NAVIXY

NAVIXY TT 1
Protocol Document

Version: 1.01

Date: April 30/2011

***General Notes*:**

All materials contained on this documentation is protected by the copyright law and may not be reproduced, transmitting, published or broadcast without the prior obtaining authorization of NAVIXY Technology. The documentation is provided for testing, evaluation, integration and product information purpose and it may contain deficiencies or inadequacies information of products. This product is not intended for use in life support appliance, devices or systems where a malfunction of the product can reasonably be expected to result personal injury. NAVIXY or its supplier will not be liable for any consequential, direct, indirect, incidental, punitive or other damages including without limitation, damages for loss of business profits, business interruption, loss of business information or other pecuniary loss that arising out the use of or inability to use the documentation or product, even if NAVIXY has been advised of the possibility of such damages. The customers using or reselling the product in such application do so at their own risk and agree to full indemnify NAVIXY for any damages resulting from illegal use or resale. Subject to change without notice at any time.

Copyright

Reproduction, dissemination, edition of this document, or utilization of the content and communication format as well as giving to other without authorization are prohibited. Offenders will be held liable for payment of damages.

Table of Content

1. Introduction to NAVIXY Protocol Document for TT 1 Device

This document describes the protocol of the NAVIXY TT1 devices. This document is used for all communications information between the base station/controller center and the TT1 devices. The document includes command syntax with full acknowledgement of sending/receiving messages upon request, also the features/functionalities of each command. Hence, this document covers all information which you need to design/build application/software that uses the TT1 as the devices.

2. Version History:

Version	Description	Supported Firmware Version
1.01	Initial commands	VT10_1.021_SIM_G_TT_Rev00 or above

3. Syntax of "$WP" Commands:

- In order to successfully communicate with TT1 (VT-10) device, the "$WP" or "$wp" prefix is required when issuing command and the <CR> is required for terminating the command line. Throughout this document, the <CR> char is omitted intentionally.
- The response of the command is usually followed by the <CR><LF> in the end of responding message. Throughout this document, the <CR><LF> chars are omitted intentionally.
- There are two types of the commands and responses will be seen through this documents as following:

1. Three types of command acknowledgement:

Ex 1: Issuing commands (configure the parameters for a command):
Issuing command:
$WP+<Command>+<Tag>=<Password>,<Para>,<Para>,<Para>,….<CR><LF>
Returning acknowledgement:
$OK:<Command>+<Tag>=<Para>,<Para>,<Para>,….<CR><LF>

Ex 2: Querying command parameters (read command parameters):
Issuing command:
$WP+<Command>+<Tag>=<Password>,?<CR><LF>
Returning acknowledgement:
$OK:<Command>+<Tag>=<Para>,<Para>,<Para>,<Para>….<CR><LF>

Ex3: Query the information (rather than parameters)
Issuing command:
$WP+<Command>+<Tag>=<Password>
Returning message:
$MSG:<Command>=<Para>,<Para>

2. Ask for positioning information:

The returning positioning string (for $WP+GETLOCATION or $WP+TRACK) will **NOT** include the "+<command>+<Tag>" in the beginning of the string message. The positioning data will be displayed as described in the chapter 6.

Please note:
All characters of returning acknowledgement will be in upper case.

- Entering a series of $WP commands on Separate Lines:

  In order to successfully enter series commands through separate lines, a "pause" is suggested to add between each command (preceding and following commands) until the final responses appears such as "$OK:<Command>". This action will avoid sending too many $WP commands at the same time but without receiving the responses for each issuing command to ensure the device receives all command correctly and successfully.

- Default parameters for each command are underlined in this document for reference.
- There are two types of data transmission formats

  - Hex format:

    For GPRS_keep_Alive packet.

  - ASCII format:

    For all data transmission except the "GPRS Keep_Alive message".

4. Supported Communication Types:

The TT1 (VT10) device supports GSM frequency of 850MHz, 900MHz, 1800MHz, and 1900MHz. The device could be communicated with the base station via several communication ways such as following:

- Direct connection

  - USB communication: Auto-adjustable baud rate.

- GSM SMS messages
- GSM CS Data (GSM Circuited Switch Data). ***(Reserved)***
- GPRS UDP: Static IP address is required for controller center software.
- GPRS TCP/IP: Static IP address is required for controller center software

Please note:

TT1 (VT10) device currently does not support CDMA communication protocol.

5. Parameter Format for Returning Messages:

The returning position string includes a series parameters indicating as following:

(RP Header),Device ID, DateTime, Longitude, Latitude, Speed, Heading, Altitude, Satellite, Event ID, (Mileage), Input status, , , Output status

Parameter format for returning string:

(RP Header): Header for returning message
Device ID: The ID of the device. (Maximum length is 10 digits)
DateTime: YYYYMMDDhhmmss (GMT)
Longitude: WGS-84 coordinate system
Latitude: WGS-84 coordinate system
Speed: 0~65535 km/h
Heading: 0~360 degrees
Altitude: Parameter column Reserved (currently showing '0')
Satellite: 0~12
Event ID: xxx. Different event ID indicates different meaning of each returning message,
Please refer to appendix 8.1 for detailed description.
Mileage: the mileage value in kilometer
Input status: Input status indication (bitwise), the returning value is in "decimal" format.
Please convert it to "binary" mode to read the input status:
Ex:
If returning value is 28 (decimal) ⇔ 11100 (Binary):
Corresponding table:

Input port	IG/ACC	Input 4	Input 3	Input 2	Input 1
Binary code	1	1	1	0	0
Status	On	On	On	Off	Off

Empty column: reserved to be compliant with the parameter of VT200 Trailer Tracker
Empty column: reserved to be compliant with the parameter of VT200 Trailer Tracker

Output Status: Output status indication (bitwise), the returning value is in “decimal” format. Please convert it to “binary” mode to read the input status:

Ex:

If returning value is 2 (decimal) ⇔ 0010

Corresponding table:

Output port	Output 4	Output 3	Output 2	Output 1
Binary code	0	0	1	0
Status	Off	Off	On	off

Voltage level of Backup Battery:

This parameter shows the current voltage level of the backup battery. This function supports real time report only, not for position logs in the memory.

Please Note:

- **The above information is only for the returning string with “Event ID” parameter.**

6. Command List of WP Commands:

6.1 Standard WP Command:

Command	Description
$WP+UNCFG	Set/Read device ID, Password, PIN Code of the SIM card and input delay time interval
$WP+COMMTYPE	Set/Read device communication type and its parameters
$WP+ROAMING	Enable/Disable GPRS roaming function
$WP+GETLOCATION	Get current position of the device
$WP+TRACK	Enable/disable/read tracking function to the device
$WP+REC	Enable/disable/read logging function to the device
$WP+CLREC	Erase all logging data from the memory of the device
$WP+DLREC	Download entire/selective logging data from the memory of the device
$WP+SPDLREC	Stop downloading logging data from the device.
$WP+REBOOT	Restart up the device
$WP+RESET	Reset all parameters to the manufactory default settings
$WP+SETDR	Set default event for input, main power low/lost, and voltage level of internal battery
$WP+SETEVT	Enable (set)/disable/read user defined Geo-fencing /Input triggering/ Output Control event(s)
$WP+SETVIP	Set up to 5 different SMS phone number for user defined event.
$WP+SACC	Using Voltage level changing to detect ACC on/off event
$WP+AVL	Alignment the voltage reading of the device
$WP+DISEV	Enable/Disable sending message with event ID information
$WP+CLEVT	Clear the user defined Geo-Fencing event(s)
$WP+QBCLR	Clear the queue buffer of the device.
$WP+IMEI	Query the IMEI number of the internal GSM module
$WP+SIMID	Query the identification of the SIM card
$WP+GSMINFO	Query the information about the GSM communication information
$WP+GBLAC	Enable/disable/query GSM BTS information
$WP+MGBLAC (Only for Siemens module)	Execute this command to query GSM BTS location information
$WP+VER	Query the current firmware version.
$WP+SPD	Enable/disable/read over-speed event
$WP+OUTC	Enable/disable output state/behavior.
$WP+BATC	Enable/disable backup battery function
$WP+SETTOW	Enable/disable the tow alert.
$WP+SETMILE	Set/Reset/Query mileage information
$WP+TMRR	Set up to reporting position for a certain time up to 3 times a day

$WP+SETTZ	Set the time zone information
$WP+FKEY	Enable/disable the action of the function key
$WP+RPHEAD	Enable/Disable to carry the header in returning message.

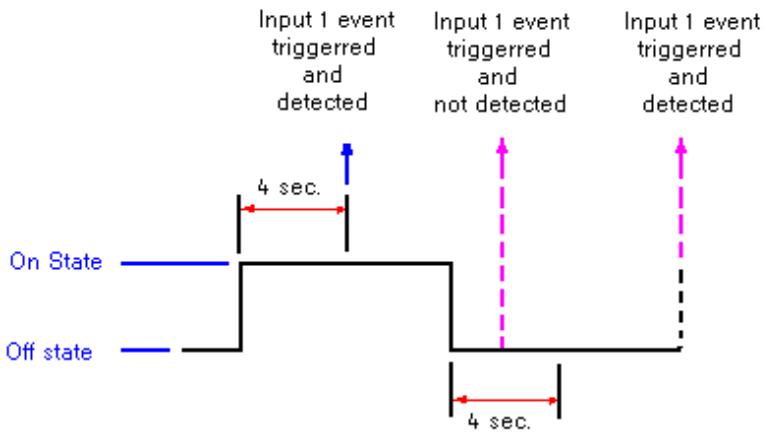
6.2 Command list for Trailer Tracker Feature:

Command	Description
$WP+IDLESET	Detect the IDLE status of the vehicle (by checking GPS speed)
$WP+PSM	Enable/disable Power Saving mode
$WP+BATPSM	Enable/Disable the feature of “Backup Battery Power Saving Mode)

7. Command Description:

7.1 Standard WP command:

$WP+UNCFG		
Description	Execute this command to configure the device ID, device password, PIN code of the SIM card, and the delay time for input ports (input 1~4).	
Format	Write	$WP+UNCFG+[Tag]=[Password],[Device ID],[New Password], [PIN code],[Input 1 delay time interval], [Input 2 delay time interval], [Input 3 delay time interval], [Input 4 delay time interval]
	Read	$WP+UNCFG+[Tag]=[Password],?
Response	$OK:UNCFG+[Tag]= [Device ID],[New Password], [PIN code], [Input 1 delay time interval], [Input 2 delay time interval],[Input 3 delay time interval], [Input 4 delay time interval]	
Error Response	$ERR:UNCFG+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Device ID	Device identification number. The maximum length is 10 digits. Only integer can be used. Default device ID is 2000000001 **Note**: The most left digit is reserved in which must be ‘2’.
	New Password	New password of the device. Default is “0000”
	PIN Code	The PIN Code of the SIM card. The maximum length is 8 digits. **Note:** Please use “” to clear parameter.

