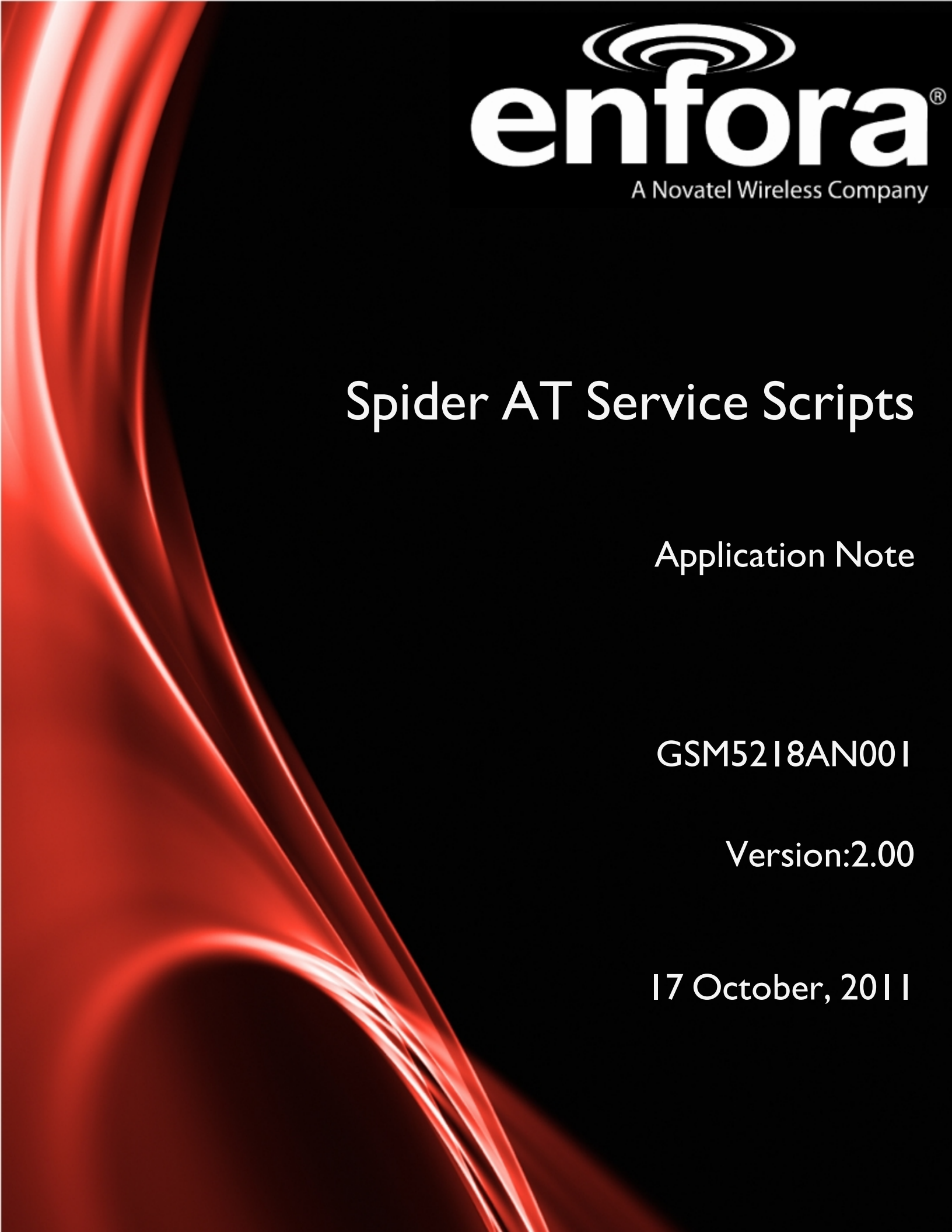

Spider AT Service Scripts

Application Note

GSM5218AN001

Version:2.00

17 October, 2011

General

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Table of Contents

1 Introduction

1.1 Overview

This document provides information about using service scripts to configure the Spider AT device..

1.2 Spider AT Components

The spider AT is a fully contained Mobile Location device. It includes the following components:

- GSM/GPRS modem
- Auxiliary processor
- Motion Detection
- GPS
- Battery

Local configuration of the device is accomplished through the USB port, which communicates directly with the modem. There are two types of AT commands: Standard modem (AT) commands (i.e. AT$EVENT) and External Processor (EP) commands (AT$EP=x).

Standard modem commands are saved into non-volatile memory by sending AT&W.
EP commands are saved by sending AT$EP=”SAV”.
The modem can be restored to the factory default setting by using AT$EP="RSTR".

1.3 Applicability

This document applies to the following devices:

- Enfora Spider AT (GSM5108)
- Enfora Spider AT 3000 (GSM5218-00FEAxx)
- Enfora Spider AT 3010 (GSM5218-00FEBxx)
- Enfora Spider AT 4000 (GSM5218-02)

The use cases in the following sections apply to all three devices except where indicated.

1.4 Message Conventions

The purposes of standard services are to provide an alert of certain conditions by transmitting pre-defined messages via UDPAPI. These messages are grouped by Message IDs which follow a standardized convention. Services utilize those Messages IDs which are pertinent to their purpose.

Message ID	Meaning
20000	GPS valid
21000	GPS invalid
22000	Stationary, PCELL data, no valid GPS data
23000	Moving, PCELL data, no valid GPS data
24000	Stationary, valid GPS data
25000	Moving, valid GPS data
30000	Entering Geofence 1
31000	Exiting Geofence 1
32000	Entering Geofence 2 (Two Geofence); Stopped with GPS invalid (Dynamic Geofence)
33000	Exiting Geofence 2
50000	Motion transition to stationary outside existing Geofence, New Geofence created
51000	No Geofence exists, New Geofence created
52000	Outside existing Geofence, New Geofence created

1.5 Minimum Time Reporting

If using the AT (BAT-0007-0001), AT 3000 (BAT5208-02), or AT 4000 (BAT5208-02) the following minimum time reporting values apply.

If using the AT 3010 (BAT5208-01) reporting time is not limited by temperature.

Temperature Range	**Minimum Time Reporting**
-30°C to 0°C	180 Minutes
0°C to 55°C	30 Minutes
55°C to 85°C	60 Minutes

Table: 1 - Battery temperature ranges, and minimum time reporting.

2 Spider AT Services

2.1 Static Asset Monitoring

Static Asset Monitoring has two cases: (1) Periodic reporting and (2) Time of Day Reporting.

USER CASE ONE- PERIODIC REPORTING

User sets report time to a reporting frequency.

The reporting frequency is a timer that is reset when the previous report is completed. For instance, with a reporting interval of 6 hours, if the Device reports at 12:00 AM, the next scheduled report will not be exactly at 6:00 AM. This time difference is due to the fact the MSP has to power on the GPS, acquire or attempt to acquire a GPS lock, then power on the modem, acquire an IP, send the data, and wait for possible response from the server. As soon as the device gets an IP, the data will be sent. The unit is allowed to be GSM registered for 60 seconds and then deregister from the network. The 6 hour clock starts after the unit deregisters from the GSM network. The default maximum time allowed for a GPS lock is 60 minutes and the default maximum time allowed for GSM registration 4 minutes. Users should expect the timed reporting to have an additional 3-12 minutes of lag time between reporting. This will be accumulative over time. Battery life can be improved by lowering the maximum time allowed for a GPS lock and GSM registration.

For each timer expiry, the device will send a 20000 report if the GPS can get a valid fix, or a 21000 reportwith GSM Parted Cell (PCELL information) if the GPS cannot get a fix.

If the product supports external power, then the user can input a different reporting period (DeltaTimePowered) to be used when the device detects that external power is available. The PeriodicReportingRate is used when on battery power and the DeltaTimePowered interval is used when external power is applied.

Messages Used:

Message	Condition
20000	Valid GPS data
21000	No Valid GPS

Default settings:

STATIC MONITORING	
AT$EP="RCFG=0,0"	Param1: 0 for position based reporting, 1 for motion based. Parm2: 0 for respond to ALL moving events transition and occurrence. 1 for only Transition

	from Moving to Stopped or Stopped to Moving.
AT$EP="UTCW=0,0,0,127"	Configuration parameters specifically for position reporting for specified time of day. This is disabled for periodic reporting.
AT$EP="CFGI=65535,0,65535,10,<Periodic Reporting Rate>,60"	All parameters are in seconds Motion sensor always OFF 65535, never ON, GPS never OFF (but only ON when device comes on for a report), Max ON for 10 seconds after fix, how often to wake up, max time on after registration in seconds. This sets the periodic reporting frequency.
AT$EP="CFGO=65535,0,65535,10,<Periodic Reporting Rate>,60"	Same as above.
AT$EP="CFGIP=65535,0,65535,10,<DeltaTimePowered>,60"	This line is only used on devices that support external power. Same as CFGI above, but for when the device is powered(AT 4000)
AT$EP="CFGOP=65535,0,65535,10,<DeltaTimePowered>,60"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT 4000)
AT$EP="GFNC=0"	Disable geofences
AT$EP="TCFG=240,240"	Both in seconds. The maximum amount of time for the modem to register to the GSM network, and the max amount of time GPS is allowed to try to get a valid fix. The default maximum is 240 seconds for GSM registration and 3600 seconds for GPS Lock. The vaalue 240 is used in this script to improve battery life.
AT$EP="GPC1=0,0"	GPIO parameter, customer doesn't have access to it so it N/A
AT$EP="GPC2=0,0"	GPIO parameter, customer doesn't have access to it so it N/A
AT$EP="SAV"	Save the EP commands
AT$EVDELA	Delete all previous programmed events
AT$APIOPT=1,1,4	Include Optional Header: Modem ID, Parm2 and Event sequence number
AT$EVENT=20,1,27,1,1	When device gets a valid GPS
AT$EVENT=20,3,40,20000,2752483	Send a GPS message of 20000
AT$EVENT=21,1,27,0,0	When the device gets an invalid GPS
AT$EVENT=21,3,40,21000,36306915	end a 21000 message
AT&W	Save configuration

USER CASE TWO – TIME OF DAY REPORTING

Time of Day Reporting is used when a specific time, rather than an interval is required for reporting. After initial power up, the device MUST acquire a GPS lock so the Real Time clock can be set, before the device will report correctly at the selected weekdays and time. If the device cannot acquire a GPS lock it will default to the last time in the RTC clock. If the device has never acquired a GPS lock, the time will start at 0 time (the default settings in the RTC registers) when the device was first powered on. The actual report will not be sent at exactly the time specified. This time difference is due to the fact the device must power on the GPS, get a lock or wait for the GPS lock timer expiry (4 minutes by default), and then power on the EIII and wait for an IP address. Users should expect the timed reporting to have an additional 3-12 minutes of lag time between reporting. This will not accumulate over time.

For each timer expiry, the device will send a 20000 report if the GPS can get a valid fix, or a 21000 report if the GPS cannot get a fix.

- Upon initial configuration, the device will not have a valid RTC time until the first periodic report wakes up the GPS receiver, gets a valid fix, and updates the RTC clock. The first report will not be synchronous to a real RTC time, subsequent reports after the first GPS fix will be synchronous to the RTC time.

If the product supports external power, the Time of Day Reporting will be at the same time and day regardless of whether the device is on external power or battery power. The user is not allowed to specify a different day or time for external power versus battery power.

Messages Used:

Message	Condition
20000	Valid GPS data
21000	No Valid GPS

Default settings:

STATIC TIME OF DAY MONITORING	
AT$EP="RCFG=0,0"	
AT$EP="UTCW=1,<hr>,<min>,<Day Of Week>"	Based on UTC time without any offset to time zone. In the order that it appears: {Enable, Hour, Min, Day of the week Mask} 1 = Sunday, 2 = Monday, 4 = Tuesday, 8 = Wednesday, 16 = Thursday, 32 = Friday, 64 = Saturday. The days can be added together if you want to report on multiple days.
AT$EP="CFGI=65535,0,65535,10,65535,60"	Periodic reporting frequency is OFF 65535 second to last parameter
AT$EP="CFGO=65535,0,65535,10,65535,60"	Same as above but for outside the fence
AT$EP="CFGIP=65535,0,65535,10,65535,60"	This line is only used on devices that support external power. Same as CFGI above, but for when the device is powered(AT4000)
AT$EP="CFGOP=65535,0,65535,10,65535,60"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$EP="GFNC=0"	
AT$EP="TCFG=240,240"	The maximum amount of time for the modem to register to the GSM network, and the max amount of time GPS is allowed to try to get a valid fix. The default maximum is 240 seconds for GSM registration and 3600 seconds for GPS Lock. The vaalue 240 is used in this script to improve battery life.
AT$EP="GPC1=0,0"	GPIO parameter,not accessible.
AT$EP="GPC2=0,0"	GPIO parameter,not accessible.
AT$EP="SAV"	Save the EP commands
AT$EVDELA	Delete all previous programmed events (standard commands, not EP)
AT$APIOPT=1,1,4	Include Optional Header: Modem ID, Parm2 and Event sequence number

AT$EVENT=20,1,27,1,1	The device has a valid GPS fix.
AT$EVENT=20,3,40,20000,2752483	Send a GPS message of 20000
AT$EVENT=21,1,27,0,0	The device has an invalid GPS fix.
AT$EVENT=21,3,40,21000,36306915	Send a 21000 message
AT&W	Save configuration

2.2 Basic Motion Monitoring

This service is designed to allow the Spider AT to combine periodic reporting with device motion. When the device is in the stationary state (no motion detected) the device will enable the motion sensor for 5 seconds out of every 55 seconds. The motion sensor is only powered on for a specific time interval and it is only during that time interval motion is being sampled.

If there is no motion for the entire report time while stationary, the device will report normally at this interval. The device will send out either the 20000 or 21000 reports depending on if a GPS fix is acquired or not. This reporting structure will repeat until motion is detected.

