00, failure response; =0x01, success response.

8. Geo-fence Alarm - 0x4107, 0x4207

Command:	@@<L><ID><0x4107 or 0x4207><coordinates><checksum>\r\n
Description:	Sets geo-fence alarm. When the tracker moves out of (in) a preset scope, three SMS alarms and three GPRS alarms will be sent to the authorized phone number for SOS button and the server every 30 seconds.
Note:	0x4107 is the command for exiting the geo-fencing area (Out). 0x4207 is the command for entering the geo-fencing area (In). Coordinates includes: Lower-left X,Lower-left Y,Upper-right X,Upper-right Y Lower-left X should be less than Upper-right X; All longitudes and latitudes should be in ASCII format as follows: - Longitude: DDDFF.FFFF,E/W. 4 places of decimal. '0' is needed to be stuffed if no value available.

	<p>Latitude: DDFF.FFFF,N/S. 4 places of decimal. '0' is needed to be stuffed if no value available</p> <p>Only one alarm can be set in either In or Out.</p> <p>Only one alarm can be set in either Movement Alarm or Geo-fence Alarm.</p> <p>The latest setting will overwrite the previous one.</p>
Example	<p>40 40 00 42 12 34 56 FF FF FF FF 41 07 31 31 34 30 34 2E 30 30 30 30 2C 45 2C 32 32 33 32 2E 30 30 31 30 2C 4E 2C 31 31 35 30 35 2E 31 32 33 34 2C 45 2C 32 33 33 33 2E 35 36 37 38 2C 4E E5 90 0D 0A</p> <p>Above command will set Geo-fence:</p> <p>11404.0000,E,2232.0010,N,11505.1234,E,2333.5678,N</p>
Response:	\$\$<L><ID><0x4107 or 0x4207><Flag><checksum>\r\n
Note:	<p>Flag</p> <p>=0x00, failure response;</p> <p>=0x01, success response.</p>
Cancel Geo-fence	@@<L><ID><0x4107 or 0x4207><checksum>\r\n
Example:	40 40 00 11 12 34 56 FF FF FF FF 41 07 07 1F 0D 0A

9. Extended Settings – 0x4108

Command:	@@<L><ID><0x4108><ABCDEFGHJIJ><checksum>\r\n
Description:	<p>Set extended functions with details as follows:</p> <p>ABCDEFGHJIJ (defaulted as 0x01 0x00 0x00 0x00 0x01 0x00 0x00 0x00 0x00 0x01):</p> <p>A=0x00, turn off the function of replying with an SMS position report after a call is made to the tracker.</p> <p>A=0x01, turn on the function of replying an SMS position report after a call is made to the tracker.</p> <p>B=0x00, location data of NMEA 0183 GPRMC will be interpreted into normal text for easy reading.</p> <p>B=0x01, location data complies with NMEA 0183 GPRMC protocol.</p> <p>C=0x00, turn off the function to automatically hang up an incoming call.</p> <p>C=0x01, turn on the function to automatically hang up an incoming call after 5 rings.</p> <p>D=0x00, turn off the function of sending alarms when the tracker is turned on.</p> <p>D=0x01, turn on the function of sending an SMS alarm to the authorized phone number for SOS and a GPRS alarm to the server when the tracker is turned on.</p> <p>E: reserved and defaulted as 0x01.</p> <p>F=0x00, turn off the function of sending alarms when the tracker enters GPS blind area.</p> <p>F=0x01, turn on the function of sending an SMS alarm to the authorized phone number for SOS and a GPRS alarm to the server when the tracker enters GPS blind area.</p> <p>G=0x00, all LED lights work normally.</p> <p>G=0x01, all LED lights stop flashing when the tracker is working.</p> <p>H: reserved and defaulted as 0x00.</p>

	<p>I=0x00, turn off the function of sending an SMS alarm when the extra power of the vehicle tracker is cut.</p> <p>I=0x01, turn on the function of sending an SMS alarm to the authorized phone number for SOS when the extra power of the vehicle tracker is cut.</p> <p>J=0x00, turn off the buzzer for the incoming call.</p> <p>J=0x01, turn on the buzzer for the incoming call.</p>
Example:	40 40 00 1B 12 34 56 FF FF FF FF 41 08 01 00 00 00 01 00 00 00 00 01 B0 78 0D 0A
Response:	\$\$<L><ID><0x4108><Flag><checksum>\r\n
Note:	<p>Flag</p> <p>=0x00, failure response;</p> <p>=0x01, success response.</p>

