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HN9000 Satellite Modem Installation Guide

1037576-0001
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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

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

⚠ WARNING

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

⚠ CAUTION

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

Messages concerning property damage

NOTICE

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

This document uses this symbol to indicate a safety alert message that concerns a potential electric shock hazard.

Scope and audience

This installation guide explains how to install, commission, activate, and troubleshoot the Hughes HN9000 satellite modem. It also contains certain reference information concerning operation of the satellite modem.

This guide is written primarily for professional installers. It may also be useful for:

- Trainers who train installers
- Call center operators who respond to customers' calls

This guide is written for satellite modem installations in the United States and Canada.

Chapter

1

Satellite modem overview

Topics:

- *Supported configurations*
- *Satellite modem specifications*

The HN9000 satellite modem connects to the Internet or an intranet by satellite and provides Internet or intranet service to a single host, typically a computer, or to multiple hosts on a LAN. A host may be a computer using Windows or other supported operating system.

The modem is a self-hosted unit, meaning that it does not depend on a computer to establish and maintain the Internet or intranet connection. However, the modem must be connected to a properly aligned satellite antenna. The modem has an Ethernet port so it can be connected to a computer or to an Ethernet LAN.

Figure 1: HN9000 satellite modem

Note: Acronyms used in this installation guide are identified in *Acronyms used in this guide* on page 131.

Supported configurations

This section shows examples of supported configurations using the HN9000 satellite modem.

The satellite modem may be used in a single-host configuration or multiple-host configuration. In a single-host configuration, the satellite modem is directly connected to the host (a computer), as shown in *Figure 2: Single-host configuration* on page 2. The Hughes Internet Gateway is a Hughes-operated satellite station that provides a connection between the Internet and the satellite. The gateway routes data to and from the Internet and to and from the satellite, which in turn beams a signal down to the satellite modem to provide Internet connectivity.
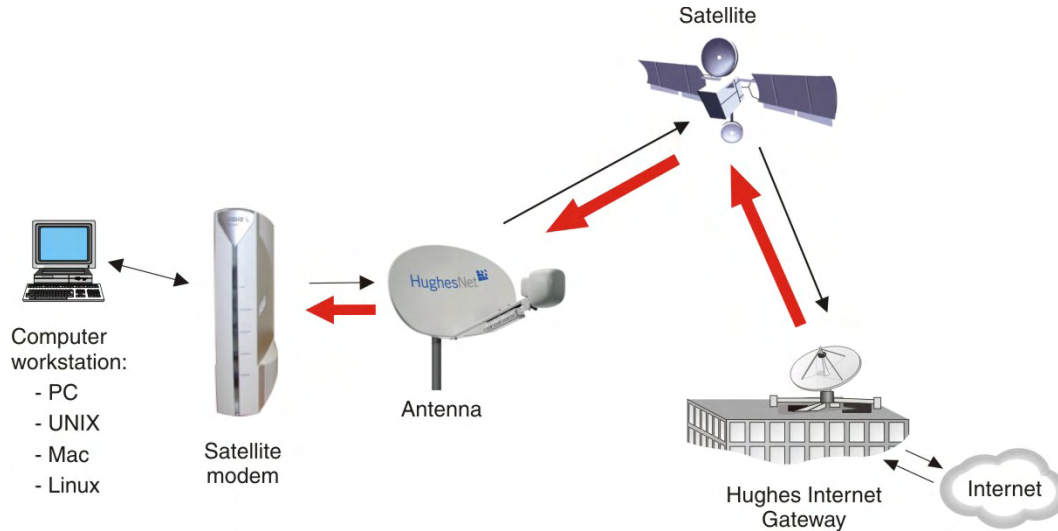
Figure 2: Single-host configuration

In a multiple-host configuration, the hosts on the LAN share satellite Internet or intranet connectivity through an Ethernet hub, router, or wireless base station. The satellite modem is connected to the hub, router, or wireless base station, as shown in *Figure 3: Multiple-host configuration in an Ethernet wired LAN* on page 3.

Note: The customer must provide and configure hub, router, or wireless base station equipment.
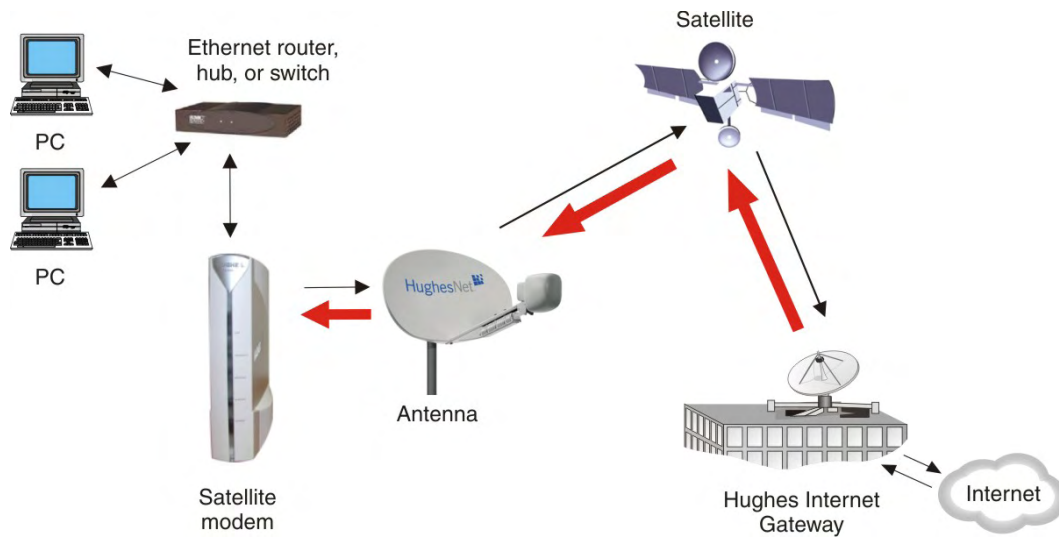
Figure 3: Multiple-host configuration in an Ethernet wired LAN

Figure 4: Private network configuration on page 3 shows a private network using two satellite modems at two locations. The thick broken line shows how the network connects a PC at one location and to a PC at a second location. This configuration requires two antennas—one at each location. The Hughes Internet Gateway connection is optional and is based upon the network design for the customer private network. Typically this type of configuration is used only in enterprise (business) environments.
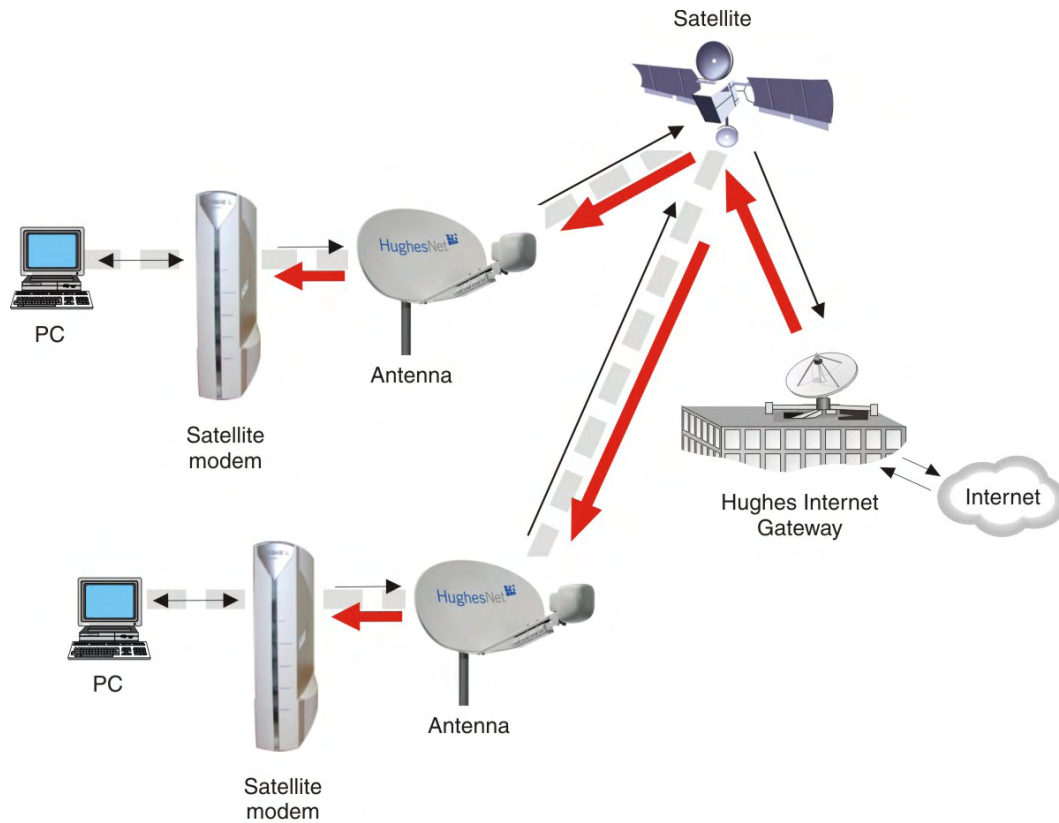
Figure 4: Private network configuration

Satellite modem specifications

Table 1: Specifications for the HN9000 satellite modem

Weight	1.6 lb (0.73 kg)
Width	2.4 inch (6.1 cm)
Height	7.8 inch (19.8 cm)
Depth	9.0 inch (22.9 cm)
Safe operating temperature range	5 to 40º C (Above 5000 ft altitude, the maximum temperature is reduced by 1º C per 1000 ft.)
Safe operating humidity range	5% to 95% non-condensing
Safe altitude	Up to 10,000 ft
Cooling method	Convection
Protocol support	TCP/IP (Transmission Control Protocol / Internet Protocol) protocol suite
Interface ports	One Ethernet port supporting 10BaseT or 100BaseT operation, RJ-45-switched
Power supplies and power requirements	See *Power supply information* on page 10.