When motion is detected, the device will power on the GPS receiver, attempt to acquire a GPS lock, and send a 25000 (if valid GPS) or 23000 (if invalid GPS) report. The device will then start reporting according to the “Report time while moving” timer. The motion sensor will then wake up every for 5 seconds out of every 55 seconds and check for motion. If the device detects motion at each sample period until the report time when moving expires, the device will send out either the 20000 or 21000 reports depending on if the GPS fix is valid or invalid.

If the device determines that motion has stopped, it will send out a transition from moving to stationary report, 24000 for valid GPS fix, and 22000 for invalid GPS fix, and then transition over to “Report time when idle” reporting interval. As before, if the motion state does not change, (i.e. the device remains stationary), then the device will send either 20000 or 21000 reports depending if the GPS fix is valid or invalid. Similar to the Static Asset Monitoring service, both the stationary and moving report intervals will accumulate time lags for the time takes to get GPS lock and EIII IP service. Users should expect the timed reporting to have an additional 3-12 minutes of lag time. This will be accumulative over time.

If the product supports external power, then the user can input different reporting periods to be used when the device detects that external power is available. The reportTimeWhileStationary interval is used when on battery power and the PoweredStationary interval is used when external power is applied when no movement is detected. The reportTimeWhileMoving interval is used when on battery power and the PoweredInMotion interval is used when external power is applied when movement is detected.

Note: to conserve battery life there are minimum reporting intervals inherent in the AT, AT 3000, and AT 4000 devices based on battery capabilities. For instance from 0 to 55 degrees, the minimum reporting interval is 30 minutes, below 0 degrees it is 180 minutes. Between 55 to 85 degrees, the minimum reporting interval is 60 minutes. If the device detects a change from either moving to idle or idle to moving within 30 minutes from the last transition, then a report will not be sent out. The device will set a flag, and when the minimum reporting interval expires, AND if the device is still in the same state (either idle or moving) the report will be sent out at this time. If the device has transitioned twice before the minimum reporting interval, only the latest transition report will be sent.
If the AT 3010 device, the minimum reporting interval does not apply since this battery has a minimum reporting interval of 0 minutes for all temperature ranges.

Messages Used:

Message	Condition
20000	Valid GPS data
21000	No Valid GPS
22000	Stationary, No Valid GPS
23000	Moving, No Valid GPS
24000	Stationary, Valid GPS
25000	Moving, Valid GPS

Default Settings:

BASIC MOTION	
Default Settings:	
AT$EP="RCFG=1,1"	Param1: 0 for position based reporting, 1 for motion based. Parm2: 0 for respond to ALL moving events transition and occurrence. 1 for only Transition from Moving to Stopped or Stopped to Moving.
AT$EP="UTCW=0,0,0,127"	Configuration parameters specifically for position reporting for specified time of day. Based on UTC time without any offset to time zone. In the order that it appears: {Enable, Hour, Min, Day of the week Mask} 1 = Sunday, 2 = Monday, 4 = Tuesday, 8 = Wednesday, 16 = Thursday, 32 = Friday, 64 = Saturday. The days can be added together if you want to report on multiple days.
AT$EP="CFGI=50,5,65535,10,<reportTimeWhileStationary>,60"	On for 5 seconds out every 50 seconds, Gps on for 10 seconds after successfully acquiring GPS
AT$EP="CFGO=50,5,65535,10,<reportTimeWhileMoving>,60"	Same as above
AT$EP="CFGIP=50,5,65535,10,<PoweredStationary>,60"	This line is only used on devices that support external power. Same as CFGI above, but for when the device is powered(AT4000)

AT$EP="CFGOP=50,5,65535,10,<PoweredInMotion>,60"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$EP="GFNC=0"	Disabling geofences
AT$EP="TCFG=240,240"	Both in seconds The maximum amount of time for the modem to register to the GSM network, and the max amount of time GPS is allowed to try to get a valid fix
AT$EP="GPC1=0,0"	GPIO parameter, customer doesn't have access to it so it N/A
AT$EP="GPC2=0,0"	GPIO parameter, customer doesn't have access to it so it N/A
AT$EP="SAV"	Save the EP commands
AT$EVDELA	Delete all previous programmed events
AT$APIOPT=1,1,4	Include Optional Header: Modem ID, Parm2 and Event sequence number
AT$EVENT=20,1,27,1,1	When device gets a valid GPS
AT$EVENT=20,3,40,20000,2752483	Send a GPS message of 20000
AT$EVENT=21,1,27,0,0	When the device gets an invalid GPS
AT$EVENT=21,3,40,21000,36306915	end a 21000 message
AT$EVENT=22,1,62,0,0	If NOT moving
AT$EVENT=22,2,27,0,0	And NO GPS
AT$EVENT=22,3,40,22000,36306915	Send a 22000 message
AT$EVENT=23,1,62,1,1	If MOVING but
AT$EVENT=23,2,27,0,0	AND NO GPS
AT$EVENT=23,3,40,23000,36306915	Send a 23000 Message
AT$EVENT=24,1,62,0,0	If NOT moving
AT$EVENT=24,2,27,1,1	And valid GPS
AT$EVENT=24,3,40,24000,2752483	Send a 24000 message
AT$EVENT=25,1,62,1,1	MOVING
AT$EVENT=25,2,27,1,1	AND VALID GPS
AT$EVENT=25,3,40,25000,2752483	Send a 25000 message
AT&W	Save configuration

2.3 Mobile Asset Monitoring

This service is designed to allow the Spider AT to determine reporting interval based on being inside or outside one or two defined Geofence areas. The Spider AT will also report the transition to/from being inside and outside the defined Geofence areas. The motion sensor wakes up and checks for motion for 5 seconds out of every 55 seconds while inside a Geofence. If motion is detected, the GPS is activated and the location is checked against the programmed Geofences. Reporting includes timed reporting based on being either inside or outside Geofence(s), or on transition from inside/outside Geofence(s). Users may program either 1 or 2 Geofences.

ONE GEOFENCE

When the device is inside the Geofence, the device will check for motion for 5 seconds out of every 55 seconds. If no motion is detected, the motion sensor will be turned off and awaken 55 seconds later to check for motion again. If motion is detected the device will turn on the GPS receiver to check if it is inside the Geofence. If the device is still inside the Geofence, the device will turn off the GPS receiver and not generate a report until the “inside Geofence reporting interval” has expired. If the device has remained inside the Geofence for the full “inside Geofence reporting interval”, it will send either the 20000 or 21000 reports depending on if the GPS fix is valid or invalid.

When the device determines that it is outside the Geofence, the device will send a 31000 message indicating it has left the fence (this assumes that the device had to have a valid GPS to determine it has left the Geofence area). Once the device is outside the Geofence, the device will use the “outside Geofence reporting interval”. The device will not use the motion sensor to determine motion and will only wakeup and look for current GPS position when the reporting interval has expired. The device will send either the 20000 or 21000 reports depending on if GPS is valid or invalid. If the device cannot get a valid GPS lock, it will assume it is still outside the Geofence, generate a 21000 report, and continue with the outside interval reporting Interval. If the device determines that is now inside a Geofence, it will send a 20000 and also the transition message (30000) from outside to inside Geofence. Reporting will change over to the inside Geofence reporting interval and the motion sensor will be activated every 55 seconds.

If the product supports external power, then the user can input different reporting periods to be used when the device detects that external power is available. The reportTimeWhenInsideFence interval is used when on battery power and the PoweredInsideFence interval is used when external power is applied when the device is inside the Geofence. The reportTimeWhenOutsideFence interval is used when on battery power and the PoweredOutsideFence interval is used when external power is applied and the device is outside the Geofence.

Messages Used:

Message	Condition
20000	Valid GPS data
21000	No Valid GPS
30000	Enter Geofence
31000	Exit Geofence

Default settings:

ONE GEOFENCE	
AT$EP="RCFG=0,1"	Position based reporting (whenever device wakes up due to motion, check position,

	whether inside or outside fence). Second parameter 0 means respond to ALL moving events regardless whether is transition or occurrence.
AT$EP="UTCW=0,0,0,127"	Time of the day is OFF
AT$EP="CFGI=50,5,65535,10,<reportTimeWhenInsideFence>,60"	
AT$EP="CFGO=65535,5,65535,10,<reportTimeWhenOutsideFence>,60"	
AT$EP="CFGIP=50,5,65535,10,<PoweredInsideFence>,60"	This line is only used on devices that support external power. Same as CFGI above, but for when the device is powered(AT4000)
AT$EP="CFGOP=65535,5,65535,10,<PoweredOutsideFence>,60"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$EP="GFNC=1	Enabling geofences
AT$EP="TCFG=240,240"	Both in seconds The maximum amount of time for the modem to register to the GSM network, and the max amount of time GPS is allowed to try to get a valid fix
AT$EP="GPC1=0,0"	GPIO parameter,not accessible.
AT$EP="GPC2=0,0"	GPIO parameter,not accessible.
AT$EP="SAV"	Save the EP commands
AT$APIOPT=1,1,4	Include Optional Header: Modem ID, Parm2 and Event sequence number
AT$EVDELA	Delete all previous programmed events
AT$GEOFNC=1,<radius1>,<lat1>,<lon1>	Set Geofence 1 parameters
AT$EVENT=20,1,27,1,1	When device gets a valid GPS
AT$EVENT=20,3,40,20000,2752483	Send a GPS message of 20000
AT$EVENT=21,1,27,0,0	When the device gets an invalid GPS
AT$EVENT=21,3,40,21000,36306915	end a 21000 message
AT$EVENT=30,0,21,1,1	Inside geofence 1
AT$EVENT=30,3,40,30000,2752483	Send 30000 message
AT$EVENT=31,0,21,0,0	Outside geofence 1
AT$EVENT=31,3,40,31000,2752483	Send 30000 message
AT&W	Save configuration

TWO GEOFENCE

The two Geofence scenario is designed to show movement in and out of two Geofences, similar to going from home to work. So let's say Geofence 1 is your home, so you set up a Geofence of 500 meters around your house. Geofence 2 is work and you set a Geofence 500 meters around work. So you are really monitoring leaving home and arriving at work, and conversely leaving work and arriving at home.

This reporting structure will report leaving a Geofence, entering a Geofence, and periodic reporting for being either inside or outside a Geofence. Now here is where we need a little more definition. The Spider AT only stores in the MSP one Geofence at a time, so it cannot detect entering or exiting both Geofence 1 and Geofence 2 at the same time. The Provisioner loads Geofence 1 into the MSP. The MSP's Geofence

setting changes when you enter a Geofence, not when you exit. The MSP Geofence only gets changed whenever the Enabler III, detects that the device has entered a new Geofence. When the EIII detects entry into Geofence 1 or Geofence 2, it sends a command to the MSP to read the new Geofence location from the EIII set of 2 Geofences (whichever Geofence we just entered). The MSP Geofence is not modified when it leaves the Geofence. Thus, if we exit Geofence 1, drive around without entering Geofence 2, and then return to Geofence 1, then the modem will detect re-entry into Geofence 1.

If power is removed (battery disconnected or power button deactivation), then the unit saves its last known Geofence setting in the FFS so it will use the last saved Geofence when it is powered back on. If the unit drives into Geofence 2, reports that it is in Geofence 2, and powers off, then the MSP will use Geofence 2 when it powers back up.

Upon initial power on, the Spider AT assumes it is physically located within Geofence 1, uses the Inside Geofence reporting interval, and also checks for motion for 5 seconds out of every 55 seconds. If it does not detect motion, it does nothing, for now. Every 55 seconds the motion sensor wakes up and looks for motion, until it either detect motion, or the inside Geofence reporting interval expires. If the Geofence reporting interval expires without motion, the device will wake up the GPS, get a fix, and report either a 20000 or 21000 message.

If the device wakes up and finds that it is outside Geofence 1, it will send the 20000 and 31000 messages since it has exited Geofence 1. If the device wakes up and detects that it is outside of the MSP's Geofence, then the MSP will send the data to the EIII. The EIII will run the event engine to send the appropriate message(s) (in this case 20000 and 31000). If the EIII detects that the modem is inside Geofence 2, then it will send a 32000 message (as long as this is the first time that it detected entry into Geofence 2), it will tell the MSP to use Geofence 2, and the MSP will continue to use the Inside Geofence report timing since it is still inside one of the two fences. If the EIII detects that the modem is outside both Geofences, then the MSP will continue to use the previous Geofence location but will switch to Outside Geofence reporting intervals.

If the device detects motion it will wake up the GPS and check location. If it is still within the MSP's Geofence, it goes back into sleep. If it has left the programmed Geofence, it will send a 31000 or 33000 message and change over to the Outside Geofence reporting interval. The motion sensor behavior is the same for the One Geofence scenario and the Two Geofence scenario. In both cases, the motion sensor is disabled and the next MSP wakeup is determined by the ReportTimeWhenOutsideFence parameter in Provisioner. When the ReportTimeWhenOutsideFence timer expires, the MSP sends the new GPS data to the EIII. At a minimum, the 20000 (or 21000) message will be sent. If the new location is inside one of the two Geofences, then the appropriate 30000 or 32000 message will be sent, EIII will tell MSP to use the appropriate new Geofence location, and the MSP will switch back to the Inside Geofence reporting intervals.

The only time the Spider AT can detect that it must change the Geofence in the MSP is when the Enabler III is powered on to send a report.

If it has entered Geofence 2, it will send a 32000 message and change reporting interval to inside Geofence again. It will check for motion for 5 seconds out of every 55 seconds and only check for being outside Geofence 2 (it does not check for any relation to Geofence 1). If the Inside Geofence reporting interval expires without motion, the GPS wakes up and sends either a 20000 or 21000 message. If the device detects that it has left Geofence 2, it will send a 33000 message and change reporting over to the Outside Geofence interval.

If the product supports external power (AT 4000), then the user can input different reporting periods to be used when the device detects that external power is available. The reportTimeWhenInsideFence interval is used when on battery power and the PoweredInsideFence interval is used when external power is applied when the device is inside one of the defined Geofences. The reportTimeWhenOutsideFence interval is used when on battery power and the PoweredOutsideFence interval is used when external power is applied and the device is outside both Geofences.