10. Initialization – 0x4110

Command:	@@<L><ID><0x4110><checksum>\r\n
Description:	Make all settings (except for the password, IP, Port, APN, ID and GPRS interval) back to factory default.
Example:	40 40 00 11 12 34 56 FF FF FF FF 41 10 65 C9 0D 0A
Response:	\$\$<L><ID><0x4110><Flag><checksum>\r\n
Note:	<p>Flag</p> <p>=0x00, failure response;</p> <p>=0x01, success response.</p>

11. Sleep Mode – 0x4113

Command:	@@<L><ID><0x4113><power-saving level (1 byte in hex code)><checksum>\r\n
Description:	Set sleep mode for power saving.
Note:	<p>If power-saving level</p> <p>=0x00, to close sleep function;</p> <p>=0x01, level 1;</p> <p>=0x02, level 2.</p> <p>Description of power-saving level:</p> <p>Assume that the GPS acquisition time is ONE minute.</p> <p>In level 1, the GPS module will be working for the first three minutes and then shut down for ONE minute, and then work again for another three minutes.....</p> <p>In level 2, the GPS module will be working for the first two minutes and then shut down for ONE minute, and then work again for another two minutes.....</p>
Example:	<p>40 40 00 12 12 34 56 FF FF FF FF 41 13 01 C8 8B 0D 0A</p> <p>Above command will set sleep mode to level 1.</p>
Response:	\$\$<L><ID><0x4113><Flag><checksum>\r\n
Note:	<p>Flag</p> <p>=0x00, failure response;</p> <p>=0x01, success response.</p>

12. Output Control (Limited) – 0x4114 or 0x5114

Description:	This command is to control the outputs of the trackers with a speed limit and used for vehicle trackers (VT300 and VT310) only. Advised Caution in Using this Function
Note:	This function is only achievable when the speed is below 10km/h (0x4114) or 20km/h (0x5114) and meantime GPS is available.
For VT300	
Command:	@@<L><ID><0x4114 or 0x5114><A><checksum>\r\n
Note:	A=0x00, close output (OUT1) - open drain A=0x01, open output (OUT1) - connect to GND
Example:	40 40 00 12 12 34 56 FF FF FF FF 41 14 01 51 1C 0D 0A Above command will open output1.
For VT310	
Command:	@@<L><ID><0x4114 or 0x5114><ABCDE><checksum>\r\n
Note:	A=0x00, close output (OUT1) -open drain A=0x01, open output (OUT1) -connect to GND A=0x02, remain previous status. B=0x00, close output (OUT2) -open drain B=0x01, open output (OUT2) -connect to GND B=0x02, remain previous status. C=0x00, close output (OUT3) -open drain C=0x01, open output (OUT3) -connect to GND C=0x02, remain previous status. D=0x00, close output (OUT4) -open drain D=0x01, open output (OUT4) -connect to GND D=0x02, remain previous status. E=0x00, close output (OUT5) -open drain E=0x01, open output (OUT5) -connect to GND E=0x02, remain previous status.
Example:	40 40 00 16 12 34 56 FF FF FF FF 41 14 01 00 01 00 01 89 2E 0D 0A Above command will open output1, output3 and output5 and close output2 and output4.
Response:	\$\$<L><ID><0x4114 or 0x5114><Flag><checksum>\r\n
Note:	Flag =0x00, failure response; =0x01, success response.

13. Output Control (Unlimited) – 0x4115

Description:	This command is to control the outputs of the trackers and used for vehicle trackers (VT300 and VT310) only. Advised Caution in Using this Function
For VT300	
Command:	@@<L><ID><0x4115><A><checksum>\r\n

Note:	A=0x00, close output (OUT1) - open drain A=0x01, open output (OUT1) - connect to GND
Example:	40 40 00 12 12 34 56 FF FF FF FF 41 15 01 62 2D 0D 0A
For VT310	
Command:	@@<L><ID><0x4115><ABCDE><checksum>\r\n
Note:	A=0x00, close output (OUT1) -open drain A=0x01, open output (OUT1) -connect to GND A=0x02, remain previous status. B=0x00, close output (OUT2) -open drain B=0x01, open output (OUT2) -connect to GND B=0x02, remain previous status. C=0x00, close output (OUT3) -open drain C=0x01, open output (OUT3) -connect to GND C=0x02, remain previous status. D=0x00, close output (OUT4) -open drain D=0x01, open output (OUT4) -connect to GND D=0x02, remain previous status. E=0x00, close output (OUT5) -open drain E=0x01, open output (OUT5) -connect to GND E=0x02, remain previous status.
Example:	40 40 00 16 12 34 56 FF FF FF FF 41 15 01 00 01 00 01 CC 8E 0D 0A
Response:	\$\$<L><ID><0x4115><Flag><checksum>\r\n
Note:	Flag =0x00, failure response; =0x01, success response.

