



BGAN SATELLITE TERMINAL USER GUIDE

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For your safety and protection, read this entire user manual before you attempt to use the Broadband Global Area Network (BGAN) Satellite Terminal. In particular, read this safety section carefully. Keep this safety information where you can refer to it if necessary.

▶▶ WARNING SYMBOLS USED IN THIS MANUAL



WARNING

Potential radio Frequency (RF) hazard. Where you see this alert symbol and WARNING heading, strictly follow the warning instructions to avoid injury to eyes or other personal injury.



WARNING

Where you see this alert symbol and WARNING heading, strictly follow the warning instructions to avoid personal injury.



DANGER

Electric shock hazard: Where you see this alert symbol and DANGER heading, strictly follow the warning instructions to avoid electric shock injury or death.

▶▶ WARNINGS FOR SATELLITE TERMINAL



DO NOT STAND IN FRONT OF THE ANTENNA

This device emits radio frequency energy when in the transmit mode. To avoid injury, do not place head or other body parts in front of the satellite antenna when system is operational. Maintain a distance of two meters away from the front of the Satellite Terminal antenna.



PROPERLY GROUND THE ANTENNA

Failure to properly ground the optional external antenna may result in severe personal injury or death. Do not attempt to ground the optional external antenna unless you have the skills to do so in accordance with local electrical codes.



DO NOT OPERATE DURING ELECTRICAL STORMS

Operation of the Satellite Terminal during electrical storms may result in severe personal injury or death. Disconnect the Terminal from the computer and store the unit indoors if lightning is anticipated in the area of operation.



GENERAL

Handle your Satellite Terminal with care. The enclosure is weather resistant per IEC 60529 IP55; however, do not submerge the unit or expose it to severe rain storms. Avoid exposing your Satellite Terminal to extreme hot or cold. Terminal is -25°C to +60°C.

Avoid placing the Terminal close to cigarettes, open flames or any source of heat.

Changes or modifications to the Terminal not expressly approved by Hughes Network Systems could void your authority to operate this equipment.

Only use a soft damp cloth to clean the Terminal.

To avoid impaired Terminal performance, please ensure the unit's antenna is not damaged or covered with foreign material like paint or labeling.

When inserting the USIM/SIM, do not bend the it or damage the contacts in any way. When connecting the interface cables, do not use excessive force.



IN THE VICINITY OF BLASTING WORK AND IN EXPLOSIVE ENVIRONMENTS

Never use the Satellite Terminal where blasting work is in

progress. Observe all restrictions and follow any regulations or rules. Areas with a potentially explosive environment are often, but not always, clearly marked. Do not use the Terminal while at a petrol filling station. Do not use near fuel or chemicals.



QUALIFIED SERVICE

Do not attempt to disassemble your Satellite Terminal. The unit does not contain consumer-serviceable components. Only qualified service personnel may install or repair equipment.



BATTERIES AND ACCESSORIES

Use approved batteries (HNS P/N 3003702-0001) and accessories only. Use of non-approved accessories may result in loss of performance, damage to the Satellite Terminal, fire, electric shock or injury.

AC Mains power adapter (HNS P/N 3003727-0001) is for indoor use only. It has an indoor operating temperature range of 0°C to +40°C and provides an output voltage of 20 VDC.

The storage capability of the battery decreases when operated.

Battery charging should only be attempted when the temperature is within the range of 0 to 45 degrees C.



CONNECTING DEVICES

Never connect incompatible products. When connecting the Satellite Terminal to any other device, read the device's User Manual for detailed safety instructions.



PACEMAKERS

The various brands and models of cardiac pacemakers available exhibit a wide range of immunity levels to radio signals. Therefore, people who wear a cardiac pacemaker and who want to use a Satellite Terminal should seek the advice of their cardiologist. If, as a pacemaker user, you are still concerned about interaction with the Satellite Terminal, we suggest you follow these guidelines:

- Maintain a distance of 30 cm between the Terminal and your pacemaker;
- Maintain a distance of two meters from the front of the unit's antenna;
- Refer to your pacemaker product literature for information on your particular device.

If you have any reason to suspect that interference is taking place, turn off your Satellite Terminal immediately!



HEARING AIDS

Most new models of hearing aids are immune to radio frequency interference from Satellite Terminals that are more than 2 meters away. Many types of older hearing aids may be susceptible to interference, making it very difficult to use them near a Terminal. Should interference be experienced, maintain additional separation between you and the unit.

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The Hughes Network System (HNS) 9201 Broadband Satellite Terminal and Wi-Fi Access Point is your gateway to global communication. The 9201 allows you to simultaneously send and receive IP packet and circuit-switched data via Universal Serial Bus (USB), Ethernet, Integrated Services Digital Network (ISDN), and Wi-Fi interfaces over the Inmarsat BGAN satellite network. The unit offers you the following features and benefits:

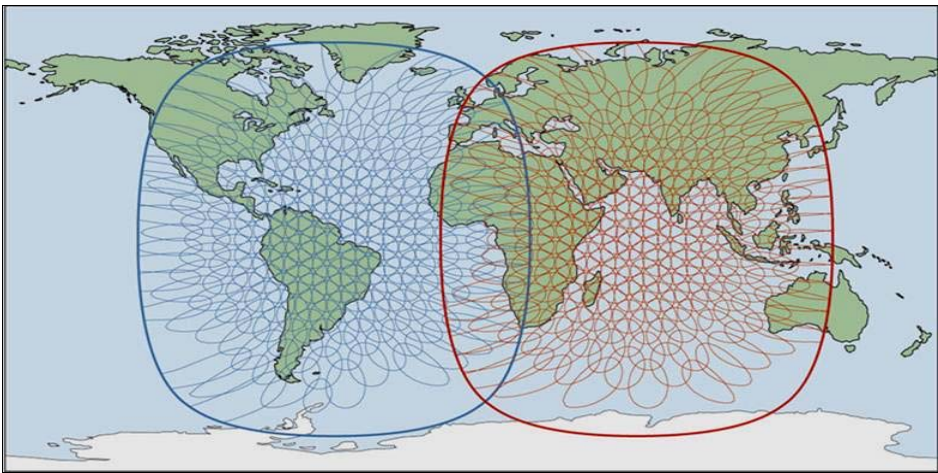
- 432 kbps IP data (transmit and receive)
- Speech (4Kbps)
- ISDN voice (3.1 KHz audio)
- ISDN data (64kbps)
- Wi-Fi access point
- Multi-user capability for sharing a single unit
- Selectable Quality-of-Service (QoS)
- Full IP compatibility for Email, file transfer (FTP), browsing, VPN, etc.
- Cost-effective “always-on” access – charges only for data sent and received
- UMTS IP-based services
- Wi-Fi, FCC, UL, CE, and GMPCS certified
- Subscriber Identification Module (SIM) card security
- LED indicators and audio pointing aids for obtaining an Inmarsat satellite signal
- GPS status light

The unit is easy to install and connects in minutes. It is built for use in fixed, semi-fixed, and portable environments. The rugged design allows the unit to be installed outside in extreme weather conditions for extended periods of time, and the small size and weight lets you easily move it from site to site.

In this document, the following names and abbreviations are used to identify the Satellite Terminal, your computer, and the linked Satellite Terminal and computer:

Term	Definition
Terminal	Satellite Terminal
TE	Terminal Equipment (your computer)
UT	User Terminal Station (Terminal + TE)
MMI	Man-Machine Interface on the TE

▶▶ COVERAGE



The coverage map shows the globally-available satellite coverage. You are able to access multiple satellites around the world. The BGAN Radio Access Network (RAN) includes the BGAN Radio Network Controller (RNC) and BGAN RF Subsystem. It handles all radio-related aspects of the BGAN ground system network infrastructure. The RF subsystem provides communication to and from the User Equipment community via the Inmarsat 4 satellite

constellation. The RNC interfaces to the Core Network (CN) for switching and routing calls and data connections to and from the external networks.



When you unpack the Satellite Terminal package, you will find these standard components:

- BGAN 9201 Broadband Satellite Terminal and Wi-Fi Access Point
- Rechargeable lithium ion battery pack
- AC Mains Power Adapter and cable (100 – 240 VAC)
- USB cable
- Ethernet cable
- ISDN cable
- User Guide (this document)
- Installation CD

These are optional accessories you may choose to include in the package:

- Extra standard lithium ion battery pack
- Extended lithium ion battery pack
- Standard AC Mains power adapter (100 – 240 VAC)
- Fixed installation kit
- Vehicular Power Adapter

Your Service Provider will supply a Subscriber Identification Module (SIM) and Satellite Terminal configuration instructions – you will need these to access the network.



MINIMUM SYSTEM REQUIREMENTS

These are the minimum computer system requirements for successful interface with the Satellite Terminal:

- CD-ROM (for installation CD)
- Internet Browser: Microsoft Internet Explorer version 5.5 or later; Netscape Communicator version 7.0 or later (Java must be active).
- PC Support for at least one of these interfaces – USB, Ethernet, ISDN or WiFi.
- Intel Pentium III CPU, or equivalent.
- 100 MB of free hard disk space.
- 128 MB of RAM.

▶▶ SUPPORTED OPERATING SYSTEMS

The Satellite Terminal supports the following Laptop/PC operating systems:

- Microsoft Windows® XP
- Linux Red Hat 9 - KDE 3.1.10 (Kernel Version 20.4.20-8)
- Mac 10.x
- Mac 9.2 (Classic)

☒	You must disconnect any existing LAN connections on your PC before proceeding with installation. This avoids any conflict with the network configuration that you are setting up for the Satellite Terminal.
Note	You must verify that the proxy server settings in your browser are disabled. For Microsoft Internet Explorer, select Tools / Internet Options / Connections / LAN Settings and uncheck the box labeled 'Use a proxy server for your LAN'. For Netscape, go to Advanced Preferences and select 'Direct connection to the Internet'. When complete please close your browser. DO NOT FORGET YOU MAY NEED TO RECHECK THIS BOX ON RETURN TO YOUR OTHER INTERNET CONNECTION.