Note: to conserve battery life there are minimum reporting intervals inherent in the AT, AT 3000, and AT 4000 devices based on battery capabilities. For instance from 0 to 55 degrees, the minimum reporting interval is 30 minutes, below 0 degrees it is 180 minutes. Between 55 to 85 degrees, the minimum reporting interval is 60 minutes. If the device detects a change from inside fence to outside fence within 30 minutes from the last transition, then a report will not be sent out. The device will set a flag, and when the minimum reporting interval expires, AND if the device is still in the same state (either inside fence or outside fence) the report will be sent out at this time (see clarification at the end of this paragraph). If the device has transitioned twice before the minimum reporting interval, only the latest transition report will be sent. If a transition is detected during the minimum reporting period and the report must be delayed, then a report will be sent as soon as the minimum reporting period has expired. The contents of the report depend upon the state of the device at the time that the report is actually sent. At a minimum, a 20000 report will be sent. The EIII will not have any knowledge of the original transition event because the MSP never wakes the modem up until after the minimum reporting period expires. Pretend like that event transition never occurred except that a flag is set in the MSP to force a GPS report when the minimum reporting timer expires. The MSP then gathers new position data and sends the information to EIII. The Spider AT will send the 20000 or 21000 report since one of those 2 events must be true. It may optionally

If the If using an AT 3010 device, the minimum reporting interval does not apply since this battery has a minimum reporting interval of 1 minute for all temperature ranges.

Messages Used:

Message	Condition
20000	Valid GPS data
21000	No Valid GPS
30000	Enter Geofence 1
31000	Exit Geofence 1
32000	Enter Geofence 2
33000	Exit Geofence 2

Default settings:

TWO GEOFENCES	
AT$EP="RCFG=0,1"	
AT$EP="UTCW=0,0,0,127"	
AT$EP="CFGI=50,5,65535,10,<reportTimeWhenInsideFence>,60"	
AT$EP="CFGO=65535,5,65535,10,<reportTimeWhenOutsideFence>,60"	
AT$EP="CFGIP=50,5,65535,10,<PoweredInsideFence>,60"	This line is only used on devices that support external power. Same as CFGI above, but for when the device is powered(AT4000)
AT$EP="CFGOP=65535,5,65535,10,<PoweredOutsideFence>,60"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$EP="GFNC=1"	Enabling geofences
AT$EP="TCFG=240,240"	Both in seconds The maximum amount of time for the modem to register to the GSM network, and the max amount of time GPS is allowed to try to get a valid fix
AT$EP="GPC1=0,0"	GPIO parameter,not accessible.
AT$EP="GPC2=0,0"	GPIO parameter,not accessible.
AT$EP="SAV"	Save the EP commands
AT$APIOPT=1,1,4	Include Optional Header: Modem ID, Parm2 and Event sequence number
AT$EVDELA	Delete all previous programmed events
AT$STOATEV = 1, AT$EP="GFNC=1,1"	Stored event to be used when conditions are met, this selects geofence1 as boundary for deciding when inside or outside fence.
AT$STOATEV = 2, AT$EP="GFNC=2,1"	Picks geofence 2 as boundary, like saying Iam inside fence 2.
AT$GEOFNC=1,<radius1>,<lat1>,<lon1>	Set geofence 1
AT$GEOFNC=2,<radius2>,<lat2>,<lon2>	Set geofence 2

AT$EVENT=20,1,27,1,1	When device gets a valid GPS
AT$EVENT=20,3,40,20000,2752483	Send a GPS message of 20000
AT$EVENT=21,1,27,0,0	When the device gets an invalid GPS
AT$EVENT=21,3,40,21000,36306915	end a 21000 message
AT$EVENT=30,0,21,1,1	If inside geofence 1
AT$EVENT=30,3,40,30000,2752483	Send 30000 message
AT$EVENT=30,3,44,1,0	And execute stored at command 1 GNFC=1,1
AT$EVENT=31,0,21,0,0	Outside fence 1
AT$EVENT=31,3,40,31000,2752483	Send 31000 message
AT$EVENT=32,0,22,1,1	When inside fence 2
AT$EVENT=32,3,40,32000,2752483	Send message 32000
AT$EVENT=32,3,44,2,0	Execute stored command 2. tell microprocessor you are inside fence 2.
AT$EVENT=33,0,22,0,0	When outside fence 2
AT$EVENT=33,3,40,33000,2752483	Send 33000
AT&W	Save configuration

2.4 Dynamic Geofence

This service is similar to the Mobile Asset Monitoring service and is designed to allow the Spider AT to determine reporting interval based on being inside or outside a non-predetermined Geofence area (the user does not specify the location, the modem creates appropriate Geofence locations on-the-fly). In addition The Spider AT will check for a stop in motion, and create a new Geofence based on the new location where the device stopped. It checks for motion for 5 seconds out of every 55 seconds in both out of and inside Geofence conditions.

Upon power on, the MSP will not have a valid Geofence loaded, and upon first wake for motion, will query the EIII for the Geofence. This Geofence, in all likelihood, will not be valid. The next time the MSP wakes up (55 seconds later) it will realize it does not have a valid Geofence, and it will wake up the GPS, get a valid fix (if possible), set the first Geofence, and send out the 51000 message. The device will then be in stationary mode and inside Geofence.

As stated above, the device will check for motion for 5 seconds out of every 55 seconds. If the device does not detect motion for the Inside Geofence reporting interval, it will wake up the EIII and send a 20000 or 21000 message. If the device does detect motion, it will wake up the GPS to attempt to get a GPS fix and check to see if it is inside or outside the Geofence. If it is inside the Geofence, no message will be sent out. If it is outside the Geofence, the MSP will wake up the EIII and send out a 31000 message. The device will also transition to the Outside Geofence reporting interval.

Every 55 seconds the MSP will check for motion again. If it still detects motion, the MSP will wake the GPS and check to see if it has re-entered the Geofence. If it has re-entered the Geofence, it will wake up the EIII

and send a 30000 message, and transition to Inside Geofence reporting. If it has not re-entered the Geofence it will continue to check for motion every 55 seconds. If it determines that it has become stationary (no motion), the MSP will set a new Geofence based on the current location, then the device will send out a 20000 and a 50000 message. It will then transition to the Inside Geofence reporting Interval.

The device will now be in stationary mode and will be checking for motion every 55 seconds. If there is no motion for the entire Inside Geofence reporting interval, the device will wake up the GPS and check for inside/outside Geofence position. If determined to be outside the Geofence (even though it did not detect motion), the device will wakeup up the EIII and send a 20000 and 31000 message. The device will now be in a "recovery" mode since it has moved without detecting the movement. While in "recovery" mode, the device will continue checking for motion every 55 seconds. If a new start-of-motion is detected, the device will operate like it is outside the Geofence and moving as described earlier. If no motion is detected for another ReportTimeWhenInsideGeofence interval, then the GPS and the EIII will be turned on. If GPS is invalid, the last known location is outside the Geofence, and the device is stationary, then a 32000 report will be sent. If GPS is valid, the last known location is outside the Geofence, the device is stationary, and the last two valid GPS locations were the same location (within the Geofence radius distance of each other), then a new Geofence is created, a 52000 report is sent, and the device transitions to the InsideGeofence reporting period.

If the device is in motion and remains outside of its most recent Geofence for the entire ReportTimeWhenOutsideFence interval, a 20000 or 21000 report will be sent.

If the product supports external power, then the user can input different reporting periods to be used when the device detects that external power is available. The reportTimeWhenInsideFence interval is used when on battery power and the PoweredInsideFence interval is used when external power is applied when the device is inside the Geofence. The reportTimeWhenOutsideFence interval is used when on battery power and the PoweredOutsideFence interval is used when external power is applied and the device is outside the Geofence.

Messages Used:

Message	Condition
20000	Valid GPS fix
21000	Invalid GPS fix
30000	Enter Geofence
31000	Exit Geofence
32000	Stopped with Invalid GPS fix
50000	Stationary, Valid GPS, Creating New Geofence
51000	Valid GPS, No Geofence, Creating New Geofence (usually at power up)
52000	Valid GPS, Outside Geofence, Creating New Geofence (usually after motion was not detected or after stopping with invalid GPS)

Default settings:

DYNAMIC GEOFENCE	
AT$EP="RCFG=0,0"	Start with position based reporting, meaning , when it feels motion it will wakeup an determine if it's inside or outside fence.
AT$EP="UTCW=0,0,0,127"	No time of day
AT$EP="CFGI=50,5,65535,10,<reportTimeWhenInsideFence>,60"	All parameters are in seconds Motion sensor always OFF 65535, never ON, GPS never OFF (but only ON when device comes on for a report), Max ON for 10 seconds after fix, how often to wake up, max time on after registration in seconds
AT$EP="CFGO=50,5,65535,10,<reportTimeWhenOutsideFence>,60"	Same as above but for outside the fence
AT$EP="CFGIP=50,5,65535,10,<PoweredInsideFence>,60"	This line is only used on devices that support external power. Same as CFGI above, but for when the device is powered(AT4000)
AT$EP="CFGOP=50,5,65535,10,<PoweredOutsideFence>,60"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$EP="GFNC=1"	Enable geofences
AT$EP="TCFG=240,240"	Both in seconds The maximum amount of time for the modem to register to the GSM network, and the max amount of time GPS is allowed to try to get a valid fix
AT$EP="GPC1=0,0"	GPIO parameter,not accessible.
AT$EP="GPC2=0,0"	GPIO parameter,not accessible.
AT$EP="SAV"	Save the EP commands
AT$APIOPT=1,1,4	Include Optional Header: Modem ID, Parm2 and Event sequence number
AT$STOATEV=1,AT$EP="GFNC=1,1"	Store AT event
AT$STOATEV=2,AT$EP="RCFG=0,0"	Position based reporting,
AT$STOATEV=3,AT$EP="RCFG=1,1"	Motion based reporting, 1st Parm:when motion sensed immediately send a report. 2nd Parm: report on ALL moving events independent of transition or occurrence.
AT$GEOFNC=1,0,0,0	Delete Geofence 1
AT$EVTEST=21,2	Set Geofence 1 state to neither in or out
AT$GEOFNC=2,0,0,0	Delete Geofence 2
AT$EVTEST=22,2	Set Geofence 2 state to neither in or out
AT$EVDELA	Delete all previous programmed events
AT$EVENT=20,1,27,1,1	If valid GPS fix
AT$EVENT=20,3,40,20000,2752483	Report 200000 message
AT$EVENT=21,1,27,0,0	If invalid GPS fix
AT$EVENT=21,3,40,21000,36306915	Report 21000 message
AT$EVENT=30,0,21,1,1	If Inside Geofence 1 &
AT$EVENT=30,2,100,0,0	UserVar == 0 (outside Geofence)
AT$EVENT=30,3,40,30000,2752483	Report 30000 message
AT$EVENT=30,3,125,0,1	Set UserVar0 = 1 (inside Geofence)
AT$EVENT=31,1,21,0,0	If Outside Geofence 1 &
AT$EVENT=31,2,100,1,1	UserVar0 == 1 (inside Geofence)
AT$EVENT=31,3,40,31000,2752483	Report 31000 message
AT$EVENT=31,3,125,0,0	Set UserVar0 = 0 (outside Geofence)

AT$EVENT=32,1,62,0,0	If stopped &
AT$EVENT=32,2,27,0,0	Invalid GPS position &
AT$EVENT=32,2,100,0,0	UserVar0 == 0 (outside Geofence)
AT$EVENT=32,3,40,32000,36306915	Report 32000 message
AT$EVENT=50,1,62,0,0	If stopped &
AT$EVENT=50,2,27,1,1	Valid GPS &
AT$EVENT=50,2,21,0,0	Outside Geofence 1
AT$EVENT=50,3,49,1,<radius>	Set Geofence 1 to <radius>
AT$EVENT=50,3,49,2,<radius>	Set Geofence 2 to <radius>
AT$EVENT=50,3,44,1,0	Enable Geofence 1
AT$EVENT=50,3,40,50000, 2752483	Report 50000 message
AT$EVENT=50,3,125,0,1	Set UserVar0 = 1 (inside Geofence)
AT$EVENT=51,1,27,1,1	If valid GPS position &
AT$EVENT=51,2,54,0,0	No Geofence
AT$EVENT=51,3,49,1,<radius>	Set Geofence 1 to current location and <radius>
AT$EVENT=51,3,49,2,<radius>	Set Geofence 2 to current location and <radius>
AT$EVENT=51,3,44,1,0	Enable Geofence 1
AT$EVENT=51,3,40,51000,2752483	Report 51000 message
AT$EVENT=51,3,125,0,1	Set UserVar0 = 1 (inside Geofence)
AT$EVENT=52,1,27,1,1	If valid GPS position &
AT$EVENT=52,2,21,0,0	Outside Geofence &
AT$EVENT=52,2,22,1,1	In temp Geofence &
AT$EVENT=52,2,101,0,0	UserVar1=0 (stationary)
AT$EVENT=52,3,49,1,<radius>	Set Geofence 1
AT$EVENT=52,3,49,2,<radius>	Set Geofence 2
AT$EVENT=52,3,44,1,0	Set new Geofence in MSP
AT$EVENT=52,3,40,52000,2752483	Report 52000 message
AT$EVENT=52,3,125,0,1	Set UserVar0 = 1 (inside Geofence)
AT$EVENT=53,1,27,1,1	If valid GPS position &
AT$EVENT=53,2,21,0,0	outside Geofence &
AT$EVENT=53,2,101,0,0	UserVar1 = 0 (stationary)
AT$EVENT=53,3,49,2,<radius>	Set Geofence 2
AT$EVENT=60,1,62,0,0	If stopped
AT$EVENT=60,3,125,1,0	Set UserVar1=0 (stationary)
AT$EVENT=60,3,44,2,0	Set Position based reporting
AT$EVENT=61,1,62,1,1	If moving
AT$EVENT=61,3,125,1,1	Set UserVar1 = 1 (moving)
AT$EVENT=62,1,62,1,1	If moving &
AT$EVENT=62,2,21,0,0	Outside Geofence
AT$EVENT=62,3,44,3,0	Set motion based reporting
AT&W	Save configuration

2.5 FOTA

FOTA is the Firmware upgrade Over-The-Air. This service allows the user to upgrade the device's firmware using the cellular network without any cables attached. The firmware upgrade is automatically started when the FTP file transfer is completed. During the upgrade process, the motion sensor is disabled and the MSP configuration is optimized to complete the upgrade quickly. After the firmware has been upgraded, the MSP configuration is reverted back to the previous settings from before the FOTA process. If an error is detected during the upgrade process, the upgrade is aborted and the MSP reverts to its previous configuration. If an error or timeout occurs during the FTP download, the file download will be resumed twice from the point that the file download was left off.

