



MT 3000

User Guide

GSM2374UG001

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General

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Regulatory Compliance

FCC

FCC ID: MIVGSM2374

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits pursuant to Part 15 Subpart B, Part 22, and Part 24 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. This equipment generates, uses, and can radiate radio frequency energy and, if not used in accordance with instructions, can cause harmful radiation to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

FCC RF EXPOSURE

Your MT 3000 is a radio transmitter and receiver. It is designed and manufactured not to exceed the emissions limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission (FCC) of the U.S. Government. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. These guidelines are based on the safety standards previously set by the U.S. and international standards bodies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure standard for wireless RF devices, such as the MT 3000, employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. SAR values at or below that limit are considered safe for the general public.

The MT 3000 conforms with the RF exposure requirements for portable devices in accordance with FCC Part 2.1093.

The MT 3000 transmitter is configured with a 10% transmission duty factor, for GPRS Multislot class 2 operation, and is excluded from routine RF exposure evaluation in accordance with FCC Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies, KDB447498 D01, V04.

Canadian Compliance (Industry Canada)

IC ID: 4160A-GSM2374 MODEL NUMBER: GSM2374

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The MT 3000 transmitter is configured with a 10% transmission duty factor, for GPRS Multislot class 2 operation, and is excluded from routine RF exposure evaluation in accordance with the requirements of RSS-102 section 2.5.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

L'émetteur de 3000 MT est configuré avec un facteur d'obligation de transmission de 10 %, pour GPRS Multislot opération de classe 2 et est exclu de l'évaluation de l'exposition RF conformément aux exigences du CNR-102 article 2.5 de la routine.

ROHS COMPLIANCE

The MT 3000 complies with the European Union Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2002/95/EC), effective since July 1, 2006..

DISCLAIMER

The information and instructions contained within this publication comply with all applicable FCC, GCF, PTCRB, R&TTE, IMEI and other applicable codes that are in effect at the time of publication. Enfora disclaims all responsibility for any act or omissions, or for breach of law, code or regulation, including local or state codes, performed by a third party. Enfora strongly recommends that all installations, hookups,

transmissions, etc., be performed by persons who are experienced in the fields of radio frequency technologies. Enfora acknowledges that the installation, setup and transmission guidelines contained within this publication are guidelines, and that each installation may have variables outside of the guidelines contained herein. Said variables must be taken into consideration when installing or using the product, and Enfora shall not be responsible for installations or transmissions that fall outside of the parameters set forth in this publication.

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I Introduction

1.1 Objective

The objective of this document is to provide the user with basic information about the Spider MT Series, including how to configure the device and verify communication with Enfora's UDP API test server.

Capabilities of the Enfora Spider MT devices include:

- GSM Registration
- GPRS Registration
- Velocity
- Geo-Fence
- IP Status
- GPS Status
- Timer
- MT Power Save
- RTC Alarm
- Memory Full Percentage
- Input Event Counter
- GPS Overspeed
- Message Log Count
- SMS Indication
- GPS Distance

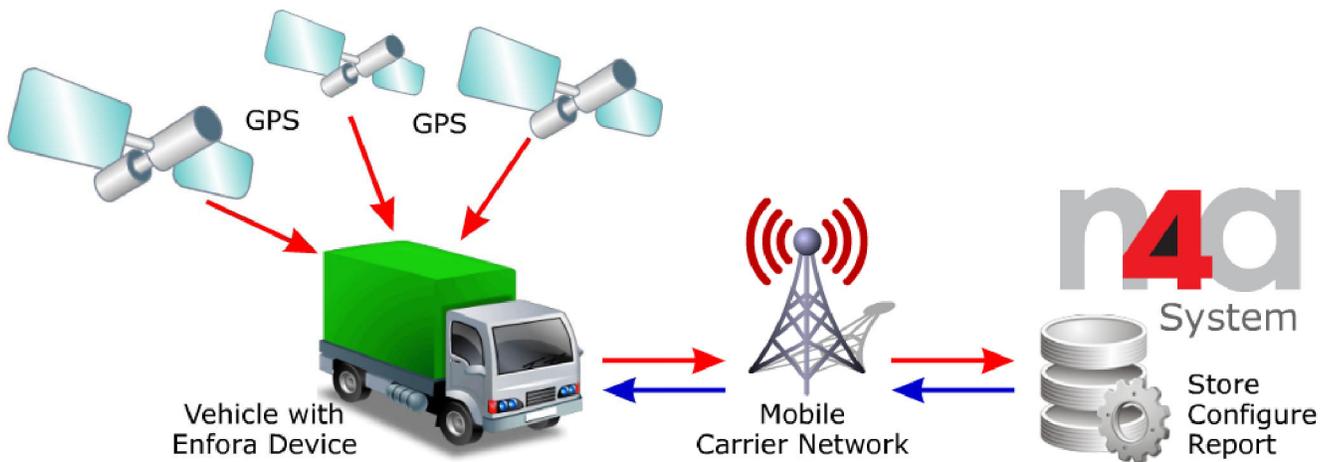


Figure: 1 - N4A System Overview

1.2 References

- Spider MT 3000 AT Command Set (GSM2374AT001)
- GSM Network Configuration Worksheet (GSM0000AN019)
- Mobile Tracker Event Cookbook (GSM2000CB001)

1.3 On-Board Diagnostics Overview

An On-Board Diagnostics (OBD) system controls engine functions and serves as the diagnostic control network of the vehicle. All cars built and sold in the United States since 1996 must be equipped with the newer OBDII system. The Enfora MT 3000 connects to a vehicle's OBDII port and monitors the OBDII system using a variety of communication protocols.

The MT 3000 can be configured to provide notification messages based on engine rpm, low fuel or battery, or other events monitored by the OBDII system in addition to events triggered by the device's accelerometer or GPS information.



Some vehicles are not compatible with the MT 3000. If the vehicle is not compatible with the parameters the MT 3000 requires, functionality may be limited, problematic or unavailable.

The SAE (Society of Automobile Engineers) 1979 standard defines the method for requesting diagnostics data and a list of standard parameters from the engine control unit.

Compliance to this standard is the responsibility of the vehicle manufacturer, therefore Enfora cannot guarantee performance of the MT 3000 with every vehicle.

The following are some of the OBDII parameters monitored by the Enfora MT 3000 and triggered as alerts when so configured:

- Vehicle Identification Number (VIN)
- Excessive engine speed (RPM)
- Vehicle speed
- Vehicle battery voltage (low battery warning)
- Check engine light (MIL alert)
- Odometer (trip distance)
- Idle time
- Low fuel

The MT 3000 supports the following standard OBDII protocols:

- J1850 PWM
- J1850 VPW
- ISO-9141-2
- ISO-14230 KWP2000
- ISO-15765 CAN



Some vehicles only support a subset of these protocols, in these cases functionality of the MT 3000 will be limited.

2 Overview

2.1 Description

The MT 3000 has a rugged plastic housing that measures 46 x 43 x 28 mm. It contains internal GSM and GPS antennas, internal SIM card holder, J1962 compliant OBDII connector, micro USB connector, and 3 LED indicators.

MT 3000 Panel Illustrations



Figure: 2 - Front Right View



Figure: 3 - Bottom Left View

2.2 Barcode Label

The barcode label is located on the underside of the device.