Chapter

2

Preparing for installation

Topics:

- *Installation summary*
- *Installation checklist*
- *Conducting a site survey*
- *Instructions for other terminal components*
- *Power supply information*
- *Primary tools and equipment needed for installation*
- *Additional equipment*
- *Computer requirements*
- *Configuring the installer laptop IP address*

This section describes preparations for installing the satellite modem and includes information you should know before you begin. Review this information before you install the satellite modem, antenna assembly, antenna mount, or IFL cables. Refer also to *Installation summary* on page 6.

To install the satellite modem, you need the *Installation Reference Sheet*. This form includes parameters you need to enter to install the modem (A code, B code, C code, and U code, which are explained later). Print the Installation Reference Sheet for your specific installation from the online HughesNet Installation Portal.

Before you proceed, review the sections in this chapter, which are listed in the left panel.

Installation summary

This installation guide covers installation of the satellite modem. It does not cover installation of the other satellite terminal components: the antenna and radio assembly, antenna mount, and IFL cables. However, to understand modem installation, you must understand the overall installation process, which includes installation of all of the satellite terminal components. A summary of the overall terminal installation process is presented in *Figure 5: Satellite modem installation summary* on page 7. This diagram focuses on tasks performed by the installer to install the satellite modem. Details for modem installation tasks are included in the sections that follow.

Prepare for installation

1. Make sure you have the Installation Reference Sheet, all equipment to be installed, and required tools.

2. Conduct a site survey. Use a GPS receiver to determine latitude and longitude at the antenna site.

3. Move the satellite modem, antenna, radio assembly, and mount to their respective installation locations.

Install satellite modem

4. Physically install the satellite modem:
Place it. Connect power. Make sure the modem passes its self-test.

5. Connect modem to installer laptop.

6. Start browser and open the initial installation screen.

Enter installation parameters

7. Enter installation parameters.

8. Read and note the azimuth, elevation, tilt, and ODU polarization values to be used for initial antenna pointing; these values are displayed by the installation software.

┌Outdoor tasks

These tasks are not modem installation tasks, but are closely related and are required for overall installation of the terminal.

14. Connect the transmit and receive IFL cables to the modem.

Install outdoor equipment

9. Confirm line of sight using azimuth and elevation displayed by the installation software

10. Install the antenna mount.

11. Install the antenna and radio assembly.

12. Set the ODU polarizer (LHCP or RHCP).

13. Route and connect the IFL cables to the radio with the DAPT connected in-line on the receive cable.

◀ *See 14 (indoor step).*

Point antenna and validate results

15. Point the antenna as instructed in the ***Antenna Pointing Guide***.

16. Validate pointing and store the pointing results.

Monitor commissioning

17. Monitor commissioning progress messages. (Commissioning includes registration.)

Validate the installation

18. Use the Onsite Validation Tool to validate the installation.

Activate the broadband service

19. Connect modem to customer PC.

20. Customer activates the broadband service. For detailed information, see the ***Quick Start Guide***, which is shipped in the box with the modem, and *Activating the HughesNet service* in this guide.

Details for satellite modem installation tasks are included in the sections that follow.

Figure 5: Satellite modem installation summary

Complete the steps in the order shown in *Figure 5: Satellite modem installation summary* on page 7 unless you have a specific reason for doing them in a different order. In any case, make sure all steps are completed. Be aware that the satellite modem has to provide the azimuth, elevation, polarization, and tilt angle values before antenna pointing can be completed.

Installation checklist

Later in the installation process you are instructed to use the onsite validation tool (OVT) to validate the installation. Validation ensures that the site is performing to acceptable standards. To increase the likelihood that the site will pass validation the first time you try, **pay careful attention to the items listed in the checklist below as you install the modem, antenna, and IFL cables**.

IFL cables

☐ Use only approved cables.

☐ Do not exceed maximum length for the ODU type (such as 2 W or 4 W), cable type, and cable part number.

☐ Do not exceed the cable bend radius.

☐ Properly terminate cables.

Connectors and connections

☐ Use only connector types that are approved for the type of cable used. Check all connections for tightness.

Outdoors:

☐ Make sure F connectors connected to the radio assembly are tightened to 22 in-lb torque.

☐ Carefully follow waterproofing procedures, using dielectric grease and Hughes-approved weatherproof tape.

Power source

☐ Before connecting the modem power supply to the AC power source (using a surge protector), use an AC outlet tester to verify that the power outlet is wired correctly. Wiring problems may include:

  • Hot and neutral wires reversed
  • Neutral and ground wires reversed
  • Open ground (incomplete connection)
  • Open neutral

If the outlet is wired improperly, notify the customer that you are not permitted to connect the system to a faulty outlet. Do not proceed with the installation until a properly wired outlet is provided.

Grounding (modem, antenna, radio, and IFL)

☐ Adhere to Hughes grounding requirements.

☐ Use only approved ground wires, ground blocks, lugs, and clamps.

For detailed information refer to the appropriate FSB, as listed in *Table 2: Related installation documents* on page 9.

Conducting a site survey

Survey the customer site to confirm that it is satisfactory for installation of the satellite terminal.

The tasks listed here are the key tasks related to installation of the satellite modem. For complete site survey information, see the ***Antenna Site Preparation and Mount Installation Guide*** (1035678-0001).

1. Use a GPS receiver to determine the latitude and longitude at the antenna site. Note the readings.
2. Make sure there is an unobstructed line of sight to the satellite indicated on the Installation Reference Sheet.
3. Confirm that the customer's computer meets the requirements listed in *Computer requirements* on page 12.

Instructions for other terminal components

This installation guide covers only installation of the satellite modem. For installation instructions for other components, see *Table 2: Related installation documents* on page 9. You can view or download these documents on the HughesNet Installation Portal at https://dwayinstalls.hns.com/start/loginInstaller.jsp. If you have any problem logging in, contact Installer Support.

Table 2: Related installation documents

Component or topic	Where to find instructions
Safety (all components) Site survey Site preparation Antenna mounts IFL	***Antenna Site Preparation and Mount Installation Guide*** (1035678-0001)
IFL cables (specifications, approved types, maximum lengths)	Field Service Bulletin (FSB), ***IFL Cable, Approved List (with lengths) for Spaceway Domestic Installations*** (FSB_080202_01)
IFL cable connectors Grounding Ground blocks	Field Service Bulletin (FSB), ***HNS Broadband Requirements for RG-6 and RG-11 IFL Cable Connectors, Ground Blocks, and Ground Block Location*** (FSB_050518_01)
Antenna Radio assembly	See the antenna installation manual for the specific antenna model you are installing.
Antenna pointing	***Ka-Band Antenna Pointing Guide*** (1037663-0001)
Site validation (OVT)	***Installer's Guide to the Ka-Band Onsite Validation Tool (OVT)*** (1038091-0001)

Also see and adhere to the customer-specific installation specification. Typically these specifications apply to all installations for a particular company.

Power supply information

The power supply is included in the satellite modem shipping carton.
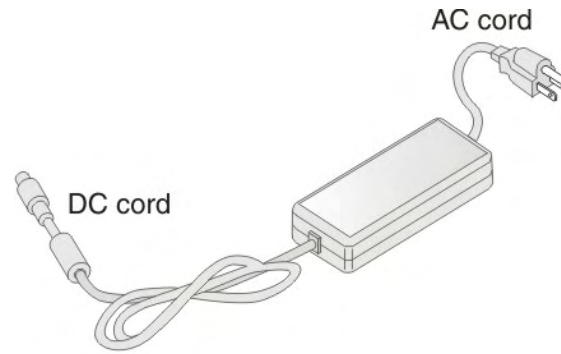
Figure 6: Power supply for the HN9000 satellite modem

Before proceeding, make sure you have the correct power supply. Check the part number on the power supply and refer to *Table 3: Power supply specifications for the HN9000 satellite modem* on page 10.

NOTICE

- Always use the power supply provided with the satellite modem. The modem's performance may suffer if the wrong power supply is used.
- Connect the power supply to a three-wire, grounded outlet with an input of 110/130 VAC. A suitable surge protector is recommended to protect the satellite modem from possible damage due to power surges.
- If the satellite modem is installed outside the United States or Canada, observe the power standards and requirements of the country where it is installed.

Table 3: Power supply specifications for the HN9000 satellite modem

Power supply type and part number	Application	Electrical requirements	Power cord
AC/DC, 73 W P/N 1501006-0001	HN9000 satellite modem with 1-W or 2-W radio	Input line voltage: 100 – 130 V, 2 A maximum Input line frequency: 60 Hz AC Rated power consumption: 73 W	Detachable, for 110 VAC outlet type.

⚠ CAUTION

If there is any reason to remove power from the satellite modem, always unplug the AC power cord from the power source (power outlet, power strip, or surge protector). Do *not* remove the DC power cord from the modem's rear panel. Doing so could result in an electrical shock or damage the modem.

When you re-apply power to the modem, plug the AC power cord into the power source.

Primary tools and equipment needed for installation

To install the satellite modem, you need the following items, which are included in the satellite modem shipping carton:

- Satellite modem.
- Power supply.
- Ethernet cable.

To install the satellite modem, antenna assembly, and IFL cables you also need the additional items listed below.

- Antenna.
- IFL cables, cable connectors, and ground blocks – You need enough cable to connect the satellite modem to the antenna (transmit cable and receive cable). For additional information, see *Table 2: Related installation documents* on page 9.
- Laptop computer (installer computer) with Internet Explorer browser installed.
- DAPT – A small device that guides the installer through the antenna pointing process and displays pointing values.
- Squinter – A tool used to fine point the antenna by capturing the satellite signal from different portions of the antenna reflector surface. The squinter type depends on the radio assembly to be installed, as explained in the ***Ka-Band Antenna Pointing Guide*** (1037663-0001).
- Fine azimuth pointing tool – Required for some antenna models.
- GPS receiver – The GPS receiver must give readings accurate to 1/1000 minute (for example, 60 degrees, 15.152 minutes).
- Installation Reference Sheet – This document describes the work to be done and provides important information that needs to be entered on the installation screens—the Terminal site name or ID and parameters that are required for installation.

