NAVIXY

NAVIXY SPT-10

Protocol Document

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Table of Content

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1. Introduction to NAVIXY SPT10 Protocol Document:

This document describes the protocol of the NAVIXY SPT10 devices. This document is used for all communications information between the base station/controller center and the SPT10 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 SPT10 as the devices.

2. Version History:

Version	Description	Supported Firmware Version	Supported Hardware Version
1.01	Initial commands	V0.001 or above	V7 or above
1.02	Added $WP+LOWBATT command	V0.007 or above	V7 or above
1.03	Modified $WP+SPD command	V0.008 or above	V7 or above
1.04	Added $WP+EMOV command Added $WP+VWT command	Siemens V4.000 Simcom V3.000	with internal microphone
1.05	Modified $WP+PSM command (Note-5)	Siemens V4.000 Simcom V3.000	with internal microphone

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3. Related Documents:

1. SPT10 User Manual.

4. Syntax of "$WP" Commands:

- In order to successfully communicate with SPT10 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:

  - Two 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>=<Pwd>,?<CR><LF>
  Returning acknowledgement:
  $OK:<Command>+<Tag>=<Para>,<Para>,<Para>,<Para>….<CR><LF>

  - 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.

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- 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 receiving 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.

5. Supported Communication Types:

The SPT10 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 (via USB communication port): Auto-adjustable baud rate.
- GSM SMS messages
- GSM CS Data (GSM Circuited Switch Data): ***(Reserved)***
- GPRS UDP: Static IP address is required for controller center software.
- GPRS TCP/IP: Static IP address is required for controller center.

Please note:

SPT10 currently does not support CDMA communication.

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6. Parameter Format for Returning Messages:

The returning position string includes a series parameters indicating as following:
Device ID, DateTime, Longitude, Latitude, Speed, Heading, Altitude, Satellite, Event ID, (Mileage)

Format for each returning messages:

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 is Reserved, currently showing '0'.

Satellite: 0~12

Event ID: xxx. Different event ID indicates different meaning of each returning message,
Please refer to appendix for detailed description.

(Mileage): the mileage value in kilometer. Can be appeared when the SETMILE function enable.

Please Note:

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

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7. Command List of WP Commands:

Command	Description
$WP+UNCFG	Set/Read device ID, Password, and PIN Code of the SIM card
$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+SETEVT	Enable (set)/disable/read user defined Geo-fencing event(s)
$WP+CLEVT	Clear the user defined Geo-Fencing event(s)
$WP+IMEI	Query the IMEI number of the internal GSM module
$WP+SIMID	Query the identification of the SIM card
$WP+TEST	Device hardware diagnostic function
$WP+VER	Query the current firmware version.
$WP+NMEA	Enable/disable outputting GPS strings via USB port (NMEA-0183 format)
$WP+SPD	Enable/disable/read over-speed event
$WP+EMSMS	Set the emergency contact number for sending emergency GSM SMS messages
$WP+SETTZ	Set the time zone information
$WP+SETMILE	Set/Reset/Query mileage
$WP+GSMINFO	Query the information about the GSM communication information
$WP+LOWBATT	Set/Read the internal battery low alert
$WP+EMOV	Enable/disable unauthorized movement
$WP+VWT	Activate Voice monitoring function (only for the hardware with internal microphone)

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8. Command Description:

$WP+UNCFG		
Description	Execute this command to configure the device ID, device password, and PIN code of the SIM card.	
Format	Write	$WP+UNCFG+[Tag]=[Password],[Device ID],[New Password],[PIN code]
	Read	$WP+UNCFG+[Tag]=[Password],?
Response	$OK:UNCFG+[Tag]= [Device ID],[New Password],[PIN code]	
Error Response	$ERR:UNCFG+[Tag]=[Error Code] *Please refer to appendix 9.2 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 1000000001 **Note**: The most left digit is reserved in which must be ‘1’.
	New Password	New password of the device
	PIN Code	The PIN code of the SIM card. The maximum length is 8 digits. 0: Disable
Example	Ex: Issue command: $WP+UNCFG=0000,1000000002, Response: $OK:UNCFG=1000000002,	
Note	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.	