	Input 1 delay time interval	Effect time interval 0~255 100ms
	Input 2 delay time interval	Effect time interval 0~255 100ms
	Input 3 delay time interval	Effect time interval 0~255 100ms
	Input 4 delay time interval	Effect time interval 0~255 100ms
Example	Ex: Issue command: $WP+UNCFG=0000,2000000002,0000,,10,10,10,10 Response: $OK:UNCFG=2000000002,0000,,10,10,10,10	
Notes	1) The SIM card will be locked by the TELCO if enter incorrect PIN code for 3 times then the PUK code is required. Please contact the local TELCO to unlock the SIM card. Please use the Culler phone to unlock the PUK once the card is locked. 2) The "Input Delay" status changing detection might not able to be detected if the status changing happens in the "Input Delay" interval after precious state changing. (for both "on" and "off") For example: If we set an event when input 1 status changing to "ON" state with delay interval of 4 seconds. Once the input 1 event triggers, the next "Input 1 on event" can be detected after 4 seconds in "Off" state. Please refer to the illustration as below:  	

	E	Base phone number for the GSM SMS base station. Maximum
	SMS Base Phone No.	Execute this command to get the primary communication type and its related parameters.
		$WP+COMMTYPE+[Tag]=[Password],[CommSelect],[SMS Base Phone No.],[CSD Base Phone No.],[GPRS_APN],[GPRS_Username],[GPRS_Password],[GPRS_Server_IP_Address],[GPRS_Server_Port],[GPRS_Keep_Alive Packet_Interval],[GPRS_DNS IP address]
	CSD Base Phone No. *(Reserved)*	Write
		Read
	GPRS_APN	Access Point Name for GPRS service (required for GPRS communication) The maximum length is 40 characters.
	GPRS_Username	User name for GPRS service if applicable. The maximum length is 31 characters.
	GPRS_Password	Password for GPRS service if applicable. The maximum length is 20 characters
	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	GPRS_Server_ IP_Address	Static IP address. format xxx.xxx.xxx.xxx (Please do not use virtual IP address) Host Domain Name (GPRS_DNS server must be defined) for the base station. The maximum length is 40 characters.
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits, maximum length of character is 10 digits. It supports numerical characters only. Default password is "0000"
	GPRS_Server_ Port	The port # of the computer which the control center software is operating. The available range is from 1000-65535. Default setting: 1000
	CommSelect	Set primary communication type: 1. GSM SMS communication 2. CSD: Circuit Switched Data communication (Reserved, currently not support) 3. GPRS UDP communication 4. GPRS TCP/IP communication 5. USB port communication **Note:** Support COM numbers: COM 1 ~ COM 199 autodetection
	GPRS_Keep_Alive Packet Interval	GPRS Keep_Alive Packet is used to establish the GPRS connection and maintain the GPRS connectivity between the device and the base station. The range is between 0~65535 seconds. Default setting: 30 seconds **Note:** Set to '0' to disable sending GPRS Keep_Alive Packet. This parameter will not send any Keep_Alive Packet to the control center.
		Note: Please use "" to clear the parameter.
		$OK:COMMTYPE=[CommSelect],[SMS Base Phone No.],[CSD Base Phone No.], [GPRS_APN],[GPRS_Username],[GPRS_Password],[GPRS_Server_IP_Address], [GPRS_Server_Port],[GPRS_Keep_Alive Packet_Interval],[GPRS_DNS IP address]
		$ERR:COMMTYPE+[Tag]+[Error Code]
		Please refer to appendix 8.2 for detailed error code descriptions.

	GPRS_DNS Server	Domain Name System IP address. Please contact local ISP for the IP address of DNS server. Please use the xxx.xxx.xxx.xxx as the format for this parameter. Default setting: 168.95.1.1
Example	Ex1: GPRS TCP/IP with static IP address Issue command: $WP+COMMTYPE=0000,4,,,internet,,,**60.210.45.68**,1050,30,168.95.1.1 Response: $OK:COMMTYPE=4,,,internet,,,60.210.45.68,1050,30,168.95.1.1 Ex2: If the control center use DNS name(Domain Name System) server Issue command: $WP+COMMTYPE=0000,4,,,internet,,,**serverDNSNAME**,6080,30,**168.95.1.1** Response: $OK:COMMTYPE=4,,,internet,,,serverDNSNAME,6080,30,168.95.1.1	
Notes	1) If primary communication is GPRS then both parameters “SMSPhone No.” and “CSD Phone No.” are not required. 2) The port number of GPRS_Server_Port parameter must be opened for the control center software and not conflict with others port which is occupied by OS or other software. 3) Please enable the GPRS service for the SIM card before start GPRS configuration. Also, please obtain related information such as “Access Point Name” (APN), user name (if applicable), and password (if applicable) for GPRS configuration ($WP+COMMTYPE command). 4) The Static IP address is required for the GPRS communication. Sometimes the failure of GPRS connection is caused by the firewall setting enabled. 5) The software developer must implement the function in the control center software in which must echo back exact GPRS Keep_Alive packet back to the device once the base station receives the GPRS Keep_Alive packet which was sent from the device to confirm the GPRS connection. 6) The performance of the GPRS connectivity might be affected by the Keep_Alive packet interval due to the TELCO policy for the dynamic IP address source control. 7) The optimized Keep_Alive Packet interval needs to be tested in the local area in order to obtain the optimized interval (cost effective).	
	Keep_Alive message format (Data transmission by Hex format) typedef struct { unsigned short Keep_Alive_Header; unsigned short Keep_Alive_ID; unsigned long Keep_Alive_Device_ID; } Keep_Alivestruct; Keep_Alive_Header is **always** 0xD7D0	

	10) Please be aware that if the GSM base phone number is not set, the device has following behaviors: - If the device receives any valid incoming command via GSM SMS, the device will execute the command, but all acknowledgements or returning message will **NOT** be sent and will be ignored. - If the device is configured under GPRS mode (GSM base phone number is set), if the device receives any valid incoming GSM command from a phone number other than GSM base phone number then the device will execute this command and return all acknowledgements and returning messages back to the GSM base phone number. 11) If this command is issued over GSM SMS, please be aware the text length limitation of the GSM message.

$WP+ROAMING		
Description	Execute this command to enable/disable GPRS roaming function. This command does not affect GSM SMS roaming service. If GPRS roaming function is disabled, the device will automatically closed the GPRS session and all undelivered messages would be stored in the queue buffer. Those undelivered messages would be sent out whenever the device returns the non-GPRS roaming network.	
Format	Write	$WP+ROAMING+[Tag]=[Password],[Enable/Disable]
	Read	$WP+ROAMING+[Tag]=[Password],?
Response	$OK:ROAMING+[Tag]=[Enable/Disable]	
Error Response	$ERR:ROAMING+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	[Enable/ Disable]	0. Disable GPRS roaming function 1. Enable GPRS roaming function
Example	Ex: Issue command: $WP+ROAMING=0000,1 Response: $OK:ROAMING=1	

$WP+GETLOCATION		
Description	Execute this command to get current position of the device	
Format	Write	$WP+GETLOCATION+[Tag]=[Password],
Response	Device ID, DateTime, Longitude, Latitude, Speed, Heading, Altitude, Satellite, Event ID, Mileage, Input status, , , Output status, Voltage Level of Backup Battery	
Error Response	$ERR:GETLOCATION+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+GETLOCATION=0000 Response: 2000000001,20080328094759,121.648443,25.060267,3,163,0,10,0,0.0,0,,,0,3.98	
Note	1) The device returns the last valid GPS information upon request regardless the GPS reception. The parameter of “Number of Satellites” is ‘0’ if there is no GPS reception or GPS is not fixed. Thus the parameter of “number of satellite” could be a reference to check whether there is GPS reception or not.	

$WP+TRACK		
Description	Execute this command to enable automatically reporting current position to the base station according to the parameter “mode” and related conditions.	
Format	Write	$WP+TRACK+[Tag]=[Password],[Mode],[Time],[Distance],[Number of Tracking Times],[Track basis],[CommSelect],[Heading]
	Read	$WP+TRACK+[Tag]=[Password],?
Response	$OK:TRACK+[Tag]= [Mode],[Time],[Distance],[Number of Tracking Times],[Track basis],[CommSelect],[Heading]	
Error Response	$ERR:TRACK+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	0. Disable (Stop tracking)
		1. Time mode: The position information is sent to the base station according to the required time interval, only whole number can be used. Effective range for different communication types: Direct Connection: 1~65535 seconds. GSM SMS: 15~65535 seconds GSM CSD: 5~65535 seconds GPRS UDP/TCP/IP: 5~65535 seconds.
		2. Distance mode: The position information is sent to the base station according to the required distance interval, only whole number can be used. Effective range for different communication types: Direct Connection: 25~65535 meters. GSM SMS: 300 ~65535 meters. GSM CSD: 100~65535 meters. GPRS UDP/TCP/IP: 100~65535 meters.

		3. Time **AND** Distance: The position information is sent back to the base station when following **BOTH** conditions are satisfied: a. “Time Interval” is reached. b. “Distance Interval” is reached.
		4. Time **OR** Distance The position information is sent to the base station when one of the following condition is satisfied: a. “Time Interval” is reached. b. “Distance Interval” is reached.
		5. Heading mode: The position information is sent when the “Heading (direction)” parameter is changed beyond the assigned degrees. Please enter the required value in the “Heading” column.
		6. Heading **OR** Time The position information is sent back to the base station when one of the following condition is satisfied: a. “Heading (direction)” parameter is changed beyond the assigned degrees b. Required “Time Interval” is reached.
		7. Heading **OR** Distance The position information is sent whenever one of the following condition is satisfied: a. “Heading (direction)” parameter is changed beyond assigned degrees b. Required “Distance Interval” is reached.
		8. Heading **OR** (Time **AND** Distance) The position information is sent back to the base station when one of the following condition is satisfied: a. “Heading (direction)” parameter is changed beyond assigned degrees b. Required **BOTH** “Time **AND** Distance Interval” are satisfied.