No tools are required to install the modem. For tools needed to install the antenna mount and antenna and point the antenna, see:

- ***Antenna Site Preparation and Mount Installation Guide*** (1035678-0001)
- ***Ka-Band Antenna Pointing Guide*** (1037663-0001)
- The installation manual for the antenna model you are installing

Additional equipment

This section discusses additional equipment that is recommended and equipment you may need depending on the specific installation.

Use a surge protector

The customer is advised to provide a surge protector (recommended). If a surge protector is not present, connect the modem power supply to a wall outlet or other power source.

NOTICE

A suitable surge protector is recommended to protect the satellite modem from possible damage due to power surges.

Requirements for IFL cables, connectors, and ground blocks

You must use approved cable types and connectors to connect the modem to the outdoor satellite antenna. For grounding, you must use approved ground blocks and grounding connectors. For detailed specifications and information on these components, see the documents listed in *Table 2: Related installation documents* on page 9.

A hub may be required

If the satellite modem is to be connected to a network, an Ethernet hub or other similar device is required. The customer must supply and configure the hub or other device, including required cables, according to the documentation for the hub or other network device.

Computer requirements

Make sure the laptop computer you use to install the satellite modem and the customer's computer that will be connected to the modem meet the following minimum requirements. Requirements are listed by operating system.

All requirements are minimum requirements except those identified as *recommended*.

The satellite modem may work with a computer that does not meet these requirements, but Hughes supports only computers that meet these requirements.

Microsoft Windows Vista Home Basic

- Processor speed: 800 MHz
- System memory: 512 MB
- Free hard disk space: 150 MB

Microsoft Windows Vista Home Premium, Business, Enterprise, or Ultimate

- Processor speed: 1 GHz
- System memory: 1 GB
- Free hard disk space: 150 MB

Microsoft Windows XP, Professional or Home Edition

- Processor speed: 233 MHz. *Recommended:* 300 MHz or higher
- System memory: 128 MB. *Recommended:* 256 MB or more
- Free hard disk space: 150 MB

Microsoft Windows 2000, Professional Edition with Service Pack 4

- Processor speed: 133 MHz
- System memory: 128 MB
- Free hard disk space: 150 MB

Apple Mac 9.0-10.5 (excludes 10.0)

- Processor speed: 300 MHz
- System memory: 128 MB
- Free hard disk space: 150 MB

> **Note:** The satellite modem can be used with a Mac computer that meets these requirements, but Mac computers are not supported as a tool for installing the satellite modem.

Networking requirements

- Ethernet port
- Ethernet cable (provided)
- Ethernet NIC, 10/100 Mbps, configured as follows:

  - Auto-negotiate
  - DHCP enabled
  - Obtain an IP address automatically

  > **Note:** The computer can be configured to use a public IP address if the HughesNet service plan provides for one or more public IP addresses.

Internet browser

- Internet Explorer 6 or greater, Netscape Navigator, Mozilla Firefox, Safari (for Windows and Mac)
- Browser settings:

  - HTTP 1.1 or greater enabled
  - Proxy settings disabled

Configuring the installer laptop IP address

You have several options for configuring the IP address on your installer laptop computer, as explained below.

The option you choose affects your ability to perform various installation tasks. To enter installation parameters and subsequently monitor commissioning progress, including state codes, which indicate installation progress, the laptop must be configured for link-local IP address 169.254.10.10. However, you cannot browse the Internet if the laptop is configured to use this address. After commissioning, you must use the address 192.168.0.1 with DHCP enabled to open the System Control Center.

From the following options, choose the address configuration that best suits your preferences and the way you work.

- **Link-local IP address with alternate private IP address** – If you want to configure the link-local IP address 169.254.10.10 on the installer laptop, but you do not want to remove that address each time you go to the System Control Center, you can configure an alternate private IP address, 192.168.0.2, along with the 169.254.10.10 address. For instructions see *Configuring a link-local IP address on the installer laptop* on page 14 and *Configuring an alternate IP address on the installer laptop* on page 15.

- **DHCP enabled** – If you enable DHCP on the laptop (no static IP address) you can type 192.168.0.1 or *www.systemcontrolcenter.com* in the browser address bar anytime *after commissioning* to go to the System Control Center home page. DHCP allows your laptop to obtain IP addresses automatically. This option may be more convenient if you use your laptop for a variety of activities.

  However, if DHCP is enabled on the laptop during commissioning, you must periodically press the F5 function key or increase the screen refresh rate to see if a commissioning error has occurred or to know when commissioning has completed. Also, with DHCP enabled, you cannot observe the entire registration process (part of commissioning) as it occurs. This is because when the modem is updating and rebooting, you cannot launch the screen that shows the registration progress.

  For instructions see *Configuring a computer to use DHCP* on page 109.

  📝 **Note:** If you switch from using the link-local IP address to DHCP enabled, the modem may acquire the dynamic address more quickly if you force a new connection (on a Windows computer) as follows:

    1. Open a (DOS) Command Prompt window.
    2. Type ipconfig/release.
    3. Press **Enter**.
    4. Type ipconfig/renew.
    5. Press **Enter**.

- **Link-local IP address (only)** – If you configure link-local address 169.254.10.10 on the installer laptop, you *will not* be able to open the System Control Center by entering 192.168.0.1 or *www.systemcontrolcenter.com* in the browser address bar. The configured link-local IP address will not allow access to the typed-in address. A typed address will only work if you clear the link-local IP address from the laptop IP configuration and enable DHCP, or configure an additional static private IP address as explained in *Configuring an alternate IP address on the installer laptop* on page 15.

Configuring a link-local IP address on the installer laptop

These instructions explain how to configure the installer laptop computer to use the link-local IP address 169.254.10.10. If you also want to configure an alternate address on the installer laptop (optional, for convenience), see *Configuring an alternate IP address on the installer laptop* on page 15.

These instructions are for Windows XP. Procedures for other Windows operating systems are similar. If you need additional instructions, see *Configuring a computer for a public IP address* on page 117.

1. Use the Windows Control Panel on the installer laptop to open the Local Area Connection Properties dialog and then the Internet Protocol (TCP/IP) Properties dialog. If you need more specific instructions, see *Configuring a computer for a public IP address* on page 117.
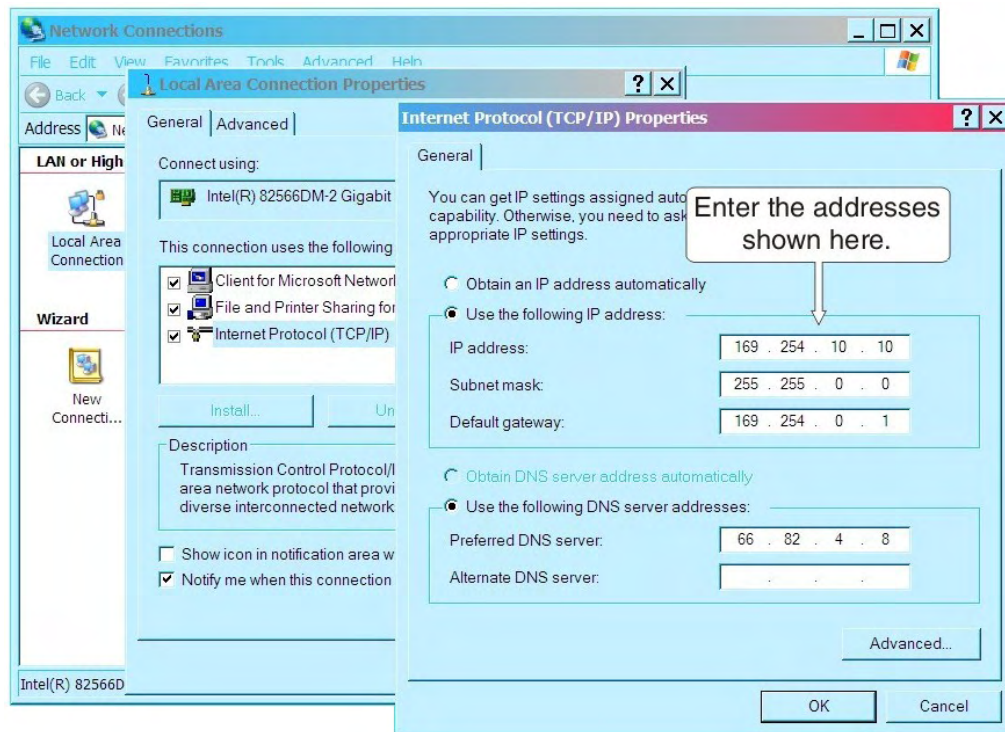
Figure 7: Internet Protocol Properties dialog

2. In the Internet Protocol Properties dialog, click Use the following IP address.

3. Enter the following:

   a) In the IP address field, type 169.254.10.10.
      This will be the laptop IP address.

   b) Typically the Subnet mask field auto-populates to 255.255.0.0. If it does not, enter this value manually.

   c) In the Default gateway field, type 169.254.0.1.
      This is the address you will use to access the modem's installation screens.

   d) In the Preferred DNS server field, type 66.82.4.8.

   e) Click **OK** twice to close the Internet Protocol Properties dialog and the Network Connections dialog.

The laptop computer is now configured to communicate with the satellite modem so you can enter installation parameters and monitor commissioning progress.

