Hughes 9450 Series

User Guide

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Understanding safety alert messages

Safety alert messages call attention to potential safety hazards and tell you how to avoid them. These messages are identified by the signal words DANGER, WARNING, CAUTION, or NOTICE, as illustrated below. To avoid possible property damage, personal injury, or in some cases possible death, read and comply with all safety alert messages.

Messages concerning personal injury

The signal words DANGER, WARNING, and CAUTION indicate hazards that could result in personal injury or in some cases death, as explained below. Each of these signal words indicates the severity of the potential hazard.

DANGER indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

Messages concerning property damage

NOTICE is used for messages concerning possible property damage, product damage or malfunction, data loss, or other unwanted results—but *not* personal injury.

Safety symbols

The generic safety alert symbol calls attention to a potential personal injury hazard. It appears next to the DANGER, WARNING, and CAUTION signal words as part of the signal word label. Other symbols may appear next to DANGER, WARNING, or CAUTION to indicate a specific type of hazard (for example, fire or electric shock). If other hazard symbols are used in this document they are identified in this section.

Additional symbols

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. 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 one meter or more from the front of the Satellite Terminal antenna.

General Handle your Satellite Terminal with care. The outdoor unit is weather resistant per IEC 60529 IP56; however, do not submerge either unit. Avoid exposing your Satellite Terminal to extreme hot or cold temperatures outside the range -25ºC to +55ºC.

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 SIM, do not bend 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.

Accessories Use Hughes approved accessories only. Use of non-approved accessories may result in loss of performance, damage to the Satellite Terminal, fire, electric shock or injury.

Connecting Devices Never connect incompatible devices to the Satellite Terminal. 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 20cm from the Wi-Fi antenna and your pacemaker:
- Maintain a distance of one meter from the main antenna front and sides and your pacemaker;
- 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 Satellite Terminal.

Electrical Storms Operation of the Satellite Terminal during electrical storms may result in severe personal injury or death. Ensure the Below Deck Equipment is properly grounded to the vehicle chassis.

Introduction

Overview

The Hughes Network Systems 9450 Broadband Satellite Terminal is your gateway to global communication. The 9450 terminal allows you to simultaneously send and receive IP packet and circuit-switched data via Ethernet (Power over Ethernet) ports and the Integrated Services Digital Network (ISDN) interfaces over the Inmarsat BGAN satellite network.

This unit offers you the following features and benefits:

- Fully autonomous tracking antenna acquires and tracks the BGAN satellite signal while on the move
- Optional antenna installation (magnetic mount) on vehicle roof
- Includes RF cable and power cable for vehicular installation
- Up to 464 Kbps data (transmit and receive) and 128 Kbps streaming IP data rate
- 4 X RJ-45 Power over Ethernet (PoE) ports
- ISDN 3.1KHz audio (above 45 degrees look angle to the satellite)
- ISDN UDI/RDI data (64Kbps) (above 45 degrees look angle to the satellite)
- 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
- FCC and CE certified
- Subscriber Identification Module (SIM) card security

With the optional antenna installation method, the unit is easy to install and connects in minutes. It is built for use in vehicular environments.

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

Term	Definition
IDU	Indoor Unit
ODU	Outdoor Unit/antenna
Terminal	Satellite Terminal
TE	Terminal Equipment (your computer)
UT	User Terminal/satellite terminal

About this User Guide

This user guide contains the most up-to-date information available on this product, on the date it was generated. It is focused on the specific information needed to operate the Hughes 9450 Land Mobile User Terminal.

For information on using LaunchPad, please refer to the Inmarsat website where a copy of the 'Inmarsat LaunchPad Guide' can be downloaded: **http://www.inmarsat.com/Support/BGAN/LaunchPad.aspx?language=EN&textonly=False**

Package Contents

When you unpack the Land Mobile Terminal Kit package, you will find the following:

- BGAN Land Mobile Tracking Antenna Kit
- Hughes 9450 BGAN Satellite Modem Kit

Your Service Provider will supply you with a Subscriber Identification Module (SIM) and its PIN, and Satellite Terminal configuration instructions – you will need these to access the network. Note: The SIM card may also have four (4) MSISDN numbers associated with it for various ISDN services:

- 4K Voice
- 3.1KHz Audio/Fax
- 64K UDI data
- 56K RDI data

Minimum System Requirements for Laptop/PC

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

- Internet Browser: Microsoft Internet Explorer (IE7 or IE8), Mozilla or Safari.
- PC Support for at least one of these interfaces: Ethernet, or WLAN (802.11b or b/g).
- 100 MB of free hard disk space if using LaunchPad.

Getting Started

This guide is the simplest and quickest way to connect to the BGAN network. If you are a first time user, you will be guided through the procedure for powering up your terminal, obtaining a GPS fix, connecting your computer to the terminal and registering with the BGAN network. You are then ready to start using voice and broadband services.

Installing your terminal

Install the Hughes 9450 terminal according to the Installation Guide P/N 3004129 supplied with the terminal. Please refer to the Installation Guide for grounding instructions.

Terminal LED functionality

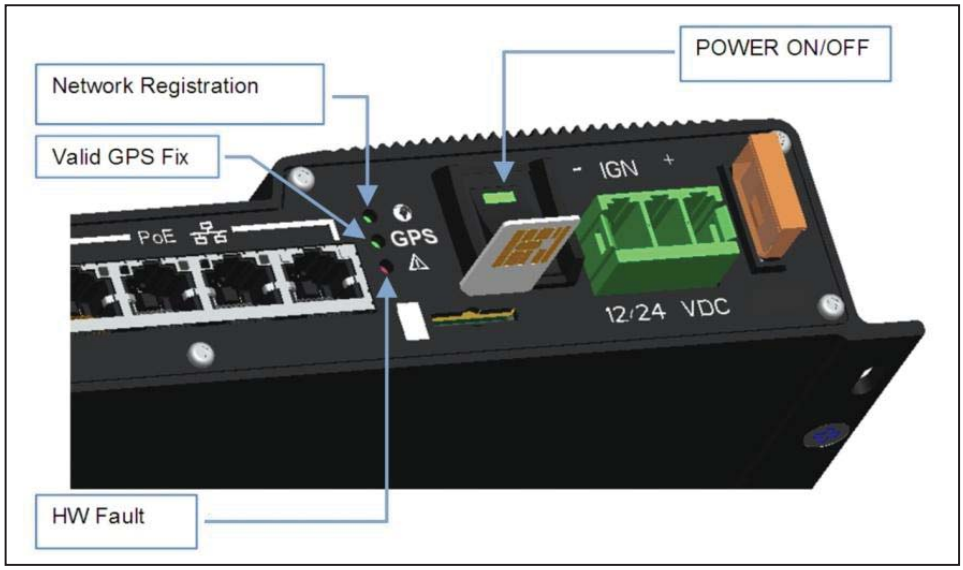
The 9450 IDU has 4 LEDs with the following functions:

Power: Green when IDU is powered on. Off when IDU is powered off. This LED is integrated in the On/Off switch.

Network Registration: Green when registered and attached with Inmarsat BGAN network, Off otherwise.

GPS: Flashing Green while acquiring fix and solid Green when valid GPS fix acquired, off otherwise.

H/W Fault: Red if HW fault detected, e.g.: IB fault, no communication to antenna or no GPS. Off otherwise.



The 9450 IDU has a four RJ-45 connector with 2 LEDs for each port with the following functions:

Green/Red bicolor: Green indicates Link active; Red indicates a power over Ethernet PD device is connected and is being powered by the IDU. When both functions are active, it will appear Orange in color.

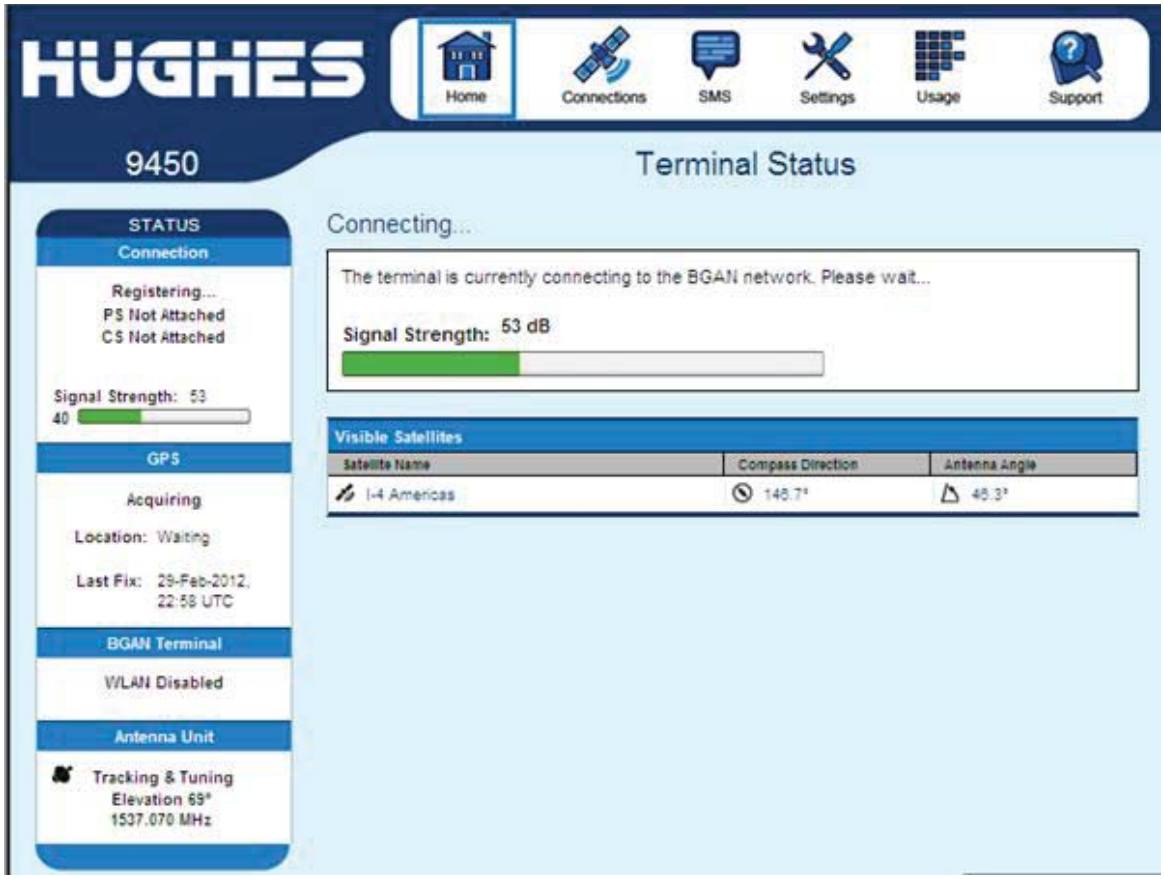
Green: Traffic indicator

Using the Hughes 9450

Auto start configuration

Since the Hughes 9450 terminal is equipped with a tracking antenna, the default configuration for the Hughes 9450 Land Mobile Terminal is as follows:

- The Hughes 9450 is configured to automatically register with the network by default: The terminal will automatically attempt to register with the network once the tracking antenna has acquired the satellite signal and obtained a GPS fix.
- The IDU has a power switch and an ignition sense line. For the unit to turn on, the power switch must be in the ON position and 12V or 24V applied to the ignition sense line. Refer to the 9450 Installation Guide P/N 3004129-0001.



NOTICE

These default configurations are accessible through LaunchPad or the web UI and it is recommended to keep these settings for convenient operation of the Hughes 9450 Land Mobile Terminal.

Power up and the connection to the Internet

After power is applied, the Hughes 9450 IDU and Hughes Tracking Antenna will begin their start-up sequence. The tracking antenna will begin its search for the BGAN satellite and the antenna motors may be heard during this time. Note that the tracking antenna must have line of sight to the BGAN satellite. Once the antenna has locked onto the BGAN satellite, it will continue to make minor adjustments to acquire optimum signal strength. The antenna may be heard 'twitching' during this time. Eventually the antenna will sit at an optimum position while the vehicle is stationary.

Once the vehicle starts moving, the Hughes Tracking Antenna will automatically track the satellite signal and keep the antenna pointed towards the satellite. During short outages (e.g. while driving under a bridge, etc.) the antenna will remain in the same position and will pick up the satellite signal immediately. For longer outages the antenna may need to repeat the search pattern to reacquire the satellite signal.

NOTICE

Circuit switched and packet switched connections will typically recover from signal outages of less than 60 seconds. User intervention ***will*** be required to reactivate circuit switched connections for outages longer than 60 seconds and ***may*** be required for packet switched connections depending upon the actual length of outage. Packet switched connections like FTP are more robust than circuit switched connections in the network.

Connecting the terminal to the computer

You can connect your computer to the 9450 IDU with one or more of the following interfaces

- Ethernet
- WLAN
- Integrated Services Digital Network (ISDN)

NOTICE

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

NOTICE

- During initial setup, the terminal can only be configured using an Ethernet connection. Once the terminal has been configured, all interfaces (Ethernet, WLAN and ISDN) can be used for data transfer depending on the service required.

  Your computer must be configured to support your chosen connection method. Refer to the documentation supplied with your computer for details.

Connecting by Ethernet

To connect the BGAN terminal to a device using Ethernet:

- Connect an Ethernet cable to your device's Ethernet port, and insert the other end of the connector into one of the four Ethernet ports on the 9450 IDU. These four Ethernet ports support Power-over-Ethernet (PoE).

Power over Ethernet (POE)

- All 4 ports are powered by a single 48Volt DC power supply capable of outputting 61.2 Watts and 30.6 Watts at 24 Volts and 12 Volts input respectively. The ports can provide power to class 1, 2, and 3 devices as long as the total power does not exceed the wattage based on the input voltage provided. If a device is connected to a port that exceeds the maximum power available, power will not be provided to that port. The existing connections will not be affected.

Connecting by WLAN

If you have not previously used the IDU's WLAN interface, it has to be enabled from the internal web UI or LaunchPad with your computer connected to the IDU using the Ethernet interface.

- WLAN Power: The default is off, which disables the WLAN feature.
- SSID (network name): The default is BGAN, but you can change it to whatever you want.
- Channel Number: This controls the radio channel number (1 through 11) used by the access point. To meet FCC regulations, channels 12 to 14 are not supported.

As you are configuring the WLAN, you can enable the Wireless Encryption Protocol (WEP), MAC address filtering and no broadcast SSID features for added security.

Once the WLAN is "Enabled" and configured, any device with a WLAN interface can detect the IDU's WLAN SSID, and connect to it automatically.

