

# CAREU Ux . Protocol Document

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## I. Introduction to CAREU U Series Protocol

This document describes the protocol of the CAREU U Series devices. The S&T proprietary messaging protocol is used for all communications between the base and the device. This protocol incorporates error checking, message sequencing with full acknowledgement of received messages on request. The base station sends messages to the device and waits for an acknowledgement message from the device to indicate the status of the request. So this guide covers all protocol information you need to design and set up AVL applications incorporating the CAREU U Series devices.







### III. Scope of the Document

This document presents the AT Command Set for the CAREU U Series devices.

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## IV. Documents Conventions

Convention	Description
< >	AT Request/Response Parameters are shown within the less than and greater than symbols.
[ ]	Optional parameters are shown between brackets. If optional parameters are not present, default values are used.
{ }	Represents a group of parameters defined elsewhere.
'''	Arguments omitted by consecutive comments are equivalent to a parameter not being specified, indicating that the default value be used.



**A. AT Command Request/Response**

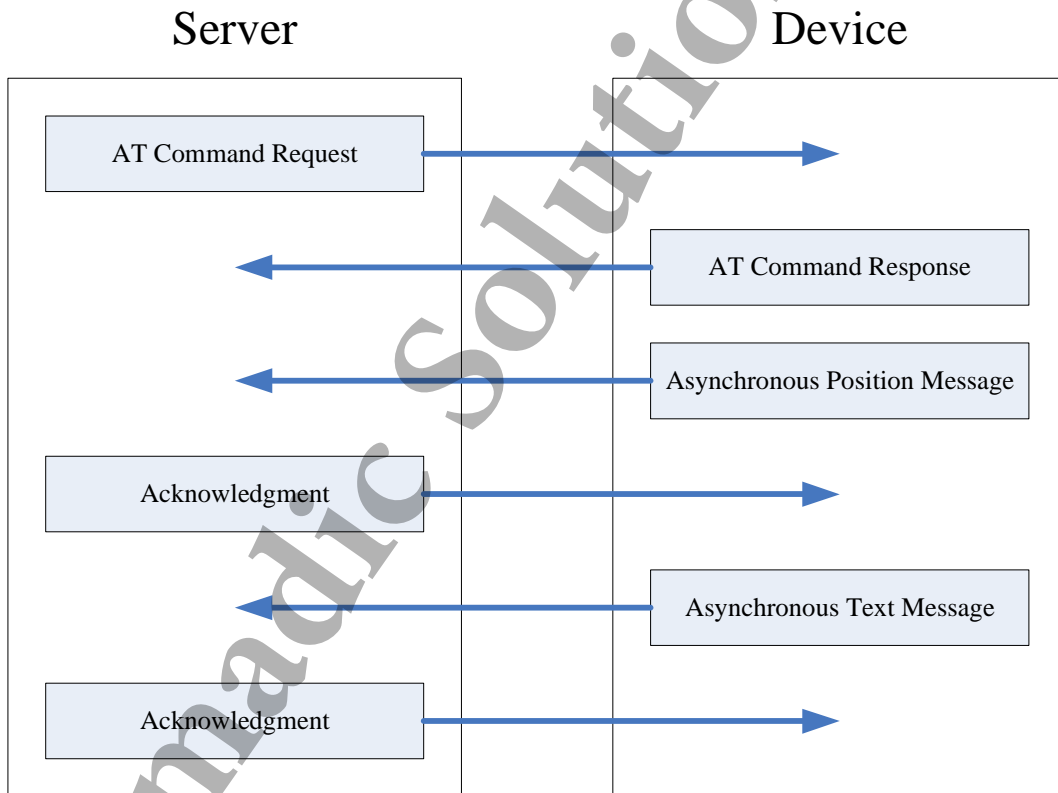
Each AT Command sent to the device shall be followed by a device response that may simply be the text "OK: command", "ERROR: command", or other response as specified in this requirements document.

**B. Request and Response Transitions**

Each AT command request send by the server to the device, there shall have a response from the device to the server. See the next section for the detailed message format.

Each Asynchronous message sent by the device to the host server via GPRS shall be followed by an acknowledgement as defined in the Message type section if use binary message format.

Each Asynchronous message sent by the device the SMS destination shall not be followed by an acknowledgement.





### C. Message Format

The request and response message format are different according to the [AT\\$FORMAT](#) command setting. The [AT\\$FORMAT](#) command can specify ASCII or Binary format for all messages. Please note that all binary message formats are described as **Big-endian**.

#### 1. AT Command Request Message Format

ASCII Format

Send AT command data directly without any other information.

Binary Format

Byte	Name	Size	Type	Description
0	Transaction ID	2	Unsigned Integer	16-bit transaction ID
2	Message Encoding	1	Unsigned Integer	0x01 – AT Command
3	Message Type	1	Unsigned Integer	0x00 – Request
4	Data Length	2	Unsigned Integer	Message data length
6	Message Data	Variable	Character String	AT Command Data

#### 2. AT Command Response Message Format

ASCII Format

Response AT Response Data directly without any other information.

Binary Format

Byte	Name	Size	Type	Description
0	Transaction ID	2	Unsigned Integer	16-bit transaction ID
2	Message Encoding	1	Unsigned Integer	0x01 – AT Command
3	Message Type	1	Unsigned Integer	0x01 – Response 0x04 – Error Response
4	Data Length	2	Unsigned Integer	Message data length
6	Message Data	Variable	Character String	AT Response Data



### 3. Asynchronous Position Message Format

ASCII Format

<Modem\_ID>,  
 <GPS\_DateTime>,<Longitude>,<Latitude>,<Speed>,<Direction>,<Altitude>,  
 <Satellites>,<Message ID>,<Input Status>,<Output Status>,<Analog  
 Input1>,<Reserved>,<RTC\_DateTime>,<Mileage>

Parameter	Format	Description
<Modem_ID>		Modem ID (See <a href="#">AT\$MODID</a> command)
<GPS DateTime>	YYYYMMDDhhmmss	The latest valid GPS date and time YYYY : Year position was received. MM : Month position was received. DD : Day position was received. Hh : Hour position was received. Mm : Minute position was received. Ss : Second position was received.
<Longitude>		Longitude in decimal degrees
<Latitude>		Latitude in decimal degrees
<Speed>		Speed in decimal kilometer per hour
<Direction>		Direction in decimal degrees
<Altitude>		Altitude in meters
<Satellites>		Number of Satellites
<Message ID>		See <a href="#">Message ID Table</a>
<Input Status>		Decimal value of Input Status (See <a href="#">I/O Status</a> Table Bit0..Bit7)
<Output Status>		Decimal value of Output Status (See <a href="#">I/O Status</a> Table Bit8..Bit15)
<Analog Input1>		Analog input 1 voltage
<Reserved>		Reserved
<RTC DateTime>	YYYYMMDDhhmmss	The RTC (Real Time Clock) date and time YYYY : Year position was received. MM : Month position was received. DD : Day position was received. Hh : Hour position was received. Mm : Minute position was received. Ss : Second position was received.
<Mileage>		Mileage accumulation



Binary Format

Byte	Name	Size	Type	Description
0	Transaction ID	2	Unsigned Integer	16-bit transaction ID
2	Message Encoding	1	Unsigned Integer	0x00 – Binary Position Data
3	Message Type	1	Unsigned Integer	0x02 – Asynchronous
4	Modem ID	8	Unsigned Integer	Modem ID or IMEI (64Bits)
12	Message ID	2	Unsigned Integer	See <a href="#">Message ID Table</a>
14	Data Length	2	Unsigned Integer	16-bit data length
16	GPS Hour	1	Unsigned Integer	0 to 23
17	GPS Minute	1	Unsigned Integer	0 to 59
18	GPS Seconds	1	Unsigned Integer	0 to 59
19	GPS Year	1	Unsigned Integer	0 to 99
20	GPS Month	1	Unsigned Integer	1 to 12
21	GPS Day	1	Unsigned Integer	1 to 31
22	Latitude	4	Signed Integer	0.00001 degree units
26	Longitude	4	Signed Integer	0.00001 degree units
30	Altitude	3	Signed Integer	Meters
33	Speed	2	Unsigned Integer	0.1 meters per second units
35	Direction	2	Unsigned Integer	0.1 degree units
37	Odometer	4	Unsigned Integer	Meters (See <a href="#">AT\$ODO</a> command)
41	HDOP	1	Unsigned Integer	0.1 units
42	Satellites	1	Unsigned Integer	Number of Satellites Used
43	I/O Status	2	Unsigned Integer	See <a href="#">I/O Status Table</a>
45	Vehicle Status	1	Bit Mask	See <a href="#">Vehicle Status Table</a>
46	Analog Input1	2	Unsigned Integer	0.001 voltage units
48	Reserved	2	Unsigned Integer	Reserved
50	RTC Hour	1	Unsigned Integer	0 to 23
51	RTC Minute	1	Unsigned Integer	0 to 59
52	RTC Seconds	1	Unsigned Integer	0 to 59
53	RTC Year	1	Unsigned Integer	0 to 99
54	RTC Month	1	Unsigned Integer	1 to 12
55	RTC Day	1	Unsigned Integer	1 to 31
56	Pos Sending Hour	1	Unsigned Integer	0 to 23
57	Pos Sending Minute	1	Unsigned Integer	0 to 59
58	Pos Sending Seconds	1	Unsigned Integer	0 to 59
59	Pos Sending Year	1	Unsigned Integer	0 to 99
60	Pos Sending Month	1	Unsigned Integer	1 to 12
61	Pos Sending Day	1	Unsigned Integer	1 to 31



#### 4. Acknowledgement

The acknowledge message for Binary format.

Byte	Name	Size	Type	Description
0	Transaction ID	2	Unsigned Integer	16-bit transaction ID
2	Message Encoding	1	Unsigned Integer	0x00 – Binary Data
3	Message Type	1	Unsigned Integer	0x03 – Acknowledge
4	Status Code	2	Unsigned Integer	0x0000 – Success 0x0001 – Error

The acknowledge message for ASCII format only used for Heartbeat.

Byte	Name	Size	Type	Description
0	Header1	1	Unsigned Integer	0xFA
1	Header2	1	Unsigned Integer	0xF8
2	Sequence ID	2	Unsigned Integer	0 to 65535
4	Modem ID	4	Unsigned Integer	See <a href="#">AT\$MODID</a> command



## 5. I/O Status Table

ASCII Format

Input Status

Bit	Description
0	Ignition Status
1	Input 1 Status
2	Input 2 Status

Output Status

Bit	Description
0	Output 1 Status
1	Output 2 Status

Binary Format

Bit	Description
0	Ignition Status
1	Input 1 Status
2	Input 2 Status
8	Output 1 Status
9	Output 2 Status

## 6. Vehicle Status Table

Binary Format

Bit	I/O Description
0	Engine
1	Motion





## 7. Heartbeat Message

### ASCII Format

Byte	Name	Size	Type	Description
0	Header1	1	Unsigned Integer	0xFA
1	Header2	1	Unsigned Integer	0xF8
2	Sequence ID	2	Unsigned Integer	0 to 65535
4	Modem ID	4	Unsigned Integer	See <a href="#">AT\$MODID</a> command

### Binary Format

Byte	Name	Size	Type	Description
0	Transaction ID	2	Unsigned Integer	16-bit transaction ID
2	Message Encoding	1	Unsigned Integer	0x00 – Binary Position Data
3	Message Type	1	Unsigned Integer	0x02 – Asynchronous
4	Modem ID	8	Unsigned Integer	Modem ID or IMEI (64Bits)
12	Message ID	2	Unsigned Integer	0xAB (Heartbeat Message ID)
14	Data Length	2	Unsigned Integer	16-bit data length (6)
16	RTC Hour	1	Unsigned Integer	0 to 23
17	RTC Minute	1	Unsigned Integer	0 to 59
18	RTC Seconds	1	Unsigned Integer	0 to 59
19	RTC Year	1	Unsigned Integer	0 to 99
20	RTC Month	1	Unsigned Integer	1 to 12
21	RTC Day	1	Unsigned Integer	1 to 31



8. Event Reserve Table

Byte		Size	Event Description	Command
62	Main / Ext Voltage	2	External Voltage in millivolt	AT\$EGN
62	GeoFence Index	1	1 to 50	AT\$GF
62	GF Speed Index	1	1 to 50	AT\$GFSP
62	Duration	2	Duration vehicle was idle mode in seconds.	AT\$IDLE
62	Maximum Speed	2	0.1 meters per second units	AT\$SPEED
64	Average Speed	2	0.1 meters per second units	
66	Duration	2	Duration device exceeded speed threshold in seconds.	
62	Main/Ext Voltage	2	External Voltage in millivolt	AT\$POWER
64	Battery Voltage	2	Battery Voltage in millivolt	
62	X-G Force	1		AT\$IMPDET
63	Y-G Force	1		
64	Z-G Force	1		



## V.AT Commands

The following shows all S&T proprietary AT command for CAREU U Series devices.

### A. System Communication Configurations

#### 1. To Define Unit ID to Device

AT\$MODID Modem ID	
<b>Description</b>	This command sets the Modem ID of the device. If the Modem ID is not set, the default Modem ID is IMEI number.
<b>Syntax</b>	<b>Write Command:</b> AT\$MODID=<Modem ID> <b>Read Command:</b> AT\$MODID?
<b>Parameters</b>	<Modem ID> Up to 20 digit modem ID. This number must be resolvable to a 64 bit unsigned integer. Note: for ASCII format, the maximum value allowed for MODID is 4294967295 (Decimal value) since ASCII heart beat Modem ID only allows 4 bytes.
<b>Return Value</b>	<b>Write Command:</b> OK : MODID <b>Read Command:</b> OK : MODID \$MODID=<Modem ID> <b>Error Response:</b> ERROR : MODID
<b>Example</b>	AT\$MODID=1010000001 OK : MODID AT\$MODID? OK : MODID \$MODID=1010000001
<b>Note</b>	



## 2. The SIMCARD Related Setting

AT\$PIN Set SIM PIN code	
<b>Description</b>	This command is used to set PIN code for the SIM card. When the device start to register to the cellular network, the device will send this PIN code to unlock the SIM card and start to register to the cellular network.
<b>Syntax</b>	<b>Write</b> Command: AT\$PIN=<PIN Code> <b>Read</b> Command: AT\$PIN?
<b>Parameters</b>	<PIN Code>      PIN code for the SIM Card. (Max 7 characters)
<b>Return Value</b>	<b>Write</b> Command: OK : PIN <b>Read</b> Command: OK : PIN \$PIN=<PIN Code> <b>Error</b> Response: ERROR : PIN
<b>Example</b>	AT\$PIN=0000 OK : PIN
<b>Note</b>	

AT\$PINEN PIN Code enable	
<b>Description</b>	This command is used to enable or disable PIN Code.
<b>Syntax</b>	<b>Write</b> Command: AT\$PINEN=<Option>
<b>Parameters</b>	<Option>      0 – Disable 1 – Enable
<b>Return Value</b>	<b>Write</b> Command: OK : PINEN <b>Error</b> Response: ERROR : PINEN
<b>Example</b>	AT\$PINEN=1 OK : PINEN
<b>Note</b>	AT\$PIN Can't be empty.