FOTA	
AT$EP="CFGI=65535,5,65535,10,6,400"	Change reporting time from whatever configured previously to report every 6 minutes (irrelevant), and keep device on for for 400 seconds (to allow enough time for device to finish FOTA).
AT$EP="CFGO=65535,5,65535,10,6,400"	Same as above
AT$EP="CFGIP=65535,5,65535,10,6,400"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$EP="CFGOP=65535,5,65535,10,6,400"	This line is only used on devices that support external power. Same as CFGO above, but for when the device is powered(AT4000)
AT$FOTACFG="ftpServerHostname",ftpPort,"ftpUsername", "ftpPassword",0,5,0,0	Configure modem to talk to the FTP server which contains the Delta File. (See Configuration for FOTA section below for details.)
AT$FOTAGET="remoteFilename"	Which file to get. Must be on root, or you must set up a login that will place you in a particular folder.

CONFIGURATION FOR FOTA

- ftpServerHostname (FTP Host Server): either FQDN or dotted-decimal IP address of FTP server. FQDN is resolved by DNS immediately prior to opening IP connection to FTP server. The FQDN may be up to a maximum of 63 characters. Default value: none.
- ftpPort (FTP Port): TCP port number on FTP server for FTP control connection. Port range: 0 – 65535, Default value: 21
- ftpUserame (FTP Username): FTP login name used to authenticate FTP connection request. The username may be up to a maximum of 31 characters. Default value: none.

- ftpPassword (FTP Password): FTP password used to authenticate FTP connection request. If no password authentication is required, the password may be a null string. The password may be up to a maximum of 31 characters. Default value: none.
- remoteFilename (File to Upload): filename of FOTA file on FTP server. The filename may be up to 31 characters. The filename should be the complete pathname starting from the login directory associated with the FTP username. This file is the delta file used to upgrade from the device's current firmware version to the new firmware version.

2.6 Power Source Switch Notification

This script configures the Spider AT to report every time it switches between battery and external power. It will not report the initial condition. For example if it starts on battery or external power it will not send an event 63 message until the first time it switches between power sources. This is applicable only to the Spider AT 4000.

at$event=60,1,63,1,1	if device is on external Power
at$event=60,2,27,1,1	and has Valid GPS
at$event=60,3,40,60000,2752451	send 60000 message
at$event=61,1,63,1,1	if device is on external power
at$event=61,2,27,0,0	and NO valid GPS
at$event=61,3,40,61000,36306883	if device
at$event=62,1,63,0,0	if device is on battery power
at$event=62,2,27,1,1	and has valid GPS
at$event=62,3,40,62000,2752451	send 62000 message
at$event=63,1,63,0,0	if device is battery
at$event=63,2,27,0,0	and has NO valid GPS
at$event=63,3,40,63000,36306883	send 63000 message
at&w	

A.1 Standard AT Commands

The following is the format in which all commands will be presented.

ATx(Command)	Xxxxx (Command Description)
Command Function	(Description of the command function)
Command Functional Group	(Functional group identification)
Command Format Query	ATx=?
Response	ATx: (parameter1 name 1 – 15), (parameter2 name 1-10),…
Write Format	ATx=<value>,<value>[,<optional value>],…
Response	OK or ERROR
Read Format	ATx?
Response	<value>,<value>,…
Execution Format	ATx
Response	OK, ERROR, or <value>
Parameter Values	
<Value 1>	ATx: (1-15),(1-10)
<Value 2>	
Reference	(Applicable standard reference)
Standard Scope	Mandatory or Optional
Enfora Implementation Scope	Full, Partial, or Not Supported
Notes	(Additional command notes)
Examples	

	Note: Where applicable, the <value> responses provided for the READ and EXECUTION formats are modem default values. All efforts will be made by Enfora, Inc. to keep these values current in the documentation but will not be responsible for any differences that may occur as a result subsequent software builds and version enhancements.

AT$EVENT User Defined Input/Output

AT$EVENT	User Defined Input/Output
Command Function	This command allows the user to customize the modem's input and output capabilities. Any combination of input events can be monitored to trigger any combination of output events
Command Functional Group	Enfora Specific
Command Format Query Response	AT$EVENT=? $EVENT: (0-99),(0-3),(0-255),(-2147483647 - 2147483647),(-2147483647 - 2147483647)
Write Format Response	AT$EVENT=<event group>,<event type>,<event category>,<parm1>,<parm2> OK
Read Format Response	AT$EVENT? $EVENT:evgpevtypevcatp1p2 1A0924 1B33710 2A0955 2B32100 3A0900 3B31300 4A0911 4 B32100
Execution Format Response	N/A N/A
Parameter Values	
<event group>	This parameter defines the group number of a group of events and the order they are executed. Events are grouped together to control execution sequence. A group number has to have at least one input event and one output event. Multiple input events within a group number would

	be treated as a logical AND condition. Multiple output events within a group number would be executed individually in a sequential manner. Valid values for group number are: 1 thru 99
<event type>	This parameter defines the type of event: Input or Output. An Input event can be defined as: Transition, Occurrence, or Input. The output event is executed when input event conditions are met. For more information see the <event type> table.
<event category> <param1> <param2>	These parameters defines the actual Input or Output Event number and their valid range for <parm1> and <parm2>. The below table defines the values for <event category>, <parm1> and <parm2> parameter for input events defined as a Transition Trigger, Occurrence Trigger, or Input Trigger. . For more information see the: Input<event category> table or the Output<event category> table.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	A maximum of 400 events (input and output) are supported.

AT$EVDELA Delete Event (All)

AT$EVDELA	Delete Event (All)
Command Function	This command allows the user to delete all events from the event table.
Command Functional Group	Enfora Specific
Command Format Query	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT$EVDELA
Response	OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	N/A

This command deletes ALL events from the event table including the default events that control the flashing of the status LEDs.
If the default events are deleted, they must be manually recreated or use AT&F to restore the factory configuration.

AT&W Save Current Settings

AT&W	Save Current Settings
Command Function	This command allows the user to save the current settings in memory.
Command Functional Group	State control
Command Format Query	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT&W
Response	OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	To ensure successful completion of the command, do not issue additional commands until 'OK' is returned.

	Warning: Users should avoid sending AT&W immediately before a modem reset. A minimum of a few seconds should be allowed between issuing the command and a modem reset.

AT$APIOPT Enable API Optional Header Fields

AT$APIOPT	Enable API Optional Header Fields

Command Function	This command allows the user to enable specific Optional Header Fields to be included in the UDPAPI and TCPAPIs' API Optional Header. See Enfora GSM/GPRS Family API Reference (GSM0308UG001) for details.
Command Functional Group	Enfora Specific
Command Format Query	AT$APIOPT=?
Response	$APIOPT: (0-1),(0-1),(0-4),(0-1), (0-1) OK
Write Format	AT$APIOPT=<MDMID>,<Msg Event Format>,<Event Seq Num>,<HdrDisable>,<Output Event Type>
Response	OK
Read Format	AT$APIOPT?
Response	$APIOPT=<MDMID>,<Msg Event Format>,<Event Seq Num>,<HdrDisable>,<Output Event Type>
Execution Format	N/A
Response	N/A
Parameter Values	
<MDMID>	0 = Disable sending of MDMID value in TCPAPI or UDPAPI Header 1 = Enable sending of MDMID value in TCPAPI or UDPAPI Header
<Msg Event Format>	0 = Disable sending of Output Message Event Format value in TCPAPI or UDPAPI Header 1 = Enable sending of Output Message Event Format in TCPAPI or UDPAPI Header
<Event Seq Num>	0 = Disable sending of Event Sequence Number value in TCPAPI or UDPAPI Header 1 = Enable sending of the least significant byte of the Event Sequence Number in TCPAPI or UDPAPI Header 2 = Enable sending of the two least significant bytes of the Event Sequence Number in TCPAPI or UDPAPI Header 3 = Enable sending of the three least significant bytes of the Event Sequence Number in TCPAPI or UDPAPI Header 4 = Enable sending of the full four bytes of the Event Sequence Number in TCPAPI or UDPAPI Header

<HdrDisable>	0 = UDPAPI header is enabled (default) 1 = UDPAPI header is disabled for UDP messages sent via event engine. The UDPAPI header will not be disabled if bit 18 (send this OTA message via SMS when GPRS services are not available) is set in parm2 of the $event command that generates the message (see AT$EVENT). This flag has no effect on commands sent from the server or the ack sequence. This feature is intended to be used with UDP messages when the size of the data packet is critical due to the rapid rate at which messages are sent over an extended period of time.
<Output Event Type>	0 = Disable sending of Output Event number in TCPAPI or UDPAPI Header 1 = Enable sending of Output Event number in TCPAPI or UDPAPI Header
Reference	Enfora GSM/GPRS Family API Reference (GSM0308UG001)
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	When a message is formatted for transmission via the event engine (UDP, TCP, SMS, or serial), we call the function to retrieve/increment the sequence number. The sequence number is passed to the task that actually makes the decision about what to do with the message. If the message is SMS or serial, the sequence number doesn't actually get used in the end, but does get incremented.
Examples	This example will disable the sending of the MDMID, enable the Msg Event Format and enable the full Event Sequence Number. AT$APIOPT=0,1,4 This example will enable the sending of the MDMID and the least two significant bytes of the Event Sequence Number. The state of the Enable Msg Event Format will remain unchanged AT$APIOPT=1,,2 This example will enable the sending of the MDMID and disable the Msg Event Format. The state of the Event Seq Num will remain unchanged AT$APIOPT=1,0

AT$STOATEV Store AT Command Events

AT$STOATEV	Store AT Command Events
Command Function	This commands allows the user to store AT command output events. The AT command is executed upon the triggering of the associated input event.
Command Functional Group	Enfora Specific
Command Format Query	AT$STOATEV=?
Response	$$STOATEV: (1-35),<AT commands> OK
Write Format	AT$STOATEV = <1-35>, < AT command >
Response	OK
Read Format	AT$ STOATEV?
Response	$STOATEV: AT Event# AT Cmds 1 2 … … 35 OK
Execution Format	N/A
Response	N/A
Parameter Values	
<1-35 >	AT event index.
<AT command>	AT command associated with the AT event index. The AT command is not checked for validity.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	This command is used in conjunction with the Dynamic Input Output event (AT$EVENT). The output event associated with this

	command is event 44. When output event 44 is defined in the event table, Parm1 defines which index to refer to. The AT command associated with the index is executed. The use of Dynamic Event Scripting using AT$EVENT or AT$EVDEL as a stored AT Command Event can lead to unpredictable operation and is not recommended. When storing command to dial a voice call, a "v" replaces the ";" at the end of the dial string..(i.e., atd17195551212v)

AT$GEOFNC Geo Fencing a Circular Area

AT$GEOFNC	Geo Fencing a Circular Area
Command Function	This command allows a user to send a GPS message when the device moves in or out of a geographical area.
Command Functional Group	Enfora Specific
Command Format Query	AT$GEOFNC=?
Response	$GEOFNC: (1-25),(0-1000000),(-90.0 - +90.0),(-180.0 - +180.0) OK
Write Format	AT$GEOFNC=<fenceNum> <radius>,<latitude>,<longitude>
Response	OK
Read Format	AT$GEOFNC?
Response	$GEOFNC: <fenceNum>,<radius>,<latitude>,<longitude> OK
Execution Format	N/A
Response	N/A
Parameter Values	
<fenceNum>	Defines the fence number
<radius>	Defines radius of the circle from given Latitude and Longitude coordinates (in meters)
<latitude>	Defines the latitude for the center point of a circle

<longitude>	Defines the longitude for the center point of a circle
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	An AT$EVENT command has to be set to send a GPS message to the remote host when entering or exiting the fenced area. See GSM2000CB001 – Mobile Tracker Event Cookbook to see an example. Although this command accepts latitude/longitude parameters with up to 15 characters, internally the value is stored as a C float type which has less precision (but requires half the storage size). The float type is capable of storing accuracy commensurate with the GPS receiver's capability, but the queried latitude/longitude values of the AT$GEOFNC command may differ from the input parameters due to this precision limitation.

AT$EVTEST Generate Test Input Event

AT$EVTEST	Generate Test Input Event
Command Function	This command allows the user to generate any input event. This is useful for testing the user event table.
Command Functional Group	Enfora Specific
Command Format Query Response	N/A N/A
Write Format Response	N/A N/A
Read Format Response	N/A N/A
Execution Format Response	AT$EVTEST=<event>,<state> OK
Parameter Values	
<event>	input event number
<state>	input event test state
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	AT$EVTIM4 will affect the values in AT$WAKEUP. Do not use this event timer if you are using AT$WAKEUP.

AT$FOTACFG Configure Firmware Upgrade

AT$FOTACFG	Configure Firmware Upgrade
Command Function	This command allows the user to configure the modem Firmware Over The Air (FOTA) Server.
Command Functional Group	Enfora Specific
Command Format Query	AT$FOTACFG=?
Response	$FOTACFG: "host",(0-65535),"username","password",(0,1),(0-20),(0,1),(0,1),(0,1) OK
Write Format	AT$FOTACFG=<”ftpServerHostname”>,<ftpPort>,<”ftpUsername”>,<”ftpPassword”>,<ftpMode>,<retries>,<reportMode>,<upgradeMode>
Response	OK
Read Format	N/A
Response	N/A
Execution Format	N/A
Response	N/A
Parameter Values	
<ftpServerHostname>	Either Fully Qualified Domain Name (FQDN) or a dotted-decimal IP address of the FTP server. The FQDN is resolved by DNS immediately prior to opening IP connection to FTP server. The FQDN may be up to a maximum of 63 characters. Default value: none.
<ftpPort>	The TCP port number on the FTP server. Port range: 0 – 65535, Default value: 21
<ftpUsername>	FTP login name on the FTP server. The username may be up to a maximum of 31 characters. Default value: none.
<ftpPassword>	The FTP password for the FTP user. The password may be an empty string if the FTP user does not have a password. The password may be up to a maximum of 31 characters. Default value: none.
<ftpMode>	The FTP mode to use for data connections. FTP data connections may be active or passive. Passive mode is generally better to use with FTP servers located behind firewalls. Values: 0 = active, 1 = passive. Default value: 0 (active mode).