WEP Security

- WEP Protection Status: Check the box to "Enable" the WEP for added security. Encryption Level: 64 or 128 bit WEP encryption can be enabled.
- WEP Key: You can define the WEP key or use the default WEP key, which is formulated using the IMEI number of the terminal (e.g. IMEI number +0123456789).
- Hexadecimal 128-bit: Requires 26 characters. Recommended
- Hexadecimal 64-bit: Requires 10 characters

NOTICE

- SSID Broadcast: For added security you can choose not to broadcast your SSID.
- MAC Filtering: For added security, check the box to "Enable" MAC Filtering. You can define up to 10 MAC addresses that are allowed to connect to your WLAN.

NOTICE

To determine the MAC address of a PC, go to a DOS prompt and type ipconfig/all.

For Mac OS X, under the Apple Menu go to System Preferences -> Network and Show Airport. The Airport Id is the MAC address. Alternatively, go to About this Mac -> More Info -> network, and select Airport.

NOTICE

When WLAN is enabled, unauthorized users may be able to access your BGAN service. If WEP is enabled, you must provide other WLAN users with the WEP key in order for them to connect to the terminal. You can go to the Manage Connections page to see what computers are actually using the BGAN service.

Connecting by ISDN

Connect an ISDN cable to your computer's or phone's ISDN port, and insert the other end of the connector into the Terminal's ISDN port.

To dial, prefix the international number with 00 and terminate with #. For example, to dial a number in the USA, enter: 0018005551234#

To receive incoming calls you must configure your ISDN device with the MSN (Multiple Subscriber Number) of the service it supports. See the ISDN section for information on configuration of MSNs. To configure the MSN in your ISDN device, refer to the user guide of your ISDN device.

Connecting by RJ-11

You can connect an analog phone or fax machine to the RJ-11 ports:

- The FAX port is configured for 3.1k service for fax
- The TEL port is configured for speech service for voice calls

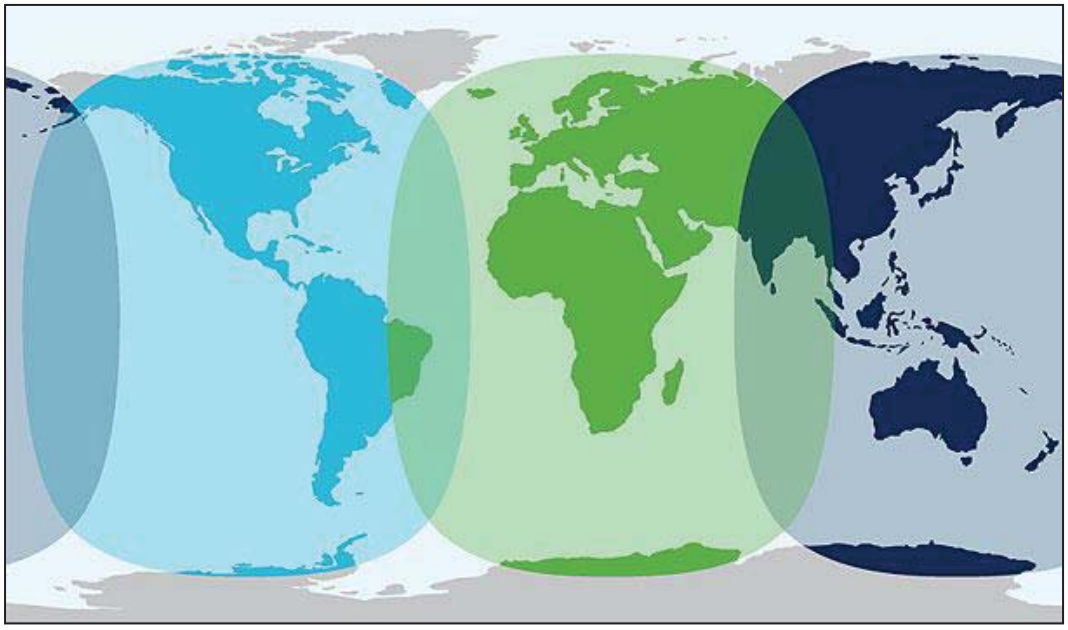
To dial, prefix the international number with 00 and terminate with #. For example, to dial a number in the USA, enter: 0018005551234# (00 + Country code + phone number)

Operational note: *RJ-11 and ISDN handsets cannot be connected at the same time. The 9450 will configure itself to ISDN or RJ-11 mode depending on which type of handset is plugged in first, and will be in this mode thereafter.*

To switch modes, the 9450 must be rebooted with only the desired handset connected. If both types of handsets are connected at power-on, the 9450 will default to ISDN mode and RJ-11 will not be operational.

Coverage Map

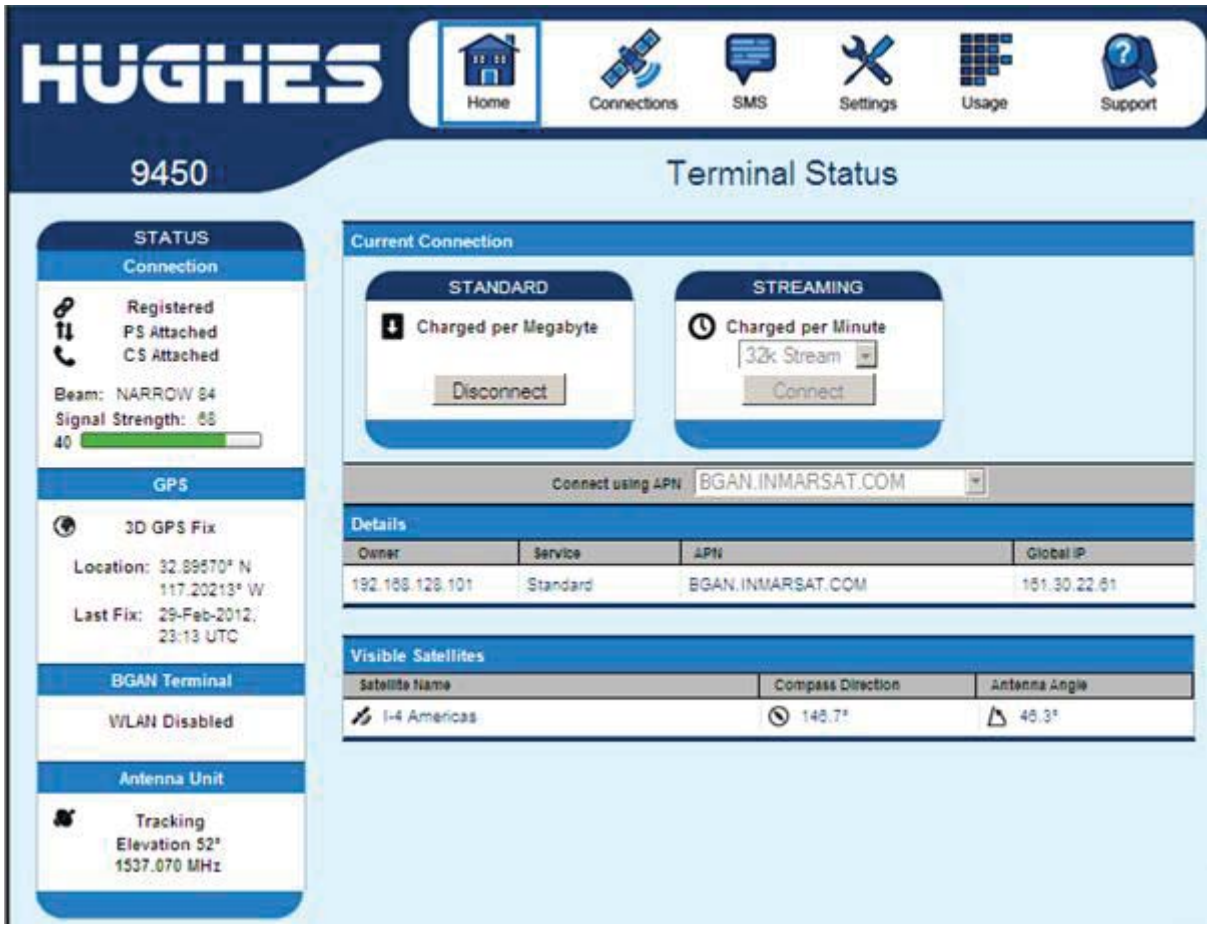
The Inmarsat BGAN service is operated with 3 satellites as shown below. The Hughes 9450 terminals will perform best in areas where the elevation angle is 20 degrees or higher. Lower elevation angles increase the probability of signal outages caused by trees, buildings and hilly terrain and may severely impact the usability on the move.



Using the Web UI

Accessing the Web UI

The Hughes UT includes its own internal Web User Interface (UI). To access the web UI, open your favorite Web Browser and type in the internal IP address of the UT e.g. **http://192.168.128.100**. The web UI opens up to the "Home" page as shown below:



Home page

The Home page shows the current terminal status and allows you to setup your initial data connection.

On the left side of the page is the Status bar. These items are updated automatically when the status of any of these items change.

1. Connection: This field indicates whether you are Registered with the Network. It also shows the PS and CS status, beam type and receive signal quality.
    a. **PS Attach Status**: This field indicates whether you are PS (Packet Switch) attached with the Network. You will still need to setup a PDP context in order to send PS data.
    b. **CS Attach Status**: This indicates whether you are CS (Circuit Switch) attached with the Network. Once you are CS Attached and Registered with the network, you are able to make CS calls.
2. GPS: This field displays the current GPS position status. If you have received a GPS fix and the Network GPS policy has been received and it allows the GPS position to be shown to the user, it will display the Latitude, Longitude, Fix Quality, and the Last time the GPS position was updated. Time displayed is UTC time.
3. BGAN terminal: This field indicates the WLAN status.
4. Antenna Unit: This field indicates the detailed state of the tracking antenna
    a. The state field indicates the tracking state of the antenna
    b. Elevation: the current elevation look angle of the antenna
    c. The frequency of the global beam in MHz that the antenna is attempting to track is displayed. If the unit is experiencing problems, use the table below to verify the antenna is searching for the correct satellite for your location

    The frequency is the frequency of the global beam. Possible values are the primary and secondary frequencies of the three satellites.

Satellite ID	Satellite Longitude	Primary Freq MHZ	Alternate MHz
I4-F1 Asia Pacific	143.5 E	1537.485	1540.825
I4-F2 Europe, Middle East & Africa	25.0 E	1537.920	1541.115
I4- Americas	98.0 W	1537.070	1540.730

In the middle of the page you will find the following items:

Current Connection field allows you to activate data connections for your TE. You can activate a Standard connection or a Streaming connection. For streaming connections use the drop down box to select the data rate for the stream.

Connect using APN field allows you to control the APN used for the connection.

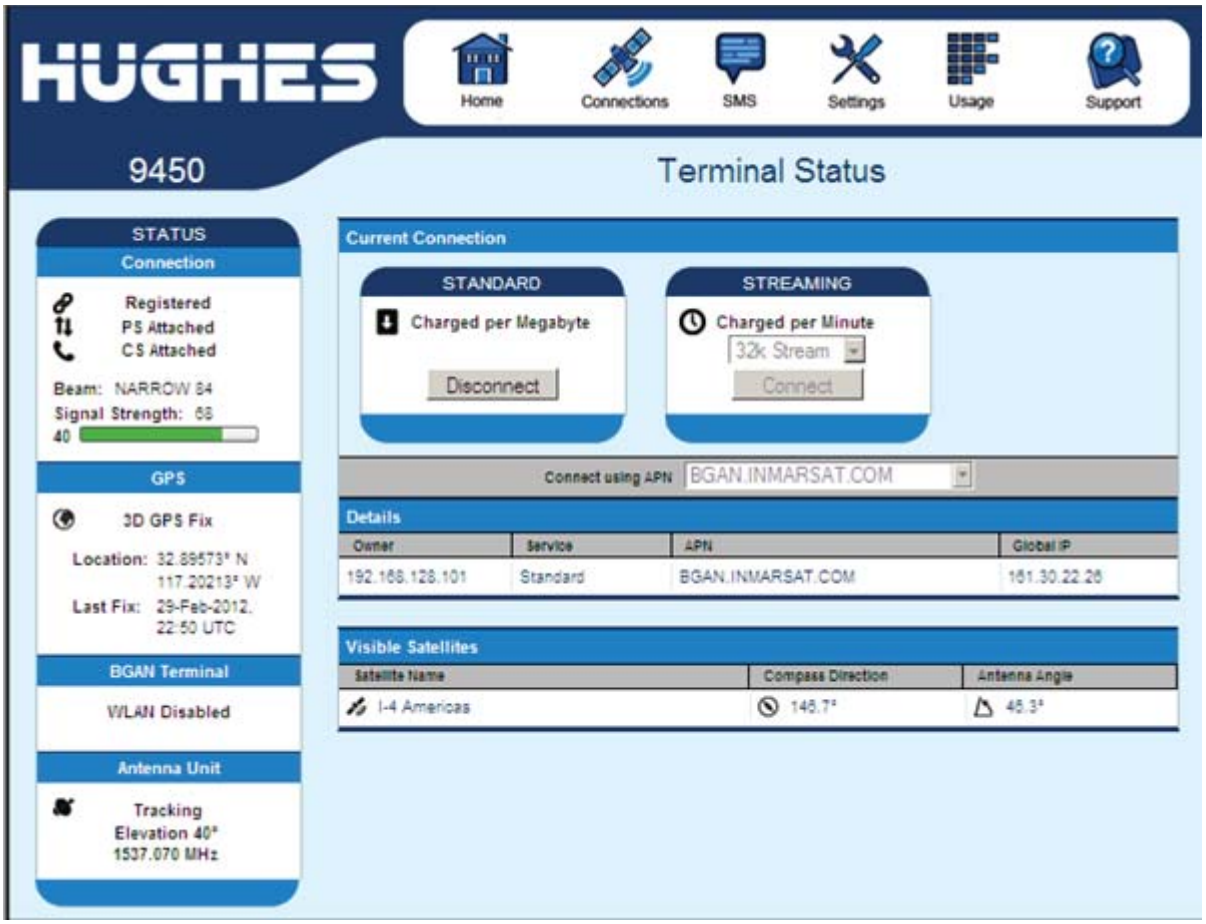
Details show the status of the connection for this TE.

Visible Satellites shows the satellites visible for your current location and the pointing information.