14. Triggered Alarms – 0x4116

Description:	This command is to get alarms when tracker's button (or input) is triggered.
For GT30, GT30X and GT60	
Command:	@@<L><ID><0x4116><ABC><checksum>\r\n
Note:	A=SOS Button B=Button B C=Button C When A or B or C (in ASCII) =1 (0x31), alarm when button is pressed =2 (0x32), alarm when button is released =3 (0x33), alarm when button is either pressed or released SOS button only alarms when it is pressed (active alarm).
Example:	40 40 00 14 12 34 56 FF FF FF FF 41 16 31 32 33 2C 52 0D 0A Above command will enable alarms when SOS button is pressed, Button B is released and Button C is either pressed or released.
For VT300	
Command:	@@<L><ID><0x4116><A><checksum>\r\n

Note:	As the Input of VT300 is linked with SOS button, only active alarm (SOS button is pressed) is available. A=1 (0x31).
For VT310	
Command:	@@<L><ID><0x4116><ABCDE><checksum>\r\n
Note:	<p>A=Input1 (SOS Button) B=Input2 C=Input3 D=Input4 E=Input5</p> <p>When A or B or C or D or E (in ASCII) =1 (0x31), to enable alarm when input is active =2 (0x32), to enable alarm when input is inactive =3 (0x33), to enable alarm when input is either active or inactive</p> <p>SOS button only alarms when it is pressed (active alarm). Input1, Input2 and Input3 are negative triggering; Input4 and Input5 are positive triggering.</p>
Example:	<p>40 40 00 16 12 34 56 FF FF FF FF 41 16 31 32 33 31 32 54 50 0D 0A</p> <p>Above command will enable alarms when Input1 is active, Input2 is inactive, Input3 is either active or inactive, Input4 is active and Input5 is inactive.</p>
Response:	\$\$<L><ID><0x4116><Flag><checksum> \r\n
Note:	<p>Flag =0x00, failure response; =0x01, success response.</p>

15. Power Down – 0x4126

Command:	@@<L><ID><0x4126><data><checksum>\r\n
Description:	Makes the tracker into power down mode (for power-saving purpose) when it is inactive or stationary for a period of time. In Power Down states, GPS stops working and GSM enters sleep and stop sending out message until it is activated by message, incoming calls, movement or any input changes.
Note:	<p>data is in ASCII code and in unit of minute. = 00 (0x30 0x30), to turn off this function; = [01,99], to set Power Down mode.</p>
Example:	<p>40 40 00 13 12 34 56 FF FF FF FF 41 26 31 35 9D 07 0D 0A</p> <p>Above command will set the tracker to enter Power Down mode after it is inactive for 15 (0x31 0x35) minutes.</p>
Response:	\$\$<L><ID><0x4126><Flag><checksum> \r\n
Note:	<p>Flag =0x00, failure response; =0x01, success response.</p>

16. Listen (Voice Wiretapping) – 0x4130

Command:	@@<L><ID><0x4130><data><checksum>\r\n
Description:	Authorize a phone number to make a silence call to the tracker, the track answers the call automatically and allows the caller to listen to what happens around the tracker. There is no voice indication that the call is in progress.
Note:	data is the telephone number for wiretapping and it should be numbers or numbers started with '+'. Max 16 digits. In ASCII code.
Example:	40 40 00 1B 12 34 56 FF FF FF FF 41 30 38 38 38 38 38 38 38 38 38 AD 3A 0D 0A Above command will authorize phone number '8888888888' for wiretapping.
Response:	\$\$<L><ID><0x4130><Flag><checksum> \r\n
Note:	Flag =0x00, failure response; =0x01, success response.

17. Log by Interval – 0x4131

Command:	@@<L><ID><0x4131><data><checksum>\r\n
Description:	Set time interval for logging GPS information. The information is stored within the device memory. When the memory gets full, the newest record will be overwritten on top of the oldest (FIFO - First In, First Out). In that case, only the newest information is stored.
Note:	data is in ASCII code and in unit of second. If data = 0 (0x30), to close this function. = [1,65535], to set interval for logging.
Example:	40 40 00 13 12 34 56 FF FF FF FF 41 31 31 35 5B F4 0D 0A Above command will make the tracker to log every 15 (0x31 0x35) seconds when it gets GPS fix.
Response:	\$\$<L><ID><0x4131><Flag><checksum> \r\n
Note:	Flag =0x00, failure response; =0x01, success response.