		9. Heading **OR** Time **OR** Distance The position information is sent whenever one of the following condition is satisfied: a. When the “Heading (direction)” parameter is changed beyond assigned degrees. b. Required “Time Interval” is reached. c. Required “Distance Interval” is reached.
	Time Interval	Specify elapsed time interval to report current position. Default value is ‘0’. The effective range, please refer to the “mode” parameters option ‘1’ => “Time mode”.
	Distance Interval	Specify elapsed distance interval to report current position. Default value is ‘0’. The effective range, please refer to the “mode” parameters option ‘2’ => “Distance mode”.
	Number of Tracking Times	Frequency (number of times the report needs to be sent). Effective range is from 0~65535. Set ‘0’ indicating “Continuously tracking. **Note:** The counter of “Times” will be displayed how many times left while the command is executing when we query the command parameters.
	Track Basis	0. Tracking report is sent ONLY IF GPS is fixed. 1. Tracking report is sent regardless the GPS signal reception 2. Track report is sent when ACC is on and GPS is fixed 3. Track report is sent when ACC is on regardless whether the GPS signal is fixed or not.
	CommSelect	Set the output communication channel: 1. GSM SMS communication 2. CSD: Circuit Switched Data communication (Reserved, currently not support) 3. GPRS UDP communication 4. GPRS TCP/IP communication 5. USB port **Note**: Support COM numbers: COM 1~ COM 199 auto detectable.

	Heading	The effective value is from 10~90 degrees.
Example	Ex: Issue command: $WP+TRACK=0000,1,5,0,5,0,4,15 Response: $OK:TRACK=1,5,0,5,0,4,15 210000001,20080313170020,121.123456,12.654321,0,233,0,9,2,0.0,0,,,0,3.98 210000001,20080313170025,121.123456,12.654321,0,233,0,9,2,0.0,0,,,0,3.96 210000001,20080313170030,121.123456,12.654321,0,233,0,9,2,0.0,0,,,0,3.98, 210000001,20080313170035,121.123456,12.654321,0,233,0,9,2,0.0,0,,,0,3.98 210000001,20080313170040,121.123456,12.654321,0,233,0,9,2,0.0,0,,,0,3.99	
Notes	1) The mode 2,3,5,7,and 8 require the GPS reception. If the GPS reception is not stable then the accuracy will be decreased. 2) “Track basis” can be set to 1 or 3 when mode is set to 1,4,6,or 9.	

$WP+REC		
Description	Execute this command to enable automatically logging current position into the memory of the device according to the parameter “Mode” and corresponding conditions.	
Format	Write	$WP+REC+[Tag]=[Password],[Mode],[Time],[Distance],[Number of Times],[Record Basis],[Heading],
	Read	$WP+REC+[Tag]=[Password],?
Response	$OK:REC+[Tag]= [Mode],[Time],[Distance],[Number of Times],[Record basis], [Heading]	
Error Response:	$ERR:REC+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	0. Disable (Stop storing position data into flash memory)
		1. Time mode: The position information is logged into the memory of the device according to the required time interval, only integer can be used. Effective parameters: Range: 1~65535 seconds.
		2. Distance mode: The position information is logged into the memory of the device according to the required distance interval, only integer can be used. Range: 25~65535 meters. **Note**: For vehicle application, suggest to set 50 meters or above for better performance.

		3. Time **AND** Distance: The position information is logged into the memory of the device according to the required "Time interval" **AND** "Distance interval"; the position information is not logged if one of the "Time interval" and "Distance interval" does not satisfy.
		4. Time **OR** Distance The position information is logged when one of the following condition is satisfied: a. "Time Interval" is reached. b. "Distance Interval" is reached.
		5. Heading mode: The position information is logged when the "Heading (direction)" parameter is changed beyond the assigned degrees. Please enter the required value in the "Heading" column.
		6. Heading **OR** Time The position information is logged when one of the following condition is satisfied: a. "Heading (direction)" parameter is changed beyond the assigned degrees b. Required "Time Interval" is reached.
		7. Heading **OR** Distance The position information is logged whenever one of the following condition is satisfied: a. "Heading (direction)" parameter is changed beyond assigned degrees b. Required "Distance Interval" is reached.
		8. Heading **OR** (Time **AND** Distance) The position information is logged when one of the following condition is satisfied: a. "Heading (direction)" parameter is changed beyond assigned degrees b. Required **BOTH** "Time **AND** Distance Interval" are satisfied.

		9. Heading **OR** Time **OR** Distance The position information is logged whenever one of the following condition is reached: a. When the “Heading (direction)” parameter is changed beyond assigned degrees. b. Required “Time Interval” is reached. c. Required “Distance Interval” is reached.
	Time Interval	Specify elapsed time interval to report current position. Default value is ‘0’. The effective range, please refer to the “mode” parameters option 1 “Time mode”.
	Distance Interval	Specify elapsed distance interval to report current position. Default value is ‘0’. The effective range, please refer to the “mode” parameters option 2 “Distance mode”.
	Number of Times	Frequency (number of times the report needs to be sent). Effective range is from 0~65535. Set ‘0’ indicating “Continuously logging”. **Note:** The counter of “Times” will be displayed how many times left while the command is executing when we query the command parameters.
	Record Basis	0. Logging function is executed ONLY IF GPS is fixed. 1. Logging function is executed regardless the GPS signal reception. 2. Logging function is executed when ACC is on and GPS is fixed. 3. Logging function is executed when ACC is on regardless whether the GPS signal is fixed or not.
	Heading	The effective value is from 10~90 degrees.
Example	Ex: Issue command: $WP+REC=0000,1,5,0,0,0,15 Response: $OK:REC=1,5,0,0,0,15	
Notes	1) This function follows the FIFO (first in first out algorithm) algorithm. 2) The mode 2,3,5,7,and 8 require the GPS reception. If the GPS reception is not stable then the accuracy will be decreased. 3) “Record Basis” parameter can be set to 1 or 3 when mode is set to 1,4,6,or 9.	

$WP+CLREC		
Description	Execute this command to erase all logging data from the memory of the device.	
Format	$WP+CLREC+[Tag]=[Password],	
Response	$OK:CLREC+[Tag]=OK	
Error Response	$ERR:CLRREC+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+CLREC=0000 Response: $OK:CLREC	

<table>
<tr><th colspan="3">$WP+DLREC</th></tr>
<tr><td>Description</td><td colspan="2">Execute this command to download request logging data from the memory of the device</td></tr>
<tr><td rowspan="2">Format</td><td>Write command</td><td>$WP+DLREC+[Tag]=[Password],[Start Date/Time],[End Date/Time]</td></tr>
<tr><td>Read command</td><td>$WP+DLREC+[Tag]=0000,?</td></tr>
<tr><td rowspan="2">Response</td><td colspan="2">For Write command:

Command acknowledgement:
$OK:DLREC+[Tag]=[Start Date/Time],[End Date/Time]

Download task completes:
$Download Completed</td></tr>
<tr><td colspan="2">For Read command:

$OK:DLREC=number of logs (Start Date ~ End Date)

Ex:
$OK:DLREC=388(20080322074235~20080322074907)</td></tr>
<tr><td>Error Response</td><td colspan="2">$ERR:DLREC+[Tag]=[Error Code]
Please refer to appendix 8.2 for detailed error code descriptions.</td></tr>
<tr><td rowspan="4">Parameters</td><td>Tag</td><td>The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)</td></tr>
<tr><td>Password</td><td>Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”</td></tr>
<tr><td>Start Date/Time</td><td>Format of this parameter: YYYYMMDDHHMMSS or ‘0’ (please refer to the “Note” section for detail)</td></tr>
<tr><td>End Date/time</td><td>Format of this parameter: YYYYMMDDHHMMSS or ‘0’ (please refer to the “Note” section for detail)</td></tr>
</table>

Example

Ex:

Issue command:

$WP+DLREC=0000,0,0

Response:

$OK:DLREC=0,0

2000000001,20080330074922,121.648699,25.060560,0,159,0,5,1,0.0,0,,,0

2000000001,20080330074923,121.648699,25.060560,0,159,0,6,1,0.0,0,,,0

2000000001,20080330074924,121.648699,25.060560,0,159,0,6,1,0.0,0,,,0

2000000001,20080330074925,121.648699,25.060560,0,159,0,5,1,0.0,0,,,0

2000000001,20080330074926,121.648699,25.060560,0,159,0,5,1,0.0,0,,,0

2000000001,20080330074927,121.648699,25.060560,0,159,0,5,1,0.0,0,,,0

2000000001,20080330074928,121.648699,25.060560,0,159,0,5,1,0.0,0,,,0

$Download Completed

Notes

1) The downloading logs function is not available when the device is configured the GSM SMS communication.
2) The voltage level of backup battery will not be recorded in the log file.
2) If the download process is interrupted by any insertion command/message then the error message “$ERR:7” is sent back to the base station.
3) This command does not support resume function.
4) The value ‘0’ can be used for both parameters “Start Date/Time” and “End Date/ Time”. The corresponding actions are following:

Start Date/Time	End Date/Time	Corresponding data will be downloaded
0	0	Get entire logging data from the flash memory
Start Date/Time	0	Download selective logging data from the “Start Date/Time” to the last logging data in the flash memory
0	End Date/Time	Download selective logging data from the first logging position data to the “End Date/Time” logging data
Start Date/Time	End Date/Time	Download selective logging data from the “Start Date/Time” to the “End Date/Time”

$WP+SPDLREC		
Description	Execute this command to stop downloading process	
Format	$WP+SPDLREC+[Tag]=[Password],	
Response	$OK:SPDLREC+[Tag]	
Error Response	$ERR:SPDLREC+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+SPDLREC=0000 Response: $OK:SPDLREC	

$WP+REBOOT		
Description	Execute this command to reboot the device. All setting will be remained.	
Format	$WP+REBOOT+[Tag]=[Password]	
Response	$OK:REBOOT+[Tag]	
Error Response	$ERR:REBOOT+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+REBOOT=0000 Response: $OK:REBOOT	
Note	1) Please re-establish the direct connection after issuing the $WP+REBOOT command. The physically unplug and re-plug in the USB cable might be necessary.	