NOTICE

Reference the screenshot below. The antenna angle under **Visible Satellites** section (46.3°) may not be exactly the same as seen under the **Antenna Unit** section showing Elevation (40°). This is due to the wide beam width of the antenna

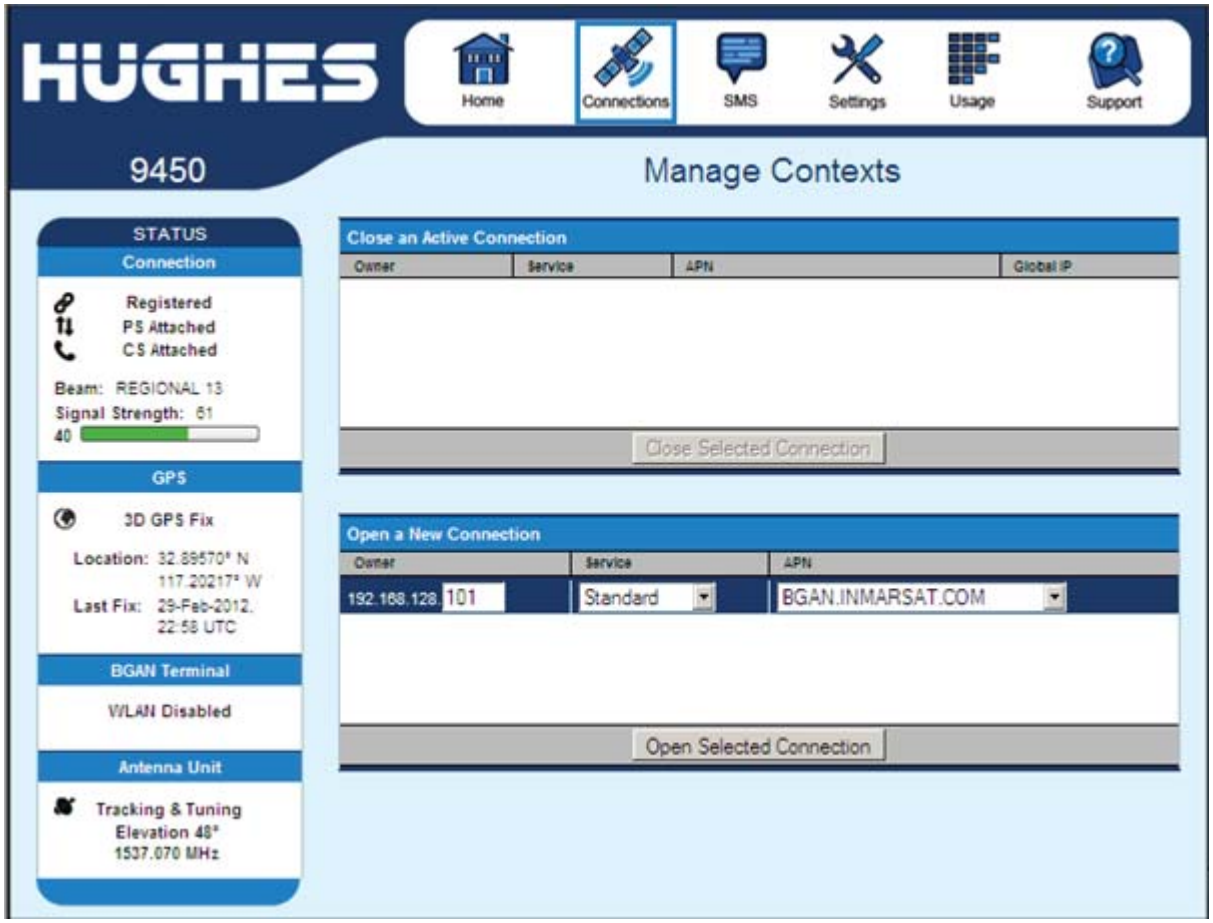
The following figure shows how the UI looks if you activate a Standard connection. Use the **Disconnect** button to deactivate your connection.


HUGHES
Home
Connections
SMS
Settings
Usage
Support
9450
Terminal Status
STATUS
Connection
Registered
PS Attached
CS Attached
Beam: NARROW 84
Signal Strength: 68
40
GPS
3D GPS Fix
Location: 32.89573° N
117.20213° W
Last Fix: 29-Feb-2012,
22:50 UTC
BGAN Terminal
WLAN Disabled
Antenna Unit
Tracking
Elevation 40°
1537.070 MHz
Current Connection
STANDARD
Charged per Megabyte
Disconnect
STREAMING
Charged per Minute
32k Stream
Connect
Connect using APN
BGAN.INMARSAT.COM
Details
Owner
Service
APN
Global IP
192.168.128.101
Standard
BGAN.INMARSAT.COM
161.30.22.26
Visible Satellites
Satellite Name
Compass Direction
Antenna Angle
I-4 Americas
146.7°
46.3°

Connections

The Connections icon has three configuration areas to select from: Manage Contexts, Automatic Context Activation (ACA), and Manage APN. The following section will review each of these pages.

Manage Connections



Manage Connections page under the Data tab allows the user to setup and configure PDP contexts (data connection) for any TE that is connected to the UT. It also shows you all current Active Connections.

Open a New Connection - To open a new connection, enter the required data in the lower box.

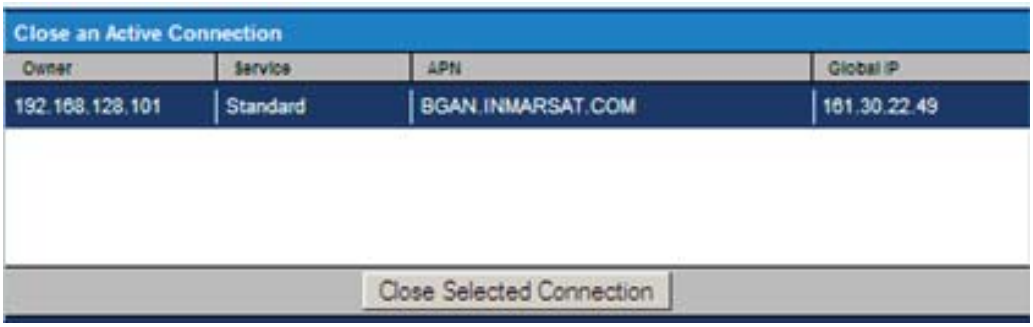
Owner – Your current IP address is shown by default (.101), but you can change it to control connections for any other device

connected to the terminal. The page automatically displays entries for all **detected** devices and these entries can be selected to activate connections for those devices.

Service - Select the service that you want by clicking on the down arrow. The drop down list shows all of the different QoS types: standard, streaming 32K, streaming 64K, and streaming 128K. Select the appropriate service required.

APN - The APN is read from the SIM card, but if you have other APN's defined (go to Manage APN page), you can use the down arrow to select a different APN. Once everything is defined correctly, click on the "*Open Selected Connection"* button. The new context will appear in the All Active Connections field above.

Close a Connection - In the upper field, all active connections are shown and you can select and close any of these connections unless an Administration Password has been enabled. See **Security** Section for more information about the administration password.



Username (UN)/Password (PW): Some Service Providers require a username and password to be used when setting up a connection. This is often required when using Static Global IP addresses assigned by the Service provider. These fields can be entered when defining a new APN or when you select a different APN.

Automatic Contexts

This web page allows you to use Automatic Context Activation (ACA) in **two** different ways;

- One way is to use a static IP addresses in the TE device so you can establish an automatic PDP context with any QoS that is offered by the network (upper half of the web page).
- The second way is to use DHCP IP addresses from the UT so you can establish an automatic standard PDP context for

any TE that connects via DHCP to the UT (lower part of the web page).

- You can also choose whether the context should be activated as soon as the UT detects the device, or if the context should only be activated when the TE attempts to send data to the satellite link. For the “data activated” option, choose “Data” from the drop down list rather than just On in either static or DHCP sections.

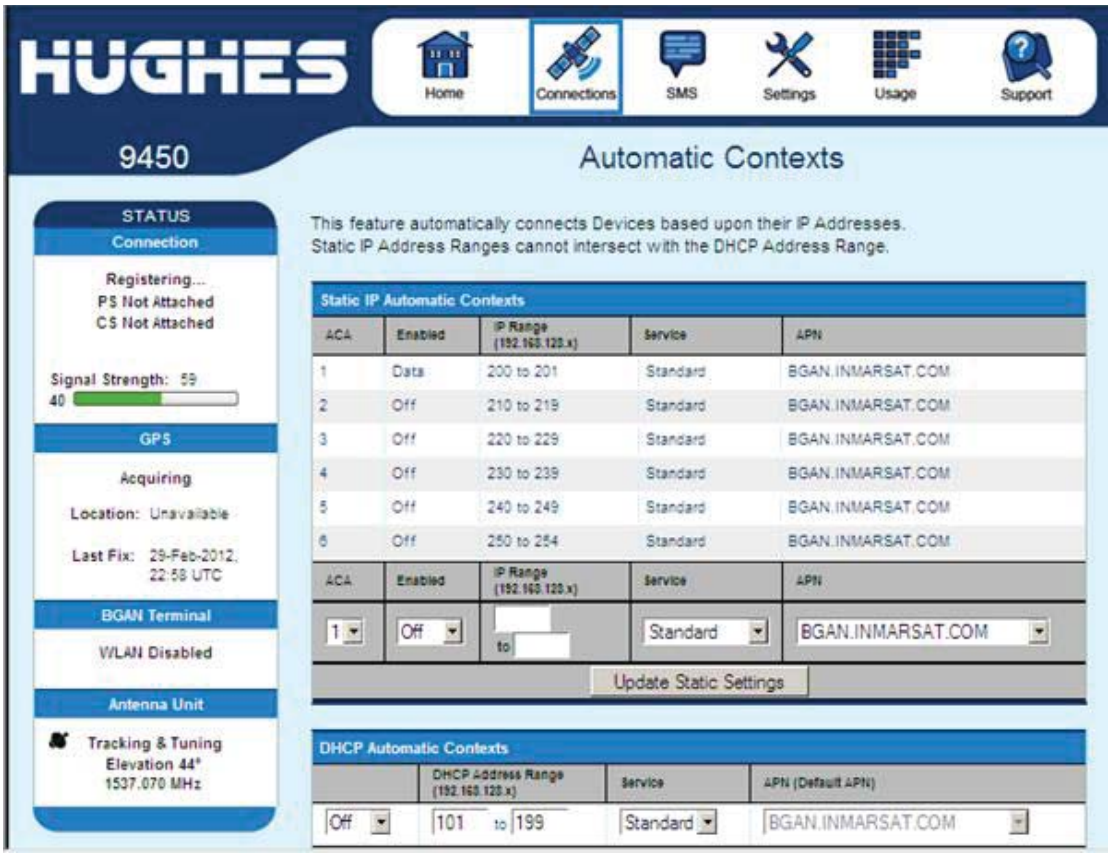
NOTICE

With “Data activation”, if the context is ever deactivated, it will be reactivated when more data is sent.

Static IP Automatic Contexts: You can configure your own range of static IP addresses and QoS’s to use with a static automatic context.

To turn on a particular range of static addresses, select “On” or “Data” from the drop down list and choose a range of addresses, low and high to use (e.g. 192.168.128.200 to 192.168.128.202) or you can leave the defaults (192.168.128.200 to 192.168.128.209).

Next select the desired QoS for that range of IP addresses (e.g. ***Standard***). The APN listed is the default APN read from the SIM card (bgan.inmarsat.com). If your SIM is provisioned for more than one APN, then you can select a secondary APN from the drop down list.



If you want to setup additional ranges of addresses, please follow the same instructions as above.

NOTICE

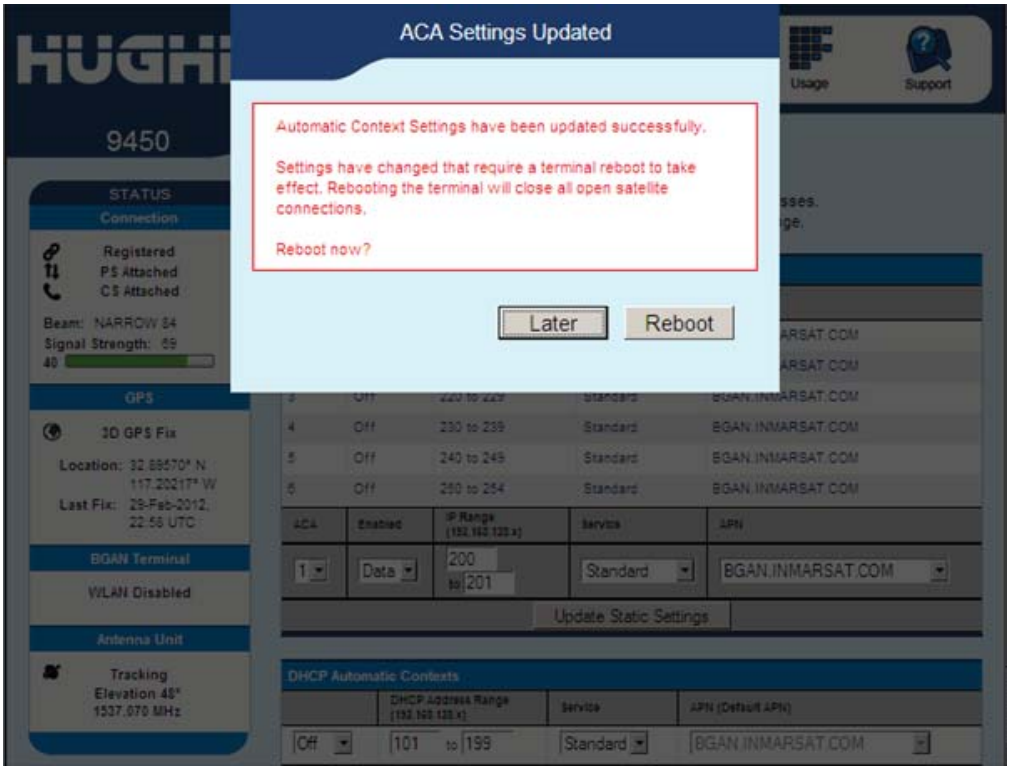
You cannot overlap the IP address ranges. If you do, an error will pop-up telling you that you have an overlap region. Check all of the ranges for overlaps and try again.

When you are finished, click on "Apply" and you should see a message saying "Operation Successful".

DHCP Automatic Contexts: This option allows you to set up the UT for dynamic ***standard*** ACA. This means that any device connected to the UT via ***DHCP***, whether wired or wirelessly will automatically receive a standard context.