▶▶ INSTALLATION CD AND INSTALLATION WIZARD

Insert the installation CD into your computer's CD-ROM drive to initiate the software installation. If the Installation Wizard, the program which guides you through the installation process, does not automatically begin, use your Windows® Explorer utility or Mac OS X Finder utility to find setup.exe on the installation CD; then, double-click that program to start the Installation Wizard. Follow the steps in the Installation Wizard[GLC1].



QUICK START USER GUIDE

▶▶ PORTABLE SETUP

USIM/SIM

Your Service Provider will supply you with a Subscriber Identification Module (SIM). The SIM is either a Universal Mobile Telecommunications System (UMTS) Subscriber Identification Module (USIM) or a Global System for Mobile (GSM) SIM.

A USIM/SIM is a card commonly used in a GSM phone. The card holds a microchip that stores information and encrypts voice and data transmissions, making it close to impossible to listen in on calls. The SIM card also stores data that identifies the caller to the network service provider.

Installation Instructions

1. Position the MT so that the Satellite Terminal battery door is facing you.
2. Open the battery door. If you have already installed the battery, release and then remove it.





3. Push the button on the left-hand side of the USIM/SIM card holder. This releases the holder from its slot.



4. Install the USIM/SIM card in the card holder with the gold shield facing up. Snap the card into place in the holder.



5. With the card in place, orient the holder with the card's gold shield facing down. Place the holder back in its slot in the MT.



6. Put the battery into its slot (positioned as shown below) in the MT and lock it in place. Then close and lock the battery door.



When you start the MMI application on your computer (TE) and connect to the Terminal, the Terminal will query the current USIM/SIM card to see if the Personal Identification Number (PIN) is enabled. If the PIN is enabled, the MMI displays a PIN window and requires you to enter a valid SIM PIN before service is enabled. If the SIM PIN is disabled then the MMI bypasses this display.

POWER

Battery Charging

Battery charging can take place as long as the following conditions are satisfied:

- The Satellite Terminal is connected to an external power source.
- The battery is less than fully charged.

- The temperature of the battery is within 0 to 45 degrees C.
- The battery has not been found by software to be defective.

The Satellite Terminal contains battery charging circuitry that will automatically charge the battery whenever the Terminal is plugged into DC power.

- Insert the battery as shown in the previous section. Battery installation should be coordinated with USIM/SIM installation (see **USIM/SIM installation instructions** previously detailed in this section).
- Plug in the Power Cable and charge the battery for three hours.



Note

You can run the User Terminal Station (UT) while the battery is charging.

AC/DC Adapter

The AC Mains power adapter (HNS P/N 3003727-0002) is for indoor use only. It has an indoor operating temperature range of -10°C to +55°C and provides an output voltage of 20 VDC.

1. Remove the power adapter from the Satellite Terminal box.



2. Insert the power adapter output connector to the DC Power Input Jack on the back of the Terminal. Insert the plug end into any AC outlet between 100 and 240 VAC.



TERMINAL STAND POSITIONING

The positioning of the Satellite Terminal stand at an appropriate angle is very important as a prerequisite for getting a fix on the satellite. The Terminal elements used in this process are the knobs, protractor, and compass.

1. Place the Satellite Terminal on a flat table. Locate the knobs on one end of the unit. Loosen the knobs by turning them counter-clockwise.



2. To prepare to lift the Terminal, place a finger in the lower right hand corner of the unit and place your other hand in the middle of the unit.



3. Pull out the front stabilizer. Lay the Terminal back on the table.



4. Lift up the Terminal while referring to the protractor on the right-hand side. The protractor gives you the angle at which the unit is positioned. Note that an angle of zero to 45 degrees is displayed on the inside portion of the protractor, while a 46 to 90 degree angle is displayed on the outside portion. The desirable angle is between 15 and 30 degrees.



5. After you have positioned the Terminal at the desired angle, tighten the knobs by turning them clockwise. Tighten them so that they are firm and hold the angle but are still movable in case further adjustments are needed.

6. You can now view the compass to prepare for pointing the antenna. Refer to the Antenna Pointing section for further instructions.



CONNECTING SATELLITE TERMINAL TO TERMINAL EQUIPMENT (TE)

INTERFACE CONNECTION PROCEDURES

1. Choose one of the following interface options to connect your TE to the Satellite Terminal:
 - USB
 - Ethernet
 - Integrated Services Digital Network (ISDN)
 - Wi-Fi



2. Proceed by following the appropriate set of instructions detailed below for the interface you have chosen.



There is no need to check the active interface. All interfaces can be used simultaneously to

Note	accommodate multiple users.
------	-----------------------------

USB

Connect the USB cable to your computer's USB serial port, and insert the other end of the connector into the Terminal's USB port.



3. At the Terminal connection point, slide the cable through the rubber door slot in order to secure and protect the connection.



☒	When plugging in the USB cable for the first time, you will see Windows installing a new driver for the device.
Note	

ETHERNET

1. Connect the Ethernet cable to your computer's Ethernet port, and insert the other end of the connector into the Terminal's Ethernet port.



2. At the Terminal connection point, slide the cable through the rubber door slot in order to secure and protect the connection.



ISDN

1. Connect the ISDN cable (use the provided Ethernet cable – it is a dual-use cable for both Ethernet and ISDN) to your computer's or phone's ISDN port, and insert the other end of the connector into the Terminal's ISDN port.
2. At the Terminal connection point, slide the cable through the rubber door slot in order to secure and protect the connection.



Wi-Fi

When the Satellite Terminal is turned on, note that the Wi-Fi LED is green when the Wireless LAN is connected and active.



OBTAINING GPS FIX

Your Satellite Terminal contains an integrated Global Positioning System (GPS) receiver that is used to provide location information to the BGAN system. GPS location information is required for system access and the reception of a new GPS location is attempted automatically every time the Terminal is powered up.

The GPS antenna is located in the main Antenna. For optimum GPS signal reception, make sure the Terminal is placed in a horizontal position pointed towards the satellite. Since GPS receivers must "see" a large part of the sky without obstructions from buildings, mountains or trees, it is necessary to take your Satellite Terminal out to a clear space to obtain a new GPS location. It may be possible to obtain a new GPS location in a less favorable circumstance, but the time to completion may be longer.

Once the GPS position is updated, the Satellite Terminal "remembers" your location so the unit can be relocated to a more convenient working area, such as inside a building by a window facing the satellite.

GENERAL INSTRUCTIONS

1. Take the Satellite Terminal outside and lay it down flat. Verify that the unit has an open view of the sky to get a GPS fix.
2. Power up the Terminal. The GPS LED will start to flash green unless a GPS hardware failure is detected.



3. Monitor either the MMI GPS indicator or the Terminal's GPS LED for the quality of the GPS fix.

GETTING THE GPS FIX USING THE LED

The following is the progression of the GPS LED display as you try to obtain the GPS fix:

- **Getting a fix:** The LED flashing green (½ duty cycle, 1 second period) indicates a 3D GPS fix has not been made since the unit was powered on. The current fix may be acceptable in which case the Satellite Terminal may register but the LED will continue to flash indicating the MT is still trying to get a 3D fix.
- **Needs a fix:** The LED changes to flashing red (½ duty cycle, 1 second period) indicating that the GPS fix was rejected by network or the system determined that a new or more accurate fix is needed based on the broadcast GPS Policy Info.
- **Got a fix:** The LED changes to solid green when a new 3D GPS fix is obtained. The LED will remain on until the unit registers with the network and the fix is accepted. (Note that once the fix is obtained, the GPS unit will be turned off unless it is still getting almanac data.)
- **Complete:** The LED turns off when the unit successfully registers with the network and the GPS unit has been turned off either because a 3D fix was obtained, or the GPS unit timed out.
- **GPS Failure:** The LED will be solid red if the Terminal detects a hardware fault with the GPS module.

USING THE MMI

Here is how to use the MMI to obtain the GPS fix[GLC5].

To be provided by Inmarsat.

ANTENNA POINTING

☒	Do not stand in front of the Antenna
Note	The Satellite Terminal emits radio frequency energy when in the transmit mode. To avoid injury, do not place head or other body parts in front of the antenna when system is operational.

Establishing a new connection requires the careful orientation of the Satellite Terminal towards the BGAN Satellite. The more precise this alignment, the faster your data will be able to travel over the network.

The goal of pointing is to maximize the received signal. The Terminal provides you with information on the received signal via the audio pointing aid and LEDs on the unit and the MMI application on your computer. These displays work simultaneously, and the user can use either of them. The MMI can also provide azimuth and elevation information for use with the compass and protractor integrated on the MT.

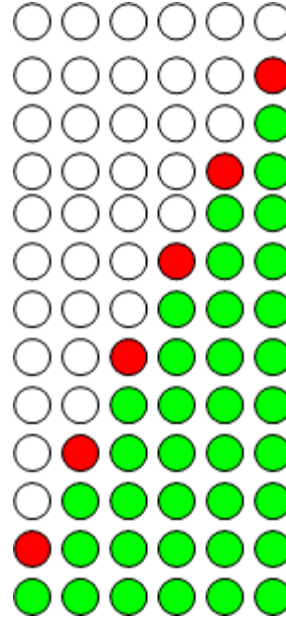
Pointing Using LEDs and Audio Indicator

1. Manipulate the angle and position of the Satellite Terminal by checking the compass and the protractor angle. The optimum compass position is S -> SE.





3. Below is a summary table outlining the progressive behavior of the LEDs (**going right to left**) as you try to acquire a satellite signal during Pointing. The optimum signal is 58dB and above.



BGAN Terminal User's Guide

4. If the Audio buzzer is on, the tones act like those of a Geiger counter: a long time between tones if the signal is weak and a faster rate of tones as the signal is acquired.



Note

The audio buzzer will always default to off when the unit powers on. When the unit is in pointing mode, pressing the Audio button located in the front of the terminal turns the buzzer on. Pressing it again turns the buzzer off. Once pointing is exited, the buzzer will turn off. If the Audio button is pressed when the unit is not in pointing mode, it will have no effect.

POINTING USING THE MMI[GLC6]

To be provided by Inmarsat.

CONNECTING TO THE NETWORK

Establishing a connection with the network requires the careful orientation of the BGAN Terminal towards the Satellite, a process called pointing. The more precise the pointing, the faster your data can travel over the network. When pointing is complete, you can register the Terminal with the BGAN network.