<retries>	This is the maximum number of FTP file resumes to attempt before giving up on original AT$FOTAGET command. The range of retries is 0 – 20. Default Value: 0.
<reportMode>	The reporting mode is used to control the level of status reporting during the FOTA process. Normal reporting mode sends only critical status updates, extended reporting mode sends informative and critical status updates. The command parameters are: 0 = normal reporting, 1 = extended reporting. Default value: 0 (normal reporting mode).
<upgradeMode>	The system behavior following successful FOTA file transfer to modem. The upgrade Mode may be either Automatic or Manual. Auto mode will immediately initiate FOTA upgrade when file transfer completes. Manual mode will wait after file transfer until an explicit upgrade command is issued (AT$FOTAUPG). The command line parameters are: 0 = auto, 1 = manual. Default value: 0 (automatic mode).
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Refer to Enfora Application Note ENF000AN002 for more information on FOTA operations

AT$FOTAGET Get Firmware Upgrade OTA

AT$FOTAGET	Get Firmware Upgrade OTA
Command Function	This command will initiate a connection to the FOTA Server to download the FOTA Delta File. The FOTA Server is defined with the $FOTACFG command.
Command Functional Group	Enfora Specific
Command Format Query	AT$FOTAGET=?
Response	$FOTAGET: "remotefile" OK
Write Format	AT$FOTAGET=<"remotefile">
Response	OK
Read Format	AT$FOTAGET?
Response	$FOTAGET: <fotaState>,<"remotefilename">,<retriesRemaining>, <appErrorCode>,<errorCode>
Execution Format	N/A
Response	N/A
Parameter Values	
<fotaState>	Current FOTA mode indicating if FOTA is in the process of transferring a FOTA file. The values are: 0 = IDLE, 1 = BUSY.
<retriesRemaining>	The number of FTP resumes remaining before terminating file transfer. This number starts with the retries specified in the AT$FOTACFG command and is decremented for each FOTA restart which occurs.
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Refer to Enfora Application Note ENF000AN002 for more information on FOTA operations

AT&F Set All TA Parameters to Factory Defined Configuration

AT&F	Set All TA Parameters to Factory Defined Configuration

Command Function	Set All TA Parameters to Factory Defined Configuration
Command Functional Group	State Control
Command Format Query	N/A
Response	N/A
Write Format	N/A
Response	N/A
Read Format	N/A
Response	N/A
Execution Format	AT&F
Response	OK
Parameter Values	N/A
Reference	GSM Ref. 07.07 Chapter 6.1.2
Standard Scope	Mandatory
Enfora Implementation Scope	Full
Notes	The OK response is returned PRIOR to this command being executed on the module to allow the response to be seen at the current baud rate in case the factory default changes this (back to autobaud). Allow one second after the returned OK before issuing the next command. While under CMUX, AT&F will not cause the modem to revert back to the default baud rate.

B.1 External Processor Command

The External Processor Command is used to pass commands to the External Processor (EP).

$EP	External Processor
Command Function	This command is used to pass commands to the EP
Command Functional Group	Enfora Specific
Command Format Query	N/A
Response	N/A
Write Format	AT$EP="<ext command>"
Response	$EP: response "OK" or "0"
Read Format	N/A
Response	N/A
Execution Format	N/A
Response	N/A
Parameter Values	
<ext command>	Any command the EP supports
Reference	N/A
Standard Scope	Optional
Enfora Implementation Scope	Full
Notes	Multiple external processor commands can be concatenated, if they are separated by the "|" (pipe) character. With certain low power applications, this command might extend the time before the modem is powered down. If the external processor does not send a response, then only the "OK" or "0" will be sent, without the $EP: response
Example	AT$EP="stat1|stat2|stat3" $EP: 12,0,2,0 $EP: 3,1,3,0 $EP: 0,3,0 0

	AT$EP="stat1|cfg1=1,2,3,4,5,6|cfg1?" $EP: 1,2,3,4 $EP: 1,2,3,4,5,6 0

Do not concatenate SMS AT$EP commands.

CFGI – CONFIGURATION INSIDE THE ACTIVE GEOFENCE

CFGI	
Command Function	Configuration constants used while 'inside' the active geofence if in Position-based reporting,or while ‘stopped’ if in Motion-based reporting.
Write Format	CFGI=<MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Response	
Read Format	CFGI?
Response	$EP: <MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Parameter Values	
<MtnSnsrOff>	units: seconds range: 0 - 14400, 65535 (0 - 4 hours, forever) default: 65535 (forever) The amount of time from when the motion sensor is powered off to when it is powered back on. Essentially, the amount of time the motion sensor is off.
<MtnSnsrMaxOn>	units: seconds

	range: 0 - 3600 (0 - 1 hour) default: 5 The amount of time the motion sensor is allowed to determine if the device is moving, shaking, or vibrating. This value is highly dependent on <MotionCoef>, which determines the time constant of the low pass filtered interrupts/second. Essentially, the amount of time the motion sensor is on.
<GpsOff>	units: minutes range: 0 - 1440, 65535 (0 - 24 hours, never) default: 65535 (forever) The amount of time from when the GPS is powered off after a geofence check or from when the modem is powered off after a position report, until the following geofence check is needed. The purpose of a geofence check is to determine if the device has moved, regardless of whether the motion sensor has detected any motion. Like <PosRptOff>, this will not generate fixed rate geofence checks since GPS may take a variable amount of time to acquire satellites.
<GpsMaxOnAfterFix>	units: seconds range: 10 - 3600 (10 sec - 1 hour) default: 10 The maximum amount of time the GPS is allowed to determine if inside or outside of a geofence, after getting a valid fix. If the geofence status cannot be determined in this time, then the GPS is powered off.
<PosRptOff>	units: minutes range: 0 - 43200, 65535 (0 - 30 days, forever) default: 1440 (24 hours) The amount of time from when the modem is powered off until a position report is needed. The purpose of a position report is to pass location and status information back to a server, as well as receive commands from the server. A position report is made regardless of motion or geofence location.

	Note that the position reports will not be generated at a fixed rate since the modem may be on for a variable amount of time based on registration and GPS acquisition. If this amount of time is less than MDM_MIN_PWR_OFF, then GPS and the modem are left on, and this timeout is simply used to determine when to request a NMEA from the GPS to send to the modem.
<PosRptMaxOnAfterReg>	units: seconds range: 30 - 3600 (30 sec - 1 hour) default: 90 The maximum amount of time the modem is left powered on after registration or registration has timed out. Note that this value must be at least 10 seconds longer than MdmNwInfoTimeout that is set by the CFGP command. Note that the position reporting period will be extended by this amount if a $EP command is received from the server. This is intended to give the user more time to send multiple commands without the Controller powering off the modem.

CFGIP – CONFIGURATION INSIDE ACTIVE GEOFENCE IN POWERED MODE

CFGIP	
Command Function	Configuration constants used while 'inside' the active geofence if in Position-based reporting,or while ‘stopped’ if in Motion-based reporting when in powered mode.
Write Format	CFGIP=<MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Response	
Read Format	CFGIP?
Response	$EP: <MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Parameter Values	
<MtnSnsrOff>	units: seconds range: 0 - 14400, 65535 (0 - 4 hours, forever) default: 65535 (forever) The amount of time from when the motion sensor is powered off to when it is powered back on. Essentially, the amount of time the motion sensor is off.
<MtnSnsrMaxOn>	units: seconds range: 0 - 3600 (0 - 1 hour) default: 15 The amount of time the motion sensor is allowed to determine if the device is moving, shaking, or vibrating. This value is highly dependent on <MotionCoef>, which determines the time constant of the low pass filtered interrupts/second. Essentially, the amount of time the motion sensor is on.
<GpsOff>	units: minutes range: 0 - 1440, 65535 (0 - 24 hours, never) default: 65535 (forever)

	The amount of time from when the GPS is powered off after a geofence check or from when the modem is powered off after a position report, until the following geofence check is needed. The purpose of a geofence check is to determine if the device has moved, regardless of whether the motion sensor has detected any motion. Like <PosRptOff>, this will not generate fixed rate geofence checks since GPS may take a variable amount of time to acquire satellites.
<GpsMaxOnAfterFix>	units: seconds range: 10 - 3600 (10 sec - 1 hour) default: 10 The maximum amount of time the GPS is allowed to determine if inside or outside of a geofence, after getting a valid fix. If the geofence status cannot be determined in this time, then the GPS is powered off.
<PosRptOff>	units: minutes range: 0 - 43200, 65535 (0 - 30 days, forever) default: 1440 (24 hours) The amount of time from when the modem is powered off until a position report is needed. The purpose of a position report is to pass location and status information back to a server, as well as receive commands from the server. A position report is made regardless of motion or geofence location. Note that the position reports will not be generated at a fixed rate since the modem may be on for a variable amount of time based on registration and GPS acquisition. If this amount of time is less than MDM_MIN_PWR_OFF, then GPS and the modem are left on, and this timeout is simply used to determine when to request a NMEA from the GPS to send to the modem.
<PosRptMaxOnAfterReg>	units: seconds range: 30 - 3600 (30 sec - 1 hour) default: 90 The maximum amount of time the modem is left powered on after

	registration or registration has timed out. Note that this value must be at least 10 seconds longer than MdmNwInfoTimeout that is set by the CFGP command. Note that the position reporting period will be extended by this amount if a $EP command is received from the server. This is intended to give the user more time to send multiple commands without the Controller powering off the modem.

CFGO – CONFIGURATION OUTSIDE THE ACTIVE GEOFENCE

CFGO	
Command Function	Configuration constants used while 'outside' the active geofence if in Position-based reporting,or while ‘moving’ if in Motion-based reporting.
Write Format	CFGO=<MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Response	
Read Format	CFGO?
Response	$EP: <MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Parameter Values	
<MtnSnsrOff>	units: seconds range: 0 - 14400, 65535 (0 - 4 hours, forever) default: 65535 (forever) The amount of time from when the motion sensor is powered off to when it is powered back on. Essentially, the amount of time the motion sensor is off.
<MtnSnsrMaxOn>	units: seconds range: 0 - 3600 (0 - 1 hour) default: 5 The amount of time the motion sensor is allowed to determine if the device is moving, shaking, or vibrating. This value is highly dependent on <MotionCoef>, which determines the time constant of the low pass filtered interrupts/second. Essentially, the amount of time the motion sensor is on.
<GpsOff>	units: minutes range: 0 - 1440, 65535 (0 - 24 hours, never) default: 65535 (forever) The amount of time from when the GPS is powered off after a geofence check or from when the modem is powered off after a position report, until the following geofence check is needed.

	The purpose of a geofence check is to determine if the device has moved, regardless of whether the motion sensor has detected any motion. Like <PosRptOff>, this will not generate fixed rate geofence checks since GPS may take a variable amount of time to acquire satellites.
<GpsMaxOnAfterFix>	units: seconds range: 10 - 3600 (10 sec - 1 hour) default: 10 The maximum amount of time the GPS is allowed to determine if inside or outside of a geofence, after getting a valid fix. If the geofence status cannot be determined in this time, then the GPS is powered off.
<PosRptOff>	units: minutes range: 0 - 43200, 65535 (0 - 30 days, forever) default: 60 (1 hour) The amount of time from when the modem is powered off until a position report is needed. The purpose of a position report is to pass location and status information back to a server, as well as receive commands from the server. A position report is made regardless of motion or geofence location. Note that the position reports will not be generated at a fixed rate since the modem may be on for a variable amount of time based on registration and GPS acquisition. If this amount of time is less than MDM_MIN_PWR_OFF, then GPS and the modem are left on, and this timeout is simply used to determine when to request a NMEA from the GPS to send to the modem.
<PosRptMaxOnAfterReg>	units: seconds range: 30 - 3600 (30 sec - 1 hour) default: 90 The maximum amount of time the modem is left powered on after registration or registration has timed out. Note that this value must be at least 10 seconds longer than MdmNwInfoTimeout that is set in the CFGP command.

	Note that the position reporting period will be extended by this amount if a $EP command is received from the server. This is intended to give the user more time to send multiple commands without the Controller powering off the modem.