Configuring an alternate IP address on the installer laptop

If you do not want to make address changes on the laptop computer during modem installation, you can configure a link-local IP address and a *second* (alternate) private IP address. Then you can access the satellite modem and browse the Internet without changing the IP address settings on the laptop. **The instructions here assume you have already set up an address** on the laptop as explained in *Configuring a link-local IP address on the installer laptop* on page 14.

Configure the second (alternate) IP address as follows:

1. Use the Windows Control Panel to open the Local Area Connection Properties dialog and then the Internet Protocol (TCP/IP) Properties dialog.

2. Click **Advanced** to open the Advanced TCP/IP Settings dialog.

3. In the IP addresses box, click **Add** to open the TCP/IP Address dialog.

    a) Type the second IP address 192.168.0.2.

    b) Type the subnet mask 255.255.255.0.

    c) Click **Add**.

4. In the Default gateways box, click **Add** to open the TCP/IP Gateway Address dialog.

    a) Type the second gateway IP address 192.168.0.1.

    b) Click **Add**.

5. Click **OK** three times to close the Advanced TCP/IP settings dialog, Internet Protocol Properties (TCP/IP) dialog and the Network Connections dialog.

6. Close the Network Connections and Control Panel windows.

For your reference, *Figure 8: Settings for link-local and alternate addresses on the laptop* on page 16 shows the information you should see in the Internet Protocol Properties dialog and Advanced TCP/IP Settings dialog after you have set up the primary address and an alternate address on the installer laptop. In the Advanced TCP/IP Settings dialog, the laptop addresses are listed under IP Addresses (primary first, then alternate), and the modem addresses are listed under Default gateways.
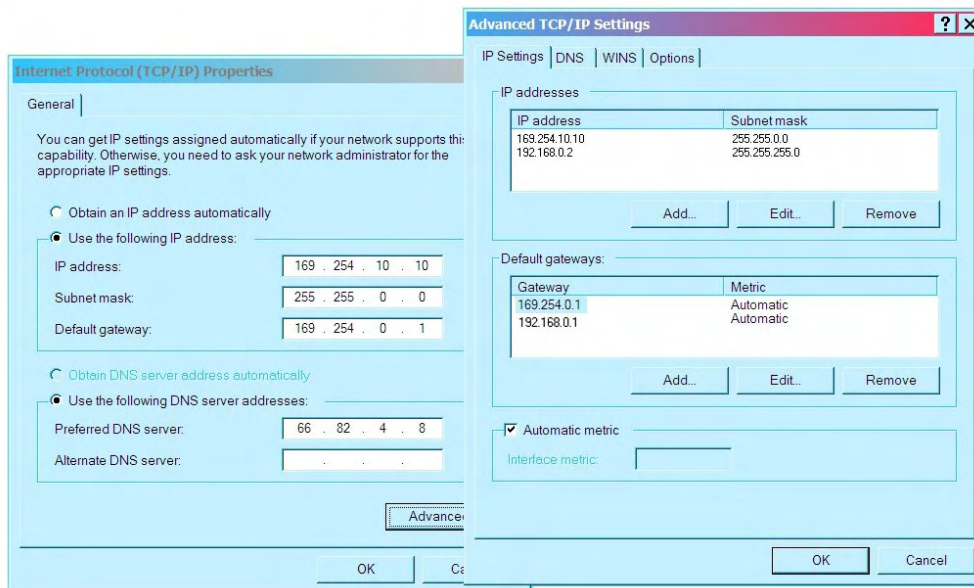
Figure 8: Settings for link-local and alternate addresses on the laptop

Chapter

3

Installing the satellite modem

Topics:

- *Selecting the modem location*
- *Modem operating position*
- *Powering up the modem*
- *Connecting the installer laptop to the modem*
- *Entering the installation parameters*

Installation of the HN9000 satellite modem consists of physical installation, which is very simple, followed by a complex but highly automated process that fully prepares the modem for operation on the satellite network. Installation tasks include:

- Physical installation and power-up
- Entering required installation parameters
- Pointing the antenna
- Monitoring the commissioning process
- Service activation

Typically, the satellite modem is installed as part of a new satellite terminal installation. Under some circumstances, a modem may have to be re-installed.

Note: In some cases re-installation may correct a specific service problem. Re-installation should only be done by a qualified installer or service technician or someone under specific direction by Hughes Customer Care.

The installation software is factory pre-installed in the satellite modem. If necessary, this software is automatically updated as part of the installation process. You access the installation software through a browser on your installer computer to perform tasks such as entering required installation parameters.

Selecting the modem location

Select a location for the satellite modem that will accommodate all required cable connections, including the power source. Place the modem in the desired location.

NOTICE

- Do not block any ventilation openings. Do not place the satellite modem near heat sources such direct sunlight, radiators, heat registers or vents, ovens, stoves, or other apparatus (including amplifiers) that produce heat.
- Leave 6 inches of space around the top and sides of the modem to ensure ventilation and prevent overheating.

Modem operating position

Install and operate the HN9000 modem only in a vertical position, that is, resting on its built-in base as shown in *Figure 9: HN9000 in vertical position* on page 18. In any other position, the modem may overheat and malfunction because of inadequate ventilation.

Figure 9: HN9000 in vertical position

NOTICE

To avoid overheating, install and operate the HN9000 modem only in the upright vertical position as shown in *Figure 9: HN9000 in vertical position* on page 18.

Powering up the modem

For this task you must have the satellite modem and the correct power supply. To make sure you have the correct power supply, see *Power supply information* on page 10.

Test the power outlet and power up the satellite modem:

1. Use an AC outlet tester to verify that the power outlet is wired correctly. Wiring problems may include:

   - Hot and neutral wires reversed
   - Neutral and ground wires reversed
   - Open ground (incomplete connection)
   - Open neutral

   If the outlet is wired improperly, notify the customer that you are not permitted to connect the system to a faulty outlet. Do not proceed with the installation until a properly wired outlet is provided.

2. Connect the DC power cord to the modem's DC IN connector, as shown in *Figure 10: Powering up the modem* on page 19.

3. Connect the AC power cord to the three-prong connector on the modem's power supply.

4. Connect the surge connector (recommended) to an AC power outlet.

5. Apply power by connecting the AC power cord to the surge connector. The Power LED turns on, and various LEDs turn on and off as the modem performs a self-test and transitions to boot phase. (Indication that the self-test passed appears later as Self Test : Passed on the screen shown in *Figure 22: Terminal Initialization Sequence complete* on page 34.)
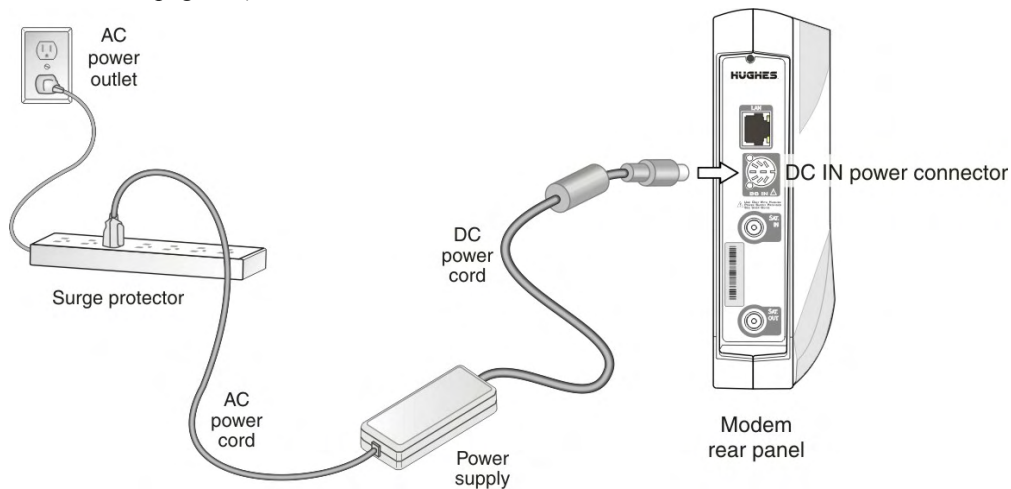
Figure 10: Powering up the modem

NOTICE

A suitable surge protector is recommended to protect the satellite modem from possible damage due to power surges.

Connecting the installer laptop to the modem

For this task you need the provided Ethernet cable.

To access the satellite modem so you can perform the required installation procedures, you connect your installer laptop computer to the modem. After the modem is installed and registered

with the satellite network, you connect the modem to the customer's computer. During modem installation the installer laptop computer must be directly connected to the modem without any intervening connection.

Connect the installer laptop to the modem:

1. Use the Ethernet cable to connect your laptop computer *directly* to the modem's LAN port, as shown in *Figure 11: Connecting the installer's laptop computer to the modem* on page 20.

    Do not connect the installer laptop to the modem through an Ethernet router or switch.
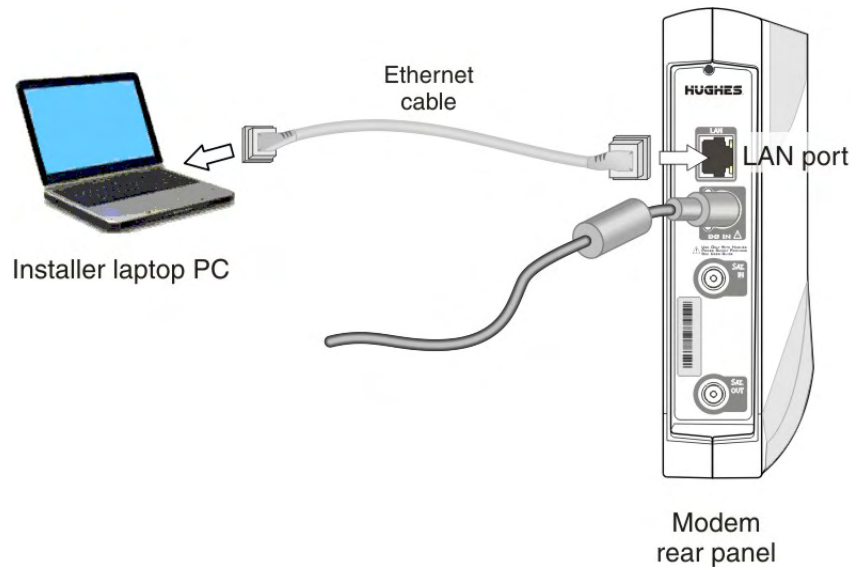
Figure 11: Connecting the installer's laptop computer to the modem

2. Make sure the satellite modem is not connected to the customer's computer.
3. If you are running firewall software on the laptop computer, disable it until you complete installation of the modem.
    The LAN LED on the front of the modem should now be on.

