NAVIXY

NAVIXY VT 300

Protocol Document

Version: 1.20

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Table of Content

1. Introduction to Navixy VT300 Protocol Document:

This document describes the protocol of the Navixy VT300 devices. This document is used for all communications information between the base station/controller center and the VT 300 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 VT300 as the devices.

2. Version History:

Version	Description	Supported Firmware Version
1.01	Initial commands	V200_1.001 or above
1.02	Added $WP+SETDR command Added $WP+DISEV command Added $WP+QBCLR command Added $WP+GSMINFO command Added $WP+GBLAC command Added $WP+SETBR command Added $WP+DCMSG command Added $WP+CDMSG command Added $WP+TIMER command Modified $WP+SIMID command Modified $WP+IMEI command Modified $WP+VER command	V200_1.002 or above
1.03	Modified “Track Basis” for $WP+TRACK and “Record Basis” for $WP+REC command	V200_1.003 or above
1.04	- Fixed incorrect [Mode] expression for the $WP+TRACK command - Fixed incorrect returning string for $WP+SETEVT command - Fixed incorrect returning string for $WP+SETDR command - Modified $WP+SETDR command	V200_1.007 or above

1.05	- Added $WP+SETVIP command - Modified $WP+SETEVT command	V200_1.012 or above
1.06	- Added ACC condition for entering/wake up from sleeping mode. (Document correction) - Added definition for detecting time for power low/lost/recover events. - Modified the Event ID table - Modified the command name of $WP+TIMER to $WP+TMRR - Modified the $WP+SETTOW command - Added $WP+SACC command - Added $WP+AVL command	V200_1.014 or above
1.07	- Modified the effective range for the parameters of $WP+SPD command - Added the $WP+SETAE command for analog function	V200_1.017 or above
1.08	- Added the $WP+MGBLAC command	V200_1.018 or above
1.09	- Opened $WP+SETAE command	V200_1.019 or above
1.10	-Added the $WP+RPHEAD command -Modified the $WP+SETEVT command -Modified the $WP+SETMILE command -Modified the $WP+SACC command	V200_1.020 or above
1.11	-Modified the $WP+OUTC command -Modified the $WP+PSM command -Modified the $WP+SETTOW command	V200_1.023 or above
1.12	-Modified the $WP+SETAE command -Modified the $WP+DCMSG command -Modified the $WP+CDMSG command -Modified the $WP+AVL command (Added last two parameters) -Modified the $PSM command (Illustration)	V200_1.025 or above
1.13	-Modified the $WP+SPD command (Add speeding mode)	V200_1.029 or above

1.14	-Modified the $WP+SPD command (Add Off-Speeding Duration)	V200_1.033 or above
1.15	-Modified the note of $WP+CDMSG command -Modified the $WP+VER command -Modified the $WP+PSM command(Notes)	V200_1.033 or above

3. Syntax of "$WP" Commands:

- In order to successfully communicate with VT300 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 VT300 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.
  - Serial Port: 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:

VT300 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, Analog port 1 status(input 1), Analog port 2 status (input 2), Output status, RFID TAG identification ,

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

Voltage level of Analog 1 : 0.00~30.00 V
Voltage level of Analog 2: 0.00~30.00 V

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

(Text message): Reserved for future used such as RFID or Barcode message.

Please Note:

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

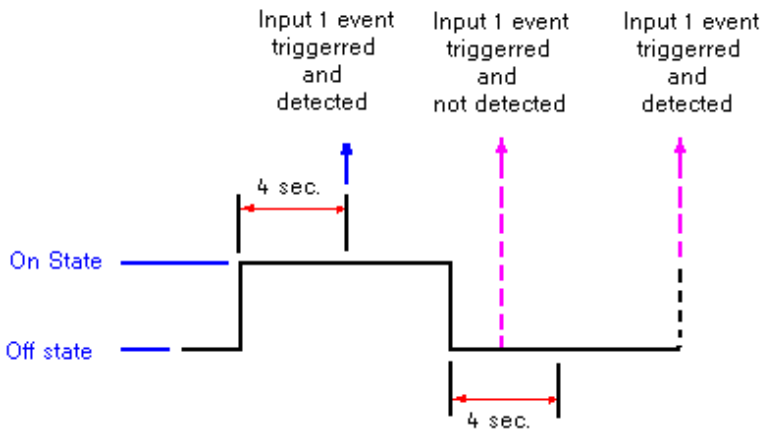
6. Command List of WP Commands:

