



NTT-101

GPS Vehicle Tracking System Command Summary

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General Introduction

This document defines the protocols for establishing, managing & maintaining a GSM session (SMS or GPRS) with NaxerTech NTT-101 device and the Server Base Control.

NTT-101 device acts as a mobile data station in an SMS (Short Message Service) or GPRS (General Packet Radio Service) network. General Packet Radio Service is a radio technology for GSM networks that adds packet-switching protocols, shorter set-up time for ISP connections. It is a new non-voice value added service that allows information to be sent and received across a mobile telephone network. Allowing information to be transmitted more quickly, immediately and efficiently across the mobile network, GPRS can provide instant connections subject to radio coverage. No dial-up modem connection is necessary.

The GSM session protocols defined in this document includes communications sequences and send/receive data formats.

Unit Initialization

In this section SMS communication initialization and GPRS initialization protocols are discussed.

GSM Initialisation: This is needed for both SMS and GPRS		
Format	%[CID]INI,Contact No 1,Contact No 2,Contact No 3,Control Center No,Name,ID	
CID	CID refers to Command Identification, a randomly created 8-digit command tag. (Max 8 digits)	
INI	Command	
Contact No 1	First authorized contact number. (Max 15 characters)	
Contact No 2	Second authorized contact number. (Max 15 characters)	
Contact No 3	Third authorized contact number. (Max 15 characters)	
Control Center No	GSM number assigned to Unit at Control Base. (Max 15 characters)	
Name <i>(optional)</i>	It could be the device name or owner's name. (Max 15 characters) Name is inserted when sending SMS alerts.	
ID <i>(optional)</i>	Unit ID. (Max 15 characters)	
Example	%25900213INI,+4433100000,+4433200000,+4433300000,+4433999999,Adrian,12345	
	Command Identification	25900213
	Contact No 1	+4433100000
	Contact No 2	+4433200000
	Contact No 3	+4433300000
	Control Center No	+4433999999
	Name	Adrian <i>(optional)</i>
	ID	12345 <i>(optional)</i>

GPRS Initialisation		
Format	%[CID]INO,GPRS Dial No,APN,UserID,Pasword,UnitID,Control Center IP,Control Center Port,Max Speed,CCIP2,CCPort2	
CID	CID refers to Command Identification, a randomly created 8-digit command tag. (Max 8 digits)	
INO	Command	
GRPS Dial No.	SIM GPRS dialing number. (Max 15 characters) Usually not required	
APN	GSM Operator GPRSAPN. (Max 31 characters)	
User ID	SIM User ID for GPRS Access. (Max 15 characters)	
Password	GSM Operator Password for GPRS Access (Max 15 characters)	
Unit ID	Identification tag for GPRS device, issued by Control Base.	
Control Center Domain/IP	Domain Name/IP address for GPRS data exchange at Control Base. (Max 15 characters)	
Control Center Port	Port number for GPRS data exchange with Control Base. (Max 15 characters)	
Max Speed	Over speed limit. (Min 0km/h Max 250km/h)	
CC Domain/IP 2	Backup Domain Name/IP address for GPRS data exchange.	
CC Port	Backup port number for GPRS data exchange.	
Example	%25900213INO,*99#,Internet,Telenor,Telenor,00000001,gprs.naxertech.com,6081,180,203.81.81.92,6081	
	Command Identification	25900213
	GPRS Dial No	*99#
	APN	Internet
	User ID	Telenor
	Password	Telenor
	Unit ID	00000001
	Control Center Domain	pegasus.naxertech.com
	Control Center Port	6081
	Max Speed	180 k m/h
	CCIP 2	203.81.81.92
	CC Port	6081
	If max speed violation occurs, the device will send GPS data and status of the Control Base through GPRS or SMS (backup). The Control Base shall return a PDU packet containing address details and alert test in order to let the device send the text message to authorized contact number. If no GPRS connection can be established, the SMS terminal at the Control Base shall send SMS messages to authorized contact numbers itself.	
%GPRS,0	Configure device to send data SMS if GPRS connection cannot be established at all occasions.	
%GPRS,1	Configure device to send data only through GPRS. SMS fallback will only be used in case of alarms.	