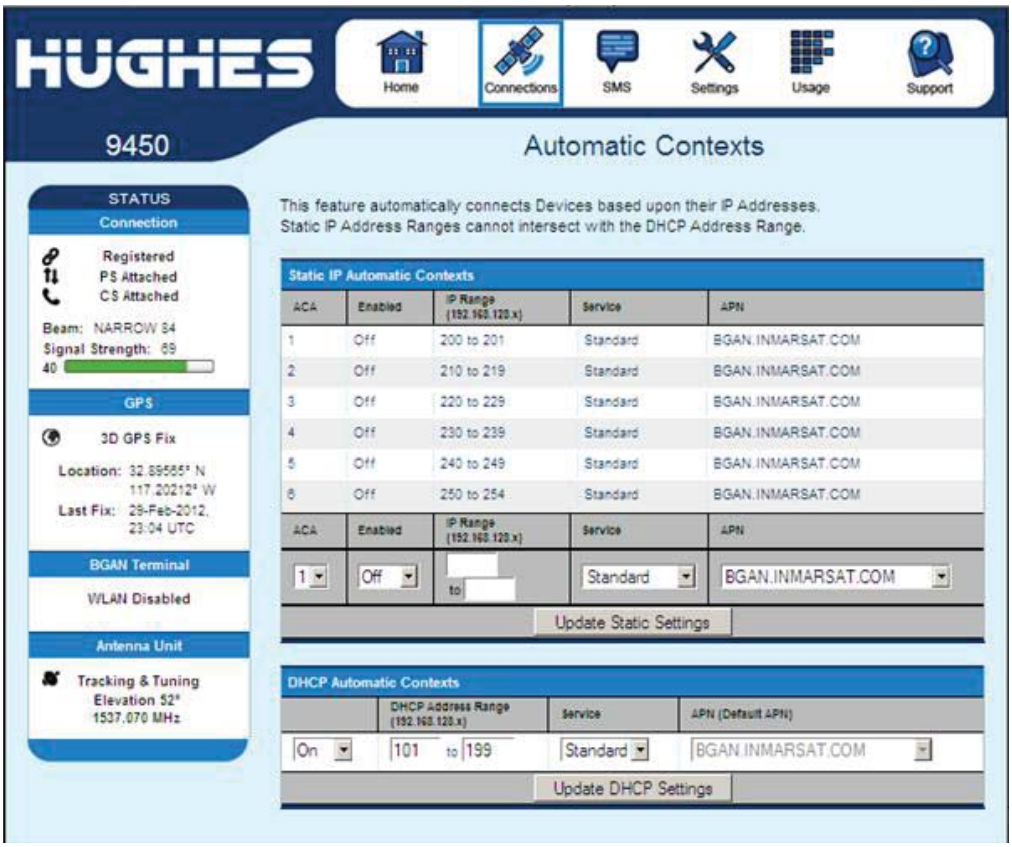
To activate this feature, select "On" or "Data" from the drop down list under DHCP Automatic Context section, select the DHCP range of addresses to use if you don't want to use the

default (.101 -.199) and click on “Apply”. The APN will be the default APN configured on the Manage APNs page.

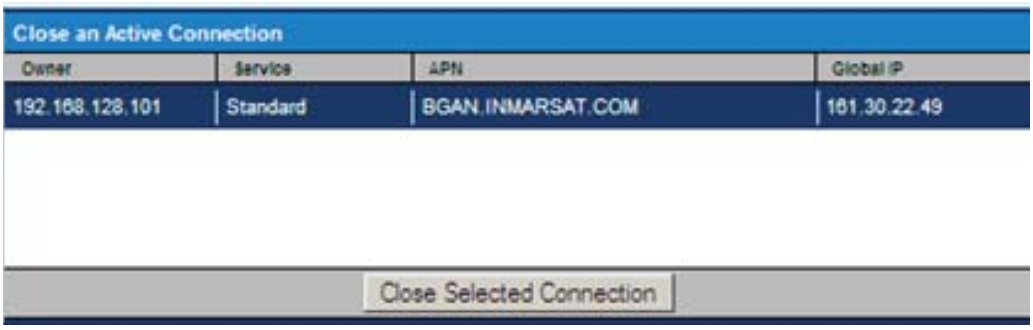


Once you hit “Apply” you will get a pop-up message saying that the ACA settings were updated successfully and to take effect you will have to reboot the terminal.

Once you reboot the terminal, check that the settings took effect.

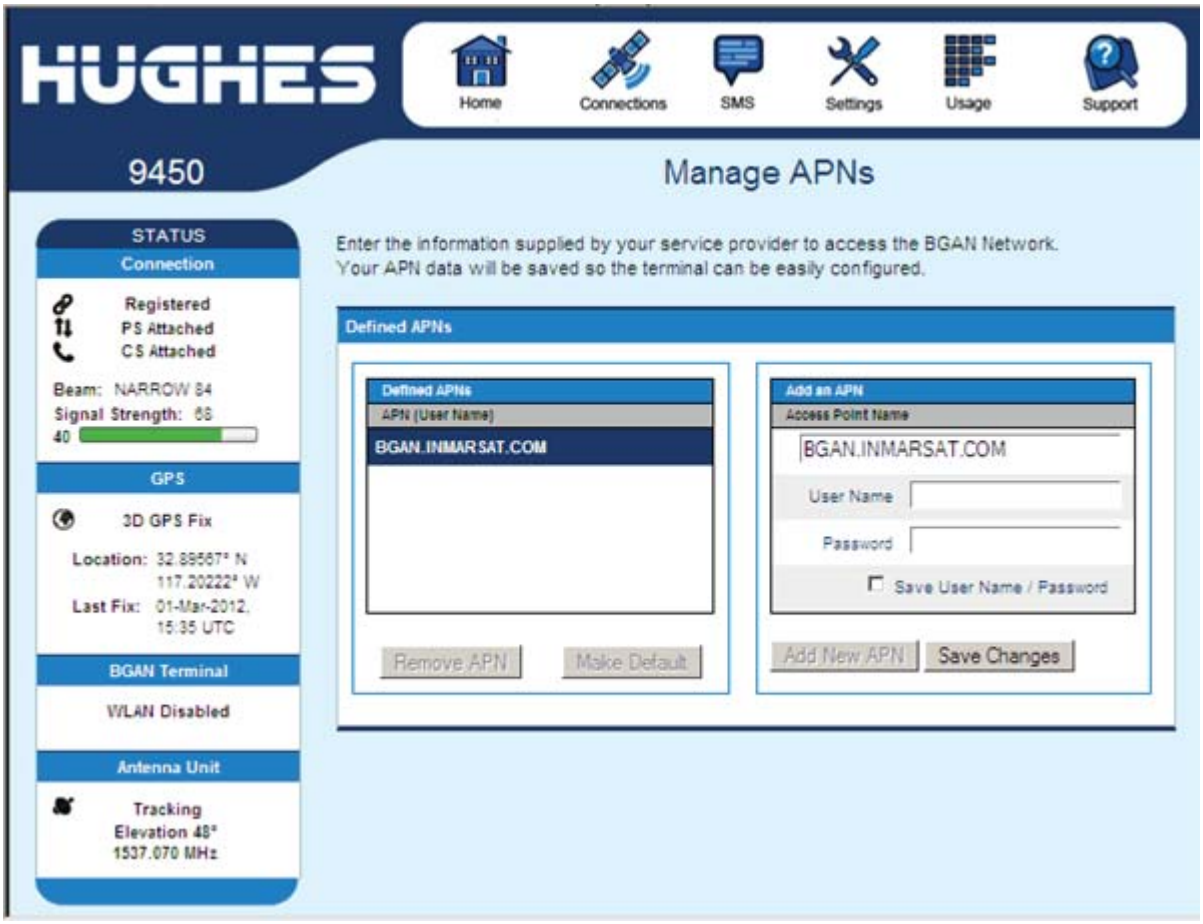


To see if the context has been setup properly, click on the "Data tab>Manage Connections Page and this will show you all contexts that have been setup (active or inactive). See screen shot below.



Manage APNs

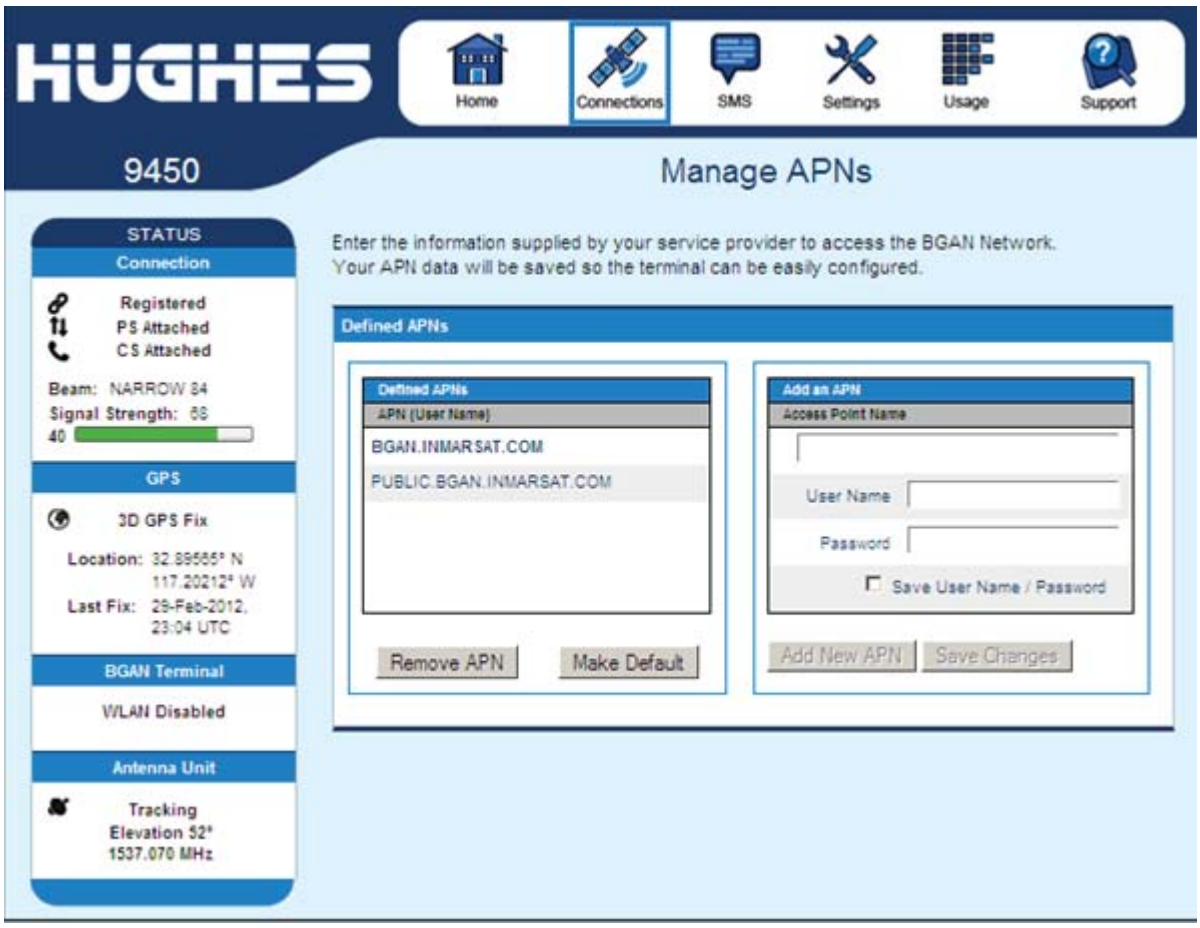
Some SIM cards are provisioned with multiple APNs, so you can use this page to pre-configure those additional APNs if needed. Once the APN is defined, you can select it from the drop down list without having to put in the username and password every time.



Add an APN field – Use this field to add an additional APN that you want to use, or to edit an existing APN. For adding a new APN, type in the new APN, username and password (if required) then select **Add New APN**. If you want to save the username and password so you don't have to re-type it each time you configure a PDP context for that APN, check the *Save User Name / Password* box and then click the **Add New APN** button. The new APN name will show up in the **Defined APNs** field. This APN will now be available to use from any APN drop down menu.

User Name /Password: Some Service Providers require a username and password to be used when setting up a connection.

This is often required when using Static Global IP addresses assigned by the Service provider.



The screenshot above shows the new APN that was added, in the **Defined APNs** section.

If you wish to edit an existing APN, first select the APN to edit under the **Defined APNs** section on the left. The information for that APN will then appear in the **Add an APN** field to the right, and you can then edit it. Click the **Save Changes** button to save your changes.

Make Default. If you wish to change the default APN, select an entry in the list of Defined APNs and then click **Make Default**. This APN will now be the default APN on the other context control pages. Note that already configured static ACA entries must be manually updated to change the APN.

SMS

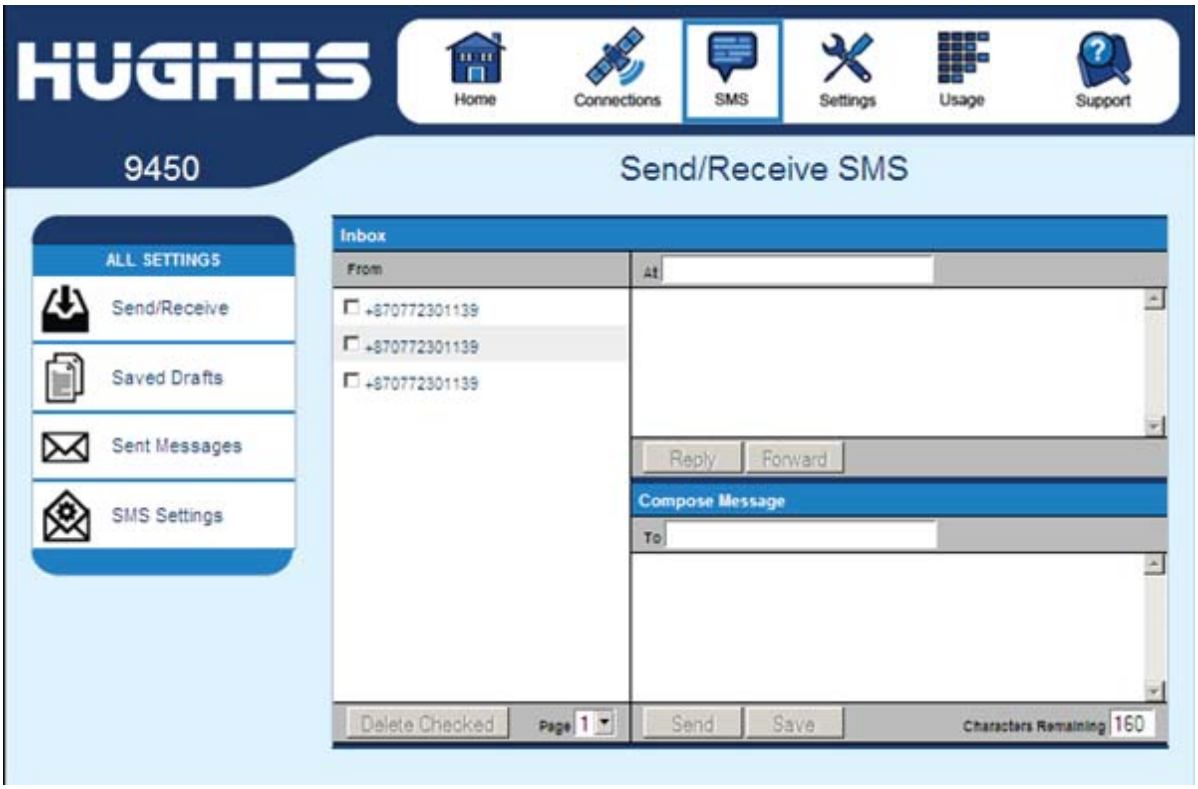
You can manage SMS text messages from the SMS pages which provide a similar function to LaunchPad. You must have a valid Service Center number configured in order to send messages – see the SMS Settings Page.