Figure: 4 - MT 3000 Label

2.3 Connector & LEDs

The MT 3000 includes a J1962 compliant OBDII connector, a micro USB I/O port, and LEDs to indicate OBD II, GSM, and GPS status.

The following figure shows the MT 3000 connector and LEDs.



Figure: 5 - MT 3000 Connector and LEDs

The following table describes the LED operation.

MT 3000 LEDs	
OBD	The OBD LED will flash at a fast rate when the unit is first connected to the OBD port for power. Once a protocol is discovered through the OBD port, the LED will flash at a slow rate.
GSM	The GSM LED will flash at a fast rate when the unit is finding cellular coverage. Once cellular coverage is found, the LED shall flash at a slow rate. While the unit is transmitting, the LED is lit continuously.
GPS	The GPS LED will flash at a fast rate when the unit is acquiring a satellite fix. Once a fix is acquired, the LED will flash a slow rate.

Table: 1 - MT 3000 LEDs

2.4 Accelerometer

The three-axis digital accelerometer provides the following features:

- Motion alert
- Driver behavior reporting
 - Rapid acceleration
 - Harsh braking
- Configurable thresholds
 - Range settings
 - Mode (Normal, Sleep, Wakeup)
 - Device orientation setup

2.5 GSM Radio

The MT 3000 contains a quad-band (850/900/1800/1900 MHz) GSM radio.

- Class 4 (2W@850/900 MHz)
- Class 1 (1W@1800/1900 MHz)



The MT 3000 has an internal antenna limited to dual band.

2.6 Packet Data

Packet data characteristics include:

- Class B, Multislot 2
- GSM/GPRS Rel 97

GSM Functionality includes:

- Text
- PDU
- MO/MT
- Cell Broadcast

2.7 GPS Functionality

GPS functionality includes:

- NMEA update with all data points
- Binary
- Buffered GPS message feature

3 Hardware Features

3.1 Opening The Device

It is highly recommended using the MT 3000 Disassembly Kit (Enfora Part Number KIT2374-01) to remove the cover of the MT 3000.

The MT 3000 Disassembly Kit includes the Six-Pin Base and the Metal Lever.

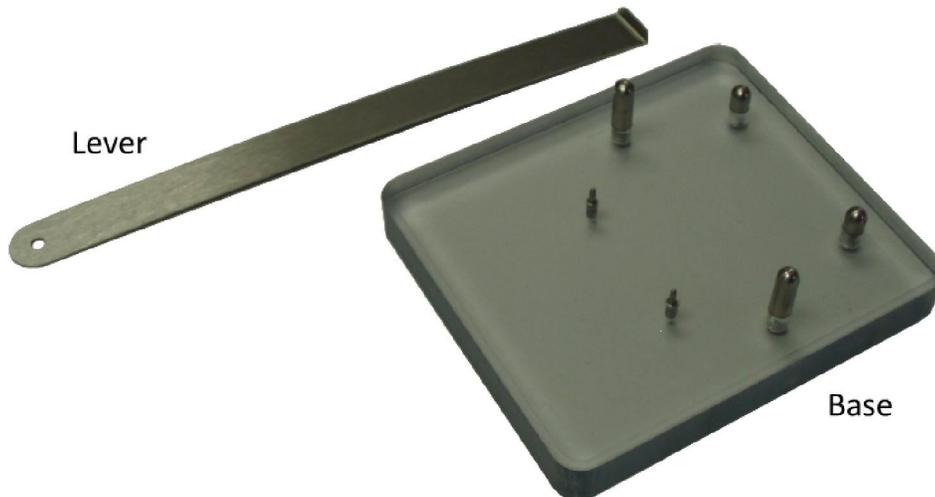


Figure: 6 - MT 3000 Opening Toolkit

To use the MT 3000 Disassembly Kit, follow the following steps:

1. Insert the curved foot of the Metal Lever into the gap between the lid and the body next to the retainer snaps.

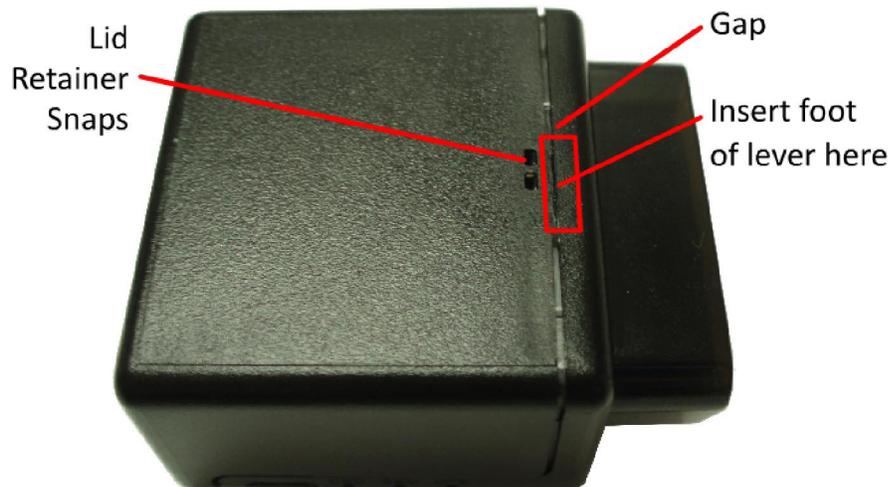


Figure: 7 - MT 3000

2. Gently apply pressure upwards on the lever until the lid unsnaps.



Figure: 8 - Lever inserted into MT 3000 lid gap



Figure: 9 - MT 3000 with Lid unsnapped

3. Place the MT 3000 into the Base making sure the two small Base Pins are inserted into the two holes in the base of the MT 3000. The four larger pins fit around the outside of the case and help hold the MT 3000 in place during the next step.



Figure: 10 - MT 3000 on the Opener Base

4. Apply pressure downwards onto the MT 3000 and slide the MT 3000 Lid backwards away from the rest of the MT 3000.



Downward pressure is required while sliding the lid. Exerting the downward pressure releases the internal locking clips.