To register with the network:

1. Use the LaunchPad Pointing Wizard to step through the process of pointing your Terminal, and register with the network. Follow the on-screen instructions for details.
2. When you are registered with the network, the LaunchPad window displays, containing the following:
 - **Launch Bar** – click on any icon to display the associated tab, where you can perform LaunchPad functions.



- The Launch Bar options include:
 - Data Connections – connecting to the Internet to browse Web sites and send and receive emails, and also using advanced applications such as video and FTP. Refer to About Data for details.
 - Text Message Options – sending and receiving text messages. Refer to About Text for details.
 - Phone Options – monitoring call records. Refer to About Phone for details.
 - Usage information – providing data usage and call duration information. Refer to Monitoring Usage for details.
 - Services information – listing Service Provider support options. Refer to Using Services for details.

- Support information – listing LaunchPad help and Service Provider contact details. Refer to Using Support for details.

- **Registration status** – displays the connection date and time, location information and other registration information, as shown below:

Registration status

You are registered with **Inmarsat**

Registered: **11:50
06/16/05**

Latitude: **4°18'N**
Longitude: **74°06'W**

NearestCity: **Santafede bog**
Local time: **01:22**

Paris: **07:22**
Washington: **01:22**
Perth: **14:22**
Mumbai: **11:52**

Recommended: Antenna angle: 68° Compass direction: E (93°)

- **Connected to status, Terminal Status and Signal strength** – all shown on the status bar, as shown below:

Connected to

BGAN Terminal

100% **GPS: Valid**

Status

Connected at Background

Help...

Signal strength

- **Launch Bar** – click on any icon to display the associated tab, where you can perform LaunchPad functions.
 - Refer to Monitoring Alarm Status for details on the **Connected to** information.
 - Refer to Monitoring Terminal Status for details on the **Status** information.
 - Refer to Monitoring Signal Strength for details on the **Signal strength** information.

Inmarsat recommends that you use LaunchPad's Pointing Wizard to point your Terminal to the satellite. You can also point your Terminal using the Terminal's indicator lights and audio indicator. To do this, refer to the following section.

USING THE TERMINAL TO REGISTER WITH THE NETWORK

WARNING: Do not stand in front of the antenna. The BGAN Terminal emits radio frequency energy when in transmit mode. To avoid injury, do not place head or other body parts in front of the antenna when system is operational.

You can point the Terminal using the indicator lights on the Terminal, and using the audio buzzer.

USING THE INDICATOR LIGHTS

To point the antenna using the Terminal indicator lights:

1. Set the angle and position of the BGAN Terminal using the compass and the graduated scale.
2. Monitor the Pointing indicator lights as you adjust the azimuth and elevation. The following is a summary table outlining the progressive behavior of the indicator lights (going right to left) as you try to acquire a satellite signal during pointing.

USING THE AUDIO BUZZER

You can also monitor the signal strength using the audio buzzer. By default the audio buzzer is switched off. To use the buzzer when the Terminal is in pointing mode:

1. Press the **audio button** on turn the buzzer on.
2. Monitor the signal strength using the buzzer. The shorter the interval between tones, the stronger the signal.
3. When you register with the network, the buzzer turns off automatically.

Note: If the audio button is pressed when the unit is not in pointing mode, it will have no effect.

Once the terminal has been pointed to the satellite using the MMI, the indicator lights or the buzzer, then a suitable handset needs to be connected to the terminal for voice calls to be made. Any ISDN

handset can be used by connecting it to the ISDN port, using the supplied ISDN cable. Alternatively, analog handsets can be used with a suitable ISDN Terminal Adaptor. To ensure that calls can also be made to the terminal's handset, ensure that the ISDN handset, or the ISDN Terminal Adaptor, is programmed with an MSN of 1. The instruction manual supplied with this equipment will describe how to do this.

Data Session[GLC7]

▶▶ | FIXED/SEMI-FIXED INSTALLATION

The satellite terminal can be mounted to a pole or flat surface (such as a wall or roof) using the Fixed Installation Accessory Kit. This kit includes all the installation brackets, mounting hardware, tools and instructions to complete the installation, including mounting the terminal so that it is always correctly pointed at the satellite. The terminal can then be left alone for an extended period of time without having to be re-pointed or set-up. The Fixed Installation Accessory Kit can be re-used to install the terminal in different locations.

When mounted in a location where access to the terminal may not be straightforward (for example, mounted high on a wall), you may want the terminal to recover automatically after a power outage. To permit this, the following automatic mode settings are recommended (see the Automatic Mode section for more details):

- Auto “on” mode is enabled
- LED off mode is enabled
- Antenna pointing bypass is enabled
- Automatic context activation is enabled
- SIM PIN entry is disabled

In addition, it is recommended that the battery be removed to prevent it being damaged at extreme temperatures.

▶▶ SIZE AND WEIGHT

The Satellite Terminal is 27.5 cm x 34.5 cm x 5.0 cm. Its weight is 2.5 kg (including the battery).

The small size and weight allows you to easily move it from site to site, and it can be connected at a new site in minutes.

▶▶ TERMINAL INTERFACES AVAILABLE

INTERFACE OVERVIEW AND DEFAULTS

The Satellite Terminal includes four interfaces for connecting to your computer.

- Ethernet
- USB
- ISDN (for voice and data)
- Wi-Fi (IEEE 802.11)

By default the ISDN, USB and Ethernet interfaces are active when the unit is turned on. The 802.11 Wireless LAN (Wi-Fi) interface is disabled by factory default, but by using the MMI you can configure the Wi-Fi to be on at startup.

When the Terminal is connected to a DC power source, such as mains, the ISDN interface remains on at all times. When running from the battery, the ISDN interface will turn off 5 minutes after pointing is completed if no ISDN device is connected. You can re-enable the ISDN interface from the MMI if you subsequently need to connect an ISDN device. This saves power and maximizes operating times because the power sourcing circuitry draws significant current even if no device is connected. If an ISDN device is connected at power up and then disconnected before the timer expires, the ISDN port will power off.

You can configure the Wi-Fi interface to be on, off or auto-detect for T minutes. It behaves the same on DC power and battery, since turning off is for security as well as power savings. After time T, the WLAN interface can be reactivated by changing the interface to "On" in the MMI.

The following table summarizes the interface on/off behavior during battery and DC Power operation.

Interface		Battery Operation	DC Power Operation
USB		On	On
Ethernet		On	On
ISDN		On.	On
		Note: After 5 minutes if no ISDN device detected, turn off.	
Wi-Fi Configuration Options	Off (default)	Off	Off
	Once Enabled	On	On
	Auto (time T)	On.	On.
	Default 5 mins.	Note: After T minutes if no WLAN device detected, turn off.	Note: After T minutes if no WLAN device detected, turn off.

ESTABLISHING COMPUTER <-> SATELLITE TERMINAL COMMUNICATIONS

ETHERNET

Ethernet communications are established by connecting your computer Ethernet LAN port directly to the Satellite Terminal LAN port via the supplied Ethernet cable and monitoring the MMI for the connection.

USB

USB communications are established by connecting your computer USB port directly to the Satellite Terminal LAN port via the supplied USB cable and monitoring the MMI for the connection.

ISDN

ISDN communications are established by connecting your computer ISDN port directly to the Satellite Terminal LAN port via the supplied ISDN cable (same as the Ethernet cable) and monitoring the MMI for the connection.

With the ISDN interface you can make voice or data calls and can perform limited MMI functions. Only one terminal at a time may make a call since only one B channel is supported per Terminal in the BGAN system. However, up to four ISDN phones may be utilized with the one ISDN connection. Note that this limit is imposed by the current limit function in order to protect Ethernet devices in case they are accidentally connected to the ISDN port.

Wi-Fi

The Wi-Fi function is used in access point mode. You can use the MMI to configure (at least) the following parameters:

- Wireless LAN interface on/off. The default is off.
- Network name. The default is "BGAN" but the user can change it.
- Channel number. This controls the channel number (1-14) used by the access point. Depending on the country only certain subsets of these channels may be used (4 options:

FCC, ETSI, France or Japan). Channel 11 is common to almost all regulatory options and so it is used as the default.

- Encryption

Up to ten Wi-Fi users can utilize the Satellite Terminal simultaneously. However, for added security you can invoke a single user option in the MMI, ensuring that no one else can use Wi-Fi while you are connected. Monitor the MMI for the connection.

▶▶| TERMINAL FEATURES

USIM/SIM CARD



The USIM contains an identity that unambiguously identifies a subscriber. The USIM provides storage for subscription and subscriber related information.

The User-to-USIM authentication feature restricts access to the USIM until the USIM has authenticated the user. Thus, access to the USIM can be restricted to an authorized user or number of users. Your USIM Personal Identification Number (PIN) is stored securely in the USIM. The entry of a correct PIN opens access to the USIM.

The USIM-Terminal Link authentication feature ensures that access to a terminal or other user equipment can be restricted to an authorized USIM. The USIM and the terminal share a code stored securely in the USIM and the terminal. If a USIM fails to prove its knowledge of the code, it is denied access to the terminal.

If the USIM is removed during operation, the terminal will deactivate any active PDP contexts, detach from the network, and enter a "NO SIM" operational mode. If the USIM is reinserted while the MT is still on, the MT must be restarted to detect the new or replaced USIM.

BATTERY

Hughes Network Systems Part Number 300-3702-0001



The standard battery is a rechargeable lithium ion battery pack. An optional extended lithium ion battery pack (same form factor) is also available for purchase.

Battery charging can take place as long as the following conditions are satisfied:

- The Satellite Terminal is connected to an external power source.
- The battery is less than fully charged.
- The temperature of the battery is within 0 to 45 degrees C.
- The battery has not been found by software to be defective.

The Satellite Terminal contains battery charging circuitry that will automatically charge the battery whenever the unit is plugged into DC power.

BUTTONS

The Satellite Terminal has two buttons:



- The **Power** button is used for turning the unit on or off. A “long” press of the button when the unit is off turns it on, and a long press of the button when the unit is on turns it off.
- The **Audio** button is used for switching the audio tones on and off. These tones are useful during pointing mode (**see description later in the Guide**). A “short” press of the button accomplishes this.

