

EMT3050UG001

MT 3050



User Guide



General

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Warranty Information

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Regulatory Compliance

FCC

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.

RF EXPOSURE

Your device 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 device, 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 device conforms with the RF exposure requirements for portable devices in accordance with FCC Part 2.1093.

The transmitter is configured with a 10% transmission duty factor, for GPRS Multislot class 8 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.

The CDMA transmitter is configured with a 1.6% transmission duty factor 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 v05.



Effective with HW revision 1, the device is in conformity with the requirements of the R&TTE directive 1999/5/EC. It has been fully tested and complies with all the requirements of EN301489-1, EN301489-3, EN301489-7 and EN60950-1. Compliance to EN301511 has been demonstrated by testing on both the device and the integrated module.

Novatel Wireless M2M hereby declares that the GSM2378 is in compliance with the essential requirements and other provisions of the Directive 1999/5/EC.

A full copy of the declaration of conformity can be found at <http://documentation.nvtl.com>

Industry Canada

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 3050 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.

Cet appareil est conforme aux normes d'Industrie Canada exemptes de license(s) RSS. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas provoquer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant provoquer un fonctionnement indésirable de l'appareil.

L'émetteur MT 3050 est configuré avec un facteur de service de transmission de 10%, pour l'opération en GPRS multislot class 2, et est exclu de l'évaluation de routine d'exposition RF en conformité avec les exigences du CNR-102 section 2.5.

ROHS COMPLIANCE

The device 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 FCC, GCF, PTCRB, R&TTE, IMEI and other applicable codes that are in effect at the time of publication. Novatel Wireless M2M 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. Novatel Wireless M2M strongly recommends that all installations, hookups, transmissions, etc., be performed by persons who are experienced in the fields of radio frequency technologies. Novatel Wireless M2M 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 Novatel Wireless M2M shall not be responsible for installations or transmissions that fall outside of the parameters set forth in this publication.

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1

Introduction

Description
Technical Specifications
On-Board Diagnostics Overview

Description

Novatel Wireless designed the MT 3050 for the Usage-Based Insurance (UBI), telematics, and fleet management markets. The MT 3050 has a rugged plastic housing and includes a disconnect alert feature that uses an in-device backup battery. The MT 3050 is available in GSM/GPRS and 1xRTT versions. It contains an internal GPS, a cellular antenna, a J1962 compliant OBDII connector, a micro USB connector, and 3 LED indicators.

The GSM2378 variant also contain an internal SIM card holder.



Figure 1-1 Front Right View



Figure 1-2 Front View

The MT 3050 has a printed label on the top side of the device. The figures below show the information included on the label.

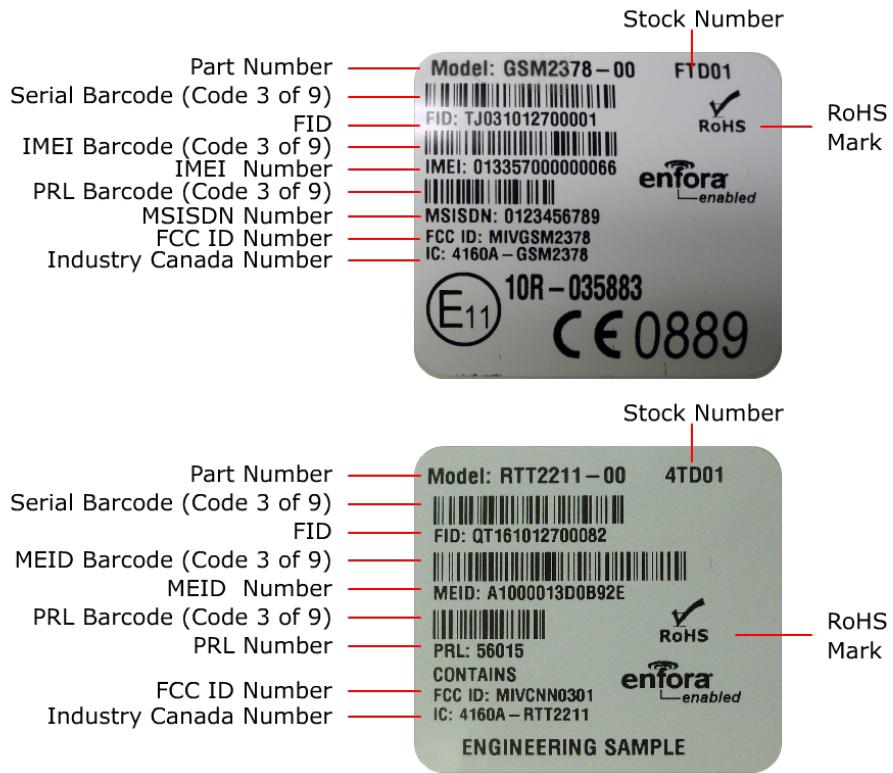


Figure 1-3 MT 3050 Labels

Technical Specifications

General

Name:	MT 3050
Model:	RTT2211, GSM2378
Approvals:	FCC, CE, RoHS, Industry Canada
Housing:	Rugged textured plastic enclosure UL94-Vo fire
Weight:	
Dimensions:	55 x 49 x 29 mm
Battery:	Rechargeable lithium-ion battery (230mAh)
Recharge Temperature Range	0 to +45°C
Operating Voltage:	9 - 16 V DC operational for 12 V vehicle support.

Radio Technology

GSM/GPRS:	850/900/1800/1900 MHz
1xRTT (CDMA2000) :	800/1900 MHz
GSM/GPRS/Edge 2G:	850/900/1800/1900 MHz

Packet Data

Packet Data	Class B, Multislot 8 GSM/GPRS Rel 97
SMS Functionality:	
- GSM SMS:	Text, PDU, MO/MT, Cell Broadcast
- CDMA SMS:	Text, MO/MT

Environmental

Operating Temperature:	-20°C to 60°C
Storage Temperature:	-20°C to 60°C
Humidity:	Up to 85% non-condensing
Vibration Stability:	In accordance with SAE J1211
Drop:	

Components

GPS Protocols:	NMEA, Binary
Buffered GPS Message Feature:	Yes
Accelerometer:	3-axis digital .
Cellular Antenna:	Internal
GPS Antenna:	Internal
I/O Connector:	Micro USB (2.0), command port
LEDs:	GPS (blue), Cellular (green), OBD (red)
OBDII Connector:	J1962 compliant

Protocols

OBD Protocols:	ISO 9141-2 ISO 14230 KWP 2000 J1850 PWM J1850 VPW Some vehicles only support a subset of these protocols, which may limit the functionality of the MT 3060.
Host Protocols:	AT commands, UDP API, FOTA
Internal Protocols:	UDP API, TCP API
API Control/Status:	AT commands, UDP API, TCP API, AT commands over SMS

Part Numbers

GSM2378-00	GSM/GPRS
RTT2211-00	CDMA 1xRTT

Document References

GSM2378AT001	MT 3050 AT Command Set For GPRS
RTT2211AT001	MT 3050 AT Command Set For 1xCDMA
GSM0000AN019	GSM Network Configuration Worksheet

Certifications

FCC:	Yes
CE:	Yes
RoHS Compliant:	Yes
Industry Canada:	Yes

Additional Features

GSM Registration	GPS Status	Input Event Counter
GPRS Registration	Timer	GPS Overspeed

Velocity	MT Power Save	Message Log Count
Geo-Fence	RTC Alarm	SMS Indication
IP Status	Memory Full Percentage	GPS Distance

On-Board Diagnostics Overview

The Novatel Wireless M2M MT 3050 connects to a vehicle's On-Board Diagnostics (OBDII) port and monitors the OBDII system using communication protocols. 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 require the newer OBDII system.

You can configure the MT 3050 to provide notification messages based on events triggered by:

- Accelerometer change
- Check engine light (MIL alert)
- Engine RPM
- GPS information
- Idle time
- Low fuel
- Trip Odometer (trip distance)
- Vehicle battery voltage (low battery warning)
- Vehicle Identification Number (VIN)
- Vehicle speed
- Other events monitored by the OBDII system



Some vehicles are not compatible with the MT 3050. If a vehicle is not compatible with the required MT 3050 parameters, then functionality may be limited, problematic, or unavailable.

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

Since the vehicle manufacturer is responsible for complying with the SAE standard, Novatel Wireless M2M cannot guarantee that the MT 3050 will perform with every vehicle.

2

Features And Functions

- GPS
- LEDs
- Power
- Accelerometer
- GSM Radio
- CDMA Radio
- New Event Reporting
- Micro USB Connector
- AT Commands Over SMS

GPS

GPS functions include:

- NMEA update with all data points
- Novatel Wireless M2M Binary Packets
- Buffered GPS message feature
- Geo-fencing
- Virtual odometer

LEDs

The MT 3050 includes LEDs to indicate OBDII, NETWORK, and GPS status.