5. Continue sliding the lid away from the MT 3000 until it completely disengages from the MT 3000.



Figure: 11 - Lid pulled away from the MT 3000

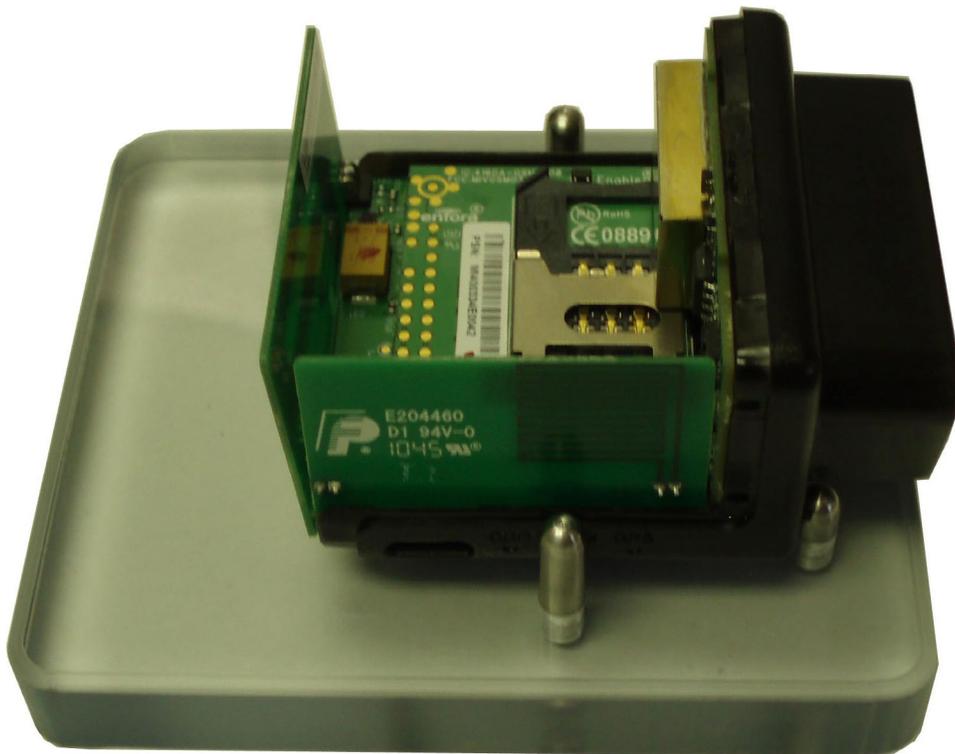


Figure: 12 - MT 3000 with Lid completely removed

6. The MT 3000 can now be removed from the Opener Base.

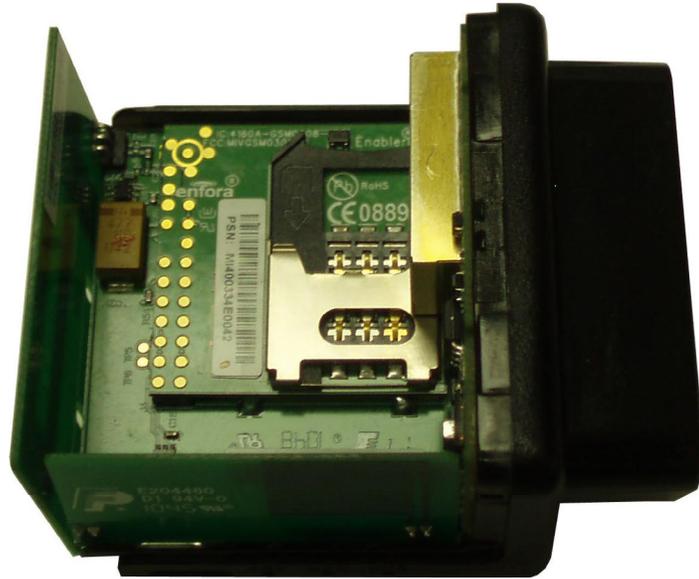


Figure: 13 - MT 3000 without Lid

3.2 Closing the Device

Replace the MT 3000 Lid by using the following steps:

1. Place the MT 3000 Lid onto the base as shown in the following figure.

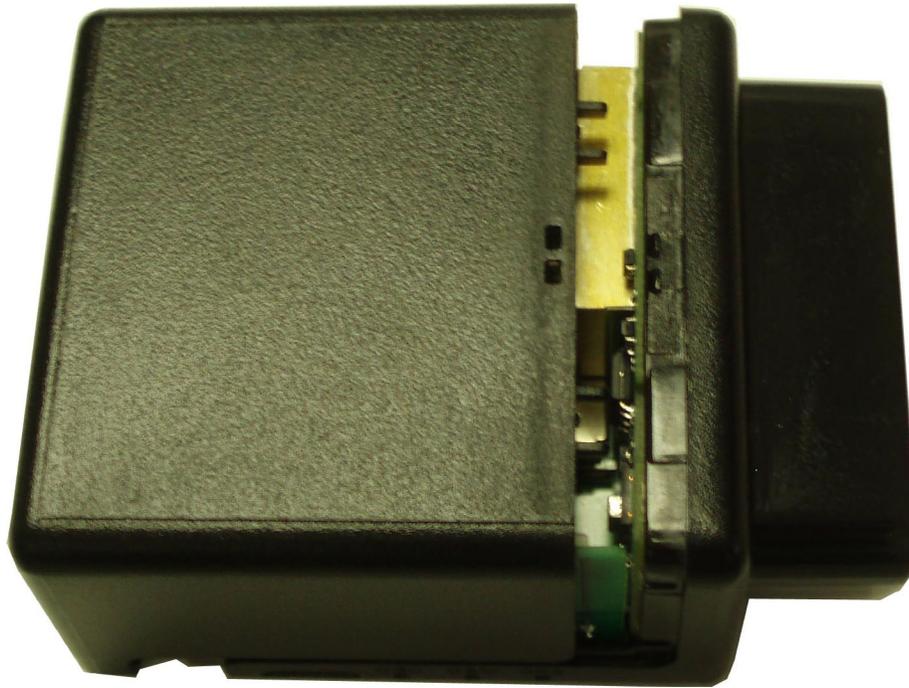


Figure: 14 - Replacing the MT 3000 Lid

2. Carefully slide the lid so that it snaps in place.

3.3 SIM Card Access

The top cover of the MT 3000 unsnaps to provide access to the internal SIM holder.

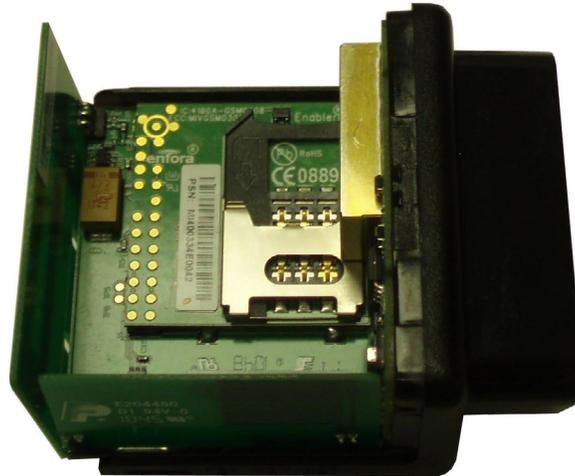


Figure: 15 - Internal SIM Holder

3.4 Power

The Enfora MT 3000 device draws 9-16 Vdc (SAE J1211 compliant) power from the vehicle's OBDII port. No additional power cabling is required.

3.5 Micro USB



Warning: The Micro USB (2.0) connector is an input/output connector and is not intended for general use. This connector should only be used when programming the modem.



Note: This USB port cannot be used to supply power to other USB devices and nothing should be connected to this port when the vehicle is in motion. The MT3000 can not be powered through the USB Port.

The micro USB connector is only used to program the modem. When programming the modem, a micro USB cable is required.



Figure: 16 - Micro USB Cable

4 Software Features

AT Commands Over SMS

A user can send AT commands to the MT 3000 via SMS. Please refer to Enfora Application Note GSM0308AN001 - Enabler IIIG AT Commands Over SMS.

Store/Transmit Event Data

The user can configure the MT 3000 to store event-generated data in its internal memory, to be sent over the air to a remote server. This feature can be enabled or disabled using the AT\$MSGLOGEN command.

“Total Number of Unread Messages” is decremented if an unread message is read via the AT\$MSGLOGRD command.