INDICATOR LIGHTS (LEDs) AND AUDIO BUZZER

The LEDs and Audio Buzzer serve as indicators for the status of the Satellite Terminal. The figures below illustrate where the LEDs are located on the MT and the functions of each.

POWER LED



The Power LED indicates power status.

Light	Status
-------	--------

Off	Terminal is turned off.
Green	Terminal is powered on.
Flashing Red	Fault detected.
Flashing Green	Operating on battery power. Also when Power button is pressed to turn unit off and it is being powered down.

BATTERY LED



The Battery LED indicates battery status. The indicators are different when the Terminal is on DC power as opposed to on battery power.

Light DC Power – Status

Off	No battery.
Green	Battery fully charged.
Flashing Green	Battery charging.
Flashing Red	Battery Fault – not charging

Light Battery Power – Status

Off	Unit is off.
Green	Terminal on, in pointing mode.
Flashing Green	Terminal on, pointing completed.
Flashing Red (fast)	Terminal on, battery low (Power LED is green)
Flashing Red (slow)	Terminal on, battery fault detected (Power LED is also flashing red)

POINTING LEDs



These six, two-color LEDs have significance for two events: System Power-Up/Boot-Up and Antenna Pointing.

Initially, all LEDs are off. On power on, the power LED turns green. As the Satellite Terminal progresses through the boot sequence, pointing LEDs 2 through 6 (**right to left** progression) turn green.

If the boot completes successfully, the LEDs turn off and resume their normal function.

These LEDs also indicate the signal quality during antenna pointing. The LEDs are intended only as a guide for accuracy – the audio tones or MMI application must be used for full accuracy (see the **Antenna Pointing** section in the **First Time Setup** chapter). During the Terminal power-up and boot, the six pointing LEDs on the unit indicate boot progress. Upon successful boot-up, the LEDs switch to indicate antenna pointing status or turn off if pointing is bypassed. The first (rightmost) pointing LED is not used during this process to avoid confusion with pointing displays.

WIRELESS LAN LED





- This LED is not lit during Power-Up or if the Wireless LAN card is turned off.
- It is green if Wireless LAN is on and Wireless Encryption Protocol (WEP) is enabled (encryption).
- It is red if Wireless LAN is on and WEP is disabled.
- If Wireless LAN is enabled and the MT is operating off battery power, the LED flashes at 1/8 duty cycle 1-second period to save power, after the unit exits pointing.

GPS LED



The GPS unit in the Satellite Terminal will attempt to get a 3D fix each time the unit powers up. The GPS LED indicates the state of the GPS fix. See **Obtaining a GPS Fix** section.

AUDIO BUZZER

An audio buzzer is used to indicate the signal quality during antenna pointing. If the Audio buzzer is on, the tones act like those of a Geiger counter: a long time between tones if the signal is weak and a faster rate of tones as the signal is acquired.

The buzzer will always default to off when the unit powers on. Pressing the Audio button in pointing mode turns the buzzer on. Pressing it again turns the buzzer off. Once you exit pointing, the buzzer will turn off. If the Audio button is pressed when the unit is not in pointing mode, it will have no effect.

COMPASS



Reference the compass during the Antenna Pointing process to get the correct Compass Direction needed for the antenna. During this process, the MMI instructs you in which direction to point the antenna.



Note

The compass can be affected when close to magnetic fields or metallic objects.

SOLAR PANEL COMPATIBILITY

The terminal is compatible with solar panels. The easiest way to interface to a solar panel is through the HNS supplied DC Power Adapter (HNS P/N 3004065-0001). The output of the DC power adapter is plugged into the terminal, with the input (cigarette lighter adaptor) connected to the output of the solar panel.

The terminal has been tested to work with the following solar panels:

- IDG T-60 (3 panels) form IDG Europe (60W max, 3.3A at max power)
- SunCatcher F0001 (2 panels) from Powerline Electronics Accessories (14.5W max)

▶▶ | TERMINAL ACCESSORIES

Terminal accessories include:

- DC Power Adapter
- Extended Battery
- AC Mains Power Adapter (w/30mm Cable)
- Cables
- Compatible Devices
- Fixed Installation Kit

Each is described in this section.

DC POWER ADAPTER[GLC10]



Solar Panel, etc.

EXTENDED BATTERY



The Extended lithium ion battery pack (HNS P/N 300-3702-0002) can be purchased through Hughes Network Systems. The Extended battery pack has the same form factor as the standard battery pack, with 33% more capacity.

AC MAINS POWER ADAPTER (w/30MM CABLE)



AC Mains power adapter (HNS P/N 300-3727-0001) is for indoor use only. It has an indoor operating temperature range of 0°C to +40°C and provides an output voltage of 20 VDC.

When the Satellite Terminal is first connected to AC Mains power, the unit powers on immediately. Note that when the Terminal is attached to AC Mains power, the unit still supports battery charging while it is turned off.

CABLES

The Satellite Terminal package comes with a USB cable and cables that serve both Ethernet and ISDN connections.

- USB cable (HNS P/N 300-3027-0001)



- Ethernet/ISDN 10 meter cable (HNS P/N 300-3692-0001)



When the Terminal is connected to a PC or laptop it uses a regular Ethernet cable. If the Terminal is connected to a LAN hub, a "switchover" LAN cable is required.

COMPATIBLE DEVICES

The terminal has been successfully tested with the following commercial ISDN handsets:

- ASCOM Eurit 33 plus
- SwissVoice Eurit 25
- ISDN handset supplied with the NERA BGAN terminal
- Siemens Gigaset SX255

FIXED INSTALLATION KIT

The following items are found in the fixed installation kit. Note that you are responsible for mounting the hardware at a fixed site.

- Fixed Mount Screws (Theft-Proof)



Photo of screws here.

- 30-Meter Cord for AC Mains



- Ethernet/ISDN 30 meter cable (HNS P/N 300-3692-0002)





MAN-MACHINE INTERFACE (MMI) OVERVIEW

The BGAN Man-Machine Interface (MMI) allows you to view and manage Satellite IP Modem operations and status via a user-friendly set of tools installed on your computer.

▶▶ PIN CODE ENTRY

When the MMI application is started and connects to the Satellite Modem, the modem queries the current SIM card to see if the SIM PIN is enabled. If the SIM PIN is enabled, the MMI displays a SIM PIN window and requires you to enter a valid SIM PIN before service is enabled. If the SIM PIN is disabled then the MMI will bypass this display.

▶▶ PERSONALIZATION

After the PIN check, if Personalization is enabled and any checks fail, the MMI displays the Security window and requires you to enter a valid depersonalization code before access to further functions is allowed. If all Personalization checks pass, the modem will bypass the Security window.

▶▶ POINTING

After the PIN and Personalization checks, the pointing screen is displayed. Once you have completed pointing, click the **Connect** button to exit pointing and connect to the network.

▶▶ MAIN DISPLAY

Once all the initial checks have been completed, the main MMI page is displayed, showing progress towards acquiring the network.

▶▶ CONFIGURABILITY

Use the MMI application to make all configuration changes on the Satellite IP modem.

▶▶ MULTIPLE USERS

Up to 10 users attached to the LAN Access Point interfaces (Ethernet, USB and Wireless LAN) can access the MMI at the same time. Each user establishes a TCP connection to the Satellite IP modem.

In a multi-user scenario, it is advisable to have one user do all MT configuration changes to avoid confusion; other users could use an MMI profile that prevents configuration changes.

▶▶ SOFTWARE DOWNLOAD/UPGRADE

Upgrading MT software is a two-phase process controlled by an "Upgrader" function in the MMI. The Upgrader is accessed from a drop down menu on the MMI application

In the first phase, the software is downloaded from a common Network location (i.e., an Internet HTTP/FTP server) to your computer. The computer may utilize the BGAN network or any other accessible network to obtain the new software image.

In the second phase, the Upgrader copies the current software image from your computer, stores it in the modem, and then installs it on the modem. If the upgrade fails, the old software is available on your computer and can be re-downloaded to the modem.

CONNECTING TERMINAL TO PC AND OTHER DEVICES

The MT provides a Wi-Fi interface to any terminal which operates in the same frequency band.

- When the MT is operating on main power, the Wi-Fi interface will always be activated.
- When the MT is operating on battery, the Wi-Fi interface will be turned off after five minutes of inactivity.

The Wi-Fi interface is configurable via the MMI, as follows:

Parameter	Description	Default	AT-Command
Wireless access	Turn on/off Wi-Fi Interface	Disabled (0)	AT+INIS
Network Name (SSID)	Sets the SSID	BGAN	AT+IHWLAN
Region	Region of Operation	Rest of the world (2)	AT+IHWLAN
Channel	Wireless Channel of Operation	11	AT+IHWLAN
WEP Security	Turn on/off WEP Security	Off (0)	AT+IHWLAN
WEP Keys [1-4]	Four 26 character WEP Keys	None	AT+IHWLAN
Key Selection	Selects the WEP Key	0	

The MT does not provide MAC Filtering as a security option.

▶▶ VOICE TELEPHONY SERVICES

You can make and receive voice calls using the BGAN Satellite IP Terminal. To do this, you have to connect a phone handset. You can use two general types of phone handsets; either an ISDN handset, or a 2-wire analog handset with an ISDN terminal adaptor (see page 12 for details of how to connect these devices).

Before you can use your handset for voice services, you have to program its MSN (mobile subscriber number) to 1. This identifies the handset to the BGAN Satellite IP Terminal. The handset's instruction manual will explain how to do this. Note: you can make emergency calls without the correct MSN programmed into the handset.

▶▶ SUPPLEMENTARY SERVICES

You can also access supplementary services via the handset. The services are controlled by key-presses on the phone handset. The key-presses consist of the following format:

A one or two digit activation code

A two or three digit service code

Optional parameters preceded by a * keypress

The following tables show the key-presses for each supplementary service.