Note:

- ❖ When entering INI/ INO commands leave unassigned parameters empty but always include the comma. (,)
- ❖ In all the commands there is no space after the comma.
- ❖ Control Center Number and Unit ID issued by the Control Base software cannot be changed after the initial %INI/ %INO commands have been implemented.
- ❖ Any further initializations with changes in Control Center Number have to be sent using the original GSM number, before you can switch to a new Control Center Number.

Response Message

The Control Base shall send a response message to every alarm send through GPRS or SMS.

Format	%RES,Status	
RES	Command to send a Response Message.	
Status	Alarms acknowledged. This is a 32-bit Hex number corresponding to Alarm bits.	
Example	%RES,00000020	
	Status	00000020
	The Control Base shall send a response message to every alarm sent to it through GPRS or SMS. If the unit does not receive any response message within 3 minutes, unit will keep sending alarm to Control Base. SOS alarm, Accident alarm, Doors open alarm, Car movement, Ignition started in security mode alarm should be sent a response message by Control Base.	

Unit Commands

To communicate with NTT-101 remotely a median is required which are called commands that the unit understands. These commands are divided into four types with respect to their functionality/ output i.e. Status Commands, Security Commands, Setup Commands and Administrative Commands. Below all these four types of commands are described in detail :

A. Status Commands:

Status Commands offer such commands to be sent to the tracking unit to get the status of the features that the tracking unit offers. Let's discuss each Status command in detail:

Format	%GPOS
%POS	When the unit receives the command, it will send its current position to the number which sent the command in SMS text format or GPRS. (Only for authorized numbers)
Unit Response:	-
Format	%VER
%VER	When the unit receives the command, it will send the firmware version number installed in it to the number which sent the command in SMS text format. (Will report to any GSM numbers)
Unit Response:	-
Format	%CGSN
%CGSN	When the unit receives the command, it will send the IMEI number of the unit to the number which sent the command in SMS text format. (Only for authorized numbers)
Unit Response:	356895031721734
Format	%GFS
%GFS	When the unit receives the command, it will send all the settings applied to the unit to the number which sent the command in SMS text format.
Unit Response:	-
Format	%GPS
%GPS	When the unit receives the command, it will send its GSM & GPS status to the number which sent the command in SMS text format or GPRS. (Only for authorized numbers)
Unit Response:	GSM signal strength is 27. GPS is valid now. Satellite number is 5, valid satellite number is 4.
Format	%ARM?
%ARM?	When the unit receives the command, it will send its current security settings applied to the number which sent the command in SMS text format or GPRS. (Only for authorized numbers)
Unit Response:	-
Format	%GEO?
%GEO?	When the unit receives the command, it will send its settings set for geo fence to the number which sent the command in SMS text format or GPRS format.
Unit Response:	-
Format	%ADC,1
%ADC,1	When the unit receives the command, it will send its analog input readings which ranges 0 volt to 2.5 volts to the number which sent the command in SMS text format or GPRS format. Response: ADC1: 2.54 This means current analog input is at 2.54 volts.Range is 0 -- 3.3V.

Unit Response:	-
Format	%INI?
%INI?	When the unit receives the command, it will send its initial settings applied under INI command to the number which sent the command in SMS text format. (Only for authorized numbers)
Unit Response:	INI,+4433100000,+4433200000,+4433300000,+4433999999,+4433000000,William
Format	%INO?
%INO?	When the unit receives the command, it will send its GPRS settings applied under INO command to the number which sent the command in SMS text format. (Only for authorized numbers)
Unit Response:	INO,*99#,internet,Telenor,Telenor,00000004,gprs.naxertech.com,6081,180,203.81.81.92,6081
Format	%BATCUT?
%BATCUT?	
Unit Response:	
Format	%ODO?
%ODO?	When the unit receives the command, it will send the current reading of the ODO to the number which sent the command in SMS text format. (Only for authorized numbers)
Unit Response:	

B. Security Commands:

Security Commands offer such commands to be sent to the tracking unit to enable/ disable features that the tracking unit offers. Let's discuss each Security command in detail:

Format	%PULSEOUT,3,1																																				
%PULSEOUT,3,1	When the unit receives the command, it will Lock the vehicle’s doors and send a confirmation SMS text format to the number which sent the command. <i>(Only for authorized numbers)</i>																																				
Unit Response:	Doors Locked																																				
Format	%PULSEOUT,2,1																																				
%PULSEOUT,2,1	When the unit receives the command, it will Unlock the vehicle’s doors. <i>(Only for authorized numbers)</i>																																				
Unit Response:	Doors Unlocked.																																				
Format	%ARM,1																																				
%ARM,1	When the unit receives the command, unit will turn on the Security Mode, Engine will be turned off and doors will be locked. Unit will send a confirmation SMS and GPRS message to base and any users’ contacts if defined. In ARM’d mode unit will monitor Ignition, doors and motion. If Ignition is turned on, or doors open or and motion is sensed, it will generate alerts and will sound hooter (if configured).																																				
Unit Response:	Security Mode enabled. Engine Killed. Doors Locked.																																				
Format	%ARM,0																																				
%ARM,0	When the unit receives the command, unit will turn off the Security Mode, Engine will be released and doors will be unlocked. Unit will send a confirmation SMS to base and three users contacts if defined																																				
Unit Response:	Security Mode disabled. Engine Released, Doors unlocked.																																				
Extended ARM commands																																					
Format	%ARM,0,x																																				
%ARM,0,x	When the unit receives the command, unit will turn on the Security Mode with extended ARM option and unit will send a confirmation SMS to Control Base and authorized contact numbers. In below example, Security Mode will be turned on with bit 2 and bit 3 activated which will turn ON Hooter output and will generate SMS text message if illegal action is performed.																																				
Example	%ARM,1,6																																				
Unit Response:	Security Mode enabled.																																				
	A complete table of values given below for the possible values of x parameter.																																				
	<table><tr><td>Bit 3</td><td>Bit 2</td><td>Bit 1</td><td>Result (values for x parameter)</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0 – No option enabled.</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1 – Immobilize Engine only.</td></tr><tr><td>0</td><td>1</td><td>0</td><td>2 – Hooter on only.</td></tr><tr><td>0</td><td>1</td><td>1</td><td>3 – Immobilize Engine with Hooter On.</td></tr><tr><td>1</td><td>0</td><td>0</td><td>4- SMS only.</td></tr><tr><td>1</td><td>0</td><td>1</td><td>5 – Immobilize Engine with SMS.</td></tr><tr><td>1</td><td>1</td><td>0</td><td>6 – Hooter on with SMS.</td></tr><tr><td>1</td><td>1</td><td>1</td><td>7- Immobilize Engine, Hooter on & SMS.</td></tr></table>	Bit 3	Bit 2	Bit 1	Result (values for x parameter)	0	0	0	0 – No option enabled.	0	0	1	1 – Immobilize Engine only.	0	1	0	2 – Hooter on only.	0	1	1	3 – Immobilize Engine with Hooter On.	1	0	0	4- SMS only.	1	0	1	5 – Immobilize Engine with SMS.	1	1	0	6 – Hooter on with SMS.	1	1	1	7- Immobilize Engine, Hooter on & SMS.
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	1	1	1	7- Immobilize Engine, Hooter on & SMS.																																	
	Bit 1- Engine Immobilize, Bit 2 – Hooter, Bit 3 – SMS																																				