Send/Receive

The **Send/Receive** page allows you to view your Inbox box messages and Compose a new message. If there are more than 10 messages, you can view the older ones by changing the page number. You can also reply to received messages or forward them to another number.

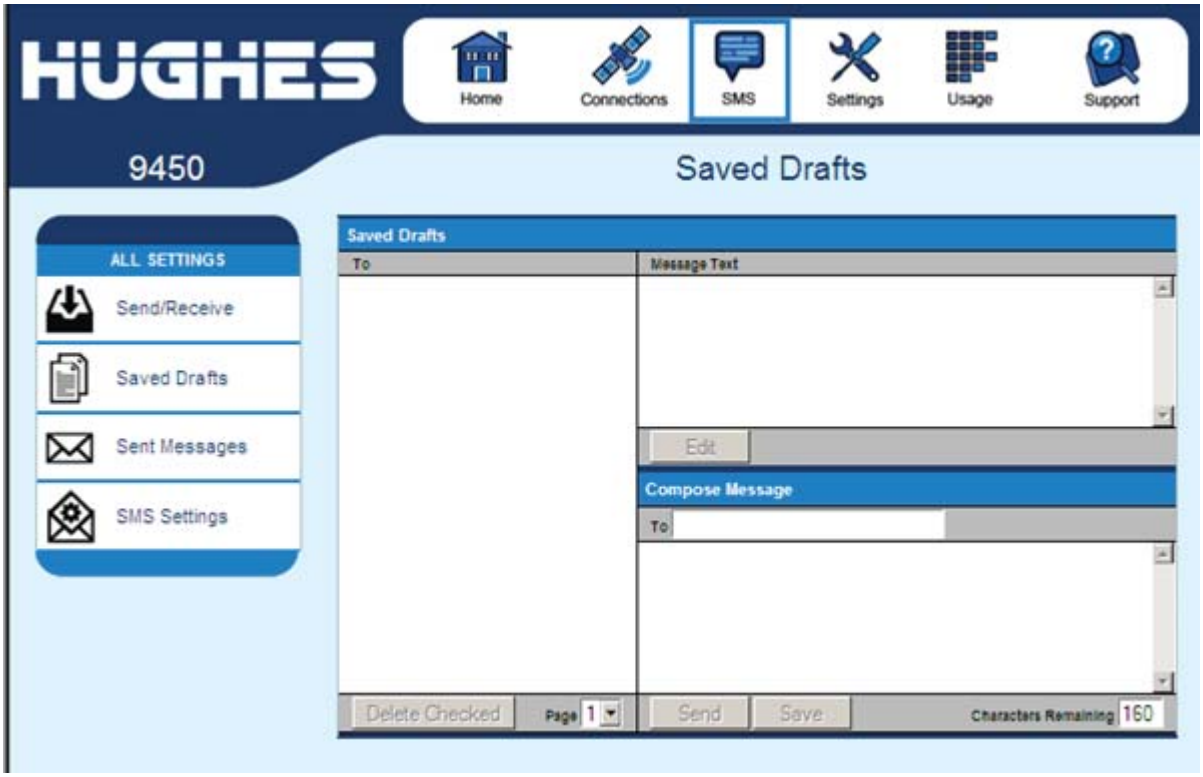
You may need to periodically delete messages to prevent the SIM from filling up which will prevent the receipt of new messages. You can select a single message by checking the box next to the message and press the “Delete Checked” button. To delete multiple messages just select the check box next to each message you want to delete and click the “Delete Checked” button.

After composing a message you can save it to drafts rather than sending it, by pressing the “Save” button.



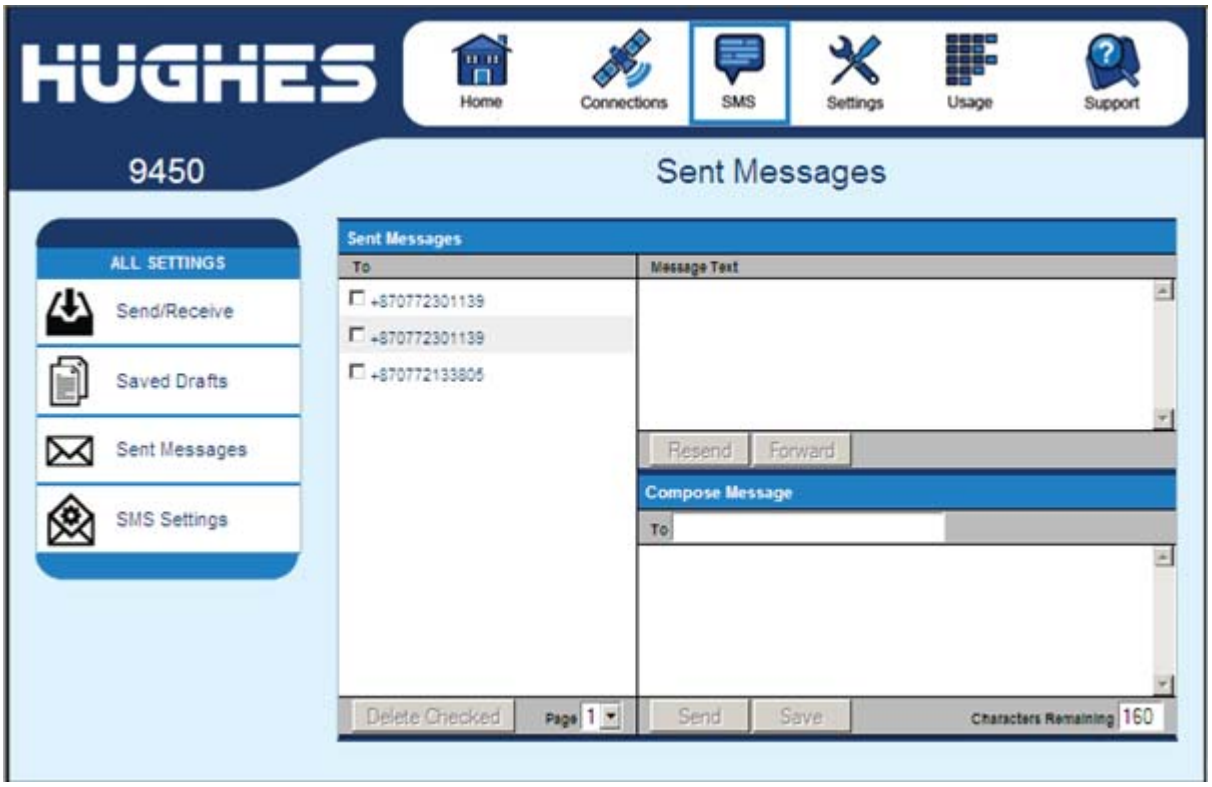
Saved Drafts

The **Saved Drafts** page allows you to view previously saved messages. After editing a message you can resave (Save) or send the message (Send). You can also compose a message from this page.



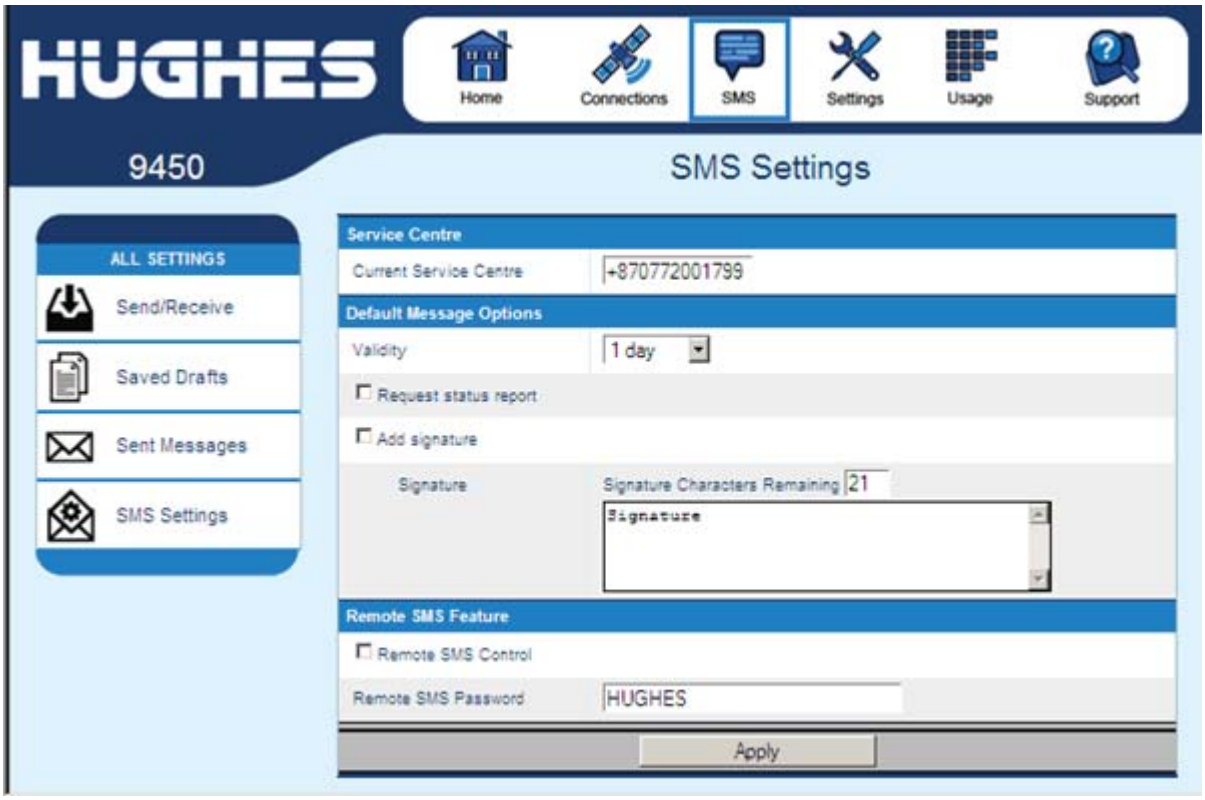
Sent Messages

The **Sent Messages** page allows you to view previously sent messages. Again, you may need to periodically delete messages to prevent the SIM from filling up. You can also compose a new message from this page.



SMS Settings

On the **SMS Settings** page you can configure the default settings for messages. You must have a valid Service Center number configured in order to send messages. The default Service Center number is +870772001799.



On the **Remote SMS Feature** section you can enable the unit to receive and act on special remote control SMS messages. Contact your service provider for more information on this feature. Before this feature can be enabled you must obtain the feature activation code from your service provider and activate the feature from the Features Web page.

You can configure the password that must be contained in remote control SMS messages. Be sure to make a note of the password if you change it from the default. Note: If you activate this feature and do not change the password, it is possible that other people may be able to send control messages to your unit.

Remote control messages will be deleted after they are received and will not be stored in the SIM.

Settings page

General Setup

This page allows the user to configure various parameters of the UT. A description of each item on this page follows:

Terminal Startup – The default configuration for the 9450 terminal has Bypass Antenna pointing and Always power on checked and grayed out due to the tracking antenna.

Connection – The default configuration is always set to Automatic. This parameter is used within a satellite overlap region and allows the user to override the default satellite (selected by the 9450 terminal based upon elevation angle/GPS location) and select a different satellite.

NOTICE

This change does not take effect until the UT is reset. When set to Automatic, the UT will select the satellite based on the unit's GPS position. When set to a specific satellite, it will attempt to use that satellite only. Be careful to select the correct satellite for your position.

Streaming – By enabling this parameter, the user can turn on a timer for inactivity for a streaming QoS that has been set up. The timer is in either seconds or minutes and will tear down a streaming context after **X** seconds or minutes of inactivity.

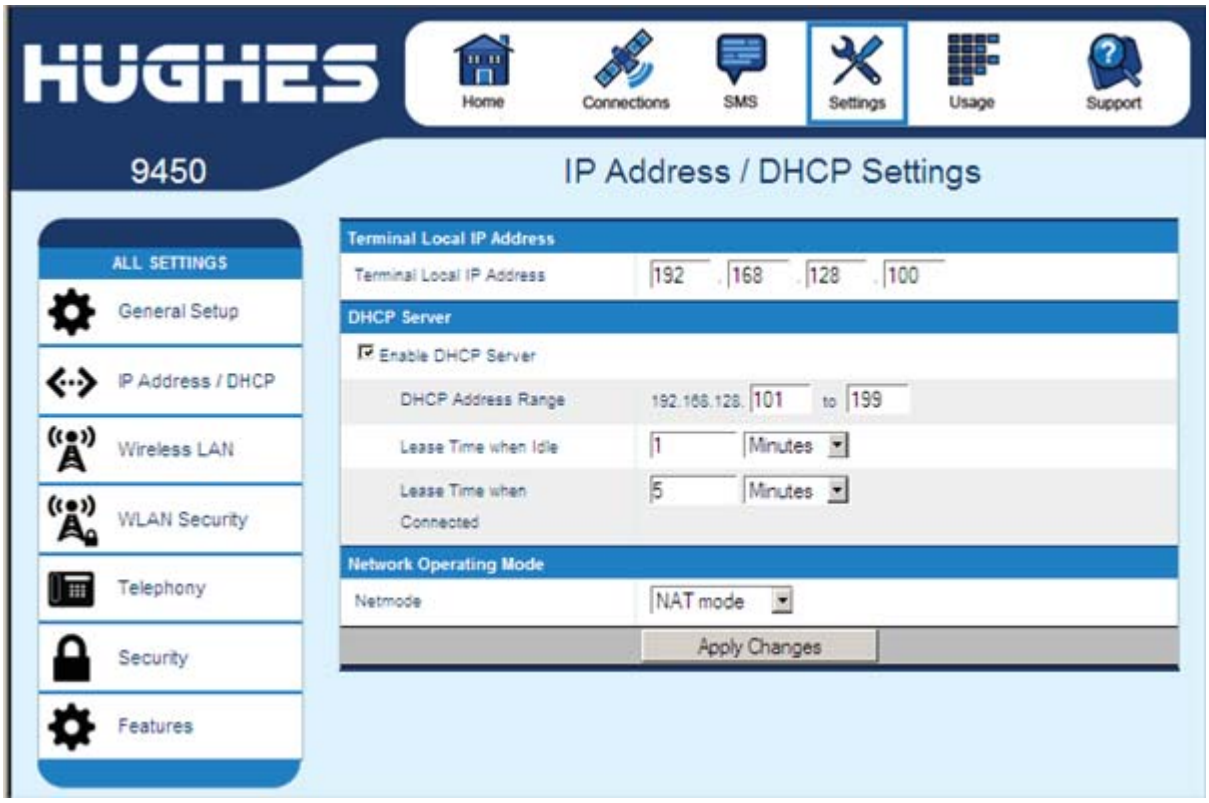
Emergency Call Numbers: Allows the user to add the emergency call number that is applicable in the part of the world where the terminal is being used, if it is not already defined.