$WP+RESET		
Description	Execute this command to reset the device to factory default settings or pre-set settings	
Format	Write	$WP+RESET+[Tag]=[Password]
Response	$OK:RESET+[Tag]	
Error Response	$ERR:RESET+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000” **Note:** If user forgets the password of the device, the last 4 digits of IMEI could be accepted to execute “Reset” function.
Example	Ex: Issue command: $WP+RESET=0000 Response: $OK:RESET	
Notes	1) The “Device ID” and “Pin code” parameters will remain the same after executing this command. Other settings will be set back to factory default. 2) If the password is forgotten then the device can accept the last 4 digits of IMEI number as the password to reset the device successfully.	

$WP+SETDR		
Description	Execute this command to enable/disable the default event sending for input triggering, main power voltage low/lost, and internal backup battery voltage low/recover.	
Format	$WP+SETDR+[Tag]=[Password], [Low Voltage],[Polling],[Logging]	
Response	$OK:SETDR+[Tag]= [Low Voltage],[Polling],[Logging]	
Error Response	$ERR:SETDR+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Low Voltage	Set the voltage for the main power low report. Effective range: 0.00~30.00 V; Default voltage level: 11.50V
	Polling	If any of specific report triggered then the report will be sent back to the control center. This setting is based on the bitwise operation. This parameter can specify what report would be available. The bitwise definition is following (default setting:127) : 0. Disable 1. Input 1 2. Input 2 4. Input 3 8. Input 4 16. Main power low 32. Main power lost 64. Internal battery voltage low 256.Main power voltage recover 512.Main power recover 1024. Internal battery voltage recover

	Logging	If any of specific report triggered then report will be stored into the device memory and can be downloaded later. This setting is based on the bitwise operation. This parameter can specify what report would be available. The bitwise definition is following: 0. Disable 1. Input 1 2. Input 2 4. Input 3 8. Input 4 16. Main power low 32. Main power lost 64. Internal battery voltage low 256.Main power voltage recover 512.Main power recover 1024. Internal battery voltage recover
Example	Ex: Issue command: $WP+SETDR=0000,9.00,1919, 1919 Response: $OK:SETDR=9.00, 1919, 1919	
Notes	1) Each event has different report indication, below is the list of event name with the corresponding report ID: Input 1: Report ID 11 Input 2: Report ID 12 Input 3: Report ID 13 Input 4: Report ID 14 Main power low: Report ID 40 Main power lost: Report ID 41 Main power low recover: Report ID 42 Main power lost recover: Report ID 43 Internal backup battery low: Report ID 46 Internal backup battery low recover: Report ID 47	

	2) For event detecting time, please refer to the following definitions: a) Main Power low event: voltage level of the main power is lower than the pre-defined voltage level (“Low Voltage” parameter in this command) for 3 minutes b) Main power lost event: 5 seconds c) Main power low recover event: - ACC on : 1 hour - ACC off : 30 minutes d) Main power lost recover event: the voltage level is greater than 7.5V e) Internal backup battery low event: voltage level is lower than 3.7V for 1 minutes f) Internal backup battery low recover event: voltage level of internal back battery is greater than 4V or greater than 3.7V for 30 minutes continuously.

$WP+SETEVT		
Description	Execute this command to set GEO-Fencing, input triggered/output control	
Format	Write	$WP+SETEVT+[Tag]=[Password],[Event ID],[Enable/Disable],[Longitude],[Latitude],[Radius],[Zone Control],[Actions],[Input Used],[Input Control],[Output Port],[Output control],[Output Toggle duration] ,[Output Toggle time],[SMS VIP Mask]
	Read	$WP+SETEVT+[Tag]=[Password],[Event ID],?
Response	$OK:SETEVT+[Tag]=[Event ID],[Enable/Disable],[Longitude],[Latitude],[Radius],[Zone Control],[Actions],[Input Used],[Input Control],[Output Port],[Output control] ,[Output Toggle duration] ,[Output Toggle time],[SMS VIP Mask]	
Error Response:	$ERR:SETEVT+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Event ID	The identifier of individual report. The event ID only can be assigned by the integers. The device supports up to 50 event settings and the effective ID number is from 100~149.
	Enable/ Disable	0: Disable 1: Enable
	Longitude	The longitude of center point of defined circle zone.
	Latitude	The latitude of center point of defined circle zone.
	Radius	The radius of the circle zone. The effective range is from 50 to 65535 meters.

	Zone Control	0. Disable 1. Inside Zone The event will be sent when the GPS coordinate is inside the defined zones. 2. Outside Zone The event will be sent when the GPS coordinate is outside the defined zones.
	Actions	This parameter is to define the actions when the conditions become true. The following actions are available: 1. Logging: When the conditions of the defined report are true then the device will store the current GPS position information for the specify event into the memory. 2. Polling: When the conditions of the defined report are true then the device will send the current GPS position information for the specify event back to the base station. 3. Logging and Polling: When the conditions of the defined report are true then the device will store the current GPS position information for specific event into memory and send the event back to the base station as well.
	Input Used	This parameter can specify which input port is used as the input condition for this specific report. This setting is based on the bitwise operation. The definitions are following: 0. Disable 1. Input 1 2. Input 2 4. Input 3 8. input 4 16. IG Detection **Note**: If “IG Detection” is selected, then input 1 is available for connecting a sensor other than ACC of the vehicle.

	Input Control	This parameter is used to specify the input port which defines in the "Input Used" parameters which must be "on" state. 0. Disable 1. Input 1 2. Input 2 4. Input 3 8. Input 4 16. IG Detection **Note**: - Remaining "Used" input port (s) in the "Input Used" must be "off" state as the input triggering condition. - If "IG Detection" is selected, then input 1 is available for connecting a sensor other than ACC of the vehicle.
	Output Port	This parameter can specify which output port is activated when the condition(s) of the event is true. The definitions are following: 0. Disable 1. Output 1 2. Output 2 3. Output 3 4. Output 4
	Output Control	This parameter is to set the output state to 0 (off) or 1(on) of the defined output port in the "Output Port" parameter. 0. Off 1. On
	Output Toggle Duration	To define the time interval of the specific output port staying in the specific state. Effective range: 0~65535 100ms Ex: 255 100ms = 25.5 seconds
	Output Toggle Times	To define the times of the specific output port changing from current state to alternative state and back to the original state after reaching the duration. Effective range: 0~65535 times

	SMS VIP Mask	If the event is triggered then the device could send a SMS alert to up to 5 different pre-defined SMS phone number. The SMS VIP is defined in the $WP+SETVIP command. The bitwise definition is following: 0. Disable 1. SMS VIP 1 2. SMS VIP 2 4. SMS VIP 3 8. SMS VIP 4 16. SMS VIP 5 Ex: Set to 12 means enabled (SMS VIP 3 + SMS VIP 4)
Examples	Ex 1: Issue command (Geo-fencing + Input as condition): $WP+SETEVT=0000,100,1,120.167453,28.649871,200,1,3,7,1,0,0,0,0,4 Response: $OK:SETEVT=100,1,120.167453,28.649871,200,1,3,7,1,0,0,0,0,4 Ex 2: Issue command (input condition only): $WP+SETEVT+50=0000,101,1,,,,,, 3,3,2,3,1,0,0,0 Response: $OK:SETEVT+50=0000,101,1,,,,,, 3,3,2,3,1,0,0,0 Ex 3: Issue command: $WP+SETEVT=0000,105,? Response: $OK:SETEVT=105,1,20.145634,25.764956,500, 2,1,0,0,0,0,0,0,0	

$WP+SETVIP		
Description	Execute this command to set up to 5 different mobile phone numbers for the user defined reports.	
Format	Write	$WP+SETVIP+[Tag]=[Password],[VIP 1],[VIP 2],[VIP 3],[VIP 4], [VIP 5]
	Read	$WP+SETVIP+[Tag]=[Password],?
Response	$OK:SETVIP+[Tag]=[VIP 1],[VIP 2],[VIP 3],[VIP 4],[VIP 5]	
Error Response	$ERR:SETVIP+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	VIP 1	Set VIP number 1
	VIP 2	Set VIP number 2
	VIP 3	Set VIP number 3
	VIP 4	Set VIP number 4
	VIP 5	Set VIP number 5
Example	Ex: Issue command: $WP+SETVIP=0000,+886932400821,+886937400841,0933765432,0911013433, 0987453146 Response: $OK:SETVIP=+886932400821,+886937400841,0933765432,0911013433, 0987453146	

$WP+SACC		
Description	Execute this command to define voltage level of vehicle battery to detect the ACC on/off event.	
Format	Write	$WP+SACC+[Tag]=[Password],[Enable/Disable],[Voltage threshold of ACC off],[Voltage threshold of ACC on],[Duration]
	Read	$WP+SACC+[Tag]=[Password],?
Response	$OK:SACC+[Tag]=[Enable/Disable],[Voltage threshold of ACC off], [Voltage threshold of ACC on],[Duration]	
Error Response	$ERR:SACC+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Enable/ Disable	0: Disable 1: Enable
	Voltage threshold of ACC off	Effective range: 0.0~30.0V
	Voltage threshold of ACC on	Effective range: 0.0~30.0V
	Duration	Effective range: 0~65535 seconds
Example	Ex: Issue command: $WP+SACC=0000,1,11.5,13.0,5 Response: $OK:SACC=1,11.5,13.0,5	

Notes	1) The main power source of VT device must connect to the vehicle battery in order to use this function. 2) This event must be set up in the user defined report ($WP+SETEVT command). 3) In order to increase the accuracy for the voltage detection, please use the $WP+AVL command to synchronize the voltage level between the VT device and the real voltage.