Format	%TIMEARM,<StartTime>,<EndTime>,<Latitude>,<Longitude>,<DelayAfterIGN>,<Options>
%TIMEARM,x,x,x,x,x,x,x	When the unit receives the command, unit will turn on the Security Mode itself during a specified period of time when it reaches a specific place after a specified period of ignition being turned off. In below example, Auto Security On Function will be activated at 1630 hrs till 2200 hrs and 5 minutes after the ignition being turned off.
Example	%TIMEARM,1630,2200,31.467977,74.27189,5,1.
Format	%AUTOARM,1
%AUTOARM,1	When the unit receives the command, unit will turn on the Auto Security Mode after 30 seconds when the ignition has been turned off and doors are locked. Unit will send a confirmation SMS.
Unit Response:	Auto Security On Function Activated.
Format	%AUTOARM,0
%AUTOARM,0	When the unit receives the command, unit will turn off the Auto Security Mode when the ignition has been turned off and the unit will send a confirmation SMS.
Unit Response:	Auto Security On Function De-Activated.
Format	%AJAM,1
%AJAM,1	When the unit receives the command, it will turn on the Anti Jamming with Engine Immobilizing mode and will send a confirmation SMS to the number which sent the command. <i>(Only for authorized numbers)</i>
Unit Response:	Anti Jamming with Engine Immobilizing mode activated.
Format	%AJAM,2
%AJAM,2	When the unit receives the command, it will turn on the Anti Jamming with Horn mode and will send a confirmation SMS to the number which sent the command. <i>(Only for authorized numbers)</i>
Unit Response:	Anti Jamming with Horn mode activated.
Format	%AJAM,3
%AJAM,3	When the unit receives the command, it will turn on the Anti Jamming with Alert only mode and will send a confirmation SMS to the number which sent the command. <i>(Only for authorized numbers)</i>
Unit Response:	Anti Jamming with Alert only mode activated.
Format	%AJAM,0
%AJAM,0	When the unit receives the command, it will turn off the Anti Jamming mode and will send a confirmation SMS to the number which sent the command. <i>(Only for authorized numbers)</i>
Unit Response:	Anti Jamming mode de-activated.
Format	%ENG,1
%ENG,1	When the unit receives the command, it will enable/release the engine. Gradual kill mode is used for Engine Kill to avoid sudden brake fail in vehicles with power brakes.
Unit Response:	Engine Released.
Format	%ENG,0
%ENG,0	When the unit receives the command, it will disable/kill the engine.
Unit Response:	Engine Killed.

Format	%ODO,x
%ODO,x	When the unit receives the command, it will set/ reset its odometer to x value (<i>where x is a numeric value</i>) and will send confirmation to the number which sent the command in SMS text format or GPRS. In below example ODO is set to zero metres.
Example	%ODO,0
Format	%BATCUT,0
%BATCUT,0	When the unit receives the command, it will send an alert once only to the authorized number if it detects disconnection with the main battery.
Example	-
Format	%BATCUT,1
%BATCUT,1	When the unit receives the command, it will send alert continuously to the authorized number if it detects disconnection with the main battery.
Example	-

Note:

- ❖ In AUTOARM mode NTT will automatically Arm itself when the IGN is off and Input-3 is active. It will DisArm itself when Input-3 is inactive.
- ❖ Input-3 must be connected to the vehicle's central locking signal which is going to doors. This provides very high security for the vehicle as the Engine will be killed when drivers locks the vehicle.
- ❖ In this mode if any intruder somehow opens the door, Alarm will be generated. He will not be able to start the vehicle and if he tries to tow the vehicle, alarm will be generated.

C. Setup Commands:

Setup Commands offer such commands to be sent to the tracking unit to set the parameters for the features that the tracking unit offers. Let's discuss each Setup command in detail:

Format	%GEO,0
%GEO,0	When the unit receives the command, it will disable all the geo fence settings applied to it and will send a confirmation SMS text format to the number which sent the command. <i>(Only for authorized numbers)</i>
Example	Geo Fence disabled.
Format	%IDLERUN,x (seconds),x (metres)
%IDLERUN,x,x	Alert triggers if ignition is ON for more than the time duration specified and vehicle does not move more than the specified distance. In below example, if ignition remain on for 10 minutes within 50 metres device will trigger IDLERUN alert
Example	%IDLERUN,600,50
Format	%MINDISTANCE,50
%MINDISTANCE,50	When the unit receives the command, if the vehicle moves more than 50 metres from last position the unit will send its locations as per the time interval settings set under TRACK command. But if the unit remains under 50 metres, it will send its location after every stationary time period specified. Value could be any number denoting metres.
Example	-
Format	%MINDISTANCE,0
%MINDISTANCE,0	When the unit receives the command, it will disable the MINDISTANCE command and will send its locations as per the settings applied under TRACK command.
Example	-
Format	%ANMED,1
%ANMED,1	When the unit receives the command, it will turn on the Analog Median calculations and will send a confirmation SMS text format to the number which sent the command. In Median mode, fast oscillations in analog input are smoothed.
Example	-
Format	%ANMED,0
%ANMED,0	When the unit receives the command, it will turn off the Analog Median calculations and will send a confirmation SMS text format to the number which sent the command.
Example	-
Format	%GPRS,0
%GPRS,0	When the unit receives the command, it will send the data SMS if GPRS connection cannot be established at all occasions.
Example	-
Format	%GPRS,1
%GPRS,1	When the unit receives the command, it will send the data only through GPRS. SMS fallback will only be used in case of alarms.
Example	-
Format	%GPRS,2
%GPRS,2	When the unit receives the command, it will send Alert SMS only to Control Centre and Contacts if GPRS connection cannot be established at all occasions.
Example	-