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<table>
<tr><th colspan="3">$WP+COMMTYPE</th></tr>
<tr><td>Description</td><td colspan="2">Execute this command to set the primary communication type and its related parameters.</td></tr>
<tr><td rowspan="2">Format</td><td>Write</td><td>$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 9.2 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>CommSelect</td><td>Set primary communication type:
0: USB communication
<u>Note</u>:
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</td></tr>
<tr><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>

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	CSD Base Phone No. ***(Reserved)***	Base phone number for the GSM Circuit Switched Data communication. Maximum length is 16 digits (could be ignored if uses GPRS communication). **Note:** Please use “” to clear the parameter
	GPRS_APN	Access Point Name for GPRS service (required for GPRS communication) The maximum length is 40 characters. **Note:** Please use “” to clear the parameter
	GPRS_User name	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 **Note:** Please use “” to clear the parameter
	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.
	GPRS_DNS Server	Domain Name System IP address. Please contact local ISP for the IP address of DNS server. Please use the xxx.xxx.xxx.xxx as the format for this parameter. Default setting: 168.95.1.1

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Examples	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).

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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_Alive_DeviceID = 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.

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	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.

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$WP+ROAMING		
Description	Execute this command to enable/disable GPRS roaming function. This command does not affect GSM SMS roaming service. If GPRS roaming function is disabled, the device will automatically closed the GPRS session and all undelivered messages would be stored in the queue buffer. Those undelivered messages would be sent out whenever the device returns the non-GPRS roaming network.	
Format	Write	$WP+ROAMING+[Tag]=[Password],[Enable/Disable]
	Read	$WP+ROAMING+[Tag]=[Password],?
Response	$OK:ROAMING+[Tag]=[Enable/Disable]	
Error Response	$ERR:ROAMING+[Tag]=[Error Code] *Please refer to appendix 9.2 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	

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$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,	
Error Response	$ERR:GETLOCATION+[Tag]=[Error Code] *Please refer to appendix 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: 1010000001,20070313170020,121.123456,12.654321,45,233,0,9,0	
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.	

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$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 Interval],[Distance Interval],[Number of Times],[Track Basis],[CommSelect],[Heading]
	Read	$WP+TRACK+[Tag]=[Password],?
Response	$OK:TRACK+[Tag]= [Mode],[Time Interval],[Distance Interval],[Number of Times], [Track Basis],[CommSelect],[Heading]	
Error Response	$ERR:TRACK+[Tag]=[Error Code] *Please refer to appendix 9.2 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.

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		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.

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		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 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 the how many times left while the command is executing when we query the command parameters.
	Track Basis	0: Position information is sent only GPS signal available. 1: Position information is sent regardless the GPS signal reception
	CommSelect	Set the output communication channel: 0: USB 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
	Heading	The effective value is from 10~90 degrees.

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Example	Ex: Issue command: $WP+TRACK=0000,1,5,0,5,0,4,15 Response: $OK:TRACK=1,5,0,5,0,4,15 1010000001,20070313170020,121.123456,12.654321,0,233,0,9,2 1010000001,20070313170025,121.123456,12.654321,0,233,0,9,2 1010000001,20070313170030,121.123456,12.654321,0,233,0,9,2 1010000001,20070313170035,121.123456,12.654321,0,233,0,9,2 1010000001,20070313170040,121.123456,12.654321,0,233,0,9,2
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 set to 1 when the mode is set to 1,4, 6,and 9.

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$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 interval],[Distance Interval],[Number of Times],[Record Basis],[Heading]
	Read	$WP+REC+[Tag]=[Password],?
Response	$OK:REC+[Tag]= [Mode],[Time],[Distance],[Times],[Record basis],[Heading]	
Error Response	$ERR:REC+[Tag]=[Error Code] *Please refer to appendix 9.2 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 the vehicle application, suggest to set 50 meters or above for better performance.

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		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 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.