CFGOP – CONFIGURATION OUTSIDE ACTIVE GEOFENCE IN POWERED MODE

CFGOP	
Command Function	Configuration constants used while 'outside' the active geofence if in Position-based reporting,or while ‘moving’ if in Motion-based reporting while in powered mode
Write Format	CFGOP=<MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Response	
Read Format	CFGOP?
Response	$EP: <MtnSnsrOff>, <MtnSnsrMaxOn>, <GpsOff>, <GpsMaxOnAfterFix>, <PosRptOff>, <PosRptMaxOnAfterReg>
Parameter Values	
<MtnSnsrOff>	units: seconds range: 0 - 14400, 65535 (0 - 4 hours, forever) default: 65535 (forever) The amount of time from when the motion sensor is powered off to when it is powered back on. Essentially, the amount of time the motion sensor is off.
<MtnSnsrMaxOn>	units: seconds range: 0 - 3600 (0 - 1 hour) default: 5 The amount of time the motion sensor is allowed to determine if the device is moving, shaking, or vibrating. This value is highly dependent on <MotionCoef>, which determines the time constant of the low pass filtered interrupts/second. Essentially, the amount of time the motion sensor is on.
<GpsOff>	units: minutes range: 0 - 1440, 65535 (0 - 24 hours, never) default: 65535 (forever)

	The amount of time from when the GPS is powered off after a geofence check or from when the modem is powered off after a position report, until the following geofence check is needed. The purpose of a geofence check is to determine if the device has moved, regardless of whether the motion sensor has detected any motion. Like <PosRptOff>, this will not generate fixed rate geofence checks since GPS may take a variable amount of time to acquire satellites.
<GpsMaxOnAfterFix>	units: seconds range: 10 - 3600 (10 sec - 1 hour) default: 10 The maximum amount of time the GPS is allowed to determine if inside or outside of a geofence, after getting a valid fix. If the geofence status cannot be determined in this time, then the GPS is powered off.
<PosRptOff>	units: seconds range: 30 - 3600 (30 sec - 1 hour) default: 90 The maximum amount of time the modem is left powered on after registration or registration has timed out. Note that this value must be at least 10 seconds longer than MdmNwInfoTimeout that is set in the CFGP command. Note that the position reporting period will be extended by this amount if a $EP command is received from the server. This is intended to give the user more time to send multiple commands without the Controller powering off the modem.
<PosRptMaxOnAfterReg>	units: seconds range: 30 - 3600 (30 sec - 1 hour) default: 90 The maximum amount of time the modem is left powered on after registration or registration has timed out. Note that this value must be at least 10 seconds longer than MdmNwInfoTimeout that is set in the CFGP command.

	Note that the position reporting period will be extended by this amount if a $EP command is received from the server. This is intended to give the user more time to send multiple commands without the Controller powering off the modem.

GFNC – CONFIGURE GEOFENCE

CFGOP	
Command Function	Configure active geofence parameters. Writing new GeoIndex value forces the external processor to retrieve 1 of 25 geofences stored in the modem after the next valid GPS fix.
Write Format	GFNC=<GeoIndex>
Response	
Read Format	GFNC?
Response	$EP: <GeoIndex>,<GeoRadius>,<lGeoLatitude>, <lGeoLongitude>
Parameter Values	
<GeoIndex>	units: n/a range: 0 - 25 default: 0 The GPS receiver has the ability to determine whether the current location is inside or outside a single geofence setting. The <GeoIndex> parameter is used to select a single geofence index from the device geofences. 0 = disable geofence. A value between 1 and 25 selects the corresponding geofence from the device FFS. When <GeoIndex> is changed, the EP reads the <GeoRadius>, <lGeoLatitude>, and <lGeoLongitude> values from the device. This information is given to the GPS receiver every time the GPS is powered on so that the GPS receiver can determine whether the current location is inside or outside of the specified geofence.
<GeoRadius>	Current GeoFence Radius (meters)
<lGeoLattitude>	Current GeoFence Latitude (LAT=π/232 radians per bit)
<lGeoLongitude>	Current GeoFence Longitude (LONG= π/231 radians per bit)

GPC1 – CONFIGURE GPIO1

GPC1	
Command Function	Configuration parameters specifically for user input IO, GPI1.
Write Format	GPC1=<GpiIntCfg[gpi1]>, <GpiPullCfg[gpi1]>
Response	
Read Format	GPC1?
Response	$EP: <GpiIntCfg[gpi1]>, <GpiPullCfg[gpi1]>
Parameter Values	
<GpiIntCfg[gpi1]>	units: n/a range: 0 - 2 default: 0 (Disabled) Configures the interrupt for the user input IOs. If the interrupt is detected, a position report is started. Once the modem is ready, the Controller sends a User Input Event to the modem's event engine. Set <GpiIntCfg> = 0 to disable user input IO interrupt. Set <GpiIntCfg> = 1 to configure user input IO to be active low and to trigger interrupt on a falling edge. Set <GpiIntCfg> = 2 to configure user input IO to be active high and to trigger interrupt on a rising edge.
<GpiPullCfg[gpi1]>	units: n/a range: 0 - 2 default: 0 (Disabled) Configures an internal pull-up/pull-down resistor on the user input IO. Set <GpiPullCfg> = 0 to disable the feature. Set <GpiPullCfg> = 1 for an internal pull-down resistor. Set <GpiPullCfg> = 2 for an internal pull-up resistor.

GPC2 – CONFIGURE GPIO2

GPC2	
Command Function	Configuration parameters specifically for user input IO, GPI2.
Write Format	GPC2=<GpiIntCfg[gpi2]>, <GpiPullCfg[gpi2]>
Response	
Read Format	GPC2?
Response	$EP: <GpiIntCfg[gpi2]>, <GpiPullCfg[gpi2]>
Parameter Values	
<GpiIntCfg[gpi2]>	units: n/a range: 0 - 2 default: 0 (Disabled) Configures the interrupt for the user input IOs. If the interrupt is detected, a position report is started. Once the modem is ready, the Controller sends a User Input Event to the modem's event engine. Set <GpiIntCfg> = 0 to disable user input IO interrupt. Set <GpiIntCfg> = 1 to configure user input IO to be active low and to trigger interrupt on a falling edge. Set <GpiIntCfg>= 2 to configure user input IO to be active high and to trigger interrupt on a rising edge.
<GpiPullCfg[gpi2]>	units: n/a range: 0 - 2 default: 0 (Disabled) Configures an internal pull-up/pull-down resistor on the user input IO. Set <GpiPullCfg> = 0 to disable the feature. Set <GpiPullCfg> = 1 for an internal pull-down resistor. Set <GpiPullCfg> = 2 for an internal pull-up resistor.

RCFG – CONFIGURE REPORTING BEHAVIOR

RCFG	
Command Function	Configuration parameters specifically for reporting behavior
Write Format	RCFG=<RptMode>, <RptEvent>
Response	
Read Format	RCFG?
Response	$EP: <RptMode>, <RptEvent>
Parameter Values	
<RptMode>	units: n/a range: 0 - 1 default: 0 Configuration parameter to determine the controller reporting behavior. Set <RptMode> = 0 for position based reporting. In this mode, motion detected by the sensor enables a GPS report to verify position inside or outside of the geofence. Set <RptMode> = 1 for motion based reporting. In this mode, motion detected by the sensor forces a position report. For each mode, device behavior is also determined by the value of the RptEvent parameter.
<RptEvent>	units: n/a range: (0-1 – Legacy) (0-64) default: 0 Configuration parameter to determine the controller reporting behavior. Legacy Parameters: Set <RptEvent> = 0 to respond to ALL MOVING events. In this mode, GPS or position reports are started each time device is determined to be moving as well as the transition from MOVING to STOPPED. Set <RptMode> = 1 to only respond to the transition events. In this mode, consecutive MOVING events do not cause further action. For each mode, device behavior is also determined by the value of <RptMode>

	parameter. Current Parameters: The device can be configured to ignore or respond to individual MTN or GPS events. Set the bit below if device should respond to event. RPT_MTN_START=2 RPT_MTN_STOP=4 RPT_MTN_MOVING=8 RPT_GPS_ENTER=16 RPT_GPS_EXIT=32 RPT_GPS_OUTSIDE=64 The legacy values of 0 and 1 for <RptEvent> have been replaced with the bit-fields described above. The embedded code will automatically translate from the legacy values to the new values and will still report the legacy values until the user inputs a new value which uses one of the newly defined bits.

SAV – SAVE CONFIGURATION TO FLASH FILE SYSTEM

SAV	
Command Function	Saves the EP configuration parameters into the internal flash so they will be retained across an EP power cycle. If the input voltage is too low, then the flash write will fail and an error status will be returned.
Write Format	SAV
Response	
Read Format	N/A
Response	N/A
Parameter Values	N/A
<RptEvent>	units: n/a range: (0-1 – Legacy) (0-64) default: 0 Configuration parameter to determine the controller reporting behavior. Legacy Parameters: Set <RptEvent> = 0 to respond to ALL MOVING events. In this mode, GPS or position reports are started each time device is determined to be moving as well as the transition from MOVING to STOPPED. Set <RptMode> = 1 to only respond to the transition events. In this mode, consecutive MOVING events do not cause further action. For each mode, device behavior is also determined by the value of <RptMode> parameter. Current Parameters: The device can be configured to ignore or respond to individual MTN or GPS events. Set the bit below if device should respond to event. RPT_MTN_START=2 RPT_MTN_STOP=4 RPT_MTN_MOVING=8 RPT_GPS_ENTER=16

	RPT_GPS_EXIT=32 RPT_GPS_OUTSIDE=64 The legacy values of 0 and 1 for <RptEvent> have been replaced with the bit-fields described above. The embedded code will automatically translate from the legacy values to the new values and will still report the legacy values until the user inputs a new value which uses one of the newly defined bits.

TCFG – CONFIGURATION TIMEOUTS

TCFG	
Command Function	Configuration timeouts for the Controller.
Write Format	TCFG=<MdmRegTo>, <GpsValidFixTo>
Response	
Read Format	TCFG?
Response	$EP: <MdmRegTo>, <GpsValidFixTo>
Parameter Values	
<MdmRegTo>	units: seconds range: 60 - 65535 (1 min - forever) default: 240 (4 min) The maximum amount of time for the modem to register to the GSM network. Currently, registration is considered successful when an unsolicited AT response of +CREG: 1 or +CREG: 5 is received. It is assumed that the modem is configured with AT$AREG=2 for automatic registration at power up.
<GpsValidFixTo>	units: seconds range: 40 - 3600 (40 sec - 1 hour) default: 240 (4 min) The amount of time allowed for the GPS to acquire a valid GPS fix before the modem is turned on. At that point, the GPS is still allowed to acquire satellites while the modem is registering and waiting for PosRptMaxOnAfterReg for server communications.

UTCW – CONFIGURE TIME OF DAY BASED POSITION REPORTING

UTCW	
Command Function	Configuration parameters specifically for position reporting for specified time of day. Based on UTC time without any offset to time zone.
Write Format	UTCW=<UtcEnable>, <UtcHour>, <UtcMin>, <UtcDowMask>
Response	
Read Format	UTCW?
Response	$EP: <UtcEnable>, <UtcHour>, <UtcMin>, <UtcDowMask>
Parameter Values	
<UtcEnable>	units: n/a range: 0 - 1 default: 0 Configuration parameter to enable time-of-day position reporting. This feature was added to allow the user to report at the same time of day on given days. Using the UTC position reporting does not mean that we send the message out at that exact time. It just means that we will evaluate starting at that time and we may send the report at some time after based on Motion Sensor, GPS, and GSM conditions.
<UtcHour>	units: hours range: 0 - 23 default: 12 The hour value used in time-of-day position reporting.
<UtcMin>	units: minutes range: 0 - 59 default: 30 The minutes value used in time-of-day position reporting.
<UtcDowMask>	units: n/a range: 1 - 127, 65535 default: 65535 The day-of-week bitmask used in time-of-day position reporting. 1 = Sunday 2 = Monday 4 = Tuesday 8 = Wednesday 16 = Thursday

	32 = Friday 64 = Saturday The days can be added together if you want to report on multiple days. 127 and 65535 mean that reports should be generated every day. Example: 2+8+32=42 for reports on Monday, Wednesday, and Friday.

RSTR – RESTORE DEFAULT CONFIGURATION

RSTR	
Command Function	Restores the EP factory default configuration parameters into the RAM. If the restored parameters need to be retained following a power cycle, then the SAV command is needed following the RSTR.
Write Format	RSTR
Response	
Read Format	N/A
Response	N/A
Parameter Values	N/A
<RptEvent>	units: n/a range: (0-1 – Legacy) (0-64) default: 0 Configuration parameter to determine the controller reporting behavior. Legacy Parameters: Set <RptEvent> = 0 to respond to ALL MOVING events. In this mode, GPS or position reports are started each time device is determined to be moving as well as the transition from MOVING to STOPPED. Set <RptMode> = 1 to only respond to the transition events. In this mode, consecutive MOVING events do not cause further action. For each mode, device behavior is also determined by the value of <RptMode> parameter. Current Parameters: The device can be configured to ignore or respond to individual MTN or GPS events. Set the bit below if device should respond to event. RPT_MTN_START=2 RPT_MTN_STOP=4 RPT_MTN_MOVING=8 RPT_GPS_ENTER=16 RPT_GPS_EXIT=32

	RPT_GPS_OUTSIDE=64 The legacy values of 0 and 1 for <RptEvent> have been replaced with the bit-fields described above. The embedded code will automatically translate from the legacy values to the new values and will still report the legacy values until the user inputs a new value which uses one of the newly defined bits.

C.1 Input Event Table

The following table defines the values for <event category>, <parm1> and <parm2> parameter for input events defined as a Transition Trigger, Occurrence Trigger, or Input Trigger.