Key-press	Activation Code
**	Registration
*	Activation

#	Deactivation
*#	Interrogation
# #	Erasure

Service Code	Supplementary Service	Key-press
30	CLIP – Called Line Identification Presentation	none
31	CLIR – Called Line Identification Restriction	none
76	COLP – Connected Line Identification Presentation	none
77	COLR – Connected Line Identification Restriction	none
21	CFU – Call Forwarding Unconditional	*DN*BS
67	CFB – Call Forwarding on Mobile Busy	*DN*BS
61	CFNRy – Call Forwarding on Mobile No Reply	*DN*BS*T
62	CFNRc – Call Forwarding on Mobile Not Reachable	*DN*BS
43	WAIT – Call Waiting	*BS
33	BAOC – Call Barring, All Outgoing Calls	*PW*BS
331	BAOIC – Call Barring, All Outgoing International Calls	*PW*BS
332	BAOICexHC – Call Barring, All Outgoing International Calls except Home Country	*PW*BS
35	BAIC – Call Barring, All Incoming	*PW*BS

Service Code	Supplementary Service	Key-press
	Calls	
351	BAICroam – Call Barring, All Incoming Calls when Roaming outside Home Country	*PW*BS
96	ECT – Explicit Call Transfer	

Parameter	Description
*DN	Directory Number
*BS	Basic Service
*T	Timeout (5-30 seconds)
*PW	Password

Example:

If you want to **Call Forward all incoming calls to a number** (00018584529550 in this example), you must activate the Call Forwarding, Unconditional supplementary service.

- Key-presses ***21*DN*BS#**
- Key-presses ***21*00018584529550*#**

If you want to **cancel Call Forwarding**, you must deactivate this supplementary service.

- Key-presses **#21*DN*BS#**
- Key-presses **#21**#**

▶▶ | MESSAGING SERVICES

SHORT MESSAGE SERVICE (SMS) VIA MMI

The BGAN Satellite IP Modem supports Short Message Service (SMS) capabilities. The Short Message Service handles point-to-point messages and comprises two basic services:

- SM MT (Short Message Mobile Terminated)
- SM MO (Short Message Mobile Originated).

The text messages to be transferred by SM MT or SM MO can contain up to 140 octets. The number of bytes actually transmitted within an SMS message is dependent on the message size.

 Note	SMS Messages can be read, edited, created, and sent via the SMS Application in the MMI. You cannot access SMS from an ISDN Handset or any other ISDN equipment.
---	--

▶▶ | DATA SERVICES^[GLC16]

LaunchPad provides a variety of connection options to help ensure that all your data requirements are met. LaunchPad is configured with five connections by default. You can edit these default connections or add to them by setting up any number of customized connections, called dedicated connections, using a simple to use configuration tool.

DEFAULT CONNECTIONS

Of the five default types of data connections available from the launch bar, there are one standard and four streaming.

- **Standard:** A standard connection is charged per Mb. You are charged only for the transmitted data. The bandwidth you are allocated depends on terminal type and network availability, but is always 'best effort', that is, you are allocated bandwidth depending on your requirements and the requirements of other users of the BGAN network, or

BGAN Terminal. This connection class is suitable for most data types, other than multimedia.

- **Streaming:** A streaming connection is charged by time. You are charged for the amount of time the connection is active. Streaming enables multimedia data, such as video, to be sent in a continuous data stream and converted into sound and pictures. The bandwidth required for a streaming connection is difficult to predict, and depends on factors such as length of connection and number of receivers.

The standard connection is suitable for most basic data requirements, and is charged by the amount of data sent. If you require a guaranteed data rate for your connection, to eliminate delay for example, you can connect using one of the four streaming connections, at the following data rates:

- 32 kbps streaming
- 64 kbps streaming
- 128 kbps streaming
- 256 kbps streaming

Each streaming class connection is charged by the length of time that the connection is live.

The standard connection and four streaming connections are primary connections and are alternatives to each other, that is only one can be open at a time. You must close one connection before you can open another.

DEDICATED STREAMING CONNECTIONS

If required, you can set up one or more dedicated streaming connections for applications such as live video and FTP. A dedicated streaming connection ensures that a selected application does not have to share the connection with any other traffic. The Terminal supports up to ten dedicated connections alongside the primary connection. A dedicated streaming connection is charged by the length of time that the connection is live.

LaunchPad displays an information note if you are about to open a streaming connection, or open two or more connections at the same time. Refer to About PDP Contexts for details on how LaunchPad manages data connections[GLC17].

ISDN DATA

Data can be sent and received via the ISDN interface on the BGAN IP Terminal. To make use of this service, you will need to connect a piece of ISDN terminal equipment. Examples of ISDN equipment are ISDN cards in PCs or MACs, ISDN AudioVideo cameras and video-conferencing systems, ISDN group 4 fax machines.

To use the ISDN equipment with the BGAN IP Terminal, you first have to program 1 of 3 MSNs (mobile subscriber numbers) into the equipment.

The number you program depends on the capability of your ISDN equipment:

- For equipment that sends and receives data as 3.1 KHz audio, such as group 3 fax machines, use program 2.
- For equipment that sends and receives data either as Unrestricted Digital Information (UDI), or Restricted Digital Information (RDI), use program 3.

Refer to the instructions supplied with the ISDN equipment for information on the equipment capability and how to program the appropriate MSN.

When you have completed the programming, you can then connect the ISDN equipment to the ISDN jack on the BGAN IP Terminal, which is shown on **page TBD**. You are then ready to use ISDN Data Services from the ISDN equipment.

▶▶ AUTOMATIC MODE

The Satellite IP modem includes four automatic options: auto power on, LED on/off, antenna pointing bypass, and automatic context activation. You can set all of these options with the MMI.

AUTO "ON" MODE

When the Satellite IP modem is mounted on a pole, the power switch may be inaccessible; this can be a problem if there is a power failure since the unit will turn off and will not turn back on when power is applied. You could use the unit with a battery to provide battery backup in case of power failure. However, in extreme weather conditions a battery could be damaged and should not be used.

To handle pole mount or other fixed installation, you can activate an auto on configuration feature. With auto on enabled, if DC power is applied, the unit turns on as if the power key was pressed. If the power key is pressed while the unit is on with this feature enabled, it will still power off. To power back on, you can use the power key, or you can disconnect and reconnect DC power to create a rising edge on the power input. The default configuration of the Satellite IP Modem is for auto on to be disabled.

The auto on feature can be used in conjunction with antenna pointing bypass to allow the modem to automatically recover from a power outage (assuming PIN, etc are disabled).

LED ON/OFF MODE

In a semi-fixed installation, you can use this option to operate with all LEDs off to make your unit and operation less conspicuous.

ANTENNA POINTING BYPASS

You can configure a pointing bypass option that causes the unit to skip the pointing phase. The unit then performs spot beam selection, registration and network connection. This option should only be used for fixed installations where pointing is not required on subsequent power ups. With this option active, if the unit is moved or the signal attenuated, the unit will remain in global beam scan until the problem is fixed and the global beam acquired. After acquiring the global beam the modem automatically continues with PSAB acquisition.

AUTOMATIC CONTEXT ACTIVATION

If you have enabled automatic context activation, the Satellite IP modem automatically activates a PDP context when it sees data destined for the network from a local IP address for which there is no context.

The "context create" request uses the default Access Point Name (APN), username and password stored in the modem. You can modify these parameters using the MMI. "Subscribed" QoS is requested and a dynamic network assigned IP address requested ("global" address).

PHONEBOOK

BGAN supports a phonebook feature to facilitate the management of phone numbers.

There are 3 phonebooks: a phonebook stored on your computer (with 250 entries), the USIM global phonebook, and the USIM application local phonebook. You can work with any of the three phonebooks. The active phonebook can be saved as a file on the TE. Files on the TE can be read into the application and then written back to the USIM.

EMERGENCY CALLS

If you want to make an emergency call from the ISDN handset (or analog handset plus ISDN terminal adaptor) and you do not know the PIN code, you can point the terminal using the audio tones or LEDs and then enter the connect command **#1#** from the handset. This causes the modem to exit pointing, but not to register with the network. When you enter a recognized emergency number, the modem then makes an emergency call without having to register with the network. If the modem is configured for pointing bypass, you do not have to enter the connect command; instead, simply enter the emergency number from the handset.

▶▶ PERSONALIZATION SERVICES

The personalization features store information in your computer and check this information against the SIM/USIM whenever the Satellite IP Modem is powered up or a SIM/USIM is inserted. If a check fails, the modem enters the "limited service state" in which only emergency calls can be attempted. You can enter depersonalization codes to deactivate these checks and progress to normal mode.

The modem performs personalization checks after completion of initialization and checking for the SIM PIN. The following types of personalization services are available:

- **Network Personalization:** Allows the network operator to personalize a modem so that it can only be used with that particular network operator's SIM/USIMs;
- **Network Subset Personalization:** A refinement of network personalization, which allows network operators to limit the usage of a modem to a subset of SIM/USIMs;
- **Service Provider (SP) Personalization:** Allows the service provider to personalize a modem so that it can only be used with that particular service provider's SIM/USIMs;
- **Corporate Personalization:** Allows a corporate customer to personalize modems that it provides for its employees or customers use so that they can only be used with the company's own SIM/USIMs;
- **SIM/USIM Personalization:** Enables a user to personalize a piece of mobile equipment so that it may only be used with particular SIM/USIM(s).

▶▶ LAN ACCESS POINT SETUP

PDP CONTEXTS – PRIMARY AND SECONDARY

Resource management for BGAN is based on PDP contexts, or connections. This means that in congested networks each user needs his or her own context to ensure a fair allocation of bandwidth from the network. Therefore, the Satellite IP modem creates a PDP context for each TE/user. The multiple contexts can be primary or secondary, but there are benefits to using primary contexts.

- Primary contexts can connect to different APNs each with an individual username and password. This is useful because each APN will only support a single set of subscribed Quality of Service (QoS) values.
- Primary contexts each get their own global IP address, which means each TE can be a server/host.

You can configure the modem to enable or disable automatic context activation. Even if automatic context activation is used, you can still manually control contexts for flexibility and exception conditions.

Primary Context

The modem creates a primary context with the entered information. If a primary context already exists for your local IP address, the current context is deleted before creating the new one. This could happen if a context was created automatically and the user wants to change to a different APN or QoS. Your MMI indicates whether the context is successfully created or displays any errors.

