

HUGHES[®]



Hughes 9502 Fixed Satellite Terminal

User Guide

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Revision A



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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 d'alerte de sécurité attirent l'attention sur les dangers potentiels et de vous dire comment les éviter. Ces messages sont identifiés par un signal mots DANGER, AVERTISSEMENT, ATTENTION, ou avis, comme illustré ci-dessous. Pour éviter des dommages matériels, des blessures ou la mort dans certains cas possible de lire et de respecter tous les messages d'alerte de sécurité.

Messages concerning personal injury / Messages concernant des blessures corporelles

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.

Le signal de DANGER mots, AVERTISSEMENT et ATTENTION indiquer les dangers qui pourraient entraîner des blessures ou, dans certains cas la mort, comme expliqué ci-dessous. Chacun de ces mots du signal indique la gravité du danger potentiel.



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

DANGER indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, entraînera la mort ou des blessures graves.

 **WARNING**

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

AVERTISSEMENT indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, pourrait entraîner des blessures graves.

 **CAUTION**

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

ATTENTION indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, pourrait entraîner des blessures mineures ou modérées.


**Messages concerning
property damage /
Messages concernant des
dommages matériels**


NOTICE

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

AVIS est utilisée pour les messages concernant les dommages matériels, des dommages au produit ou de dysfonctionnement, de perte de données ou d'autres résultats indésirables, mais des blessures non personnelle.

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.

Le symbole générique d'alerte suivant  attire l'attention sur un danger potentiel de risque de blessures. Il apparaît à côté des mots DANGER, AVERTISSEMENT et ATTENTION dans le cadre de l'affichage d'alerte. D'autres symboles peuvent apparaître à côté de DANGER, AVERTISSEMENT ou ATTENTION pour indiquer un type spécifique de danger (par exemple, un incendie ou un choc électrique). Si d'autres symboles de danger sont utilisés dans ce document, ils sont décrits dans cette section.

Additional symbols / Symboles supplémentaires



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.

Avertissement Danger possible de Fréquence Radio (RF). A la vue de ce symbole d'alerte et du terme AVERTISSEMENT, suivez rigoureusement les instructions d'avertissement afin d'éviter une blessure aux yeux ou toute autre blessure .



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

Avertissement A la vue de ce symbole d'alerte et du terme AVERTISSEMENT, suivez rigoureusement les instructions d'avertissement pour éviter toute blessure.



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.

Danger Risque de choc électrique: A la vue de ce symbole d'alerte et du terme DANGER, suivez rigoureusement les instructions d'avertissement pour éviter tout choc électrique ou blessure mortelle.

Warnings for Satellite Terminal / Avertissements pour le Terminal Satellite



Do not stand in front of the ODU (Antenna)
This device emits radio frequency energy. To avoid injury, do not place head or other body parts in front of the satellite ODU when system is operational. Maintain a distance of 1 m or more from the front of the Satellite Terminal ODU.

Ne pas se tenir en face de l'ODU (antenne)
Cet appareil émet une énergie de fréquence radio. Pour éviter toute blessure, ne placez pas la tête ou toute autre partie du corps en face de l'ODU satellite lorsque le système est opérationnel. Maintenez une distance de 1 m ou plus par rapport à l'ODU du terminal satellite.



General Handle your Satellite Terminal with care. Avoid exposing your Satellite Terminal to extreme hot or cold temperatures outside the range -40°C to +75°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 will void the Warranty and 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 ODU 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.

Général Manipulez votre terminal satellite avec soin. Évitez d'exposer votre terminal satellite à des températures extrêmement chaudes ou froides en dehors de la plage -40 ° C à 75 ° C.

Évitez de placer le terminal à proximité de la cigarette, de flammes nues ou de toute source de chaleur.

Les changements ou modifications apportées au Terminal et non expressément approuvées par Hughes Network Systems annulent la garantie et peuvent annuler votre droit à utiliser cet équipement.

Utilisez uniquement un chiffon doux humide pour nettoyer le terminal.

Pour éviter toute dégradation des performances du terminal , veuillez vous assurer que l'ODU de l'unité n'est pas endommagée ou recouverte d'un corps étranger, comme de la peinture ou de l'étiquetage.

Lorsque vous insérez la carte SIM, ne pas la plier ni endommager les contacts en aucune manière. Ne pas forcer lors de la connexion des câbles d'interface.



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.

A proximité de travaux de dynamitage et d'environnements explosifs N'utilisez jamais le terminal satellite près de travaux de dynamitage en cours. Respectez toutes les

restrictions et suivez toutes les instructions ou la réglementation. Les zones présentant une atmosphère potentiellement explosive sont généralement, mais pas toujours, clairement signalées.



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.

Service Qualifié N'essayez pas de démonter votre terminal satellite. L'unité ne contient pas de composants réparables par le consommateur. Seul le personnel qualifié peut installer ou réparer le matériel.



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.

Accessoires Utilisez uniquement des accessoires approuvés par Hughes. L'utilisation d'accessoires non approuvés peut entraîner une dégradation de performance, un endommagement du terminal satellite, un incendie, une électrocution ou des blessures.



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.

Connexion de périphériques Ne jamais connecter des périphériques incompatibles au terminal satellite. Lors du raccordement du terminal satellite à un autre appareil, lire le manuel utilisateur du périphérique pour les instructions détaillées de sécurité.



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 one meter from the front and sides of the ODU 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.

Stimulateurs Cardiaques Les différentes marques et modèles de stimulateurs cardiaques disponibles présentent un large éventail de niveaux d'immunité aux signaux radio. Par conséquent, les personnes qui portent un stimulateur cardiaque et qui veulent utiliser un terminal satellite doivent demander l'avis de leur cardiologue. Si, en tant qu'utilisateur de stimulateur cardiaque, vous êtes toujours soucieux d'une éventuelle interaction avec le terminal satellite, nous vous suggérons de suivre ces directives:

- Maintenez un mètre de distance entre votre stimulateur cardiaque et l'avant ou les côtés de l'ODU;
- Reportez-vous à la documentation de votre stimulateur cardiaque pour toute information spécifique à celui-ci.

Si vous avez un doute que des interférences se produisent, éteignez votre terminal satellite immédiatement.



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.

Appareils Auditifs La plupart des nouveaux appareils auditifs sont insensibles aux interférences dues aux fréquences radio des terminaux satellites situés à plus de 2 m . De nombreux modèles plus anciens peuvent être sensibles aux interférences, ce qui les rend très difficiles à utiliser à proximité d'un terminal. En cas d'interférences détectées, veuillez maintenir une distance supplémentaire entre vous et le terminal.



Electrical Storms installation of the Satellite Terminal during electrical storms may result in severe personal injury or death.

Orages Electriques L'installation d'un terminal satellite pendant un orage électrique peut entraîner des blessures graves ou mortelles.



Protective Earth Grounding is recommended by Hughes for both the IDU and the ODU equipment. Please consult professional local advice for these requirements.

Une mise à la terre de protection est recommandée par Hughes à la fois pour l'IDU et le matériel ODU. Veuillez consulter un conseil professionnel local pour ces spécifications.

Chapter 1 Product Description

Contents of the Hughes 9502 Kit

The Hughes 9502 Kit (P/N 3500509-0001) is a two piece design that comes with an Indoor Unit (IDU), an Outdoor Unit (ODU) and a 10 meter RF cable with N to TNC adapter.



Figure 1 – IDU P/N 3500563-0001



Figure 2 – RF Cable with N to TNC adapter P/N 3500634-0001



Figure 3 – ODU P/N 3500564-0001

Optional Mounting Accessories

The IDU can be mounted using the IDU strap (P/N 3500617-0001) if desired. The ODU can be mounted using the Basic Fixed Mount Kit (P/N 3004066-0002) or by using the azimuth elevation bracket (P/N 1022994-0022) and an existing 1.5” diameter pole.

Main features of the 9502

The main features of the Hughes 9502 terminal are listed below:

- Use of Internet Protocol (IP) via the BGAN satellite network
- Remote Management
 - Web UI interface
 - SMS Control
 - AT Command Control
 - Log file upload
 - Terminal configuration
 - Remote firmware upgrade
- Power Savings and Sleep Mode
- IP Watchdog
- Install Mode
- XL-band ready
- Relay Mode

- Auto Power ON when power is applied
- Automatic PDP Context Activation (Static or DHCP)
- Dedicated M2M webUI
- Security
 - Ethernet MAC Filtering
 - Administration Password
 - SMS Control password
 - White List for SMS control
 - AT Command password lock
 - SIM Personalization
 - Phone-to-SIM
 - DP SIM Lock
 - SP SIM Lock

Interfaces

The Hughes 9502 has the following interfaces:

- Ethernet connection (RJ45)
- USB 1.1 connection (USB Type-B) for PC to configure terminal
- TNC type RF connector on IDU and N-type RF connector on the ODU
- Integrated GPS receiver and L-band ODU
- RS232 serial interface (DB9 male, DTE) to external NMEA 0183 based GNSS device (e.g., GLONASS receiver). This port **cannot** be used for serial data.
- 3 LED status display and a single function button
- 3.5 mm stereo audio jack for audio tone or voltage level to assist in ODU pointing
- USIM card slot behind SIM door



Figure 4 – Front side view of IDU

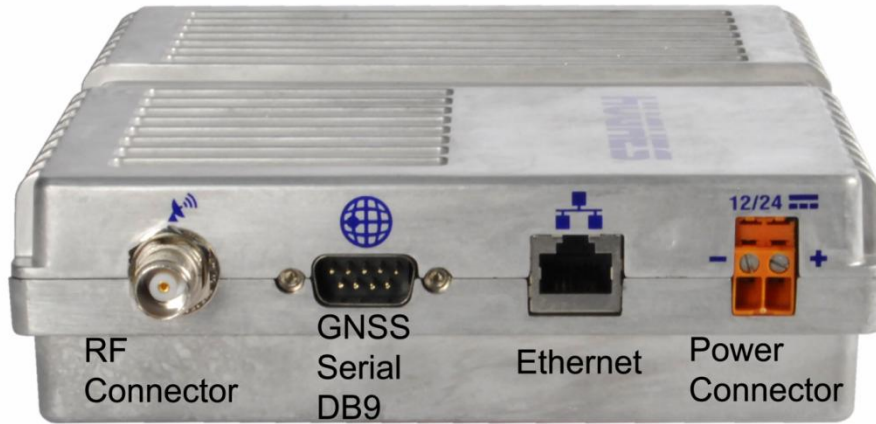


Figure 5 – Back side view of IDU

Terminal Specifications

| Technical Specifications | |
|--------------------------------------|--|
| Satellite TX Frequency | @ 1626.5 – 1675MHz |
| Satellite RX Frequency | @ 1518 – 1559 MHz |
| GPS Frequency | @ 1574.42 – 1576.42 MHz |
| 9502 Indoor Unit Weight: | 1.12 Kg |
| 9502 Indoor Unit Dimensions: | 150 mm x 200 mm x 45 mm |
| 9502 External Antenna Weight: | 1.85 Kg (exclude mount and cable) |
| 9502 External Antenna Dimensions: | 385 mm x 385 mm x 33 mm |
| Operating Temperature | -40°C to +75°C |
| Storage Temperature | -55°C to +75°C |
| Humidity | 95% RH at +40°C |
| 9502 External Antenna Wind loading | Survival wind loading (with optional mount) up to 100 mph |
| 9502 Indoor Unit Water and Dust | IP-40 Compliant |
| 9502 External Antenna Water and Dust | IP-65 Compliant |
| Nominal Input Voltage | +12VDC / +24VDC |
| Data Connectivity: | RJ45 connector (Ethernet 10BaseT) USB –Type B (USB 1.1 for configuration PC) |
| Other Features: | Single external BGAN Satellite and GPS antenna connection GPS module inside Indoor Unit 3 status LEDs Antenna pointing audio tone and voltage level indicator through audio jack SIM/USIM Slot (behind SIM door) |

Table 1 – Terminal Specifications

Chapter 2 Configuration via Web UI

The UT is typically configured via the Web User Interface (UI).