The following figures show the MT 3050 connectors and LEDs.



Figure 2-1 MT 3050 Connectors

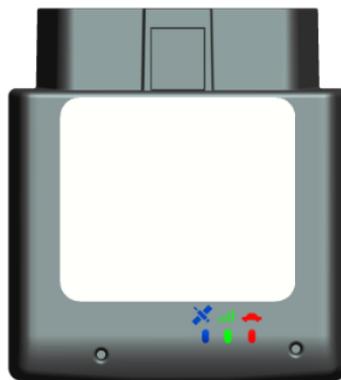


Figure 2-2 MT 3050 LEDs

The following table describes the LED operation.

MT 3050 LEDs	
OBD (Red)	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.

MT 3050 LEDs	
NETWORK (Green)	The NETWORK 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.
GPS (Blue)	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 at a slow rate.

Table 2-1 MT 3050 LEDs

Power

The MT 3050 requires 9-16 VDC minimum 2 amps input power. Pin 16 on the 16-Pin I/O connector is the positive power input, and pins 4 and 5 are ground. This device contains a battery. This battery is not to be removed or replaced by the user. Please dispose of this device according to local recycling laws.

Bench Testing / Programming



After performing a firmware upgrade the device will respond that the firmware load is complete. However, power must remain applied to the device for approximately 2 minutes after the firmware upgrade completion message is received. This allows time for the upgrade to be applied to the auxiliary processor. The user can confirm it is safe to remove power by sending the AT\$OBDVER? command. If the upgrade is still processing, the device will respond with an error. If the upgrade is complete, the device will respond with the current software version.

Accelerometer

The three-axis digital accelerometer provides the following features:

- Motion alert (towing alert)
- Driver behavior reporting
 - Rapid acceleration
 - Harsh braking
- Configurable thresholds
 - Range settings
 - Mode (Normal, Sleep, Wakeup)
 - Wakeup pause (20 to 2560 msec)
 - Sample Rate (0-25 per second)
 - Filter Coefficient and Filter Bandwidth
 - Device Orientation Setup

GSM Radio

The MT 3050 (GSM2378) contains a quad-band (850/900/1800/1900 MHz) GSM radio.

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

CDMA Radio

The MT 3050 (RTT2211) contains a dual-band (800/1900 MHz) CDMA radio.

- BC0-800 MHz – US Cell
- BC1-1900 MHz – US PCS

New Event Reporting

The MT 3050 has additional event reporting not supported by other Novatel Wireless M2M products. For general event reporting information and for detailed information about these new events refer to the *MT 3050 AT Command Document (GSM2374AT001)*.

Vehicle Identification Number (VIN)

The VIN is used as a unique identifier which is 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) exceeds a defined RPM level (in $\frac{1}{4}$ RPM increments) for a defined period of time in seconds (e.g., 30 seconds).

The MT 3050 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. One of the following situations may cause excessive engine speed:

- Obstructions, such as ice or mud, that may cause wheel slippage if the obstruction is not removed
- Revving the RPM while in neutral
- Speeding or reckless driving that causes excessive RPM engine speed

The following AT command example sets the excessive engine speed threshold at 1 to 4000 RPM. Then, if exceeded for 3 seconds, it triggers the input event. This event will clear once engine RPM is below 4000 for 30 seconds.

```
AT$OBDEES=1,4000,3,30
```

Vehicle Speed

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

The following AT Command example sets the vehicle speed threshold at 1 to 112 KPH (~70MPH). When the threshold is exceeded for 10 seconds, an input event is triggered. This event will clear when the vehicle speed is reduced to 104KPH (~65MPH).

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

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., 10.8 V) for a user-defined period of time in seconds (e.g., 300 seconds).

The following AT Command example sets the low battery threshold to 10.8 volts. When the voltage remains below this threshold for 300 seconds (5 minutes), it triggers an input event. Restoring voltage above the threshold for 300 seconds (5 minutes) will clear this event.

```
AT$OBDLVL=10800,300,300
```

Check Engine Light (MIL Alert)

When the vehicle's "Check Engine" light illuminates, this indicates that a vehicle issue requires attention for diagnosis and/or repair. This is also known as a Malfunction Indicator Light (MIL). A user can configure a device to detect a MIL issue via the OBDII protocol, and to send an alert when the device detects such an issue.

Trip Odometer Reporting

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



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

Idle Time Reporting

An idle time event is triggered when the vehicle's engine is running without the vehicle moving (i.e., velocity less than 3 KPH) 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.

The following AT Command example sets the idle time speed threshold to 3 KPH for 5 minutes (300 seconds) with a clearance time of 30 seconds. If the speed remains below this threshold for 300 seconds (5 minutes), it triggers the input event. Restoring speed above this threshold for 30 seconds will clear this event.

```
AT$OBIDIDL=3,300,30
```

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).

The following AT Command example sets the low fuel alert threshold to 12% for 1 minute (60 seconds) with a clearance time of 30 seconds. If the fuel level remains below this threshold for 60 seconds, it triggers the input event. Restoring the fuel level above this threshold for 30 seconds will clear this event.

```
AT$OBDFL=12,60,30
```

Rapid Acceleration

Rapid acceleration events can be triggered when one of three available 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).

The following AT Command example sets the rapid acceleration threshold #1 to .2G. If this threshold is exceeded for 1 second, then an input event is triggered. Keeping the acceleration of the vehicle below this threshold for 30 seconds will clear this event.

```
AT$OBDACL=1,200,1,30
```

Sudden Deceleration (Harsh Braking)

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

The following AT Command example sets the rapid deceleration threshold #1 to .5Gs. If this threshold is exceeded for 1 second, then an input event is triggered. Keeping the deceleration below this threshold for 30 seconds will clear this event.

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

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

Five additional data items can be included with event messages:

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

Right Turn

Harsh turn events can be triggered when one of two available 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).

The following AT command example sets the Right Turn accelerometer threshold 1 to .25 Gs. If this threshold is exceeded for 2 seconds, an input event is triggered. This event will clear in 15 seconds when the acceleration is below this threshold.

```
AT$OBDART=1,250,2,15
```

Left Turn

Harsh turn events can be triggered when one of two available 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).

The following AT command example sets the Left Turn accelerometer threshold 2 to .3Gs. If this threshold is exceeded for 1 second, an input event is triggered. This event will clear in 20 seconds when the acceleration is below this threshold.

```
AT$OBDALT=2,300,1,20
```

Up

Up accelerometer events can be triggered when the threshold is 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).

The following AT command example sets the Up accelerometer threshold to 1.2Gs. If this threshold is exceeded for 1 second, an input event is triggered. This event will clear in 30 seconds when the acceleration is below this threshold.

```
AT$OBDAUP=1,1200,1,30
```

Down

Down accelerometer events can be triggered when the threshold is 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).

The following AT command example sets the Down accelerometer threshold to .8Gs. If this threshold is exceeded for 1 second, an input event is triggered. This event will clear in 30 seconds when the acceleration is below this threshold.

```
AT$OBDADN=1,800,1,30
```

Micro USB Connector

The MT 3050 includes a J1962 compliant OBDII connector and a micro USB I/O port.



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.



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 MT 3050 cannot 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 (purchased separately).



A standard USB certified, micro USB cable must be used. It is NOT recommended to use micro USB cables that belong to cellular phones, MP3 players, cameras etc to connect to the device. Using these type of micro USB cables can seriously damage the device.



Figure 2-3 Micro USB Cable

AT Commands Over SMS

A user can send AT commands to the MT 3050 via SMS. Please refer to Novatel Wireless M2M Application Note *ENF0000AN012 - AT Commands Over SMS* for details.

Store/Transmit Event Data

The user can configure the MT 3050 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 message queue and the total number of messages in the message 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 stored in the memory by inputting 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.

Reporting Frequency

The minimum reporting frequency of the device is as follows:

- Periodic reporting is limited to a maximum of 1 per 6 seconds.
- The general reporting interval is 1 message every 2 seconds.

3

Installation

SIM access (GSM2378 and UMT2212 Only)

Activating The Device

Device Installation

Accelerometer Calibration

SIM Access (GSM2378 And UMT2212 Only)

SIM Installation procedures include:

- Opening
- Inserting SIM
- Closing

The GSM2378 and UMT2212 versions of the MT 3050 include an onboard SIM carrier. There is no external access to the SIM.



The RTT221 (CDMA) version of the MT 3050 does not use a SIM and should not be opened.