AT\$APN Access point name configuration	
<b>Description</b>	This command is used to set or query the device for its APN (Access Point Name) and authorization information for GPRS connection. The information is provided by GPRS service operator.
<b>Syntax</b>	<b>Write Command:</b> AT\$APN=<APN>,<User Name>,<Password> <b>Read Command:</b> AT\$APN?
<b>Parameters</b>	<APN> Access Point Name (Max 35 characters)
	<User Name> GPRS login user name (Max 30 characters)
	<Password> GPRS login password (Max 30 characters)
<b>Return Value</b>	<b>Write Command:</b> OK : APN <b>Read Command:</b> \$APN=<APN>,<User Name>,<Password> OK : APN <b>Error Response:</b> ERROR : APN
<b>Example</b>	AT\$APN=gprs.internet.com,user,pass OK : APN AT\$APN? OK : APN \$APN=gprs.internet.com,user,pass
<b>Note</b>	



3. To Define SMS Operation Priority

AT\$SMSDST SMS destination address	
<b>Description</b>	This command specifies the SMS Destination Address that shall be used to send alert data from the device via SMS.
<b>Syntax</b>	<b>Write</b> Command: AT\$SMSDST=<Address> <b>Read</b> Command: AT\$SMSDST?
<b>Parameters</b>	<Address>   Phone number or SMS short code (Max 20 characters)
<b>Return Value</b>	<b>Write</b> Command: OK : SMSDST <b>Read</b> Command: OK : SMSDST \$SMSDST=<Address> <b>Error</b> Response: ERROR : SMSDST
<b>Example</b>	AT\$SMSDST=+886123456789 OK : SMSDST  AT\$SMSDST? OK : SMSDST \$SMSDST=+886123456789
<b>Note</b>	1. SMSDST is set usually as the service center number. SMSDST number is the administrator number that device sends all SMS to confirm that a command sent to the unit via SMS was accepted by the unit, and the number the unit sends the data when tracking via SMS.





AT\$LSTLIMIT SMSLST AT command limits		
<b>Description</b>	This command is used to limit SMSLST phone number setting AT command.	
<b>Syntax</b>	<p><b>Write Command:</b>            AT\$LSTLIMIT=&lt;Network Configurations&gt;,&lt;System Configurations&gt;,&lt;Position and Device Status&gt;,&lt;Application Configurations&gt;,&lt;Alerts-1 Configurations&gt;,&lt;Alerts-2 Configurations&gt;,&lt;User Defined Report&gt;</p> <p><b>Read Command:</b>            AT\$ LSTLIMIT?</p>	
<b>Parameters</b>	< Network Configurations >	Enable or disable AT command related to network communication configurations. Refer to Network Configurations command table. (0~4294967295)
	< System Configurations >	Enable or disable AT command related to system configurations. Refer to System Configurations command table. (0~4294967295)
	< Position Status >	Enable or disable AT command related to position and device status. Refer to Position Status command table. (0~255)
	< App Configurations >	Enable or disable AT command related to application configurations. Refer to Application Configurations command table. (0~4294967295)
	<Alerts-1 Configurations>	Enable or disable AT command related to alerts configurations. Refer to Alerts-1 Configurations command table. (0~4294967295)
	<Alerts-2 Configurations>	Enable or disable AT command related to alerts configurations. Refer to Alerts-2 Configurations command table. (0~4294967295)
	<User Defined Report>	Enable or disable AT command related to user defined report configurations. Refer to User Defined Report command table. (0~255)
<b>Return Value</b>	<p><b>Write Command:</b>            OK : LSTLIMIT</p> <p><b>Read Command:</b>            OK : LSTLIMIT            \$LSTLIMIT=&lt;Network Configurations&gt;,&lt;System Configurations&gt;,&lt;Position and Device Status&gt;,&lt;Application Configurations&gt;,&lt;Alerts-1 Configurations&gt;,&lt;Alerts-2 Configurations&gt;,&lt;User Defined Report&gt;</p> <p><b>Error Response:</b>            ERROR : LSTLIMIT</p>	
<b>Example</b>	Enable AT\$OPLD, AT\$OUT, AT\$RFIDC,AT\$WIRETAP, and GP<n> command AT\$LSTLIMIT=0,0,8,4113,4096,0,0 OK : LSTLIMIT	





Network Configurations command table		
Bit	Value(Decimal)	AT Command name
0	1	MODID
1	2	HOSTS
2	4	DNS
3	8	IPTYPE
4	16	PIN
5	32	BAND
6	64	RETRY
7	128	NETCFG
8	256	GPRSEN
9	512	HB
10	1024	FORMAT
11	2048	IP
12	4096	APN
13	8192	SMSLST
14	16384	SMSDST
15	32768	Reserved
16	65536	Reserved
17	131072	LSTLIMIT
18	262144	COMM
19	524288	Reserved
20	1048576	PINEN
21	2097152	POL
22	4194304	POLC
23	8388608	SMSCFG

Note

System Configurations command table		
Bit	Value(Decimal)	AT Command name
0	1	Reserved
1	2	Reserved
2	4	SCHED
3	8	Reserved
4	16	REBOOT
5	32	RESET
6	64	GPSPT
7	128	FILTER
8	256	MSGQ
9	512	Reserved
10	1024	MSGQCL
11	2048	ODO
12	4096	PWRM
13	8192	LPRC
14	16384	Reserved
15	32768	Reserved
16	65536	VEXT
17	131072	VBAT
18	262144	VERSION
19	524288	QUST
20	1048576	IMEI
21	2097152	Reserved
22	4194304	Reserved
23	8388608	SMID
24	16777216	PKEY
25	33554432	OKEY



Position Status command table		
Bit	Value(Decimal)	AT Command name
0	1	PDSR
1	2	GETPDS
2	4	URL
3	8	GP
4	16	Reserved
5	32	Reserved

Application Configurations command table		
Bit	Value(Decimal)	AT Command name
0	1	OUT
1	2	Reserved
2	4	ICL
3	8	Reserved
4	16	Reserved
5	32	Reserved
6	64	Reserved
7	128	Reserved
8	256	Reserved
9	512	Reserved
10	1024	Reserved
11	2048	Reserved
12	4096	Reserved
13	8192	Reserved
14	16384	Reserved
15	32768	Reserved
16	65536	Reserved
17	131072	Reserved
18	262144	Reserved
19	524288	Reserved
20	1048576	Reserved
21	2097152	Reserved
22	4194304	Reserved
23	8388608	Reserved
24	16777216	Reserved
25	33554432	Reserved
26	67108864	Reserved
27	134217728	EXTRACFG
28	268435456	SMSOUT
29	536870912	Reserved
30	1073741824	Reserved
31	2147483648	Reserved



Alerts-1 Configurations command table		
Bit	Value(Decimal)	AT Command name
0	1	IGN
1	2	IGNEN
2	4	EGN
3	8	EGNEN
4	16	IN1
5	32	IN1EN
6	64	IN2
7	128	IN2EN
8	256	Reserved
9	512	Reserved
10	1024	SPEED
11	2048	SPEEDEN
12	4096	OPDL
13	8192	GF
14	16384	GFEN
15	32768	Reserved
16	65536	GFSP
17	131072	POWER
18	262144	POWEREN
19	524288	Reserved
20	1048576	GPSMON
21	2097152	GPSALEN
22	4194304	MOTDET
23	8388608	MOTEN
24	16777216	IMPDET
25	33554432	IMPEN
26	67108864	IDLE
27	134217728	IDLEEN
28	268435456	Reserved
29	536870912	Reserved
30	1073741824	SSAD
31	2147483648	SSADEN

Alerts-2 Configurations command table		
Bit	Value(Decimal)	AT Command name
0	1	Reserved
1	2	SPARM
2	4	Reserved
3	8	Reserved
4	16	TOW
5	32	TOWEN
6	64	Reserved
7	128	Reserved
8	256	HAD
9	512	HADEN

User Defined Report command table		
Bit	Value(Decimal)	AT Command name
0	1	Reserved
1	2	REPORT
2	4	Reserved



AT\$SMSCFG SMS report format configure		
<b>Description</b>	This command is used to set user defined report format for SMSLST and format for ICL phone number to get the current position.	
<b>Syntax</b>	<b>Write Command:</b> AT\$SMSCFG=< Text SMS Format >,< Google Map Link Format > , < Wap Push Format >,< Reserved >,< Standard Asynchronous Position Message Format > <b>Read Command:</b> AT\$ SMSCFG?	
<b>Parameters</b>	< Text SMS Format >	Please enable the phone number index in selected report format.
	< Google Map Link Format >	This is a 2-byte value for phone number bits.
	< Wap Push Format >	Bit0 – Index 1 of incoming call list phone number.
	< Reserved >	Bit1 – Index 2 of incoming call list phone number.
	< Standard Asynchronous Position Message Format >	Bit2 – Index 3 of incoming call list phone number. Bit3 – Index 4 of incoming call list phone number. Bit4 – Index 5 of incoming call list phone number. Bit5 – Index 6 of incoming call list phone number. Bit6 – Index 7 of incoming call list phone number. Bit7 – Reserved Bit8 – Index 1 of SMSLST list phone number. Bit9 – Index 2 of SMSLST list phone number. Bit10 – Index 3 of SMSLST list phone number. Bit11 – Index 4 of SMSLST list phone number.
<b>Return Value</b>	<b>Write Command:</b> OK : SMSCFG <b>Read Command:</b> OK : SMSCFG \$SMSCFG =< Text SMS Format >,< Google Map Link Format > , < Wap Push Format >,< Reserved >,< Standard Asynchronous Position Message Format > <b>Error Response:</b> ERROR : SMSCFG	
<b>Example</b>	AT\$SMSCFG=1,6,8,0,256 OK : SMSCFG AT\$ SMSCFG? OK : SMSCFG \$SMSCFG=1,6,8,0,256	
<b>Note</b>		



AT\$IICL Incoming call List		
<b>Description</b>	This command is to define the phone numbers of incoming call which are allowed to get the current position.	
<b>Syntax</b>	<b>Write Command:</b> AT\$IICL=<index>,<phone number> <b>Read Command:</b> AT\$IICL?	
<b>Parameters</b>	<index>	1-7: the index of the list.
	<phone number>	Phone number to be stored. (Max 20 characters)
<b>Return Value</b>	<b>Write Command:</b> OK : ICL <b>Read Command:</b> \$IICL=<index>,<phone number> ..... <index>,<phone number> OK : ICL <b>Error Response:</b> ERROR : ICL	
<b>Example</b>	AT\$IICL=1,0988123456 OK : ICL	



4. To Setup a GPRS communication

AT\$GPRSEN GPRS connection enable	
<b>Description</b>	This command determines whether or not to use GPRS or SMS when transmitting asynchronous alert messages. If GPRSEN is set to 0, then only SMS will be used. If GPRSEN is set to 1, then GPRS & SMS will be used.
<b>Syntax</b>	<b>Write Command:</b> AT\$GPRSEN=<Option>,<GPRS_TX_SEQ> <b>Read Command:</b> AT\$GPRSEN?
<b>Parameters</b>	<Option> 0 – SMS 1 – GPRS & SMS
	<GPRS_TX_SEQ> GPRS data report sequence 0 – New tracking and alert will be first priority to report 1 – First in first out
<b>Return Value</b>	<b>Write Command:</b> OK : GPRSEN <b>Read Command:</b> OK : GPRSEN \$GPRSEN=<Option> <b>Error Response:</b> ERROR : GPRSEN
<b>Example</b>	AT\$GPRSEN=1,0 OK : GPRSEN AT\$GPRSEN? OK : GPRSEN \$GPRSEN=1,0
<b>Note</b>	



AT\$HOSTS Host IP addresses used for GPRS communications		
<b>Description</b>	Up to 10 host IP addresses may be defined for TCP/UDP connection. The server host with the lowest index number is of the highest priority for establishing a TCP/UDP connection. The host connection will be changed to the next host index when GPRS fail to send messages after each retry. (Refer to <a href="#">AT\$RETRY</a> command)	
<b>Syntax</b>	<b>Write Command:</b> AT\$HOSTS=<Index>,<FQDN>,<Host Address>,<Port> <b>Read Command:</b> AT\$HOSTS?	
<b>Parameters</b>	<Index>	Index of Host in List (1~10)
	<FQDN>	Specify if the Host Address is in IP or FQDN format 0 – Specify IP address as the Host Address 1 – Specify FQDN (e.q. systech.com.tw) as the Host Address
	<Host Address>	IP address of the host
	<Port>	TCP/UDP port (0 ~65535)
<b>Return Value</b>	<b>Write Command:</b> OK : HOSTS <b>Read Command:</b> \$HOSTS=1,<FQDN>,<Host Address>,<Port> . . . \$HOSTS=10,<FQDN>,<Host Address>,<Port> OK : HOSTS <b>Error Response:</b> ERROR : HOSTS	
<b>Example</b>	AT\$HOSTS=1,0,123.45.67.89,5000 OK : HOSTS  AT\$HOSTS? OK : HOSTS \$HOSTS=1,0,123.45.67.89,5000 \$HOSTS=2,1,systech.com.tw,6000 \$HOSTS=3,0.0.0.0,0 \$HOSTS=4,0.0.0.0,0 \$HOSTS=5,0.0.0.0,0 \$HOSTS=6,0.0.0.0,0 \$HOSTS=7,0.0.0.0,0 \$HOSTS=8,0.0.0.0,0 \$HOSTS=9,0.0.0.0,0 \$HOSTS=10,0.0.0.0,0	
<b>Note</b>		



AT\$IPTYPE GPRS TCP/UDP packet type selection	
<b>Description</b>	This command specifies the GPRS IP type used for host communication.
<b>Syntax</b>	<b>Write Command:</b> AT\$IPTYPE=<Type> <b>Read Command:</b> AT\$IPTYPE?
<b>Parameters</b>	<Type>      0 – UDP 1 – TCP
<b>Return Value</b>	<b>Write Command:</b> OK : IPTYPE <b>Read Command:</b> OK : IPTYPE \$IPTYPE=<Type> <b>Error Response:</b> ERROR : IPTYPE
<b>Example</b>	AT\$IPTYPE=1 OK : IPTYPE  AT\$IPTYPE? OK : IPTYPE \$IPTYPE=1
<b>Note</b>	Please reboot device after change IPTYPE.





AT\$BAND Initial frequency band connection attempt	
<b>Description</b>	This command is used to set the initial trying frequency band.
<b>Syntax</b>	<b>Write</b> Command: AT\$BAND=<Band Option> <b>Read</b> Command: AT\$BAND?
<b>Parameters</b>	<Band Option> 0 – GSM Modem Auto Search 1 – 850/1900 as searched band 2 – 900/1800 as searched band
<b>Return Value</b>	<b>Write</b> Command: OK : BAND <b>Read</b> Command: OK : BAND \$BAND=<Band Option> <b>Error</b> Response: ERROR : BAND
<b>Example</b>	AT\$BAND=2 OK : BAND



AT\$POL Preferred Operator List		
<b>Description</b>	This command is used to set or query up to preferred operator list. When network under roaming mode, the device will select the priority operator from this list to register.	
<b>Syntax</b>	<b>Write Command:</b> AT\$POL=<Index>,<Mode>,<MCC>,<MNC> <b>Read Command:</b> AT\$POL?	
<b>Parameters</b>	<Index>	Index of priority operator (1 to 20)
	<Mode>	0 : if not found preferred operator not connect to GPRS. 1 : if not found preferred operator still using the current operator connect to GPRS. Each MCC can set different mode.
	<MCC>	Mobile Country Code
	<MNC>	Mobile Network Code
<b>Return Value</b>	<b>Write Command:</b> OK:POL <b>Read Command:</b> OK:POL \$POL=<1>,<Mode>,<MCC>,<MNC> \$POL=<2>,<Mode>,<MCC>,<MNC> ... \$POL=<20>,<Mode>,<MCC>,<MNC> <b>Error Response:</b> ERROR:POL	
<b>Example</b>	AT\$POL=1,1,466,97 OK:POL  AT\$POL? OK:POL \$POL=1,1,466,97 \$POL=2,0,, \$POL=20,0,,	
<b>Note</b>		



AT\$POLC Preferred Operator List Configuration	
<b>Description</b>	This command is used to set or query to preferred operator list configuration.
<b>Syntax</b>	<b>Write Command:</b> AT\$POLC=<Enable>,< Option >,< Time Interval > <b>Read Command:</b> AT\$POLC?
<b>Parameters</b>	< Enable > 0 : Disable POL Function. 1 : Enable POL Function.
	< Option> 0 : Disable GPRS connection when network under the roaming mode of which the current MCC not is included in POL list. 1 : Enable GPRS connection when network under the roaming mode of which the current MCC not is included in POL list.
	< Time Interval > 0 ~ 65535(s) Time interval of re-search POL, when network under roaming mode but the configuration doesn't allow GPRS connection.
<b>Return Value</b>	<b>Write Command:</b> OK:POLC <b>Read Command:</b> OK:POLC <b>Error Response:</b> ERROR:POLC
<b>Example</b>	AT\$POLC=1,1,600 OK:POLC  AT\$POLC? OK:POLC \$POLC=1,1,600
<b>Note</b>	