Event Category	Parm1	Parm2	Description
0	0 or 1	0 or 1	GPIO1 – General purpose Input/Output #1 0 = Low 1 = High
1	0 or 1	0 or 1	GPIO2 – General purpose Input/Output #2
2	0 or 1	0 or 1	GPIO3 – General purpose Input/Output #3
3	0 or 1	0 or 1	GPIO4 – General purpose Input/Output #4
4	0 or 1	0 or 1	GPIO5 – General purpose Input/Output #5
5	0 or 1	0 or 1	GPIO6 – General purpose Input/Output #6
6	0 or 1	0 or 1	GPIO7 – General purpose Input/Output #7
7	0 or 1	0 or 1	GPIO8 – General purpose Input/Output #8
8	1	1	Modem power up indication
9	0 to 5	0 to 5	Modem GSM registration (see AT+CREG command description for GSM registration status information)
10	0 to 8	0 to 8	Modem GPRS registration (see AT%CGREG command description for GPRS registration status information)
11	0 or 1	0 or 1	Receipt of IP address. 0 = No IP address 1 = Valid IP address obtained
12	1	1	Timer 1 (set by AT$EVTIM1)
13	1	1	Timer 2 (set by AT$EVTIM2)
14	1	1	Timer 3 (set by AT$EVTIM3)

15	1	1	Timer 4 (set by AT$EVTIM4)
16	0 to 1000000	1000000	GPS Distance (unit of measurement is: meters)
17	0 to 250	250	Maximum Velocity (unit of measurement is: Knots)
18	N/A	N/A	Reserved
19	0 to 5000	0 to 5000	Battery Voltage (in millivolts) as measured on MSP430
20	N/A	N/A	Reserved
21	0 or 1	0 or 1	Geo Fence #1. See AT$GEOFNC command for details on setting a circular geo-fence 0 = Leaving Geofence area 1 = Entering Geofence area
22	0 or 1	0 or 1	Geo Fence #2
23	0 or 1	0 or 1	Geo Fence #3
24	0 or 1	0 or 1	Geo Fence #4
25	0 or 1	0 or 1	Geo Fence #5
26	0 or 1	0 or 1	MT Power Save Event 0 = Exit Power Save Mode 1 = Enter Power Save Mode
27	0 or 1	0 or 1	GPS Status 0 = Invalid GPS data 1 = Valid GPS data
28	1	1	**RTC Alarm Input
29	0 to 1000000	1000000	Invalid GPS data for a period of time (unit of measurement is: seconds – assuming GPS data update rate is 1 msg/sec)
30	0 to 1000000	1000000	Unit staying Idle in one place (unit of measurement is: seconds – assuming GPS data update rate is 1 msg/sec)
31	0 or 1	0 or 1	Geo Fence #6. See AT$GEOFNC command for details on setting a circular geo-fence 0 = Leaving Geofence area 1 = Entering Geofence area
32	0 or 1	0 or 1	Geo Fence #7

33	0 or 1	0 or 1	Geo Fence #8
34	0 or 1	0 or 1	Geo Fence #9
35	0 or 1	0 or 1	Geo Fence #10
36	0 or 1	0 or 1	Geo Fence #11
37	0 or 1	0 or 1	Geo Fence #12
38	0 or 1	0 or 1	Geo Fence #13
39	0 or 1	0 or 1	Geo Fence #14
40	0 or 1	0 or 1	Geo Fence #15
41	0 or 1	0 or 1	Geo Fence #16
42	0 or 1	0 or 1	Geo Fence #17
43	0 or 1	0 or 1	Geo Fence #18
44	0 or 1	0 or 1	Geo Fence #19
45	0 or 1	0 or 1	Geo Fence #20
46	0 or 1	0 or 1	Geo Fence #21
47	0 or 1	0 or 1	Geo Fence #22
48	0 or 1	0 or 1	Geo Fence #23
49	0 or 1	0 or 1	Geo Fence #24
50	0 or 1	0 or 1	Geo Fence #25
51	0	0	**Input Event Counter. This event will occur when a counter reaches the maximum number of a selected Input event count.
52	0 or 1	0 or 1	New SMS indication. 0 = SMS message read from SIM 1 = New SMS message received
53	0 to -1	0 to –1	Current Input Event Counter count that can be used as an AND condition with other input events
54	0 or 1	0 or 1	Has the user programmed any geo-fence? Normally this can be found by sending AT$GEOFNC? command and verifying it manually based on the response sent by the device 0 = geo-fence does not exists 1 = at least one geo fence was created
55-59	N/A	N/A	Reserved

60	0 – 9999	0 – 9999	Number of Unsent Messages ($msglogrd count)
61	0 – 100	0 – 100	Memory full percentage ($msglogrd)
62	0 or 1	0 or 1	1,1 = unit is moving 0,0 = unit is stopped
63	N/A	N/A	Reserved
64	N/A	N/A	Reserved
65	1 to 5	1 to 5	Receipt of Incoming Call with Call Identifier matching one the numbers configured via the $EVCID command. <Parm1> and <Parm2> correspond to range $EVCID entries which will generate the input event.
66	1	1	Timer 5 (set by AT$EVTIM5)
67	1	1	Timer 6 (set by AT$EVTIM6)
68	1	1	Timer 7 (set by AT$EVTIM7)
69	1	1	Timer 8 (set by AT$EVTIM8)
70	N/A	N/A	Reserved
71	0-3	0-3	GPS Antenna Status 0 = unknown 1 = good 2 = open 3 = short Note: Changes in the GPS antenna status is not reported while on battery power.
72	0-1	0-1	0 = A GPS overspeed interval has ended 1 = A GPS overspeed interval has begun
73	0 or 1	0 or 1	GPIO9 – General purpose Input/Output #9 0 = Low 1 = High
74	0 or 1	0 or 1	GPIO10 – General purpose Input/Output #10
75	0 or 1	0 or 1	GPIO11 – General purpose Input/Output #11
76	0 or 1	0 or 1	GPIO12 – General purpose Input/Output #12
77	0 or 1	0 or 1	GPIO13 – General purpose Input/Output #13

78	0 or 1	0 or 1	GPIO14 – General purpose Input/Output #14
79	0 or 1	0 or 1	GPIO15 – General purpose Input/Output #15
80	0 or 1	0 or 1	GPIO16 – General purpose Input/Output #16
81	0 or 1	0 or 1	GPIO17 – General purpose Input/Output #17
82	0 or 1	0 or 1	GPIO18 – General purpose Input/Output #18
83	0 or 1	0 or 1	GPIO19 – General purpose Input/Output #19
84	0 or 1	0 or 1	GPIO20 – General purpose Input/Output #20
85	0 – 8	0 – 8	0 = CAL (reading calibration files) 1 = PRE (pre-charging) 2 = INI (reading configuration files) 3 = SUP (no charging – supervision only) 4 = CCI (constant current charging) 5 = LCI (obsolete) 6 = CCV (constant voltage charging) 7 = LCV (obsolete) 8 = RST (charging timeout, waiting for restart)
86-111	N/A	N/A	Reserved
112	1	1	System Powerup
113-115	N/A	N/A	Reserved
116	1	1	Temperature Alarm

C.2 Output Event Table

The following table defines the values for <event category>, <parm1> and <parm2> parameter for output events defined as Output.

event category	Parm1	Parm2	Description
0	0	0	Changes GPIO #1 to Input (from Output)
1	0	0	Changes GPIO #2 to Input (from Output)

2	0	0	Changes GPIO #3 to Input (from Output)
3	0	0	Changes GPIO #4 to Input (from Output)
4	0	0	Changes GPIO #5 to Input (from Output)
5	0	0	Changes GPIO #6 to Input (from Output)
6	0	0	Changes GPIO #7 to Input (from Output)
7	0	0	Changes GPIO #8 to Input (from Output)
8	0	0	Set GPIO #1 configured as Output to Low (0)
9	0	0	Set GPIO #2 configured as Output to Low (0)
10	0	0	Set GPIO #3 configured as Output to Low (0)
11	0	0	Set GPIO #4 configured as Output to Low (0)
12	0	0	Set GPIO #5 configured as Output to Low (0)
13	0	0	Set GPIO #6 configured as Output to Low (0)
14	0	0	Set GPIO #7 configured as Output to Low (0)
15	0	0	Set GPIO #8 configured as Output to Low (0)
16	0	0	Set GPIO #1 configured as Output to High (1)
17	0	0	Set GPIO #2 configured as Output to High (1)
18	0	0	Set GPIO #3 configured as Output to High (1)
19	0	0	Set GPIO #4 configured as Output to High (1)
20	0	0	Set GPIO #5 configured as Output to High (1)
21	0	0	Set GPIO #6 configured as Output to High (1)
22	0	0	Set GPIO #7 configured as Output to High (1)
23	0	0	Set GPIO #8 configured as Output to High (1)
24	0	0	Toggle GPIO #1 configured as Output
25	0	0	Toggle GPIO #2 configured as Output
26	0	0	Toggle GPIO #3 configured as Output
27	0	0	Toggle GPIO #4 configured as Output
28	0	0	Toggle GPIO #5 configured as Output
29	0	0	Toggle GPIO #6 configured as Output
30	0	0	Toggle GPIO #7 configured as Output
31	0	0	Toggle GPIO #8 configured as Output

32	See GPIO Flash Table (LINK)		Flash GPIO #1 configured as Output
33			Flash GPIO #2 configured as Output
34			Flash GPIO #3 configured as Output
35			Flash GPIO #4 configured as Output
36			Flash GPIO #5 configured as Output
37			Flash GPIO #6 configured as Output
38			Flash GPIO #7 configured as Output
39			Flash GPIO #8 configured as Output
40	0 to –1	See Bit-Field Table (LINK)	Generate and transmit one UDP Message to first IP address listed in $FRIEND command and port number listed in $UDPAPI command based on Parm1 and Parm2 values
41	0 to –1	See Bit-Field Table (LINK)	Generate and transmit a UDP message with Acknowledge. This message is controlled by $ACKTM command for number of retries sent. This message has to be acknowledged to avoid sending of retries.
42			Generate and transmit one UDP Message to all IP address listed in $FRIEND command and port number listed in $UDPAPI command based on Parm1 and Parm2 values
43	1 – 8	0	Resets the timer (Timer #1 - Timer #8) specified by Parm1 to the time (in seconds) specified by Parm2. Parm2, when set to 0, resets the timer to the time last set by $EVTIMx command or previous output event 43 execution. A value other than 0 would set the timer to expire at the new specified interval (e.g. xx,3,43,1,180 would set timer 1 to expire in 180 seconds). When used with a value other than 0, this is equivalent to invoking $EVTIMx directly from the event engine and subsequent AT&F commands will save the new value to flash.
44	1 – 15	0	Execute AT command stored at index number of the $STOATEV command. Parm1 identifies the index number.
45	0 to 2147483647	See Bit-Field Table (LINK)	Sends data over SMS to All SMS destination addresses configured via $SMSDA command. (For select $SMSDA entries, see event categories 54-58) SMS messages are truncated to 160 characters. If destination address is an e-mail address, the length of the e-mail address (plus a space) counts against the 160 character length. If binary message format is

<table>
<tr><td></td><td></td><td></td><td>chosen, note that the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).</td></tr>
<tr><td>46</td><td>N/A</td><td>N/A</td><td>Reserved</td></tr>
<tr><td>47</td><td>0</td><td>0 to –1</td><td>Input Event Counter</td></tr>
<tr><td>48</td><td>0</td><td>0 to –1</td><td>Input Event Counter reset to value stated by parm2</td></tr>
<tr><td>49</td><td>1 – 25</td><td>0 to 1000000</td><td>Set geo-fence specified by parm1 to current latitude & longitude with radius specified by parm2</td></tr>
<tr><td>50</td><td>0 – 57</td><td>0 to –1</td><td>Emulate AT$EVTEST command via event engine. Parm1 is the input event number while Parm2 is the value to emulate for the input event</td></tr>
<tr><td>51</td><td>N/A</td><td>N/A</td><td>Reserved</td></tr>
<tr><td>52</td><td>0 to –1</td><td>See Bit-Field Table (LINK)</td><td>Generate and transmit one TCP/IP Message to IP address & port number listed by $FRIEND command based on Parm1 and Parm2 values</td></tr>
<tr><td>53</td><td>0 – 99</td><td>0 – 8</td><td>Sets periodic RTC alarm in minutes, hours, days, or months.
Parm1 indicates the frequency with which to generate the message. Parm2 indicates the time-unit used.
Parm2 values:
1 = minutes
2 = hours
4 = days
8 = months
For example:
<table>
<tr><td>Parm1</td><td>Parm2</td><td>Result - RTC Alarm occurs every [parm1] [parm2]</td></tr>
<tr><td>1</td><td>1</td><td>RTC Alarm occurs every 1 minute</td></tr>
<tr><td>3</td><td>2</td><td>RTC Alarm occurs every 3 hours</td></tr>
<tr><td>1</td><td>4</td><td>RTC Alarm occurs every 1 day</td></tr>
<tr><td>6</td><td>8</td><td>RTC Alarm occurs every 6 months</td></tr>
</table></td></tr>
<tr><td>54</td><td>0-2147483647</td><td>See Bit-Field Table (LINK)</td><td>Sends data over SMS to the first indexed SMS destination address configured via $SMSDA command.
SMS messages are truncated to 160 characters. If destination address is an e-mail address, the length of the e-mail address (plus a space)</td></tr>
</table>

			counts against the 160 character length. If binary message format is chosen, note that the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).
55	0-2147483647	See Bit-Field Table (LINK)	Sends data over SMS to the second indexed SMS destination address configured via $SMSDA command. SMS messages are truncated to 160 characters. If destination address is an e-mail address, the length of the e-mail address (plus a space) counts against the 160 character length. If binary message format is chosen, note that the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).
56	0-2147483647	See Bit-Field Table (LINK)	Sends data over SMS to the third indexed SMS destination address configured via $SMSDA command. SMS messages are truncated to 160 characters. If destination address is an e-mail address, the length of the e-mail address (plus a space) counts against the 160 character length. If binary message format is chosen, note that the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).
57	0-2147483647	See Bit-Field Table (LINK)	Sends data over SMS to the fourth indexed SMS destination address configured via $SMSDA command. SMS messages are truncated to 160 characters. If destination address is an e-mail address, the length of the e-mail address (plus a space) counts against the 160 character length. If binary message format is chosen, note that the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).
58	0-2147483647	See Bit-Field Table (LINK)	Sends data over SMS to the fifth indexed SMS destination address configured via $SMSDA command. SMS messages are truncated to 160 characters. If destination address is an e-mail address, the length of the e-mail address (plus a space) counts against the 160 character length. If binary message format is chosen, note that the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).