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+PSM	Enable/disable “Power Saving Mode”
$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+SETAE	Set the analog 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	Execute this command to query GSM BTS location information
$WP+SETBR	Execute this command to set the baud rate for the serial port or GPS port
$WP+VWT	Activate Voice monitoring function
$WP+VER	Query the current firmware version.
$WP+NMEA	Enable/disable outputting GPS strings via serial port (NMEA-0183 format)
$WP+SPD	Enable/disable/read over-speed event
$WP+OUTC	Set 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+DCMSG	Send a message from the device to control center
$WP+CDMSG	Send a message from the control center to device.
$WP+SETTZ	Set the time zone information
$WP+RPHEAD	Enable/Disable to carry the header in returning message.

7. Command Description:

$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:  	

$WP+COMMTYPE

<table>
<tr><td>Description</td><td colspan="2">Execute this command to set the primary communication type and its related parameters.</td></tr>
<tr><td rowspan="2">Format</td><td>SMS Base Phone No. Write</td><td>$WP+COMMTYPE+[Tag]=[Password],[CommSelect],[SMS Base Phone No.],[CSD Base Phone No.],[GPRS_APN],[GPRS_Username],[GPRS_Password],[GPRS_Server_IP_Address],[GPRS_Server_Port],[GPRS_Keep_Alive Packet_Interval],[GPRS_DNS IP address]</td></tr>
<tr><td>Read</td><td>$WP+COMMTYPE+[Tag]=[Password],?</td></tr>
<tr><td>Response</td><td colspan="2">$OK:COMMTYPE=[CommSelect],[SMS Base Phone No.],[CSD Base Phone No.],[GPRS_APN],[GPRS_Username],[GPRS_Password],[GPRS_Server_IP_Address],[GPRS_Server_Port],[GPRS_Keep_Alive Packet_Interval],[GPRS_DNS IP address]</td></tr>
<tr><td>Error Response</td><td colspan="2">$ERR:COMMTYPE+[Tag]=[Error Code]
Please refer to appendix 8.2 for detailed error code descriptions.</td></tr>
<tr><td rowspan="3">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>CommSelect</td><td>Set primary communication type:
0. Serial Port communication (8 pin connector)
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 auto detection.</td></tr>
<tr><td></td><td>SMS Base Phone No.</td><td>Base phone number for the GSM SMS base station. Maximum length is 16 digits (could be ignored if uses GPRS communication).
Note: Please use “-” to clear the parameter.</td></tr>
</table>

	CSD Base Phone No.	Base phone number for the GSM Circuit Switched Data communication. Maximum length is 16 digits (could be ignored if uses GPRS communication)
	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. **Note**: Please use "" to clear the parameter.
	(Reserved)	
	GPRS_APN	Access Point Name for GPRS service (required for GPRS communication) The maximum length is 40 characters. Default setting: 168.95.1.1 **Note**: Please use "" to clear the parameter.
	GPRS_Username	User name for GPRS service if applicable. The maximum length is 20 characters. **Note**: Please use "" to clear the parameter.
	GPRS_Password	Password for GPRS service if applicable. The maximum length is 20 characters
	GPRS_Server_ IP_Address	Default setting: 0.0.0.0 1. Static IP address: format xxx.xxx.xxx.xxx (Please do not use virtual IP address) 2. Host/Domain Name (GPRS_DNS server must be defined) for the base station. The maximum length is 40 characters.
	GPRS_Server_ Port	The port IP of the computer which the control center software is operating. The available range is from 1000~65535. Default setting: 1000
	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.

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. The optimized Keep_Alive Packet interval needs to be tested in the local area in order to obtain the optimized interval (cost effective).

	7) 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
Keep_Alive_ID is the sequence number for the Keep_Alive message
Keep_Alive_Device ID is the device identification number. The base station could use this information to recognize the current holding dynamic IP for each device.

Ex:, received Synchronization message following:
0xD0 0xD7 0x1A 0x01 0xC7 0x54 0x44 0x3C
Keep_Alive_Header = 0xD7 0xD0
Keep_Alive_ID = 0x01 0x1A (Decimal = 282)
Keep_Device_ID = 0x3C 0x44 0x54 0xC7 (Decimal = 1011111111)

8) If the control center software is installed in a computer which is located in the "Intranet" then the parameter "GPRS_Server_IP" address should be the external one which connects to the router and the parameter "GPRS_Server_Port" should be the port number of the computer which is assigned by the router. If the parameter "GPRS_Server_IP" address is using "Virtual IP address" in the intranet then it will lead to the GPRS connection failure.
9) If the device is configured under GPRS mode (GPRS UDP/TCP), the device will send the acknowledgement for the receiving command or returning message back to the GMS SMS base phone number once the device receives the command from a GSM SMS phone number other than GSM SMS base phone number. If the GSM SMS base phone number is not set then the device will take the parameters but will not returning any message back to GSM SMS base phone number or GPRS server.