AT\$GSMJDC GSM Jamming Detection Control		
<b>Description</b>	This command is used to set/query GSM jamming detection control configuration.	
<b>Syntax</b>	<b>Write Command:</b> AT\$GSMJDC=<Enable>,<Min numbers of carriers>,<Rxlev threshold>,<Action>,<Output ID>	
<b>Parameters</b>	<Enable>	0 – Disable 1 – Enable
	<Min numbers of carriers>	Numbers of minimum disturbing carriers (1 – 255)
	<Rxlev threshold>	Power level threshold (3 – 63)
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for the future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 4 – Output Control When an RFID reader senses the tag, the specific output port would be enabled.
	<Output ID>	Output ID 1 – Output 1 2 – Output 2
<b>Return Value</b>	<b>Write Command:</b> OK : GSMJDC <b>Read Command:</b> OK : GSMJDC \$GSMJDC=<Enable>,<Min numbers of carriers>,<Rxlev threshold> ,<Action> ,<Output ID> <b>Error Response:</b> ERROR : GSMJDC	
<b>Example</b>	AT\$GSMJDC=1,10,20,7,2 OK : GSMJDC	
<b>Note</b>		



## 5. The Configuration of Data Format, and Data Sending Algorithm

AT\$FORMAT Message format setting	
<b>Description</b>	This command is used to set all communication message formats. Please refer to Message Format for detailed ASCII and Binary message format.
<b>Syntax</b>	<b>Write Command:</b> AT\$FORMAT=<Format> <b>Read Command:</b> AT\$FORMAT?
<b>Parameters</b>	<Format> 0 – ASCII format (IntelliTrac X Series format) 1 – Binary format
<b>Return Value</b>	<b>Write Command:</b> OK : FORMAT <b>Read Command:</b> OK : FORMAT \$FORMAT=<Format> <b>Error Response:</b> ERROR : FORMAT
<b>Example</b>	AT\$FORMAT=0 OK : FORMAT  AT\$FORMAT? OK : FORMAT \$FORMAT=0
<b>Note</b>	



AT\$HB Heartbeat settings	
<b>Description</b>	This command is used to enable/disable Heartbeat message to help maintain the GPRS session between the device and the server. The heartbeat message format is different according to the <a href="#">AT\$FORMAT</a> command setting. Please refer to <a href="#">Heartbeat Message Format</a> for detailed message format.
<b>Syntax</b>	<b>Write</b> Command: AT\$HB=<Period>,<Reserved> <b>Read</b> Command: AT\$HB?
<b>Parameters</b>	<Period> Time Period in seconds between Heartbeats transmits. Setting the Period to 0 disables the Heartbeat. First heartbeat will be sent when the time after the last communications from the device exceeds the specified period of time. 0 - Disable (1 – 65535)
	<Reserved>
<b>Return Value</b>	<b>Write</b> Command: OK : HB <b>Read</b> Command: OK : HB \$HB=<Period>,<Reserved> <b>Error</b> Response: ERROR : HB
<b>Example</b>	AT\$HB=60,0 OK : HB AT\$HB? OK : HB \$HB=60,0
<b>Note</b>	First message sent to server is always the heart beat (HB) message. Server must ACK (acknowledge) heart beat message back to U1 for unit to start send tracking data. Even when setting AT\$HB=0,0 U1 will send first message as heart beat and server must ACK to this heart beat message, just to let U1 know that it is sending data to the correct server. Heart Beat message serves as a first handshake to let U1 know that it is communicating with the correct server; it is also used to keep session alive with server. Please note that timer of heartbeat will addition 4 sec if you enable heartbeat.



AT\$RETRY		Retry settings for communications with host server	
<b>Description</b>	This command defines the number of retries and time between each retry when sending a message to a Host Server. The device shall wait for the appropriate acknowledgement/response from the host after sending a message.		
<b>Syntax</b>	<b>Write</b> Command: AT\$RETRY=<Max Retries>,<Retry Interval> <b>Read</b> Command: AT\$RETRY?		
<b>Parameters</b>	<Max Retries>	Maximum number of retries for each server. (1~255)	
	<Retry Interval>	Time in seconds between each retry. (1~255)	
<b>Return Value</b>	<b>Write</b> Command: OK : RETRY <b>Read</b> Command: OK : RETRY \$RETRY=<Max Retries>,<Retry Interval> <b>Error</b> Response: ERROR : RETRY		
<b>Example</b>	AT\$RETRY=2,30 OK : RETRY  AT\$RETRY? OK : RETRY \$RETRY=2,30		
<b>Note</b>			



AT\$NETCFG Roaming Network configuration	
<b>Description</b>	This command is used to set/query specific property of the communication network.
<b>Syntax</b>	<b>Write</b> Command: AT\$NETCFG=<Roaming Allowed>,<SMS/GPRS Auto switch>,<Reduce Tracking> <b>Read</b> Command: AT\$NETCFG?
<b>Parameters</b>	<Roaming Allowed> 0 – All communication allowed under roaming mode 1 – Only SMS allowed under roaming mode 2 – Only GPRS allowed under roaming mode 3 – No communication allowed under roaming mode
	<SMS/GPRS Auto switch> 0 – Disable auto switch 1 – Auto switch between SMS and GPRS reporting when GPRS network is available or not.
	<Reduce Tracking> 0 – Disable 1 ~ 255 – Time multiplier When roaming, the real time tracking report will follow the time interval of PDSR times <Reduce Tracking>.
<b>Return Value</b>	<b>Write</b> Command: OK : NETCFG <b>Read</b> Command: OK : NETCFG \$NETCFG=<Roaming Allowed>,<SMS/GPRS Auto switch>,<Reduce Tracking> <b>Error</b> Response: ERROR : NETCFG
<b>Example</b>	AT\$NETCFG=1,1,10 OK : NETCFG
<b>Note</b>	





## B. System Operation Related Configurations

### 1. The Related Settings of System Operation

AT\$SCHED		Schedule configuration
<b>Description</b>	Up to 8 schedules may be defined on a device. The scheduled time indicates when the function associated with the schedule will be enabled. All times outside the schedule indicated that an associated function will be disabled. Please note that all times specified in schedules are GMT based.	
<b>Syntax</b>	<b>Write Command:</b> AT\$SCHED=<Index>,<Start Time>,<Duration>,<Days> <b>Read Command:</b> AT\$SCHED? Or AT\$SCHED=<Index>	
<b>Parameters</b>	<Index>	Schedule Index (1 – 8)
	<Start Time>	Start Time of the schedule in minutes from midnight. (0 is midnight) (1 ~ 1439)
	<Duration>	Duration of schedule in minutes (0 means no schedule configured) (1 ~ 1439)
	<Days>	0 – All days Bit 0 – Monday Bit 1 – Tuesday Bit 2 – Wednesday Bit 3 – Thursday Bit 4 – Friday Bit 5 – Saturday Bit 6 – Sunday Bit 7 – Reserved
<b>Return Value</b>	<b>Write Command:</b> OK : SCHED <b>Read Command:</b> OK : SCHED \$SCHED=<Index>,<Start Time><Duration>,<Days> Or OK : SCHED \$SCHED=<1>,<Start Time><Duration>,<Days> . . \$SCHED=<8>,<Start Time><Duration>,<Days> <b>Error Response:</b> ERROR : SCHED	
<b>Example</b>	Ex: Setting schedule1 start from every Tuesday PM 18:00 to Wednesday AM 6:00. AT\$SCHED=1,1080,720,2 OK : SCHED	



AT\$FILTER		GPS data filtering settings
<b>Description</b>	This command is used to minimize erroneous GPS points and events. The AT\$FILTER command does not filter out "event" notifications that do not depend on GPS data such as ignition on/off alerts. If at the time of the event there is no GPS data available, then the event will send the Invalid GPS encoding format (zero for all values).	
<b>Syntax</b>	<b>Write Command:</b> AT\$FILTER=<Min Satellites>,<Max Speed>,< Reserved >,<Reserved> <b>Read Command:</b> AT\$FILTER?	
<b>Parameters</b>	<Min Satellites>	Minimum number of satellites required for a valid GPS position. If the satellite count for a position fix is less than this threshold, the GPS point is considered invalid. (1~255)
	<Max Speed>	Maximum speed (in 0.1 meters/second units) expected. Any speed received that is greater than this threshold is invalidated. [ (Kilometer per Hour) / 0.36] (1~65535)
	<Reserved> <Reserved>	
<b>Return Value</b>	<b>Write Command:</b> OK : FILTER <b>Read Command:</b> OK : FILTER \$FILTER=<Min Satellites>,<Max Speed>,<Reserved>,<Reserved> <b>Error Response:</b> ERROR : FILTER	
<b>Example</b>	AT\$FILTER=4,450,0,0 OK : FILTER	
<b>Note</b>		



AT\$ODO GPS odometer read and setting	
<b>Description</b>	This command is used to set or query odometer value. The GPS odometer is only calculate and accumulate when IGN status is ON.
<b>Syntax</b>	<b>Write Command:</b> AT\$ODO=[<Odometer Value>,<IGN Reset>, <EGN Reset>] <b>Read Command:</b> AT\$ODO?
<b>Parameters</b>	<Odometer Value> Odometer value in meters. (Default – No change in odometer value) (0~4294967295)
	<IGN Reset> 0 – Disable 1 – Enable reset of odometer when ignition status transitions from off to on. (Default - 0)
	<EGN Reset> 0 – Disable 1 – Enable reset of odometer when engine status transitions from off to on. (Default - 0)
<b>Return Value</b>	<b>Write Command:</b> OK : ODO <b>Read Command:</b> OK : ODO \$ODO=<Odometer Value>,<IGN Reset>, <EGN Reset> <b>Error Response:</b> ERROR : ODO
<b>Example</b>	AT\$ODO=0,1,1 OK : ODO  AT\$ODO? OK : ODO \$ODO=1235,1,1
<b>Note</b>	<i>The odometer is calculated by using GPS positioning. The odometer accuracy will be affected by different GPS positioning environment.</i>



AT\$URL Custom URL string for SMS GP3	
<b>Description</b>	This command is used for responding the GP3 command.
<b>Syntax</b>	<b>Write Command:</b> AT\$URL=<String> <b>Read Command:</b> AT\$URL?
<b>Parameters</b>	<String>  The string will be the heading string followed by "ModemID, GPSTime, Longitude, Latitude, SatelliteNumbers, MsgID" without quotes. (Max 50 characters)
<b>Example</b>	AT\$URL=http://www.st-fleetweb.com/pt/?q= OK:URL  Example returning string: http://www.st-fleetweb.com/pt/?q=1100000001,20110223093149,121.64546,25.06 236, 04,0



2. The Special commands for System Maintains

AT\$GPSPT      GPS pass-through																			
<b>Description</b>	This command is used to enable/disable GPS NMEA strings output.																		
<b>Syntax</b>	<b>Write Command:</b> AT\$GPSPT=<NMEA>,<Duration> <b>Read Command:</b> AT\$GPSPT?																		
<b>Parameters</b>	<p>&lt;NMEA&gt;</p> <p>Bit mask used to determine what NMEA commands are sent through the serial port. Setting NMEA to 0 exits the Pass-through mode.</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>NMEA Message</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Reserved</td> </tr> <tr> <td>1</td> <td>GGA</td> </tr> <tr> <td>2</td> <td>GSA</td> </tr> <tr> <td>3</td> <td>GSV</td> </tr> <tr> <td>4</td> <td>Reserved</td> </tr> <tr> <td>5</td> <td>RMC</td> </tr> <tr> <td>6</td> <td>Reserved</td> </tr> <tr> <td>7</td> <td>Reserved</td> </tr> </tbody> </table>	Bit	NMEA Message	0	Reserved	1	GGA	2	GSA	3	GSV	4	Reserved	5	RMC	6	Reserved	7	Reserved
	Bit	NMEA Message																	
0	Reserved																		
1	GGA																		
2	GSA																		
3	GSV																		
4	Reserved																		
5	RMC																		
6	Reserved																		
7	Reserved																		
	<p>Duration</p> <p>Time in seconds between NMEA samples (1~255)</p>																		
<b>Return Value</b>	<b>Write Command:</b> OK : GPSPT <b>Read Command:</b> OK : GPSPT \$GPSPT=<NMEA>,<Duration> <b>Error Response:</b> ERROR : GPSPT																		
<b>Example</b>	AT\$GPSPT=127,1 OK : GPSPT																		
<b>Note</b>																			



AT\$REBOOT Reboot device	
<b>Description</b>	This command is use to restart the device. The device will be reboot after receiving the AT\$REBOOT command for 2 seconds to allow time to acknowledge the request. The parameter settings will not be erased after this reboot.
<b>Syntax</b>	<b>Write Command:</b> AT\$REBOOT
<b>Parameters</b>	None
<b>Return Value</b>	<b>Write Command:</b> OK : REBOOT <b>Error Response:</b> ERROR : REBOOT
<b>Example</b>	AT\$REBOOT OK : REBOOT
<b>Note</b>	

AT\$RESET Reset device	
<b>Description</b>	This command is use to reset all parameters to manufactory default settings.
<b>Syntax</b>	<b>Write Command:</b> AT\$RESET=<Option>
<b>Parameters</b>	<Option> <ul style="list-style-type: none"> <li>0 – Reset all parameters to manufactory default and clear all data queue.</li> <li>1 – Reset all parameters to manufactory default without clear all data queue</li> <li>2 –Reserved.</li> <li>3 – Reset all parameters to configuration file.</li> </ul>
<b>Return Value</b>	<b>Write Command:</b> OK : RESET <b>Error Response:</b> ERROR : RESET
<b>Example</b>	AT\$RESET=0 OK : RESET
<b>Note</b>	



AT\$MSGQCL Message queue clear	
<b>Description</b>	This command is used to clear all messages in buffer.
<b>Syntax</b>	<b>Write Command:</b> AT\$MSGQCL=<Mode>
<b>Parameters</b>	<Mode> 0 – Clear Report and SMS messages. 1 – Clear Report messages only. 2 – Clear SMS messages only.
<b>Return Value</b>	<b>Write Command:</b> OK : MSGQCL <b>Error Response:</b> ERROR : MSGQCL
<b>Example</b>	Clear All messages AT\$MSGQCL OK : MSGQCL  AT\$MSGQCL=0 OK : MSGQCL  Clear Report messages only AT\$MSGQCL=1 OK : MSGQCL  Clear SMS messages only AT\$MSGQCL=2 OK : MSGQCL
<b>Note</b>	



AT\$SAVE Save user parameters	
<b>Description</b>	This command is used to save user parameters to flash.
<b>Syntax</b>	<b>Write Command:</b> AT\$SAVE
<b>Parameters</b>	None
<b>Return Value</b>	<b>Write Command:</b> OK : SAVE <b>Error Response:</b>
<b>Example</b>	
<b>Note</b>	<i>Please note that all changed parameters won't be saved into the non-volatile memory until issue this command.</i>





AT\$PKEY Configuration for user parameters security	
<b>Description</b>	This command is used to set/query configuration for specified user parameters security.
<b>Syntax</b>	<b>Write Command:</b> AT\$PKEY=<Old Password>,<New Password>,<Option> <b>Read Command:</b> AT\$PKEY?
<b>Parameters</b>	<Old Password>      Old password (4 characters)
	<New Password>      New password (4 characters, English and numeric)
	<Option>              0 – Disable (User can read or write parameters) 1 – Enable (User can't read or write parameters) (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : PKEY <b>Read Command:</b> OK : PKEY \$PKEY=***, ,<Option> <b>Error Response:</b> ERROR : PKEY
<b>Example</b>	AT\$PKEY=0000,1a1b,1 OK : PKEY AT\$PKEY? OK : PKEY \$PKEY=***, ,1
<b>Note</b>	<i>Use this command to lock or unlock network related, reset, save, and FW update related command.</i>