59	0	0	Turns off the modem. (Not to be confused with sleeping where RTC continues to function. This command shuts down all modem functions.)
60	0 - -1	See Bit-Field Table (LINK)	Generate and transmit message to main serial port based on Parm1 and Parm2 values in ASCII format only.
61	0	0	Changes GPIO #9 to Input (from Output)
62	0	0	Changes GPIO #10 to Input (from Output)
63	0	0	Changes GPIO #11 to Input (from Output)
64	0	0	Changes GPIO #12 to Input (from Output)
65	0	0	Changes GPIO #13 to Input (from Output)
66	0	0	Changes GPIO #14 to Input (from Output)
67	0	0	Changes GPIO #15 to Input (from Output)
68	0	0	Changes GPIO #16 to Input (from Output)
69	0	0	Changes GPIO #17 to Input (from Output)
70	0	0	Changes GPIO #18 to Input (from Output)
71	0	0	Changes GPIO #19 to Input (from Output)
72	0	0	Changes GPIO #20 to Input (from Output)
73	0	0	Set GPIO #9 configured as Output to Low (0)
74	0	0	Set GPIO #10 configured as Output to Low (0)
75	0	0	Set GPIO #11 configured as Output to Low (0)
76	0	0	Set GPIO #12 configured as Output to Low (0)
77	0	0	Set GPIO #13 configured as Output to Low (0)
78	0	0	Set GPIO #14 configured as Output to Low (0)
79	0	0	Set GPIO #15 configured as Output to Low (0)
80	0	0	Set GPIO #16 configured as Output to Low (0)
81	0	0	Set GPIO #17 configured as Output to Low (0)
82	0	0	Set GPIO #18 configured as Output to Low (0)
83	0	0	Set GPIO #19 configured as Output to Low (0)
84	0	0	Set GPIO #20 configured as Output to Low (0)
85	0	0	Set GPIO #9 configured as Output to High (1)
86	0	0	Set GPIO #10 configured as Output to High (1)

87	0	0	Set GPIO #11 configured as Output to High (1)
88	0	0	Set GPIO #12 configured as Output to High (1)
89	0	0	Set GPIO #13 configured as Output to High (1)
90	0	0	Set GPIO #14 configured as Output to High (1)
91	0	0	Set GPIO #15 configured as Output to High (1)
92	0	0	Set GPIO #16 configured as Output to High (1)
93	0	0	Set GPIO #17 configured as Output to High (1)
94	0	0	Set GPIO #18 configured as Output to High (1)
95	0	0	Set GPIO #19 configured as Output to High (1)
96	0	0	Set GPIO #20 configured as Output to High (1)
97	0	0	Toggle GPIO #9 configured as Output
98	0	0	Toggle GPIO #10 configured as Output
99	0	0	Toggle GPIO #11 configured as Output
100	0	0	Toggle GPIO #12 configured as Output
101	0	0	Toggle GPIO #13 configured as Output
102	0	0	Toggle GPIO #14 configured as Output
103	0	0	Toggle GPIO #15 configured as Output
104	0	0	Toggle GPIO #16 configured as Output
105	0	0	Toggle GPIO #17 configured as Output
106	0	0	Toggle GPIO #18 configured as Output
107	0	0	Toggle GPIO #19 configured as Output
108	0	0	Toggle GPIO #20 configured as Output

109	See GPIO Flash Table (LINK)	Flash GPIO #9 configured as Output
110		Flash GPIO #10 configured as Output
111		Flash GPIO #11 configured as Output
112		Flash GPIO #12 configured as Output
113		Flash GPIO #13 configured as Output
114		Flash GPIO #14 configured as Output
115		Flash GPIO #15 configured as Output
116		Flash GPIO #16 configured as Output
117		Flash GPIO #17 configured as Output
118		Flash GPIO #18 configured as Output
119		Flash GPIO #19 configured as Output
120		Flash GPIO #20 configured as Output

129	0-2147483647	See Bit-Field Table in 6.5.1.3	Sends data over USSD using the USSD routing prefix configured with the AT$USSDTG command. USSD messages are truncated to 182 characters which includes the length of the USSD routing prefix. If binary message format is chosen, the binary data is converted to ASCII HEX prior to transmission, effectively doubling the message length that would result from other transport mechanisms (such as UDP).

Just Scripts

C.3 STATIC MONITORING

```
AT$EP="RCFG=0,0"
AT$EP="UTCW=0,0,0,127"
AT$EP="CFGI=65535,0,65535,10,<Periodic Reporting Rate>,60"
AT$EP="CFGO=65535,0,65535,10,<Periodic Reporting Rate>,60"
#if ProductSupportsExternalPower
AT$EP="CFGIP=65535,0,65535,10,<DeltaTimePowered>,60"
```

```
AT$EP="CFGOP=65535,0,65535,10,<DeltaTimePowered>,60"
#endif
AT$EP="GFNC=0"
AT$EP="TCFG=240,240"
AT$EP="GPC1=0,0"
AT$EP="GPC2=0,0"
AT$EP="SAV"
AT$EVDELA
AT$APIOPT=1,1,4
AT$EVENT=20,1,27,1,1
AT$EVENT=20,3,40,20000,2752483
AT$EVENT=21,1,27,0,0
AT$EVENT=21,3,40,21000,36306915
AT&W
```

C.4 STATIC TIME OF DAY MONITORING

```
AT$EP="RCFG=0,0"
AT$EP="UTCW=1,<hr>,<min>,<Day Of Week>"
AT$EP="CFGI=65535,0,65535,10,65535,60"
AT$EP="CFGO=65535,0,65535,10,65535,60"
#if ProductSupportsExternalPower
AT$EP="CFGIP=65535,0,65535,10,65535,60"
AT$EP="CFGOP=65535,0,65535,10,65535,60"
#endif
AT$EP="GFNC=0"
AT$EP="TCFG=240,240"
AT$EP="GPC1=0,0"
AT$EP="GPC2=0,0"
AT$EP="SAV"
```

```
AT$EVDELA
AT$APIOPT=1,1,4
AT$EVENT=20,1,27,1,1
AT$EVENT=20,3,40,20000,2752483
AT$EVENT=21,1,27,0,0
AT$EVENT=21,3,40,21000,36306915
AT&W
```

C.5 BASIC MOTION

```
AT$EP="RCFG=1,1"
AT$EP="UTCW=0,0,0,127"
AT$EP="CFGI=50,5,65535,10,<reportTimeWhileStationary>,60"
AT$EP="CFGO=50,5,65535,10,<reportTimeWhileMoving>,60"
#if ProductSupportsExternalPower
AT$EP="CFGIP=50,5,65535,10,<PoweredStationary>,60"
AT$EP="CFGOP=50,5,65535,10,<PoweredInMotion>,60"
#endif
AT$EP="GFNC=0"
AT$EP="TCFG=240,240"
AT$EP="GPC1=0,0"
AT$EP="GPC2=0,0"
AT$EP="SAV"
AT$EVDELA
AT$APIOPT=1,1,4
AT$EVENT=20,1,27,1,1
AT$EVENT=20,3,40,20000,2752483
AT$EVENT=21,1,27,0,0
AT$EVENT=21,3,40,21000,36306915
AT$EVENT=22,1,62,0,0
```

```
AT$EVENT=22,2,27,0,0
AT$EVENT=22,3,40,22000,36306915
AT$EVENT=23,1,62,1,1
AT$EVENT=23,2,27,0,0
AT$EVENT=23,3,40,23000,36306915
AT$EVENT=24,1,62,0,0
AT$EVENT=24,2,27,1,1
AT$EVENT=24,3,40,24000,2752483
AT$EVENT=25,1,62,1,1
AT$EVENT=25,2,27,1,1
AT$EVENT=25,3,40,25000,2752483
AT&W
```

C.6 ONE GEOFENCE

```
AT$EP="RCFG=0,1"
AT$EP="UTCW=0,0,0,127"
AT$EP="CFGI=50,5,65535,10,<reportTimeWhenInsideFence>,60"
AT$EP="CFGO=65535,5,65535,10,<reportTimeWhenOutsideFence>,60"
#if ProductSupportsExternalPower
AT$EP="CFGIP=50,5,65535,10,<PoweredInsideFence>,60"
AT$EP="CFGOP=65535,5,65535,10,<PoweredOutsideFence>,60"
#endif
AT$EP="GFNC=1
AT$EP="TCFG=240,240"
AT$EP="GPC1=0,0"
AT$EP="GPC2=0,0"
AT$EP="SAV"
AT$APIOPT=1,1,4
AT$EVDELA
```

```
AT$GEOFNC=1,<radius1>,<lat1>,<lon1>
AT$EVENT=20,1,27,1,1
AT$EVENT=20,3,40,20000,2752483
AT$EVENT=21,1,27,0,0
AT$EVENT=21,3,40,21000,36306915
AT$EVENT=30,0,21,1,1
AT$EVENT=30,3,40,30000,2752483
AT$EVENT=31,0,21,0,0
AT$EVENT=31,3,40,31000,2752483
AT&W
```

C.7 TWO GEOFENCES

```
AT$EP="RCFG=0,1"
AT$EP="UTCW=0,0,0,127"
AT$EP="CFGI=50,5,65535,10,<reportTimeWhenInsideFence>,60"
AT$EP="CFGO=65535,5,65535,10,<reportTimeWhenOutsideFence>,60"
#if ProductSupportsExternalPower
AT$EP="CFGIP=50,5,65535,10,<PoweredInsideFence>,60"
AT$EP="CFGOP=65535,5,65535,10,<PoweredOutsideFence>,60"
#endif AT$EP="GFNC=1" AT$EP="TCFG=240,240"
AT$EP="GPC1=0,0"
AT$EP="GPC2=0,0"
AT$EP="SAV"
AT$APIOPT=1,1,4
AT$EVDELA
AT$STOATEV = 1, AT$EP="GFNC=1,1"
AT$STOATEV = 2, AT$EP="GFNC=2,1"
AT$GEOFNC=1,<radius1>,<lat1>,<lon1>
AT$GEOFNC=2,<radius2>,<lat2>,<lon2>
```

```
AT$EVENT=20,1,27,1,1
AT$EVENT=20,3,40,20000,2752483
AT$EVENT=21,1,27,0,0
AT$EVENT=21,3,40,21000,36306915
AT$EVENT=30,0,21,1,1
AT$EVENT=30,3,40,30000,2752483
AT$EVENT=30,3,44,1,0
AT$EVENT=31,0,21,0,0
AT$EVENT=31,3,40,31000,2752483
AT$EVENT=32,0,22,1,1
AT$EVENT=32,3,40,32000,2752483
AT$EVENT=32,3,44,2,0
AT$EVENT=33,0,22,0,0
AT$EVENT=33,3,40,33000,2752483
AT&W
```

C.8 DYNAMIC GEOFENCE

```
AT$EP="RCFG=0,0"
AT$EP="UTCW=0,0,0,127"
AT$EP="CFGI=50,5,65535,10,<reportTimeWhenInsideFence>,60"
AT$EP="CFGO=50,5,65535,10,<reportTimeWhenOutsideFence>,60"
#if ProductSupportsExternalPower
AT$EP="CFGIP=50,5,65535,10,<PoweredInsideFence>,60"
AT$EP="CFGOP=50,5,65535,10,<PoweredOutsideFence>,60"
#endif
AT$EP="GFNC=1"
AT$EP="TCFG=240,240"
AT$EP="GPC1=0,0"
AT$EP="GPC2=0,0"
```

```
AT$EP="SAV"
AT$APIOPT=1,1,4
AT$STOATEV=1,AT$EP="GFNC=1,1"
AT$STOATEV=2,AT$EP="RCFG=0,0"
AT$STOATEV=3,AT$EP="RCFG=1,1"
AT$GEOFNC=1,0,0,0
AT$EVTEST=21,2
AT$GEOFNC=2,0,0,0
AT$EVTEST=22,2
AT$EVDELA
AT$EVENT=20,1,27,1,1
AT$EVENT=20,3,40,20000,2752483
AT$EVENT=21,1,27,0,0
AT$EVENT=21,3,40,21000,36306915
AT$EVENT=30,0,21,1,1
AT$EVENT=30,2,100,0,0
AT$EVENT=30,3,40,30000,2752483
AT$EVENT=30,3,125,0,1
AT$EVENT=31,1,21,0,0
AT$EVENT=31,2,100,1,1
AT$EVENT=31,3,40,31000,2752483
AT$EVENT=31,3,125,0,0
AT$EVENT=32,1,62,0,0
AT$EVENT=32,2,27,0,0
AT$EVENT=32,2,100,0,0
AT$EVENT=32,3,40,32000,36306915
AT$EVENT=50,1,62,0,0
AT$EVENT=50,2,27,1,1
AT$EVENT=50,2,21,0,0
AT$EVENT=50,3,49,1,<radius>
```

```
AT$EVENT=50,3,49,2,<radius>
AT$EVENT=50,3,44,1,0
AT$EVENT=50,3,40,50000, 2752483
AT$EVENT=50,3,125,0,1
AT$EVENT=51,1,27,1,1
AT$EVENT=51,2,54,0,0
AT$EVENT=51,3,49,1,<radius>
AT$EVENT=51,3,49,2,<radius>
AT$EVENT=51,3,44,1,0
AT$EVENT=51,3,40,51000,2752483
AT$EVENT=51,3,125,0,1
AT$EVENT=52,1,27,1,1
AT$EVENT=52,2,21,0,0
AT$EVENT=52,2,22,1,1
AT$EVENT=52,2,101,0,0
AT$EVENT=52,3,49,1,<radius>
AT$EVENT=52,3,49,2,<radius>
AT$EVENT=52,3,44,1,0
AT$EVENT=52,3,40,52000,2752483
AT$EVENT=52,3,125,0,1
AT$EVENT=53,1,27,1,1
AT$EVENT=53,2,21,0,0
AT$EVENT=53,2,101,0,0
AT$EVENT=53,3,49,2,<radius>
AT$EVENT=60,1,62,0,0
AT$EVENT=60,3,125,1,0
AT$EVENT=60,3,44,2,0
AT$EVENT=61,1,62,1,1
AT$EVENT=61,3,125,1,1
AT$EVENT=62,1,62,1,1
```

```
AT$EVENT=62,2,21,0,0
AT$EVENT=62,3,44,3,0
AT&W
```

C.9 FOTA

```
AT$EP="CFGI=65535,5,65535,10,6,400"
AT$EP="CFGO=65535,5,65535,10,6,400"
#if ProductSupportsExternalPower
AT$EP="CFGIP=65535,5,65535,10,6,400"
AT$EP="CFGOP=65535,5,65535,10,6,400"
#endif
AT$FOTACFG="ftpServerHostname",ftpPort,"ftpUsername",
"ftpPassword",0,5,0,0
AT$FOTAGET="remoteFilename"
```