Format	%GPRS,3
%GPRS,3	When the unit receives the command, it will send Alert SMS only to Control Centre and Control Centre will then forward Alert SMS to all contacts if GPRS connection cannot be established at all occasions.
Example	-
Format	%GPRS,4
%GPRS,4	When the unit receives the command, it will not send any SMS to Control Centre and to all contacts if GPRS connection cannot be established at all occasions.
Example	-
Format	%ONLINE,x (minutes)
%ONLINE,x	When the unit receives the command, it will keep GPRS session persistent by sending a ping packet on GPRS after period of every specified number of minutes. The packet is about 30 bytes in length. In below example, unit will send ping packets after every 5 minutes.
Example	%ONLINE,5
Format	%ONLINE,0
%ONLINE,0	When the unit receives the command, it will stop sending ping packets on GPRS.
Example	-
Format	%INALERT,x1,x2,x3
%INALERT,x1,x2,x3	When the unit receives the command, it will turn on/ off the alerts for the three digital inputs as per their status respectively, whereas x1, x2, x3 represents the values for the three digital inputs. In below example, alerts will be generated to the authorized numbers when all the three digital inputs will turn on.
Example 1	%INALERT,1,1,1 Where each Input will generate an alert respectively when connected with Ground.
Example 2	%INALERT,1,2,1 Where Input 1 will generate an alert when connected with neutral, Input 2 will generate an alert when disconnected from neutral and Input 3 will generate an alert when connected with a Ground.
Example 3	%INALERT,0,1,2 Where Input 1 will not generate any alert as being disabled, Input 2 will generate an alert when connected with neutral and Input 3 will generate an alert when disconnected from Ground.
Format	%TURNS,x
%TURNS,x	When the unit receives the command, it will send location whenever the vehicle turns at an angle more than set turn value, where "x" is the angle in degrees. This is useful to depict all the turns of the vehicle accurately on the map.
Example	%TURNS,20 Location will be sent whenever the vehicle turns at an angle more than 20 degrees.
Format	%AUDIO,x,y,z
%AUDIO,x,y,z	When the unit receives the command, it will set the number of rings before pick (x), microphone level (y) and speaker volume level (z).
Example	%AUDIO,3,12,100 When the above command will be received by the unit it will set the number of rings to 3 after which call will be attended, set the microphone level to 12 and speaker volume level to 100. Whereas microphone level range is 0(0dB)- 15(+22.5dB) and speaker volume level is 0 – 100.

Format	%SMSLMT,x
%SMSLMT,x	When the unit receives the command, it will generate text alert to Control Centre whenever device crosses the defined limit. SMS Counter will reset on 1st day of every month. If SMS Limit is reached, GPRS mode will be set to 3 (i.e. NO SMS). When next month starts, GPRS mode will revert back to the original mode and SMS Counter will be reset to 0.
Example	%SMSLMT,100 An alert will be generated to Control Centre whenever device crosses the limit in the below form “ ALERT: SMS Limit reached! 100 SMS sent ”. After it device will send similar alert after every additional SMSLMT SMS messages i.e. on 200, 300, 400 ... in this case.
Format	%AXL,Accel,Brake
%AXL,Accel,Brake	When the unit receives the command, it will set threshold for Alerts on high acceleration or harsh brake. Accel will be positive and Brake in negative. Values are in tenth of g.
Example	%AXL,5,-5 This will report Alert when acceleration is more than 0.5g or deceleration (as a result of brake or impact) is greater than 0.5g. Maximum and Minimum acceleration will be reported with each location to monitor the driving patterns and generate reports.
Format	%IBTN,MinutesToArm,ID1,ID2,ID3
%IBTN,MinutesToArm, ID1,ID2,ID3	When the unit receives the command, it will ARM vehicle whenever IGN is turned off and MinutesToArm pass after it. It will also inform server about this. If user wants to DisArm the vehicle, iButton with the specified Key should be presented and device will unlock vehicle. Vehicle could also be disarmed by using %ARM,0 command from one of the authorized contact numbers.
Example	%IBTN,5,x,x,x Vehicle will be armed 5 minutes after the ignition is turned off. Up to 3 iButton IDs can be given to DisArm. Whenever device will detect any of the given IDs, it will DisArm vehicle.
Format	%PARCFG,x
%PARCFG,x	When the unit receives the command, it will set itself to report to server for the option set for the reading values on 1-Wire.
Example	%PARCFG,1 Device will report for the values of motion sensor attached to 1-Wire. Where other values are: 1 = Motion Sensor Values, 2 = Temperature Readings, 3 = GSM Signal Strength
Format	%TEMP,x,x
%TEMP,x,x	When the unit receives the command, it will send an alert to Control Center and authorized contact numbers whenever the temperature range is crossed.
Example	%TEMP,-10,4 Device will send an alert if the temperature range is crossed. Where -10 is the minimum temperature level and 4 is maximum temperature level set.
Format	%BRAKE,x,x,x
%BRAKE,x,x,x	A new command (%BRAKE) is now introduced to set the harsh break parameters. It will supersede %AXL command.
Example	%BRAKE,0.6,40,5 Device will raise an alert of harsh brake when it detects the set parameters are violated. Where MinAxl (0.6) is G value of the brake , SpeedDiff (40) is the difference of speed device should