	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 close 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,(Analog input 1), (Analog input 2), Output status	
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: 2100000001,20070313170020,121.123456,12.654321,45,233,0,9,0,0.0,3,0.00,0.00,5	
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: 0. Serial port communication 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 210000001,20070313170020,121.123456,12.654321,0,233,0,9,2,0.0,0,0.00,0.00,0 210000001,20070313170025,121.123456,12.654321,0,233,0,9,2,0.0,0,0.00,0.00,0 210000001,20070313170030,121.123456,12.654321,0,233,0,9,2,0.0,0,0.00,0.00,0 210000001,20070313170035,121.123456,12.654321,0,233,0,9,2,0.0,0,0.00,0.00,0 210000001,20070313170040,121.123456,12.654321,0,233,0,9,2,0.0,0,0.00,0.00,0	
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:
$OK:DLREC=388(20070522074235~20070522074907)</td></tr>
<tr><td>Error Response</td><td colspan="2">$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 2000000001,20070830074922,121.648699,25.060560,0,159,0,5,1,0.0,0,0.00,0.00,0 2000000001,20070830074923,121.648699,25.060560,0,159,0,6,1,0.0,0,0.00,0.00,0 2000000001,20070830074924,121.648699,25.060560,0,159,0,6,1,0.0,0,0.00,0.00,0 2000000001,20070830074925,121.648699,25.060560,0,159,0,5,1,0.0,0,0.00,0.00,0 2000000001,20070830074926,121.648699,25.060560,0,159,0,5,1,0.0,0,0.00,0.00,0 2000000001,20070830074927,121.648699,25.060560,0,159,0,5,1,0.0,0,0.00,0.00,0 2000000001,20070830074928,121.648699,25.060560,0,159,0,5,1,0.0,0,0.00,0.00,0 $Download Completed

Notes

1) The downloading logs function is not available when the device is configured the GSM SMS communication.

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	

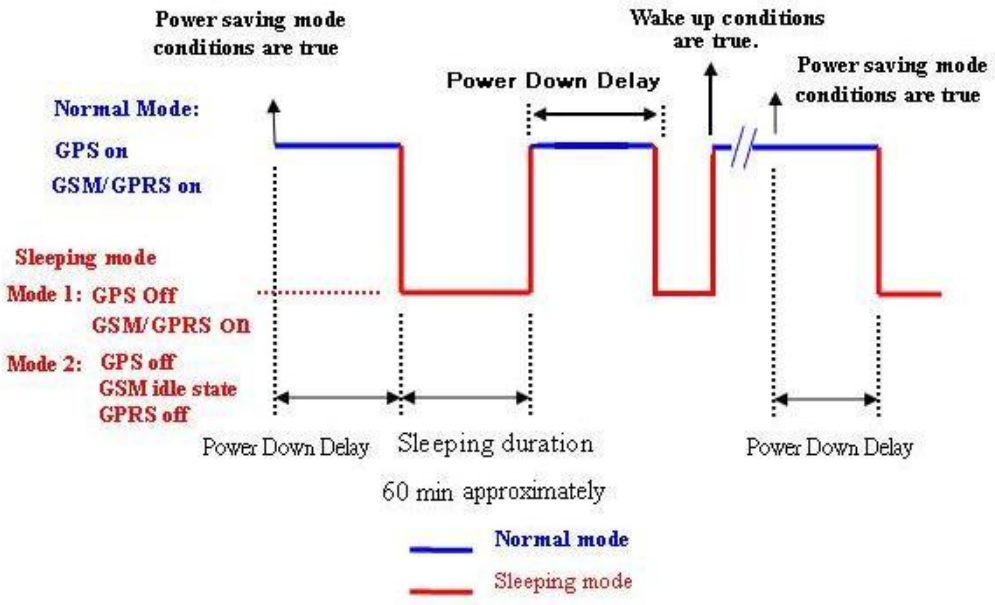
$WP+REBOOT		
Description	Execute this command to reboot the device. All setting will be remained.	
Format	$WP+REBOOT+[Tag]=[Password]	
Response	$OK:REBOOT+[Tag]	
Error Response	$ERR:REBOOT+[Tag]=[Error Code] *Please refer to appendix 8.2 for detailed error code descriptions.*	
Parameters	Tag	The tag 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 No. as password in order to reset the device successfully.	