18. Time Zone – 0x4132

Command:	@@<L><ID><0x4132><data><checksum>\r\n
Description:	Corrects time into your local time
Note:	Default GPS time is GMT. data is to set time difference in minutes to GMT data = [0,65535]/[-1,-65535]. In ASCII code and in unit of minute This correction is applied to location reports by SMS and SMS alarms, NOT GPRS.
Example:	40 40 00 14 12 34 56 FF FF FF FF 41 32 34 38 30 E5 B5 0D 0A Above command will set 480 minutes as time difference; 40 40 00 15 12 34 56 FF FF FF FF 41 32 2D 34 38 30 41 A1 0D 0A

	Above command will set -480 minutes as time difference.
Response:	\$\$<L><ID><0x4132><Flag><checksum> \r\n
Note:	Flag =0x00, failure response; =0x01, success response.

19. Veer Report – 0x4136

Command:	@@<L><ID><0x4136><data><checksum>\r\n
Description:	When the heading direction of the tracker changes over the preset degree, a message with location data will be sent back to the server by GPRS. This is to enhance the accuracy and continuous trace when the tracker makes a direction change.
Note:	data=[0,359], in ASCII code;
Example:	40 40 00 13 12 34 56 FF FF FF FF 41 36 31 30 A4 BE 0D 0A Above data is 10 degree. When the tracker turns over 10 degree, a message will be sent back to the server.
Response:	\$\$<L><ID><0x4136><Flag><checksum> \r\n
Note:	Flag =0x00, failure response; =0x01, success response.

20. Reboot GPS – 0x4902

Command:	@@<L><ID><0x4902> <checksum>\r\n
Description:	Reboot the GPS module of the tracker.
Example:	40 40 00 11 12 34 56 FF FF FF FF 49 02 71 AC 0D 0A
Response:	\$\$<L><ID><0x4902><Flag><checksum> \r\n
Note:	Flag =0x00, failure response; =0x01, success response.

21. Heartbeat – 0x5119

Command:	@@<L><ID><0x5119><data><checksum> \r\n
Description:	Set time interval for heartbeat
Note:	data=[0,65535], in ASCII code and in unit of minute
Example:	40 40 00 13 12 34 56 FF FF FF FF 51 19 31 32 AC E0 0D 0A Above command will set interval as 12 minutes and the tracker will send heartbeat (0x00) data to the server at every 12 minutes.
Response:	\$\$<L><ID><0x5119><Flag><checksum> \r\n
Note:	Flag =0x00, failure response;

=0x01, success response.

22. Format – 0x5503

Command:	@@<L><ID><0x5503><checksum> \r\n
Description:	Clear all auto logged data in memory (temp buffer) .
Note:	This command is to clear those data logged when no GPRS connection.
Example:	40 40 00 11 12 34 56 FF FF FF FF 55 03 AC E0 0D 0A
Response:	\$\$<L><ID><0x5503><Flag><checksum> \r\n
Note:	Flag =0x00, failure response; =0x01, success response.

23. Get SN & IMEI – 0x9001

Command:	@@<L><ID><0x9001><checksum> \r\n
Description:	Get tracker's Serial Number, IMEI and firmware version.
Example:	40 40 00 11 12 34 56 FF FF FF FF 90 01 41 CF 0D 0A
Response:	24 24 00 33 12 34 56 FF FF FF FF 90 01 33 30 33 37 38 31 35 30 35 39 2C 33 35 33 33 35 38 30 31 31 30 31 38 31 34 35 2C 56 31 2E 34 35 2D 4E FE D0 0D 0A Here we can see: SN=3037815059 IMEI=353358011018145 Firmware Version= V1.45-N

24. Read Interval – 0x9002

Command:	@@<L><ID><0x9002><checksum>\r\n
Description:	Read preset time interval of automatic timed report (GPRS tracking).
Example:	40 40 00 11 12 34 56 FF FF FF FF 90 02 71 AC 0D 0A
Response:	\$\$<L><ID><0x9002><preset time interval (2 bytes in hex code)><checksum> \r\n
Example:	24 24 00 13 12 34 56 FF FF FF FF 90 02 00 0A 8F D4 0D 0A The preset time interval is 10 (0x00 0x0A)*10=100 seconds.