Example: Assume there are 50 unread messages in the GPRS queue and the total number of messages in GPRS queue is 100. This means that the first 50 messages have been read while the last 50 messages have not been read. If a user sends AT\$GPSLOGRD=0,1,51 then the total number of unread messages drops down to 49 after successful transmission of that message. However, if a user sends AT\$GPSLOGRD=0,1,99 then the total number of unread messages still remains at 50 – that message is transmitted to the remote server.

A user can also read a message that has already been read from the memory by passing in the appropriate starting index number.

Synchronize RTC Time with GPS Time

The Real Time Clock ("RTC") is synchronized with GPS time automatically every time the device is powered up and first acquires valid GPS data. Additionally, the RTC time is synched with GPS time every time the GPS time rolls over from 23:59:59 to 00:00:01.

4.1 New Event Reporting

The MT 3000 has additional event reporting not supported by other Enfora products. For general event reporting information and for detailed information about these new events refer to the MT 3000 AT Command Document (GSM2374AT001).

Vehicle Identification Number (VIN)

The VIN is used as a unique identifier, sent at first power up, with heartbeat messages, and with events.



Vehicle manufacturers are responsible for defining the list of data returned, therefore not all vehicles support returning the Vehicle Identification Number.

Excessive Engine Speed (RPM)

Excessive engine speed alerts are triggered when the engine speed (in RPM) exceed a defined RPM level (in ¼ RPM increments) for a defined period of time in seconds (e.g. 30 seconds).

The MT 3000 has three definable thresholds.

Unnecessary wear and tear on the powertrain control module (PCM) may occur if constant or frequent excessive engine speed is reported. The excessive engine speed event may be caused by one of the following situations:

- There are obstructions (ice, mud, etc...) causing wheel slippage that must be cleared from the vehicle
- The driver is revving the RPM while in neutral
- The driver is driving in such a way that the RPM engine speed is deemed excessive, such as speeding

AT\$OBDEES=1,16000,3,30

Sets excessive engine speed threshold 1 to 4000 RPM, if exceeded for 3 seconds, trigger input event. This event will clear once engine RPM is below 4000 for 30 seconds.

Vehicle Speed

If configured for vehicle speed alerts and the vehicle moves faster than one of the three configurable thresholds (e.g. 70 MPH), then a vehicle speed alert is triggered.

AT\$OBDSPD=1,112,10,104

Sets Vehicle Speed Threshold 1 to 112 KPH (~70MPH). If Threshold exceeded for 10 seconds trigger input event. This event will clear when vehicle speed is reduced to 104KPH (~65MPH).

Vehicle Battery Voltage (Low Battery Warning)

The vehicle battery voltage alert is triggered when the vehicle's battery is reported to be below a threshold (e.g. 10.7 V) for a user-defined period of time in seconds (e.g. 300 seconds).

AT\$OBDLBLE=10800,300,300

Sets low battery threshold to 10.8volts. If below this threshold for 300 seconds (5 minutes) trigger the input event. restoring voltage above the threshold for 300 seconds (5 minutes) will clear this event.

Check Engine Light (MIL Alert)

When the vehicle “Check Engine” light illuminates, this indicates a vehicle issue that requires attention for diagnosis and/or repair. This is also known as a Malfunction Indicator Light (MIL). When a MIL issue is detected through the OBDII protocol, an alert is sent from the device if the device is configured to do so.

Trip Odometer Reporting

Trip odometer reporting provides the odometer miles accumulated from ignition on to ignition off, which is considered a “trip”.



NOTE: Ignition events are not yet detected on hybrid or electric vehicles.

Idle Time Reporting

Idle time event is triggered when the vehicle’s engine is running without the vehicle moving (i.e. velocity less than 2 MPH) for a defined period of time in seconds (e.g. 300 seconds).

The alert is cleared when the vehicle speed exceeds another speed and time threshold.

Both the violation and clearing of the alert are reported if configured.

AT\$OBDLBLE=10800, 300, 300

Sets low battery threshold to 10.8volts. If below this threshold for 300 seconds (5 minutes) trigger the input event. restoring voltage above the threshold for 300 seconds (5 minutes) will clear this event.

Low Fuel Alert

The low fuel alert triggers when the vehicle’s fuel level falls below a defined threshold in percent (e.g. 12%) for a defined period of time in seconds (e.g. 60 seconds).

Rapid Acceleration

Rapid acceleration events can be triggered when one of three available vehicle speed thresholds are exceeded as determined by the accelerometer in milli-Gs (e.g. 0.75) for a defined period of time in seconds (e.g. 30 seconds).

AT\$OBDAACL=1, 200, 1, 30

Sets Rapid accel threshold 1 to .2Gs. If this threshold is exceeded for 1 second, trigger the input event. This event will clear in 30 seconds below this threshold.

Sudden Deceleration (Harsh Braking)

Rapid deceleration events can be triggered when one of three available vehicle speed thresholds are exceeded as determined by the accelerometer in milli-Gs (e.g. 1.0) for a defined period of time in seconds (30 seconds).

```
AT$OBDDCL=1, .500, 1, 3
```

Sets Rapid decel threshold 1 to .5Gs. If this threshold is exceeded for 1 second, trigger the input event. This event will clear in 30 seconds below this threshold.

Motion Detection

Motion alerts for vehicles can be configured to communicate that a vehicle is being towed. Motion detection based on measuring movement via the accelerometer occurs when the vehicle ignition is off, and the vehicle is stationary.

A motion alert is triggered when motion defined in milli-Gs is detected for a defined period of time.

OBDII Basic Event Data

Four additional data items can be included with event messages:

- VIN
- Firmware version (\$PKG)
- OBD Protocol (i.e. J1850 PWM)
- Cellular signal strength (RSSI)

5 Installation

5.1 Inserting the SIM

Insert the SIM per the following procedure:



Note: The SIM card is not provided with the MT 3000 device. The SIM must be obtained from the GSM/GPRS service provider and must be provisioned by the operator for data. Always take care to protect the SIM. Without the SIM installed, MT 3000 modem is not able to communicate on the network.

1. Using the correct tool, carefully remove the device cover to access the internal SIM holder.
2. Insert the SIM into the SIM holder of the MT 3000.
3. Replace the cover.

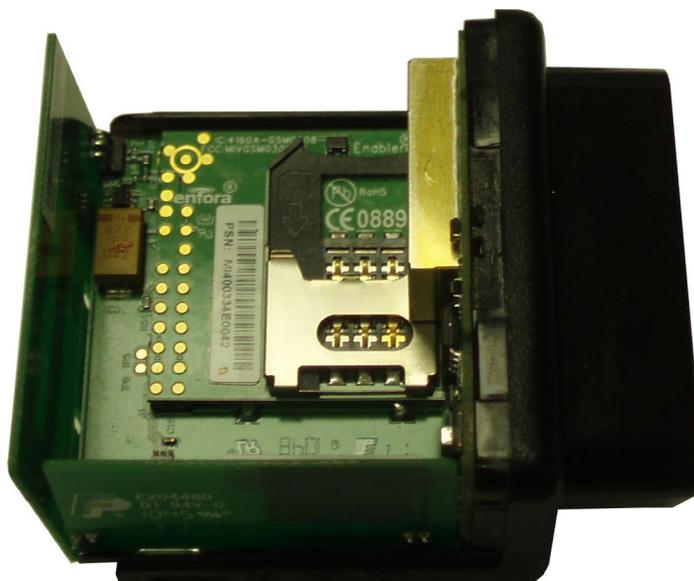


Figure: 17 - Internal SIM Holder

5.2 Device Installation

Instructions provided in this section describe the hardware installation of the MT 3000 device. To install the MT 3000 in a vehicle, follow these steps:

- Locate the OBDII socket. The location will vary between different vehicle manufacturers, models, and production years.