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		9. Heading **OR** Time **OR** Distance The position information is sent 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”.
	Record Basis	0: Position information is sent only GPS signal available. 1: Position information is sent regardless the GPS signal reception
	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) “Record Basis” parameter can be set to 1 when mode is set to 1,4,6,or 9.	

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$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]	
Error Response	$ERR:CLRREC+[Tag]=[Error Code] *Please refer to appendix 9.2 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	

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$WP+DLREC		
Description	Execute this command to download request logging data from the memory of the device	
Format	Write command	$WP+DLREC+[Tag]=[Password],[Start Date/Time],[End Date/Time]
	Read command	$WP+DLREC+[Tag]=0000,?
Response	For Write command: Command acknowledgement: $OK:DLREC+[Tag]=[Start Date/Time],[End Date/Time] Download task completes: $Download Completed	
	For Read command: $OK:DLREC=number of logs (start date~ end date) Ex: $OK:DLREC=388(20070522074235~20070522074907)	
Error Response	$ERR:DLREC+[Tag]=[Error Code] *Please refer to appendix 9.2 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”
	Start Date/Time	Format of this parameter: YYYYMMDDHHMMSS or ‘0’ (please refer to the “Note” section for detail)
	End Date/Time	Format of this parameter: YYYYMMDDHHMMSS or ‘0’ (please refer to the “Note” section for detail)

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<table>
<tr><td>Example</td><td>Ex:
Issue command:
$WP+DLREC=0000,0,0
Response:
$OK:DLREC=0,0
1010000001,20070313180520,121.123456,12.654321,45,233,0,8,1
1010000001,20070313181020,121.123456,12.654321,45,233,0,7,1
1010000001,20070313181520,121.123456,12.654321,45,233,0,8,1
1010000001,20070313182020,121.123456,12.654321,45,233,0,8,1
1010000001,20070313182520,121.123456,12.654321,45,233,0,8,1
1010000001,20070313183020,121.123456,12.654321,45,233,0,8,1
1010000001,20070313183520,121.123456,12.654321,45,233,0,8,1
$Download Completed</td></tr>
<tr><td>Notes</td><td>1) If the download process is interrupted by any insertion command/message then the error message “$ERR:7” is sent back to the base station.
2) This command does not support resume function.
3) The value ‘0’ can be used for both parameters “Start Date/Time” and “End Date/ Time”. The corresponding actions are following:
<table>
<tr><th>Start Date/Time</th><th>End Date/Time</th><th>Corresponding data will be downloaded</th></tr>
<tr><td>0</td><td>0</td><td>Get entire logging data from the flash memory</td></tr>
<tr><td>Start Date/Time</td><td>0</td><td>Download selective logging data from the “Start Date/Time” to the last logging data in the flash memory</td></tr>
<tr><td>0</td><td>End Date/Time</td><td>Download selective logging data from the first logging position data to the “End Date/Time” logging data</td></tr>
<tr><td>Start Date/Time</td><td>End Date/Time</td><td>Download selective logging data from the “Start Date/Time” to the “End Date/Time”</td></tr>
</table>
4) This command supports “Resume” function in the GPRS TCP/IP mode. The downloading task could be resumed once the GPRS connection is re-established.</td></tr>
</table>

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$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 9.2 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	
Note	1) Once the downloading process gets interrupted, the $ERR:7 message will be sent out to the base station.	

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$WP+REBOOT		
Description	Execute this command to reboot the device. All settings will be remained.	
Format	$WP+REBOOT+[Tag]=[Password]	
Response	$OK:REBOOT+[Tag]	
Error Response	$ERR:REBOOT+[Tag]=[Error Code] *Please refer to appendix 9.2 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.	

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$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 9.2 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+RESET=0000 Response: $OK:RESET	
Notes	1) The “Device ID” parameter 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 6 digits of IMEI No. as password in order to reset the device successfully.	