$WP+AVL		
Description	Execute this command to calibrate the difference between the voltage reading of the device and the exact voltage level before device installation. This action is suggested to be done after resetting the device, uploading the firmware, or installing a new device (if the SACC command is used). Once the voltage is calibrated then all related voltage level detection such as main power low/recover report, engine on/off report, etc would be based on the calibrated voltage reading.	
Format	Write	$WP+AVL+[Tag]=[Password],[Set/Query Current Voltage]
	Read	$WP+AVL+[Tag]=[Password],?
Response	$OK:AVL+[Tag]= [Current Voltage],[Voltage Level of Backup Battery]	
Error Response	$ERR:AVL+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Set/Query Current Voltage	Effective range: 0.00~30.00V
Example	Ex: Issue command: $WP+AVL=0000,12.70 Response: $OK:AVL=12.70,4.02	
Note	1) The internal backup battery must be ‘on’ to have correct voltage reading for “Voltage Level of Backup Battery”	

$WP+DISEV		
Description	Execute this command to enable or disable sending all returning messages with “Event ID” information back to control center. Other commands such as “$WP+VER” would be working normally.	
Format	Write	$WP+DISEV+[Tag]=[Password],[Mode]
Response	$OK:DISEV+[Tag]=[Mode]	
Error Response	$ERR:DISEV+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	0: Disable 1: Stop sending messages with “Event ID” message. (All inputs and outputs state will not be changed even though the condition of user-defined report becomes true.) 2. Stop sending messages with “Event ID” message. (All inputs and outputs state will be changed if the condition of user-defined report becomes true.)
Example	Ex1: Issue command: $WP+DISEV=0000,1 Response: $OK:DISEV=1	
Note	1) While this function is enabled, all returning messages including triggered events would not be stored in the queue buffer and will be deleted.	

$WP+CLEVT		
Description	Execute this command to clear single/all event settings	
Format	Write	$WP+CLEVT+[Tag]=[Password],[Event ID]
Response	$OK:CLEVT+[Tag]= [Event ID]	
Error Response	$ERR:CLEVT+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Event ID	Specify the report identifier which will be cleared. The effective identifier range is from 100~149. 255: clear all $WP+SETEVT settings.
Examples	Ex1: Issue command: $WP+CLEVT=0000,109 Response: $OK:CLEVT=109 Ex2: Issue command: $WP+CLEVT=0000,255 Response: $OK:CLEVT=255	

$WP+QBCLR		
Description	Execute this command to clear queue buffer	
Format	Write	$WP+QBCLR+[Tag]=[Password]
Response	$OK:QBCLR+[Tag]	
Error Response	$ERR:QBCLR+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+QBCLR=0000 Response: $OK:QBCLR	

$WP+IMEI		
Description	Execute this command to query the IMEI No. for the internal GSM module	
Format	$WP+IMEI+[Tag]=[Password]	
Response	$MSG:IMEI+[Tag]=IMEI No.	
Error Response	$ERR:IMEI+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+IMEI=0000 Response: $MSG:IMEI=357258004284081	

$WP+SIMID		
Description	Execute this command to query the identification number of the SIM card	
Format	$WP+SIMID+[Tag]=[Password]	
Response	$ MSG:SIMID+[Tag]=SIM card Identification No.	
Error Response	$ERR:SIMID+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
Example	Ex: Issue command: $WP+SIMID=0000 Response: $MSG:SIMID=89701234789209748618	

<table>
<tr><th colspan="5">$WP+GSMINFO</th></tr>
<tr><td>Description</td><td colspan="4">Execute this command to query the Name of the operator, GSM signal strength, GPRS connection status, and Roaming status.</td></tr>
<tr><td>Format</td><td colspan="4">$WP+GSMINFO+[Tag]=[Password]</td></tr>
<tr><td rowspan="11">Response</td><td colspan="4">$MSG:GSMINFO+[Tag]=[GSM Operator], [GSM signal strength], [GPRS status], [Roaming Status]</td></tr>
<tr><td rowspan="10">Parameters</td><td>GSM Operator</td><td colspan="2">Name of the Telecommunication corp.</td></tr>
<tr><td rowspan="7">GSM signal strength</td><td colspan="2">This parameter indicates the signal strength for GSM network. The closer the value approaches to 31, the stronger the signal is.</td></tr>
<tr><td>CSQ</td><td>dBm</td></tr>
<tr><td>0</td><td>-113dBm or less</td></tr>
<tr><td>1</td><td>-111dBm</td></tr>
<tr><td>2..30</td><td>-109…-53dBm</td></tr>
<tr><td>31</td><td>-51dBm or greater</td></tr>
<tr><td>99</td><td>not known or not detectable</td></tr>
<tr><td>GPRS Status</td><td colspan="2">0:GPRS is not connected
1: GPRS is connected</td></tr>
<tr><td>Roaming Status</td><td colspan="2">0: Currently is in home GSM/GPRS network.
1: Currently is in roaming GSM/GPRS network</td></tr>
<tr><td>Error Response</td><td colspan="4">$ERR:GSMINFO+[Tag]=[Error Code]
Please refer to appendix 8.2 for detailed error code descriptions.</td></tr>
<tr><td rowspan="2">Parameters</td><td>Tag</td><td colspan="3">The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)</td></tr>
<tr><td>Password</td><td colspan="3">Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”</td></tr>
<tr><td>Example</td><td colspan="4">Ex:
Issue command:
$WP+GSMINFO=0000
Response:
$MSG:GSMINFO=”Chunghwa”, 18,1,0</td></tr>
</table>

Notes	1. The command is available after the device registered to the GSM/GPRS network.

<table>
<tr><th colspan="5">$WP+GBLAC</th></tr>
<tr><td>Description</td><td colspan="4">Execute this command to query or set “auto-reporting” function of the close GSM BTS location information</td></tr>
<tr><td rowspan="2">Format</td><td>Write</td><td colspan="3">$WP+GBLAC+[Tag]=[Password],[Auto Mode]</td></tr>
<tr><td>Read</td><td colspan="3">$WP+GBLAC+[Tag]=[Password],?</td></tr>
<tr><td rowspan="6">Response</td><td>Command</td><td colspan="3">$MSG:GBLAC+[Tag]= [Auto Mode]</td></tr>
<tr><td rowspan="5">Report</td><td colspan="3">Device ID, Date/Time, LAC (Location Area Code), CI (Cell ID)</td></tr>
<tr><td rowspan="4">Parameters</td><td>Device ID</td><td>Identification of the device</td></tr>
<tr><td>Date Time</td><td>Date and Time
(Base on the Time Zone setting)</td></tr>
<tr><td>LAC</td><td>Location area code</td></tr>
<tr><td>CI</td><td>Cell ID</td></tr>
<tr><td>Error Response</td><td colspan="4">$ERR:GBLAC+[Tag]=[Error Code]
Please refer to appendix 8.2 for detailed error code descriptions.</td></tr>
<tr><td rowspan="3">Query format</td><td colspan="4">This format only query the information once, no continuously event will be sent.</td></tr>
<tr><td>Query</td><td colspan="3">$WP+GBLAC+[TAG]=[PWD]</td></tr>
<tr><td>Response</td><td colspan="3">$MSG:GBLAC= Device ID, Date/Time, LAC, CI</td></tr>
<tr><td rowspan="3">Parameters</td><td>Tag</td><td colspan="3">The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)</td></tr>
<tr><td>Password</td><td colspan="3">Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”</td></tr>
<tr><td>Auto Mode</td><td colspan="3">0: Disable
1: The event will be sent whenever the information (LAC and CI) is changed regardless GPS reception
2: The event will be sent whenever the information (LAC and CI) is changed if there is no GPS reception.</td></tr>
</table>

Examples	Ex 1: Issue command: $WP+GBLAC=0000,1 Response: $OK:GBLAC=1 Ex2: Issue command: $WP+GBLAC=0000,? Response: $OK:GBLAC=1 Ex 3: Issue Command: $WP+GBLAC=0000 Response: $MSG:GBLAC=2000000001, 20080328094809,0835,3088

<table>
<tr><th colspan="4">$WP+MGBLAC (Only for Siemens module)</th></tr>
<tr><td>Description</td><td colspan="3">Execute this command to query GSM BTS location information (up to 7 different Cell ID)</td></tr>
<tr><td rowspan="2">Format</td><td>Write</td><td colspan="2">$WP+MGBLAC+[Tag]=[Password],[Time],[Number of Times],[Basis],[CommSelect]</td></tr>
<tr><td>Read</td><td colspan="2">$WP+MGBLAC+[TAG]=[Password],?</td></tr>
<tr><td rowspan="11">Response</td><td colspan="3">$OK:MGBLAC+[Tag]= Device ID, Date/Time, Satellite, Input status,,, Output status, Cell ID info. (7 sets)</td></tr>
<tr><td rowspan="10">Response Parameters</td><td>Device ID</td><td>Device ID of the device</td></tr>
<tr><td>Date Time</td><td>Date and Time
(Base on the Time Zone setting)</td></tr>
<tr><td>Satellite</td><td>Number of satellites fixed</td></tr>
<tr><td>Input Status</td><td>Status of input port</td></tr>
<tr><td>Analog 1</td><td>Status of analog port 1</td></tr>
<tr><td>Analog 2</td><td>Status of analog port 2</td></tr>
<tr><td>Output status</td><td>Status of output port</td></tr>
<tr><td>Cell ID Info.</td><td>This parameter contains the information of 7 different Cell IDs. For each Cell ID, it provide the following items:
Mobile country code :3 digits
Mobile network code :3 digits
Location area code :4 digits
Cell ID: 4 digits
RSSI (Received Signal Strength indication 0~63) : 2 digits</td></tr>
<tr><td>Error Response</td><td colspan="3">$ERR:MGBLAC+[Tag]=[Error Code]
Please refer to appendix 8.2 for detailed error code descriptions.</td></tr>
<tr><td>Parameters</td><td>Tag</td><td colspan="2">The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)</td></tr>
</table>