Web UI Layout

The Web User Interface (UI) can be accessed from a PC browser by entering 192.168.128.100 as the URL (unless you change the IP address of the UT.) The Web UI can be used with IE8 or 9, Mozilla or Safari.

Table 2 shows the 9502 Web UI layout:



| Home | Connections | Settings | M2M | Security | SMS |
|------|--------------------------------|--|-----------|----------|---|
| Home | Manage Contexts Manage APNs | IP Address/DHCP Settings Ethernet Port ATC | M2M Setup | Security | Send/Receive SMS Saved Drafts Sent Messages |

Table 2 – 9502 WebUI Layout

Home Tab

The home page includes the following fields:

Terminal Information

- Model
- IMEI
- Software Version

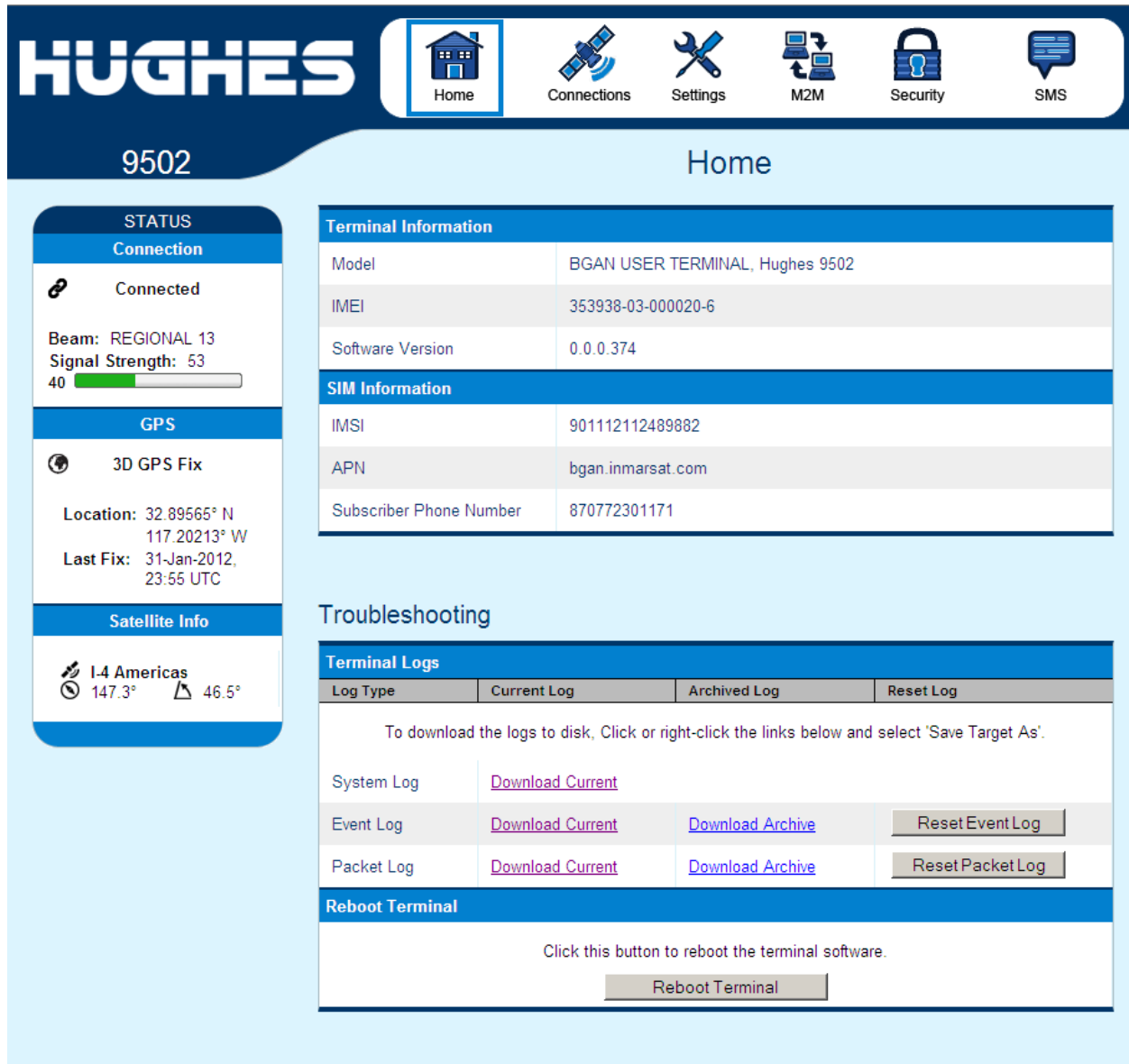
SIM Information

- IMSI
- SIM APN
- Terminal phone number

Troubleshooting

- System Log
- Event Log
- Packet Log

These files can be FTP'd out of the UT and used for debugging. To download the logs right-click on the "Download Current" link and select "Save Target As".



The screenshot displays the Hughes 9502 Home Page. At the top, there is a navigation bar with icons for Home, Connections, Settings, M2M, Security, and SMS. The main content area is divided into several sections:

- STATUS Connection:** Shows the device is "Connected" with a signal strength of 53 and a beam of REGIONAL 13. A signal strength indicator shows 40%.
- GPS:** Shows "3D GPS Fix" with location coordinates (32.89565° N, 117.20213° W) and a last fix time of 31-Jan-2012, 23:55 UTC.
- Satellite Info:** Shows "I-4 Americas" with a signal strength of 147.3° and a bearing of 46.5°.
- Terminal Information:** A table listing device details:

| | |
|------------------|---------------------------------|
| Model | BGAN USER TERMINAL, Hughes 9502 |
| IMEI | 353938-03-000020-6 |
| Software Version | 0.0.0.374 |
- SIM Information:** A table listing SIM details:


| | |
|-------------------------|-------------------|
| IMSI | 901112112489882 |
| APN | bgan.inmarsat.com |
| Subscriber Phone Number | 870772301171 |
- Troubleshooting Terminal Logs:** A table with columns for Log Type, Current Log, Archived Log, and Reset Log. It provides links to download logs and buttons to reset them.

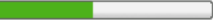
| Log Type | Current Log | Archived Log | Reset Log |
|------------|----------------------------------|----------------------------------|---|
| System Log | Download Current | | |
| Event Log | Download Current | Download Archive | <input type="button" value="Reset Event Log"/> |
| Packet Log | Download Current | Download Archive | <input type="button" value="Reset Packet Log"/> |
- Reboot Terminal:** A section with a button to "Reboot Terminal" and a note: "Click this button to reboot the terminal software."

Figure 6 - Home Page


STATUS

Connection

 **Connected**




Beam: REGIONAL 13
 Signal Strength: 56
 40 

GPS

 **3D GPS Fix**

Location: 32.89573° N
 117.20222° W
 Last Fix: 28-Nov-2011,
 15:51 UTC

Satellite Info

 **I.4 Americas**
 147.3°  46.5°

Status Bar

The status bar is included on the home page and other pages that do not have a navigation bar. It includes a field with the elevation angle and compass direction towards the visible satellite(s).

The status text in the *Connection* section is as shown in Table 3 – Status Bar below.

| Display | Comments | Corresponding LED display |
|--------------|---|--|
| Initializing | Initial start up (~15-20 secs) | Various |
| Pointing | UT in pointing mode | All three LEDs flash 1Hz |
| Registering | Attempting to register - pointing mode exited or bypassed | PWR on, GPS on or flashing, NET off |
| Registered | Registered and attached, no context | PWR on, GPS on and NET flashing |
| Connected | PDP context active | All three on (or off after 1 minute timeout) |

Table 3 – Status Bar

The signal strength bar shows the quality of the received signal. The same scale is used for all beam types and so during pointing only the left part of the bar is used. The signal strength in the Global Beam should be 46 to 52dB when it is pointed correctly (the higher the better).

The signal strength increases in value as you transition to the Regional Beam and again when you get a PDP context and transition to the Narrow Beam.

The *GPS* status area shows the status of the GPS fix and results are shown in the following table:

| Display | Comments |
|------------|---|
| Acquiring | Trying to acquire a GPS fix |
| Stored | UT is using a Stored GPS fix |
| 2D GPS Fix | The UT has acquired a @D GPS fix and can continue Registration with the network |
| 3D GPS Fix | The UT has acquired a 3D Fix |
| Location | Shows Latitude and Longitude coordinates if allowed by network GPS Policy |
| Last Fix | Shows date and UTC time of last GPS fix |

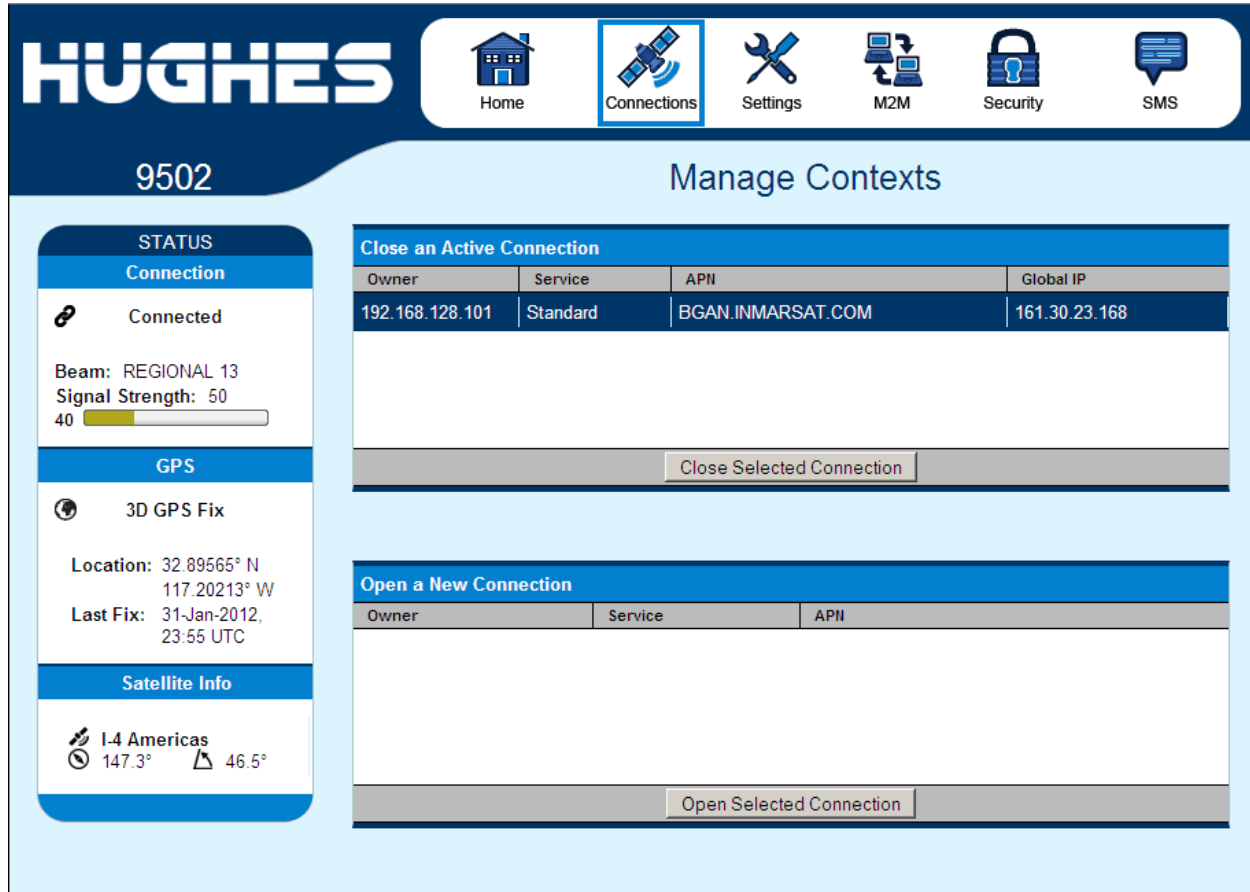
Table 4 – GPS Status

The *Satellite Info* section shows the satellite that the UT should be pointed to and gives the Azimuth and elevation angles to the satellite. When the UT is in an overlap region, the Satellite Info section will show both satellites and the user will have to pick the best one to point to.