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$WP+PSM		
Description	Execute this command to enable the “Power Saving Function” of the device.	
Format	$WP+PSM+[Tag]=[Password],[Mode],[Power Down Delay Interval],[Sleeping Mode Mask],[Enable /Disable Sleeping Report]	
Response	$OK:PSM+[Tag]= [Mode],[Power Down Delay],[Sleeping Mask],[Enable /Disable Sleeping Report]	
Error Response	$ERR:PSM+[Tag]=[Error Code] *Please refer to appendix 9.2 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; G-sensor on 2. GPS off; GSM on; GPRS off; G-sensor on 3. GPS off, GSM on, GPRS off, G-sensor off
	Power Down Delay	60~65535 seconds
	Sleeping Mask	0: Device will not go to sleeping mode while the $WP+TRACK and $WP+REC command are executing. 1: Device goes to sleeping mode regardless the execution of $WP+TRACK and $WP+REC command
	Enable /Disable Sleeping Report	0: Disable - Device will not connect to the GPRS Server while it performs the task of “Update GPS ephemeris” every 60 minutes. - No “Entering-sleeping event (ID 37)” is sent. 1: - Device will connect to GPRS server while it performs the task of “Update GPS ephemeris” every 60 minutes. - No “Entering-sleeping event (ID 37)” is sent.

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		2: - Device will not connect to GPRS server while it performs the task of "Update GPS ephemeris" every 60 minutes. - An "Entering-sleeping event (ID 37)" is sent. 3. - Device will connect to GPRS server while it performs the task of "Update GPS ephemeris" every 60 minutes. - An "Entering-sleeping event (ID 37)" is sent.
Example	Ex: Issue command: $WP+PSM=0000,1,120,1,0 Response: $OK:PSM=1,120,1,0	
Notes	1) The device will periodically wake up to update the GPS ephemeris every 60 minutes after entering sleeping mode. 2) **Conditions for entering sleep mode (AND algorithm):** 1. No movement within "Power Down Delay" duration. 2. Not receive any command within "Power Down Delay" seconds 3. No button is pressed within "Power Down Delay" seconds 4. No undelivered messages exist 3) **Condition for device waking up (OR algorithm):** 1. Movement detected (Mode 1 and Mode 2) 2. Any button is pressed 3. Receive a command form GSM message (All Modes)or GPRS server (Mode 1) 4) If 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" remaining true. 5) If "Sleeping Mask 0" is selected, the device will not enter sleeping mode until the $WP+TRACK or $WP+REC command is disabled or finish execution.	

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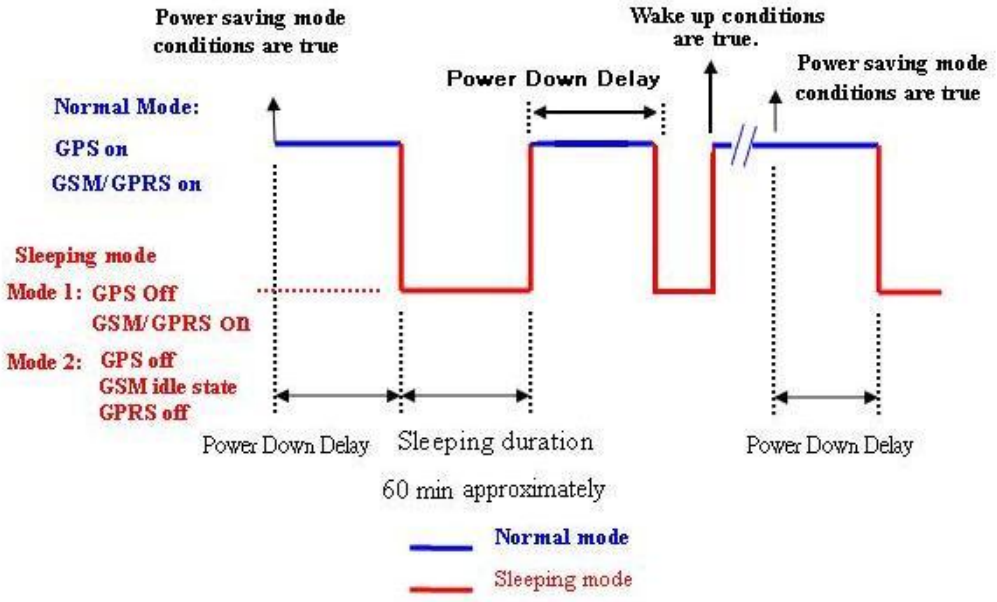
6) Please refer to the power saving mode diagram as following:



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$WP+SETEVT		
Description	Execute this command to set GEO-Fencing event	
Format	Write	$WP+SETEVT+[Tag]=[Password],[Event ID],[Enable/Disable],[Longitude],[Latitude],[Radius],[Zone Control],[Actions]
	Read	$WP+SETEVT+[Tag]=[Password],[Event ID],?
Response	$OK:SETEVT+[Tag]= [Event ID],[Enable/Disable],[Longitude],[Latitude],[Radius],[Zone Control],[Actions]	
Error Response:	$ERR:SETEVT+[Tag]=[Error Code] *Please refer to appendix 9.2 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 event. 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 50~99.
	Enable/ Disable	0: Disable 1: Enable
	Longitude	The longitude of the circle zone center point.
	Latitude	The latitude of the circle zone center point.
	Radius	The radius of the circle zone. The effective range is from 50 to 65535 meters.
	Zone Control	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.

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	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 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.
Examples	Ex 1: Issue command: $WP+SETEVT=0000,50,1,120.167453,28.649871,200,1,3 Response: $OK:SETEVT=50,1,120.167453,28.649871,200,1,3 Ex 2: Issue command: $WP+SETEVT=0000,51,? Response: $OK:SETEVT=51,1,20.145634,25.764956,500,2,1	

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$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 9.2 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 50~99. 255: clear all $WP+SETEVT settings.
Examples	Ex1: Issue command: $WP+CLEVT=0000,50 Response: $OK:CLEVT=50 Ex2: Issue command: $WP+CLEVT=0000,255 Response: $OK:CLEVT=255	

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$WP+IMEI		
Description	Execute this command to query the IMEI No. for the internal GSM module	
Format	$WP+IMEI+[Tag]=[Password]	
Response	$OK:IMEI+[Tag]=IMEI No.	
Error Response	$ERR:IMEI+[Tag]=[Error Code] *Please refer to appendix 9.2 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: $OK:IMEI=357258004284081	

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$WP+SIMID		
Description	Execute this command to query the identification number of the SIM card	
Format	$WP+SIMID+[Tag]=[Password]	
Response	$OK:SIMID+[Tag]=SIM card Identification No.	
Error Response	$ERR:SIMID+[Tag]=[Error Code] *Please refer to appendix 9.2 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: $OK:SIMID=87109834789209748618	

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<table>
<tr><th colspan="4">$WP+TEST</th></tr>
<tr><td>Description</td><td colspan="3">Execute this command to test major modules status and the voltage level of the device</td></tr>
<tr><td>Command Format</td><td>Write</td><td colspan="2">$WP+TEST+[Tag]=[Password]</td></tr>
<tr><td rowspan="3">Response</td><td colspan="3">$OK:TEST+[Tag]=[Status], [Voltage Level of internal battery]</td></tr>
<tr><td rowspan="2">Parameters</td><td>Status</td><td>0: No Error occurs.
1: GSM Error.
2. GPS Error</td></tr>
<tr><td>Voltage Level</td><td>The voltage level of the internal backup battery.</td></tr>
<tr><td>Error Response</td><td colspan="3">$ERR:TEST+[Tag]=[Error Code]
Please refer to appendix 9.2 for detailed error code descriptions.</td></tr>
<tr><td rowspan="2">Parameters</td><td>Tag</td><td colspan="2">The tag could consist of number or character string which can be defined by user. The returning message will include the same tag and it is helpful to recognize the acknowledgements with corresponding issued commands. This tag could be left as empty if it is not used. (Max. 5 characters)</td></tr>
<tr><td>Password</td><td colspan="2">Password of the device. Only correct password can access the device and change the configuration. The minimum length of character is 4 digits; maximum length of character is 10 digits. It supports numerical characters only. Default password is “0000”</td></tr>
<tr><td>Example</td><td colspan="3">Ex:
Issue command:
$WP+TEST+12345=0000
Response:
$OK:TEST+12345=3,3.9</td></tr>
<tr><td>Notes</td><td colspan="3">1) If the device connect to a computer by USB cable then the voltage level always shows 4.2V (approximate value)
2) In order to get actual voltage level of the interval backup battery, this command must be issued via remotely communication such as GSM/GPRS without the device connecting to a computer.</td></tr>
</table>