	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Time	The position information is sent to the base station according to the required time interval, only whole number can be used. Effective range for different communication types: 0: Disable Direct Connection: 1~65535 seconds. GSM SMS: 15~65535 seconds GSM CSD: 5~65535 seconds GPRS UDP/TCP/IP: 5~65535 seconds.
	Number of Times	Frequency (number of times the event needs to be sent). Effective range is from 0~65535. Set ‘0’ indicating “Continuously tracking. **Note:** The counter of “Times” will be displayed how many times left while the command is executing when we query the command parameters.
	Basis	0. Event will be sent regardless the state of ACC or GPS. 1. Event will be sent if there is no GPS reception. 2. Event will be sent only if ACC of vehicle is on.
	CommSelect	Set the output communication channel: 1: GSM SMS communication 2: CSD: Circuit Switched Data communication (Reserved, currently not support) 3: GPRS UDP communication 4: GPRS TCP/IP communication 5: USB port **Note**: Support COM numbers: COM 1~ COM 199 auto detectable

Examples	Ex 1: Issue command: $WP+MGBLAC=0000,30,3,0,4 Response: $OK:MGBLAC=30,3,0,4 Returning message: $MSG:MGBLAC=2000000001,20080129054210,0,0,,,0,4660920835A5B835 $MSG:MGBLAC=2000000001,20080129054240,0,0,,,0,4660920835A5B835 4660920835308822460920835E3D5134660920835000011 $MSG:MGBLAC=2000000001,20080129054210,0,0,,,0,4660920835A5B835 4660920835308822 **Note**: Cell ID Info.=mobile country code+ mobile network code+ Location area code+ Cell ID+ RSSI 466+ 092+ 0835+ 3088+ 22 Ex2: Issue command: $WP+MGBLAC=0000,? Response: $OK:MGBLAC=30,3,0,4
Note	1. If the parameter “Basis” sets to 2, then the input 1 must connect to ACC of the vehicle or $WP+SACC command must be enabled. 2. The maximum number of Cell ID is 7 sets; only sensed Cell ID will be displayed 3. Due to limited length (less than 160 characters), only 5 sets of Cell ID will be displayed if GSM communication is chosen. 4. The command is available after the device registered to the GSM/GPRS network.

$WP+VER	
Description	Execute this command to query the current firmware and hardware version of the device.
Format	$WP+VER+[Tag]
Response	$MSG:VER+[Tag]=firmware version
Error Response	$ERR:VER+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*
Example	Ex: Issue command: $WP+VER+3 Response: $MSG:VER+3= VT10_1.021_SIM_G_TT

$WP+SPD		
Description	Execute this command to enable the speeding event. If the vehicle speed is in/out the speeding range (between minimum and maximum speed) for the certain time period (Duration) then it will trigger the speeding event.	
Format	Write	$WP+SPD+[Tag]= [Password],[Mode],[Minimum Speed],[Maximum Speed],[Speeding Duration],[Output Port],[Output Control],[Speeding Mode],[Off-Speeding Duration]
	Read	$WP+SPD+[Tag]=[Password],?
Response	$OK:SPD+[Tag]= [Mode],[Minimum Speed],[Maximum Speed],[Speeding Duration],[Output Port],[Output Control],[Speeding Mode],[Off-Speeding Duration]	
Error Response	$ERR:SPD+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	This parameter is to define the actions when the conditions become true. The following actions are available: 0. Disable 1. Logging: When the conditions of the defined event are true then the device will store the current GPS position information for the specify event into the memory. 2. Polling: When the conditions of the defined event are true then the device will send the current GPS position information for the specify event back to the base station. 3. Logging and Polling: When the conditions of the defined event are true then the device will store the current GPS position information for specific event into memory and send the event back to the base station as well.

	Minimum Speed	Set Minimum Speed. Valid range: 0~255 km/hr.
	Maximum Speed	Set Maximum Speed. Valid range: 0~255 km/hr
	Speeding Duration	The parameter defined the time duration to activate the speeding event (Event ID 3). In Speeding Mode '0', the range: 15~65535 seconds In Speeding Mode '1', the range: 0~ 65535 seconds
	Output Port	This parameter can specify what output port is activated when the condition(s) of the event is true. The definitions are following: 0. Disable 1. Output 1 2. Output 2 3. Output 3 4. Output 4
	Output Control	This parameter is to set the output state to 0 (off) or 1(on) of the defined output port in the "Output Port" parameter. 0. Off 1.On
	Speeding Mode	0: As the GPS speed is in the defined range, the device will send Event ID 3 according to the defined duration continually. 1: Enter and End speeding reports: - As the GPS speed is in the defined range for the defined duration, Event ID 3 will be sent once. - As the GPS speed is out the defined range for the defined duration, Event ID 9 will be sent once.
	Off-speeding Duration	The parameter defined the time duration to activate the off-speeding event (Event ID 9). In Speeding Mode '0', this parameter is disabled. In Speeding Mode '1', the range: 0~ 65535 seconds

Example	Ex: Issue command: $WP+SPD=0000,3,100,200,15,2,1,1,30 Response: $OK:SPD=3,100,200,15,2,1,1,30
Notes	1. If the Speeding mode '1' is selected, when the conditions of speeding report are satisfied (speeding) or not satisfied (no speeding), the report only sending once. For example, issue $WP+SPD=0000,1,60,120,15,0,0,1,30 If the vehicle speed is 70 KPH for 40 seconds, the Event (ID 3) would be sent once in the first 15 seconds. Then if the speed is down to 40 KPH for 20 minutes, then the Event (ID 9) would be sent once in the first 15 seconds. 2. If we need only using one specific speed as the condition (send Event ID 3 above the speed for defined interval and send Event ID 9 below the speed for defined interval) then we can set the specific speed condition in "Minimum Speed" parameter and set the speed which is not possible to reach in the "Maximum Speed" parameters. For example, issue $WP+SPD=0000,3,120,255,15,0,0,1,30 The device will generate a Speeding Event (ID 3) as the vehicle speed is over 120 for 15 seconds and a Speeding Event (ID 9) as the vehicle speed is below 120 for 30 seconds. 3. If the "Speeding Mode" sets to '0', like $WP+SPD=0000,3,120,255,15,0,0,0,0 then the speeding report (ID 3) will be sent every 15 seconds when the vehicle speed is between 120 and 255 KPH continuously. 4. In the Speeding Mode '1', the Event ID 9 will be sent if the ACC is off. For example, issue $WP+SPD=0000,3,120,255,15,0,0,1,30. As the speed is lower than 120 KPH for only 20 seconds but the ACC is off, the device will generate an Event ID 9.

$WP+OUTC		
Description	Execute this command to set the output behavior.	
Format	Write	$WP+OUTC+[Tag]=[Password],[Output Port],[Output Control], [Output Toggle Duration], [Output Toggle Times]
Response	$OK:OUTC=[Output Port],[Output Control], [Output Toggle Duration], [Output Toggle Times]	
Error Response	$ERR:OUTC+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Output Port	This parameter can specify what output port will be activated. The definitions are following: 1.Output 1 2.Output 2 3.Output 3 4.Output 4
	Output Control	This parameter is to set the output state to 0 (off) or 1(on) of the defined output port in the “Output Port” parameter. 0.Off 1. On
	Output Toggle Duration	To define the time interval of the specific output port staying in the specific state. Effective range: 0~65535 100ms. Ex: 255 100ms = 25.5 seconds

	Output Toggle Times	To define the times of the specific output port changing from current state to alternative state and back to the original state after reaching the duration. Effective range: 0~65535 times.
Example	Ex: Issue command: $WP+OUTC=0000,1,1,20,2 Respond: $OK:OUTC=1,1,20,2	

$WP+BATC		
Description	Execute this command to enable/disable internal backup battery function.	
Format	Write	$WP+BATC+[Tag]=[Password],[Enable/Disable]
	Read	$WP+BATC+[Tag]=[Password],?
Response	$OK:BATC+[Tag]=[Enable/Disable]	
Error Response	$ERR:BATC+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Enable/Disable	0.Disable 1.Enable
Example	Ex: Issue command: $WP+BATC=0000,1 Response: $WP+BATC=1	
Notes	1) The internal backup battery function can be enabled when the internal backup battery is installed. It will not take any effect if there is no internal backup battery installed. 2) If the “ground” of output port (share with the same ground power of the device) is lost then all output ports might not working properly.	

$WP+SETTOW		
Description	Execute this command to enable/disable Tow alert.	
Format	Write	$WP+SETTOW+[Tag]=[Password], [Mode],[Satellite Fixed], [Speed threshold],[Tow Duration],[Auto Reset Duration]
	Read	$WP+SETTOW+[Tag]=[Password],?
Response	$OK:SETTOW+[Tag]= [Mode],[Satellite Fixed],[Speed threshold], [Tow Duration],[Auto Reset Duration]	
Error Response	$ERR:SETTOW+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	0.Disable 1.Logging 2.Polling 3.Logging + Polling
	Satellite Fixed	Effective range: 3~12
	Speed Threshold	10~255 km/hr
	Tow Duration	30~65535 seconds
	Auto Reset Duration	The Tow function will be re-enabled when reaching the end of “Auto Reset Duration” after the first tow event is triggered. 0~65535 seconds
Example	Ex: Issue command: $WP+SETTOW=0000,3,3,10,30,10 Response: $OK:SETTOW=3,3,10,30,10	

$WP+SETMILE		
Description	Execute this command to initial/read mileage accumulator function.	
Format	Write	$WP+SETMILE+[Tag]=[Password],[Mode],[Mileage]
	Read	$WP+SETMILE+[Tag]=[Password],?
Response	$OK:SETMILE+[Tag]= [Mode],[Mileage]	
Error Response	$ERR:SETMILE+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	0.Disable 1. Mileage will be accumulated regardless the ACC status. 2. Mileage will be accumulated only if the ACC is on.
	Mileage	Initial the mileage value (Km). Effective range is from 0.0~4294967.2
Example	Ex: Issue command: $WP+SETMILE=0000,1,12345 Response: $OK:SETMILE=1,12345.0	
Notes	1) If the mileage function is enabled then this parameter will be added in the end of each returning message with “Event ID” parameter. For example: 2000000001,20080313170020,121.123456,12.654321,45,233,0,9,0,**56734.4**,0,,,0,4.05 1) If the mileage reaches the maximum value then it returns to ‘0.0’ km.	