25. Read Authorization – 0x9003

Command:	@@<L><ID><0x9003><button no (1 byte in hex code)><checksum>\r\n
Description:	To get the authorized phone number.
Note:	button no should be 0x01, 0x02 or 0x03. If button no is 0xff, it is to read all authorized numbers.
Example:	40 40 00 12 12 34 56 FF FF FF FF 90 03 01 99 5C 0D 0A
Response:	\$\$<L><ID><0x9003><phone no for SMS><phone no for call><checksum>\r\n
Example:	24 24 00 31 12 34 56 FF FF FF FF 90 03 38 38 38 38 38 38 38 38 38 38 00 00 00 00 00

	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C8 8A 0D 0A
Note:	phone no is 16 bytes in ASCII. If the phone no is less than 16 bytes, the blank byte(s) read as '0x00'.

26. Read Logged Data – 0x9016

Command:	@@<L><ID><0x9016><device random(1B)><PC random(1B)><Flag(2B)><checksum>\r\n
Description:	To read logged data (logged by preset interval) in memory.
Response:	\$\$<L><ID><0x9016><device random(1B)><PC random(1B)><waypoints(4B)><data><checksum>\r\n
Note:	<p>device random and PC random are random data, for example, 0x03, 0x2A, etc.</p> <p>waypoints is the total number of waypoints that have been saved in memory. High byte prior to low byte.</p> <p>data is the first record of the logged waypoints which is in GPRMC format.</p> <p>If Flag =0x00 0x00, read the first waypoint. =0x00 0x01, delete the received waypoint from memory on the condition that sent device random(1B)=latest received device random(1B) and read the next waypoint.</p>
Example:	<p>If you first send:</p> <p>40 40 00 15 12 34 56 FF FF FF FF 90 16 03 15 00 01 AF AB 0D 0A</p> <p>Then device maybe return:</p> <p>24 24 00 4B 12 34 56 FF FF FF FF 90 16 2B 15 00 00 00 59 30 33 34 34 33 33 2E 30 30 30 2C 41 2C 32 32 33 32 2E 35 32 30 39 2C 4E 2C 31 31 34 30 34 2E 36 36 35 39 2C 45 2C 30 2C 30 2C 30 31 30 38 30 39 2C 41 30 7C A0 18 0D 0A</p> <p>Next time you should send:</p> <p>40 40 00 15 12 34 56 FF FF FF FF 90 16 2B 15 00 01 1D 26 0D 0A</p> <p>Where device random (0x2B) must equal to the latest received.</p>

27. Alarms – 0x9999

Command:	\$\$<L><ID><0x9999><Alarm><data><checksum>\r\n
Description:	When there is an alarm detected described as below, this command will be sent from the tracker to the server
Alarms	1 byte in Hex code and details as follows
Alarm	Definition
=0x01	SOS button is pressed / Input 1 active
=0x02	Call B button is pressed / Input 2 active
=0x03	Call C button is pressed / Input 3 active
=0x04	Input 4 active
=0x05	Input 5 active
=0x10	Low battery alarm
=0x11	Speeding alarm
=0x12	Movement alarm
=0x13	Geo-fence alarm

=0x14	Alarm of tracker being turned on
=0x15	Alarm of tracker entering GPS blind area
=0x16	Alarm of tracker exiting GPS blind area
=0x31	SOS button is released/Input 1 inactive
=0x32	Call B button is released/Input 2 inactive
=0x33	Call C button is released/Input 3 inactive
=0x34	Input 4 inactive
=0x35	Input 5 inactive
=0x50	External power cut alarm
=0x52	Veer report
Example:	24 24 00 61 12 34 56 FF FF FF FF 99 99 03 30 33 35 39 30 31 2E 30 30 30 2C 41 2C 32 32 33 32 2E 36 30 38 33 2C 4E 2C 31 31 34 30 34 2E 38 31 33 37 2C 45 2C 30 2E 30 30 2C 2C 30 31 30 38 30 39 2C 2C 2A 31 32 7C 31 32 2E 32 7C 31 39 34 7C 30 34 30 30 7C 30 30 30 30 2C 30 30 30 30 83 4B 0D 0A It means button C is pressed / Input 3 is active.
Note:	See Annex 1 for description of 'data'.