Connections Tab

Manage Contexts Page

The Manage Contexts page under the Connections tab displays the status of any active contexts and allows contexts to be controlled. Typically this page will not be used and you configure context activation via the always on option on the M2M page.



HUGHES 9502 **Manage Contexts**

Home | **Connections** | Settings | M2M | Security | SMS

STATUS

Connection

Connected

Beam: REGIONAL 13
Signal Strength: 50
40

GPS

3D GPS Fix

Location: 32.89565° N
117.20213° W
Last Fix: 31-Jan-2012,
23:55 UTC

Satellite Info

I-4 Americas
147.3° 46.5°

Close an Active Connection

| Owner | Service | API | Global IP |
|-----------------|----------|-------------------|---------------|
| 192.168.128.101 | Standard | BGAN.INMARSAT.COM | 161.30.23.168 |

Close Selected Connection

Open a New Connection

| Owner | Service | API |
|-------|---------|-----|
|-------|---------|-----|

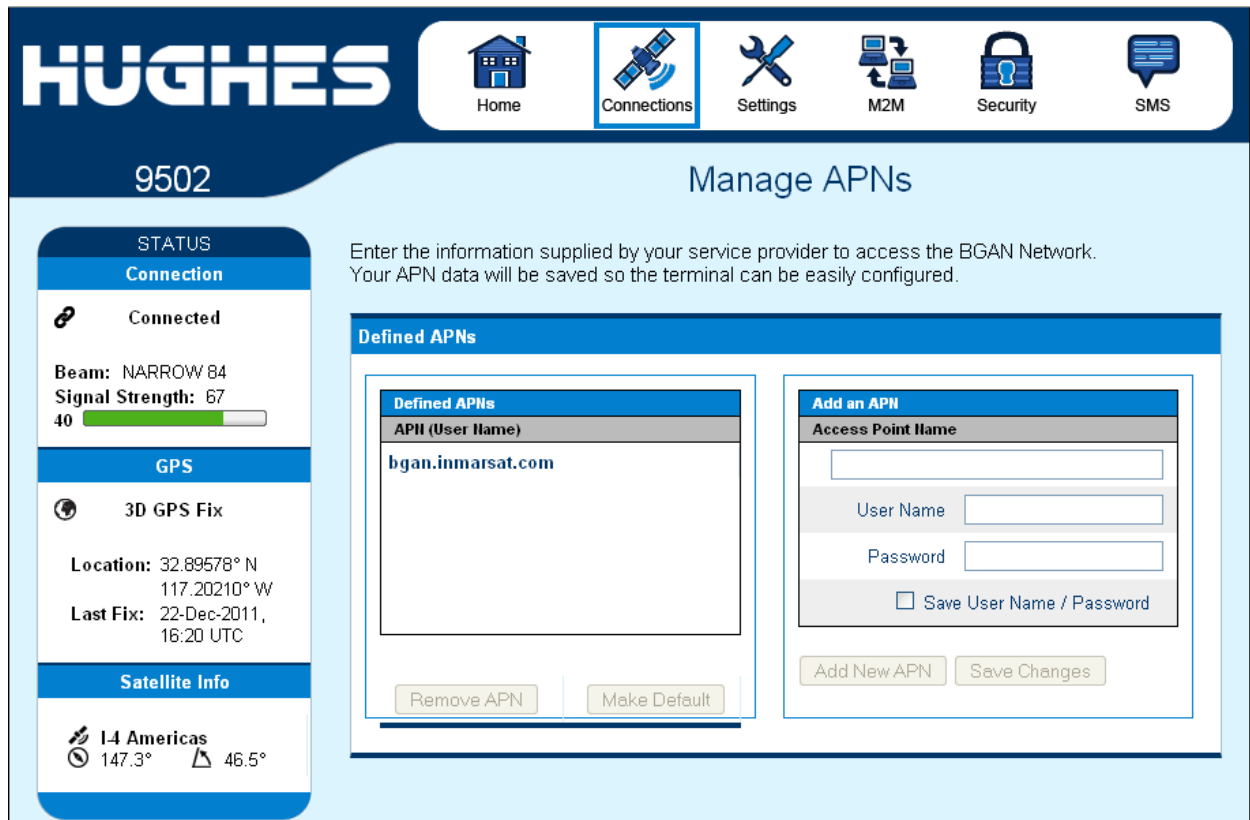
Open Selected Connection

Figure 7 – Manage Contexts

Manage APNs Page

The Manage APNs page under the Connections tab allows the user to view the available APNs and define new ones, e.g. if the correct APN is not configured in the SIM.

To make an APN the default, select it in the Defined APNs list and press “Make Default”. The selected APN will be moved to the top of the list and shown in bold font. If an Always on Context is already defined, you must manually update the configuration on the M2M page to change to the new APN.



HUGHES Home Connections Settings M2M Security SMS

9502 Manage APNs

STATUS
Connection
 Connected
 Beam: NARROW 84
 Signal Strength: 67
 40

GPS
 3D GPS Fix
 Location: 32.89578° N
 117.20210° W
 Last Fix: 22-Dec-2011,
 16:20 UTC

Satellite Info
 I-4 Americas
 147.3° 46.5°

Enter the information supplied by your service provider to access the BGAN Network.
 Your APN data will be saved so the terminal can be easily configured.

Defined APNs

| Defined APNs |
|--------------------------|
| APN (User Name) |
| bgan.inmarsat.com |

Remove APN Make Default

Add an APN

Access Point Name

User Name

Password

Save User Name / Password

Add New APN Save Changes

Figure 8 – Manage APNs

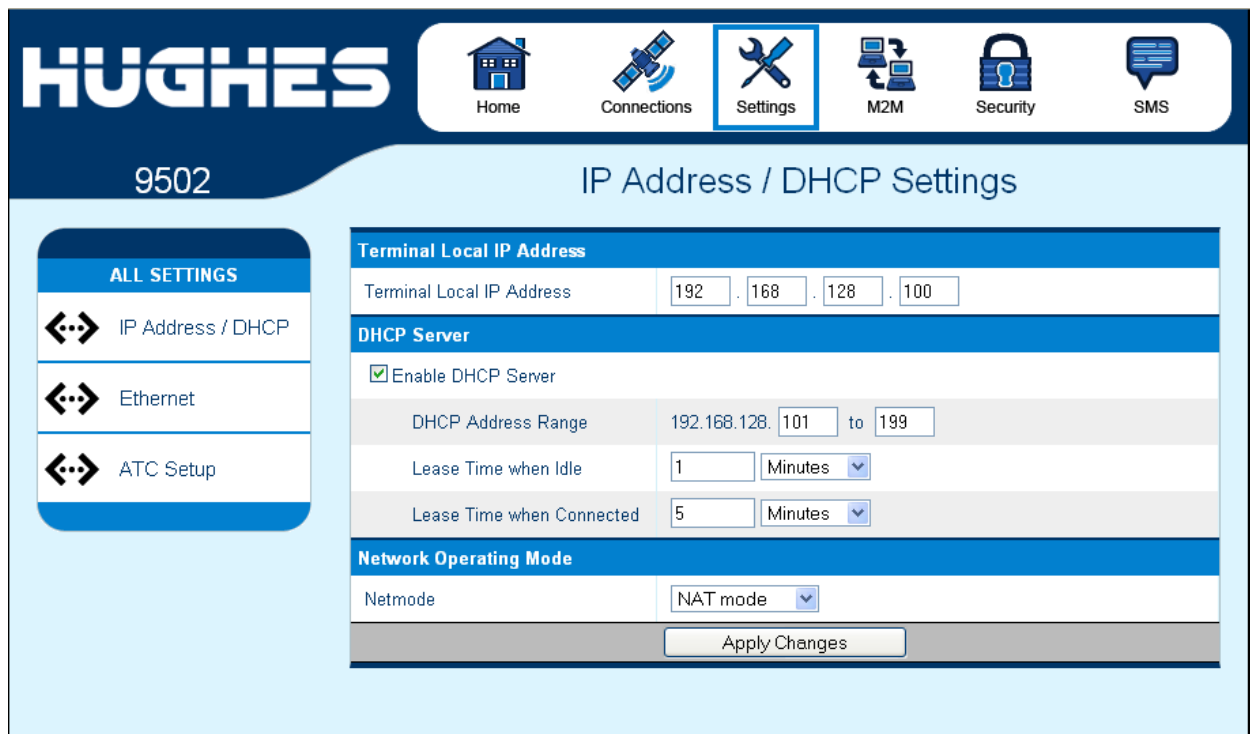
Settings Tab

The settings tab has the following configuration pages:

IP Address/DHCP Settings

The IP settings page under the Settings tab includes the following fields:

- Terminal Local IP address
- DHCP Server enable
- DHCP Address Range
- Lease Time when Idle
- Lease Time when Connected
- Network Mode field: NAT or Relay (see Network Mode section.)



The screenshot displays the 'IP Address / DHCP Settings' page. At the top, there is a navigation bar with icons for Home, Connections, Settings (highlighted), M2M, Security, and SMS. Below the navigation bar, the page title '9502 IP Address / DHCP Settings' is visible. On the left side, there is a sidebar with 'ALL SETTINGS' and three menu items: 'IP Address / DHCP', 'Ethernet', and 'ATC Setup'. The main content area is divided into three sections:

- Terminal Local IP Address:** A field for 'Terminal Local IP Address' with the value '192 . 168 . 128 . 100'.
- DHCP Server:** A section containing:
 - A checked checkbox for 'Enable DHCP Server'.
 - A field for 'DHCP Address Range' with the value '192.168.128.101 to 199'.
 - A field for 'Lease Time when Idle' with the value '1' and a dropdown menu set to 'Minutes'.
 - A field for 'Lease Time when Connected' with the value '5' and a dropdown menu set to 'Minutes'.
- Network Operating Mode:** A field for 'Netmode' with a dropdown menu set to 'NAT mode'.