AT\$OKEY Configuration for firmware upgrade security	
<b>Description</b>	This command is used to set/query configuration for firmware upgrade security.
<b>Syntax</b>	<b>Write Command:</b> AT\$OKEY=<Old Password>,<New Password>,<Option>,<Error Limit> <b>Read Command:</b> AT\$OKEY?
<b>Parameters</b>	<Old Password>      Old password (4 characters)
	<New Password>      New password (4 characters, English and numeric)
	<Option>              0 – Disable (User can do firmware upgrade) 1 – Enable (User can't do firmware upgrade) (Default is 0)
	<Error Limit>        W: Error Limit for password. (It will enable AT\$PKEY and lock firmware upgrade if password error count over the limit) R: Remain error counter (0~255. Default is 100) * It must be set value
<b>Return Value</b>	<b>Write Command:</b> OK : OKEY <b>Read Command:</b> OK : OKEY \$OKEY=****, <Option>, <Error Limit> <b>Error Response:</b> ERROR : OKEY
<b>Example</b>	AT\$OKEY=0000,1a1b,1,100 OK : OKEY  AT\$OKEY? OK : OKEY \$OKEY=****,1,100
<b>Note</b>	<i>Use this command to lock or unlock FW update related command. It will enable AT\$PKEY and lock firmware upgrade if password error down count to 0.</i>



3. The Commands for Querying System Status

AT\$DNS Query the DNS IP address(es)	
<b>Description</b>	This command is used to query the DNS address(es) when using FQDN as the Host Address.
<b>Syntax</b>	<b>Read Command:</b> AT\$DNS?
<b>Parameters</b>	<Primary DNS IP>      The IP address for primary DNS
	<Secondary DNS IP>      The IP address for secondary DNS
<b>Return Value</b>	<b>Read Command:</b> OK : DNS \$DNS=<Primary DNS IP>,<Secondary DNS IP> <b>Error Response:</b> ERROR : DNS
<b>Example</b>	

AT\$MSGQ Message queue read	
<b>Description</b>	This command is used to query the number of current message buffer.
<b>Syntax</b>	<b>Read Command:</b> AT\$MSGQ?
<b>Parameters</b>	<Reserved>      Reserved for further use
	<Number of Messages>      Number of messages pending in the message queue.
<b>Return Value</b>	<b>Read Command:</b> OK : MSGQ \$MSGQ=<Reserved>,<Number of Messages> <b>Error Response:</b> ERROR : MSGQ
<b>Example</b>	
<b>Note</b>	



AT\$VEXT External or main power voltage read	
<b>Description</b>	This command is used to read current external power voltage.
<b>Syntax</b>	<b>Read Command:</b> AT\$VEXT?
<b>Parameters</b>	<External Voltage>      External voltage reading in millivolt
<b>Return Value</b>	<b>Read Command:</b> OK : VEXT \$VEXT=<External Voltage> <b>Error Response:</b> ERROR : VEXT
<b>Example</b>	AT\$VEXT? \$VEXT=12995 OK : VEXT
<b>Note</b>	

AT\$VBAT Battery voltage read	
<b>Description</b>	This command is used to read current internal backup battery voltage.
<b>Syntax</b>	<b>Read Command:</b> AT\$VBAT?
<b>Parameters</b>	<Battery Voltage>      Battery voltage reading in millivolt
<b>Return Value</b>	<b>Read Command:</b> OK : VBAT \$VBAT=<Battery Voltage> <b>Error Response:</b> ERROR : VBAT
<b>Example</b>	AT\$VBAT? OK : VBAT \$VBAT=4152
<b>Note</b>	



AT\$VERSION Get the firmware version of the unit.	
<b>Description</b>	Execute this command to query firmware version of the unit.
<b>Syntax</b>	<b>Read Command:</b> AT\$VERSION
<b>Parameters</b>	None
<b>Return Value</b>	\$VERSION=<FW Version>,<HW Version>,<GSM Version>,<Model name>
<b>Example</b>	AT\$VERSION \$OK : VERSION \$VERSION=v0.1_r07,v0.1,SARA G350 v8.34.0,Ux

AT\$QUST Query communication status	
<b>Description</b>	Execute this command to query GSM/GPRS connection status.
<b>Syntax</b>	<b>Read Command:</b> AT\$QUST
<b>Parameters</b>	None
<b>Return Value</b>	<b>Read Command:</b> \$QUST=<GSM Location Area Identification number>,<CSQ>,<GPRS connection state>,<Network Registration> GPRS connection state: 1 → Connected 0 → Disconnected Network Registration state : 0 → Not registered. 1 → Registered. 2 → Not registered,but searching a new operator to register 3 → Registration denied. 4 → Unknown. 5 → Registered,roaming
<b>Example</b>	AT\$QUST \$OK : QUST \$QUST="46692",28,1,1



AT\$IMEI Read device IMEI number	
<b>Description</b>	Execute this command to read the IMEI (International Mobile station Equipment Identity) of the unit.
<b>Syntax</b>	<b>Read Command:</b> AT\$IMEI
<b>Parameters</b>	None
<b>Return Value</b>	<b>Read Command:</b> \$IMEI=<IMEI>
<b>Example</b>	AT\$IMEI OK : IMEI \$IMEI=355117003358879

AT\$IP Device IP query	
<b>Description</b>	This command is used to query the device for its local IP address assigned by the cell tower. This IP address is valid when GPRS connection is established.
<b>Syntax</b>	<b>Read Command:</b> AT\$IP?
<b>Parameters</b>	<Local IP>   IP Address assigned to the device.
<b>Return Value</b>	<b>Read Command:</b> OK : IP \$IP=<Local IP>
<b>Example</b>	AT\$IP? OK : IP \$IP=10.2.16.250



AT\$SMID Read device ICCID number	
<b>Description</b>	Execute this command to read the ICCID (Integrate circuit card ID).
<b>Syntax</b>	<b>Read Command:</b> AT\$SMID?
<b>Parameters</b>	<ICCID>      Integrate circuit card ID
<b>Return Value</b>	<b>Read Command:</b> OK : SMID \$SMID=<ICCID>
<b>Example</b>	AT\$SMID OK : SMID \$SMID=89886970711201585274

AT\$SIMID Read IMSI number	
<b>Description</b>	Execute this command to read the IMSI (International Mobile Subscriber Identity).
<b>Syntax</b>	<b>Read Command:</b> AT\$SIMID
<b>Parameters</b>	<IMSI>      International Mobile Subscriber Identity
<b>Return Value</b>	<b>Read Command:</b> OK : SIMID \$SIMID=<IMSI>
<b>Example</b>	AT\$SIMID OK : SIMID \$SIMID=466972001299970



4. Power Management Setting

AT\$PWRM Power management settings	
<b>Description</b>	This command is used to set/query power management settings.
<b>Syntax</b>	<p><b>Write Command:</b>            AT\$PWRM=&lt;Ignition Inactive Duration&gt;,&lt;No Motion Duration&gt;,&lt;No Comm Duration&gt;[,            &lt;Low Wake Duration&gt;,&lt;Low On Duration&gt;, &lt;Low Transition Duration&gt;,            &lt;VLow Wake Duration&gt;,&lt;VLow On Duration&gt;]</p> <p><b>Read Command:</b>            AT\$PWRM?</p>
<b>Parameters</b>	<Ignition Inactive Duration> Duration in minutes that must have elapsed after Ignition off, prior to transitioning to low power. 0 - Disable (1~255)
	<No Motion Duration> Duration in minutes that must have elapsed after no motion is detected prior to transitioning to low power after waked up by motion. 0 - Disable (1~255)
	<No Comm Duration> Duration in minutes that must have elapsed after no communication is detected prior to transitioning to low power. 0 - Disable (1~255)
	<Low Wake Duration> Duration in minutes for waking up when in low power mode. (1~65535)
	<Low On Duration> Duration in minutes that device goes to full power when waking up in low power mode. (Default is 0 indicating always in Low On or Idle mode when in Low Power Mode) (1~255)
	<Low Transition Duration> Duration in minutes that must elapse to transition from low power to very low power mode. (Default is 0 indicating no transition to very Low Power Mode) (1~65535)
	<VLow Wake Duration> Duration in hours for waking up when in very low power mode. (1~255)
	<VLow On Duration> Duration in minutes that device goes to full power when waking up in very low power mode. (Default is 0 indicating allows in VLow on when in Very Low Power Mode) (1~255)





<b>Return Value</b>	<b>Write Command:</b> OK : PWRM <b>Read Command:</b> OK : PWRM \$PWRM=<Ignition Inactive Duration>,<No Motion Duration>,<No Comm Duration>, <Low Wake Duration>,<Low On Duration>, <Low Transition Duration>, <VLow Wake Duration>,<VLow On Duration> <b>Error Response:</b> ERROR : PWRM
<b>Example</b>	AT\$PWRM=2,2,2,5,1,15,1,5 OK : PWRM
<b>Notes</b>	Please set AT\$MOTDET command if you want to additionally wake up unit by motion when it enters LOW or VLOW power saving modes.



5. To Get Position and Setup Device for Regular Tracking

AT\$GETPDS Get position and device status		
<b>Description</b>	This command is used to get current position or history log data.	
<b>Syntax</b>	<b>Write Command:</b> AT\$GETPDS= <Duration>[,<Year>,<Month>,<Day>,<Hour>,<Minute>]	
<b>Parameters</b>	<Duration>	Duration in minutes of points to retrieve. If no date and time is specified, points retrieved should be for the last duration of time. If time and date is specified, then the duration beginning at the specified date and time should be retrieved. 0 – Stop report queue from Log data queue. (1 to 10000)
	<Year>	Year at which to retrieve position and device status. (0 to 99)
	<Month>	Month at which to retrieve position and device status. (1 to 12)
	<Day>	Day at which to retrieve position and device status. (1 to 31)
	<Hour>	Hour at which to retrieve position and device status. (0 to 23)
	<Minute>	Minute at which to retrieve position and device status. (0 to 59)
<b>Return Value</b>	<b>Write Command:</b> <a href="#">Asynchronous Position Message</a> <b>Error Response:</b> ERROR : GETPDS	
<b>Example</b>	Get position data. No equal symbol. AT\$GETPDS OK : GETPDS 101000001,20100304075605,121.64547,25.06200,0,0,61,7,2,1,0,0.054 ,0.000,20100304075606,0  AT\$GETPDS=5 OK : GETPDS 101000001,20100304075545,121.64547,25.06200,0,0,61,7,2,1,0,0.046 ,0.000,20100304075546,0 101000001,20100304075555,121.64547,25.06200,0,0,61,7,2,1,0,0.046 ,0.000,20100304075556,0  ..... 101000001,20100304075605,121.64547,25.06200,0,0,61,7,2,1,0,0.054 ,0.000,20100304075606,0 OK : GETPDS Data  Stop report queue from Log data queue. AT\$GETPDS=0 OK : GETPDS	
<b>Note</b>		



GP<n> Short command for get current position	
<b>Description</b>	This command is used for get current position by using SMS. It is easy to command by using cellular phone.
<b>Syntax</b>	<b>Write Command:</b> GP<n>
<b>Parameters</b>	<n>  1 – Text SMS Format 2 – Google Map Link Format 3 – Wap Push Format (Returning format is defined by AT\$URL) 4 – Garmin™ Peer to peer Format (not ready yet) 5~8 – Reserved for further use 9 – Standard Asynchronous Position Message Format
<b>Example</b>	GP1
<b>Note</b>	Text SMS Format: Date:<Date> Time:<Time> Lon:<Longitude> Lat:<Latitude> Speed:<Speed in km/hr> Heading:<Heading degree> SatUsed:<Satellite Numbers>



AT\$PDSR Position and device status reporting settings	
<b>Description</b>	Position and data shall be reported when the device is moving. Reporting shall be based upon satisfying a minimum time requirement and minimum distance requirement
<b>Syntax</b>	<p><b>Write Command:</b> AT\$PDSR=&lt;Mode&gt;,&lt;Min. Time&gt;,&lt;Min. Distance&gt;,&lt;Heading Change&gt;,[&lt;Destination&gt;,&lt;Schedule&gt;,&lt;Delay&gt;,&lt;Time Multiplier&gt;,&lt;IgnoreGPS&gt;]</p> <p><b>Read Command:</b> AT\$PDSR?</p>
<b>Parameters</b>	<p>&lt;Mode&gt;</p> <p>0 – Disable Bit 0(2<sup>0</sup> = 1) – Time Mode Bit 1(2<sup>1</sup> = 2) – Distance Mode Bit 2(2<sup>2</sup> = 4)– Ignition ON Mode Bit 3(2<sup>3</sup> = 8) – Heading change Mode</p> <p>You can set two or more conditions like 5(1+4)for ignition on and time conditions.</p>
	<p>&lt;Min. Time&gt;</p> <p>Minimum Time in seconds that must elapse before reporting next position. (1 – 65535)</p>
	<p>&lt;Min. Distance&gt;</p> <p>Minimum Distance in meters that must be traveled before reporting next position. (25 – 50000)</p>
	<p>&lt;Heading Change&gt;</p> <p>Minimum heading in degree that be changed before reporting next position. (5 – 180)</p>
	<p>&lt;Destination&gt;</p> <p>Bit 0 – Log to Data Queue Bit 1 – Transmit GPRS Bit 2 – Reserved Bit 3 – Transmit SMS</p>
	<p>&lt;Schedule&gt;</p> <p>0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)</p>
	<p>&lt;Delay&gt;</p> <p>Reserve for future used.</p>



	<Time Multiplier>	1 – The PDSR Log and GPRS messages will be sent according to the <Min. Time> setting. n – The PDSR Log messages will be performed according to the <Min. Time> setting, the PDSR GPRS messages will be sent according to <Min. Time> times n. (2 – 65535)
	<IgnoreGPS>	0 – Continuously tracking regardless of GPS signal. 1 – Ignore no GPS signal tracking report.
<b>Return Value</b>	<b>Write Command:</b> OK : PDSR <b>Read Command:</b> OK : PDSR \$PDSR=<Mode>,<Min. Time>,<Min. Distance>,<Heading Change>,<Destination>,<Schedule>,<Delay>,<Time Multiplier>,<IgnoreGPS> <b>Error Response:</b> ERROR : PDSR	
<b>Example</b>	Tracking every 30 seconds through GPRS AT\$PDSR=1,30,1000,20,2,0,0,1,0 OK : PDSR  Tracking every 60 seconds through GPRS and Logging every 15 seconds AT\$PDSR=1,15,1000,20,3,0,0,4,0 OK : PDSR	
<b>Note</b>	If <Mode> is 3 and both <Min. Time> and <Min. Distance> parameters are set, the position and data are only reported if both the minimum amount of time has elapsed and the minimum distance has been traveled.	



AT\$LPRC Low Power Report Configuration		
<b>Description</b>	This command is used to set/query low power report send enable. The Setting is enable, Send message id 193, 194 and 201 report to server when going into low, very-low wake up and low wake up.	
<b>Syntax</b>	<b>Write Command:</b> AT\$ LPRC =< Enable >,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$ LPRC?	
<b>Parameters</b>	<Enable>	0 – Disable Bit 0 – Send 193 (going into low) report to server. Bit 1 – Send 194 (very low wake up) report to server. Bit 2 – Send 201 (low wake up ) report to server. Bit 3 – Send 202 (going into very low) report to server.
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : LPRC <b>Read Command:</b> OK : LPRC \$ LPRC =< Enable >,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : LPRC	
<b>Example</b>	AT\$LPRC=3,3,0,0 OK : LPRC AT\$LPRC? OK : LPRC \$LPRC=3,3,0,0	
<b>Note</b>		



## C. The Basic Alert Operation

### 1. The Way to Detect Input Condition

AT\$IN1 Input 1 alert settings	
<b>Description</b>	This command is used to set or query input 1 alert setting.
<b>Syntax</b>	<b>Write</b> Command: AT\$IN1=<Debounce Time> <b>Read</b> Command: AT\$IN1?
<b>Parameters</b>	<Debounce Time> Amount of time in seconds that must elapse before an input 1 state change is accepted. (1~65)
	<Status> Current input 1 status 0 – Input 1 Off 1 – Input 1 On
<b>Return Value</b>	<b>Write</b> Command: OK : IN1 <b>Read</b> Command: OK : IN1 \$IN1=<Debounce Time>,<Status> <b>Error</b> Response: ERROR : IN1
<b>Example</b>	AT\$IN1=2 OK : IN1 AT\$IN1? \$IN1=2,0
<b>Note</b>	For the input 2 alert settings, Please use AT\$IN2 command instead of AT\$IN1. The parameters are identical.