Opening The Device

To prevent damaging the device, we highly recommend that you use the Plastic Lever (Novatel Wireless M2M part number ASA-3000-0001) when opening the MT 3050.

To open the MT 3050, follow these steps:

1. Insert the tool into the opening and gently push until that corner of the lid unsnaps as shown below.



Figure 3-1 Opening the MT 3050 Case

2. Repeat step 1 for the other corner.



Figure 3-2 MT 3050 With Cover Unsnapped

3. Carefully slide the cover off the device.



Figure 3-3 MT 3050 With Cover Partially Removed



Figure 3-4 MT 3050 With Cover Removed

Inserting The SIM

Insert the SIM using the following steps:



The SIM card is not provided with the MT 3050 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, the MT 3050 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 3050.
3. Replace the cover (as described below).

Closing The Device

Replace the MT 3050 cover using the following steps:

1. Place the MT 3050 cover onto the base as shown in the following figure.
2. Apply gentle downward pressure to the back of the cover first as you carefully slide the cover into place.
3. Apply gentle down and forward pressure to the front of the cover until it snaps shut.

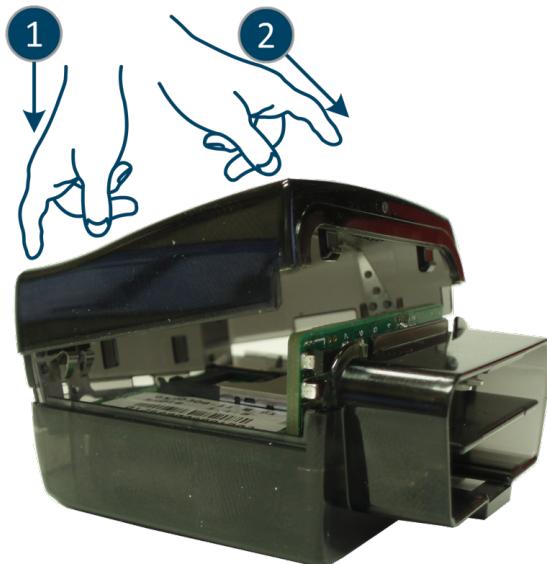


Figure 3-5 MT 3050 Cover Replacement

Activating The Device

Verizon Activation:

To activate with Verizon, the user must contact Verizon and provide the MEID of the device to the provider. Once Verizon has acknowledged that the device is ready to activate, the user will then be required to send an activation string to the network.

Send the activation string: AT+CDV*22899. This will initiate a call with the network. A successful call will last approximately 40 seconds. If the call is terminated within 10-15 seconds, the call was not successful. Multiple attempts might be required. If the call is not successful after a few attempts, please check the MEID of the device and compare it with the MEID provided to the provider.

To verify that the activation has successfully completed, attempt a voice call AT+CDVxxxxxx. If the call is successful, then the over-the-air provisioning was successful.

As part of the activation process, the network will download a new PRL. The device will reset after the PRL is successfully reset to allow the new PRL to take effect.

Sprint Activation:

To activate with Sprint, the user must contact Sprint and provide the MEID of the device. After the MEID is provided to Sprint, the user will need to power on the device when instructed by the carrier. The device will automatically activate when it attaches to the network. For the first attempt the user should see a series of unsolicited reports. If the device gets to +HFA: 6, the device has successfully activated. This process can take up to 60 seconds to complete. AT+HFA? can be used to query the activation state. A response of 1 means the device is successfully activated. A response of 0 means that it has not.

An unsuccessful activation attempt may take up to 5 minutes, because of the number of retries specified by the carrier.

As part of the activation process, the network will download a new PRL. The device will reset after the PRL is successfully reset to allow the new PRL to take effect.

Device Installation

Make sure the vehicle is parked on level ground prior to installing the MT 3050.

Instructions provided in this section describe the hardware installation of the MT 3050 device. To install the MT 3050 in a vehicle, follow these steps:

1. Locate the OBDII socket. The location will vary between different vehicle manufacturers, models, and production years.
2. Carefully insert the MT 3050 into the OBDII socket.
3. After the device is installed, the GPS lock and cellular connection LEDs will validate that the device is working properly.



The MT 3050 is NOT a waterproof or sealed device. Keep the device away from water or any other liquids.

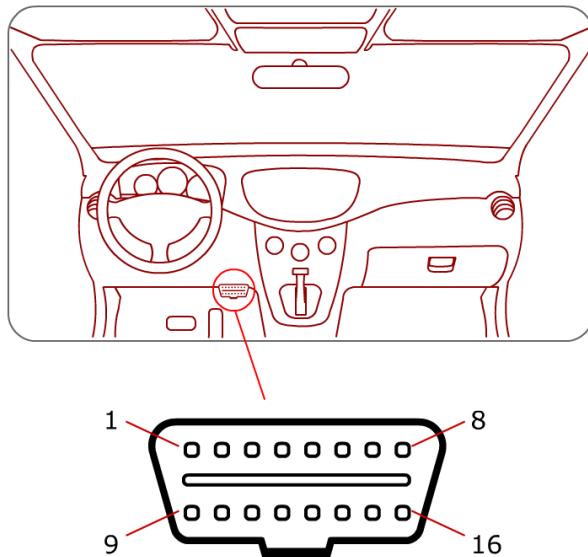


Figure 3-6 Typical OBDII Socket Location



The device starts the accelerometer auto-calibration process immediately after the device is installed and the vehicle's ignition is turned on.

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 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.

1. Make sure the vehicle is parked on level ground prior to installing the MT 3050.
2. Drive the vehicle 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.)



When the vehicle passes 32 KPH, the auxiliary processor assumes that the vehicle is moving in a straight line and determines the forward axis.

4

USB Driver Installation

[USB Driver Installation \(Windows XP\)](#)

[USB Driver Installation \(Windows 7\)](#)

USB Driver Installation (Windows XP)

These instructions illustrate how to correctly install the USB drivers in Windows XP using the Novatel Wireless M2M Driver Setup Utility.

1. Run the Novatel Wireless M2M Driver Setup Utility by double-clicking the **Novatel Wireless M2MDriverSetup** executable file.



The Novatel Wireless M2M Driver Setup Utility Extraction window opens.

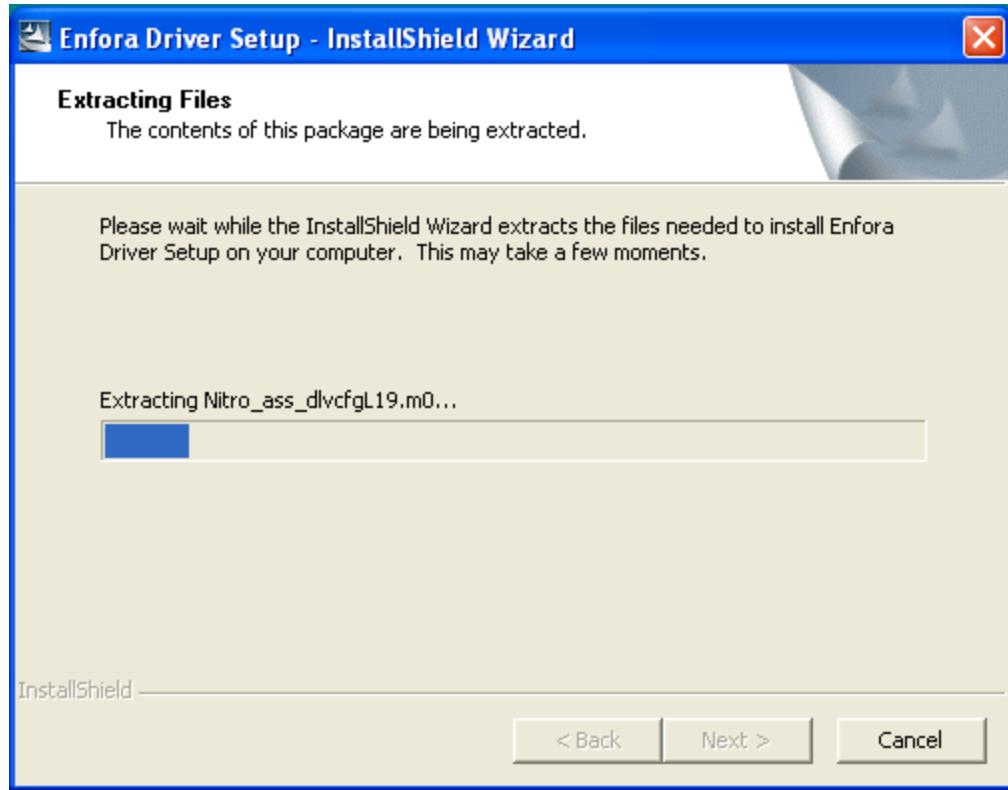


Figure 4-1 Novatel Wireless M2M Driver Setup Utility Extraction

Once the contents have been extracted to memory, the Welcome Window opens.