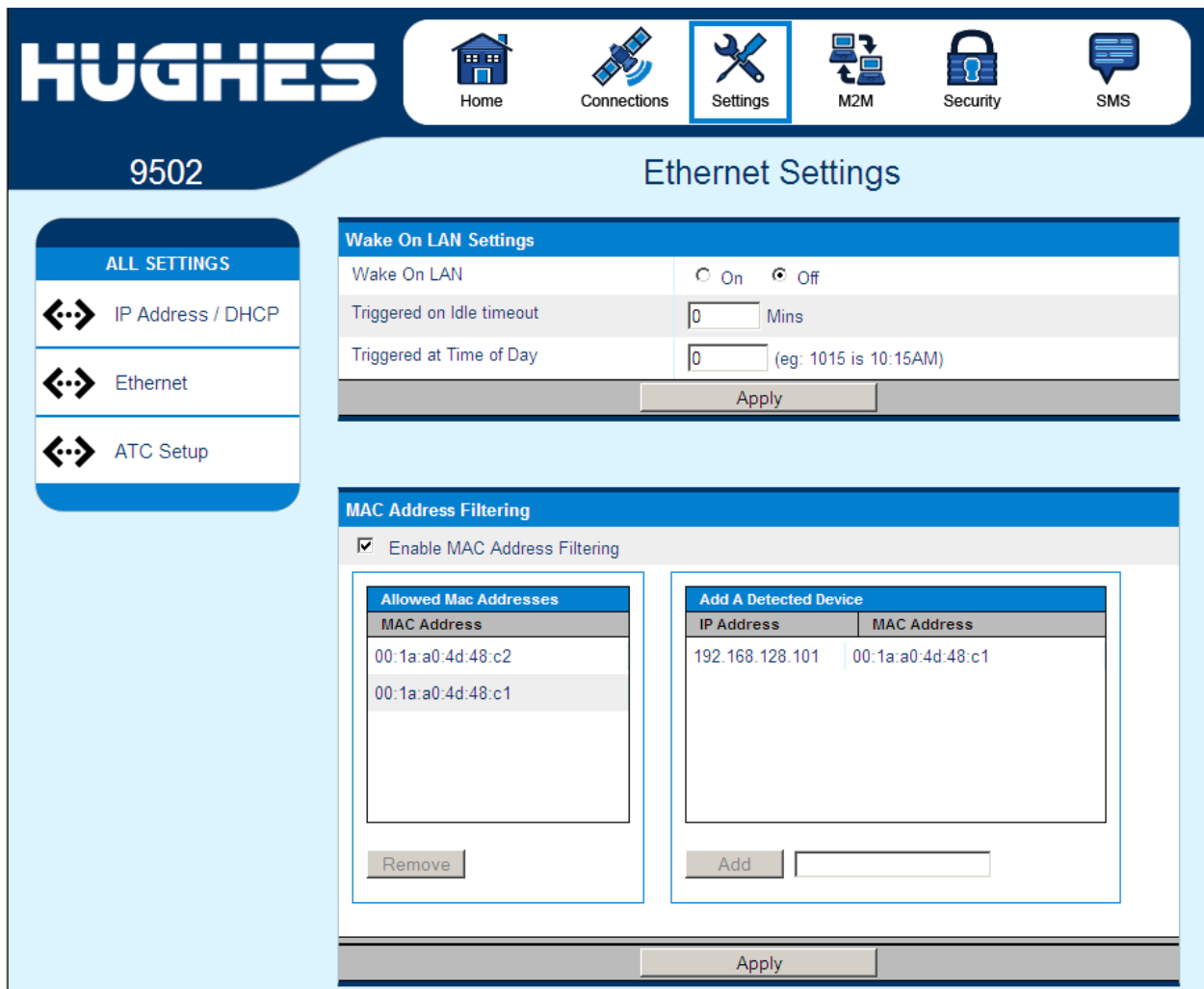
At the bottom of the settings area, there is an 'Apply Changes' button.

Figure 9 – IP Address/DHCP Settings

Ethernet Port Page

The Ethernet Port settings page includes:

- Wake On LAN (see Wake on LAN (Any Packet section)):
 - Wake On LAN – On/Off radio button
 - Wake On LAN idle timer – in minutes
 - Wake On LAN time of day – 24 hour clock
- MAC Address filtering:
 - Ethernet MAC Address filtering enable tick box
 - Table of allowed Ethernet MAC addresses.



The screenshot shows the 'Ethernet Settings' page for a device with ID 9502. The interface includes a navigation bar with 'Home', 'Connections', 'Settings' (highlighted), 'M2M', 'Security', and 'SMS'. A sidebar on the left lists 'ALL SETTINGS' with options for 'IP Address / DHCP', 'Ethernet', and 'ATC Setup'. The main content area is divided into two sections:

Wake On LAN Settings

| | |
|---------------------------|---|
| Wake On LAN | <input type="radio"/> On <input checked="" type="radio"/> Off |
| Triggered on Idle timeout | <input type="text" value="0"/> Mins |
| Triggered at Time of Day | <input type="text" value="0"/> (eg: 1015 is 10:15AM) |

MAC Address Filtering

Enable MAC Address Filtering

| Allowed Mac Addresses | |
|-----------------------|--|
| MAC Address | |
| 00:1a:a0:4d:48:c2 | |
| 00:1a:a0:4d:48:c1 | |

| Add A Detected Device | |
|-----------------------|-------------------|
| IP Address | MAC Address |
| 192.168.128.101 | 00:1a:a0:4d:48:c1 |

Figure 10 – Ethernet Settings

ATC Page

The ATC page includes:

- ATC robustness On/Off radio button
- ATC scan button
- ATC scan status bar. This indicates the results of the last scan.

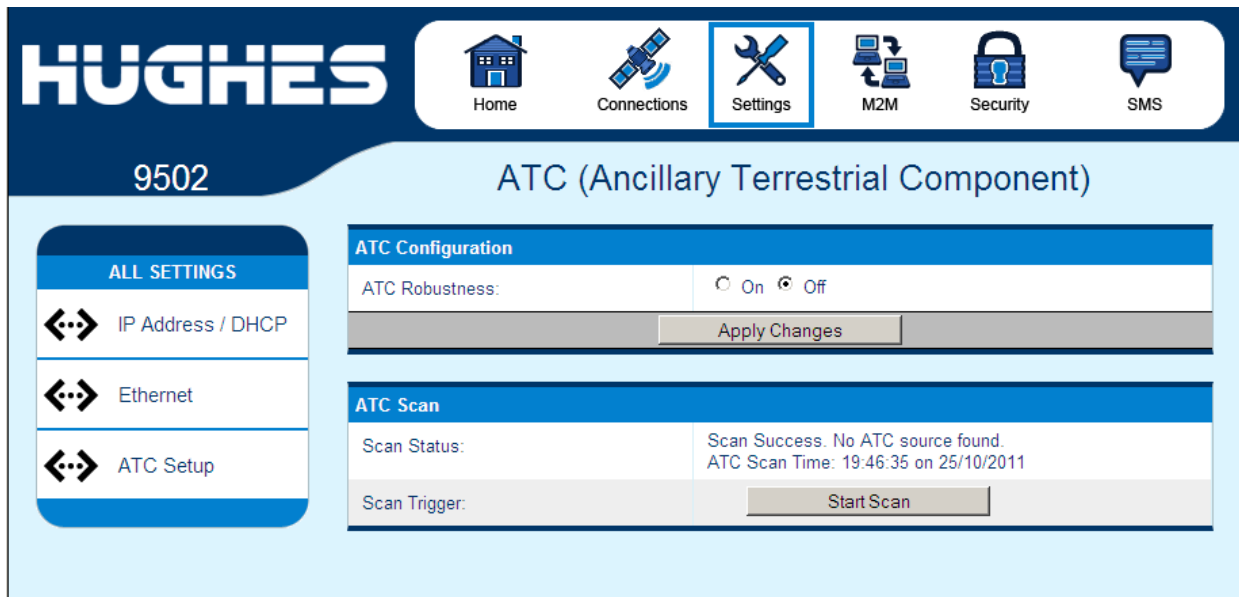


Figure 11 – ATC Page

M2M Page


The M2M page (see Figure 12 – M2M Setup) includes the following configurable parameters:

Ping Configuration:

- Context Watchdog - On/Off
- Primary Ping Address
- Secondary Ping Address
- Tertiary Ping Address
- Time between Pings
- Ping required - Yes/No If not set, then the system will not try to ping on timer expiration if data was transmitted within the watchdog period.

Always On Context:

- Always on context - On/Off (default is on)
- Always on static IP address. If the TE has a known static IP address or never ARPs, enter this address. Alternatively, leave the IP address blank (0.0.0.0) and the UT will set up a context for the first device it detects through ARP during startup.
- APN drop down box



HUGHES Home Connections Settings **M2M** Security SMS

9502 M2M Setup

STATUS
Connection
 Registered
 Beam: REGIONAL 13
 Signal Strength: 56
 40

GPS
 2D GPS Fix
 Location: 32.89572° N
 117.20225° W
 Last Fix: 20-Dec-2011,
 22:39 UTC

Satellite Info
 I-4 Americas
 147.3° 46.5°

Ping Configuration

Context Watchdog: On Off
Sends a PING to keep the context alive and test connectivity. If ping fails and the unit cannot recover, resets unit.

Primary Ping IP Address:

Secondary Ping IP Address: (Optional)

Tertiary Ping IP Address: (Optional)

Time between Pings: minutes

Ping Required: Yes No
(Always send ping even if other data sent recently)

Apply Changes

Always ON Context

Always On Context: On Off

Static ACA IP Address:
(If the Local IP address field is left blank, a context will be set up for the first device detected via an ARP)

APN Config:

Apply Changes

Figure 12 – M2M Setup

Security Passwords

The security passwords page includes the following functions:

- Personalization Key to lock the UT to a particular USIM (SIM to Phone lock)
- Administration password – off by default. Default password is **admin**
- SMS Remote Control – off by default. On/Off radio button
- SMS Remote Password – default is **remote**
- Sender White-list – is a list of numbers that the terminal will allow a remote SMS message to come from. When entering the number use the + symbol in front of the country code e.g., +870 or just start with the country code e.g., 870. Do not use 00 in front of the country code.



HUGHES 9502 Security Passwords

STATUS

Connection

Registered

Beam: REGIONAL 13
Signal Strength: 57
40

GPS

2D GPS Fix

Location: 32.89572° N
117.20225° W
Last Fix: 20-Dec-2011,
22:39 UTC

Satellite Info

I4 Americas
147.3° 46.5°

Remote SMS Feature

Remote SMS Control On Off

Remote SMS Password

Senders White-list
(List of Allowed Remote-SMS Senders)
If configured, ONLY Remote-SMS messages from
this list of Senders will be honoured.