IP Address/DHCP Settings

Terminal Local IP Address: This page allows the user to change the local IP address of the terminal from the default 192.168.128.100 IP address. All four octets are available to change. Once the local IP address is changed on this page and applied, the IP address ranges for the DHCP server, the Manage Context page and ACA page will also be changed automatically.

NOTICE

Updates to this field will **not** take effect until the UT is **rebooted.**



DHCP Server: allows the DHCP server in the UT to be turned on or off by checking the Enable box.

DHCP Address Range: This allows the user to set the range of DHCP addresses that are given out by the UT to any connected TE.

Lease Time when idle: Idle-mode DHCP Lease Time refers to the DHCP lease time when the UT is not connected to the network. This parameter allows the user to change the default time (60 seconds) that the DHCP lease to the TE is good for. This parameter was introduced because of a problem with some models of Cisco routers that will not accept a short DHCP lease time.

NOTICE

The longer the Idle-mode DHCP lease time, the longer it will take the Network/UT to update the TE with the correct DNS servers for web browsing after establishing a data context.

Lease Time when connected: The Connected-mode DHCP Lease Time refers to the DHCP lease time when the UT is connected to the network. Most users will have no need to change this parameter.

Network Operating Mode: The Netmode field indicates the mode of operation of the terminal. In NAT mode the UT will translate between the local and global IP addresses. In Relay mode the UT will supply the global IP address to the TE once a PDP Context is established. Relay mode is single user/single PDP Context and only supports a single connected TE. **Note:** Updates to this field will not take effect until the UT is restarted.

Nat Mode

In **NAT mode** once a PDP context is active, the UT will translate between the local and global IP addresses. This is a basic NAT that only performs IP address translation. It does not use port translation.

Relay Mode

In **Relay mode** the UT will supply the global IP address to the TE when the context is established. Relay mode is single user and only supports a single connected TE.

In Relay mode DHCP is required to provide the global IP address to the TE. When the context is activated, the DHCP

server in the UT will NACK the next DHCP lease renewal from the TE and assign the global IP address assigned by the network. The local IP connection will be torn down and reestablished as the IP address changes. Similarly, when the context is deactivated the DHCP server will NACK the lease renewal and then reassign the original private IP address.

LaunchPad and the Web UI will lose and reestablish their connections to the terminal as the IP address is changed.

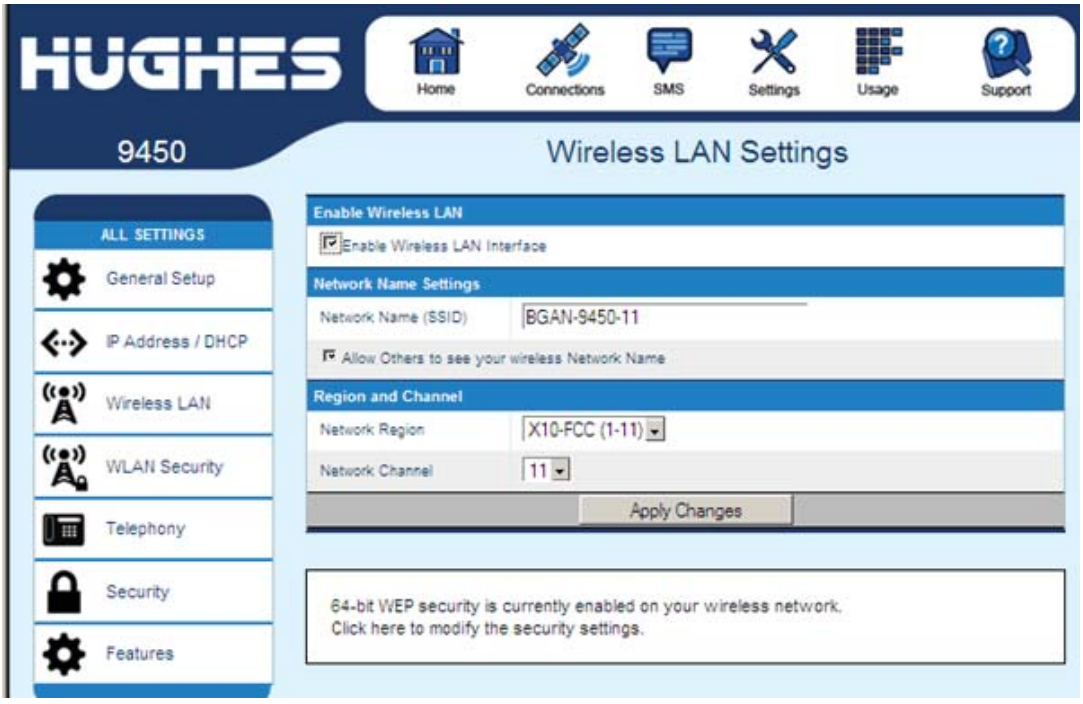
To make the IP address change happen quickly a short DHCP lease should be used. The terminal defaults the DHCP lease time to 60 seconds in idle and connected mode.

NOTICE

Relay mode only supports a single user TE.

Wireless LAN

The Wireless LAN settings page allows the user to enable, disable, and configure the Wireless LAN functionality of the terminal.



NOTICE

The Wireless LAN Security is controlled on a separate web page – WLAN Security.

If you have not previously used the terminal's WLAN interface, it has to first be enabled from this page using a computer connected to the terminal using an Ethernet connection. Once WLAN is enabled/configured, TEs can connect to the terminal wirelessly.

Fields on this page include:

Enable Wireless LAN Interface: Turns the Wireless LAN interface on/off. The default is off (unchecked).

Network Name (SSID): The default is "BGAN", but you can change it to whatever you want.

NOTICE

You can "hide"/prevent the SSID broadcast on the WLAN Security page

Network Region: There is only one region for all countries.

Network Channel: This controls the radio channel number (1 through 11) used by the access point. To meet FCC regulations, channels 12 to 14 are not supported.

NOTICE

If performance issues occur over the WLAN interface, changing the Channel may help.

Wireless LAN Security

This page allows the user to configure WEP Security for use when the terminal is communicating wirelessly to TEs. Additional security measures that can be used with WEP to make it more secure are: 1) Do not broadcast your SSID and 2) enable MAC address filtering so that only the MAC addresses that you select, can connect to the terminal. A maximum of ten (10) addresses can be filtered.

Check the box if you want your SSID name to be broadcast.

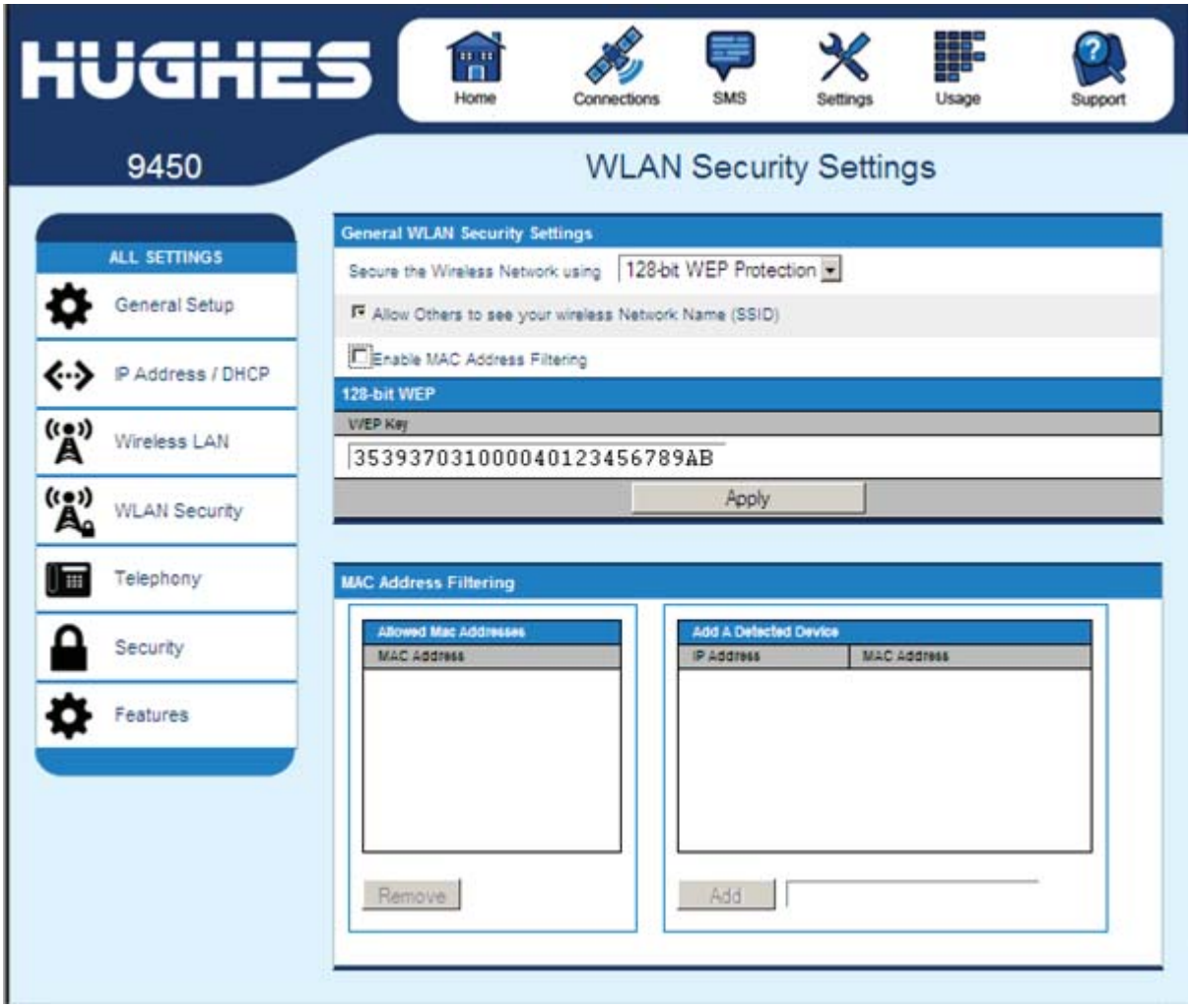
Select from the down arrow, No protection, 64 bit WEP and 128 bit WEP.

Mac Address Filtering

Check the box to “Enable MAC Address Filtering”

If any TE is already connected to the terminal wirelessly, the MAC address of that TE will be detected and show up in the “Add a Detected Device” field.

To add the detected MAC address, click on the address to highlight it and then click Add. It will now show up in the “Allowed MAC Address” field.



Telephony

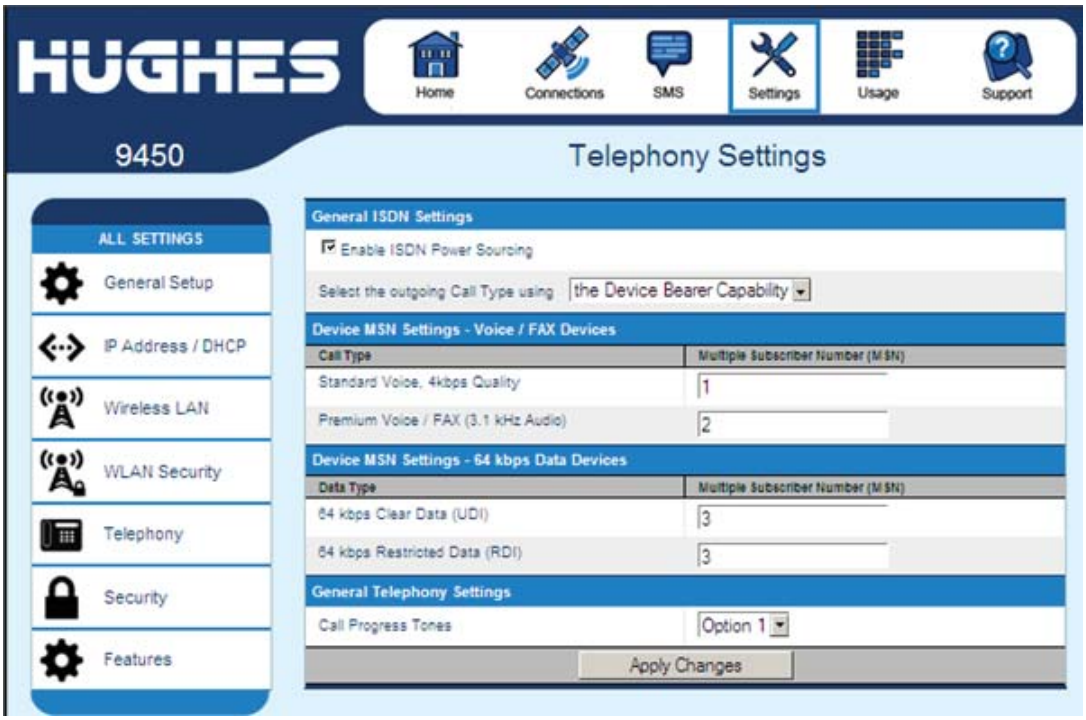
You can establish ISDN data communication by connecting your ISDN equipment directly to the BGAN Terminal's ISDN port with an ISDN cable (which is the same as the Ethernet cable). The Telephony page allows you to activate 40V power sourcing on the ISDN interface, and configure **Device MSN Settings**.

General ISDN Settings:

Enable ISDN Power Sourcing: To turn on the ISDN power sourcing, click the check box in the upper left-hand corner that says "Enable ISDN Power Sourcing" and then click on "Apply". The ISDN device should receive 40V power immediately via the ISDN cable. This field should be on unless you never use ISDN or are using an ISDN device that has its own power source.