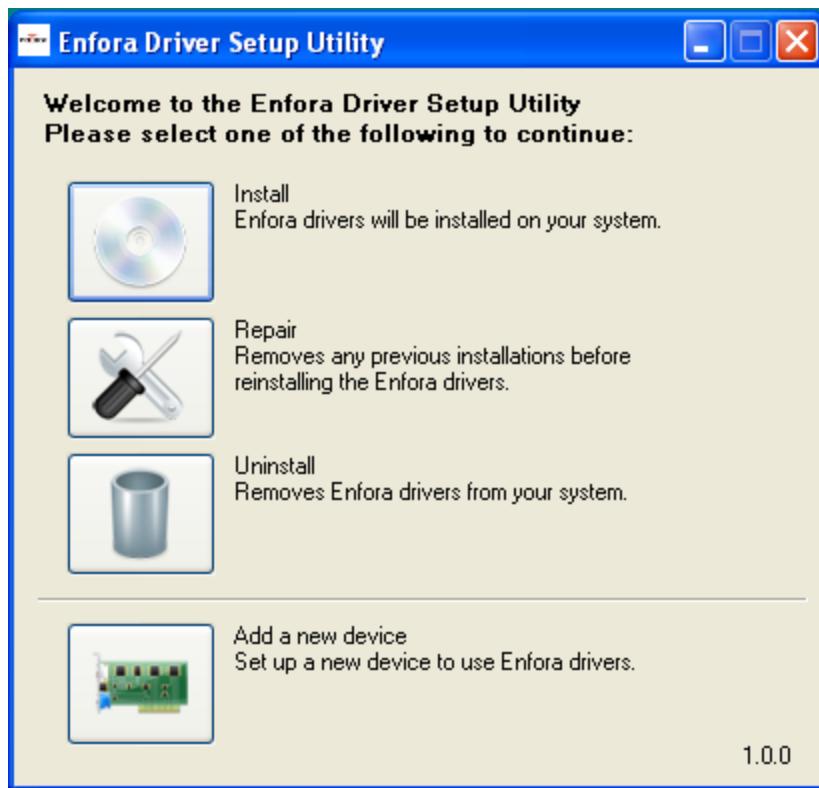


Figure 4-2 Novatel Wireless M2M Driver Setup Utility Welcome

2. To install the drivers, select **Install**.

The Novatel Wireless M2M Driver Setup Utility Window opens.

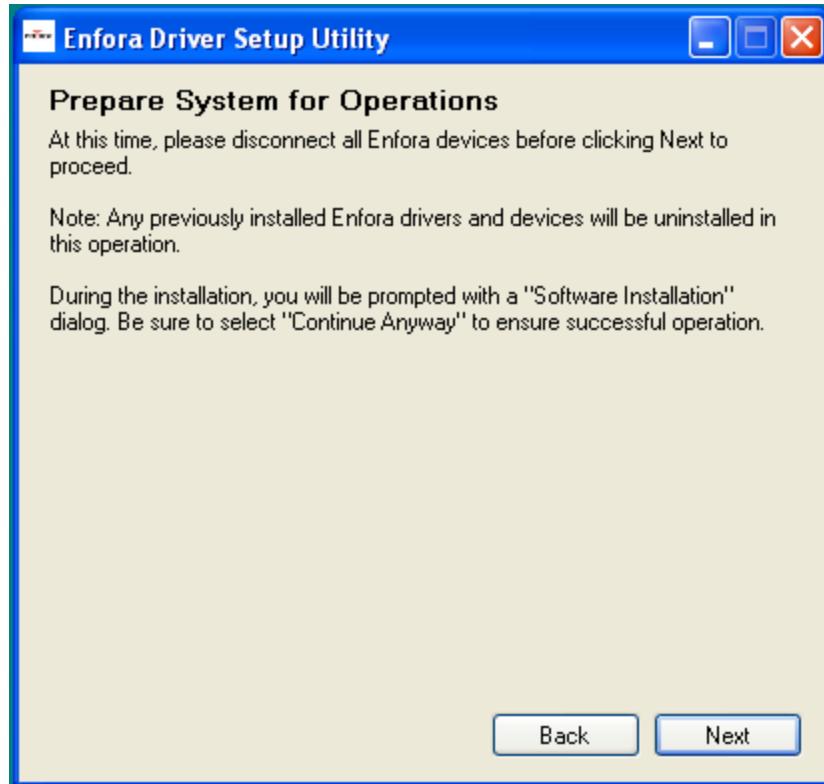


Figure 4-3 Novatel Wireless M2M Driver Setup Utility Prepare System Window

3. Select **Next** to continue.

The Novatel Wireless M2M Driver Setup Utility Installation Window opens while the system installs the drivers.

4. Disconnect any Novatel Wireless M2M devices.

Previous drivers will be removed during this phase.



During the installation, your computer's display may freeze and appear non-responsive. If this occurs, allow the computer to continue working. After 2-3 minutes, the display and installer will resume normal behavior.

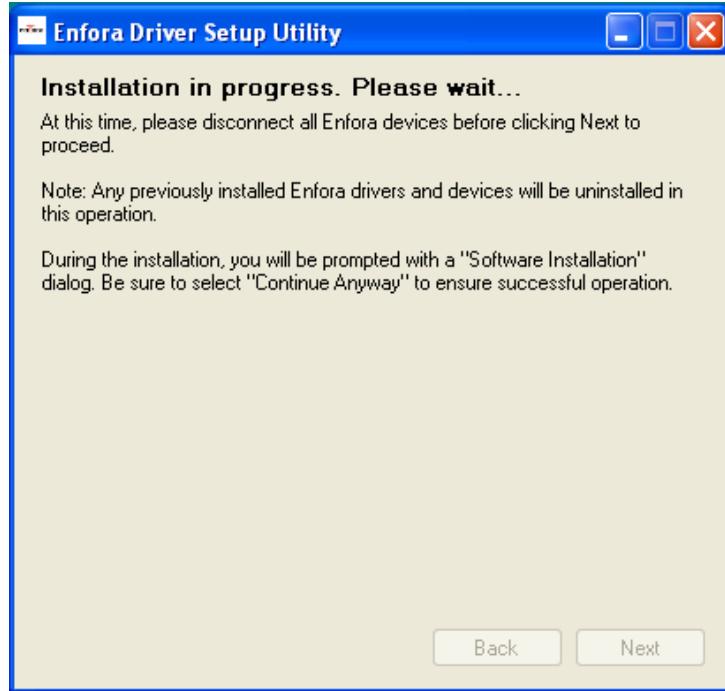


Figure 4-4 Novatel Wireless M2M Driver Setup Utility Installation Window

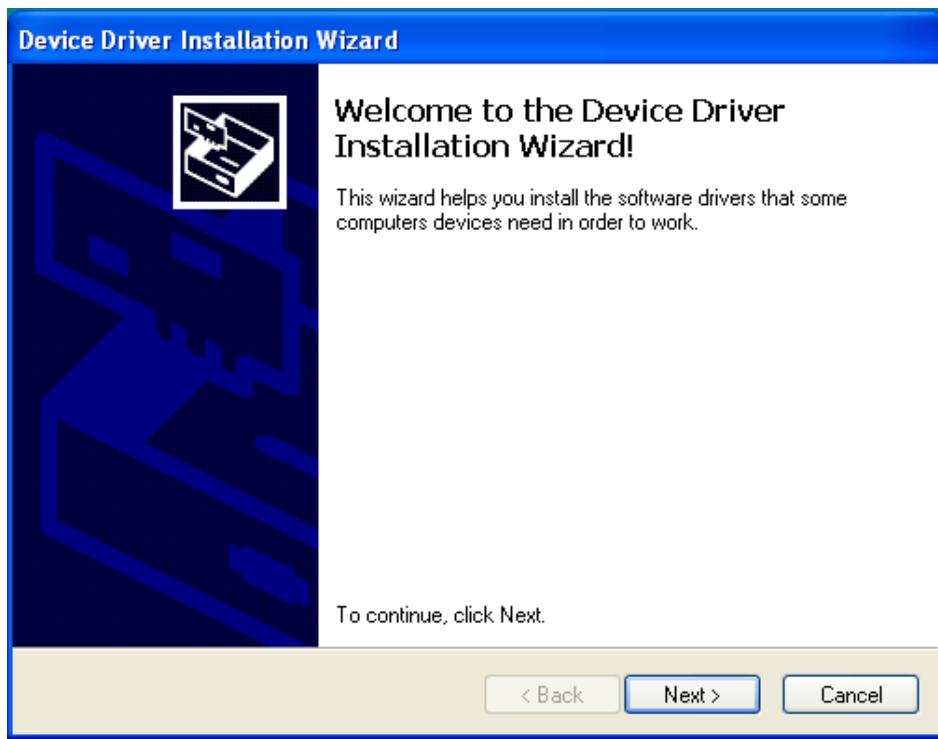


Figure 4-5 Novatel Wireless M2M Driver Setup Utility Driver Installation

5. When prompted to install the device driver, select **Next**.



Figure 4-6 Novatel Wireless M2M Driver Setup Utility Driver Installation Progress

You may see the following warning message:



Figure 4-7 Windows Security Window

6. Click **Continue Anyway**.

When installation of the USB drivers is complete, the Completion window opens.