| | |
|---|---|
| - | - |
| - | - |
| - | - |
| - | - |
| - | - |

Apply

Administration Password

Administration Password has not been Created

Phone-to-SIM PIN

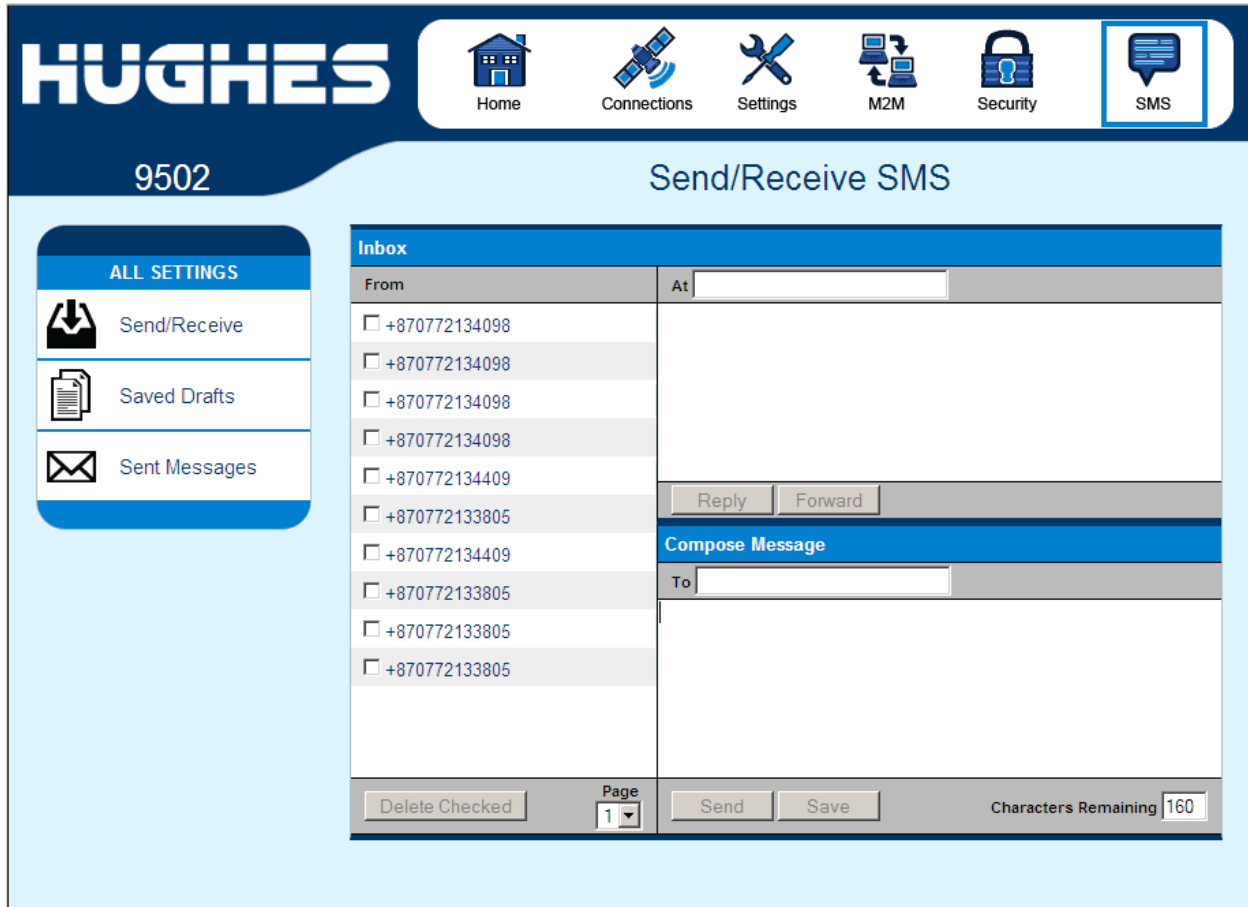
A Phone-to-SIM PIN (up to 8 digits) can be used to lock the terminal to the installed SIM.
The terminal will require the Phone-to-SIM PIN before another SIM can be used.

Phone-to-SIM PIN is Disabled

Figure 13 – Security Passwords

SMS Pages

The SMS pages are used to send SMS messages from the terminal to another BGAN device or another phone number. When sending an SMS message, use the + symbol in front of the country code of the number you want to send the SMS to e.g., +16199778619.



HUGHES Home Connections Settings M2M Security SMS

9502 Send/Receive SMS

ALL SETTINGS

- Send/Receive
- Saved Drafts
- Sent Messages

Inbox

| From | At |
|--|----|
| <input type="checkbox"/> +870772134098 | |
| <input type="checkbox"/> +870772134098 | |
| <input type="checkbox"/> +870772134098 | |
| <input type="checkbox"/> +870772134098 | |
| <input type="checkbox"/> +870772134409 | |
| <input type="checkbox"/> +870772133805 | |
| <input type="checkbox"/> +870772134409 | |
| <input type="checkbox"/> +870772133805 | |
| <input type="checkbox"/> +870772133805 | |
| <input type="checkbox"/> +870772133805 | |

Reply Forward

Compose Message

To:

Delete Checked Page 1 Send Save Characters Remaining 160

Figure 14 – SMS Send/Receive

Chapter 3 Operational Features

Network Mode

By default the 9502 is configured for NAT mode in the Network Mode field on the IP Address/DHCP settings page.

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 reassigns the original private IP address.

The Web UI will lose and reestablish its connection 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 lease time to 60 seconds in idle and connected mode.

NOTICE

Relay mode only supports a *single* user TE. If you need to connect a laptop via the USB port for configuration and monitoring purposes, you must set the laptop up with a local static IP address within the same subnet as the terminal e.g., 192.168.128.200. This prevents the USB port from getting the single DHCP address when in Relay mode once you reboot the terminal.

Remote Control

The 9502 can be controlled remotely via SMS and locally via AT commands. The AT interface can be used for remote control if AT commands can be sent by smart terminal equipment (TE) that is controlled via the IP pipe over the PDP context. The syntax of the AT commands is covered in the “Inmarsat BGAN UT-TE Interface Specification”.

The 9502 includes a remote control by SMS feature that supports the special SMS messages listed in Table 5 – Remote Control SMS Message Commands. Remote control SMS is supported by default in the 9502 and does not have to be activated by a feature code. The syntax of the messages is covered in the “Hughes 9502 SMS Remote Control User Guide.”

All remote control messages and responses must fit in a single 160 character SMS.

The SMS handler automatically deletes any message that fills the last SMS slot in the USIM to ensure there is always room to receive control SMS messages. Control messages are received into the SIM then read out and deleted so a free slot is required.

| Command | Action |
|------------|---|
| ACTIVATE | Activate PDP context |
| DEACTIVATE | Deactivate PDP context |
| CLEAR | Clear SMS messages in the UT SIM |
| GETINFO | Get info from the UT. This returns an SMS with the following information: |
| RESTART | Restart the UT |
| WATCHDOG | Change the configuration of the watchdog parameters |
| ATCO | Execute the AT command encapsulated in the SMS. This can be used for the following new remote control functions: <ul style="list-style-type: none"> • Download Firmware • Start Firmware upgrade • Get file • Send file, e.g. log files. • Activate Remote Web access • Perform ATC scan and/or set ATC robustness. |

Table 5 – Remote Control SMS Message Commands

Remote Upgrade and File Transfer

The 9502 includes an FTP client. The operator can send SMS messages or AT commands to command the 9502 to send or retrieve files from an FTP server in the network or Internet. This allows the 9502 to be upgraded, reconfigured and also allows log files to be sent back to the server. The FTP server can be in the Inmarsat network, e.g. accessible via a free APN for upgrades; or can be outside the Inmarsat network, e.g. accessible via a normal APN for debugging and configuration changes.

The remote upgrade process uses download firmware and firmware upgrade commands.

Security

The Web UI includes an admin feature that can be activated from the security page to prevent unauthorized access to the Web UI. Additionally the AT command port is locked by default and the command: `AT_ICLCK="AD",0,"<admin password>"` must be used to unlock it before AT commands can be used. Both mechanisms use the same password but the AT commands port and each Web UI session use a separate lock and must be individually unlocked.

Support for SMS Remote control is configured from the SMS settings page. Each Remote Control SMS must include the correct password. Remote control SMS containing AT commands will be processed regardless of the Admin setting (they require the feature to be active and the correct SMS password.)

USIM personalization (or “Phone to SIM lock”) can be used to lock the UT to a particular SIM.

MAC address filtering on the Ethernet port page allows the user to define the MAC address of TEs authorized to communicate via the Ethernet port. **Note:** The USB port is not included in the MAC filtering and can be used if the proper USB driver is installed on the TE.

Wake on LAN (Any Packet)

The UT includes a special low power mode called Wake on LAN (any packet). From the Web UI you can configure the UT to power down into this mode after a configurable idle timer or time of day.

Wake on LAN operation is configured from the Ethernet Settings page (Figure 10 – Ethernet Settings) under the Settings tab. It

includes a configurable idle timer to control when the UT shuts down into the Wake on LAN mode. The UT declares the link idle if no packets are received on the Ethernet port within the idle time.

Additionally, the UT can be configured to power down at a configurable time of day. Enter UTC time as 0001 to 2400. Set to 0 to deactivate the time of day feature.

When the UT powers down into this mode it will disconnect from the BGAN network and monitor the local Ethernet port and power up again if it sees any Ethernet packet (ARP, DHCP, data packet, etc). In this mode the power consumption is less than 10mW when powered from a 12V source. The UT generates Ethernet sync pulses so the TE believes the link is still active.

When an Ethernet packet is detected the UT will power up normally, register and bring up a PDP context (if configured for ACA.) It takes about 1 minute for the UT to be fully connected to the Inmarsat network.

For this mode to be useful the TE must only send Ethernet packets when it has data to send over the air. Thus, for example, the TE should be configured with a static IP address to avoid periodic DHCP exchanges for waking up the UT.

Serial Pin Power Control

The UT can be switched off by applying a voltage to pin 9 of the DB9 serial port.

If you apply voltage to Pin 9 of the serial port with pin 5 as Ground, the UT will power down. It will power up when you remove the voltage.

The voltage can be 2.5V to 50V. 12V is the recommended level.

ATC

The UT includes an extended L-band scanning mode to detect Auxiliary Terrestrial Component (ATC) or other sources of external interference. The terminal can be commanded into scanning mode by the Web UI, AT command or SMS command. During the scan the terminal will be offline to the BGAN network and will automatically reboot to return to normal operation.

In scanning mode the terminal measures the received signal strength across the 34MHz of L-band spectrum (1518 to 1559MHz). Once the scan is complete the UT restarts and communicates the results of the scan.

If an interference signature is detected, an attenuator is switched into the receiver path to attempt make the UT more resilient to ATC interference.

The attenuator setting can be controlled from the Web UI, AT command or remote SMS.

Watchdog

The M2M terminal includes a watchdog mechanism that can be used to periodically verify the UT network connectivity and take action if a problem is detected.

Configuration Parameters are shown in the M2M Page section Page 26.

GNSS

The Hughes 9502 terminal supports a **Global Navigation Satellite System (GNSS)** feature. During start up, if the UT detects a GNSS device connected to the GNSS serial port, it will attempt to obtain a position fix from the GNSS device via NMEA messages.

The serial port is a DB9 male, configured as a DTE and supports autobaud between the valid NMEA rates 4800bps and 38.4kbps. The GNSS device must provide a fix via the RMC or GGA NMEA messages. Typically a straight through DB9 serial cable can be used with the correct plug for the GNSS device.