A disconnect option is also provided to allow you to tear down their context. This is useful if a streaming context was created, or to free contexts if other users need to connect. If a user with an automatically created context disconnects from the MMI, his or her context is deleted. When the MMI application is shut down, all contexts are deleted.

If multiple users are connected to a router with DHCP and a NAT (e.g. a Linksys) that is connected to the MT, all the users appear as a single user and share a single PDP context. This gives users flexibility in case charges are by IP address/PDP context.

Secondary Context

Secondary contexts can be set-up from the MMI, and are associated with a primary context. Secondary contexts might be used, for example, when multiple applications on one TE are started, and the TE's primary context has already been set-up.

Each secondary contexts requires a Traffic Flow Template to be configured, which defines how the data for the secondary context should be routed. This is done through the MMI.

IP ADDRESSING

Connections between each TE and the terminal are achieved with private IP addresses, and between the terminal and the BGAN network with global addresses.

Private addresses can be dynamically assigned by the DHCP server in the terminal, starting from 192.168.128.100. They can also be statically configured from the TE (via the MMI), in which case addresses in the range 192.168.128.2 through 192.168.128.100 should be used.

The global address of the terminal is assigned by the Network Service Provider, and can be either static or dynamic. Dynamic global address configuration is automatically carried out by the mechanism in the terminal that activates contexts. Static global address configuration is carried out by the user via the MMI on the TE, by entering a static address provided by the Network Service Provider.

FIREWALL AND DMZ HOST

The terminal will operate as a firewall and block all IP connections that are initiated from the BGAN network or internet. However, it can be configured to forward network initiated connections to one or more local TEs, eg. for FTP or HTTP data transfers. This is called "DMZ host", and is configured on the MMI.

More details about secondary PDP contexts, IP addressing and DMZ hosting can be found at www.hns.com and www.inamrsat.com (TBD)

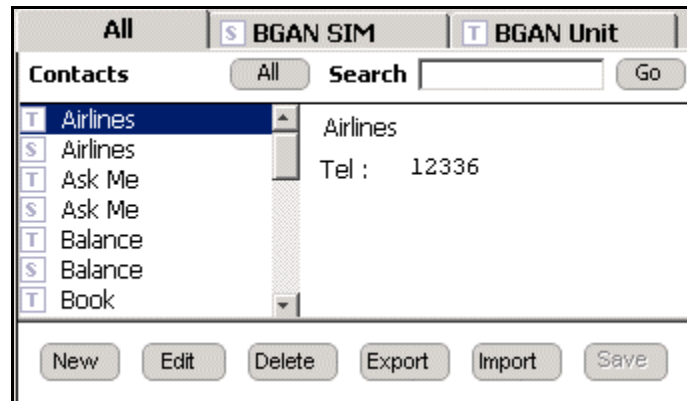
USING BGAN IN A GROUP_[GLC20]

MULTIPLE USER SCENARIOS_[GLC23]

▶▶ MANAGING CONTACTS^[GLC25]

The Contacts window enables you to manage your Phone and Text contacts. You can add a new contact, edit or delete an existing contact. In addition, you can export a contact to a file on your computer, or import a contact from any file on the computer.

The Contacts screen shown below displays when you click on the Phone icon or the Text icon on the launch bar.



Contacts displayed in this window are stored either in the BGAN SIM or on the BGAN Terminal. You can also select the All tab to view all contact names.

From this window you can^[GLC26]:

- Add a Contact
- Edit a Contact
- Export a Contact to a File
- Export a Contact to an Address Book
- Import a Contact from a File

Click on a contact name in the Contacts column to display the details of the contact alongside.

You can also search for a contact by typing in the first few letters of the contact name in the Search text box. The Contacts list scrolls down to the closest matching name as you type.

▶▶ TCP PEP SOFTWARE^[GLC27]

Transmission Control Protocol (TCP) enables two hosts, usually computers to establish a connection and exchange data. It improves the efficiency of data transfer by dividing the data into packets, then delivering the packets in the same order that they were sent. TCP with Performance Enhancing Proxies (TCP PEP) enhances the performance of TCP over a satellite network such as the BGAN network by providing:

- Fast start – useful for transferring small amounts of data, since traditional TCP is often slow with smaller data transfers.
- Increased window size – improves TCP performance in larger bandwidth applications
- Delay based congestion control – ensures high transfer rates and less delay.

TCP PEP is automatically installed during the Standard installation of LaunchPad, or you can install TCP PEP separately from the installation CD. By default, TCP PEP is enabled in the BGAN Terminal.

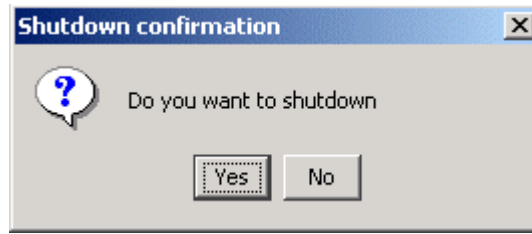
▶▶ EXIT, RESET AND RESTART FEATURES^[GLC28]

EXITING LAUNCHPAD

Before you can exit LaunchPad, you must close all currently active connections. Refer to [Closing a Data Connection](#) or Closing a Connection in Multi-User Mode for details.

Once you have closed all connections, you can exit LaunchPad as follows:

1. Click **File > Exit**. The Shutdown Confirmation dialog box displays:



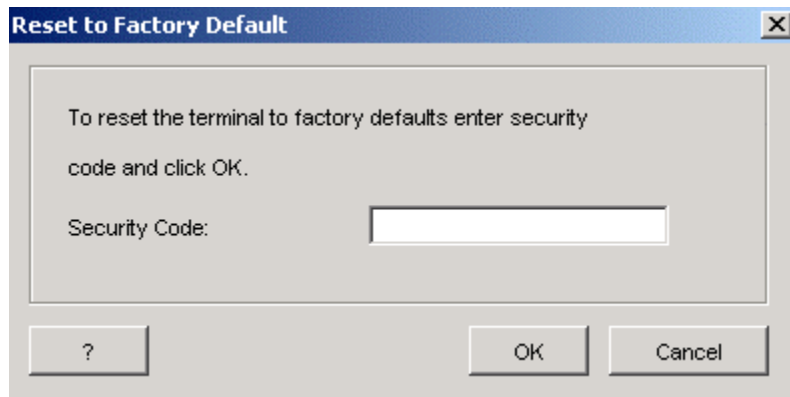
2. Click **Yes** to confirm shutdown, or No to cancel.

RESETTING THE TERMINAL

If you have the required access privileges, you can reset all the configuration settings of the Terminal to the factory default. Note that your current settings are lost during the reset.

To reset the terminal to factory default:

1. Select the **File > Reset to Factory Default** option on LaunchPad main menu. The Reset to Factory Default dialog box displays, as shown below:



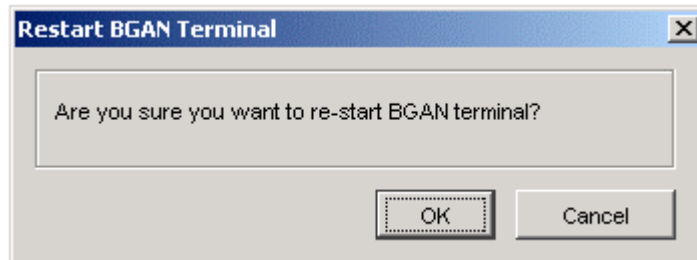
2. Enter the **security code** in the Security Code text box.
3. Click on **OK** to reset the terminal, or click on Cancel to exit without resetting.

RESTARTING THE TERMINAL

You may want to restart the terminal if an error occurs with the Terminal or ... (ANY OTHER REASONS?)

To restart the terminal:

1. Select **File > Restart Terminal** from the LaunchPad main menu.
The Restart BGAN Terminal dialog box displays, as shown below:



2. Click on **OK** to restart the terminal, or click on Cancel to exit without restarting.

▶▶ GETTING HELP_[GLC29]

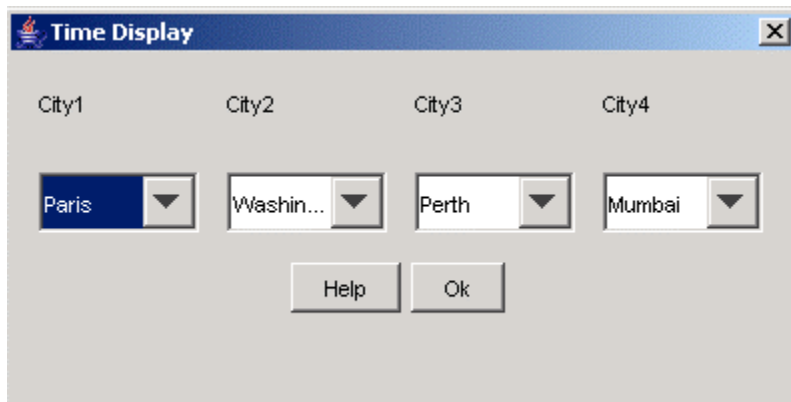
Support for the BGAN Satellite Modem is provided via the following help options:

- Using Services
- Using Support
- Using Diagnostics
- Using LaunchPad Help
- Viewing Properties

▶▶ TIME ZONE CUSTOMIZATION_[GLC30]

You can choose which time zones to display on the LaunchPad menu. To do this:

1. Select **Settings > Time Display** from the LaunchPad main menu.
The **Time Display** dialog box displays, as shown below:



2. Choose up to four locations from the **City** drop-down lists, and click on **OK**. The chosen cities and their local time display in the LaunchPad display area, alongside the satellite coverage map.

▶▶|BGAN USER PROFILE MAKER_[GLC31]

▶▶|SECURITY_[GLC32]

▶▶|SOFTWARE UPGRADE_[GLC33]

Inmarsat to do...

▶▶|LOG FILES_[GLC34]

LaunchPad maintains log files that detail the commands sent to the Terminal, and the responses obtained from the terminal. LaunchPad also records any unsolicited events reported by the terminal. LaunchPad maintains three types of log file:

- Event log file – reports details of all command and responses exchanged between the LaunchPad and the Terminal.
- Network log file – reports network activity-related information, such as network usage, QoS information, and unsolicited alerts reported by the network.
- BGAN log file – generated by the terminal, and can be accessed from LaunchPad.