Do not use this product on '06 or '07 Ford F-150 trucks. Faulty wiring in these vehicles may cause a fire.



Warning: The MT 3000 is NOT a waterproof or sealed device. Care must be taken to ensure the device is kept away from water or any other liquids.

Carefully insert the MT 3000 into the OBDII socket.

- After the device is installed, ensure the device is working properly as evidenced by a GPS lock and cellular connection, which can be validated by the LEDs.

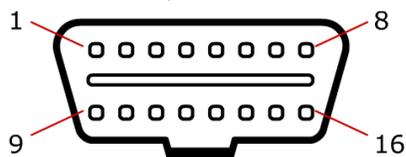
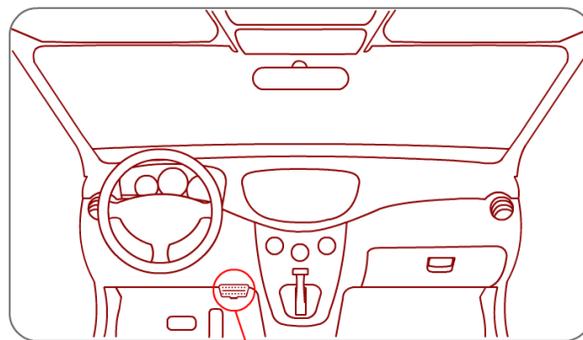


Figure: 18 - Typical OBDII Socket Location



Warning: Upon vehicle ignition on, immediately following device installation, the device starts the Accelerometer Auto-calibration process.

5.3 Accelerometer Calibration

The accelerometer undergoes an automatic calibration sequence on the first drive after any of the following events:

- Device installation
- Software upgrade
- Vehicle battery replacement (or recharge if battery was fully discharged)
- Device auxiliary processor reset



Failure to follow the process below will cause could cause an undesired behavior of the motion feature. Failure to drive straight on level ground during the automatic calibration may reduce the accuracy of the accelerometer and have an adverse impact on events triggered by accelerometer readings.

When the vehicle passes 92 KPH, the auxiliary processor assumes that the vehicle is moving in a straight line and determines the forward axis.

Before installing the MT3000 make sure the vehicle is parked on level ground.

The vehicle should be driven in a straight path on level ground during the automatic calibration. An inclined surface will put part of the gravity vector into the XY plane, which will affect the acceleration thresholds. (A 5.7 degree angle will place 10 % of the gravity vector into the XY plane.)

6 Network Test Procedure

6.1 Configuration

The Enfora Mobile Tracker family of products is designed with features to support a robust connection with the network. However, there can be conditions when the connection to the network or the ability to transfer data across the network is beyond the control of the device alone.

6.2 Equipment Needed

In this example the requirements are:

- GSM2374 MT 3000
- Computer with one available Serial port or USB-to-serial converter
- GSM/GPRS SIM with GPRS data enabled.
- An APN (Access Point Name).
- Username and Password, if GPRS is operating on a non-transparent network.



Note: If you don't know the name of the APN you need to use, please contact your cellular network carrier for that information. Once you have acquired this information, please complete Application Note GSM0000AN019 – GSM Network Configuration Worksheet and keep this worksheet for future reference.

6.3 Configure the Computer and Verify Correct Communications

Please refer to Enfora document ENF0001IN001 – USB Installation Guide for detailed instructions for installing USB drivers and connecting with the modem.

Configure the Device to Communicate with the Enfora Server



Note: In the following instructions, <CR> means using the Enter Key on the keyboard.

1. Connect and verify connectivity with the device.
 - a. Connect the PC connector to the device.
 - b. With HyperTerminal open, hit the Enter key. The device should respond with OK. If you do not see this response, double-check your connections. If the connections seem correct, disconnect the MT 3000 from the computer and perform a serial loop-back test.
 - c. Type AT<CR>. The device should respond with OK.
 - i. If you do not see the letters AT, send the following command to the device:
 - ii. ATE1<CR>
 - d. Type ATI<CR>. The device should respond with Enfora, Inc. If you get any different response, you are not connected to the Enfora device. See Figure: 19 - "ATI Response"

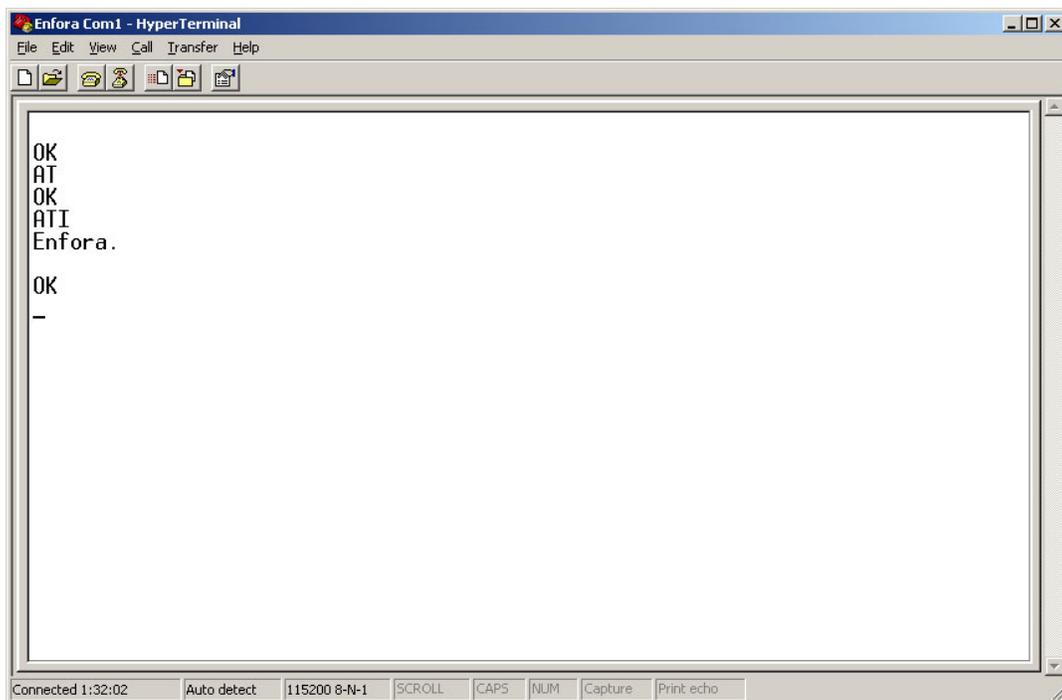


Figure: 19 - ATI Response

2. Configure the device to communicate with the Enfora Test Server.
 - a. The following information will need to be obtained from the SIM provider. Please refer to GSM0000AN019 – Network Configuration Worksheet.