Entering the installation parameters

Prerequisites:

• Before proceeding, make sure the link-local IP address 169.254.0.1 is set up on the installer laptop computer as explained in *Setting the installer laptop IP address*.
• For this task you need the Installation Reference Sheet, which lists parameters you need to enter on screens displayed by the modem's installation software.

Installation of the satellite modem is accomplished through actions performed by the installer, network and installation software, and interaction between the satellite modem and the NOCC. After powering up the modem, the installer enters required parameters. Then, before installation can continue, the installer must accurately point the antenna.

Enter information about the site, satellite, antenna, and radio, as explained in this section. Enter the values shown on the Installation Reference Sheet. **Be sure to enter the information correctly or you may not be able to successfully install the modem**.

1. Start a web browser on your laptop computer.

2. Type 169.254.0.1 in the browser address bar and press **Enter**.

The System Control Center home page opens.

> **Note:** Use 169.254.0.1 to open the System Control Center only before the satellite modem is commissioned. After the modem is commissioned, use the address www.systemcontrolcenter.com *or* 192.168.0.1. To use 192.168.0.1, the installer's laptop must be configured for two addresses as described in *Configuring an alternate IP address on the installer laptop* on page 15, and DHCP must be enabled.
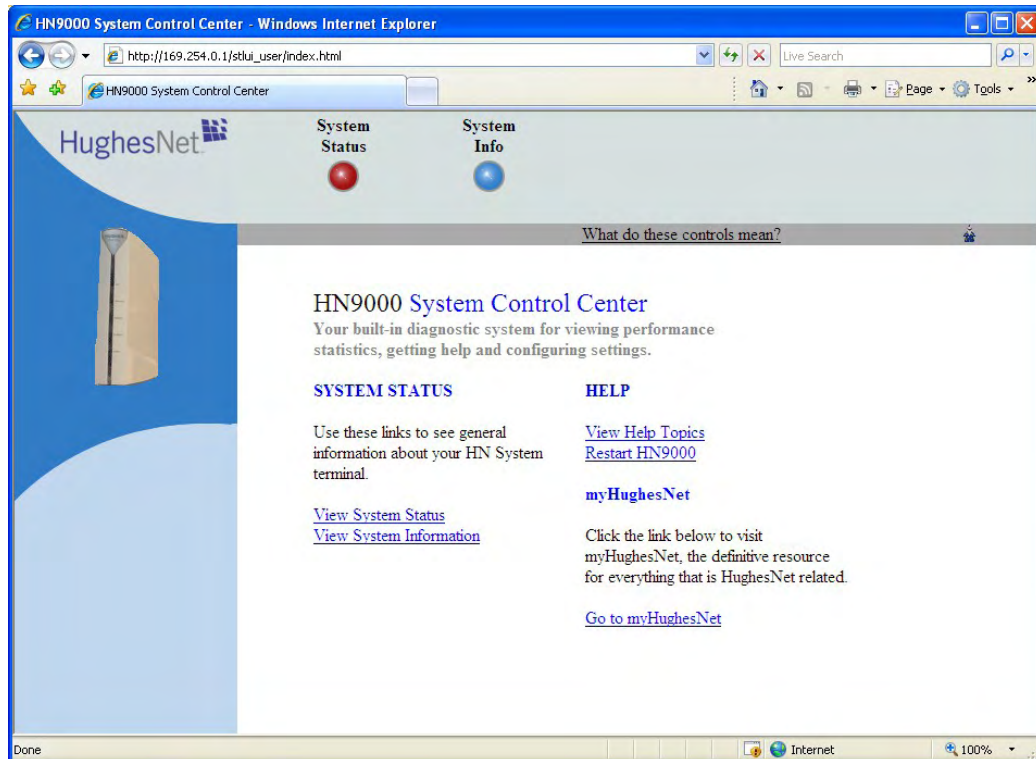
Figure 12: System Control Center home page

The System Status and System Info buttons are always visible near the top of the System Control Center screens. Three additional buttons are visible after the modem has been commissioned and is operational.

3. Click the small icon indicated by the arrow in *Figure 13: Icon for opening Advanced Pages* on page 21.
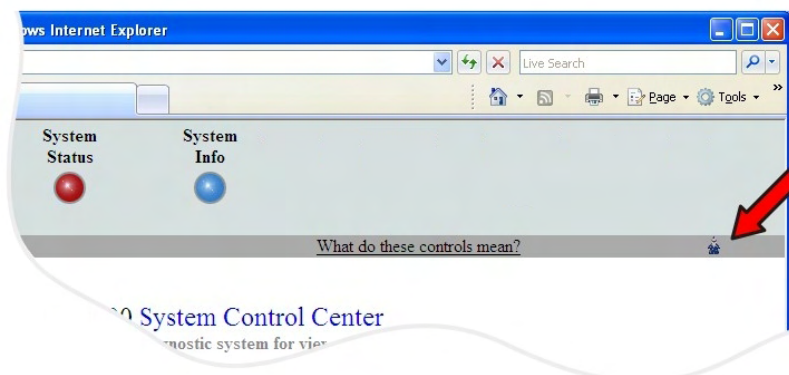
Figure 13: Icon for opening Advanced Pages

The browser opens the Installation Parameters screen, which appears within a larger screen titled Advanced Configuration and Statistics (*Figure 14: Installation Parameters screen* on page 22). The Installation Parameters screen is the first of several screens that appear within the Advanced Configuration and Statistics screen as you install the modem.

Figure 14: Installation Parameters screen on page 22 is an example, showing the Installation Parameters screen with parameters entered. You must enter the specific parameters for the site where you are installing the satellite modem, as listed on the Installation Reference Sheet. Do not copy parameters from this example.

Figure 14: Installation Parameters screen

> **Note:** On some screens and in some messages you may see the word *terminal*. This word refers to the satellite modem.

4. For each of the following parameters, select the value that is listed on the Installation Reference Sheet:

   • Terminal site name – Note that this field is case-sensitive.
   • A code – Satellite orbital location. The value 0949505, which corresponds to the orbital location 94.950° W.
   • B code – Antenna size. The B code and C code values are used to ensure that the satellite modem transmits at the correct maximum power.

B code	Antenna size
0749	0.74 m
0988	0.98 m
1208	1.2 m

B code	Antenna size
1804	1.8 m

For the HN9000 modem, select 0.74 m or 0.98 m antenna size only.

- C code – ODU power

C code	Nominal ODU power
000103	1 W
000200	2 W
000406	4 W
001004	10 W Power booster unit

For the HN9000 modem, select 1 W or 2 W ODU power only.

- U code – Select the U Code (Satellite ID) shown on the Installation Reference Sheet.

The A, B, C, and U code fields each have a drop-down menu for easier and more accurate data entry. Make your selections from these menus. You can type your own value in the space that reads, *Enter Your Own Value*—but do this *only if you are specifically instructed to do so by Hughes Installer Support*.

> **Note:** You can clear previously entered installation information by clicking **Control** in the screen's left panel, and then clicking **Clear Terminal Install**. A message warns that **this operation could make the modem inoperable.** Execute this command only if you are confident you know what to expect. The modem reboots, and all fields are cleared.

5. Enter the site latitude and longitude values from your GPS receiver, in degrees and minutes to three decimal places.

Figure 15: Fields where latitude and longitude are entered

The modem's installation software uses the site latitude and longitude to determine the uplink and downlink cells to which the modem will be assigned and the uplink polarization setting on the radio assembly (LHCP or RHCP).

You must enter the latitude and longitude in the format shown in *Figure 15: Fields where latitude and longitude are entered* on page 23:

- Latitude: DD MM.MMM
- Longitude: DDD MM.MMM

Enter **degrees** in whole numbers only, with no decimals. Degrees latitude is 1 or 2 digits (0 – 90° north or south). Degrees longitude is 1 – 3 digits (0 – 180° east or west). Examples of degrees correctly entered:

5, 05, 42 or 112

Enter **minutes** as a whole number plus a decimal fraction to three places (thousandths) with no seconds. Examples of minutes correctly entered:

7.223 and 34.775

If you type a number with a leading zero, the zero is not displayed after you press **Submit Installation Parameters**. For example, if you type 06 it is displayed as 6.

If you enter the site latitude and longitude incorrectly, the modem will report a Probing Failure and will not be able to uplink to the satellite. *Probing* refers to the first time the modem tries to transmit back to the satellite.

Some GPS receivers are suitable for Ka-band installations such as HN9000; some are not suitable. For a complete discussion on various GPS receivers, see *Field Service Bulletin (FSB), Introduction to Commercial GPS Units for Ka Installers* (FSB_080404_01).