Chapter 4 Installation Instructions

Inspecting the parts

Make sure you have all parts listed in the shipment box before beginning the installation; you should have the following parts:

1. Hughes 9502 IDU
2. Flat panel ODU
3. 10m coaxial cable terminating in N(M) and TNC(M) connectors

Optional installation items:

1. Basic Fix Mount Kit (P/N 3004066-0002)
2. Azimuth elevation bracket (P/N 1022994-0022)
3. IDU Strap (P/N 3500617-0001)

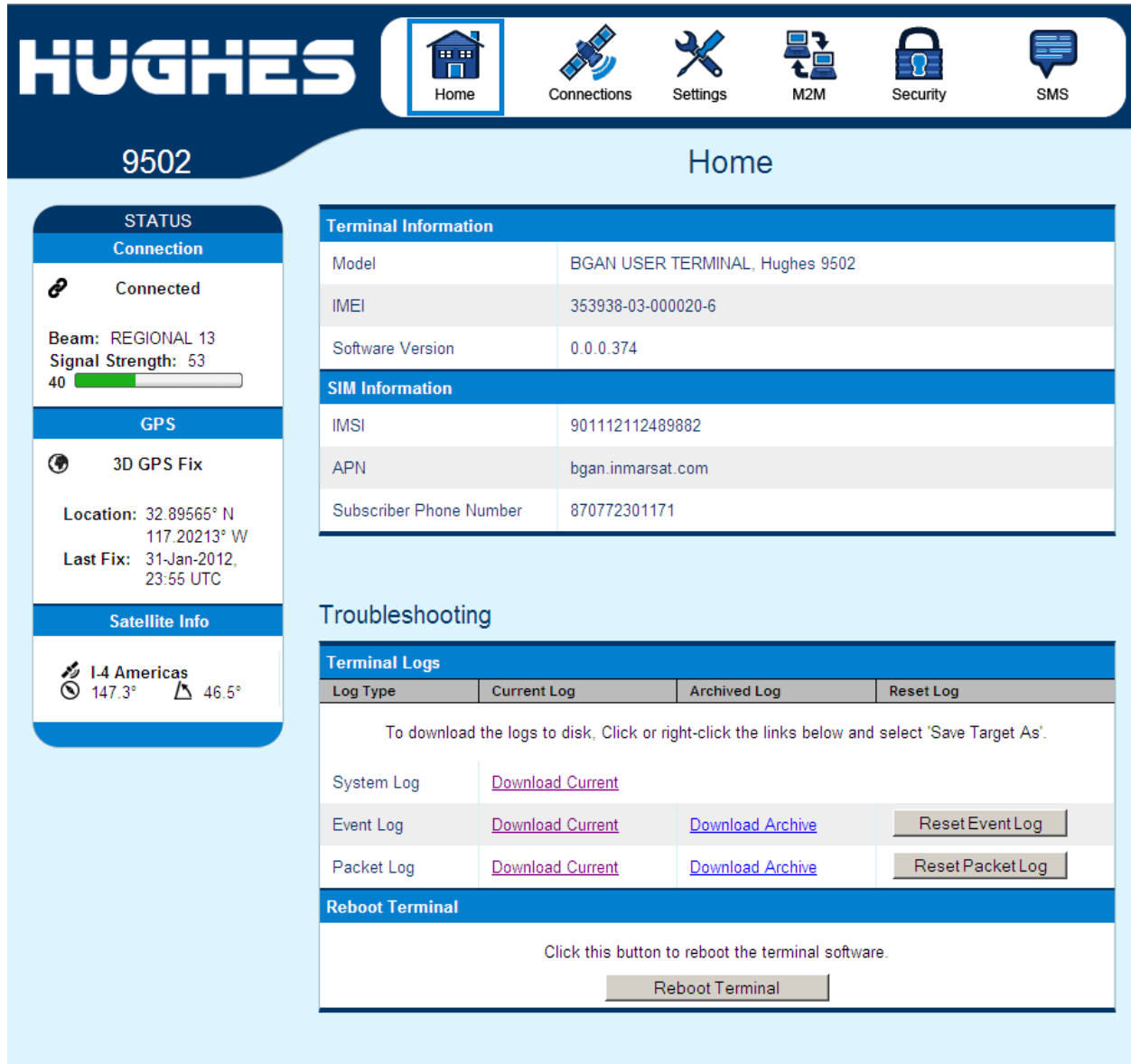
Determining where to install the ODU

In order for your terminal to work correctly, it must be installed in a location that provides a clear, unobstructed, line of sight between the ODU and the satellite. Any objects such as building structures or trees may degrade the quality of the satellite signal. To determine where to install the ODU, you need to determine that you have both a clear unobstructed line of sight to the satellite and that your fixed mount is aimed in the approximate direction to the satellite.

To determine the direction from your location to the satellite follow the steps below:

1. Determine the latitude and longitude of the site and enter them into the Location Spreadsheet that has been provided. This will give you the compass direction and the elevation angle to point the ODU. Alternatively, it can be done by powering up the UT, allowing it to get a GPS fix and then checking the pointing information on the web UI Home page.
2. Unbox the Hughes 9502 and remove the ODU and cable assembly.

3. Determine the location of both the IDU and ODU before starting to make sure that the IDU and ODU can be installed within the 10M cable length.
4. Install the ODU with the installation hardware that you have chosen by following the instructions that follow.



The screenshot shows the Hughes 9502 Home Page. At the top, there is a navigation bar with the Hughes logo and icons for Home, Connections, Settings, M2M, Security, and SMS. Below the navigation bar, the page title is "9502 Home".

The main content area is divided into several sections:

- STATUS Connection:** Shows "Connected" with a signal strength indicator. Beam: REGIONAL 13, Signal Strength: 53, 40.
- GPS:** Shows "3D GPS Fix" with location coordinates: 32.89565° N, 117.20213° W. Last Fix: 31-Jan-2012, 23:55 UTC.
- Satellite Info:** Shows "I-4 Americas" with elevation angles: 147.3° and 46.5°.
- Terminal Information:** A table with the following data:

| | |
|------------------|---------------------------------|
| Model | BGAN USER TERMINAL, Hughes 9502 |
| IMEI | 353938-03-000020-6 |
| Software Version | 0.0.0.374 |
- SIM Information:** A table with the following data:

| | |
|-------------------------|-------------------|
| IMSI | 901112112489882 |
| APN | bgan.inmarsat.com |
| Subscriber Phone Number | 870772301171 |
- Troubleshooting:**
 - Terminal Logs:** A table with columns for Log Type, Current Log, Archived Log, and Reset Log. It includes links for "Download Current" and "Download Archive" for System Log, Event Log, and Packet Log. There are also "Reset Event Log" and "Reset Packet Log" buttons.
 - Reboot Terminal:** A button labeled "Reboot Terminal" with the instruction "Click this button to reboot the terminal software."

Figure 15 – Home Page showing pointing information

ODU installation using the basic fix mount kit; (P/N 3004066-0002)

⚠ CAUTION

You may install the fixed mount on any structurally sound surface; either on a horizontal, or vertical, or a sloped surface such as a roof or wall.

1. The pole has a 1.66” (4.2164cm) outer diameter (schedule 40 metal).
2. The pole mount is 2lbs/0.9Kg. The azimuth/elevation bracket is 1lb/0.45Kg.
3. The wall mounting pattern has four bolts in a 6” x 3 3/4” (15.24cm x 9.525cm) rectangle.

The pole is shipped attached to the base bracket. Mount the base bracket of this assembly to the structure with the appropriate hardware (not included). Consult local building codes if needed. Once the base bracket is mounted, perform the following steps (refer to Figure 16 – Base Bracket and bubble level and Figure 17 – Pole Assembly):

1. Insert the bubble level into the end of the pole (pipe) opposite the base bracket. The bubble level fits inside the pole.
2. Loosen the pole attachment fasteners at the base bracket so the pole can swivel.
3. Swivel the pole until the end of the pole where the ODU will be installed is vertical. Adjust the pipe position until the bubble is centered inside the circles on the top surface of the bubble level.
4. Tighten the pole attachment fasteners on the base bracket.

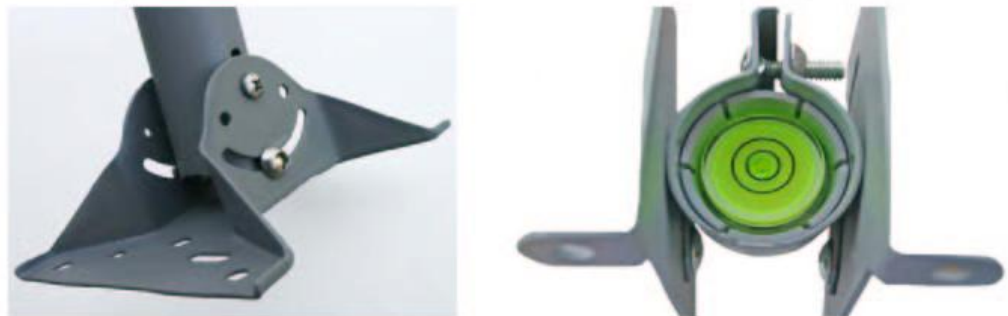


Figure 16 – Base Bracket and bubble level



Figure 17 – Pole Assembly

Mounting the azimuth elevation bracket

Mount the azimuth elevation bracket to the back of the ODU using four washers/nuts (see Figure 18 – Azimuth elevation bracket). The N-type RF connector should be on the left or right side of the azimuth elevation bracket if installed correctly.

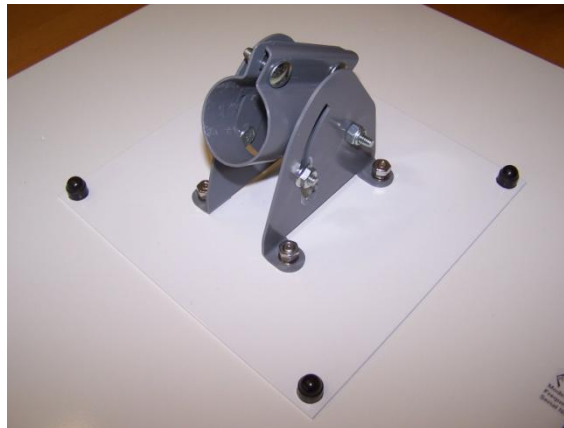


Figure 18 – Azimuth elevation bracket

Mounting the azimuth elevation bracket onto the pole

1. Slide the pole collar of the azimuth elevation bracket over the end of the pole (see Figure 19 – Pole Collar).
2. Leave the pole collar bolts loose to allow for azimuth adjustment during pointing.



Figure 19 – Pole Collar

NOTICE

Important Notes:

- The RF cable assembly supplied (10m), forms an integral part of the ODU system and is made to a specific length in order to meet the system specifications. The cable must not be cut to a shorter length, nor must any cables be added to the cable run.
- It is essential that only the supplied cable is used. Third party cables may not be used; their use will invalidate the warranty of the ODU and may cause system malfunction.
- It is important not to stress the connection to the ODU during installation of the coaxial ODU cable.
- The minimum bend radius of the cable is 2” (50mm) however; it is recommended that a 4” (100mm) bend radius be used.
- Any modification to these rules must be approved by Hughes and Inmarsat prior to the installation.

Attaching RF cable to ODU

1. Attach the cable to the mounting pole via a zip strap to take the weight of the cable.
2. Mate the connector to the ODU firmly by hand but do not over tighten.
3. Weatherproof the connection using self-amalgamating tape (not provided) (see Figure 20 – Weather proof connector).
4. Route the cable to the 9502 IDU avoiding any sharp bends, extremes in temperature, and compression of the cable.



Figure 20 – Weather proof connector

Attaching RF cable to the Hughes 9502 IDU



Locate the TNC connector on the back of the ODU and connect the cable from the ODU to the IDU (see Figure 21 – Connect cable to TNC connector on IDU using N to TNC adapter provided)



Figure 21 – Connect cable to TNC connector on IDU

Connecting power leads to the Hughes 9502 IDU



Once the ODU is properly connected, you can then connect the power leads (positive + and negative -) from the power source to the 9502 IDU power connector. The IDU is clearly marked for positive and negative leads and the IDU is designed for a nominal 12Vdc and 24Vdc voltage and is protected from reverse polarity.

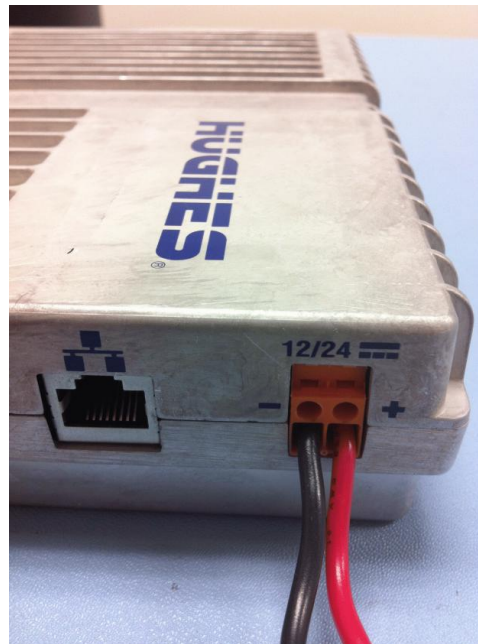


Figure 22 - Power connector

Insert the positive lead into the positive terminal jack and tighten the screw. Then connect the negative lead into the negative terminal jack and tighten the screw (see Figure 23 - Connecting power leads).