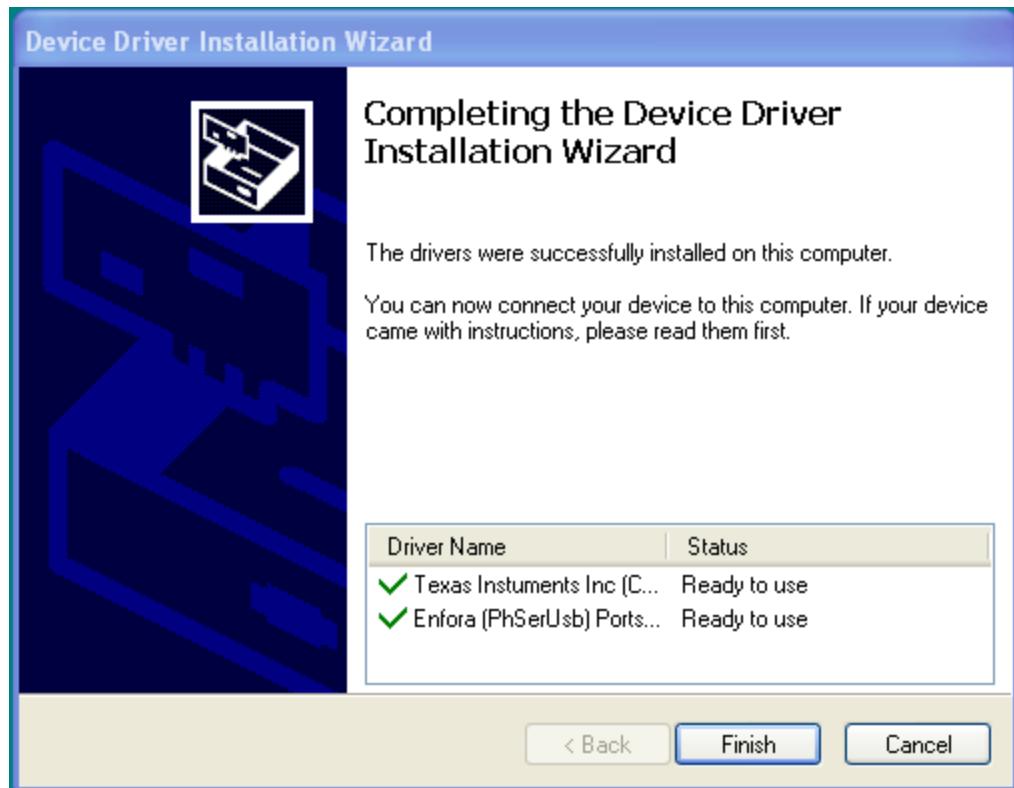


Figure 4-8 Novatel Wireless M2M Driver Setup Utility Driver Install Completion Window

7. Click **Finish**.

When the installation is complete, the list of attached devices will appear within the Attached Devices Window.



Figure 4-9 Novatel Wireless M2M Driver Setup Utility Attached Devices Window

USB Driver Installation (Windows 7)

These instructions illustrate how to correctly install the USB drivers in Windows 7 using the Novatel Wireless M2M Driver Setup Utility.

1. Run the Novatel Wireless M2M Driver Setup Utility by double-clicking the **Novatel Wireless M2MDriverSetup** executable file.



The Novatel Wireless M2M Driver Setup Utility Welcome window opens.

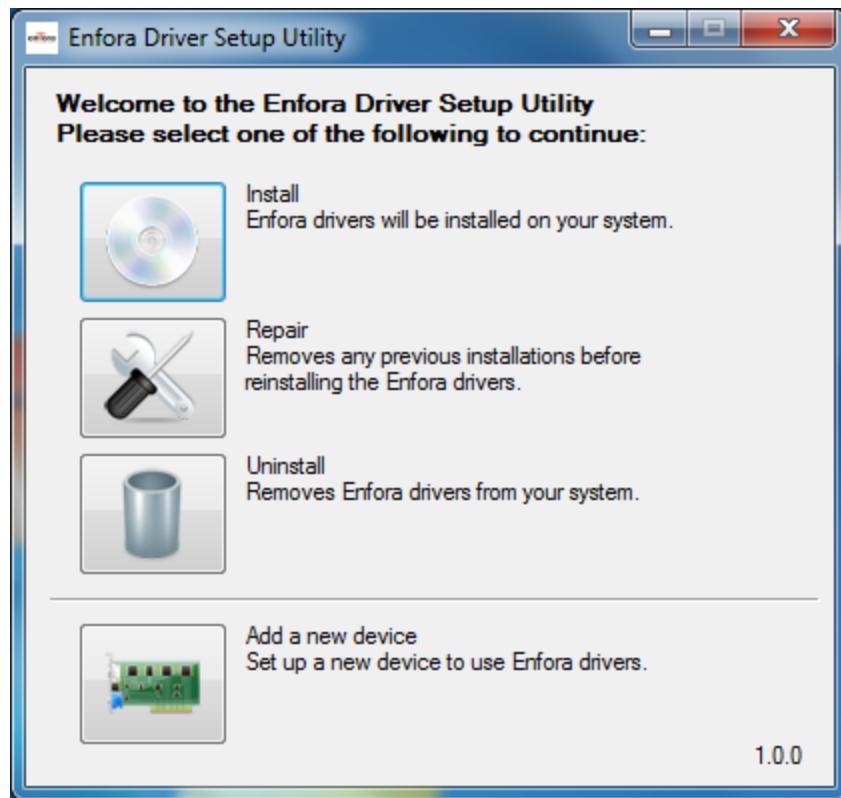


Figure 4-10 Novatel Wireless M2M Driver Setup Utility Welcome Window

Once the contents have been extracted to memory, the Driver Setup Window opens.

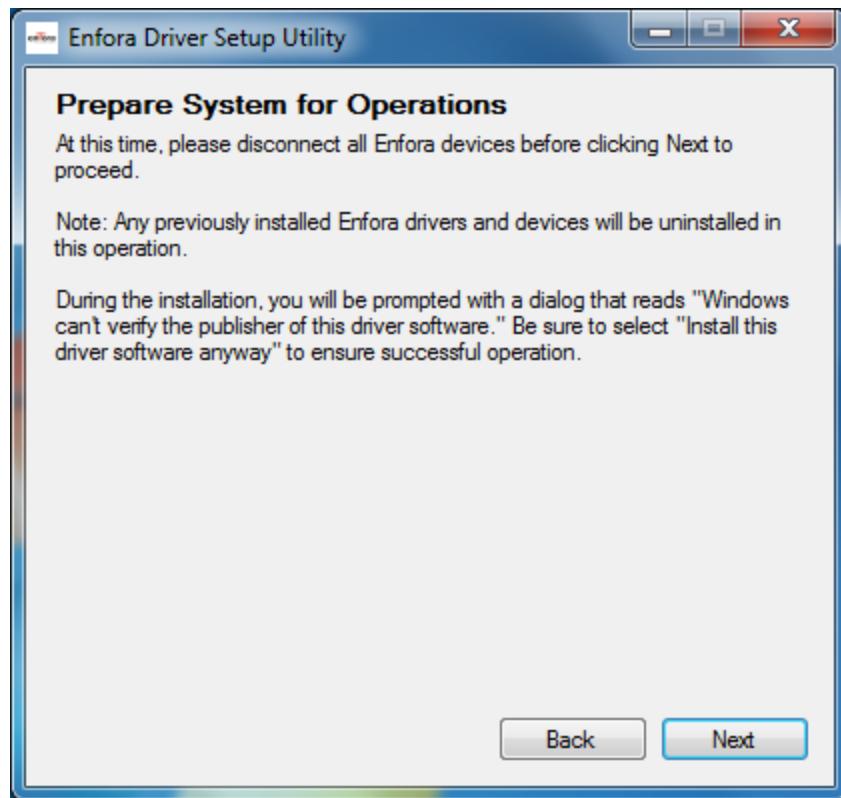


Figure 4-11 Novatel Wireless M2M Driver Setup Utility Preparation Window

2. To install the drivers, click **Install**.

The Novatel Wireless M2M Driver Setup Utility Prepare System Window opens.