Figure 16: Example of a GPS receiver display on page 24 shows an example of a GPS receiver display showing latitude and longitude along with the fields on the Installation Parameters screen where these values are entered.
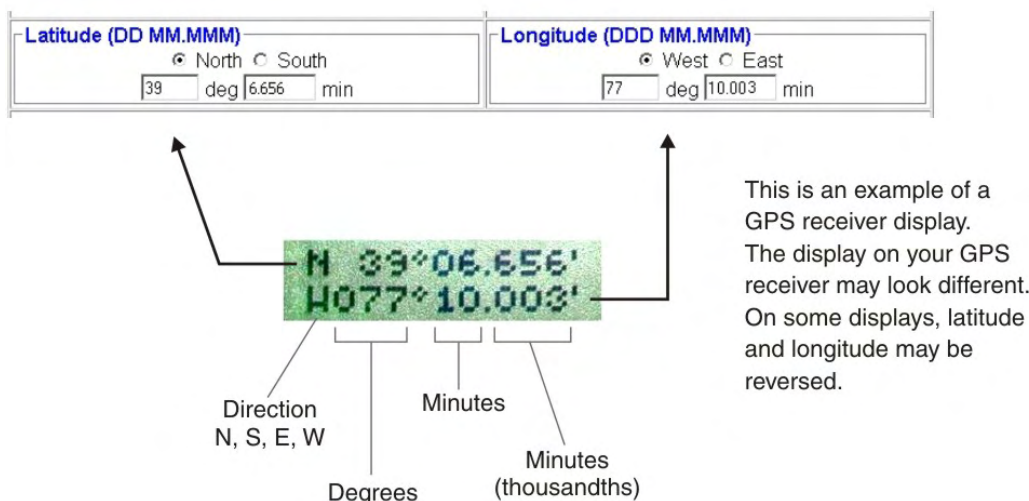
Figure 16: Example of a GPS receiver display

For Latitude, the North radio button is selected by default. For Longitude, West is selected by default.

Figure 17: State code displayed below latitude and longitude fields on page 24 shows state code 7 displayed beneath the latitude and longitude fields.

Figure 17: State code displayed below latitude and longitude fields

The current state code is displayed on several of the installation screens and on some System Control Center screens. The state code indicates the current operational state of the satellite modem.

While you are entering installation parameters but before you click **Submit Installation Parameters**, it is normal to see state code 4, 5, 7, or 8. To see a list of state codes with explanation, click the state code. For additional information, see *Table 17: State codes* on page 88.

Note: Do not change the Antenna Pointing Indicator Delay value.

6. Click **Submit Installation Parameters**.
The modem saves the information you entered to flash memory. If you enter a new parameter or modify a parameter, the modem reboots. After the reboot, the Terminal Pointing Info screen appears. See *Figure 18: Terminal Pointing Info screen* on page 25.
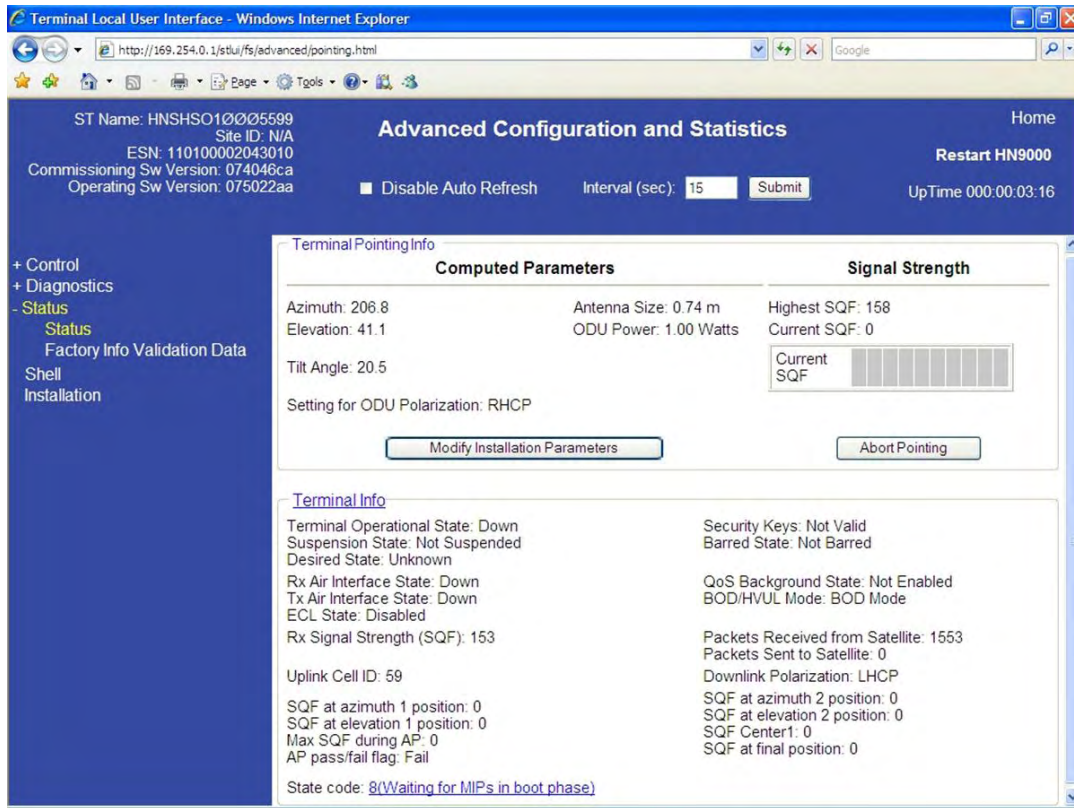
Figure 18: Terminal Pointing Info screen

If you want to change any of the values you previously entered on the Installation Parameters screen, click **Modify Installation Parameters**. This returns you to the Installation Parameters screen.

Do not click the **Abort Pointing** button. This would skip the pointing phase and subsequently cause registration to fail. Then you could only register the modem by obtaining a pointing override from the NOCC. The **Abort Pointing** button is used only during manual IDU (modem) replacement, for which the NOCC explicitly approves an antenna pointing override for the site.

Note: At this point, prior to antenna pointing, the SQF value may be 0, indicating that the demodulator is initializing, or 1, indicating that the demodulator is searching for a beacon signal. Most of the time the SQF value is 1 until the demodulator acquires the beacon signal; then it is > 1.

7. Make a note of the values shown in the **Computed Parameters** area of the Terminal Pointing Info screen:

- Azimuth
- Elevation
- Tilt angle
- ODU polarization setting (LHCP or RHCP)

You will need the azimuth and elevation values to point the antenna.

Note: When you install the antenna, be sure to set LHCP or RHCP as indicated on the Terminal Pointing Info screen (Setting for ODU Polarization). If you set polarization incorrectly—for example, LHCP when RHCP is specified—the satellite modem will not receive a signal.

For explanation of the information in the Terminal Info section (lower part) of the Terminal Pointing Info screen, see *Table 6: Parameters in Terminal Info section (appears on two installation screens)* on page 38.

Chapter

4

Installing outdoor equipment and antenna pointing

Topics:

- *Installing the IFL cables*
- *Pointing the antenna*

After you enter the installation parameters on the Installation Parameters screen and click **Submit Installation Parameters**, the satellite modem enters pointing mode. This allows you to point the antenna.

This section provides some general information about antenna installation and pointing, especially as these tasks relate to modem installation. For complete instructions on installing antenna mounts, antennas (including radio assemblies) and pointing, refer to the manuals listed in *Instructions for other terminal components* on page 9.

The HN9000 satellite modem can be used with a .74 m or .98 m two-way satellite antenna. Assemble and install the antenna assembly according to the antenna installation manual. If you do not have the antenna installation manual, find the required antenna type and model on the Installation Reference Sheet. Then find the installation manual for the specified antenna on your installation support web site. The antenna and satellite modem are shipped in separate boxes.

⚠️ **CAUTION**

When you install the antenna assembly, read and follow all safety alerts and instructions in the antenna installation manual and in the *Antenna Site Preparation and Mount Installation Guide* (1035678-0001).

Installing the IFL cables

Before you can point the antenna, you must route the IFL cables between the indoor satellite modem location and the antenna. Then you connect the modem and the antenna by connecting the IFL cable to both components.

(See also *Requirements for IFL cables, connectors, and ground blocks* on page 12.)

Routing and connecting the IFL cables

To point the antenna, you must connect the modem to the antenna and install the DAPT (a Hughes tool that displays antenna pointing values.)

1. Route the IFL cables from the indoor satellite modem location to the antenna.
    The routing path depends on the building configuration. Guidelines for installing IFL cables are included in the ***Antenna Site Preparation and Mount Installation Guide*** (1035678-0001).
2. Connect the transmit IFL cable to the transmit connector on the radio transmitter.
    (The transmit cable is not shown in *Figure 19: In-line connection of the DAPT* on page 28.)
3. Connect the receive IFL cable to the DAPT, as shown in *Figure 19: In-line connection of the DAPT* on page 28.
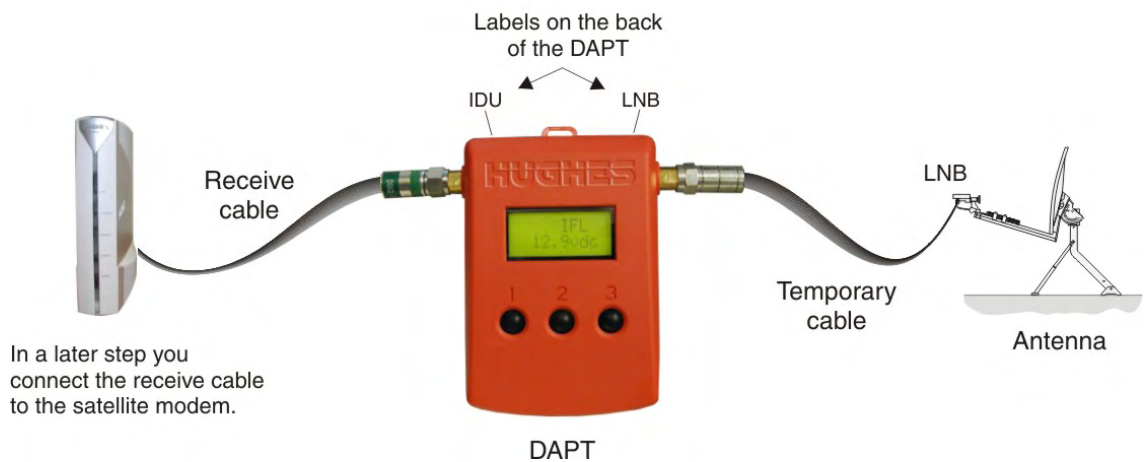
Figure 19: In-line connection of the DAPT

For additional information on pointing and the DAPT, see the ***Ka-Band Antenna Pointing Guide*** (1037663-0001).