AT\$IN1EN Input 1 alert enable		
<b>Description</b>	This command is used to set or query input 1 alert enable.	
<b>Syntax</b>	<b>Write</b> Command: AT\$IN1EN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read</b> Command: AT\$IN1EN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + Polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report(Default is 0)
<b>Return Value</b>	<b>Write</b> Command: OK : IN1EN <b>Read</b> Command: OK : IN1EN \$IN1EN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error</b> Response: ERROR : IN1EN	
<b>Example</b>	AT\$IN1EN=1,2,0,0 OK : IN1EN	
<b>Note</b>	For the input 2 alert enable settings, Please use AT\$IN2EN command instead of AT\$IN1EN. The parameters are identical.	





## 2. The Way to Detect Input/ACC Condition

AT\$IGN Ignition alert settings	
<b>Description</b>	This command is used to set or query ignition alert settings.
<b>Syntax</b>	<b>Write Command:</b> AT\$IGN=<Debounce Time> <b>Read Command:</b> AT\$IGN?
<b>Parameters</b>	<Debounce Time> Amount of time in seconds that must elapse before an Ignition state change is accepted. (1~65)
	<Status> Current ignition status 0 – Ignition Off 1 – Ignition On
<b>Return Value</b>	<b>Write Command:</b> OK : IGN <b>Read Command:</b> OK : IGN \$IGN=<Debounce Time>,<Status> <b>Error Response:</b> ERROR : IGN
<b>Example</b>	AT\$IGN=2 OK : IGN  AT\$IGN? OK : IGN \$IGN=2,1
<b>Note</b>	



AT\$IGNEN Ignition alert enable		
<b>Description</b>	This command is used to set or query ignition alert enable.	
<b>Syntax</b>	<b>Write Command:</b> AT\$IGNEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$IGNEN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report(Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : IGNEN <b>Read Command:</b> OK : IGNEN \$IGNEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : IGNEN	
<b>Example</b>	AT\$IGNEN=1,2,0,0 OK : IGNEN	
<b>Note</b>		



3. The Way Detect Engine ON/OFF Condition

AT\$EGN Engine alert setting											
<b>Description</b>	Set or query engine on-off alert.										
<b>Syntax</b>	<p><b>Write</b> Command: AT\$EGN=&lt;engine on voltage&gt;,&lt;on duration&gt;,&lt;engine off voltage&gt;,&lt;off duration&gt;</p> <p><b>Read</b> Command: AT\$EGN?</p>										
<b>Parameters</b>	<table border="1"> <tr> <td>&lt;engine on voltage&gt;</td> <td>In millivolt. Engine is on if main power voltage is higher than this setting. (1~30000)</td> </tr> <tr> <td>&lt;on duration&gt;</td> <td>In seconds. The above on voltage must be maintained for this period of time to be accepted as engine on. (1~255)</td> </tr> <tr> <td>&lt;engine off voltage&gt;</td> <td>In millivolt. Engine is off if main power voltage falls below this setting. (1~30000)</td> </tr> <tr> <td>&lt;off duration&gt;</td> <td>In seconds. The above off voltage must be maintained for this period of time to be accepted as engine off. (1~255)</td> </tr> <tr> <td>&lt;status&gt;</td> <td>0: engine off 1: engine on</td> </tr> </table>	<engine on voltage>	In millivolt. Engine is on if main power voltage is higher than this setting. (1~30000)	<on duration>	In seconds. The above on voltage must be maintained for this period of time to be accepted as engine on. (1~255)	<engine off voltage>	In millivolt. Engine is off if main power voltage falls below this setting. (1~30000)	<off duration>	In seconds. The above off voltage must be maintained for this period of time to be accepted as engine off. (1~255)	<status>	0: engine off 1: engine on
	<engine on voltage>	In millivolt. Engine is on if main power voltage is higher than this setting. (1~30000)									
	<on duration>	In seconds. The above on voltage must be maintained for this period of time to be accepted as engine on. (1~255)									
	<engine off voltage>	In millivolt. Engine is off if main power voltage falls below this setting. (1~30000)									
	<off duration>	In seconds. The above off voltage must be maintained for this period of time to be accepted as engine off. (1~255)									
<status>	0: engine off 1: engine on										
<b>Return Value</b>	<p><b>Write</b> Command: OK:EGN</p> <p><b>Read</b> Command: OK:EGN \$EGN=&lt;engine on voltage&gt;,&lt;on duration&gt;,&lt;engine off voltage&gt;,&lt;off duration&gt;, &lt;status&gt;</p> <p><b>Error</b> Response: ERROR : EGN</p>										
<b>Example</b>	<p>Set engine on at 13.7 volts or higher, 12.5 volts or lower for engine off, and each must hold on for a period of 10 seconds.</p> <p>AT\$EGN=13700,10,12500,10 OK:EGN</p>										
<b>Note</b>											



AT\$EGNEN Engine alert enable															
<b>Description</b>	This command is used to set or query engine alert enable.														
<b>Syntax</b>	<b>Write</b> Command: AT\$EGNEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read</b> Command: AT\$EGNEN?														
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable													
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.													
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)													
	<Force Connection>	0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)													
<b>Return Value</b>	<b>Write</b> Command: OK : EGNEN <b>Read</b> Command: OK : EGNEN \$EGNEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error</b> Response: ERROR : EGNEN														
<b>Example</b>	AT\$EGNEN=1,2,0,0 OK : EGNEN														
<b>Note</b>	Engine Alert Format: <a href="#">Asynchronous Position Message</a> + <Ext Voltage> <b>ASCII</b> Format: <table border="1"> <thead> <tr> <th>Parameter</th> <th>Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Ext Voltage</td> <td>#####</td> <td>External Voltage in millivolt</td> </tr> </tbody> </table> <b>Binary</b> Format: <table border="1"> <thead> <tr> <th>Name</th> <th>Size</th> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Ext Voltage</td> <td>2</td> <td>Unsigned Integer</td> <td>External Voltage in millivolt</td> </tr> </tbody> </table>	Parameter	Format	Description	Ext Voltage	#####	External Voltage in millivolt	Name	Size	Type	Description	Ext Voltage	2	Unsigned Integer	External Voltage in millivolt
Parameter	Format	Description													
Ext Voltage	#####	External Voltage in millivolt													
Name	Size	Type	Description												
Ext Voltage	2	Unsigned Integer	External Voltage in millivolt												



## 4. The Way to Detect Over-Speeding Condition

AT\$SPEED High speed alert setting	
<b>Description</b>	Set, query speeding alert setting.
<b>Syntax</b>	<b>Write</b> Command: AT\$SPEED=<set threshold>,<clear threshold> <b>Read</b> Command: AT\$SPEED?
<b>Parameters</b>	<set threshold> In 0.1 meter/sec. Alert is triggered if speed is over the set threshold. (1~65535)
	<clear threshold> In 0.1 meter/sec. Alert is cleared if speed falls below the clear threshold. (1~65535)
<b>Return Value</b>	<b>Write</b> Command: OK:SPEED <b>Read</b> Command: OK:SPEED \$SPEED=<set threshold>,<clear Threshold> <b>Error</b> Response: ERROR : SPEED
<b>Example</b>	Set at 105 km/hr and clear at 100 km/hr. AT\$SPEED=292,277 OK:SPEED
<b>Note</b>	



AT\$SPEEDEN High speed alert enable	
<b>Description</b>	This command is used to enable/disable speeding alert and speeding report.
<b>Syntax</b>	<b>Write Command:</b> AT\$SPEEDEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$SPEEDEN?
<b>Parameters</b>	<Option> 0 – Disable 1 – Enable
	<Action> 1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule> 0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection> 0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : SPEEDEN <b>Read Command:</b> OK : SPEEDEN \$SPEEDEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : SPEEDEN



<b>Note</b>	Speeding Report Format: <a href="#">Asynchronous Position Message</a> + <Maximum_Speed> + <Average_Speed> + <Duration>															
	<b>ASCII Format:</b>															
	<table border="1"><thead><tr><th>Parameter</th><th>Format</th><th>Description</th></tr></thead><tbody><tr><td>Maximum Speed</td><td>#####</td><td>Meters per second units</td></tr><tr><td>Average Speed</td><td>#####</td><td>Meters per second units</td></tr><tr><td>Duration</td><td>#####</td><td>Duration device exceeded speed threshold in seconds.</td></tr></tbody></table>	Parameter	Format	Description	Maximum Speed	#####	Meters per second units	Average Speed	#####	Meters per second units	Duration	#####	Duration device exceeded speed threshold in seconds.			
	Parameter	Format	Description													
	Maximum Speed	#####	Meters per second units													
Average Speed	#####	Meters per second units														
Duration	#####	Duration device exceeded speed threshold in seconds.														
<b>Binary Format:</b>																
<table border="1"><thead><tr><th>Name</th><th>Size</th><th>Type</th><th>Description</th></tr></thead><tbody><tr><td>Maximum Speed</td><td>2</td><td>Unsigned Integer</td><td>0.1 meters per second units</td></tr><tr><td>Average Speed</td><td>2</td><td>Unsigned Integer</td><td>0.1 meters per second units</td></tr><tr><td>Duration</td><td>2</td><td>Unsigned Integer</td><td>Duration device exceeded speed threshold in seconds.</td></tr></tbody></table>	Name	Size	Type	Description	Maximum Speed	2	Unsigned Integer	0.1 meters per second units	Average Speed	2	Unsigned Integer	0.1 meters per second units	Duration	2	Unsigned Integer	Duration device exceeded speed threshold in seconds.
Name	Size	Type	Description													
Maximum Speed	2	Unsigned Integer	0.1 meters per second units													
Average Speed	2	Unsigned Integer	0.1 meters per second units													
Duration	2	Unsigned Integer	Duration device exceeded speed threshold in seconds.													



5. The Way to Setup Prohibit Zone Area Detection

AT\$GF Geo-fence alert settings															
<b>Description</b>	This command is used to set/query GeoFence settings.														
<b>Syntax</b>	<p><b>Write Command:</b></p> <p>1. Config. geofence:            AT\$GF=&lt;Group number&gt;,-1,&lt;Type&gt;,&lt;Delay&gt;,&lt;Minimum Movement&gt;[,...]            a. Circle: AT\$GF=&lt;Group number&gt;,-1,1,&lt;Delay&gt;,&lt;Minimum Movement&gt;,&lt;Entry Radius&gt;,&lt;Exit Radius&gt;            b. Polygon: AT\$GF=&lt;Group number&gt;,-1,2,&lt;Delay&gt;,&lt;Minimum Movement&gt;,&lt;Vertex Amount&gt;</p> <p>2. Set position:            AT\$GF=&lt;Group number&gt;[,&lt;Vertex Number&gt;],&lt;Latitude&gt;,&lt;Longitude&gt;            a. Circle: AT\$GF=&lt;Group number&gt;,&lt;Latitude&gt;,&lt;Longitude&gt;            b. Polygon: AT\$GF=&lt;Group number&gt;,&lt;Vertex Number&gt;,&lt;Latitude&gt;,&lt;Longitude&gt;</p> <p>3. Reset parameter:            AT\$GF=-1</p> <p>4. Save parameter:            AT\$GF=-2</p> <p><b>Read Command:</b>            AT\$GF? Reads all GeoFence Settings            AT\$GF?&lt;Group number&gt; Reads selected GeoFence Setting</p>														
<b>Parameters</b>	<table border="1"> <tr> <td>&lt;Group number&gt;</td> <td>Index of GeoFence.</td> </tr> <tr> <td>&lt;Type&gt;</td> <td>Type of GeoFence: 1 – Circle 2 – Polygon</td> </tr> <tr> <td>&lt;Delay&gt;</td> <td>Qualifying delay in seconds. Duration of time that must elapse after transitioning state before accepting the new state. (0~255)</td> </tr> <tr> <td>&lt;Minimum Movement&gt;</td> <td>Qualifying distance in meters. Distance that a device must move before accepting the new location as being a valid location. (0~255)</td> </tr> <tr> <td>&lt;Vertex Amount&gt;</td> <td>Vertex number for polygon 3 – Triangle 4 – Rectangle or polygon 5 ~ Polygon</td> </tr> <tr> <td>&lt;Latitude&gt;</td> <td>Latitude of Circular GeoFence center or Polygon vertex (-90 ~ +90)</td> </tr> <tr> <td>&lt;Longitude&gt;</td> <td>Longitude of Circular GeoFence center or Polygon vertex (-180 ~ +180)</td> </tr> </table>	<Group number>	Index of GeoFence.	<Type>	Type of GeoFence: 1 – Circle 2 – Polygon	<Delay>	Qualifying delay in seconds. Duration of time that must elapse after transitioning state before accepting the new state. (0~255)	<Minimum Movement>	Qualifying distance in meters. Distance that a device must move before accepting the new location as being a valid location. (0~255)	<Vertex Amount>	Vertex number for polygon 3 – Triangle 4 – Rectangle or polygon 5 ~ Polygon	<Latitude>	Latitude of Circular GeoFence center or Polygon vertex (-90 ~ +90)	<Longitude>	Longitude of Circular GeoFence center or Polygon vertex (-180 ~ +180)
<Group number>	Index of GeoFence.														
<Type>	Type of GeoFence: 1 – Circle 2 – Polygon														
<Delay>	Qualifying delay in seconds. Duration of time that must elapse after transitioning state before accepting the new state. (0~255)														
<Minimum Movement>	Qualifying distance in meters. Distance that a device must move before accepting the new location as being a valid location. (0~255)														
<Vertex Amount>	Vertex number for polygon 3 – Triangle 4 – Rectangle or polygon 5 ~ Polygon														
<Latitude>	Latitude of Circular GeoFence center or Polygon vertex (-90 ~ +90)														
<Longitude>	Longitude of Circular GeoFence center or Polygon vertex (-180 ~ +180)														





	<Entry Radius>	Radius of circle in meters used to detect entry of the device into the GeoFence. (0~65535)
	<Exit Radius>	Radius of circle in meters used to detect exit of the device from the GeoFence. (0~65535)
Return Value	<p><b>Write Command:</b></p> <p>a. Circle:            AT\$GF=1,-1,1,1,1,800,1000            OK:GF,1            AT\$GF=1,-4.693761,-80.316589            OK:GF,1</p> <p>b. Polygon:            AT\$GF=2,-1,2,0,0,4            OK:GF,2            AT\$GF=2,1,-4.691009,-80.317929            OK:GF,2            AT\$GF=2,2,-4.696969,-80.317929            OK:GF,2            AT\$GF=2,3,-4.696969,-80.299677            OK:GF,2            AT\$GF=2,4,-4.691009,-80.299677            OK:GF,2</p> <p><b>Read Command:</b>            OK:GF            \$GF=1,-1,1,1,1,800,1000            \$GF=1,-4.693760,-80.316589</p> <p>\$GF=2,-1,2,0,0,4            \$GF=2,1,-4.691009,-80.317932            \$GF=2,2,-4.696969,-80.317932            \$GF=2,3,-4.696969,-80.299674            \$GF=2,4,-4.691009,-80.299674</p> <p><b>Error Response:</b>            ERROR : GF</p>	
Example		
Note		