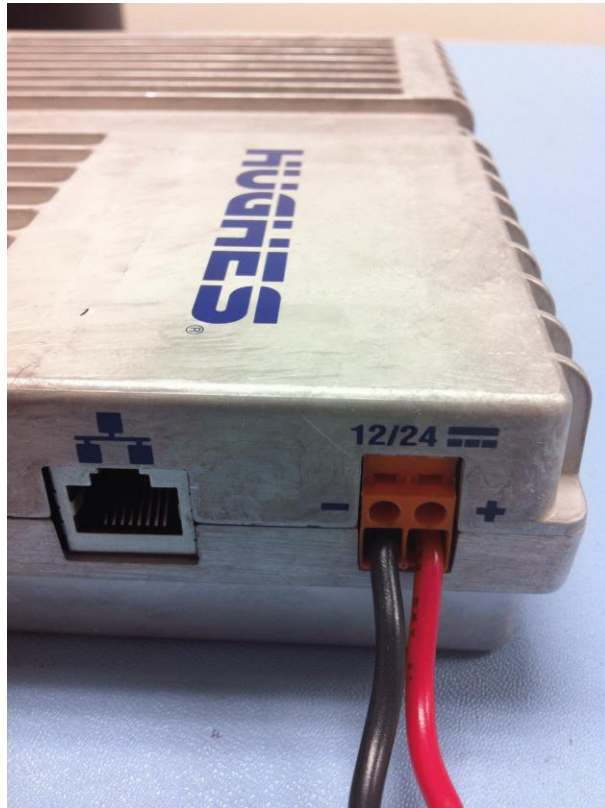


Figure 23 - Connecting power leads

NOTICE

Important Note:

- Ensure the power source is turned off before connecting the power leads to the 9502 IDU
- Ensure that the screws are tightened to where the power leads cannot fall out

Powering up the Hughes 9502



The 9502 will power up automatically when DC power is applied. It does not have a power button. By default it will bypass antenna (ODU) pointing and automatically register, attach and activate a PDP context.

Once you have applied DC power, the terminal goes through a power-on-self-test (POST) that takes approximately 15-20 seconds and then the power LED will start flashing for another 15 seconds. If you want to enter pointing mode, you will need to short press (<2 seconds) the function button within those 15 seconds. If you do not short press the Function button, the unit will start to register with the network and set up a PDP context.



If the unit bypasses ODU pointing and starts to register with the network, the ODU is now transmitting so please stay at least 1 m clear of the front of the ODU to avoid RF radiation.



Figure 24 - Function Button

Pointing the ODU



Determine the azimuth and elevation for the look angle to the satellite in advance of the installation by using the approximate latitude and longitude of the site in a simple satellite pointing application or specially marked map. This is the preferred mode as it simplifies the install and may be critical data for choosing the site if there are multiple potential locations to mount the UT in wooded, mountainous or built-up areas.

Alternatively, you can get the azimuth and elevation angle by powering up the UT, allowing it to get a GPS fix and then checking the pointing information on the 9502 home webUI page.

In order to speed up getting the initial GPS fix, while you are in pointing mode you should lay the ODU flat with a clear view of the sky first so that it can see as many GPS satellites as quickly as possible. Once you get the initial GPS fix (GPS LED solid green), then you can point the ODU to the Inmarsat satellite.


If you short press the function button to enter pointing mode, all three LEDs starts to blink, indicating that the terminal is in pointing mode.


To aid in pointing, you can use two different methods:


1. You can use the 3.5mm jack to connect stereo speakers or a headset in order to hear the tones for pointing. As the signal strength increases, the tone pitch will get higher and faster.
2. You can also use the 3.5mm jack to connect a 3.5mm stereo plug that has two bare wires exposed. Touching the two exposed wires with voltmeter leads you can see the voltage readings from 2.5V to 3.2V as you are pointing. The higher the voltage the better the ODU is pointed. A voltage reading of approximately 2.9V equates to a good signal level of 50dB.


You can also monitor the signal strength by hooking up a laptop/PC to the USB port and monitor it from the webUI (see Figure 25). Access the webUI by opening a browser (Mozilla, Safari or IE8 or 9) and typing in the local IP address of the terminal 192.168.128.100


HUGHES



Home


Connections


Settings


M2M



Security


SMS

9502
Home


STATUS

Connection

 **Connected**




Beam: REGIONAL 13
Signal Strength: 53
40

GPS

 **3D GPS Fix**

Location: 32.89565° N
117.20213° W
Last Fix: 31-Jan-2012,
23:55 UTC

Satellite Info

 I-4 Americas
 147.3°  46.5°

Terminal Information

| | |
|------------------|---------------------------------|
| Model | BGAN USER TERMINAL, Hughes 9502 |
| IMEI | 353938-03-000020-6 |
| Software Version | 0.0.0.374 |

SIM Information

| | |
|-------------------------|-------------------|
| IMSI | 901112112489882 |
| APN | bgan.inmarsat.com |
| Subscriber Phone Number | 870772301171 |

Troubleshooting

Terminal Logs

| Log Type | Current Log | Archived Log | Reset Log |
|---|----------------------------------|----------------------------------|---|
| To download the logs to disk, Click or right-click the links below and select 'Save Target As'. | | | |
| System Log | Download Current | | |
| Event Log | Download Current | Download Archive | <input type="button" value="Reset Event Log"/> |
| Packet Log | Download Current | Download Archive | <input type="button" value="Reset Packet Log"/> |

Reboot Terminal

Click this button to reboot the terminal software.

Figure 25 – Signal Strength on Home Page

LED Flow Chart

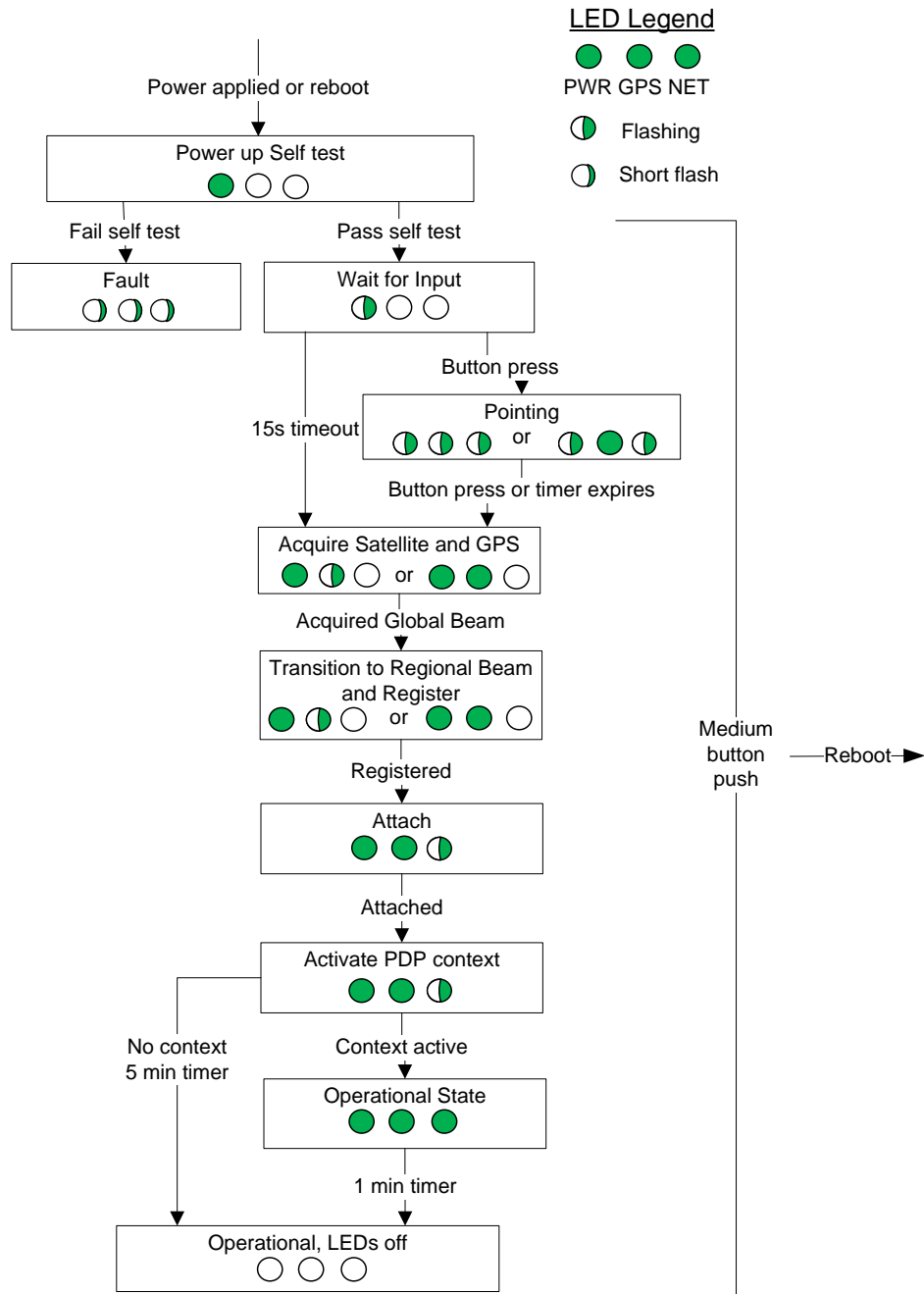


Figure 26 – LED Flow Chart

NOTICE

Important Notes:

- To aid in pointing the ODU, there is a 3.5mm stereo audio jack port on the IDU. The user can insert a stereo headset to hear audio tones or use a voltmeter to measure the voltage which indicates the quality of the signal detected during install mode.
- The IDU must have DC power applied for pointing.
- The GPS antenna is an integral part of the ODU and a GPS fix can be obtained as part of the pointing process.



- Once you are out of pointing mode, you need to stay away from the front and sides of the ODU at least 1m for safety purposes.

Adjusting the azimuth and elevation of the ODU



To adjust elevation, refer to Figure 27 - Adjusting elevation

1. Loosen the two bolts in the curved slots on the azimuth elevation bracket.
2. Read the elevation angle from the elevation scale on the bracket, using the red edge on the pole collar as the angle indicator. View this edge through the curved slot on the azimuth elevation bracket.
3. Pivot the ODU to obtain the desired elevation.



Figure 27 - Adjusting elevation



Figure 28 - Adjusting azimuth

To adjust azimuth, refer to Figure 28 - Adjusting azimuth

4. Loosen the two bolts on the pole collar.
5. Move the ODU to either side, in small increments, as necessary to get the optimum signal strength as shown on the voltmeter or by the fast high pitch sounds that you hear with the headphones.

When you have maximized the signal quality:

6. Tighten the two bolts in the curved slots on the azimuth elevation bracket to lock down the elevation adjustment.
7. Be careful not to change the ODU's orientation while tightening the bolts.
8. Tighten the two bolts on the pole collar to lock down the azimuth adjustment.
9. Make sure all other fasteners on both brackets are tight.

Exit Pointing Mode

1. Short press the function button (<2 seconds) to exit pointing mode. The terminal will initiate registration with the network.
2. Verify the unit registers, attaches, and establishes a PDP context by checking the status on the web UI or when all three of the LEDs are solid green (Figure 26 – LED Flow Chart).
3. Optionally, verify the unit will correctly recover from a power cycle by removing and reapplying power. Verify it registers, attaches, and establishes a PDP context by again checking the status on the web UI or when all three of the LEDs are solid green (Figure 26 – LED Flow Chart).
4. Verify end to end connectivity of the system, by sending a small amount of data from the device connected to the 9502 and verifying that the data was received by the other end (e.g., data center).