Annex 1: Description of data

Data Format: GPRMC | HDOP | Altitude | State | AD1,AD2

Example: 094506.000,A,2232.5412,N,11404.6919,E,0.00,,290709,,*12|1.7|110|0000|00AA,0267

(1) GPRMC includes:

hhmmss.dd,S,xxmm.dddd,<N|S>,yyymm.dddd,<E|W>,s.s,h.h,ddmmyy,d.d,D*HH

Example: 134829.486,A,2232.6083,N,11404.8137,E, 58.31,309.62,010809,,*1A

Note:

Parameter	Description	Example
hhmmss.dd	UTC time hh = hours; mm = minutes; ss = seconds; dd = decimal part of seconds	13:48:29.486
S	GPS status indicator, A = valid, V = invalid	A=Valid
xxmm.dddd	Latitude xx = degrees; mm = minutes; dddd = decimal part of minutes	22 deg. 32.6083 min.
<N S>	Either character N or character S N = North, S = South	N = North
yyymm.dddd	Longitude yyy = degrees; mm = minutes; dddd = decimal part of minutes	114 deg. 04.8137 min.
<E W>	Either character E or character W E = East, W = West	E = East
s.s	Speed, in unit of knot. (1 knot = 1.852 km)	58.31 Knots
h.h	Heading, in unit of degree	309.62 deg.
ddmmyy	Date dd = date; mm = month' yy = year	01,08,09
d.d	Magnetic variation	Normally blank
D	Either character W or character E W = West ,E=East	Normally blank
*	checksum delimiter:	In case there would be one more comma (,) prior to *, GPRMC is still to be ended by '*'.
HH	Checksum	1A

(2) '|' is list separator in ASCII (0x7c)

(3) HDOP, in ASCII code, 0.5-99.9. HDOP is blank when the tracker has no GPS fix.

(4) Altitude, in algorism.

(5) State: Status of inputs and outputs:

For GT30/GT30X/GT60

Bit0~Bit7: Reserved and default as '0'

Bit8: Status of Input1

If Bit8=0: Input1 is inactive; Bit8=1: Input1 is active (SOS button is pressed)

Bit9: Status of Input2

If Bit9=0: Input2 is inactive; Bit9=1: Input2 is active (Button B is pressed)

Bit10: Status of Input3

If Bit10=0: Input3 is inactive; Bit10=1: Input3 is active (Button C is pressed)

For VT300

Bit 0: Status of Output1.

If Bit0=0: Out1 is closed; Bit0=1: Out1 is open.

Bit8: Status of Input1

If Bit8=0: Input1 is inactive; Bit8=1: Input1 is active (SOS button is pressed)

Bit1~Bit7 and Bit8~Bit15: Reserved and default as '0'

For VT310

Bit0: Status of Out1

If Bit0=0: Out1 is closed; Bit0=1: Out1 is open.

Bit1: Status of Out2

If Bit1=0: Out2 is closed; Bit1=1: Out2 is open.

Bit2: Status of Out3

If Bit2=0: Out3 is closed; Bit2=1: Out3 is open.

Bit3: Status of Out4

If Bit3=0: Out4 is closed; Bit3=1: Out4 is open.

Bit4: Status of Out5

If Bit4=0: Out5 is closed; Bit4=1: Out5 is open.

Bit5~Bit7: Reserved.

Bit8: Status of Input1

If Bit8=0: Input1 is inactive; Bit8=1: Input1 is active.

Bit9: Status of Input2

If Bit9=0: Input2 is inactive; Bit9=1: Input2 is active.

Bit10: Status of Input3

If Bit10=0: Input3 is inactive; Bit10=1: Input3 is active.

Bit11: Status of Input4

If Bit11=0: Input4 is inactive; Bit11=1: Input4 is active.

Bit12: Status of Input5

If Bit12=0: Input5 is inactive; Bit12=1: Input5 is active.

Bit13~Bit15: Reserved and default as '0'

(6) AD1, AD2: 10 bit analog input (only for voltage) for VT310 only, 0x0000~0x03ff in HEX, separated by ',' (comma).

Example: 094506.000,A,2232.5412,N,11404.6919,E,0.00,,290709,,*12|1.7|110|0000|00AA,0267

AD1 is 0x00AA and AD2 is 0x0267.

Voltage Formula: $\text{Input Voltage} = (\text{AD} * 6) / 1024$

0x00AA => 170(decimal) => $(170 * 6) / 1024 = 0.99609375\text{V}(\text{voltage})$

0x0267 => 615(decimal) => $(615 * 6) / 1024 = 3.603515625\text{V}(\text{voltage})$