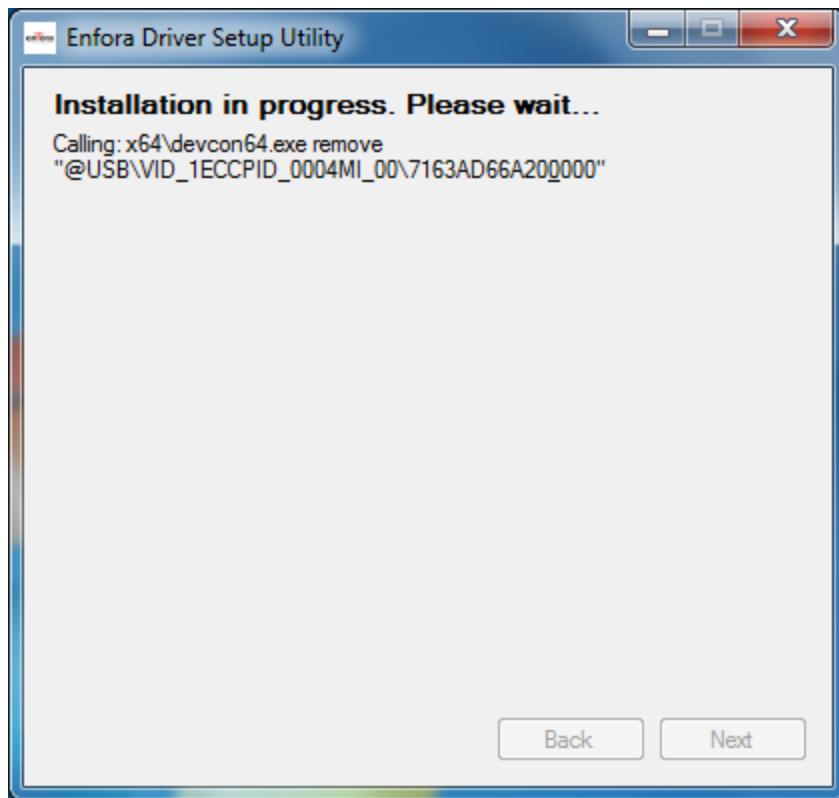


Figure 4-12 Novatel Wireless M2M Driver Setup Utility Installation Window

3. Select **Next** to continue.

The Novatel Wireless M2M Driver Setup Utility Installation Window opens while the system installs the drivers.

4. Disconnect any Novatel Wireless M2M devices.

Previous drivers will be removed during this phase.



During the installation, your computer's display may freeze and appear non-responsive. If this occurs, allow the computer to continue working. After 2-3 minutes, the display and installer will resume normal behavior.

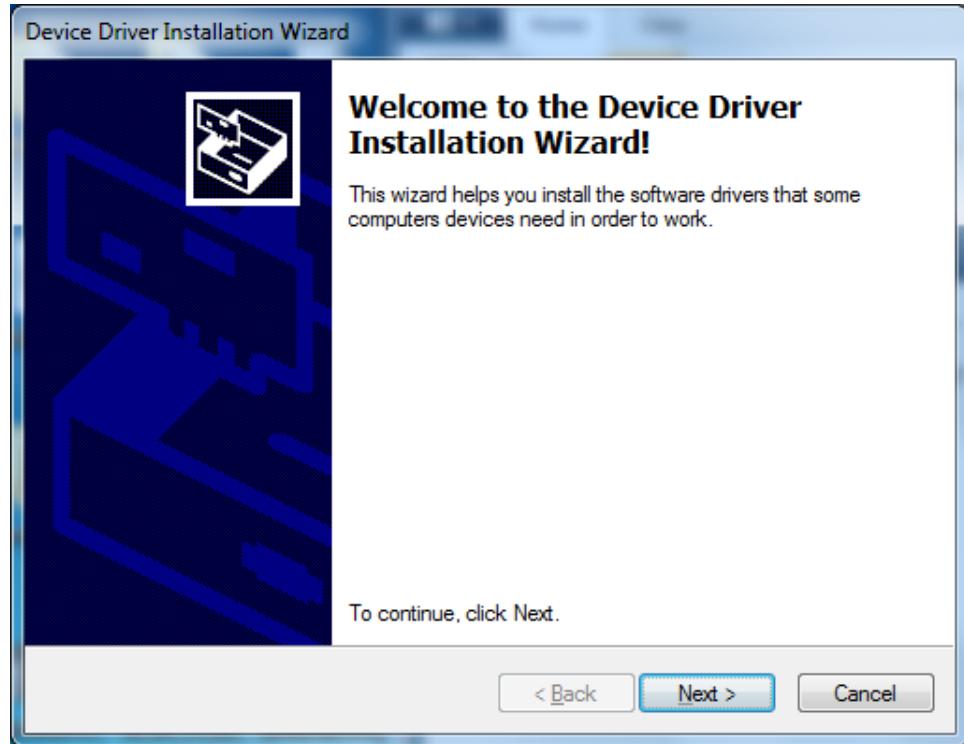


Figure 4-13 Novatel Wireless M2M Driver Setup Utility Driver Installation

- When prompted to install the device driver, select **Next**.

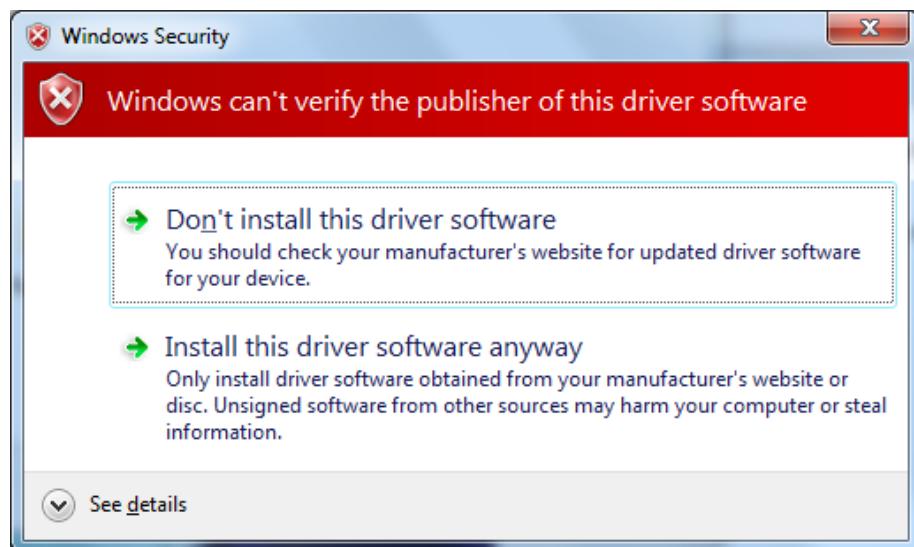


Figure 4-14 Windows Security Window

- Select **Install this driver software anyway**.

During the driver install phase, you may be prompted to continue or stop installation due to potential compatibility issues.