Chapter 5 Lightning Protection and Safety

Lightning and Grounding Precautions / La foudre et la terre Précautions



A lightning strike on the ODU, mounting hardware or cable may cause death or serious injury and is likely to damage both the ODU and the IDU.

La foudre sur l'ODU, le matériel de montage ou les câbles peut causer des blessures graves ou mortelles et est susceptible d'endommager à la fois l'ODU et l'IDU.

It is therefore essential that the installer does not use an installation location, which is likely to experience a lightning strike, and make suitable grounding and lightning protection arrangements to minimize any possibility of injury or damage. Professional local advice should be sought with respect to these matters. Hughes accepts no liability for any injury or damage caused by lightning strikes.

Il est donc essentiel que l'installateur évite tout emplacement d'installation susceptible d'être frappé par la foudre, et de mettre en place un dispositif de mise à la terre et de protection contre la foudre adapté afin de minimiser tout risque de blessure ou de dommage. Un conseil professionnel local devrait être consulté à cet égard. Hughes n'accepte aucune responsabilité pour tout préjudice ou dommage causé par la foudre.

Hughes 9502 indoor unit (IDU) chassis shall be connected to earth ground. Connect the earth grounding wire with lug in between the ground screw and chassis. Tighten the ground screw after the wire lug is installed. The wire lug material shall be either tin-plated copper or tin-plated steel.

Le châssis de l'unité d'intérieur Hughes 9502 (IDU) doit être connecté à la terre. Connectez le câble de mise à la terre avec une cosse entre la vis de terre et le châssis. Serrez la vis de terre après que le câble avec cosse ait été installé. Le câble avec cosse doit être soit en cuivre zingué ou en acier étamé.

Hughes also recommends that a protective earth cable be connected to the ODU or ODU mount. Please consult professional local advice for protective earth grounding requirements.

**Hughes recommande également qu'un câble de terre de protection soit connecté à l'ODU ou au montage de l'ODU .
Veuillez consulter un conseil professionnel local pour les spécificités concernant la mise à la terre de protection.**

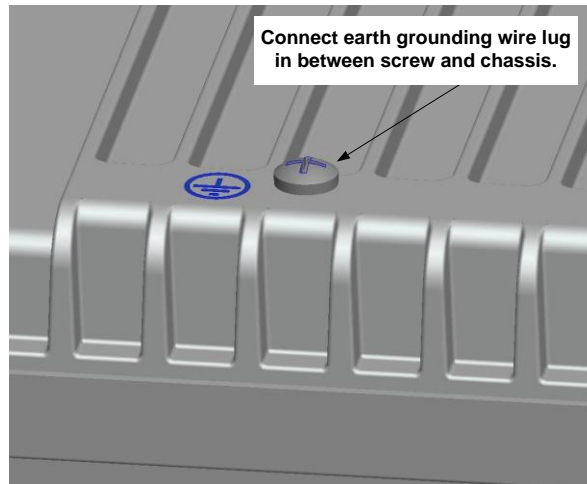


Figure 29 – 9502 IDU Protective Earth Grounding

Disclaimer / Avertissement

Whilst prepared in good faith, Hughes makes no warranty or representation as to the accuracy, completeness or fitness for purpose of this document or its contents and all warranties, whether express or implied are excluded. Hughes, to the maximum extent permitted by law, excludes any liability arising from the use of this document or its contents. Users' attention is brought to the fact that the local applicable laws and regulations as to the use of the remote ODU may apply and it is the user's responsibility to identify and comply with these.

Tout en étant rédigé de bonne foi, Hughes n'offre aucune garantie ou représentation quant à l'exactitude, l'exhaustivité ou l'adéquation quant à l'objectif de ce document ou son contenu, et toutes garanties, exprimées ou tacites sont exclues. Hughes, dans la mesure maximale permise par la loi, exclut toute responsabilité découlant de l'utilisation de ce document ou son contenu. L'attention des utilisateurs est attirée sur le fait que les lois et réglementations locales applicables à l'utilisation de l'ODU peuvent s'appliquer et il est de la responsabilité de l'utilisateur de les identifier et de s'y conformer.

Chapter 6

AT Unsolicited Response Codes

The following codes and text may appear as unsolicited response codes on the AT interface to the UT or in an SMS response to an ATCO Remote SMS command. Each code appears in the following format:

```
<crf><at_command>: <#>, <text><crf>
```

Where:

<crf> is the carriage-return/line-feed character sequence
<at_command> identifies the command which generated the response

<#> is the numeric response code

<text> is descriptive text about the response

Examples:

_IGETFW: 20, FTP found no filename

_IUPDFW: 0, Complete

The message format is intended to be readable/usable by both automated processes and humans.

Table 6 below shows the current set of response codes, grouped by function.

| Code | Text | Explanation |
|--------------------|----------------------------|---|
| General | | |
| 0 | Complete | Operation completed successfully |
| 1 | Unexpected software error | Software error |
| 2 | SWE message data error | Software error |
| 3 | Parameter error | Parameter error in the AT command. Not used because AT command handler will catch and display ERROR. |
| 4 | Local file open error | _IGETFW: could not open local file for download _IUPDFW: could not open control file for update parameters _UPDCFG: could not compute checksum for new config file. |
| 5 | Directory not found | Could not find specified directory on UT file system. |
| 6 | File not found | Could not find named file (on local file system). |
| 7 | Error renaming file | _IUPDFW: Could not restore 'image.txt' after failed upgrade. _IUPDCFG: Could not rename new file to 'config.txt'. |
| Context Management | | |
| 8 | No entry in context table | No free entry in context ID table (all 11 contexts in use) |
| 9 | Context parameter error | Internal software error |
| 10 | Local IP addr error | Internal software error |
| 11 | Context activation error | Context activation failed. Could be problem with PS attach, SIM subscription, APN, network or connectivity. |
| 12 | Context deactivation error | Context deactivation failed |
| FTP Management | | |
| 13 | FTP hookup fail | Connection to FTP server failed. Problem could be server unreachable or specified IP address or server name invalid, or connectivity failure. |
| 14 | FTP login fail | FTP username or password incorrect |
| 15 | FTP 'type' fail | Could not establish "binary" mode. |
| 16 | FTP 'cwd' fail | Could not change to working |

| | | |
|------------------|--------------------------------|--|
| 17 | FTP data connection fail | Could not establish an FTP data connection with the server. |
| 18 | FTP 'nlst' fail | Could not get list of files in current FTP server directory. Directory may be empty. |
| 19 | FTP xfer command fail | Could not initiate data transfer on an established connection. |
| 20 | FTP found no filename | Could not find a filename in the current server directory. |
| 21 | FTP local file read/write fail | Error while writing downloaded file to UT flash or reading upload file data. |
| 22 | FTP socket fail | Error while reading or writing FTP data socket. |
| 23 | FTP completion error | Error while closing the current FTP connection. |
| 24 | FTP xfer timed out | FTP client timed out waiting for socket ready (read or write), e.g. due to loss of connectivity during transfer. |
| <u>_IGETFW</u> | | |
| 25 | File in use, cannot download | The file to be downloaded is the same (by name) as the image currently in use. |
| 26 | Starting immediate update... | Normal success. File downloaded successfully, now starting immediate update. |
| <u>_IUPDFW</u> | | |
| 27 | New firmware file not found | Could not find filename specified in upgraded control file. |
| 28 | New firmware file corrupt | Firmware file failed checksum test. |
| 29 | New firmware file failure | The new firmware failed to run or failed to acquire the network and the unit fell back to the old release. |
| 30 | Upgrade admin file error | Problem with local file manipulation during upgrade process. |
| 31 | Upgrade status file error | Problem with local file manipulation during upgrade process |
| <u>_IGETFILE</u> | | |
| 32 | Can't overwrite protected file | File specified in AT command was 'config.txt', 'config.chk', 'config_bk.txt', 'config_bk.chk' |

| | | |
|-----------------|---------------------------|---|
| <u>_IUPDCFG</u> | | |
| 33 | Can't use reserved file | Attempt to use one of protected config files as the new config.txt file. |
| <u>_REMWEB</u> | | |
| 34 | Invalid IP address string | An IP address parameter string could not be interpreted as a legitimate IP address. |
| 35 | Global IP: <ip_addr> | REMWEB connection set up successfully. Indicates global IP address assigned to the UT's own PDP context, to which an HTTP connection may be made. |



*Codes may change in future software release

Table 6 - AT Unsolicited Response Codes

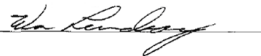
Chapter 7 Declaration of Conformity

We,
(manufacturer's name)
Hughes Network Systems
of
9605 Scranton Road, Suite 500, San Diego, CA 92121, USA
(address)
declare under our sole responsibility that the product
Hughes 9502 Satellite Terminal
(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
IEC 60950-1 (2nd Edition)
For article 3.1(b), Electromagnetic Compatibility:
EN 301 489-1, EN 301 489-20
For article 3.2, Effective Use of the Spectrum Allocated:
EN 301 444
EN 300 328

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.

Identification mark:  The equipment will also carry the Class 2 equipment identifier: 

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)

 **23 January 2012**

FCC Compliance / Conformité FCC

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.

Cet appareil est conforme aux règles FCC. Toute modification apportée à l'équipement de Hughes Network Systems et non approuvée expressément par Hughes Network Systems, peut annuler l'autorisation de l'utilisateur à opérer cet équipement.

To comply with FCC RF exposure requirements, this device must be operated with a minimum separation distance of one meter from the front of the satellite terminal's antenna to a person's body. Other operating configurations should be avoided.

Afin d'être conforme aux exigences FCC concernant l'exposition RF, cet appareil doit être utilisé tout en maintenant une distance de séparation minimale d'un mètre entre la personne et le devant de l'antenne du terminal satellite. Toute autre configuration d'utilisation doit être évitée.

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.

Cet appareil est conforme à la Section 15 du règlement FCC. Son fonctionnement est sujet aux deux conditions suivantes ; (1) ce matériel ne peut pas provoquer d'interférences nuisibles, et (2) ce matériel doit pouvoir tolérer n'importe quelle interférence reçue, y compris les interférences qui peuvent provoquer un fonctionnement indésirable.

IC Compliance / Conformité IC

This device conforms to Industry Canada's rules. Any changes to Hughes Network Systems' equipment, not expressly approved by Hughes Network Systems, could void the user's authority to operate the equipment.

Cet appareil est conforme aux règlements de l'Industrie Canada. Tout changement à l'équipement de Hughes Network Systems, sans le consentement exprès de Hughes Network Systems, peut résulter à l'annulation de l'autorité confiée à l'utilisateur d'opérer cet équipement.

To comply with Industry Canada's RF exposure requirements, this device must be operated with a minimum separation distance of one meter from the satellite terminal's antenna to a person's body. Other operating configurations should be avoided.

Pour être conforme aux règlements d'Industrie Canada sur l'exposition aux rayonnements RF, cet appareil se doit opérer à une distance d'au moins un mètre entre l'antenne du terminal de transmission satellite et le corps d'une personne. Toute autre configuration d'opération devrait être évitée.

EU RoHS (Restriction of Hazardous Substances) Directive

The European Union (EU) Directive 2002/95/EC restricts the use of certain hazardous substances in electrical and electronic equipment.

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

EU WEEE (Waste Electrical and Electronic Equipment) Directives

The European Union (EU) Directive 2002/96/EC on waste electrical and electronic equipment mandate 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 are 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.