$WP+PSM		
Description	Execute this command to enable the “Power Saving Function” of the device.	
Format	$WP+PSM+[Tag]=[Password],[Mode],[Power Down Delay],[Sleeping Mask]	
Response	$OK:PSM+[Tag]= [Mode],[Power Down Delay],[Sleeping Mask]	
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 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. GPS off; GSM on; GPRS on 2. GPS off; GSM on; GPRS off
	Power Down Delay	60~65535 seconds
	Sleeping Mask	0. a) Device 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) Device goes to sleeping mode regardless the execution of $WP+TRACK command b) Disable serial power supply (5V) during power down (sleeping) duration. 2. a) Device 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) Device goes to sleeping mode regardless the execution of $WP+TRACK command. b) Enable serial power supply (5V) during power down (sleeping) duration.
Example	Ex: Issue command: $WP+PSM=0000,1,120,1 Response: $OK:PSM=1,120,1	
Notes:	**1) Conditions for entering sleep mode (AND algorithm):** a) ACC/IG of vehicle is off b) No movement within "Power Down Delay" duration. c) No input is triggered within "Power Down Delay" seconds **2) Condition for device waking up (OR algorithm):** a) ACC on/IG of vehicle is on b) Movement detected c) Any input is triggered 3) As the device wakes up and completes the required task, it goes to sleeping mode according to the **"**Power Down Delay**"** interval if all conditions of "entering sleeping mode" remain true. 4) As "Sleeping Mask" is set to 0 and 2, the device will not go to sleeping mode until $WP+TRACK task is finished (disabled or completed).	

5) Please refer to the power saving mode diagram as following:



$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 Event ID: Input 1: Event ID 11 Input 2: Event ID 12 Input 3: Event ID 13 Input 4: Event ID 14 Main power low: Event ID 40 Main power lost: Event ID 41 Main power low recover: Event ID 42 Main power lost recover: Event ID 43 Internal backup battery low: Event ID 46 Internal backup battery low recover: Event 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 times],[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 times],[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 what 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 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
	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=105,1,20.145634,25.764956,500,2,1,0,0,0,0,0,0,0,0	

$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=1,11.50,13.00,5	

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. 4) As the $WP+SACC is enabled and ACC is on, the value 16 would be displayed in the input status in the returning message.

$WP+SETAE			
Description	Execute this command to set the analog input function. Once the input port has been used for the analog function, the digital input port detection function is disabled automatically.		
Format	Write	$WP+SETAE+[Tag]=[Password],[Analog port select],[Mode],[Action], [Minimum Voltage Level],[Maximum Voltage Level], [Duration], [Output Port],[Output Control]	
	Read	$WP+SETAE+[Tag]=[Password],[Analog port number]?	
Response	$OK:SETAE+[Tag]= [Analog port select],[Mode],[Action], [Minimum Voltage Level],[Maximum Voltage Level], [Duration],[Output Port], [Output Control]		
Error Response	$ERR:SETAE+[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”
	Analog Port select		1: Input 1 (Event ID 65) 2: Input 2 (Event ID 66)
	Mode		0. Disable 1. Event triggered when the voltage level of analog input is in the range of “Minimum Voltage Level” and “Maximum Voltage Level” for assigned time duration. 2. Event triggered when the voltage level is out the range of “Minimum Voltage Level” and “Maximum Voltage Level” for the assigned time duration

	Action	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.
	Minimum Voltage Level	0.00~30.00 volts
	Maximum Voltage Level	0.00~30.00 volts
	Duration	0~65535 seconds
	Output Port	0: Disable 1. Output 1 2. Output 2 3. Output 3 4. Output 4
	Output Control	0. Disable 1. Enable
Example	Issuing command: $WP+SETAE=0000,1,1,3,10.00,20.00,15,3,1 Response: $OK:SETAE=1,1,3,10.00,20.00,15,3,1	
Notes	1) If the input 1 or input 2 report is not disabled in the $WP+SETDR command then the default report might be triggered as well. 2) The analog port value will be attached in the returning string, please refer to the Chapter 5 of this document.	