AT\$GFEN Geo-fence alert enable		
<b>Description</b>	This command is used to set/query GeoFence enable settings.	
<b>Syntax</b>	<b>Write Command:</b> AT\$GFEN=<Index>,<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$GFEN? Reads all GeoFence Alert Enable Settings	
<b>Parameters</b>	<Index>	Index of GeoFence. Range is 1 to 50.
	<Option>	0 – Disable 1 – Entry and Exit 2 – Entry Only 3 – Exit Only
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : GFEN <b>Read Command:</b> OK : GFEN \$GFEN=1,< Option >,<Schedule>,<Force Connection> \$GFEN=2,< Option >,<Schedule>,<Force Connection> ... \$GFEN=n,< Option >,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : GFEN	



Note	Geo Fence Report Format: <a href="#">Asynchronous Position Message</a> + <GeoFence Index>		
	ASCII Format:		
	<b>Parameter</b>	<b>Format</b>	<b>Description</b>
	GeoFence Index	##	1 to 50
	Binary Format:		
<b>Name</b>	<b>Size</b>	<b>Type</b>	<b>Description</b>
GeoFence Index	1	Unsigned Integer	1 to 50



6. The Way to Setup Power Operation Status Detection

AT\$POWER Power status alert setting	
<b>Description</b>	Set or query main power low, lost, and battery low alert.
<b>Syntax</b>	<p><b>Write Command:</b>            AT\$POWER=&lt;main power low voltage&gt;,&lt;main power low duration&gt;,&lt;main power lost voltage&gt;,&lt;main power lost duration&gt;,&lt;battery low voltage&gt;,&lt;battery low duration&gt;</p> <p><b>Read Command:</b>            AT\$POWER?</p>
<b>Parameters</b>	<main power low voltage> In millivolt. If main power voltage falls below this voltage, power low alert is triggered. (1~65535)
	<main power low duration> In seconds. The main power voltage must remain low for at least this period of time for alert to be triggered. (1~255)
	<main power lost voltage> In millivolt. If main power voltage falls below this voltage, power lost alert is triggered. (1~65535)
	<main power lost duration> In seconds. If the power is lost for greater than this period of time, the power lost alert is triggered. (1~255)
	<battery low voltage> In millivolt. If battery power voltage falls below this voltage, battery low alert is triggered. (1~65535)
	<battery low duration> In seconds. The battery voltage must remain low for at least this period of time for alert to be triggered. (1~255)
<b>Return Value</b>	<p><b>Write Command:</b>            OK:POWER</p> <p><b>Read Command:</b>            OK:POWER</p> <p>\$POWER=&lt;main power low voltage&gt;,&lt;main power low duration&gt;,&lt;main power lost voltage&gt;,&lt;main power lost duration&gt;,&lt;battery low voltage&gt;,&lt;battery low duration&gt;</p> <p><b>Error Response:</b>            ERROR : POWER</p>



<b>Example</b>	Set power low alert at lower than 11 volts for 5 seconds, power lost alert at lower than 8.5 volts for 5 seconds and battery low at lower than 3.7 volts for 5 seconds. AT\$POWER=11000,5,8500,5,3700,5 OK:POWER
----------------	--

AT\$POWEREN Power alert enable		
<b>Description</b>	This command is used to enable/disable the power status alerts.	
<b>Syntax</b>	<b>Write Command:</b> AT\$POWEREN=<Option>,<Power On Enable>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$POWEREN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Power On Enable>	0 – Do not Send Power On Alert 1 – Send Power On Alert (Default is 0)
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : POWEREN	



	<p><b>Read Command:</b>            OK : POWEREN            \$POWEREN=&lt;Option&gt;,&lt;Power On Enable&gt;,&lt;Action&gt;,&lt;Schedule&gt;,&lt;Force Connection&gt;  <b>Error Response:</b>            ERROR : POWEREN</p>																					
<b>Example</b>	<p>AT\$POWEREN=1,1,2,0,0            OK : POWEREN</p>																					
<b>Note</b>	<p>Power Status Report Format:  <a href="#">Asynchronous Position Message</a> + &lt;Main/Ext Voltage&gt;,&lt;Battery Voltage&gt;  <b>ASCII Format:</b></p> <table border="1" data-bbox="584 741 1506 857"> <thead> <tr> <th>Parameter</th> <th>Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>&lt;Main/Ext Voltage&gt;</td> <td>#####</td> <td>Main or External voltage in millivolt</td> </tr> <tr> <td>&lt;Battery Voltage&gt;</td> <td>####</td> <td>Internal Battery Voltage</td> </tr> </tbody> </table> <p><b>Binary Format:</b></p> <table border="1" data-bbox="584 893 1506 1010"> <thead> <tr> <th>Name</th> <th>Size</th> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Main/Ext Voltage</td> <td>2</td> <td>Unsigned Integer</td> <td>External Voltage in millivolt</td> </tr> <tr> <td>Battery Voltage</td> <td>2</td> <td>Unsigned Integer</td> <td>Battery Voltage in millivolt</td> </tr> </tbody> </table>	Parameter	Format	Description	<Main/Ext Voltage>	#####	Main or External voltage in millivolt	<Battery Voltage>	####	Internal Battery Voltage	Name	Size	Type	Description	Main/Ext Voltage	2	Unsigned Integer	External Voltage in millivolt	Battery Voltage	2	Unsigned Integer	Battery Voltage in millivolt
Parameter	Format	Description																				
<Main/Ext Voltage>	#####	Main or External voltage in millivolt																				
<Battery Voltage>	####	Internal Battery Voltage																				
Name	Size	Type	Description																			
Main/Ext Voltage	2	Unsigned Integer	External Voltage in millivolt																			
Battery Voltage	2	Unsigned Integer	Battery Voltage in millivolt																			



## 7. The Way to Detect GPS Signal Healthy and Connector status

AT\$GPSMON GPS monitor	
<b>Description</b>	This command is used to monitor GPS receiver status. The GPS will be restarted if GPS acquisition timeout.
<b>Syntax</b>	<b>Write</b> Command: AT\$GPSMON=<GPS Timeout> <b>Read</b> Command: AT\$GPSMON?
<b>Parameters</b>	<GPS Timeout> Time period in minutes that must elapse with no GPS lock indicating a GPS failure. (1~255)
<b>Return Value</b>	<b>Write</b> Command: OK : GPSMON <b>Read</b> Command: OK : GPSMON AT\$GPSMON=<GPS Timeout> <b>Error</b> Response: ERROR : GPSMON
<b>Example</b>	AT\$GPSMON=10 OK : GPSMON
<b>Note</b>	



AT\$GPSALEN GPS alert enable		
<b>Description</b>	This command is used to enable/disable GPS timeout alert.	
<b>Syntax</b>	<b>Write</b> Command: AT\$GPSALEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read</b> Command: AT\$GPSALEN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write</b> Command: OK : GPSALEN <b>Read</b> Command: OK : GPSALEN \$GPSALEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error</b> Response: ERROR : GPSALEN	
<b>Example</b>	AT\$GPSALEN=1,2,0,0 OK : GPSALEN	
<b>Note</b>		





## 8. The Way Setup Motion Detecting Condition

AT\$MOTDET Motion detection settings	
<b>Description</b>	This command is used to set/query motion threshold settings. Motion is described as normal movement of a device as determined by a G sensor.
<b>Syntax</b>	<b>Write</b> Command: AT\$MOTDET=<Motion Detection Threshold Setting> <b>Read</b> Command: AT\$MOTDET?
<b>Parameters</b>	<Motion Detection Threshold Setting> The g-force threshold setting that must be exceeded in order to be considered in motion. (0-15G)
<b>Return Value</b>	<b>Write</b> Command: OK : MOTDET <b>Read</b> Command: OK : MOTDET \$MOTDET=<Motion Detection Threshold Setting> <b>Error</b> Response: ERROR : MOTDET
<b>Example</b>	AT\$MOTDET=4.123 OK : MOTDET
<b>Note</b>	AT\$MOTEN will be affected by the AT\$MOTDET settings



<b>AT\$MOTEN Motion detected alert enable</b>	
<b>Description</b>	This command is used to enable/disable motion detect alert.
<b>Syntax</b>	<b>Write Command:</b> AT\$MOTEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$MOTEN?
<b>Parameters</b>	<Option> 0 – Disable 1 – Enable
	<Action> 1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule> 0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection> 0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : MOTEN <b>Read Command:</b> OK : MOTEN \$MOTEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : MOTEN
<b>Example</b>	AT\$MOTEN=1,2,0,0 OK : MOTEN
<b>Note</b>	



## 9. The Command to Detect Impact in Vehicle

AT\$IMPDET		Impact detection settings
<b>Description</b>	This command is used to set/query impact threshold settings. Impact is described as an abrupt change in velocity as might be experienced during a wreck.	
<b>Syntax</b>	<b>Write</b> Command: AT\$IMPDET=<Impact Detection Threshold Setting>,<Reserved> <b>Read</b> Command: AT\$IMPDET?	
<b>Parameters</b>	<Impact Detection Threshold Setting>	The g-force threshold setting that must be exceeded in order to be considered an impact. (1-16G)
	<Reserved>	
<b>Return Value</b>	<b>Write</b> Command: OK : IMPDET <b>Read</b> Command: OK : IMPDET \$IMPDET=<Impact Detection Threshold Setting>,<Reserved> <b>Error</b> Response: ERROR : IMPDET	
<b>Example</b>	AT\$IMPDET=15 OK : IMPDET	
<b>Note</b>	The device used 3-axes G-Force sensor to detect vehicle motion and impacts. The X · Y and Z axis definition will be affected by device installation location.	



AT\$IMPEN Impact detected alert enable		
<b>Description</b>	This command is used to enable/disable impact detect alert.	
<b>Syntax</b>	<b>Write Command:</b> AT\$IMPEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$IMPEN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 – Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : IMPEN <b>Read Command:</b> OK : IMPEN \$IMPEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : IMPEN	
<b>Example</b>	AT\$IMPEN=1,2,0,0 OK : IMPEN	



<b>Note</b>	Impact Alert Report Format: <a href="#">Asynchronous Position Message</a> + <X-Axis Value>,<Y-Axis Value>,<Z-Axis Value>															
	<b>ASCII Format:</b>															
	<table border="1"><thead><tr><th>Parameter</th><th>Format</th><th>Description</th></tr></thead><tbody><tr><td>&lt;X- Axis Value&gt;</td><td>(-)##</td><td>-16 to 16</td></tr><tr><td>&lt;Y- Axis Value&gt;</td><td>(-)##</td><td>-16 to 16</td></tr><tr><td>&lt;Z- Axis Value&gt;</td><td>(-)##</td><td>-16 to 16</td></tr></tbody></table>	Parameter	Format	Description	<X- Axis Value>	(-)##	-16 to 16	<Y- Axis Value>	(-)##	-16 to 16	<Z- Axis Value>	(-)##	-16 to 16			
	Parameter	Format	Description													
	<X- Axis Value>	(-)##	-16 to 16													
<Y- Axis Value>	(-)##	-16 to 16														
<Z- Axis Value>	(-)##	-16 to 16														
<b>Binary Format:</b>																
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Name	Size	Type	Description													
X- Axis Value	1	Signed Byte	-16 to 16													
Y- Axis Value	1	Signed Byte	-16 to 16													
Z- Axis Value	1	Signed Byte	-16 to 16													



10. The Way to Setup Vehicle Idling Status and Time

AT\$IDLE Configure idle alerts	
<b>Description</b>	This command is used to set/query vehicle idle condition. The IDLE state is triggered when a device has not moved at least a certain distance in a specified amount of time while the engine is determined to be “on”. The idle alert message (see below) is sent as soon as the idle state is triggered. The idle report is sent once the idle state has ended.
<b>Syntax</b>	<b>Write Command:</b> AT\$IDLE=<Minimum Distance>,<Maximum Time>[,<Engine Status Detection Method>] <b>Read Command:</b> AT\$IDLE?
<b>Parameters</b>	<Minimum Distance> The distance in meters that must be travelled in the specified time in order to NOT trigger the idle alert. (1~65535) No Default
	<Maximum Time> The time in minutes that a device has to travel at least the specified distance in meters in order to NOT trigger the idle alert. (1~255) No Default
	<Engine Status Detection Method> Method to use to determine if the engine is running: 0 – Either or both Engine and Ignition Status. (In this case, either the engine or ignition status being “on” is sufficient to consider the engine to be on. However, both statuses must be “off” to consider the engine off.) 1 – Engine Status only 2 – Ignition Status only 3 – Engine & Ignition Status “on”  (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : IDLE <b>Read Command:</b> OK : IDLE \$IDLE=<Minimum Distance>,<Maximum Time>,<Engine Status Detection Method>, <b>Error Response:</b> ERROR : IDLE



AT\$IDLEEN Idle alert/report enable															
<b>Description</b>	This command is used to enable/disable vehicle idle alert.														
<b>Syntax</b>	<b>Write Command:</b> AT\$IDLEEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$IDLEEN?														
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable													
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.													
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)													
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)													
<b>Return Value</b>	<b>Write Command:</b> OK : IDLEEN <b>Read Command:</b> OK : IDLEEN \$IDLEEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : IDLEEN														
<b>Example</b>															
<b>Note</b>	Idle Alert Report Format: <a href="#">Asynchronous Position Message</a> + <Idle Duration> <b>ASCII Format:</b> <table border="1" data-bbox="582 1731 1465 1805"> <thead> <tr> <th>Parameter</th> <th>Format</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>&lt;Idle Duration&gt;</td> <td>#####</td> <td>Duration vehicle was idle in seconds</td> </tr> </tbody> </table> <b>Binary Format:</b> <table border="1" data-bbox="582 1839 1465 1944"> <thead> <tr> <th>Name</th> <th>Size</th> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>&lt;Idle Duration&gt;</td> <td>2</td> <td>Unsigned Byte</td> <td>Duration vehicle was idle in seconds</td> </tr> </tbody> </table>	Parameter	Format	Description	<Idle Duration>	#####	Duration vehicle was idle in seconds	Name	Size	Type	Description	<Idle Duration>	2	Unsigned Byte	Duration vehicle was idle in seconds
Parameter	Format	Description													
<Idle Duration>	#####	Duration vehicle was idle in seconds													
Name	Size	Type	Description												
<Idle Duration>	2	Unsigned Byte	Duration vehicle was idle in seconds												



11. The Way to Setup Tow Alert

<b>AT\$TOW Configure tow information</b>	
<b>Description</b>	This command is used to set/query vehicle tow function. The tow alert is designed to recognize when a vehicle is being towed. The tow alert will only be activated when there is no ignition status indicated.
<b>Syntax</b>	<b>Write Command:</b> AT\$TOW=<Distance>,<Time>,<Count> <b>Read Command:</b> AT\$TOW?
<b>Parameters</b>	<Distance> Distance in meters that a device must travel between GPS samples to indicate movement. This GPS sample is not filtered by the PDSR time and distance parameters. Example: 10 (meters) (Required: 1 to 1000)
	<Time> Time in seconds in which the device must move the distance <Distance> in order to be considered being towed. (Required: 5 to 1000)
	<Count> The number of consecutive GPS samples that must meet the <Distance> and <Time> requirements before the vehicle is considered to be in a towing state. Example: 3 (Required: 1 to 50)
<b>Return Value</b>	<b>Write Command:</b> OK : TOW <b>Read Command:</b> OK : TOW \$TOW=<Distance>,<Time>,<Count> <b>Error Response:</b> ERROR : TOW
<b>Example</b>	
<b>Note</b>	<ol style="list-style-type: none"> <li>1. Please remember to set AT\$MOTDET to wake up device when being towed.</li> <li>2. Please remember to set AT\$TOWEN so that TOW alert will be sent.</li> <li>3. Please set enough &lt;No Motion Duration&gt; of AT\$PWRM to execute TOW event.</li> </ol>





AT\$TOWEN Tow alert enable		
<b>Description</b>	This command is used to enable/disable vehicle tow alert.	
<b>Syntax</b>	<b>Write Command:</b> AT\$TOWEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$TOWEN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : TOWEN <b>Read Command:</b> OK : TOWEN \$TOWEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : TOWEN	
<b>Example</b>	AT\$TOWEN=1,3,0,0 OK : TOWEN	
<b>Note</b>		



## 12. The Way to Setup Speed Acceleration and Deceleration Alert

AT\$SSAD Speed Acceleration and Deceleration setting	
<b>Description</b>	This command is used to set/query Acceleration and Deceleration setting.
<b>Syntax</b>	<b>Write</b> Command: AT\$SSAD=<Max acceleration>,<Max deceleration> <b>Read</b> Command: AT\$SSAD?
<b>Parameters</b>	<Max acceleration> Max acceleration. 0.1 meters per second. (1~65535) [ (Kilometer per Hour) / 0.36]
	<Max deceleration> Max deceleration. 0.1 meters per second. (1~65535) [ (Kilometer per Hour) / 0.36]
<b>Return Value</b>	<b>Write</b> Command: OK : SSAD <b>Read</b> Command: OK : SSAD \$SSAD=<Max acceleration>,<Max deceleration> <b>Error</b> Response: ERROR : SSAD
<b>Example</b>	AT\$SSAD=32,25 (11.5Km for acceleration & 9 Km for deceleration) OK : SSAD
<b>Note</b>	



AT\$SSADEN Speed Acceleration and Deceleration report enable		
<b>Description</b>	This command is used to enable/disable SSAD alert.	
<b>Syntax</b>	<b>Write Command:</b> AT\$SSADEN=<Option>,<Action>[,<Schedule>,<Force Connection>] <b>Read Command:</b> AT\$SSADEN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
<b>Return Value</b>	<b>Write Command:</b> OK : SSADEN <b>Read Command:</b> OK : SSADEN \$SSADEN=<Option>,<Action>,<Schedule>,<Force Connection> <b>Error Response:</b> ERROR : SSADEN	
<b>Example</b>	AT\$SSADEN=1,3,0,0 OK : SSADEN	
<b>Note</b>	Report ID 206 Accelerating Report ID 207 Stop Accelerating Report ID 208 Decelerating Report ID 209 Stop Decelerating Can't both enable AT\$HADEN and AT\$SSADEN at the same time.	