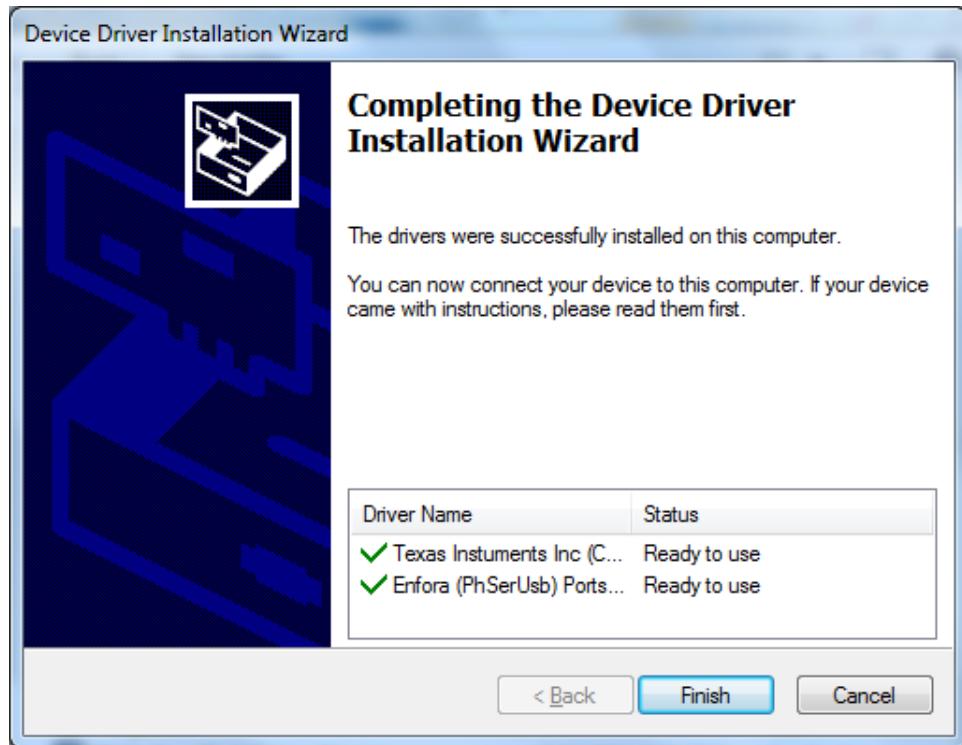


Figure 4-15 Novatel Wireless M2M Driver Setup Utility Driver Install Completion Window

When installation of the USB drivers is complete, the Completion window opens.

7. If there are no errors, click **Finish**.
8. If the status displays an issue, click **Correct issues!**
9. At the "OK to apply fix" prompt, click **Yes**.

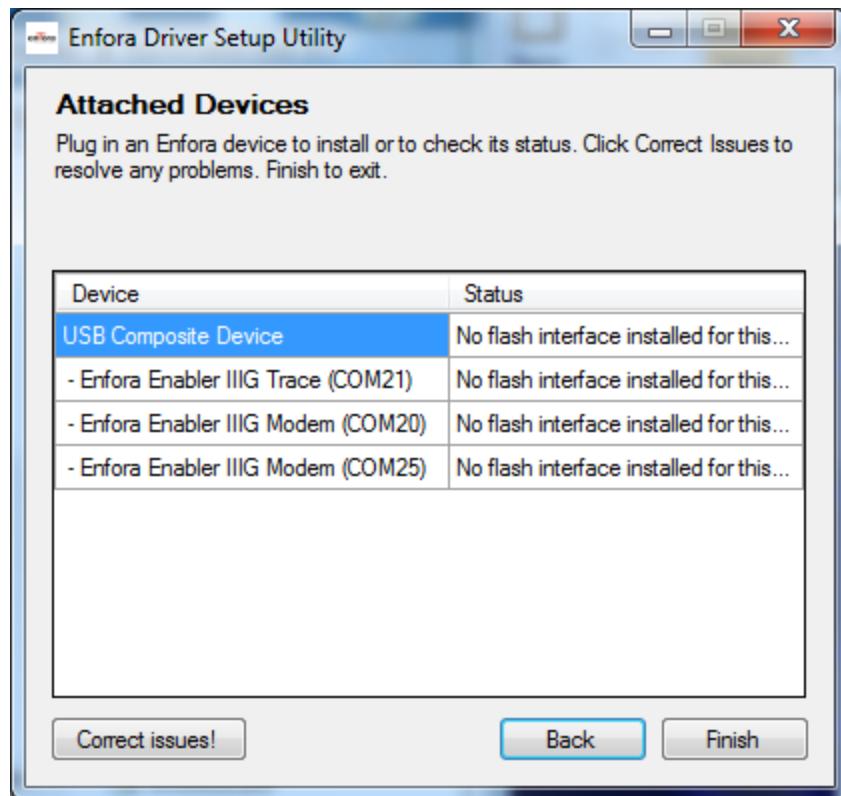


Figure 4-16 Novatel Wireless M2M Driver Setup Utility Attached Devices Window

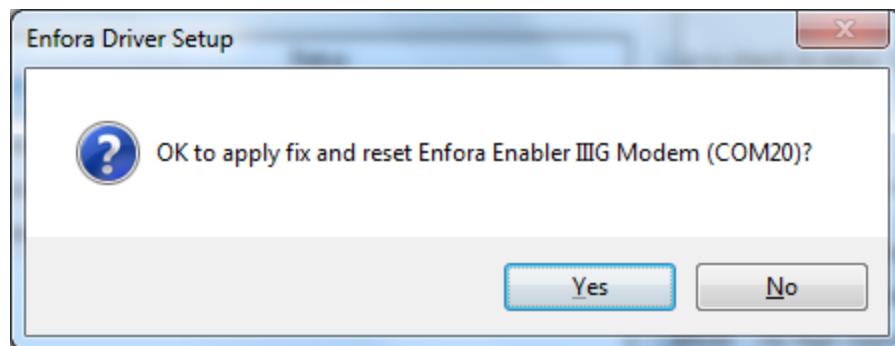


Figure 4-17 Novatel Wireless M2M Driver Setup Utility Apply Fix Window

When the installation is complete, the list of Attached Devices appears within the Novatel Wireless M2M Driver Setup Utility Attached Devices window.

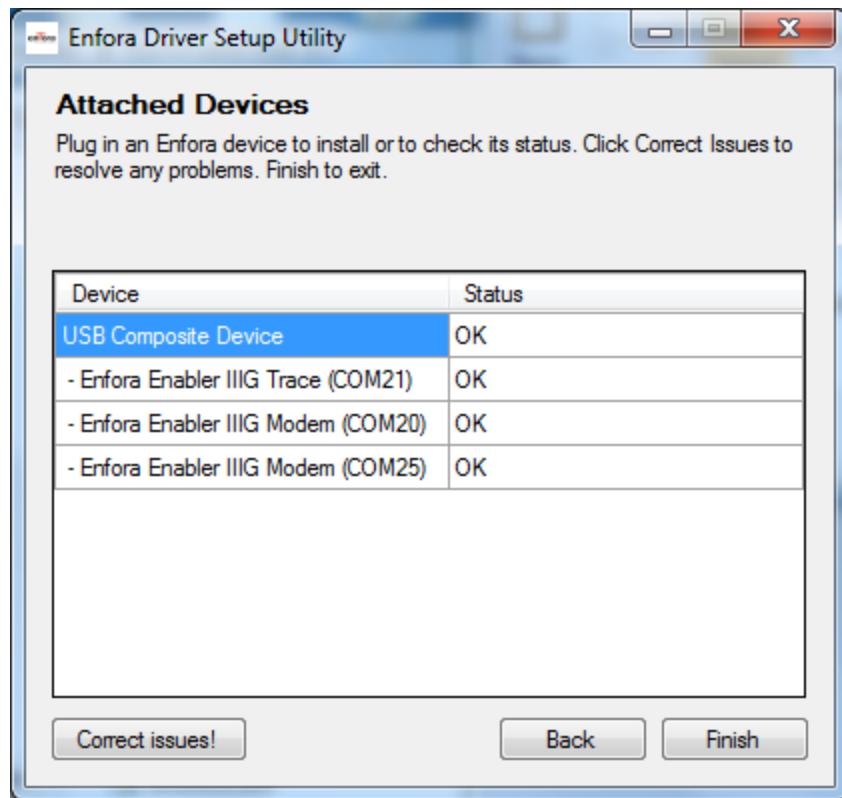


Figure 4-18 Novatel Wireless M2M Driver Setup Utility Attached Devices Window

5

Network Test Procedure

Configuring the Modem

Verifying Server Connectivity

Configuring The Modem

Use the following instructions to configure the Novatel Wireless M2M modem to communicate with the Novatel Wireless M2M test server using UDP.

First, consider the following:

- Most configurations are Mobile Originate only.
- A mobile modem initiates a conversation with a remote server before it can talk to the modem.
- IP addresses are dynamically assigned and can change.
- Some IP addresses are NAT and are non-routable.

The following configuration commands address these issues:

- Modem ID/name = “My_MT_TEST”
- Remote Server address = <http://apitest.nvtl.com/UDPAPP/>
- Remote Server IP port = 1721

Ensure the device is powered up and connected to the PC using serial connection or USB (whichever is applicable for the device you are using). You will require a serial application tool like Hyperterminal or similar to communicate with the device.

To configure the modem for test server connection follow these steps:

Step 1: Verifying Communications with the Computer:

AT	The modem should respond with OK.
ATE1	Use ATE1 if the modem doesn't respond to AT
ATI	The modem should respond with Novatel Wireless M2M Inc
AT&F	Reset the modem to factory defaults
AT&W	Write current configuration to memory. The modem is now ready to be configured using Step 2.
AT\$RESET	Reset the modem

Step 2: Configure the modem to access the GPRS network.