You can do the following for any of these log files:

- Delete or Clear a Log File
- Display a Log File
- Email a Log File

- Print a Log File
- Save a Log File

In addition, for event logs and network logs you can:

- Turn Logging On and Off

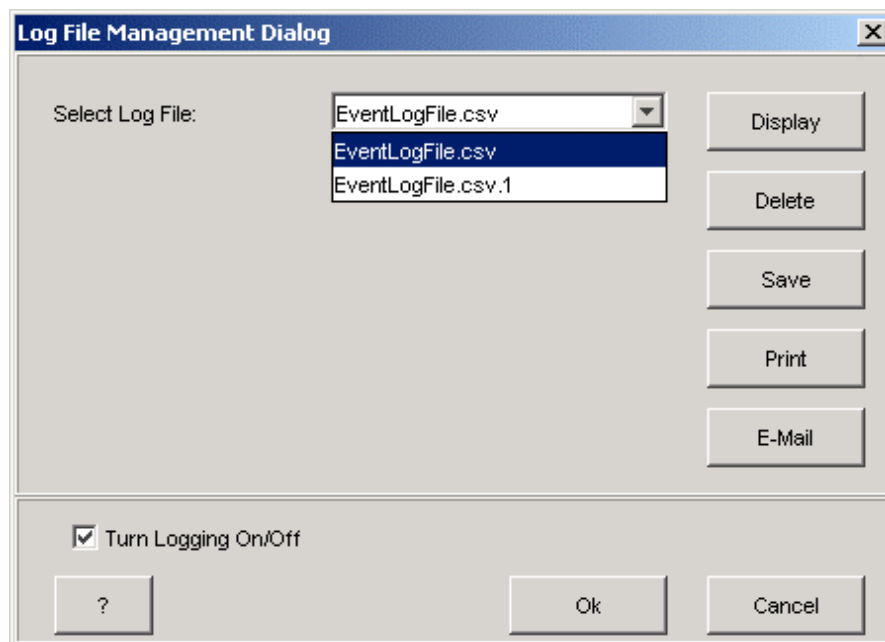
TURNING LOGGING ON AND OFF

You can turn event logging or network logging on or off from LaunchPad main menu.

EVENT LOGGING

To turn event logging on or off, do the following from LaunchPad main menu:

1. Select **File > Log Files > Event Log**. The Log File Management Dialog box displays, as shown below:



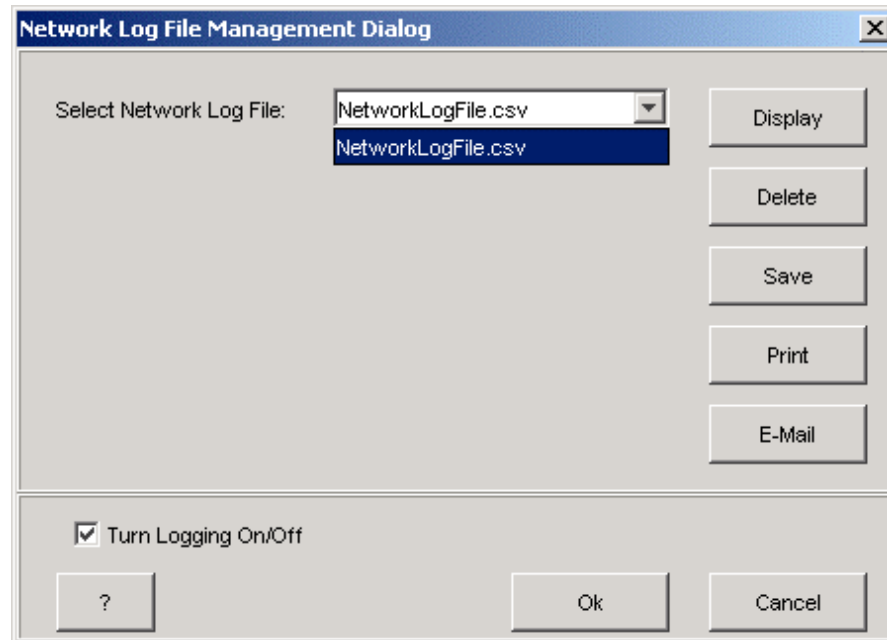
2. Check the **Turn Logging On/Off** check box to turn logging on, or uncheck the check box to turn logging off.

3. Click **OK** to save the change.

NETWORK LOGGING

To turn network logging on or off, do the following from LaunchPad main menu:

1. Select **File > Log Files > Network Log**. The Log File Management Dialog box displays, as shown below:



2. Check the **Turn Logging On/Off** check box to turn logging on, or uncheck the check box to turn logging off.
3. Click **OK** to save the change.

DISPLAYING EVENT AND NETWORK LOG FILES

You can display the event log file, the network log file or the BGAN log file from LaunchPad main menu.

To display event logging, do the following from LaunchPad main menu:

1. Select **File > Log Files > Event Log or Network Log**. The Log File Management Dialog box displays.
2. Click **Display**. The Log Display Dialog displays.
3. Check the **Turn Logging On/Off** check box to turn logging on, or uncheck the check box to turn logging off.
4. Click **OK** to save the change.

BGAN LOGGING

When displaying the log file contents of the terminal log file, you have the option to view full log file contents or only specific number of lines. To display terminal logging, from the LaunchPad main menu:

1. Select **File > Log Files > BGAN Log**. The BGAN Log File Management Dialog box displays, as shown below:

GRAPHIC NOT YET AVAILABLE

2. Click on **Display**. The Log Display Dialog displays, as shown below:

GRAPHIC NOT YET AVAILABLE

3. Either:
 - If you want to display all the lines in the log file, check the Retrieve all lines of log file check box. Or,
 - If you want to display selected lines in the log file, uncheck Retrieve all lines of log file check box, and enter the number of lines you want to retrieve in the Number of lines to retrieve/n from User Terminal text box.
4. Click **OK** to save the change.

EMAILING LOG FILES

You can email the event log file, the network log file or the BGAN log file from LaunchPad main menu.

EVENT LOGGING

To email the event log file, do the following from LaunchPad main menu:

1. Select **File > Log Files > Event Log**. The Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select the **file** to email from the **Select Log File**: drop down list.
3. Click on **Email** to open a new message in your Email application, addressed to your support contact and with the log file attached. You can type in a message, if required.

NETWORK LOGGING

To email the network log file, do the following from LaunchPad main menu:

1. Select **File > Log Files > Network Log**. The Network Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select the file to email from the **Select Network Log File**: drop down list.
3. Click on **Email** to open a new message in your Email application, addressed to your support contact and with the log file attached. You can type in a message, if required.

BGAN LOGGING

When displaying the log file contents of the terminal log file, you have the option to view full log file contents or only specific number of lines. To display terminal logging, from the LaunchPad main menu:

1. Select **File > Log Files > BGAN Log**. The BGAN Log File Management Dialog box displays, as shown below:

GRAPHIC NOT YET AVAILABLE

2. Select the **file** to email from the **Select BGAN Log File**: drop down list.
3. Click on **Email** to open a new message in your Email application, addressed to your support contact and with the log file attached. You can type in a message, if required.

PRINTING LOG FILES

You can print an event log file, a network log file or a BGAN log file from LaunchPad main menu.

EVENT LOGGING

To print an event log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > Event Log**. The Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the **Select Log File** drop-down list.
3. Click on **Print** to open your operating system's print dialog box, and print the log file.

NETWORK LOGGING

To print a network log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > Network Log**. The Network Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the Select Network Log File drop-down list.
3. Click on **Print** to open your operating system's print dialog box, and print the log file.

BGAN LOGGING

To print a BGAN log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > BGAN Log**. The BGAN Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the **Select BGAN Log File** drop-down list.
3. Click on **Print** to open your operating system's print dialog box, and print the log file.

SAVING LOG FILES TO DISK

You can save an event log file, a network log file or a BGAN log file to a file on your computer from LaunchPad main menu.

EVENT LOGGING

To save an event log file, do the following from LaunchPad main menu:

1. Select **File > Log Files > Event Log**. The Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the **Select Log File** drop-down list.
3. Click on **Save**. The directory folder for your operating system opens.
4. Navigate through to the required directory, and save the log file under the selected name.

NETWORK LOGGING

To print a network log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > Network Log**. The Network Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the **Select Network Log File** drop-down list.
3. Click on **Save**. The directory folder for your operating system opens.
4. Navigate through to the required directory, and save the log file under the selected name.

BGAN LOGGING

To print a BGAN log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > BGAN Log**. The BGAN Log File Management Dialog box displays, as shown below:

GRAPHIC NOT YET AVAILABLE

2. Select a **log file** from the **Select BGAN Log File** drop-down list.
3. Click on **Save**. The directory folder for your operating system opens.
4. Navigate through to the required directory, and save the log file under the selected name.

DELETING OR CLEARING LOG FILES

You can delete an event log file or a network log file, and clear a BGAN log file from LaunchPad main menu.

EVENT LOGGING

To delete an event log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > Event Log**. The Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the **Select Log File** drop-down list.

3. Click on **Delete**. The log file is deleted from your computer.

NETWORK LOGGING

To delete a network log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > Network Log**. The Network Log File Management Dialog box displays, as shown below:

Insert Graphic from Help file

2. Select a **log file** from the **Select Network Log File** drop-down list.
3. Click on **Delete**. The log file is deleted from your computer.

BGAN LOGGING

To clear a BGAN log file from your computer, do the following from LaunchPad main menu:

1. Select **File > Log Files > BGAN Log**. The BGAN Log File Management Dialog box displays, as shown below:

GRAPHIC NOT YET AVAILABLE

2. Select a **log file** from the **Select BGAN Log File** drop-down list.
3. Click on **Clear**. The log file is cleared from your computer.

▶▶ SATELLITE TERMINAL BOOT BEHAVIOR

When the terminal is powered up, it goes through a two-phase boot process. The first phase loads a Minimum Boot ROM (MBR) module, which provides basic functionality, including self-test and basic network connectivity.