4. Use a temporary cable to connect the DAPT to the LNB on the radio assembly as shown in *Figure 19: In-line connection of the DAPT* on page 28.
    This is a temporary arrangement that is required for antenna pointing.

    Note: The connectors on the DAPT are labeled IDU and LNB. If the cable from the satellite modem (the IDU) and the cable from the radio assembly on the antenna are connected to the wrong connectors, the DAPT will not receive a signal.

IFL grounding requirement

The coaxial IFL cables and the ground block to which they are connected must meet the grounding requirements specified in the following warning:

You must comply with applicable local codes and the grounding requirements in Field Service Bulletin (FSB), ***HNS Broadband Requirements for RG-6 and RG-11 IFL Cable Connectors, Ground Blocks, and Ground Block Location*** (FSB_050518_01). Improper grounding can result in electric shock injury and/or property damage.

Labeling the IFL cables

Label the receive and transmit IFL cables at the outdoor point-of-entry and at the indoor location where the satellite modem is installed as follows:

* Wrap a piece of *red* electrical tape around the receive cable, and mark SAT IN on the tape.
* Wrap a piece of *blue* electrical tape around the transmit cable, and mark SAT OUT on the tape.

Connecting the IFL cables to the modem

Connect the transmit and receive IFL cables to the satellite modem.

1. Connect the transmit and receive cables to the connectors on the rear panel of the modem as shown in .

Figure 20: Connecting the transmit and receive cables

The transmit and receive cable connectors must be securely tightened.

* Make sure each connector is properly aligned (not cross-threaded).
* The connector should be finger tight with no play.

Note: The satellite modem may operate correctly when first installed even if the transmit and receive cable connectors are not adequately tightened. However, problems could

develop later. Therefore, successful modem operation is not an indication that the cables are adequately tightened.

2. Make sure neither the satellite modem nor the customer's computer are connected to an Ethernet device.

> Note: Do not connect any device to the satellite modem at this time except the installer laptop computer. Ethernet devices may only be connected to the modem after it is installed and commissioned.

Pointing the antenna

Make sure you have the DAPT and the correct squinter for the radio assembly to be installed. You will need these tools to point the antenna.

1. Go outside to the antenna location.
2. Follow the procedure explained in the ***Ka-Band Antenna Pointing Guide*** (1037663-0001) to point the antenna using the DAPT and squinter.

When you finish the pointing procedure, a screen message on the DAPT asks if you want to store the pointing information in the satellite modem. If you answer *yes*, the modem exits pointing mode. When the modem finishes downloading the pointing information, the DAPT displays a Pointing Done message.

3. Make sure you see the Pointing Done message on the DAPT.

NOTICE

Do not remove the DAPT until you see the Pointing Done message.

4. Remove the DAPT and connect the receive IFL cable from the satellite modem to the LNB on the radio assembly.
    At this point the modem automatically begins the process of *commissioning*—which includes registering with the NOCC, downloading operational software, and related activities.
5. Go back inside to complete installation of the modem.

Chapter

5

Commissioning the satellite modem

Topics:

- *Prerequisites for commissioning*
- *Monitoring the commissioning process*
- *Troubleshooting installation problems*

During the *commissioning* phase of installation the satellite modem downloads software and completes other activities so it can become an operational element of the network. When commissioning is completed, the modem is ready for service activation.

The NOCC and the modem communicate to make sure commissioning software is loaded in the modem. If necessary, commissioning software is downloaded to the modem. The commissioning software is only sufficient to complete commissioning steps; it does not support end-user data transfer capabilities.

The modem interacts with the satellite to establish transmit timing and synchronization. It interacts with the NOCC for authentication and registration; and to obtain required software, security keys, and a preliminary configuration. The NOCC notifies the NSP that the satellite modem has registered with the network.

The modem downloads a temporary configuration from the NOCC. The temporary configuration allows the modem to communicate with the NSP so the broadband service can be activated. Final configuration is provided to the modem after service activation.

Prerequisites for commissioning

The following are prerequisites for commissioning:

- The satellite modem must be physically installed.
- The antenna must be pointed, and the modem must have exited pointing mode.
- Service for the modem must be configured by the service provider and the NOCC, and the terminal site name previously entered by the installer (*Figure 14: Installation Parameters screen* on page 22) must match the terminal site name configured by the service provider and NOCC.
- The satellite modem must be defined at the NOCC and authorized for commissioning by the service provider.

Monitoring the commissioning process

Commissioning activities are performed automatically by the satellite modem, the satellite, and the NOCC. Commissioning begins when the modem exits pointing mode and progresses until the modem reboots into normal operational mode. Normally, there is no need for intervention.

After you point the antenna and respond *Yes* on the DAPT to store the pointing information, the modem exits pointing mode and displays the Terminal Initialization Sequence screen on your browser (*Figure 21: Terminal Initialization Sequence in progress* on page 33).

The Terminal Initialization Sequence screen lists each commissioning activity and each activity's progress as the satellite modem proceeds through the commissioning (or *initialization*) sequence. *Figure 21: Terminal Initialization Sequence in progress* on page 33 shows the commissioning process at a point when several commissioning activities have completed, but commissioning is still underway. The activities occur in the order they are listed on the screen, top to bottom, beginning with the self test.
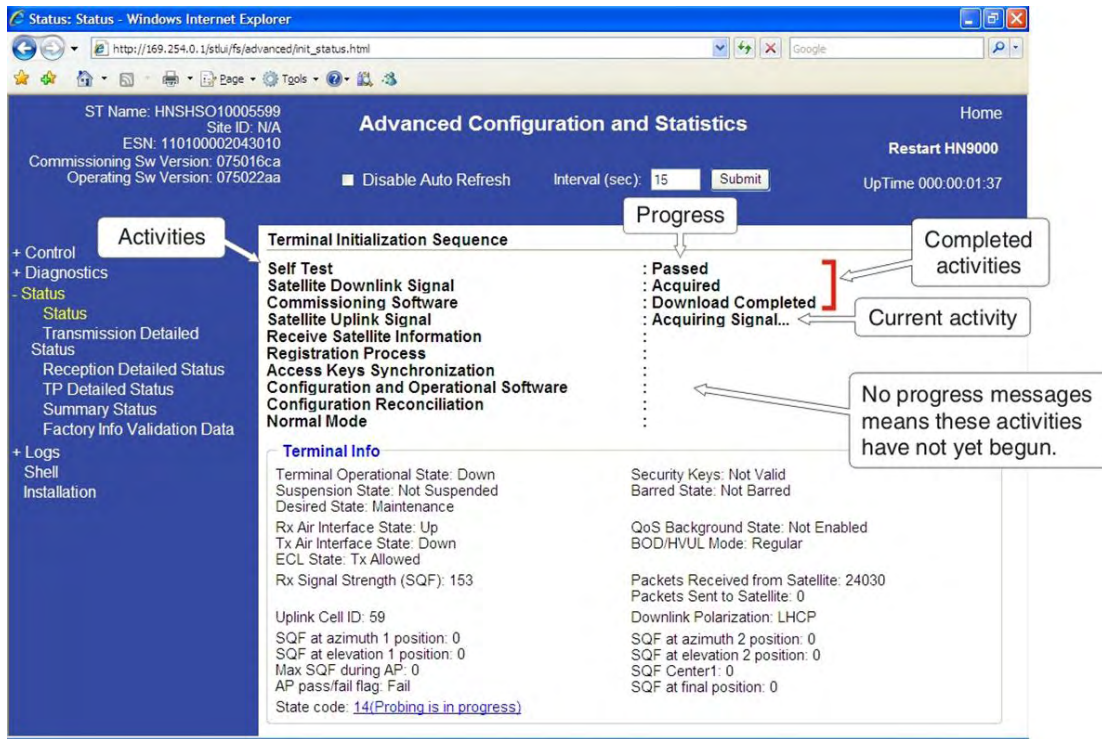
Figure 21: Terminal Initialization Sequence in progress

An activity in progress is indicated by three dots after the name of the activity, for example: **Acquiring Keys...**