	calculate from the current speed in km/h and BrakeTime (5) specified duration in seconds.
Format	%SPMUTE,x
%SPMUTE,x	When the unit receives the command, device will mute/ stop sending over speed alerts to the authorized contact numbers for the specified period of time.
Example	%SPMUTE,4 Device will stop sending Over Speed alert for four hours. Maximum value for mute is 24 hours.
Format	%PSAVE,x
%PSAVE,x	Send this command to device to enable/ disable its power saving mode. When enabled, device will put itself into power saving mode when it detects no motion for about 30 minutes.
Example	%PSAVE,[0 or 1] Where 0 – Power Saving Mode Off, 1 – Power Saving Mode On.
Format	%PWRTHS,x,x
%PWRTHS,x,x	When the unit receives the command, device will generate an alert message to base control and authorized contact number if it detects main power going below minimum volts limit or going above than maximum volts level specified.
Example	%SPMUTE,4 Device will stop sending Over Speed alert for four hours. Maximum value for mute is 24 hours.
Format	%DISACKRESP
%DISACKRESP	Send this command to device; it will disable the device to respond to when it receives the command “%ACKRESPOK”.
Example	%DISACKRESP
Format	%CFGLOCK,x
%CFGLOCK,x	When the unit receives the command, device will lock the configuration settings.
Example	%CFGLOCK,[0 or 1] Where 0 – Configuration Unlock, 1- Configuration Lock. Send this command once the configurations are set for the device. It is very useful in cases like where main and backup battery complete deplete because of issues with main battery. <i>No configuration change command will take affect if configuration is locked.</i>

D. Administrative Commands:

Admin Commands offer such commands to be sent to the tracking unit to clear all the settings, reset it and install a new version of firmware when available. These commands are only for the Administrative purposes only. Let's discuss each Setup command in detail:

Format	%CLR
%CLR	When the unit receives the command, it will clear all the settings from the EPROM which includes configuration settings, Odometer and all the stored locations. %CLR,0 will only erase configuration settings.
Unit Response:	Cleared Unit Settings.
Format	%RST
%RST	When the unit receives the command, it will restart itself.
Example	-
Format	%UPGRADE
%UPGRADE	When the unit receives the command, it allows the device to access and download the firmware from its Base Station.
Example	-

E. Tracking Commands

This section will help implement how to setup tracking period and interval, start, stop tracking and how to implement the real time tracking.