Select the outgoing call type using: This box controls the mechanism used by the terminal to select the bearer type for mobile originated calls. By default, "**the Device Bearer capability**" is set as the trigger in this drop down list. Most ISDN devices correctly signal the call type (speech, 3.1KHz audio, UDI, RDI) via the bearer capability.

There is also an option under the drop down arrow to set the trigger to use the **MSN** rather than the bearer. If there is a problem using the bearer capability setting, this field can be changed to use the MSN number instead.



Device MSN Settings - Voice/FAX Devices

Standard Voice: By default, MSN 1 is used for standard voice (speech). To receive incoming calls, you must program the same MSN into your ISDN handset connected to the ISDN port.

Premium Voice/Fax (3.1 kHz Audio): By default, MSN 2 is used for 3.1 KHz Audio. To receive incoming calls, you must program the same MSN into your ISDN fax machine connected to the ISDN port.

Device MSN Setting - 64 kbps Data Devices

64 kbps Clear Data UDI (Unrestricted Digital Information): By default, MSN 3 is used for UDI calls. UDI is a 64 Kbps service that is a European standard ISDN.

64 kbps Restricted Data RDI (Restricted Digital Information): By default, MSN 3 is used for RDI calls. RDI is a 56 Kbps service found in the USA.

Once all changes have been made, click on "Apply".

NOTICE

You can use different MSNs for any of the ISDN call types above, but your ISDN equipment must be programmed with the same MSN to accept incoming calls, and you must use different numbers for speech, audio and UDI/RDI calls.

General Telephony Settings:

Call Progress Tones: Two options are provided for call progress tones. Option 1 is the default tones used in the USA. Option 2 provides an alternative set of tones that are used in Brazil and some European countries.

Call Progress Tone	Option 1 (US)		Option 2 (Alternative)	
	Freq (Hz)	Cadence	Freq (Hz)	Cadence
Dial	350 + 440	Steady ON	425	Steady On
Ring Back	440 + 480	2 sec ON 4 sec OFF Repeating	425	1 sec ON 4 sec OFF Repeating
Network Congestion	480 + 620	0.25 sec ON 0.25 sec OFF Repeating	425	0.5 sec ON 0.5 sec OFF Repeating
Busy	480 + 620	0.5 sec ON 0.5 sec OFF Repeating	425	0.25 sec On 0.25 sec OFF Repeating

Security

You can configure three separate security settings on this page: 1) SIM PIN, 2) Phone to SIM PIN, and 3) Administration Password.

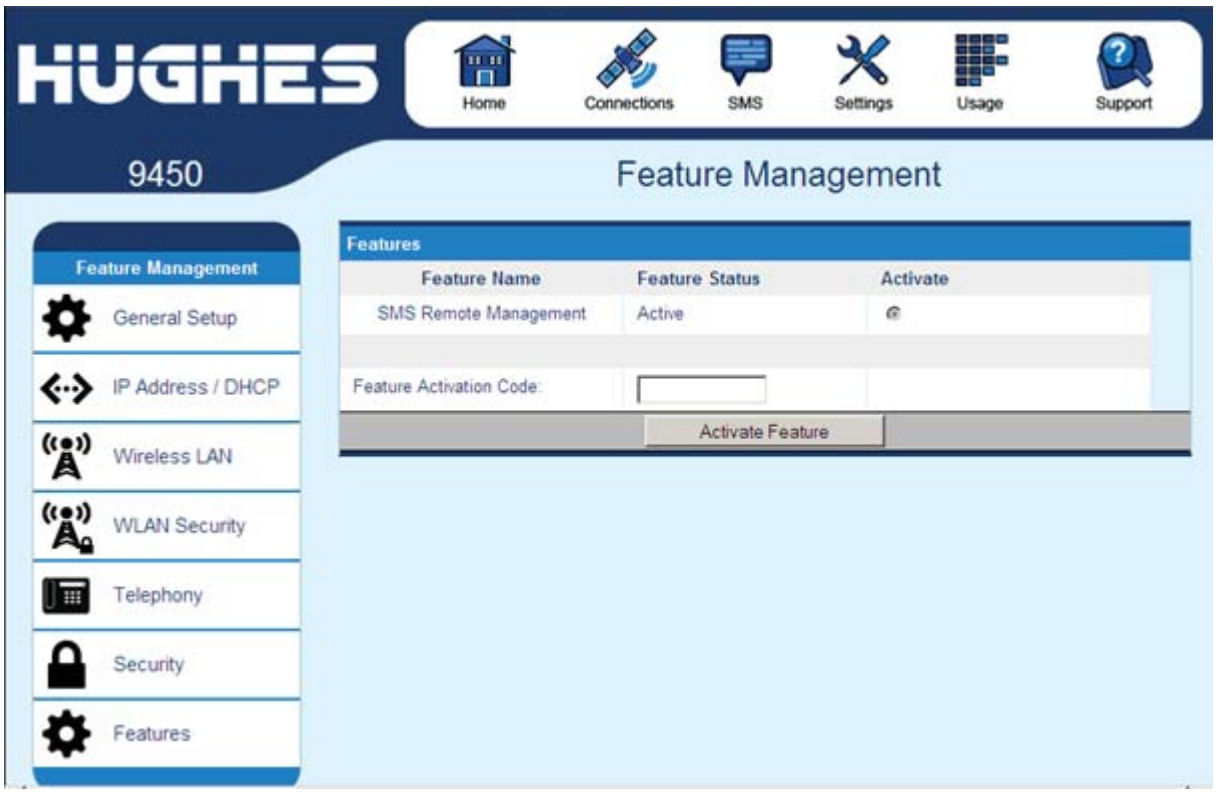
SIM PIN – this is a four digit field can be Enabled and configured by the user to secure the terminal against unwanted use. Once enabled, the terminal will require the SIM PIN at startup.

Phone to SIM PIN – use up to 5 digits to lock the terminal to that particular SIM. The Phone to SIM PIN will have to be entered any time the SIM card is changed. This setting is similar to a GSM phone's security code. Default password is 12345.

Administration Password – this configuration allows the user to prevent terminal settings from being changed once the terminal is configured properly. This password will have to be entered before any settings can be changed.

Features

You can enable special features from this page.



SMS Remote Management allows the unit to receive and act on special remote control SMS messages. Before this feature can be used you must obtain the feature activation code from your service provider and activate the feature by entering the UT specific code in the **Feature Activation Code** field. You will need to provide the unit IMEI to the Service Provider. This can be found on the Support Page.

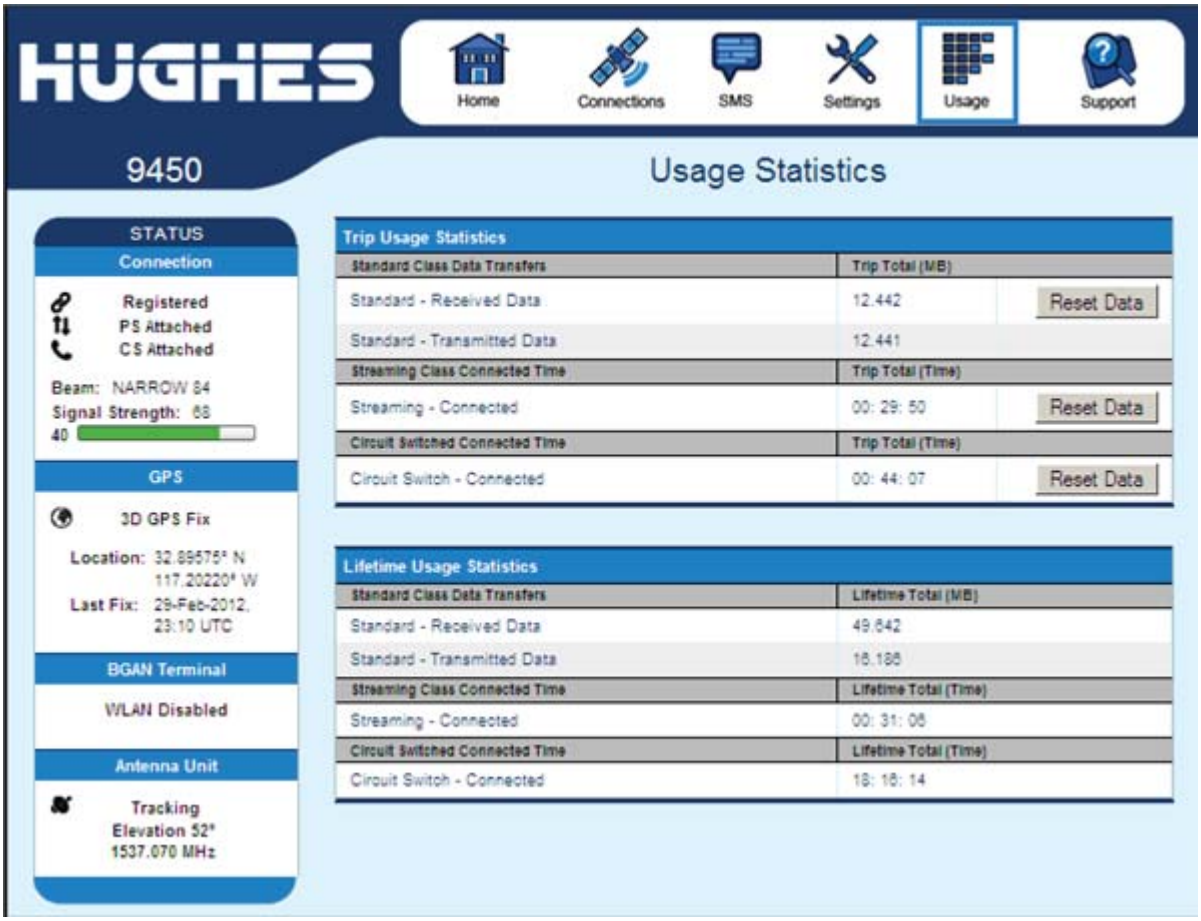
Once you Activate this feature, you must next enable it on the **Remote Settings** SMS page.

Usage Page

This web page provides an estimate of the amount of Packet Switched data that was sent and received, along with time spent on streaming connections and CS calls. The data is broken up into two types:

Trip Usage Statistics: The trip counter is similar to the trip counter on your vehicle. It can be zeroed out at anytime by the user and it will track the statistics until the user resets it.

Lifetime Usage Statistics: The Lifetime counter is similar to the odometer on your vehicle. It shows the statistics of the terminal since the software version that added this feature was loaded onto the UT. The user **cannot** reset these counters.

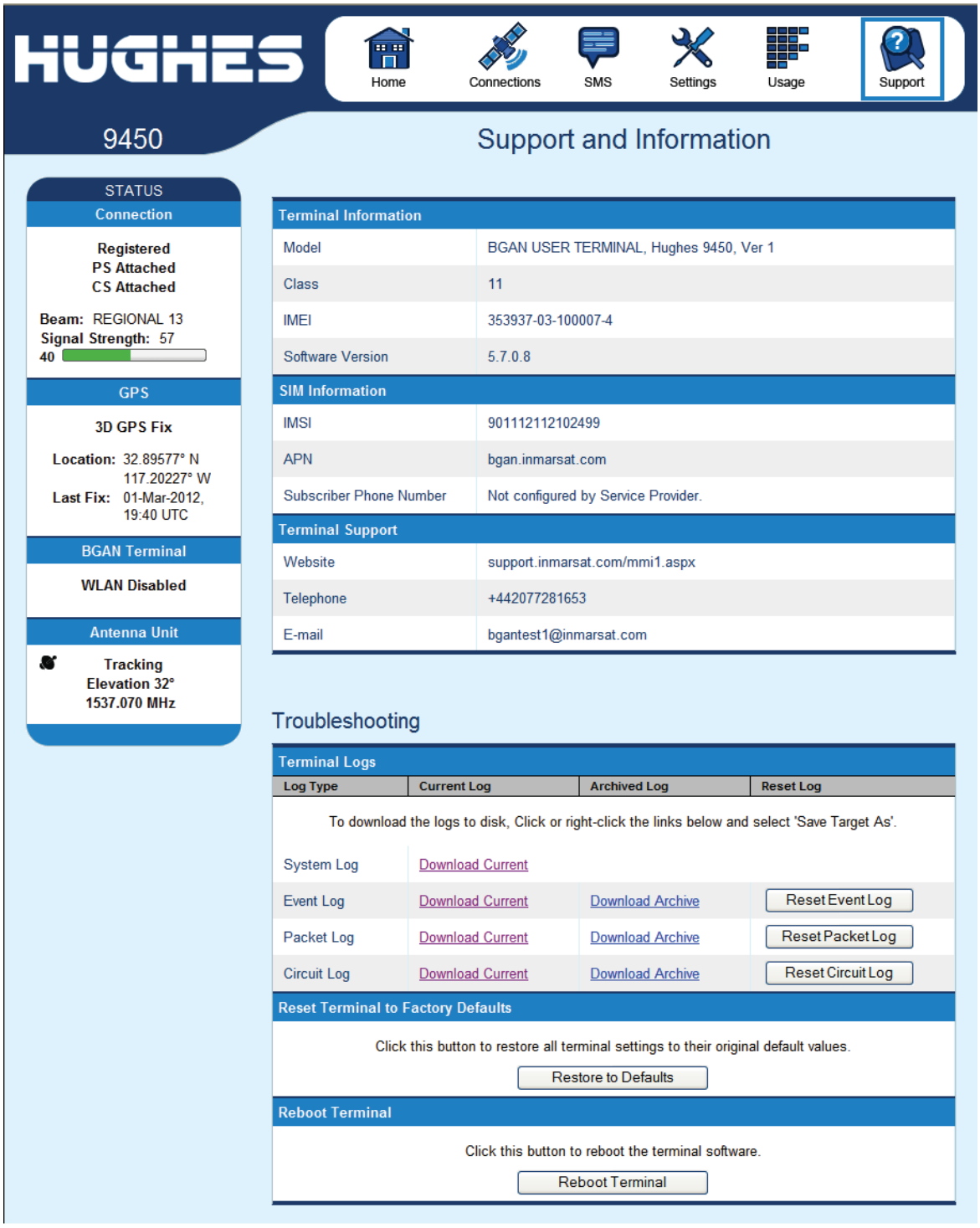


NOTICE

If the UT power is abruptly disconnected for some reason, the UT will not be able to save the statistics to flash and hence the statistics for the session (**Trip**) may be inaccurate.

Support Page

This web page allows you to display technical and support information about the terminal and retrieve logs.



Support and Information

Terminal Information

Model: this displays the UT model number.

Class: this indicates the UT Class, such as Class 11 for a land mobile terminal or Class 10 for high gain land mobile terminal.

IMEI: This displays the IMEI (serial) number of the UT.