AT\$HAD Harsh Acceleration and Deceleration setting		
<b>Description</b>	This command is used to set/query Harsh Acceleration and Deceleration setting.	
<b>Syntax</b>	<p><b>Write Command:</b> AT\$HAD=&lt;Max acceleration&gt;,&lt;Max deceleration&gt;,&lt;Max deceleration 2&gt;,&lt;Acceleration Time&gt;,&lt;Deceleration Time&gt;,&lt;Deceleration Time 2&gt;</p> <p><b>Read Command:</b> AT\$HAD?</p>	
<b>Parameters</b>	<Max acceleration>	Max acceleration. 0.1 meters per second. (1~65535) [ (Kilometer per Hour) / 0.36]
	<Max deceleration>	Max deceleration. 0.1 meters per second. (1~65535) [ (Kilometer per Hour) / 0.36]
	<Max deceleration 2>	Max deceleration. 0.1 meters per second. (1~65535) [ (Kilometer per Hour) / 0.36]
	<Acceleration Time>	In seconds. Alert is triggered if acceleration is over the Max acceleration for this period of time. (1~9)
	<Deceleration Time>	In seconds. Alert is triggered if deceleration is over the Max deceleration for this period of time. (1~9)
	<Deceleration Time 2>	In seconds. Alert is triggered if deceleration is over the Max deceleration 2 for this period of time. (1~9)
<b>Return Value</b>	<p><b>Write Command:</b> OK : HAD</p> <p><b>Read Command:</b> OK : HAD \$HAD =&lt;Max acceleration&gt;,&lt;Max deceleration&gt;,&lt;Max deceleration 2&gt;,&lt;Acceleration Time&gt;,&lt;Deceleration Time&gt;,&lt;Deceleration Time 2&gt;</p> <p><b>Error Response:</b> ERROR : HAD</p>	
<b>Example</b>	AT\$HAD=32,25,13 ,3,2,1 OK : HAD	
<b>Note</b>		



AT\$HADEN Harsh Acceleration and Deceleration report enable		
<b>Description</b>	This command is used to enable/disable HAD alert.	
<b>Syntax</b>	<b>Write Command:</b> AT\$HADEN=<Option>,<Action>,<Schedule>,<Force Connection>,<Option> <b>Read Command:</b> AT\$ HADEN?	
<b>Parameters</b>	<Option>	0 – Disable 1 – Enable
	<Action>	1 – Logging When the alert condition is true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When the alert condition is true, send the latest GPS position to the remote base station. 3 – Logging + polling When the alert condition is true, log the most recent GPS position to non-volatile flash memory and send the latest GPS position to the remote base station.
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default is 0)
	<Force Connection>	0 – Disable Bit 0 –Deliver HB before report (Only ASCII mode) Bit 1 – Send SMS Report (Default is 0)
	<Option>	Bit 0 – Harsh acceleration start report ( 206 )enable. Bit 1 – Harsh acceleration stop report ( 207 )enable. Bit 2 – Harsh deceleration start report ( 208 )enable. Bit 3 – Harsh deceleration stop report ( 209 )enable. Bit 4 – Harsh deceleration start report ( 199 )enable. Bit 5 – Harsh deceleration stop report ( 200 )enable.
<b>Return Value</b>	<b>Write Command:</b> OK : HADEN <b>Read Command:</b> OK : HADEN \$ HADEN =<Option>,<Action>,<Schedule>,<Force Connection>,<Option> <b>Error Response:</b> ERROR : HADEN	
<b>Example</b>	AT\$HADEN=1,3,0,0,63 OK : HADEN	
<b>Note</b>	Report ID 206 Accelerating Report ID 207 Stop Accelerating Report ID 208 Decelerating Report ID 209 Stop Decelerating Report ID 199 Decelerating 2 Report ID 200 Stop Decelerating 2 Can't enable AT\$HADEN and AT\$SSADEN at the same time.	



13. The Extra Application Commands

AT\$REPORT User defined report configuration		
<b>Description</b>	This command is used to set/query user defined report configuration.	
<b>Syntax</b>	<p><b>Write Command:</b>            AT\$REPORT=&lt;User Report ID&gt;,&lt;Enable&gt;[,&lt;Input Event&gt;,&lt;Input Event State&gt;,&lt;GF Index&gt;,&lt;GF Option&gt;,&lt;Output ID&gt;,&lt;Output State&gt;,&lt;Action&gt;,&lt;Action Output ID&gt;,&lt;Action Output State&gt;,&lt;Action Output Duration&gt;,&lt;Action Output Toggle&gt;,&lt;Schedule&gt;,&lt;Force Connect&gt;]</p> <p><b>Read Command:</b>            AT\$REPORT?</p>	
<b>Parameters</b>	<User Report ID>	User defined message ID (500 .. 509).
	<Enable>	0 – Disable 1 – Enable
	<Input Event>	This is a 4-byte value for event bits. 1 – Ignition (ACC) 2 – Input 1 4 – Input 2 8 – Reserved 16 – Reserved 32 – Reserved 64 –Reserved 128 –Reserved 256 – Engine Event 512 – Speed Event 1024 – Tow Alert 2048 – Main Power Low Event 4096 – Main Power Failure Event 8192 – Battery Power Low Event 16384 – Battery Power Failure Event 32768 – Main Power Restored Event 65536 – Battery Power Restored Event 131072 – Motion Event 262144 – Impact Event 524288 – Idle Event



	<Input Event State>	<p>This is a 4-byte event state bits Input State :</p> <p>Bit 00 – Ignition (ACC) 0 – From High signal to Low signal. 1 – From Low signal to High signal.</p> <p>Bit 01 – Input 1 0 – From High signal to Low signal. 1 – From Low signal to High signal.</p> <p>Bit 02 – Input 2 0 – From High signal to Low signal. 1 – From Low signal to High signal.</p> <p>Bit 03 – Reserve Bit 04 – Reserve Bit 05 – Reserve Bit 06 – Reserve Bit 07 – Reserve</p> <p>Bit 08 – Engine Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 09 – Speed Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 10 – Tow Alert 0 – Event Inactive 1 – Event Active</p> <p>Bit 11 – Main Power Low Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 12 – Main Power Failure Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 13 – Battery Power Low Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 14 – Battery Power Failure Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 15 – Main Power Restored Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 16 – Battery Power Restored Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 17 – Motion Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 18 – Impact Event 0 – Event Inactive 1 – Event Active</p> <p>Bit 19 – Idle Event 0 – Event Inactive 1 – Event Active</p>
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<GF Index>	Geo-Fence setting index (0 .. 50) 0 – Disable
<GF Option>	Geo-Fence condition 0 – Inside geo-fence 1 – Outside geo-fence
<Output ID>	Output ID bitwise for report condition 0 – Disable 1 – Output 1 2 – Output 2
<Output State>	Output State bitwise for report condition 0 – Output OFF 1 – Output ON
<Action>	This parameter defines the actions to be taken once the report is in an active state. One or more actions can be specified on any report. The following list defines all available action types: 1 – Logging When all defined report conditions are true, log the most recent GPS position to non-volatile flash memory for future retrieval. 2 – Polling When all defined report conditions are true, send the latest GPS position to the remote base station. 4 – Set Output When all defined report conditions are true, set the output relay.
<Action Output ID>	Output control ID 0 – Disable 1 – Output 1 2 – Output 2
<Action Output State>	Output control state 0 – Output OFF 1 – Output ON
<Action Output Duration>	Output duration in millisecond. (1~65535)
<Action Output Toggle>	The times from its current state to its alternate state and back again.(0~255)





	<Schedule>	<p>0 – indicates use no schedule/always on ( Default )</p> <p>Bit 0 – Schedule 1</p> <p>Bit 1 – Schedule 2</p> <p>Bit 2 – Schedule 3</p> <p>Bit 3 – Schedule 4</p> <p>Bit 4 – Schedule 5</p> <p>Bit 5 – Schedule 6</p> <p>Bit 6 – Schedule 7</p> <p>Bit 7 – Schedule 8</p>
	<Force Connection>	<p>0 – Disable</p> <p>Bit 0 – Deliver HB before report (Only ASCII mode)</p> <p>Bit 1 – Send SMS Report to number defined in AT\$SMSDST</p> <p>Bit 2 – Reserved</p> <p>Bit 3 – Send SMS to SMLST numbers 1</p> <p>Bit 4 – Send SMS to SMLST numbers 2</p> <p>Bit 5 – Send SMS to SMLST numbers 3</p> <p>Bit 6 – Send SMS to SMLST numbers 4 (Default is 0)</p>
<b>Return Value</b>	<p><b>Write Command:</b> OK : REPORT</p> <p><b>Read Command:</b> OK : REPORT</p> <p>\$REPORT=&lt;User Report ID&gt;,&lt;Enable&gt;,&lt;Input Event&gt;,&lt;Input Event State&gt;,&lt;GF Index&gt;,&lt;GF Option&gt;,&lt;Output ID&gt;,&lt;Output State&gt;,&lt;Action&gt;,&lt;Action Output ID&gt;,&lt;Action Output State&gt;,&lt;Action Output Duration&gt;,&lt;Action Output Toggle&gt;,&lt;Schedule&gt;,&lt;Force Connection&gt;</p> <p><b>Error Response:</b> ERROR : REPORT</p>	
<b>Example</b>	<p>To send to server report ID 500 when ACC is ON AT\$REPORT=500,1,1,1,0,0,0,0,2,0,0,0,0,0</p> <p>To send to server report ID 501 when ACC is OFF AT\$REPORT=501,1,1,0,0,0,0,0,2,0,0,0,0,0</p>	
<b>Note</b>		



AT\$OUT Output control		
<b>Description</b>	This command is used to set control for each output.	
<b>Syntax</b>	<p><b>Write Command:</b>            AT\$OUT=&lt;Index&gt;, &lt;New Value&gt;[,&lt;First Value Duration&gt;,&lt;Next Value Duration&gt;, &lt;Repeat Count&gt;,&lt;Schedule&gt;]</p> <p><b>Read Command:</b>            AT\$OUT=&lt;Index&gt;</p>	
<b>Parameters</b>	<Index>	Output ID (1 to 2 for Ux model)
	<New Value>	New Value for the output. 0 – Off 1 – On
	<First Value Duration>	Duration in milliseconds to set output to the New Value Setting. A value of 0 indicates indefinitely or Constant at New Value. (1~65535) (Default – 0 )
	<Next Value Duration>	Duration in milliseconds to set output to the absolute value of 1 minus the New Value. A Value of zero indicates the Next Value is not set (1~65535) (Default – 0)
	<Repeat Cycle>	Number of times to repeat the output setting. (1~1000) (Default – 0)
	<Schedule>	0 – indicates use no schedule/always on Bit 0 – Schedule 1 Bit 1 – Schedule 2 Bit 2 – Schedule 3 Bit 3 – Schedule 4 Bit 4 – Schedule 5 Bit 5 – Schedule 6 Bit 6 – Schedule 7 Bit 7 – Schedule 8 (Default – 0)



<b>Return Value</b>	<p><b>Write Command:</b> OK : OUT</p> <p><b>Read Command:</b> OK : OUT \$OUT=&lt;Index&gt;,&lt;New Value&gt;,&lt;First Value Duration&gt;,&lt;Next Value Duration&gt;,&lt;Repeat Count&gt;,&lt;Schedule&gt;</p> <p><b>Or</b></p> <p>OK : OUT \$OUT=1,&lt;New Value&gt;,&lt;First Value Duration&gt;,&lt;Next Value Duration&gt;,&lt;Repeat Count&gt;,&lt;Schedule&gt;</p> <p>.</p> <p>.</p> <p>\$OUT=n,&lt;New Value&gt;,&lt;First Value Duration&gt;,&lt;Next Value Duration&gt;,&lt;Repeat Count&gt;,&lt;Schedule&gt;</p> <p>(n is the maximum number of output for each U-series model)</p> <p><b>Error Response:</b> ERROR : OUT</p>
<b>Example</b>	<p>To enable OUTPUT1 forever AT\$OUT=1,1 OK : OUT</p> <p>AT\$OUT? OK:OUT \$OUT=1,1,0,0,0,0 \$OUT=2,0,0,0,0,0</p>
<b>Note</b>	



AT\$GFSP Geo-fence speed alert setting		
<b>Description</b>	This command is used to set speed alert in each defined Geo-Fence zone.	
<b>Syntax</b>	<b>Write Command:</b> AT\$GFSP=<Index>,<Enable>,<Speed Limit> <b>Read Command:</b> AT\$GFSP?	
<b>Parameters</b>	<Index>	Index of Geo-Fence (1~50)
	<Enable>	Enable Geo-Fence Speed Alert 0 – Disable 1 - Enable
	< Speed Limit >	Speed limit in 0.1 meters/second [ (Kilometer per Hour) / 0.36] (1~65535)
<b>Return Value</b>	<b>Write Command:</b> OK : GFSP <b>Read Command:</b> OK : GFSP \$GFSP=1,1,28 <b>Error Response:</b> ERROR : GFSP	
<b>Example</b>	AT\$GFSP=1,1,28 OK : GFSP	



AT\$OPDL Output delay		
<b>Description</b>	This command is to set the output to be enabled when the vehicle speed from GPS signal is lower than a preset value for duration of time.	
<b>Syntax</b>	<b>Write</b> Command: AT\$OPDL=<Output Mask>,<GPS Speed Limit>,<Duration> <b>Read</b> Command: AT\$OPDL?	
<b>Parameters</b>	<Output Mask>	0 – Disable (Default) 1 – Output 1 2 – Output 2
	<GPS Speed Limit>	Speed calculated from GPS signal as the threshold Value range 5 ~ 65535 in 0.1 meters/second
	<Duration>	Duration of time that must elapse after speed is lower than GPS Speed Limit before change the output state. Value range 0 ~ 255 in seconds
<b>Return Value</b>	<b>Write</b> Command: OK : OPDL <b>Read</b> Command: OK : OPDL \$OPDL=<Output Mask>,<GPS Speed Limit>,<Duration> <b>Error</b> Response: ERROR : OPDL	
<b>Example</b>	Enable output 1 when speed is lower than 10 meters/sec for 12 seconds: AT\$OPDL=1,100,12 OK : OPDL	