Tracking – Real-Time							
Format	%TRACK,1,UploadInterval						
%TRACK,1,UploadInterval	This command enables real time tracking and unit sends its GPS data & status via GPRS or SMS to Control Base after every upload interval time. Minimum Upload Interval time is 60 seconds. Interval: (Min 60 seconds, Max 65535 seconds)						
Example 1	%TRACK,1,300						
	<table> <tr> <td>Tracking Command</td><td>TRACK</td></tr> <tr> <td>Tracking Mode</td><td>1 – Represents Real-Time tracking mode</td></tr> <tr> <td>Interval</td><td>300 seconds</td></tr> </table> Unit sends the location and status to the Control Base after every 300 seconds (5 minutes).	Tracking Command	TRACK	Tracking Mode	1 – Represents Real-Time tracking mode	Interval	300 seconds
Tracking Command	TRACK						
Tracking Mode	1 – Represents Real-Time tracking mode						
Interval	300 seconds						
Example 2	%TRACK,1,7200						
	<table> <tr> <td>Tracking Command</td><td>TRACK</td></tr> <tr> <td>Tracking Mode</td><td>0 – Represents Real-Time tracking mode</td></tr> <tr> <td>Interval</td><td>7200 seconds</td></tr> </table> Unit sends the location and status to the Control Base after every 2 hours.	Tracking Command	TRACK	Tracking Mode	0 – Represents Real-Time tracking mode	Interval	7200 seconds
Tracking Command	TRACK						
Tracking Mode	0 – Represents Real-Time tracking mode						
Interval	7200 seconds						
Tracking – Store & Upload (Interval Based with Buffer)							
Format	%TRACK,2, UploadInterval,Distance(metres),StationaryInterval (optional)						
%TRACK,2,UploadInterval,StoreInterval	This command enables interval based tracking with storage on EEPROM. Unit will store GPS location and status data after every specified storage interval (in seconds) to its memory and will send to Control Base after every specified upload interval (in seconds) and will clear sent position from its memory. Store and Upload Track command can also have optional 3rd parameter named “Stationary Interval” like %TRACK,2,UploadInterval,StoreInterval,StationaryInterval. If this 3rd parameter is present then a MINDISTANCE of 50 metres will automatically be applied. If a non-zero %MINDISTANCE is applied to unit, then it will not send location & status data till the distance criteria met or with the stationary interval defined. In this way unit data traffic can be reduced while getting maximum motion values. So if unit is moving, location will be stored every “StorageInterval” seconds. But if unit is stationary, location will be stored every “StationaryInterval” seconds. UpLoadInterval: (Min 60, Max 65535 seconds) StoreInterval: (Min 60, Max 65535 seconds) StationaryInterval: (Min 60, Max 65535 seconds)						

Example 1	%TRACK,2,300,60	
	Tracking Command	TRACK
	Tracking Mode	2 – Represents Interval Base tracking with Buffer mode
	Upload Interval	300 seconds
	Store Interval	60 seconds
	Unit will store its locations after every 60 seconds and will send it to Control Base after every 300 seconds.	
Example 2	%TRA,2,43200,7200	
	Tracking Command	TRACK
	Tracking Mode	2 – Represents Interval Base tracking with Buffer mode
	Upload Interval	43200 seconds
	Store Interval	7200 seconds
	Unit will store its locations after every 2 hours and will send it to Control Base after every 12 hours.	
Example 3	%TRA,2,600,300,1800	
	Tracking Command	TRACK
	Tracking Mode	2 – Represents Interval Base tracking with Buffer mode
	Upload Interval	600 seconds
	Store Interval	300 seconds
	Stationary Interval	1800 seconds
	Unit will store location every 300 seconds (5 minutes) will send it to the Control Base after every 600 seconds (10 minutes). MINDISTANCE will be set to 50m. If its distance condition is not met then it will send location after 1800 seconds(30 minutes).	
Tracking – Distance Based		
Format	%TRACK,3,UploadInterval,Distance(metres),StationaryInterval (optional)	
%TRACK,3,UploadInterval,Distance	This command enables distance based tracking. Unit will store GPS location and status data after every specified distance interval (in meters) to its memory and will send to Control Base after every specified upload interval (in seconds) and will discard that location. If the upload interval is complete but specified distance is not yet covered, unit will not send any location to Base Control. Upload Interval: (Seconds: Max 65535 seconds) Distance: (Metres: Max 60-65535 meters)	
Example 1	%TRACK,3,300,500,3600	
	Tracking Command	TRACK
	Tracking Mode	3 – Represents Distance Base tracking mode
	Upload Period	300 seconds
	Distance	500 metres
	Unit will store its location after every 500 meters and will send it to Control Base after every 300 seconds (5 minutes). If distance condition is not met then it will send location after every 3600 seconds (1 hour).	
Example 2	%TRACK,3,7200,1000	
	Tracking Command	TRACK
	Tracking Mode	3 – Represents Distance Base tracking mode
	Upload Period	7200 minutes
	Distance	1000 metres