$WP+AVL		
Description	Execute this command to correct the difference between the voltage reading of the device and the exact voltage level before device installation for the main power and analog port 1and 2. This action is suggested to be done after reset the device, uploading the firmware, or installing a new device (if the SACC command is used). Once the voltage is corrected then all related voltage level detection such as main power low/recover report, engine on/off report, etc would be based on this voltage reading.	
Format	Write	$WP+AVL+[Tag]=[Password],[Set/Query Current Voltage],[Corrected Voltage Level of Analog Input 1],[Corrected Voltage Level of Analog Input 2]
	Read	$WP+AVL+[Tag]=[Password],?
Response	$OK:AVL+[Tag]= [Current Voltage],[Voltage Level of Backup Battery], [Corrected Voltage Level of Analog Input 1],[Corrected Voltage Level of Analog Input 2]	
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”
	Corrected Voltage level	Effective range: 0.00~30.00V
	Corrected Voltage Level of Analog Input 1	Effective range: 0.00~30.00V
	Corrected Voltage Level of Analog Input 2	Effective range: 0.00~30.00V

Example	Ex: Issue command: $WP+AVL=0000,12.70,24.38,24.38 Response: $OK:AVL=12.70,4.02,24.38,24.38
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”, “$WP+DCMSG”, and “$WP+CDMSG” 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 event 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=0000,140 Response: $OK:CLEVT=140 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=87109834789209748618	

<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">$WP+GBLAC+[Tag]=[Password],?</td></tr>
<tr><td rowspan="6">Response</td><td>Command</td><td colspan="3">$OK: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=2000000001,20070831084000,0835,3088

<table>
<tr><th colspan="4">$WP+MGBLAC</th></tr>
<tr><td>Description</td><td colspan="3">Execute this command to query GSM BTS location information (up to 7 different Cell ID)</td></tr>
<tr><td rowspan="2">Format</td><td>Write</td><td colspan="2">$WP+MGBLAC+[Tag]=[Password],[Time],[Number of Times],[Basis],[CommSelect]</td></tr>
<tr><td>Read</td><td colspan="2">$WP+MGBLAC+[TAG]=[Password],?</td></tr>
<tr><td rowspan="10">Response</td><td colspan="3">$OK:MGBLAC+[Tag]= Device ID, Date/Time, Satellite, Input status, Analog 1, Analog 2, Output status, Cell ID info. (7 sets)</td></tr>
<tr><td rowspan="9">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: 0: Serial port communication **Note**: Support COM numbers: COM 1~ COM 199 auto detectable. 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

Examples	Ex 1: Issue command: $WP+MGBLAC=0000,30,3,0,4 Response: $OK:MGBLAC=30,3,0,4 Returning message: $MSG:MGBLAC=2000000001,20080129054210,0,0,0.00,0.00,0,4660920835A5B835 $MSG:MGBLAC=2000000001,20080129054240,0,0,0.00,0.00,0,4660920835A5B835 4660920835308822460920835E3D5134660920835000011 $MSG:MGBLAC=2000000001,20080129054210,0,0,0.00,0.00,0,4660920835A5B835 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+SETBR		
Description	Execute this command to set the baud rate for the serial port or GPS port	
Format	$WP+SETBR+[Tag]=[Password],[Baud Rate of Serial port], [Baud Rate of GPS port]	
Response	$OK:SETBR+[Tag]= [Baud Rate of Serial port], [Baud Rate of GPS port]	
Error Response	$ERR:SETBR+[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”
	Baud Rate of Serial port	Set the baud rate for the serial port, below is the available baud rate list: 2400, 4800,9600,19200,38400,57600,115200
	Baud rate of GPS port	Set the baud rate for the GPS port, below is the available baud rate list: 2400,4800, 9600,19200,38400,57600,115200
Example	Ex: Issue command: $WP+SETBR=0000,57600,4800 Response: $OK:SETBR=57600,4800	

$WP+VWT		
Description	Execute this command to enable voice wiretapping function. Once the device receives this command then it will call out to the assigned phone number automatically. The device will enable microphone and disable speaker function once the phone line is connected. Thus, the user's conversation will be monitored by the assigned phone number. This function will be disabled automatically once the phone line has been hung up.	
Format	$WP+VWT+[Tag]=[Password],[Phone number]	
Response	$OK:VWT+[Tag]=[Phone number]	
Error Response	$ERR:VWT+[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"
	Phone number	The specific phone number which the device will call out. This phone number supports the international phone calls.
Example	Ex: Issue command: $WP+VWT=0000,+886932400821 Response: $OK:VWT=+886932400821	