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$WP+VER		
Description	Execute this command to query the current firmware and hardware version of the device.	
Format	$WP+VER+[Tag]=[Password]	
Response	$OK:VER+[Tag]=firmware version, hardware version	
Error Response	$ERR:VER+[Tag]=[Error Code] *Please refer to appendix 9.2 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+VER=0000 Response: $OK:VER=1.001,3	

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<table>
<tr><th colspan="3">$WP+NMEA</th></tr>
<tr><td>Description</td><td colspan="2">Execute this command to enable the outputting the NMEA string through USB port. The NMEA format is “NMEA-0183” –$GPGGA, $GPGSA, $GPGSV, $GPRMC, and $GPVTG.</td></tr>
<tr><td>Format</td><td colspan="2">$WP+NMEA+[Tag]=[Password],[Enable/Disable]</td></tr>
<tr><td>Response</td><td colspan="2">$OK:NMEA+[Tag]</td></tr>
<tr><td>Error Response</td><td colspan="2">$ERR:NMEA+[Tag]=[Error Code]
Please refer to appendix 9.2 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>[Enable/ Disable]</td><td>0: Disable
1: Enable</td></tr>
<tr><td>Example</td><td colspan="2">Ex:
Issue command:
$WP+NMEA=0000,1
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
$WP+NMEA=0000,0
$OK:NMEA=0</td></tr>
</table>

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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 the NMEA string before doing any diagnostic for the device.

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$WP+SPD		
Description	Execute this command to enable the speeding event. If the vehicle speed is in the defined speeding range (between minimum and maximum speed) for the certain time period (Duration) then it will trigger the speeding event.	
Format	Write	$WP+SPD=[Password],[Mode],[Minimum Speed],[Maximum Speed],[Duration]
	Read	$WP+SPD+[Tag]=[Password],?
Response	$OK:SPD+[Tag]= [Mode],[Minimum Speed],[Maximum Speed],[Duration]	
Error Response	$ERR:SPD+[Tag]=[Error Code] *Please refer to appendix 9.2 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 and Polling
	Minimum Speed	Set Minimum Speed. Valid range: 0~255 km/hr.
	Maximum Speed	Set Maximum Speed. Valid range: 0~255 km/hr
	Duration	The parameter defined the time duration to activate the speeding event. For logging: 15~65535 seconds For polling: 15~65535 seconds For logging and polling: 15~65535 seconds.

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Example	Ex: Issue command: $WP+SPD=0000,3,100,200,15 Response: $OK:SPD=3,100,200,15

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$WP+EMSMS		
Description	Execute this command to set the emergency contact phone number up to 5 different numbers. Once the emergency button is pressed then the emergency GSM message will be sent to the pre-defined contact phone number. The receiving message format for the contact phone numbers please refer to the “Note” section.	
Format	Write	$WP+EMSMS+[Tag]=[Password],[SMS1],[SMS2],[SMS3],[SMS4],[SMS5],[EMSMS Mask]
	Read	$WP+EMSMS+[Tag]=[Password],?
Response	$OK:EMSMS+[Tag]=[SMS1],[SMS2],[SMS3],[SMS4],[SMS5],[EMSMS Mask]	
Error Response	$ERR:EMSMS+[Tag]=[Error Code] *Please refer to appendix 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”
	SMS 1	Set the emergency contact phone number 1
	SMS 2	Set the emergency contact phone number 2
	SMS 3	Set the emergency contact phone number 3
	SMS 4	Set the emergency contact phone number 4
	SMS 5	Set the emergency contact phone number 5
	EMSMS Mask	This setting is based on the bitwise operation. This parameter can specify which pre-defined contact phone number will receive the emergency SMS report. The bitwise definitions are following: 0: Disable 1: SMS 1 2: SMS 2