- i. APN
 - ii. Username and password (If necessary.)
- b. Reset the device to factory defaults:
 - i. To restore the device to factory defaults, send the following command: AT&F<CR>
 - ii. To write current configuration to memory, send the following command: AT&W<CR>
 - iii. To reset the device, send the following command: AT\$RESET<CR>
- c. Configure the device to access the GPRS network.
 - i. To configure the device with the proper APN, send the following command:
AT+CGDCONT=1,"IP","apn"<CR> (substitute the letters "APN" for the supplied APN.)
 - ii. To configure the device with the proper username and password, (if necessary) send the following command: AT%CGPCO=1,"username,password",0<CR> (substitute the correct username and password)
 - iii. To configure the device to enable auto GPRS registration, send the following command:
AT\$AREG=2<CR>



Note: When the device is reset, Windows will detect the detachment of the device and you may have to close and reopen the communication program to reestablish communications with the device.

Verify GSM status by sending the following command:

```
AT+CREG?<CR>
```

If everything is working, you should receive one of two responses:

```
+CREG: 0,1 (GSM registered to home network)
```

OR

```
+CREG: 0,5 (GSM registered roaming.)
```

Verify GPRS status by sending the following command: AT%CGREG?<CR>

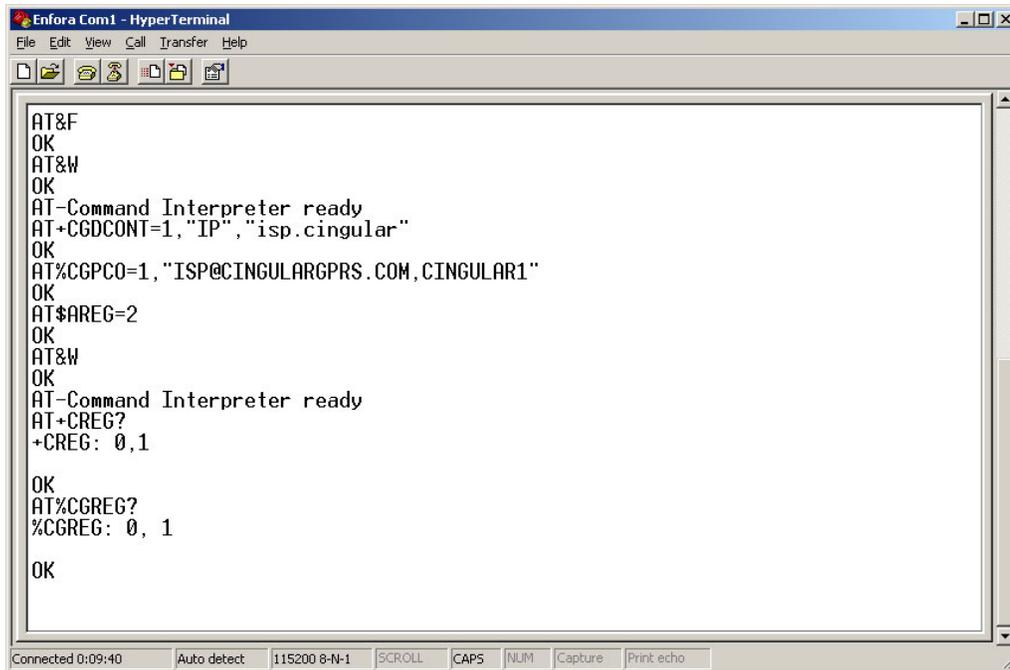
If everything is working, you should receive one of two responses:

%CGREG: 0,1 (GPRS registered to home network)

Or

%CGREG: 0,5 (GPRS registered roaming.)

See Figure: 20 - "Verify GPRS Status"



```
Enfora Com1 - HyperTerminal
File Edit View Call Transfer Help
[Icons]
AT&F
OK
AT&W
OK
AT-Command Interpreter ready
AT+CGDCONT=1,"IP","isp.cingular"
OK
AT%CGPCO=1,"ISP@CINGULARGPRS.COM,CINGULAR1"
OK
AT$AREG=2
OK
AT&W
OK
AT-Command Interpreter ready
AT+CREG?
+CREG: 0,1

OK
AT%CGREG?
%CGREG: 0, 1

OK
Connected 0:09:40 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo
```

Figure: 20 - Verify GPRS Status

Verify GPRS activation by sending the following command: AT\$NETIP?<CR>

If the response is non-zero, then everything is working.

See Figure: 21 - "Verify GPRS Activation"

```
Enfora Com1 - HyperTerminal
File Edit View Call Transfer Help
[Icons]
AT%CGPCO=1,"ISP@CINGULARGPRS.COM,CINGULAR1"
OK
AT$AREG=2
OK
AT&W
OK
AT-Command Interpreter ready
AT+CREG?
+CREG: 0,1

OK
AT%CGREG?
%CGREG: 0, 1

OK
at$netip?
$NETIP: "166.170.006.159", "066.102.163.231", "066.102.163.232"

OK
at$cgeer
$CGEER: no PDP reject cause

OK
-
```

Connected 0:16:26 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

Figure: 21 - Verify GPRS Activation

If AT\$NETIP returns all zeros, send the following command: AT\$CGEER<CR>

There are three common responses:

- \$CGEER: no PDP reject cause (Everything should be working OK)
- \$CGEER: requested service option not subscribed (APN is incorrect or SIM has not been enabled for data mode.)
- \$CGEER: user authentication failed (username and/or password is incorrect.)

Configure the device to access the Enfora Server.

To configure the device for server interoperability, several things have to be addressed:

- Most GPRS configurations are Mobile Originate only. The mobile device must initiate a conversation with a remote server before the remote server can talk to the device.
- IP addresses are dynamically assigned and can change.
- Some IP addresses are NAT and are non-routable IP addresses.

These issues are addressed with the following configuration commands.

The examples will use the following information:

- Modem ID/name = "MT_Test"
- Remote Server DNS address = apitest.enfora.com
- Remote Server IP port = 1721

1. Give the device a unique name send the following command:

```
AT$MDMID="MT_Test"
```

This command, combined with the wakeup message, will allow the server to associate a Public IP address with a specific device and create a window of opportunity where the server can send commands to the device See Figure: 4 - "Wakeup Command"

2. To talk with a specific server send the following command:

```
AT$FRIEND=1,1,"apitest.enfora.com"
```

3. To set the port number send the following command:

```
AT$UDPAPI=,1721
```

4. To Enable periodic messages (wakeup) to be sent to the server every 60 seconds send the following command:

```
AT$WAKEUP=1,1
```

See Figure: 22 - "Wakeup Command"

```
Enfora Com1 - HyperTerminal
File Edit View Call Transfer Help
AT$MDMID="MT_Test"
OK
AT$FRIEND=1,1,"apitest.enfora.com"
OK
AT$UDPAPI=,1721
OK
AT$WAKEUP=1,1
OK
-
Connected 0:07:33 Auto detect 115200 8-N-1 SCROLL CAPS F.L.N Capture Print echo
```

Figure: 22 - Wakeup Command

6.4 Verifying Server Connectivity

	<p>Note: For the following tests, Java Runtime must be installed on the computer. (To install Java Runtime, please visit the Java website: http://www.java.com/en/download/manual.jsp)</p>
---	---

1. Start Internet Explorer and enter the following URL: <http://apitest.enfora.com/udpapp/>
2. Enter the name used in the MDMID command in the box. Select Connect See Figure: 23 - "Verify Server Connectivity"