Software Version: This displays the current version of software that is running on the UT.

SIM Information

IMSI: This displays the IMSI number of the SIM card in the UT. If is the IMSI is not displayed, it indicates that there is a problem reading the SIM card, e.g. because there is no SIM, it is installed incorrectly or PIN must be entered.

APN: This is read directly from the SIM card.

Subscriber Phone Number: this field displays the MSISDN or phone number for the terminal's voice service. The number is only displayed if the number was configured in the SIM by your service provider. Even if no number is shown, the service may still be active because this field is just for your information and is not required for the service to operate.

Terminal Support – contact information retrieved from the SIM card.

Website
Telephone
E-Mail

Troubleshooting

Terminal Log Files: This allows you to extract and save any of the following log files for troubleshooting purposes:

System Log
Event Log
Packet Log

Circuit Log

These files can be e-mailed to Hughes directly for fault analysis if the user experiences any problems.

Reset Terminal to Factory Defaults: Clicking the "Restore To Defaults" button will restore the UT back to the factory default settings and delete any of the user parameters that have been set-up in the UT.

NOTICE

Hughes highly recommends that the user exhaust all possible troubleshooting procedures before using this feature

Reboot terminal: Clicking this button reboots the terminal so that configuration changes can be saved into the configuration file or can be used when just a simple reboot of the terminal is required.

Troubleshooting

Problem	Possible Cause	Possible Solution
Terminal will not turn on	Power switch not on	Check the power switch is in the ON position and LED is on
	No ignition sense	Check positive voltage is applied to the ignition sense pin of the power connector
	Fuse is blown	Remove fuse and check. Refer to Installation Manual
Cannot get SIM card to lock into position	SIM is not correctly oriented for insertion	Ensure the SIM is pressed firmly into the SIM slot Ensure the SIM is oriented as shown in on the terminal and in the **Install Guide**
The BGAN LaunchPad or web UI will not connect to the terminal	No interface connection between the terminal and computer	Ensure there is a WLAN or Ethernet connection between the terminal and computer, see **User Guide**
	Your computer is configured with a static IP address in the wrong subnet. Default UT IP address is: **192.168.128.100**	Check the IP configuration settings on your computer. Enable DHCP or use a static IP address in the same subnet as the UT local IP address. Default UT IP address is: **192.168.128.100**

Problem	Possible Cause	Possible Solution
Terminal will not accept incoming ISDN calls	The MSN programmed into the ISDN device does not match the MSN programmed into the terminal	Ensure the appropriate MSN is programmed into the ISDN device, see **User Guide** Ensure the appropriate MSN is programmed into the terminal, see ISDN Section of **User Guide**
Terminal will not make outgoing ISDN calls	ISDN power sourcing is turned off Terminal is not Registered with the Network.	Enable the ISDN power sourcing from the BGAN LaunchPad or ISDN web UI page (unless the ISDN device has a separate power source). Check the Properties page in web UI to make sure the unit is CS attached.
ISDN device does not operate correctly	The ISDN device is trying to draw too much power from the satellite terminal's ISDN interface The device you are connecting is not an ISDN device. It might be an Ethernet device that you are accidentally connecting to the ISDN port. Make sure that you don't have both RJ-11 and ISDN handsets connected at the same time.	Only connect an ISDN device that draws less than 70mA of current at 40V (equivalent power 2.8W) Make sure you connect only ISDN devices to the ISDN port Remove one of the handsets and reboot the terminal.
Terminal is connected to the BGAN network, but cannot obtain the requested Quality of Service	Network temporarily not available User tried to set up a 256 Kbps streaming connection.	Retry again. If problem persists, contact your service provider. The Inmarsat Network only supports 256K for Class 10 >45 degree look angle and 128K connections for Class 11 UT's

Problem	Possible Cause	Possible Solution
Terminal does not obtain a GPS fix	Terminal's location limits visibility of 3 or more GPS satellites.	Move the vehicle / terminal to a location where there are few obstructions such as trees or tall buildings, so that as much as possible of the sky is visible.
None of the above solutions resolve the problem	Terminal may have a hardware or software fault, and needs to be re-booted.	Remove power. Wait 30 seconds. Reconnect the DC power and turn on the terminal.

Technology Overview

GPS

The Global Positioning System (GPS) uses 24 orbital satellites to determine the position of the Terminal anywhere on the globe.

Obtaining a GPS Fix

In normal operation, a GPS receiver, such as that built in to the Tracking Antenna, needs to be able to receive signals from at least four satellites so that it can then calculate a latitude, a longitude and an altitude – this position fix is referred to as a 3-dimensional or 3-D fix. If only three GPS satellites can be seen by the GPS receiver, then the last available altitude measurement is assumed and the GPS receiver calculates a position fix based on latitude and longitude only. This simpler position fix is referred to as a 2-dimensional or 2-D fix and is quicker and easier to obtain than a 3-D fix, but may be less accurate.

The GPS receiver may take between a few seconds and a few minutes to obtain a GPS fix, depending on how frequently the GPS receiver is being used. The frequency of use determines the how quickly the GPS Terminal is able to start.

- Hot start – if the GPS receiver is being used frequently, (that is, in the last two hours), it is regularly updated with data from the GPS satellites, and so only takes a few seconds to obtain a GPS fix after being switched on.
- Warm start – if a GPS receiver has not been used for more than two hours then it will take up to 45 seconds to obtain a GPS fix.
- Cold start – if the GPS receiver has not been used for some time or is 300 km or more from where it was last used, it can take as long as 15 minutes to obtain a valid position fix.

The time taken to obtain a valid GPS fix can also be affected by the visibility that the GPS receiver has of the GPS satellites. The GPS system is relatively tolerant of atmospheric conditions such as heavy cloud or rainfall. However, physical blockages, such as tall buildings or terrain can significantly degrade the ability of the GPS receiver to obtain a fix. For this reason, ensure that the GPS receiver has a clear view of as much open sky as possible.

GPS and BGAN Registration

BGAN uses the accurate position and timing information obtained from GPS to help ensure efficient registration of a BGAN Terminal with the BGAN network.

ISDN

The Satellite Terminal provides an ISDN (Integrated Services Digital Network) interface to connect devices for Circuit Switched voice and data services. It is a Basic Rate (also known as 2B+D) interface and uses the Euro ISDN protocol. Note that the Satellite Terminal can only provide service for one 64Kbps B-channel at a time.

Dialing and Numbering

Dialing - As the ISDN numbering system follows the same pattern as the normal telephone system, dialing is carried out in exactly the same manner as making a normal telephone call. The subscriber number is used with the same international and area codes as any other telephone network. Start the dialed number with 00 and terminate it with a #.

Multi-Subscriber Numbering (MSN) - ISDN supports Multi-Subscriber Numbering (MSN). MSN is a facility whereby more than one telephone number can be allocated to an ISDN line. The BGAN Satellite Terminal assigns different MSNs for Voice, 3.1KHz Audio, UDI and RDI devices. Each incoming call will be directed to the appropriate MSN depending on the type of call. This allows proper routing of incoming calls to the correct ISDN device (e.g. ISDN phone, data card or Fax).

PDP Context

A Packet Data Protocol (PDP) Context defines connection aspects such as routing, Quality of Service (QoS), security and billing between a mobile user terminal, such as the BGAN Terminal, and a data network. PDP Contexts are essential to the General Packet Radio Service (GPRS) system, which is used by GSM and UMTS-based 3G networks worldwide for transmitting data.

In order for a user to be able to transfer data across a network, a PDP Context must be activated in the Terminal and associated Core Network. The procedure for this is as follows:

1. After registration with the network, the user activates a PDP Context using an application on the computer or Terminal, and requests sufficient radio resources (that is, power and bandwidth) to support the context activation procedure.
2. Once the resources are allocated, the Terminal sends the Activate PDP Context request to the Core Network. This request includes key information about the mobile user's PDP address (for example an IP address), PDP type (that is, static or dynamic address) the QoS requested for this context, the APN of the external network to which connectivity is requested, the user's identity (IMSI) and any necessary IP configuration parameters (for example, security settings).
3. On receiving the Activate PDP Context message, the Core Network checks the user's subscription record to establish whether the request is valid. If the request is valid, a virtual connection is established between the Terminal and the Core Network, and data transfer can then take place between the Terminal and the external data network, within the scope of the current PDP Context. The PDP Context is stored in both the Terminal and the Core Network.

A single Terminal may have multiple PDP Contexts each with different QoS profiles. The primary PDP Context is a PDP Context with default QoS profile attributes and is always activated first. All other PDP Contexts with the same PDP Address are secondary PDP Contexts. Secondary PDP Contexts share the same PDP Address and connect to the same APN but may have different QoS profiles.

Technical Specifications

	Terminal	C11 Antenna
Weight	2.3 Kg	2.0 Kg
Dimensions	46mm x 281mm x 234mm	Ø252mm x 119mm
Humidity	95% RH at +40˚C	95% RH at +40° C
Temperature	-25˚C to +55˚C operating -25˚C to +80˚C storage	-25° C to +55° C operating -25° C to +80° C survival
Water & Dust		IP-56 standard
Wind	N/A	125 mph (200 km/h) Exception for Magnetic Mount: 100 mph (160 km/h)
ICE	N/A	25 mm non-operational
Vehicle Motions	N/A	Turning Rate: 40°/s Turning acceleration 50°/s^2
Power (terminal plus antenna)	*Idle: 32 W Max: 65 W (when transmitting)	

*__Note__: This does not include power delivered to any PoE devices connected.

Declaration of Conformity

We,

Hughes Network Systems

(manufacturer's name)

of

9605 Scranton Road, Suite 500, San Diego, CA 92121, USA

(address)

declare under our sole responsibility that the product

Land Mobile BGAN Terminal, Model 9450

(detailed description of product including name, type, model and supplementary information such as lot, batch or serial number, sources and number of items)

to which this declaration relates, is in conformity with the following standards and/or other normative documents.

For article 3.1(a), Health and Safety of the User:

EN 62311 (2008-01)

IEC 60950-1:2005 (2nd Edition); Am 1:2009 and/or EN 60950-1:2006/A11:2009/A1:2010

For article 3.1(b), Electromagnetic Compatibility:

EN 301 489-1 V1.8.1 (2008-04), EN 301 489-17 V2.1.1 (2009-05), EN 301 489-20 V1.2.1 (2002-11)

EN 55022:2006/A1:2007, EN 61000-4-2: 2009, EN 61000-4-3:2006, EN 61000-4-6:2006, ISO 7637-2

For article 3.2, Effective Use of the Spectrum Allocated:

EN 301 444 V1.1.1 (2000-05),

EN 300 328 V1.7.1 (2006-10)

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 IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body(ies):

Nemko AS

Gåsevikveien 8

2027 Kjeller

Norway

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

Hughes Network Systems, 9605 Scranton Road, Suite 500, San Diego, CA 92121, USA

(name and address of EU representative)

Bill Lindsay

(name)

Senior Engineering Program Director

(title) September 29, 2010

(signature of authorized person)

FCC Compliance

- This device conforms to the FCC rules. Any changes or modifications to Hughes Network Systems' equipment, not expressly approved by Hughes Network Systems, could void the user's authority to operate the equipment.
- To comply with FCC RF exposure requirements, this device must be operated with a minimum separation distance of 20 cm or more from a person's body. Other operating configurations should be avoided.
- 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.

EU RoHS (Restriction of Hazardous Substances) Directive

Unless otherwise noted, all products, assemblies, and sub-assemblies manufactured by Hughes and its sub-contractors will be compliant with this directive and any subsequent revisions or amendments.

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 Hughes 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 addition information, contact Hughes Network Systems at: **www.hughes.com**.

Glossary

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 APN's 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, "The Terminal," or UT. This device implements and manages BGAN satellite communications between your computer and Service Provider's network.

Quality of Service: Quality of Service (QoS) assigns a level of priority to certain types of data traffic, in particular high bandwidth applications such as video and multimedia. QoS 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 directed to the correct IP address over the Internet.

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 in suitable LaunchPad windows.

GPS: Global Positioning System. The GPS receiver in the Satellite Terminal receives signals from the constellation of GPS satellites. It uses these signals to determine the Terminal's location on earth. That location is used during registration to gain access to the BGAN system.

IP Address: An Internet Protocol address, or IP address, is a number that uniquely identifies the computer accessible over a TCP/IP-based LAN or the Internet that is sending or receiving information. An IP address is a 32-bit numeric address written as four numbers, separated by periods and each number is between 0 and 255. For example, 207.115.79.4 is an IP address. In the BGAN system, IP addresses for the Network and the TE can be dynamic or static.

Network Dynamic IP Address: A network dynamic IP address is a temporary address that is assigned by your BGAN Service Provider when you connect to the BGAN Network.

Network Static IP Address: If required, a static IP address can be assigned by Service Providers to BGAN users when the SIM is provisioned. This static IP address is used every time you connect to the BGAN network and is associated with a specific username and password.

DHCP Address: Local IP address that is assigned by the UT DHCP server to the TE once connected to the UT. This is a private IP address that is not routable within the Internet.

Terminal Local IP Address: IP address of the UT to access the web UI and talk to the UT via LaunchPad. This address is configurable by the user. The default local IP address of the terminal is 192.168.128.100

Power-over-Ethernet (POE): Connection that provides power through an Ethernet cable.

Standard Connection: A standard connection is charged by volume of data sent. 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 gives you a guaranteed data rate and is charged by the amount of time the connection is active. Streams are typically used for multimedia data, such as video.

TE (Terminal Equipment): Terminal equipment refers to the piece of equipment that is connected to the BGAN UT (e.g. laptop, video equipment, phone, etc.)

Traffic Flow Template: A Traffic Flow Template, also called an Application Template, is a series of data filters such as QoS (Quality of Service), PDP Context and security settings, that allow the Core Network to classify packets received from an external network into the correct PDP Context. When incoming

data arrives at an access point in the core network, a packet classifier will make a PDP Context selection based on the Traffic Flow Template, and map the incoming data packets into the PDP Context with the correct QoS attributes. The use of a Traffic Flow Template allows multiple PDP Contexts to be associated with the same PDP address.

UT (User Terminal): The user terminal is the BGAN modem device, i.e. the Hughes 9450.

SIM Card: Your BGAN Service Provider supplies you with a Universal Mobile Telecommunications System Subscriber SIM (SIM) Card.

The SIM card is similar to the SIM Card that is commonly used in a GSM phone. The card holds a microchip that stores information and encrypts voice and data transmissions, making it extremely difficult to listen in on calls. The SIM Card also stores data that identifies the caller to the BGAN Service Provider.

Virtual Private Network: A Virtual Private Network (VPN) enables remote offices or users to gain secure access to 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, 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.