When the self-test has completed with no failures detected, the MBR then proceeds to the second phase, and loads the application module. This provides full terminal functionality.

If the applications module is not installed or is bad, a new application has to be installed. A bad application could cause the terminal to stall in the second phase, or constantly reset. To prevent this, the boot process can be stopped at the MBR phase, so that a new application can be installed. This is achieved by holding down the audio button at the same time as the power button is pressed.

If the audio button is accidentally pressed during power up, causing the boot process to stop at the MBR phase, then simply power cycle the terminal. It will power-up through both phases of the boot process.

If the terminal MBR module detects a failure during the self-test, it will stop the boot process and indicate the source of the failure through the 6 LEDs used for pointing, as follow:

	Pointing LED Color and Status
G	Solid green LED
R	Solid red LED
B	Blank or off LED

BG	Blinking green LED
BR	Blinking red LED

1	2	3	4	5	6	Description of Failure
R	B	B	B	B	B	The PIC has failed to start up the ARM proc
G	BR	BR	B	B	B	The ARM SDRAM Memory test has failed
G	BR	BG	BR	B	B	There is no "bgan.bin" file in the /tffs0/bin di
G	BR	BG	BG	BR	B	There is a "bgan.bin" file, but its checksum c the checksum in file "/tffs0/checksum.txt" or "/tffs0/checksum.txt" file does not exist.
G	G	BR	BR	B	B	The Ethernet Controller has failed to respon processor.
G	G	BR	BG	BR	B	The USB Controller has failed to respond to processor.
G	G	BR	BG	BG	BR	The WLAN Controller has failed to respond processor.
G	G	G	BR	B	B	The ASIC has failed to respond to a write c ARM processor.
G	G	G	BR	BG	BR	The PA DC Control test has failed, indicatin transmitter may not be under control of the
G	G	G	BR	BR	BG	The DSP memory test has failed.
G	G	G	BG	BR	BR	The ARM failed to startup the DSP.

▶▶| SOFTWARE INITIALIZATION

▶▶| DIGITAL SIGNAL PROCESSING (DSP) DOWNLOAD

▶▶| PARAMETER ACCESS

▶▶| SIM ACCESS



TROUBLESHOOTING_[GLC36]

Problem

Possible Cause

Action



TECHNOLOGY OVERVIEWS_[GLC38]

Weight	2.8 kg (terminal with battery)
Dimensions	27.5 cm x 34.5 cm x 5.0 cm
Battery Life	Transmit: 200 Mb
(actual performance based on range of factors and actual usage)	Receive: 700 Mb 36 hours standby time
Humidity	95% RH at +40°C
Temperature	-25°C to +60°C operating -25°C to +80°C storage
Water & Dust	IP-55 standard
Transmitter power	20dBW EIRP maximum
Antenna characteristics	Nominal gain 15dBi, nominal 3dB beamwidth ± 20 degrees.



DECLARATION OF CONFORMITY

Hughes Network Systems, LLC, of 9605 Scranton Road, San Diego, CA, 92121, USA, declares under our sole responsibility that the product HNS-9201 Satellite IP Terminal to which this declaration relates, is in conformity with the following standards and/or other normative documents:

ETSI EN 301 444 , ETSI EN 300 328, ETSI EN 301 489-1, ETSI EN 301 489-20, ETSI EN 301 489-17, IEC 60950-1

We hereby declare that all essential radio test suites have been carried out and that the above named product is in conformity to all the essential requirements of Directive 1999/5/EC.

The conformity assessment procedure referred to in Article 10 and detailed in Annex [III] or [IV] of Directive 1999/5/EC has been followed with the involvement of the following Notified Body(ies):

BABT, Balfour House, Churchfield Road, Walton-on-Thames, KT12 2TD, UK.

Identification mark: **0168** (Notified Body number).

The technical documentation relevant to the above equipment will be held at:

Hughes Network Systems, LLC, 9605 Scranton Road, San Diego, CA, 92121, USA

Signed by Peter Sroka (Senior Technical Director, August 12, 2005) and Bill Lindsay (Senior Program Manager, August 12, 2005).

EU WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT) DIRECTIVES

The European Union (EU) directive on waste electrical and electronic equipment mandates recycling of electrical and electronic equipment throughout the EU by August 13, 2005.

Unless otherwise noted, all products, assemblies, and sub-assemblies manufactured by HNS and its sub-contractors will be compliant with this directive and any subsequent revisions or amendments. This product carries the WEEE label below to demonstrate compliance.

For additional information, contact Hughes Network Systems at:
www.hns.com



APN: An Access Point Name (APN) provides access to an external network. By default, the SIM Card in your terminal is configured with the APN of your Service Provider. You may want to configure further APNs if you have arranged with your Service Provider to use more than one SIM Card.

BGAN Satellite Terminal: Referenced throughout this document as the Satellite Terminal or "The Terminal," this device implements and manages BGAN satellite communications between your computer and Service Provider's network.

Class of Service: Class of Service (CoS) assigns a level of priority to certain types of data traffic, in particular high bandwidth applications such as video and multimedia. CoS attempts to maintain a guaranteed throughput level, and minimize error rates and end to end latency, so providing a higher level of service than "best effort" protocols.

DNS Server: The Domain Name System (DNS) is an Internet service that is required because the Internet does not recognize the text-based Web address or email address that you type into your Web browser or email application. All or part of a Web address or an email address is a domain name, and DNS translates this domain name into an IP address that is recognized by the Internet.

A DNS Server holds a database of domain names and IP addresses, so that when you enter a Web address or email address, you are sent to the correct IP address over the Internet.

Dynamic DNS Server: If you are using dynamic IP addressing, Inmarsat recommends that you use a dynamic DNS server. A dynamic DNS server updates the IP address information in the DNS database each time your IP address changes. A dynamic DNS server also enables a computer using a dynamic IP address to use network applications that normally require a static IP address, for example FTP servers.

This service requires subscription with a Dynamic DNS provider.

Static DNS Server: If you are using static IP addressing, Inmarsat recommends that you use a static DNS server. If you select this option, you must enter the IP address of the Primary DNS Server. This is supplied by your Internet Service Provider. Optionally, you can enter the IP address of a Secondary DNS Server, also supplied by your ISP. This is used in the event of failure of the Primary DNS Server.

Error correction: Error correction ensures that very little data is lost during transfer by asking for dropped packets to be resent. However, because it holds subsequent data whilst the packet is being resent, you may notice some jitter or delay in the received data. This is normal for most data types.

For real-time applications, such as Voice over IP (VoIP) or video, you may find that the level of jitter or delay is too great. In this case, it is recommended that you remove error correction. Removing error correction minimizes delay and jitter, but note that a small amount of data may be lost during transfer, because dropped data packets are not resent.

Ethernet: Ethernet is a local area networking method used widely throughout the computer industry. It is one of the three communications interfaces supported by the Satellite Terminal.

Fault Code: A number which uniquely references an error in a hardware or software system. In the Satellite Terminal, if there is a fault detected, the fault code and a description are displayed at the bottom of the Mobile Terminal Control Pad Home and Status screens.

GPS: Global Positioning System. When the GPS receiver in the Satellite Terminal gets a bearing on a GPS satellite, the receiver computes and stores the Terminal's location on earth. That location is used in the Pointing Process to obtain your location relative to the Regional BGAN Satellite.

Header Compression: A header is the component of a data packet that precedes the data that you are sending. The header contains information such as source and destination address, error checking and other administrative details. In most data types this does not noticeably affect the data transmission rates. However in multimedia applications such as voice and video, the header can significantly affect performance.

Inmarsat recommends that you switch on header compression for multimedia applications, such as video.

IP Address: An Internet Protocol address, or IP address, is a number that identifies the computer that is sending or receiving information transmitted over the Internet. An IP address is made up of four groups of numbers between 0 and 255, separated by periods. For example, 207.115.79.4 is an IP address. In the BGAN system, IP addresses can be dynamic or static.

Dynamic IP Address: A dynamic IP address is a temporary address that is assigned by your Internet Service Provider (ISP) when you connect to the Internet. If you do not need a permanent IP address, Inmarsat recommends that you obtain a dynamic IP address. Normally, individual users of the Internet use a dynamic IP address.

Static IP Address: A static IP address is assigned permanently, and is used every time you connect to the Internet. Normally, companies and other organizations that have their own networks use static IP addresses.

Standard: A standard connection is charged per Mb. You are charged only for the transmitted data. The bandwidth you are allocated depends on terminal type and network availability, but is always 'best effort', that is, you are allocated bandwidth depending on your requirements and the requirements of other users of the BGAN network, or BGAN Terminal. This connection class is suitable for most data types, other than multimedia.

Streaming: A streaming connection is charged by time. You are charged for the amount of time the connection is active. Streaming enables multimedia data, such as video, to be sent in a continuous data stream and converted into sound and pictures. The bandwidth required for a streaming connection is difficult to predict, and depends on factors such as length of connection and number of receivers.

Symmetrical Rate: The rate at which streaming data is transmitted, in kilobytes (KB). This rate applies to transmitted (uplink) and received (downlink) data.

Desired Symmetrical Rate: From the drop-down list, choose the desired data rate for your Streaming connection. This can be 32 Kb, 64 Kb, 128 Kb or 256 Kb. This figure is guaranteed, unless the connection cannot meet this requirement

because of bandwidth restrictions. In this case the rate defaults to the minimum symmetrical rate.

Minimum Symmetrical Rate: From the drop-down list, choose the minimum data rate that you are prepared to accept for your Streaming connection. This can be 32 Kb, 64 Kb, 128 Kb or 256 Kb. This rate must be lower than the Desired Symmetrical Rate. If the connection cannot meet this requirement, an error message displays.

Virtual Private Network: A Virtual Private Network (VPN) enables remote offices or users to gain secure access their organization's network over the public telecommunications network. This provides the benefits of remote access without the expense of dedicated leased or owned lines. VPNs work by using tunneling protocols, such as L2TP, to encrypt data at the sending end, and decrypt the data at the receiving end. This "tunnel" cannot be accessed by data that is not properly encrypted.

Number and
Description

Cause

Solution