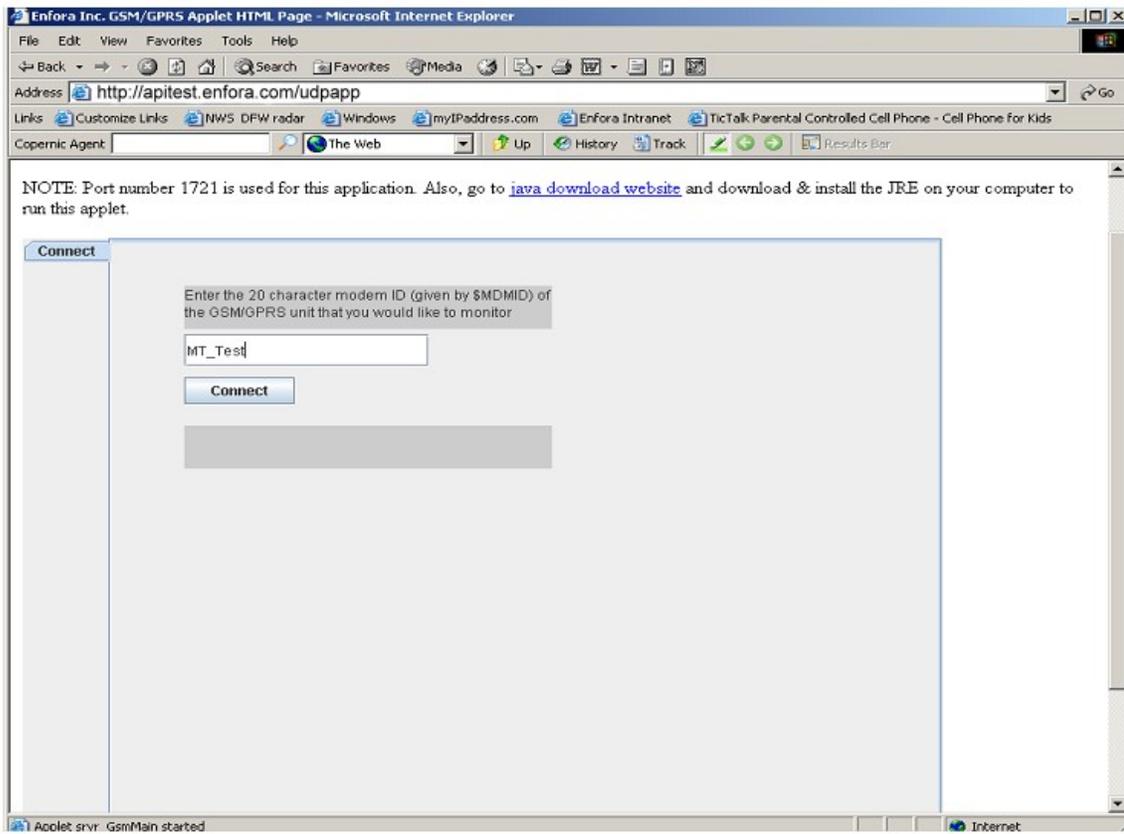


Figure: 23 - Verify Server Connectivity

3. Select the tab with the device name. (In this diagram it is labeled "MT_Test") Within approximately 60 seconds the wakeup messages should be seen in the window See Figure: 24 - "Wakeup Messages"

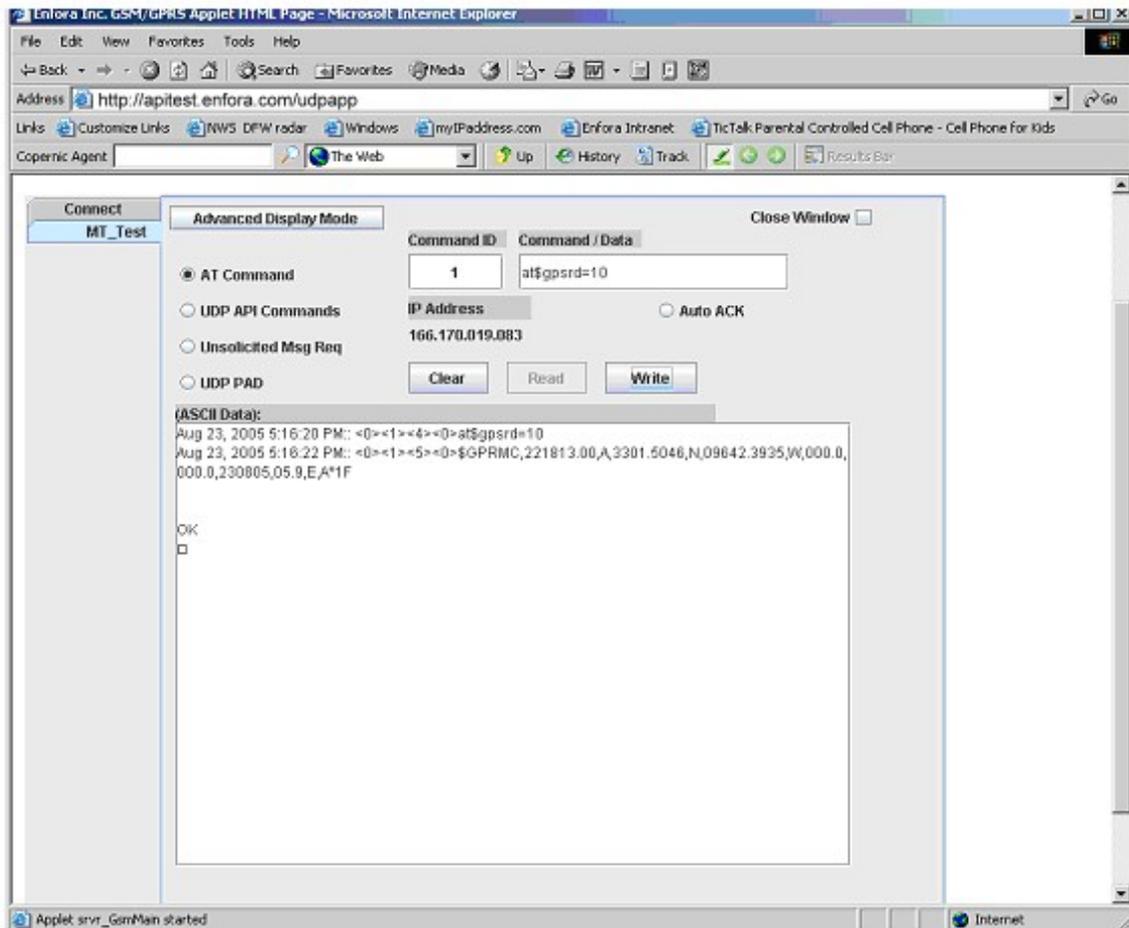


Figure: 24 - Wakeup Messages

4. Enter the following command in the command/ data block:
ATI
5. Select Write
6. Verify that you see the device respond with Enfora, Inc. See Figure: 25 - "ATI Response" . If so, you have successfully configured the device to talk with the server.