	Unit will store its location and status after every 1 kilometre and will send it to Control Base after every 2 hours.	
Tracking – Motion		
Format	%TRACK,4, UploadInterval,Distance(metres)	
%TURNS,X	Settings are similar to STORE/UPLOAD tracking mode but with an addition that whenever a motion is detected from accelerometer (motion sensor) and Storage Interval has passed, a location will be stored for sending to server.	
Example 1	%TRACK,4,60,30	
	Tracking Command	TRACK
	Tracking Mode	4 – Represents Motion mode
	Upload Interval	60 seconds
	Store Interval	30 seconds
	This will store a location maximum one per 30 seconds if any movement detected.	
Tracking – Turn Based		
Format	%TURNS,X	
%TURNS,X	Instructs unit to store/send a location whenever the vehicle turns more X degrees where X is in degrees ranges from 0 to 360. This is very useful command to allow accurate mapping of tracks when vehicle turns in the streets or goes around bends. 20 degrees turn setting is an optimal one.	
Example 1	-	

Note:

- ❖ On successful receipt of %TRACK command, unit will respond with confirmation of new settings.
- ❖ The unit will confirm by sending back the first data packet or SMS right after placing the %TRACK command.
- ❖ No phone calls or other SMS commands will be received during Real Time Tracking or other features that require the unit to go GPRS online.
- ❖ Maximum data storage available is 2,600-20,000(dependent on model) data strings. If storage capacity exceeds, first stored points will be overwritten.

Geo Fence

Geo fence is very much like a virtual fence and has variety of uses. Multiple Geo fences (up to 5) can be set on the device. Whenever device crosses the Geofence boundary, it will raise alert.

In this section we will implement the Geo Fence feature on the unit.

GEOPOLY – Polygonal Geo fence		
Format	%GEOPOLY,Number,Type,nPoints,Lat1,Lon1;...(next coordinates) ..;ID	
%GEOPOLY	Setup Polygonal Geofence. (Max. 20point)	
Number	Number of geo fence. It start from 1.	
Trigger type	0 = Trigger when inside, 1 = Trigger when outside, 3 = Disable.	
nPoints	Number of points geofence consists of.	
Lat1	Latitude of 1 st point	
Long1	Longitude of 1 st point.	
ID (Optional)	ID is any number ID assigned to the geofence. This can be used to identify geo fence when retrieving it using “GEO?” command.	
Note:	Coordinate pair is separated by semi-colons and cannot exceed 20 points.	
Example of 5 vertex polygon	%GEOPOLY,1,1,5;3138.9223,7416.7139;3135.8352,7427.7551;3127.5124,7426.8900;3123.4695,7409.5041;3131.8333,7415.2307;123	
	Type	1 = Alert when leave the area (OUT)
	Number	1 (First Geo fence)
	nPoints	5
	Lat1	Latitude 3138.9223
	Log1	Longitude 7416.7139
	ID (optional)	123
	If Geo fence violation occurs, the unit will send GPS data and status to Control Base via GPRS or SMS. It will also send alert to all the authorized contact numbers set in device.	

GEO RECTANGULAR		
Format	%GEO,GEOID,Y1,NS,X1,EW,Y2,NS,X2,EW,InOut	
%GEO	Setup Geo fence. (Max. 4 areas)	
GEOID	Geo fence number. (Max. 4 numbers)	
Y1,NS	Longitude co-ordinates left/ up, North-South direction.	
X1,EW	Latitude co-ordinates left/ up, East-West direction.	
Y2,NS	Longitude co-ordinates, North-South right/ down.	
X2,EW	Latitude co-ordinates, East-West right/ down.	
Trigger type	0 = Trigger when inside, 1 = Trigger when outside, 3 = Disable.	

Example	%25900213GEO,1,2122.2267,N,11321.1111,E,2233.3333,N,11321.000,E,0	
	GEOID	1
	Y1,NS	Longitude 2122.2267,North
	X1,EW	Latitude 11321.1111, East
	Y2,NS	Longitude 2233.3333,North
	X2,EW	Latitude 11321.0000, East
	InOut	0 = Alert when enter area (In)
	If Geo fence violation occurs, the unit will send GPS data and status to Control Base via GPRS or SMS. It will also send Alert SMS to contacts (if configured).	