AT\$SPARM Speed Output Alarm configuration		
<b>Description</b>	This command is used to set/query speeding output alarm. Output trigger when subtract <Speed Difference> from AT\$SPEED <Set Threshold> or AT\$GFSP <Speed Limit> and you have speed value equal current speed.	
<b>Syntax</b>	<b>Write Command:</b> AT\$SPARM=<Enable>,<Speed Difference>,<Speed Output ID> <b>Read Command:</b> AT\$SPARM?	
<b>Parameters</b>	<Enable>	0 – Disable 1 – Enable
	<Speed Difference>	0.1 meters per second. (1~65535)
	< Speed Output ID >	Output control ID 1 – Output 1 2 – Output 2
<b>Return Value</b>	<b>Write Command:</b> OK : SPARM  <b>Read Command:</b> OK : SPARM \$SPARM=<Enable>,<Speed Difference>,<Speed Output ID>  <b>Error Response:</b> ERROR : SPARM	
<b>Example</b>	AT\$SPARM=1,10,1 OK : SPARM	
<b>Note</b>		



AT\$COMM Communication parameters configuration																									
<b>Description</b>	This command is used to set or query specified communication parameters.																								
<b>Syntax</b>	<p><b>Write</b> Command:            AT\$COMM=&lt;Modem ID&gt;,&lt;Format&gt;,&lt;SMSDST&gt;,&lt;SMSLST1&gt;,&lt;APN Name&gt;,&lt;HOST1_Address&gt;,&lt;HOST1_Port&gt;,&lt;GPRSEN&gt;,&lt;HB_Period&gt;,&lt; Reserved &gt;,&lt;PDSR_Mode&gt;,&lt;PDSR_Min. Time&gt;</p> <p><b>Read</b> Command:            AT\$COMM?</p>																								
<b>Parameters</b>	<table border="1"> <tr> <td>&lt;Modem ID&gt;</td> <td>Refer to AT\$MODID</td> </tr> <tr> <td>&lt;Format&gt;</td> <td>Refer to AT\$FORMAT</td> </tr> <tr> <td>&lt;SMSDST&gt;</td> <td>Refer to AT\$SMSDST</td> </tr> <tr> <td>&lt;SMSLST1&gt;</td> <td>Refer to AT\$SMSLST</td> </tr> <tr> <td>&lt;APN Name&gt;</td> <td>Refer to AT\$APN</td> </tr> <tr> <td>&lt;HOST1_Address&gt;</td> <td>Refer to AT\$HOSTS</td> </tr> <tr> <td>&lt;HOST1_Port&gt;</td> <td>Refer to AT\$HOSTS</td> </tr> <tr> <td>&lt;GPRSEN&gt;</td> <td>Refer to AT\$GPRSEN</td> </tr> <tr> <td>&lt;HB_Period&gt;</td> <td>Refer to AT\$HB</td> </tr> <tr> <td>&lt; Reserved &gt;</td> <td>Reserved</td> </tr> <tr> <td>&lt;PDSR_Mode&gt;</td> <td>Refer to AT\$PDSR</td> </tr> <tr> <td>&lt;PDSR_Min. Time&gt;</td> <td>Refer to AT\$PDSR</td> </tr> </table>	<Modem ID>	Refer to AT\$MODID	<Format>	Refer to AT\$FORMAT	<SMSDST>	Refer to AT\$SMSDST	<SMSLST1>	Refer to AT\$SMSLST	<APN Name>	Refer to AT\$APN	<HOST1_Address>	Refer to AT\$HOSTS	<HOST1_Port>	Refer to AT\$HOSTS	<GPRSEN>	Refer to AT\$GPRSEN	<HB_Period>	Refer to AT\$HB	< Reserved >	Reserved	<PDSR_Mode>	Refer to AT\$PDSR	<PDSR_Min. Time>	Refer to AT\$PDSR
<Modem ID>	Refer to AT\$MODID																								
<Format>	Refer to AT\$FORMAT																								
<SMSDST>	Refer to AT\$SMSDST																								
<SMSLST1>	Refer to AT\$SMSLST																								
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<HOST1_Address>	Refer to AT\$HOSTS																								
<HOST1_Port>	Refer to AT\$HOSTS																								
<GPRSEN>	Refer to AT\$GPRSEN																								
<HB_Period>	Refer to AT\$HB																								
< Reserved >	Reserved																								
<PDSR_Mode>	Refer to AT\$PDSR																								
<PDSR_Min. Time>	Refer to AT\$PDSR																								
<b>Return Value</b>	<p><b>Write</b> Command:            OK : COMM</p> <p><b>Read</b> Command:            OK : COMM            \$COMM=&lt;Modem ID&gt;,&lt;Format&gt;,&lt;SMSDST&gt;,&lt;SMSLST1&gt;,&lt;APN Name&gt;,&lt;HOST1_Address&gt;,&lt;HOST1_Port&gt;,&lt;GPRSEN&gt;,&lt;HB_Period&gt;,&lt; Reserved &gt;,&lt;PDSR_Mode&gt;,&lt;PDSR_Min. Time&gt;</p> <p><b>Error</b> Response:            ERROR : COMM</p>																								
<b>Example</b>	AT\$COMM=3010000001,1,123456789,,internet,,0,1,0,0,1,20 OK : COMM																								
<b>Note</b>																									



AT\$FTP FTP firmware download command		
<b>Description</b>	This command is used to download firmware from FTP server.	
<b>Syntax</b>	<b>Write Command:</b> AT\$FTP=<Hostname>,<Username>,<Password>,<FTP_port_number>,<Filename>,<Filesize> <b>Read Command:</b> AT\$FTP?	
<b>Parameters</b>	<Hostname>	FTP hostname (Max 29 characters)
	<Username>	Username to login (Max 10 characters)
	<Password>	Password to login (Max 10 characters)
	<FTP_port_number>	FTP port number (0~65535)
	<Filename>	Filename of file for download (Max 20 characters)
	<Filesize>	File size of file for download (1~4294967295)
<b>Return Value</b>	<b>Write Command:</b> OK : FTP <b>Read Command:</b> OK : FTP \$FTP=ftp.systech.com.tw,u1test,***,0,Uxv0.1r10.bin, 250880 <b>Error Response:</b> ERROR : FTP	
<b>Example</b>	AT\$FTP=ftp.systech.com.tw,test,12345,, Uxv0.1r10.bin 250880 OK : FTP	
<b>Note</b>	FTP_DOWNLOAD_REPORT: ID=59, with string OK:filename FTP_DOWNLOAD_REPORT: ID=60, with string ERROR:filename	





AT\$FILE Firmware file uploading command		
<b>Description</b>	This command is used to update firmware or configuration file.	
<b>Syntax</b>	<b>Write Command:</b> AT\$FILE=<Attrib>,<Type>,<Filename>,<Filesize>	
<b>Parameters</b>	<Attrib>	File attrib (upd – file update)
	<Type>	File type (fw – update fw) (cf – update configuration file)
	<Filename>	Filename of file for download (Max 20 characters)
	<Filesize>	File size of file for download (1~4294967295)
<b>Return Value</b>	<b>Write Command:</b> OK : FILE	
<b>Example</b>	AT\$FILE=upd,fw,Ux_v0.1_r07.bin,249856 OK : FILE	
<b>Note</b>	FILE_UPDATE_REPORT : ID=61, with string OK:filename FILE_UPDATE_REPORT : ID=62, with string ERROR:filename	



AT\$EXTRACFG      Extra configuration																
<b>Description</b>	This command is used to set or query extra configuration. Only for binary format.															
<b>Syntax</b>	<p><b>Write</b> Command: AT\$EXTRACFG=&lt;Extra Data Mask&gt;,&lt; Reserved &gt;&lt; Reserved &gt;&lt;SysResetMode&gt;</p> <p><b>Read</b> Command: AT\$EXTRACFG?</p>															
<b>Parameters</b>	<table border="1"> <tr> <td>&lt;Extra Data Mask&gt;</td> <td>Setting of attaching extra data to standard report Bit 0 – vext data Bit 1 – vbat data Bit 2 – Reserved Bit 3 – Reserved Bit 4 – CSQ</td> </tr> <tr> <td>&lt; Reserved &gt;</td> <td>Reserved</td> </tr> <tr> <td>&lt; Reserved &gt;</td> <td>Reserved</td> </tr> <tr> <td>&lt;SysResetMode&gt;</td> <td>0 –Reset all parameters to manufactory default. 1 –Reset all parameters to configuration file.</td> </tr> </table>	<Extra Data Mask>	Setting of attaching extra data to standard report Bit 0 – vext data Bit 1 – vbat data Bit 2 – Reserved Bit 3 – Reserved Bit 4 – CSQ	< Reserved >	Reserved	< Reserved >	Reserved	<SysResetMode>	0 –Reset all parameters to manufactory default. 1 –Reset all parameters to configuration file.							
	<Extra Data Mask>	Setting of attaching extra data to standard report Bit 0 – vext data Bit 1 – vbat data Bit 2 – Reserved Bit 3 – Reserved Bit 4 – CSQ														
	< Reserved >	Reserved														
	< Reserved >	Reserved														
<SysResetMode>	0 –Reset all parameters to manufactory default. 1 –Reset all parameters to configuration file.															
< Reserved >	Reserved															
< Reserved >	Reserved															
<SysResetMode>	0 –Reset all parameters to manufactory default. 1 –Reset all parameters to configuration file.															
<b>Return Value</b>	<p><b>Write</b> Command: OK : EXTRACFG</p> <p><b>Read</b> Command: OK : EXTRACFG \$EXTRACFG=&lt;Extra Data Mask&gt;,&lt; Reserved &gt;&lt; Reserved &gt;&lt;SysResetMode&gt;</p> <p><b>Error</b> Response: ERROR : EXTRACFG</p>															
<b>Example</b>	AT\$EXTRACFG=3,1,0,0 OK : EXTRACFG															
<b>Note</b>	1. Only for binary data															
	2. It will attach below data after standard report if set extra data mask.															
	<table border="1"> <thead> <tr> <th>Name</th> <th>Size</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Extra data mask</td> <td>2</td> <td></td> </tr> <tr> <td>Main Voltage</td> <td>2</td> <td>External voltage in mV</td> </tr> <tr> <td>Battery Voltage</td> <td>2</td> <td>Battery voltage in mV</td> </tr> <tr> <td>CSQ</td> <td>1</td> <td>RSSI of CSQ</td> </tr> </tbody> </table>	Name	Size	Description	Extra data mask	2		Main Voltage	2	External voltage in mV	Battery Voltage	2	Battery voltage in mV	CSQ	1	RSSI of CSQ
	Name	Size	Description													
	Extra data mask	2														
Main Voltage	2	External voltage in mV														
Battery Voltage	2	Battery voltage in mV														
CSQ	1	RSSI of CSQ														



AT\$CUSD Unstructured Supplementary Service Data	
<b>Description</b>	This command is used to send unstructured supplementary service data to GSM .The result code presentation in the response.
<b>Syntax</b>	<b>Write Command:</b> AT\$CUSD=< USSD >
<b>Parameters</b>	< USSD >      Numeric parameter which indicates control of the unstructured supplementary service data.
<b>Return Value</b>	<b>Write Command:</b> OK:CUSD <b>Error Response:</b> ERROR:CUSD
<b>Example</b>	AT\$CUSD=*101*1# OK: CUSD
<b>Note</b>	



AT\$SMSOUT SMS output control setting	
<b>Description</b>	This command is to set SMS control output ID. "START" and "STOP" are used for control output states by using SMS. It is easy to command by using cellular phone.
<b>Syntax</b>	<b>Write</b> Command: AT\$SMSOUT=<Output ID> <b>Read</b> Command: AT\$SMSOUT ?
<b>Parameters</b>	< Output ID > 0 – Disable (Default) 1 – Output 1 2 – Output 2
<b>Return Value</b>	<b>Write</b> Command: OK : SMSOUT <b>Read</b> Command: OK : SMSOUT \$SMSOUT=< Output ID > <b>Error</b> Response: ERROR : SMSOUT
<b>Example</b>	AT\$SMSOUT=1 OK : SMSOUT
<b>Note</b>	"START" set output ON. " STOP " set output OFF.



## VI. Appendices

### A. Message ID Description

Message ID (Heximal)	Message ID (Decimal)	Description	Remark
0x0000	0	Get position	
0x0001	1	Log position	
0x0002	2	Tracking position	
0x000B	11	Ignition (ACC) status Alert	
0x000C	12	Accessory input 1 Status Alert	
0x000D	13	Accessory input 2 Status Alert	
0x003B	59	FTP Download Report	
0x003C	60	FTP Download Fail	
0x003D	61	File Update Report	
0x003E	62	File Update Fail	
0x00A0	160	Power-Up Alert	
0x00A1	161	Engine Status Alert	
0x00A2	162	High Speed Alert	
0x00A3	163	High Speed Report	
0x00A4	164	GeoFence Entry Alert	AT\$GF
0x00A5	165	GeoFence Exit Alert	AT\$GF
0x00A6	166	Main Power Low Alert	
0x00A7	167	Main Power Failure Alert	
0x00A8	168	Battery Power Low Alert	
0x00A9	169	Battery Power Failure Alert	
0x00AB	171	Heartbeat (Binary Format)	AT\$HB
0x00AC	172	GPS Failure Alert (No GPS lock)	
0x00AD	173	GPS Antenna Failure Alert	
0x00AF	175	Main Power Restored Alert	
0x00B0	176	Battery Power Restored	
0x00B1	177	Tow Alert	AT\$TOW
0x00B2	178	GPS Module Failure Alert	
0x00B3	179	Motion Detection Alert	AT\$MOTDET
0x00B4	180	Impact Detection Alert	AT\$IMPDET
0x00B5	181	Pre-impact data alert.	AT\$IMPDET
0x00B6	182	Post-impact data alert.	AT\$IMPDET
0x00B7	183	Idle Alert	AT\$IDLE
0x00B8	184	Idle Alert Report	AT\$IDLE
0x00BF	191	Geo-fence speed alert	AT\$GFSP
0x00C1	193	Entering Low Power Mode Report	AT\$LPRC
0x00C2	194	Wake-up from Very Low Power Mode Report	AT\$LPRC
0x00C7	199	Deceleration start report 2	AT\$HADEN
0x00C8	200	Deceleration stop report 2	AT\$HADEN
0x00C9	201	Wake-up from Low Power Mode Report	AT\$LPRC
0x00CA	202	Entering Very Low Power Mode Report	AT\$LPRC
0x00CD	205	GPS Antenna Connect Report	AT\$GPSALEN



0x00CE	206	Acceleration start report	AT\$SSADEN
0x00CF	207	Acceleration stop report	AT\$SSADEN
0x00D0	208	Deceleration start report	AT\$SSADEN
0x00D1	209	Deceleration stop report	AT\$SSADEN
0x00D2	210	Geo-fence speed alert end	AT\$GFSP
0x01F4~0x0226	500~509	User Define Report	

**B. CME Errors Description**

Error Code	Description
0	Phone failure
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
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
100..255	Reserved

**C. CMS Errors Description**

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
176	TPDU 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 required
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
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error or SMS collision
512	User abort
513	unable to store



## D. LED Indications

### 1. GPS LED Status Table

Power Mode	GPS Status	GPS LED
Power Off	N/A	Off
Low Power	N/A	Off
Full Power	Acquiring	Flash Red (five times/second)
Full Power	Tracking	Solid Red

### 2. GSM LED Status Table

Power Mode	GSM/GPRS Status	GSM LED
Power Off	N/A	Off
Low Power	N/A	Off
Full Power	Acquiring	Flash Red (three times/second)
Full Power	Registered	Solid Red



### E. About Systems & Technology Corporation

CAREU U-Series AVL device is produced by Systems & Technology Corporation. The company is a key developer and supplier of advanced systems in the Automatic Vehicle Location (AVL), Digital Map and Car Navigation Systems.

If you need information on other maps solutions or products, please contact us at the phone and fax numbers listed below, or visit our web sites.



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