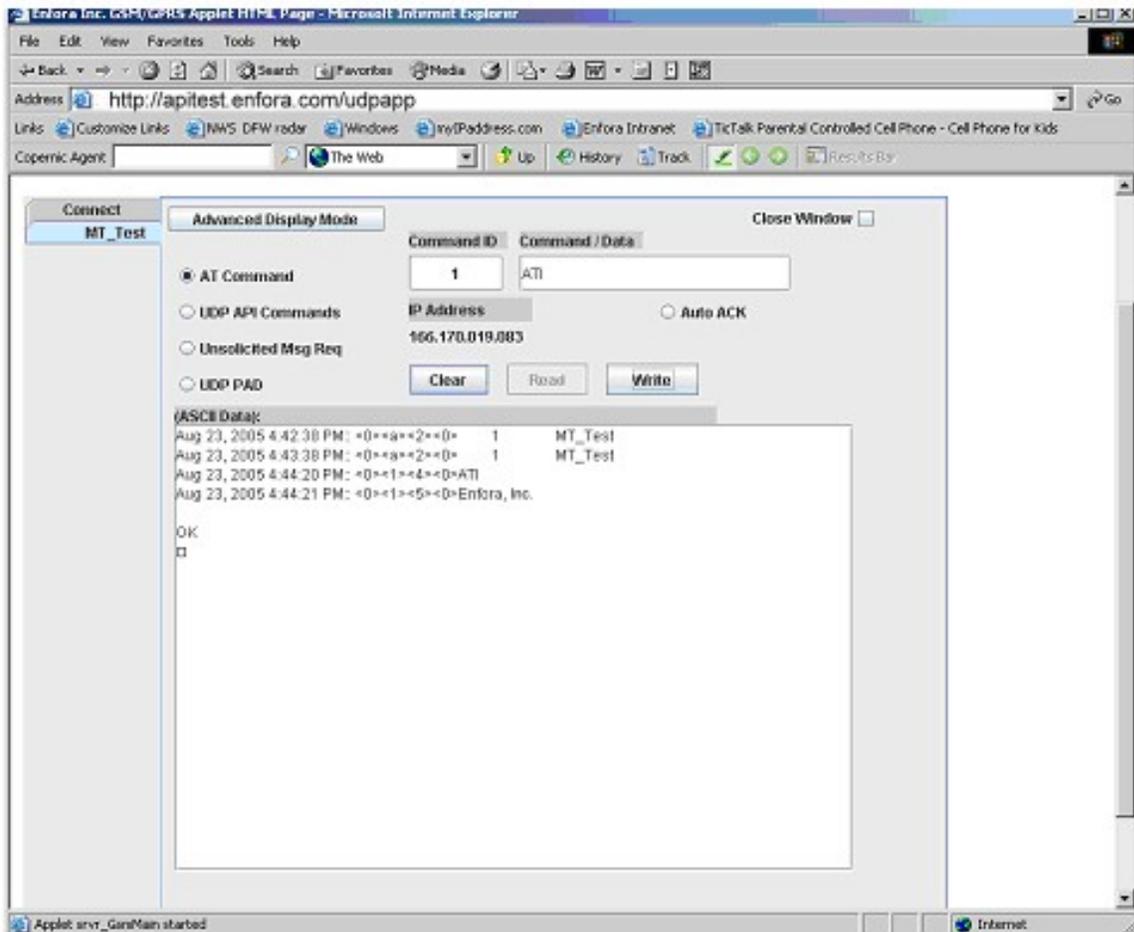


Figure: 25 - ATI Response

6.5 Verify GPS Operation

Follow these directions to verify GPS Operation.

1. From the terminal window, send the following command: AT\$GPSRD=10<CR>
 2. The device should respond with a standard GPRMC message that looks similar to the following:
\$GPRMC,221223.00,A,3301.5080,N,09642.3857,W,000.0,000.0,230805,05.9,E,A*19
- A = OK
 - V = Warning
 - 9 = Enfora Specific response that GPS solution is not valid and the last known GPS location is being substituted.

Here is an example of a GPRMC message without a GPS lock: \$GPRMC,221553.30,V,,,,,,,,,N*7C The same command can be used in the server application See Figure: 26 - "Verify GPS Operation" .

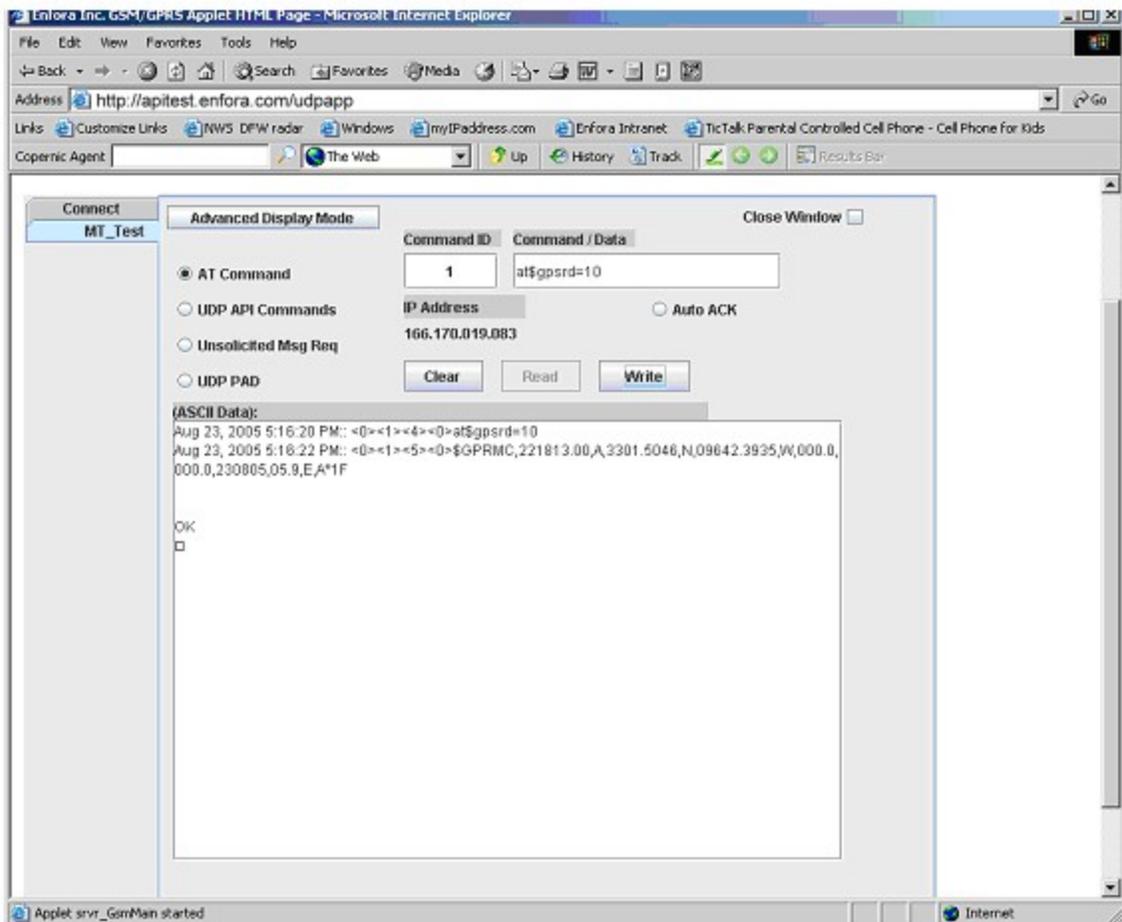


Figure: 26 - Verify GPS Operation