$WP+TMRR		
Description	Execute this command to set the time for reporting position in specific time. It can be set up to 3 times per day.	
Format	$WP+TMRR+[Tag]=[Password],[Enable/Disable],[Timer 1],[Timer 2],[Timer 3]	
Response	$OK:TMRR+[Tag]= [Timer 1],[Timer 2],[Timer 3]	
Error Response	$ERR:TMRR +[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Enable/Disable	0.Disable 1.Enable
	Timer 1	Format: HHMMSS (Time format: 24 hours)
	Timer 2	Format: HHMMSS (Time format: 24 hours)
	Timer 3	Format: HHMMSS (Time format: 24 hours)
Example	Ex: Issue command: $WP+TMRR=0000,1,083000, 100000,163233 Response: $OK:TMRR=1, 083000, 100000,163233	

$WP+SETTZ		
Description	Execute this command to setup the local time. The time of returning message will be based on the time zone setting. The default time zone is the GMT time.	
Format	$WP+SETTZ+[Tag]=[Password],[Sign],[Hour],[Minute]	
Response	$OK:SETTZ+[Tag]=[Sign],[Hour],[Minute]	
Error Response	$ERR:SETTZ +[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Sign	+: ahead GMT time -: behind GMT time
	Hour	Offset hours. Effective range is from 00~13
	Minute	Offset minute (based on 15 minutes basis). Please select one of following: 00,15,30,45
Example	Ex: Issue command: $WP+SETTZ=0000,+,08,00 Response: $OK:SETTZ=+,08,00	

<table>
<tr><th colspan="4">$WP+FKEY</th></tr>
<tr><td>Description</td><td colspan="3">Enable/disable power on/off function and set the action of the function key.</td></tr>
<tr><td>Format</td><td colspan="3">$WP+FKEY+[Tag]=[Password],[Enable/Disable power on/off function],[Mode],[SMS VIP Mask]</td></tr>
<tr><td>Response</td><td colspan="3">$OK: FKEY+[Tag]= [Enable/Disable power on/off function],[Mode],[SMS VIP Mask]</td></tr>
<tr><td>Error Response</td><td colspan="3">$ERR:FKEY+[Tag]=[Error Code]
Please refer to appendix 8.2 for detailed error code descriptions.</td></tr>
<tr><td rowspan="8">Parameters</td><td>Tag</td><td colspan="2">The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)</td></tr>
<tr><td>Password</td><td colspan="2">Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”</td></tr>
<tr><td>Enable/ Disable power on/off function</td><td colspan="2">0. Disable
1. Enable
Notes: Press and hold the function key for 3 seconds to power on/off the device</td></tr>
<tr><td rowspan="5">Mode</td><td colspan="2">Notes:
Press and hold the function key for 1 seconds to trigger</td></tr>
<tr><td>0. Disable</td><td></td></tr>
<tr><td>1. SOS Logging</td><td>Store a report in the flash memory with report ID 52</td></tr>
<tr><td>2. SOS Polling</td><td>Send a report to the base station with report ID 52</td></tr>
<tr><td>3. SOS Logging and Polling</td><td>Store a report in the flash memory and send a report to the base station with report ID 52</td></tr>
</table>

Parameters	SMS VIP Mask	If the event is triggered then the device could send a SMS alert to up to 5 different pre-defined SMS phone number. The SMS VIP is defined in the $WP+SETVIP command. The bitwise definition is following: 0. Disable 1. SMS VIP 1 2. SMS VIP 2 4. SMS VIP 3 8. SMS VIP 4 16. SMS VIP 5 Ex: Set to 12 means enabled (SMS VIP 3 + SMS VIP 4)
Example	Ex: Issue command: $WP+FKEY=0000,1,2,0 Response: $OK:FKEY=1,2,0	
Note	1) In the “SMS VIP Mask”, please pre-defined the contact phone number and enable the $WP+SETVIP. The SMS report will be sent in following format: SOS Report Unit ID: 2000000001 Date/Time: 20080401093519 Lon: 121.648843 Lat: 25.060511 Speed: 1 Km/h Satellites: 9	

$WP+RPHEAD		
Description	Enable/Disable to carry the header in returning message.	
Format	Write	$WP+RPHEAD+[Tag]=[Password],[Enable/Disable],[Text]
	Read	$WP+ RPHEAD +[Tag]=[Password],?
Response	$OK: RPHEAD +[Tag]=[Enable/Disable],[Text]	
Error Response	$ERR: RPHEAD +[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Enable/Disable	0.Disable 1.Enable
	Text	The context in the maximum of 16 characters in ASCII format, except ‘,’.
Example	Ex: Issue command: $WP+RPHEAD=0000, 1, VT10 Response: $OK:RPHEAD=1, VT10 Read command: $WP+RPHEAD=0000,? Response: $OK:RPHEAD=1, VT10	
Notes	1) The Header only shows in the returning report with the Event ID, such as tracking report, towing report, over speeding report, or user defined report, etc.	

7.2 Command list for Trailer Tracker Feature:

$WP+IDLESET (Unit idle detection setting)		
Description	Execute this command to detect the motion status of the unit by “GPS Speed”, in order to determine “Idle Start” and “Idle End” events will be generated and reported.	
Format	Write	$WP+IDLESET+[TAG]=[PWD],[Mode],[Idle Speed Threshold],[Idle Start Delay],[Idle End Delay]
	Read	$WP+IDLESET+[TAG]=[Password],?
Response	$OK: IDLESET=[Mode],[Mode],[Idle Speed Threshold],[Idle Start Delay], [Idle End Delay]	
Error Response	$ERR:IDLESET+[TAG]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the unit. Only correct password can access the unit and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”.
	Mode	0: Disable 1: Logging 2: Polling 3: Logging + Polling Note: When PSM mode is set to 4 (Trailer Tracker mode) then $WP+IDLESET command will be set to mode 3 automatically. (default value for $WP+PSM=4 mode)
	Idle Speed Threshold	This parameter is to define the GPS speed threshold for entering/exiting idle status. Effective Range: 5~255 km/h

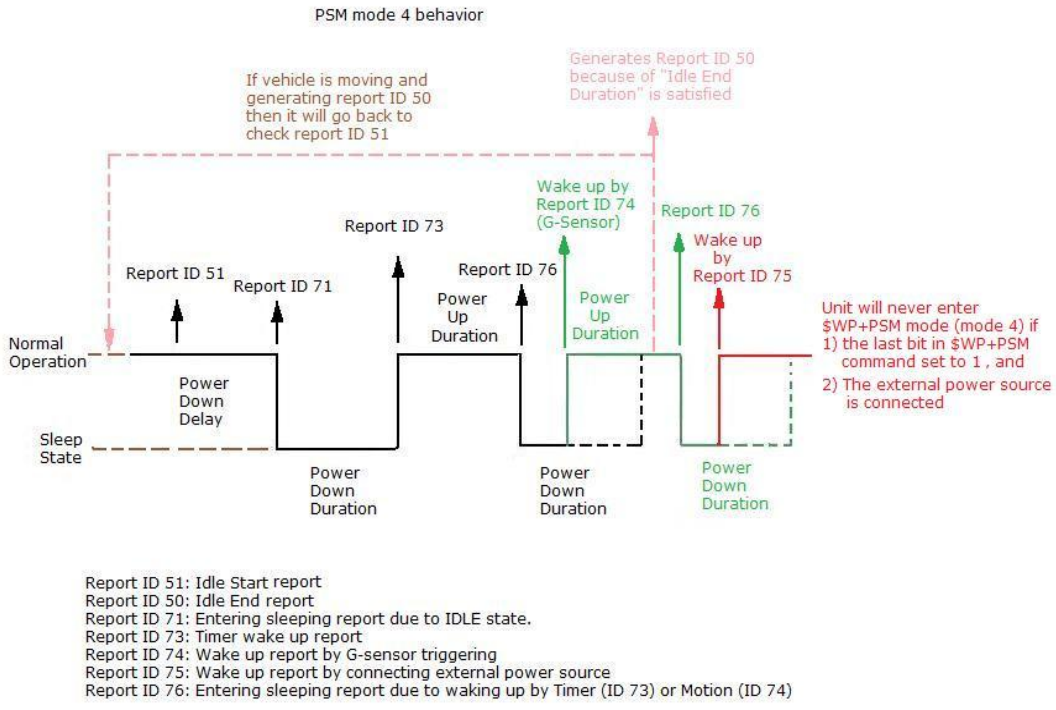
	Idle Start Delay	This parameter is to define and trigger “Idle Start” event. Effective range: 0~65535 seconds Note: When PSM mode is set to 4 (Trailer Tracker mode) then the idle start delay will be set to 20 seconds automatically.(default value for $WP+PSM=4 mode)
	Idle End Delay	This parameter is to define and trigger “Idle End” event. Effective range: 0~65535 seconds Note: When PSM mode is set to 4 (Trailer Tracker mode) then the idle end delay will be set to 15 seconds automatically.(default value for $WP+PSM=4 mode)
Example	Ex: Issue command: $WP+IDLESET=0000,3,15,20,15 Responses: $OK: IDLESET=3,15,20,15	
Note	1) Suggest settings: Mode: 3 Idle Speed Threshold: 15 Km/hr Idle Start Duration: 20 seconds. Idle End Duration: 5 seconds. 2) Report ID definition: Idle Start Event ID: 51 Idle End Event ID: 50 **3) The $WP+IDLESET command must be enabled while operating the PSM mode 4. Otherwise it could affect the performance of the execution of “Power Saving Mode ($WP+PSM command).**	

$WP+PSM (Enable/Disable Power Saving mode)		
Description	Execute this command to enable the “Power Saving Function” of the unit.	
Format	$WP+PSM+[Tag]=[Password],[Mode],[Power Down Delay],[Sleeping Mask],[Power Down Duration],[Power Up Duration],[External Power Checking]	
Response	$OK:PSM+[Tag]= [Mode],[Power Down Delay],[Sleeping Mask], [Power Down Duration],[Power Up Duration],[External Power Checking]	
Error Response	$ERR:PSM+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the unit. Only correct password can access the unit and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Mode	- 0. Disable - 4. Trailer Tracker mode GPS off, GSM off, GPRS off, G-sensor on, Real Time Clock on
	Power Down Delay	Power down delay after “Idle Start” event occurred. Effective Range: 60~65535 seconds
	Sleeping Mask	0. a) Unit does not go to sleeping mode while the $WP+TRACK command is executing. b) Disable serial power supply (5V) during power down (sleeping) duration. 1. a) Unit goes to sleeping mode regardless the execution of $WP+TRACK command b) Disable serial power supply (5V) during power down (sleeping) duration. 2. a) Unit does not go to sleeping mode while the $WP+TRACK command is executing. b) Enable serial power supply (5V) during power down (sleeping) duration.