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		4: SMS 3 8: SMS 4 16: SMS 5 32: Send a message to Control Center (base on the primary communication type) 64: Store this event into the device memory. Ex: Set to '36' means control center will receive the string with event ID '4' and the phone number of SMS 3 will receive the SMS emergency messages when the emergency button (button 5) is pressed.
Examples	Ex1: Issue command: $WP+EMSMS=0000,+886123456789,0933733456,+886987654321,+886932400821 , +886910777777, 24 Response: $OK:EMSMS=+886123456789,0933733456,+886987654321,+886932400821, ,+886910777777,24 Ex2: Issue command: $WP+EMSMS=0000, +886123456789,0933733456,,,,,2 Response: $OK:EMSMS=+886123456789,0933733456,,,,,2	
Notes	1) If control center option is selected in the "EMSMS Mask" parameter then the control center server will receive the following string with event ID '**4**'. 1010000001,20070313170020,121.123456,12.654321,45,233,0,9,**4** 2) The format for the SMS message to contact phone number is following: Emergency Report Unit ID: 1XXXXXXXXX Date/Time: (YYYYMMDDHHMMSS) Lon:XXX.XXXXXX Lat: XXX.XXXXXX Speed: XXX Km/h Satellites: XX	

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$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 9.2 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	

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$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 9.2 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: Enable
	Mileage	Initial the mileage value (Km). Effective range is from 0~4294967.2
Example	Ex: Issue command: $WP+SETMILE=0000,1,2345.0 Response: $OK:SETMILE=1,2345.0	
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: 1010000001,20070313170020,121.123456,12.654321,45,233,0,9,0,**56734.4** 2) If the mileage reaches the maximum value then it returns to ‘0.0’ km. 3) If the SETMILE function is disabled, the parameter of mileage will be disappeared.	

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<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="9">Response</td><td colspan="4">$MSG:GSMINFO+[Tag]=[GSM Operator], [GSM signal strength], [GPRS status], [Roaming Status]</td></tr>
<tr><td rowspan="8">Parameters</td><td>GSM Operator</td><td colspan="2">Name of the Telecommunication corp.</td></tr>
<tr><td rowspan="7">GSM signal strength</td><td colspan="2">This parameter indicates the signal strength for GSM network. The closer the value approaches to 31, the stronger the signal is.</td></tr>
<tr><td>CSQ</td><td>dBm</td></tr>
<tr><td>0</td><td>-113dBm or less</td></tr>
<tr><td>1</td><td>-111dBm</td></tr>
<tr><td>2..30</td><td>-109…-53dBm</td></tr>
<tr><td>31</td><td>-51dBm or greater</td></tr>
<tr><td>99</td><td>not known or not detectable</td></tr>
<tr><td>GPRS Status</td><td colspan="2">0: GPRS is not connected
1: GPRS is connected</td></tr>
<tr><td>Roaming Status</td><td colspan="2">0: Currently is in home GSM/GPRS network.
1: Currently is in roaming GSM/GPRS network</td></tr>
<tr><td>Error Response</td><td colspan="4">$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>

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

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$WP+LOWBATT		
Description	Execute this command to enable/disable the internal battery low alert	
Format	Write	$WP+LOWBATT+[Tag]=[Password],[Mask]
	Read	$WP+LOWBATT+[Tag]=[Password],?
Response	$OK:LOWBATT+[Tag]= [Mask]	
Error Response	$ERR:LOWBATT+[Tag]=[Error Code] *Please refer to appendix 9.2 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”
	Mask	0: Disable 1: Logging 2: Polling 3: Logging+ Polling
Example	Ex: Issue command: $WP+LOWBATT=0000,3 Response: $OK:LOWBATT=3	
Notes	1) When the “Mask” sets to ‘1’, the device will send a “Low Battery” message with the Event ID 40 as the voltage level of interval battery is lower than 3.75V.	