GPRS Registration Information which includes the APN (Access Point Name) Username, and Password (if applicable) should come from the service provider of the SIM.

Example:

```
APN = isp.cingular or public IP  
Username (If necessary) Username = ISP@CINGULARGPRS.COM  
Password (If necessary) Password = CINGULAR1
```

The following commands listed below are how the GPRS registration information should be programmed into the device.

AT+CGDCONT=1,"IP","<APN>"	Inform the modem of the proper APN
AT%CGPCO=1,"<user>,<pwd>",0	Inform the modem of the user and password
AT\$AREG=2	Enable auto GPRS registration
AT&W	Write current configuration to memory
AT\$RESET	Reset the modem

Step 3: Checking if the device can connect to the cellular network.

Once the device is power cycled as per the AT\$RESET in Step 2. The following commands can be used to check that the device can connect to the cellular network.

Refer to the AT command guide for the device being used for more information on the AT commands listed below.

AT+CREG?	Verify GSM status
+CREG: 0,1	-GSM registered to home network
+CREG: 0,5	-GSM registered roaming
AT%CGREG?	Verify GPRS status
%CGREG: 0,1	-GPRS registered to home network
%CGREG: 0,5	-GPRS registered roaming
AT\$NETIP?	Verify GPRS activation
	-If the response is non-zero, then everything is working.
AT\$CGEER	If AT\$NETIP returns all zeros
	-no PDP reject cause (Everything should be working OK)
	-requested service option not subscribed (APN is incorrect or SIM has not been enabled for data mode.)
	- user authentication failed (username/password is wrong)

Step 4: Configure the modem to talk to the Novatel Wireless M2M Test Server.

This example will use the following information:

--Modem ID/name = "My_MT_Test"
--Remote Server IP address = http://apitest.nvtl.com/UDPAPP/
--Remote Server IP port = 1721

The following commands listed below are how the device should be programmed to communicate with the Novatel Wireless M2M Test server.

```
AT$MDMID="My_MT_Test"           Give the modem a unique name  
AT$FRIEND=1,1,"apitest.nvtl.com" Configure the modem to talk with a specific server.  
AT$UDPAPI=,1721                 Configure the port number to be used by the modem.  
AT$WAKEUP=1,1                   Enable wakeup to be sent to the server every 60 seconds  
AT&W
```



Giving the modem a unique name using AT\$MDMID and by combining with a wakeup message allows the server to associate a Public IP address with a specific modem, and can create an opportunity where the server can send commands to the modem.

Verifying Server Connectivity

For the following tests, ensure that you have Java Runtime installed on your computer. To install Java Runtime, please visit the Java website here:

<http://www.java.com/en/download/manual.jsp>

1. Start a web browser and enter the following URL:
<http://apitest.enfora.com/enforaapp/>

API Applet HTML Page

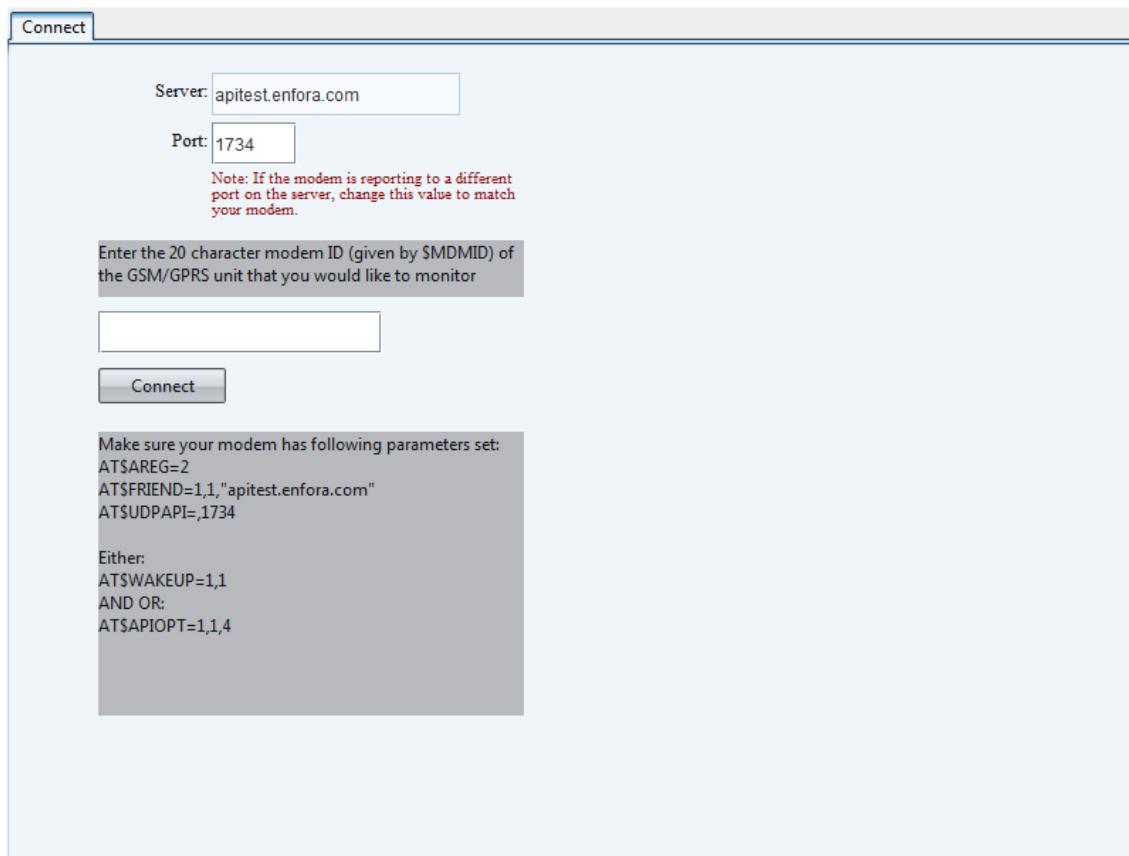


Figure 5-1 apitest.enfora.com/enforaapp/ Window

2. Enter the Server port in the port command box. In this case it is 1721 as defined in AT\$UDPAPI=1721
3. Enter the name used in the Modem ID (MDMID) command in the box.
4. Select Connect.

GSM/GPRS Applet HTML Page

The screenshot displays the 'GSM/GPRS Applet HTML Page' interface. At the top, there's a tab bar with 'Connect' and 'My_MT_Test' selected. Below it, the 'Connection Information' section shows 'Modem ID' as 'My_MT_Test', 'Modem IP' as 'unknown', and 'Server IP:Port' as '10.6.0.65:1721'. The 'Modem Communications' section contains fields for 'Command Type' (set to 'AT Command'), 'Header Bytes' (showing '00 00 04 00'), 'ASCII data' (a large text input field), 'Send Via' (set to 'UDP'), and a 'Submit' button. There's also an 'Auto ACK' checkbox. The bottom section is a 'Log' window with tabs for 'Time' and 'ASCII'. It includes checkboxes for 'Show ASCII + RAW hex view', 'Compress Extended Header', 'Enable Word Wrap', 'Auto-scroll', and a 'Clear' button.

Figure 5-2 Figure 5-2 GSM/GPRS Applet HTML Page

5. Select the tab with the modem name (My_MT_Test).
Within approximately 60 seconds you should see a wakeup message in the window.



Selecting the **Clear** button will erase the contents from the (ASCII Data) window.

6. Enter the following command in the Command/Data text box: ATI
7. Click on the **Submit** button.
8. Verify that you see the modem response: Novatel Wireless, Inc. If so, you have successfully configured the modem to talk with the server.

6

Accessories

Backup Battery

Plastic lever

The following accessories are available for the MT 3050:

Part Name	Part Number
Plastic Lever	ASA-3000-0001

Backup Battery

The primary function of the backup battery in the MT 3050 is to allow a user to be notified when the device is removed from the vehicle.

Input Event 63 can be used to trigger an output event that can be configured in the same manner as the other output events. If the modem is off (to save power), this event will be turned on. If GPS data is configured in the output event and the data is not available, the last known position can be configured to be used in the output message.

AT\$OBDBBT is used to configure the time (in seconds) that the device will stay powered after removal from the vehicle. The range is 30-6000 with the default being 600. In addition, to prevent damage to the battery, the device will turn itself off when the battery reaches the level determined to be the lowest “safe” value.

If the configured output message has not been sent when the timer or battery level dictates that the device should shut down (and is configured to do so), it will be saved and sent the next time the device registers on the network.

Plastic Lever

Use the Plastic Lever to open the device. For more information on opening the device, see the SIM Access section in this User Guide.



Figure 6-1 Plastic Lever