$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 Response: $MSG:VER=VT 300_1.001

$WP+NMEA		
Description	Execute this command to enable the output of the NMEA string through serial port. The NMEA format is “NMEA-0183” –$GPGGA, $GPGSA, $GPGSV, $GPRMC, and $GPVTG.	
Format	$WP+NMEA+[Tag]=[Enable/Disable]	
Response	$OK:NMEA+[Tag]	
Error Response	$ERR:NMEA+[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)
	[Enable/ Disable]	0. Disable 1. Enable
Example	Ex: Issue command (start outputting NMEA): $WP+NMEA=1 Response: $OK:NMEA $GPGGA,094307.000,2503.6251,N,12138.9153,E,1,10,1.0,169.9,M,15.3,M,,0000*56 $GPGSA,A,3,18,05,22,12,30,09,21,14,31,24,,,1.9,1.0,1.6*3B $GPRMC,094307.000,A,2503.6251,N,12138.9153,E,0.00,,110407,,,A*79 $GPGGA,094308.000,2503.6251,N,12138.9153,E,1,10,1.0,169.9,M,15.3,M,,0000*59 $GPGSA,A,3,18,05,22,12,30,09,21,14,31,24,,,1.9,1.0,1.6*3B $GPRMC,094308.000,A,2503.6251,N,12138.9153,E,0.00,,110407,,,A*76 $GPGGA,094309.000,2503.6251,N,12138.9153,E,1,10,1.0,169.9,M,15.3,M,,0000*58 $GPGSA,A,3,18,05,22,12,30,09,21,14,31,24,,,1.9,1.0,1.6*3B $GPRMC,094309.000,A,2503.6251,N,12138.9153,E,0.00,,110407,,,A*77 Issue command (stop outputting NMEA) $WP+NMEA=0 $OK:NMEA	
Note	1) While NMEA string is outputted via USB port of the device, the error message will not come out via USB port. Please disable output NMEA string before doing any diagnostic for the device.	

$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 is activated when the condition(s) of the event is true. 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	To define the times of the specific output port changing from

	Times	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	10~65535 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: 2010000001,20070313170020,121.123456,12.654321,45,233,0,9,0,**56734.4**,0,0.00,0.00,0 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	Write	$WP+TMRR+[Tag]=[Password],[Enable/Disable],[Timer 1],[Timer 2], [Timer 3]
	Read	$WP+TMRR+[Tag]=[Password],?
Response	$OK:TMRR+[Tag]= [Enable/Disable], [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 (at least one time should be set)
	Timer 1	Format: HHMMSS (Time format: 24 hours) Please use “” to clear parameter.
	Timer 2	Format: HHMMSS (Time format: 24 hours) Please use “” to clear parameter.
	Timer 3	Format: HHMMSS (Time format: 24 hours) Please use “” to clear parameter.
Example	Ex: Issue command: $WP+TMRR=0000,1,083000,””,163233 Response: $OK:TMRR=1, 083000,,163233	

$WP+DCMSG		
Description	Execute this command to send a text message from the device to the control center.	
Format	Write	$WP+DCMSG+[Tag]=Text Message
Response	$OK:DCMSG+[Tag]=Text Message	
Error Response	$ERR:DCMSG+[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)
	Text message	The maximum length for the text message is 330 chars
Example	Ex: Issue command: $WP+DCMSG=Hello world Response: $OK:DCMSG=Hello world	
Note	1) When the control center receives the message, the message format is following: $MSG: DCMSG=Device ID, date/time, text message.	

$WP+CDMSG		
Description	Execute this command to send a text message from the control center to the device.	
Format	Write	$WP+CDMSG+[Tag]=Text Message
Response	$OK:CDMSG+[Tag]=Text Message	
Error Response	$ERR:CDMSG+[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)
	Text message	The maximum length for the text message is 330 chars
Example	Ex: Issue command: $WP+CDMSG=Hello world Response: $OK:CDMSG=Hello world	
Note	1) When the device receives the message, it will be sent out via serial port and its string format is following: $MSG:CDMSG=Text message.	

$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	

$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, VT300 Response: $OK:RPHEAD=1, VT300 Read command: $WP+RPHEAD=0000,? Response: $OK:RPHEAD=1, VT300	
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.	

8. 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	
65	Analog 1 event (input 1)	$WP+SETAE	
66	Analog 2 event (input 2)	$WP+SETAE	
100~149	User defined event position	$WP+SETEVT	

8.2 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

Notes:

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

8.3 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

8.4 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