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$WP+EMOV		
Description	Execute this command to set up the contact number for detecting unauthorized movement (Activated/deactivated by pressing the “SOS button” 3 times within 2 seconds). This command takes effect after 3 minutes of function activation. If this function has not been disabled after 1 minute of event triggering, the selected action will be executed. The receiving message format of the control center and contact phone numbers please refer to the “Note” section.	
Format	Write	$WP+EMOV+[Tag]=[Password],[SMS1],[SMS2],[SMS3],[SMS4],[SMS5],[EMOV Mask]
	Read	$WP+EMOV+[Tag]=[Password],?
Response	$OK:EMOV+[Tag]=[SMS1],[SMS2],[SMS3],[SMS4],[SMS5],[EMOV Mask]	
Error Response	$ERR:EMOV+[Tag]=[Error Code] *Please refer to appendix 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”
	SMS 1	Set the contact phone number 1, use “” to clear the parameter
	SMS 2	Set the contact phone number 2, use “” to clear the parameter
	SMS 3	Set the contact phone number 3, use “” to clear the parameter
	SMS 4	Set the contact phone number 4, use “” to clear the parameter
	SMS 5	Set the contact phone number 5, use “” to clear the parameter
	EMOV Mask	This setting is based on the bitwise operation. This parameter can specify which pre-defined phone number will receive the moving alert message. The bitwise definitions are following: 0: Disable 1: SMS 1

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		2: SMS 2 4: SMS 3 8: SMS 4 16: SMS 5 32. Send a message to Control Center (base on the primary communication type). 64: Store this event into the device memory. Ex: Set to '36' means control center will receive the string with event ID '5' and the phone number of SMS 3 will receive a SMS alert when the unauthorized movement alert is triggered.
Examples	Ex1: Issue command: $WP+EMOV=0000,+886123456789,0933733456,+886987654321,+886932400821, +886910777777,38 Response: $OK:EMOV=+886123456789,0933733456,+886987654321,+886932400821, +886910777777,38 Ex2: Issue command: $WP+EMOV=0000, +886123456789,0933733456,,,,1 Response: $OK:EMOV=+886123456789,0933733456,,,,1	
Notes	1) If control center option is selected in the "EMOV Mask" parameter then the control center server will receive the following string with event ID '**5**'. 1010000001,20070313170020,121.123456,12.654321,45,233,0,9,**5** 2) The format for the SMS message to contact phone number is following: Moving Alert Unit ID: 1XXXXXXXXX Date/Time: (YYYYMMDDHHMMSS) Lon:XXX.XXXXXX Lat: XXX.XXXXXX Speed: XXX Km/h Satellites: XX	

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	3) The “Moving Alert” event only sends one time once it is triggered, this function will be disabled automatically. If we need to enable the “Parking” function, then we need to re-enable the function by pressing the “SOS button” 3 times within 2 seconds.

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$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 9.2 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	
Note	1) If the device fails to establish the phone line (i.e. gets the "busy tone") for 5 times, the device will stop executing this function automatically.	

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9. Appendices:

9.1 Event ID Description:

Event ID	Description	Corresponding command	Remark
0	Position data	$WP+GETLOCATION	
1	Logging data	$WP+REC	
2	Track position data	$WP+TRACK	
3	Over speeding event	$WP+SPD	
4	Emergency contact number	$WP+EMSMS	
5	Unauthorized movement event	$WP+EMOV	
37	Entering-sleeping mode event	$WP+PSM	
40	Power low report	$WP+LOWBATT	
50~99	User defined event position	$WP+SETEVT	

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9.2 Returning Command Error List:

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

Error Code	Description
0	Unknown error
1	Incorrect password
2	Incorrect 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

Notes:

1. All error codes can be appeared via USB communication.
2. Error code 1, 2, or 3 could be sent back over the air communication or USB communication.
3. All error code will not be sent back to control center over GSM SMS communication even though the GSM SMS message is the primary communication type..

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9.3 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

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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
322	Memory full

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Error code	Description
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

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9.4 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

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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

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10. 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.

http://www.navixy.ru

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