		3. a) Unit goes to sleeping mode regardless the execution of $WP+TRACK command. b) Enable serial power supply (5V) during power down (sleeping) duration. Note: If $WP+PSM mode is set to 4, the sleeping mask value will be set to 1 automatically. (default value)
	Power Down Duration	This parameter is to define the duration which the unit stays in the sleeping mode. Unit can be waken up by any report triggering, or motion detection. Effective range: 60 ~ 2147483646 seconds
	Power Up Duration	This parameter is to define the duration which the unit stays in the awakened mode. Effective range: 60~65535 seconds
	External Power Checking (only effective for mode 4)	0: Unit enters sleeping mode when the “Idle start is true, regardless the external power status. 1: Unit enters sleeping mode when the idle start is true, and the external power is unconnected. Note: Unit will not go to sleeping mode when external power is connected.
Example	Ex: Issue command: $WP+PSM=0000,4,60,1,43200,300,1 Response: $OK:PSM=4,60,1,43200,300,1	

Notes:

1) Input 1 is required to connect to ACC of the vehicle.
2) When the condition is true (Idle Start and the external power is unconnected when the last bit of $WP+PSM is set to 1, or Idle Start and the last bit of $WP+PSM is set to 0, no matter the external power is connected or not), unit will go to sleeping status, it will generate a report with report ID 71 then enter sleeping status after power down delay is reached.
3) Unit will wake up from sleeping status as soon as external power is connected and generates a position report with report ID 75.
4) Unit will generate a report ID 76 before entering sleeping mode if the unit wakes up due to the “Timer report” (report ID 73) or “Motion report” (report ID 74).
5) Unit will not go to sleeping mode if the external power is connected.
6) Please refer to the below behavior illustration of $WP+PSM mode 4

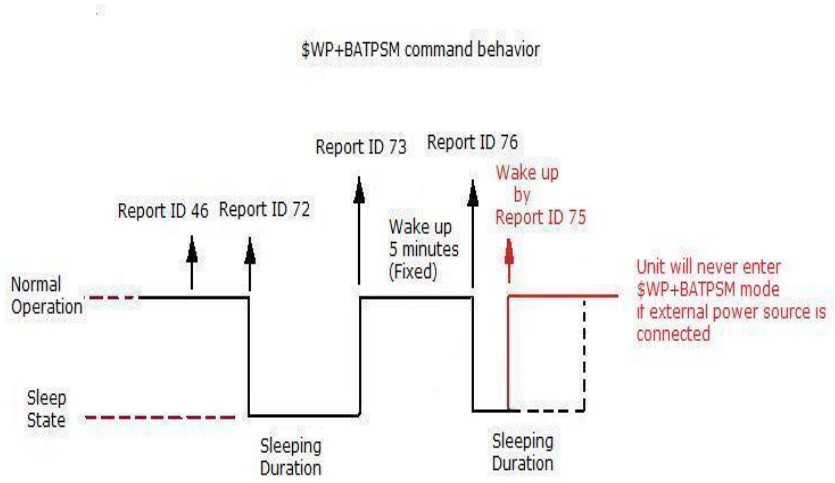


Report ID 51: Idle Start report
Report ID 50: Idle End report
Report ID 71: Entering sleeping report due to IDLE state.
Report ID 73: Timer wake up report
Report ID 74: Wake up report by G-sensor triggering
Report ID 75: Wake up report by connecting external power source
Report ID 76: Entering sleeping report due to waking up by Timer (ID 73) or Motion (ID 74)

$WP+BATPSM (Enable or Disable the Back-up Battery Power Saving Mode)		
Description	Execute this command to enable the Back-up Battery Power Saving Mode, when the voltage level of Back-up Battery is below the configured value. Unit will follow the sleeping/awakening behavior of the $WP+BATPSM mode in stead of the $WP+PSM mode 4.	
Format	Write	$WP+BATPSM+[TAG]=[PWD],[Enable/Disable],[Threshold of Low Back-up Battery Voltage],[Sleeping Duration]
	Read	$WP+BATPSM+[TAG]=[Password],?
Response	$OK: BATPSM=[Enable/Disable],[Threshold of Low Back-up Battery Voltage],[Sleeping Duration]	
Error Response	$ERR:BATPSM+[TAG]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)
	Password	Password of the unit. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”
	Enable /Disable	0: Disable 1: Enable
	Threshold of Low Back-up Battery Voltage	The effective range: 3.9~4.2 volts Note: 1. The report ID 46 (Low Back-up Battery Voltage Event) will be generated if the backup battery voltage level is lower than the set value. 2. When this command is enabled, the parameter “External Power Checking” of $WP+PSM command should NOT set to ‘0’
	Sleeping Duration	This parameter is to define the duration which the unit stays in the sleeping status. Effective range: 0 ~ 918000 seconds

Example	Ex: Issue command: $WP+BATPSM=0000,1,3.9,43200 Response: $OK:BATPSM=1,3.9,43200
Note	1) Input 1 is required to connect to ACC of the vehicle. 2) $WP+BATC command must be enabled prior enabling $WP+BATPSM command. 3) When the conditions is true (back-up battery voltage is lower than the set value, and the external power is unconnected), unit will go to sleeping status, it will generate a report with report ID 72 then enter sleeping status after power down delay is reached. 4) While this command is enabled, unit will wake up as soon as external power is connected and generates a report with report ID 75 5) If the external power is connected then unit will never go to sleeping mode. 6) When the “Sleeping Duration” is expired then unit will wake up and generate a wake up report (report ID 73). 7) The unit will generate a report with report ID 76 before entering sleeping status if unit wakes up due to the report ID 73. 8) In the $WP+BATPSM mode, unit will not wake up from sleeping status by motion detected. 9) The default power down delay for $WP+BATPSM mode is 300 seconds.

9) Please refer to the below behavior illustration of $WP+BATPSM command



Report ID 46: Backup Battery Low report
Report ID 72: Entering sleeping report due to Backup Battery Low
Report ID 73: Timer wake up
Report ID 75: Wake up report by conncting external power source
Report ID 76: Entering sleeping report due to waking up by timer report (report ID 73)

Note:

This mode operates when voltage level of backup battery is less than the set value which is configure in the $WP++BATPSM command

9. Appendices:

8.1 Event ID Description:

Event ID	Description	Corresponding command	Remark
0	Position data	$WP+GETLOCATION	
1	Logging position data	$WP+REC	
2	Track position data	$WP+TRACK	
3	Over speeding event	$WP+SPD	
4	Timer event	$WP+TMRR	
5	Tow event	$WP+SETTOW	
9	Off- speeding event	$WP+SPD	
11	Input 1 state changing event	$WP+SETDR	
12	Input 2 state changing event	$WP+SETDR	
13	Input 3 state changing event	$WP+SETDR	
14	Input 4 state changing event	$WP+SETDR	
40	Main power low event	$WP+SETDR	
41	Main power lost event	$WP+SETDR	
42	Main power voltage recover event	$WP+SETDR	
43	Main power recover event	$WP+SETDR	
46	Internal backup battery voltage low event	$WP+SETDR	
47	Internal backup battery voltage recover event	$WP+SETDR	
52	Function key report	$WP+FKEY	
100~149	User defined event position	$WP+SETEVT	

8.2 Event ID Description when the PSM mode 4 (Trailer Tracker Mode is enabled):

Event ID	Description
50	Idle End
51	Idle Start
46	Low Back-up Battery Voltage
71	Enter Sleeping Status due to Idle Event
72	Enter Sleeping Status due to Low Back-up Battery Voltage Event
73	Wake-up Event due to Timer (periodical power down duration expired)
74	Wake-up Event due to Motion detected
75	Wake-up Event due to connecting external power source
76	Sleeping Event due to Timer (periodical power up duration expired)

Note:

1. Tracking function (set by $WP+TRACK command) will be applied when the unit is not in power down status.
2. Unit will not execute the $WP+PSM mode 4 and $WP+BATPSM mode simultaneously. It follows the $WP+PSM mode 4 setting when the back-up battery voltage level is higher than the set value, or follows the $WP+BATPSM setting when the voltage level is below the set value.

8.3 Returning Command Error List:

The error list will be indicating to "$ERR: Code number"

Error Code	Description
0	Unknown communication error
1	Invalid password
2	Invalid command parameters
3	GSM SMS base phone number or GPRS Server IP address not set
4	Unable to detect GSM signal
5	GSM Failed
6	Unable to establish the GPRS connection
7	Download process interrupted
8	Voice busy tone
9	SIM PIN Code Error
10	Unsupported PDU mode
11	Write_RQ_error
12	Read_RQ_error
13	Log_Write_error
14	Log_Read_error
15	Invalid event
21	Incorrect GPRS setting / SIM Card Not Activated

Notes:

1. All error codes can be appeared via USB port communication for inspection.
2. Error code 1, 2, and 7 could be sent back over the air communication.

8.4 CMS Error List:

Error Code	Description
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be actioned
161	Command unsupported
175	Unspecified TP-Command error

Error code	Description
176	TP DU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	D0 SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN necessary
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index

Error code	Description
322	Memory full
330	SMSC address unknown
331	No network service
332	Network timeout
500	Unknown error
512	SIM not ready
513	Unread records on SIM
514	CB error unknown
515	PS busy
516	Invalid length
517	SM BL not ready
528	Invalid (non-hex) char in PDU

8.5 CME Error List:

Error Code	Description
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	Invalid index
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network timeout
32	Network not allowed - emergency calls only
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Service provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
100	Unknown

Error Code	Description
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	Service option not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
148	Unspecified GPRS error
149	PDP authentication failure
150	Invalid mobile class

9. About NAVIXY:

Navixy provides advance solution for satellite tracking related solutions including the various components, Automatic Vehicle Location (AVL) device (data logger & real time tracking devices) and tracking platform. Please contact us at the phone and fax number list below or visit our website for further product information.

www.navixy.ru