> *Note:* Downloading the *commissioning* software, if required, takes approximately 5 minutes. **Do not remove power** during this download because you think it's taking too long. If you do, you will have to wait until the commissioning software is broadcast again from the NOCC *plus* the download time. The wait for the software broadcast your modem needs can be as long as 20 to 25 minutes.
>
> Downloading *operational* software takes about 10 to 20 minutes. This download occurs after the commissioning software download, as shown in *Figure 22: Terminal Initialization Sequence complete* on page 34.
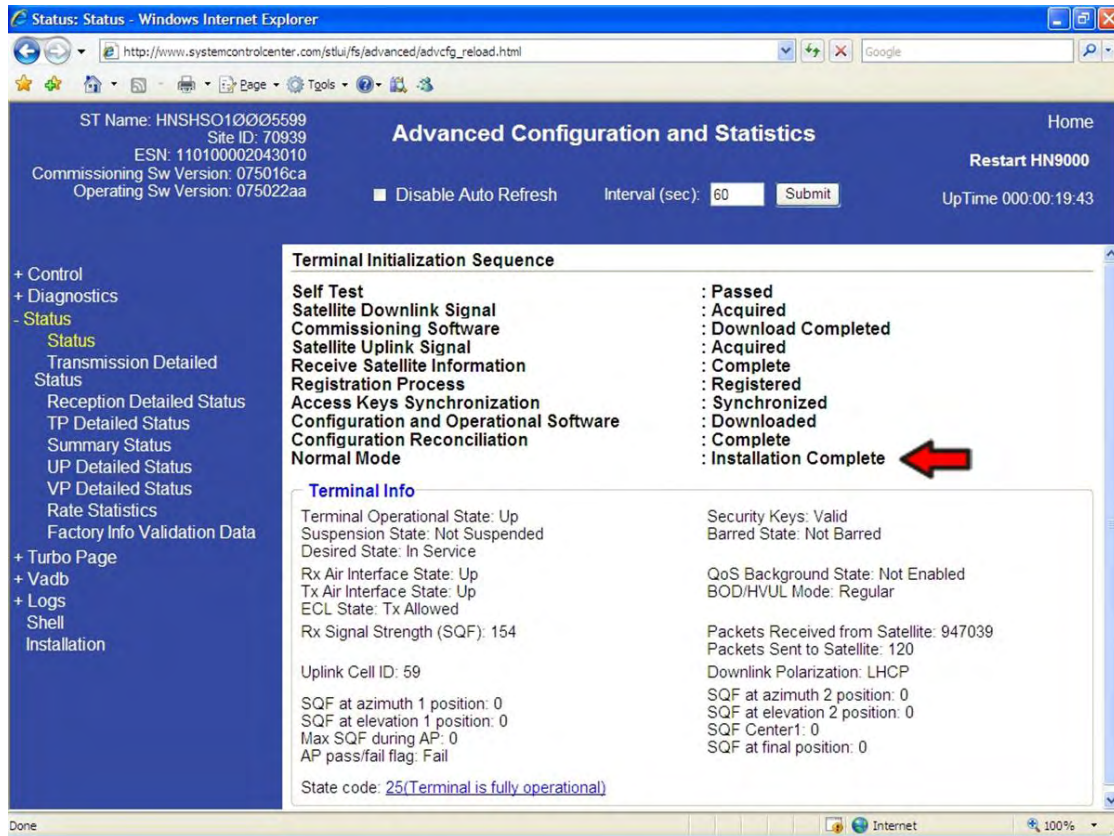
During the initialization sequence, numerous procedures are performed that are critical for operation of the satellite modem. In addition to the procedures listed on the Terminal Initialization Sequence screen, the satellite modem *probes* to optimize its timing and power levels. *Registration* refers to equipment identification, authentication, and registration with the satellite network. During *configuration reconciliation*, the modem makes sure it has the correct configuration. The modem also loads numerous profiles that are required for network operation.

Monitor the commissioning process by viewing the Terminal Initialization Sequence screen. Unless there is a problem (as indicated by an error message), you should not have to take any action during this sequence except to monitor the process.

Monitor the initialization sequence screen while the modem progresses through the commissioning process:

1. Monitor the commissioning progress messages on the Terminal Initialization Sequence screen.
   When commissioning is complete, the Terminal Initialization Sequence screen shows **Installation Complete** as the last progress message. This message is indicated by the arrow in *Figure 22: Terminal Initialization Sequence complete* on page 34.

> **Note:** Some error messages are temporary. For example, you may see a message that says a commissioning activity is halted; then in a short time the activity resumes.

Figure 22: Terminal Initialization Sequence complete

2. In the event that an error condition prevents the commissioning process from completing, refer to *Table 7: Guidelines for installation troubleshooting* on page 40 for troubleshooting steps you can take.

Successful commissioning ends with the modem rebooting into normal operational mode.

For detailed information about the commissioning process, the Terminal Initialization Sequence screen, and possible error messages, see *Commissioning and installation reference information* on page 35. There is also a section on installation troubleshooting (*Troubleshooting installation problems* on page 40). Unless you encounter a problem, you should not need this reference or troubleshooting information, and you can proceed to *Activating the HughesNet service* on page 51.

Implementation of second IP address

After commissioning has completed, the installer should continue to use the address settings specified in *Setting the installer laptop IP address* and should continue to use the 169.254.0.1 address to access the modem from the installer laptop. However, after the modem is activated (a subsequent step), the installer cannot use this address to browse the Internet.

After commissioning, using the customer's browser, you (or the customer) can type www.systemcontrolcenter.com (or 192.168.0.1) to open the System Control Center. To use 192.168.0.1, DHCP must be enabled on the computer.

> **Note:** You cannot use the address 169.254.0.1 to access the modem from a computer that has DHCP enabled.

Commissioning and installation reference information

This reference section:

- Lists the commissioning activities and corresponding progress messages that are displayed on the Terminal Initialization Sequence screen.
- Includes explanation of error messages you could see in the event of a problem.
- Explains the fields in the Terminal Info section, which appears on the Terminal Pointing Info screen and on the Terminal Initialization Sequence screen.

For explanation of state codes, which appear on the installation screens (and System Control Center screens) as *State code* plus a number, see *Table 17: State codes* on page 88.

Commissioning activities and progress messages

All possible progress (or status) messages for each commissioning activity are shown in *Table 4: Commissioning progress messages* on page 35. If a status message indicates a problem, refer to *Table 7: Guidelines for installation troubleshooting* on page 40.

Table 4: Commissioning progress messages

Phase (activity)	Progress messages indicating normal progress	Possible error messages
Self Test	**Passed**	
Satellite Downlink Signal	Acquiring **Acquired**	Attempting to acquire downlink signal in microcell *{number}*, retry # *{number}* Downlink signal acquisition failed, retry # *{number}* Final cell selection failed. (This message could mean you are trying to install the modem in a location that is outside the network service area. **Corrective action:** Make sure you entered the correct latitude and longitude on the Installation Parameters screen.)
Commissioning Software	Waiting for System Information Downloading beginning... **Download Completed** Please wait for next broadcast of Software in *{number}* mins...	
Satellite Uplink Signal	Acquiring Signal **Acquired**	Uplink signal acquisition failed (Ack attempt # *{number}*)... Attempting Probing (attempt # *{number}*) ... Probing failed (attempt # *{number}*)... Probing Failed: Downlink Signal Lost **Corrective actions:** Make sure the transmit cable is connected. (Pointing completion verifies the receive cable connection.)

Phase (activity)	Progress messages indicating normal progress	Possible error messages
		b) The Lat/Long values entered in the Installation Parameters screen are not correct for the site. Probing is quite sensitive to the accuracy of these values, whereas pointing is not as sensitive.
Receive Satellite Information	Receiving Data **Complete**	
Registration Process	Registering **Registered**	Registering (attempt # *{number}*)... Unable to register... Registration Failed ... For details concerning Registration messages, see *Registration error messages* on page 36.
Access Keys Synchronization	Acquiring Keys **Synchronized**	
Configuration and Operational Software	Downloading Software Download Complete **Downloaded**	
Configuration Reconciliation	In Progress **Complete**	
Normal Mode	**Installation Complete.**	

Messages in **bold text** in the second column indicate completion of the activity.

Fields in the Terminal Info part of the Terminal Initialization Sequence screen are explained in *Terminal Info parameters* on page 38.

Registration error messages

Modem *registration* refers to registration with the satellite network. Even after registration, the modem cannot connect to the Internet until it is activated.

Reasons for possible registration error messages are listed in *Table 5: Reasons for registration errors and corrective actions* on page 36. This table includes only the most common registration error messages; it does not include all possible registration error messages.

Note: If you see Registration Failed... with no additional error information, the modem will try to register again after a short time.

Table 5: Reasons for registration errors and corrective actions

Error message	Reason	Corrective action
Last Fail Reasons (reason for the last registration failure)		

Error message	Reason	Corrective action
Antenna Pointing Validation Failure	Antenna is not properly pointed or the pointing process has been aborted.	Repoint the antenna and ensure that Azimuth and Elevation validations pass as indicated in the DAPT during pointing.
ODU Radio Power Mismatch	The C code (ODU power) selected on the Installation Parameters screen does not match the wattage of the installed radio.	Check the radio and check the Installation Parameters screen to make sure the correct C code is specified.
Registration Not Authorized	Operator has explicitly disabled registration capability for this satellite modem.	Call Installer Support with site name to resolve the issue.
Relocation Not Authorized	Attempting to register previously registered ST Site Name or ST Site ID using latitude and longitude values outside of assigned microcell.	Call Installer Support with site name to resolve the issue.
SAM ESN Blacklisted by Operator	The satellite modem's security access module is barred for a reason such as nonpayment for service.	Call Installer Support with the satellite modem's ESN and ST Name to resolve the issue.
ST ESN Already In Use	Attempting to register a previously registered ST Site Name or ST Site ID at a different location.	Call Installer Support with the satellite modem's ESN to resolve the issue.
ST Replacement Not Authorized	Attempting to register different equipment using a previously registered ST Site Name or ST Site ID.	Call Installer Support with site name to resolve the issue.
Invalid Site Name. Please verify name and try again.	The ST Site Name sent by the satellite modem is not known at the NOCC.	Check to make sure the Terminal Site Name is the correct name and was entered correctly.
Management reasons for registration failure		
Group Barred	The satellite modem is included in a group of modems that are barred from service.	Call Installer Support with site name to resolve the issue.
Individually Barred	The satellite modem is barred from service.	Call Installer Support with site name to resolve the issue.
Registration Services Disabled	Registration services are not available because internal maintenance is underway.	No action is required. Registration service will be enabled when maintenance is complete.
Rx Air Interface Down	Satellite receive link is down.	Verify the installation, for example, check cable connections and connectivity to the antenna. If the problem is not corrected, repoint the antenna.
Tx Air Interface Down	Satellite transmit link is down.	Verify the installation, for example, check cable connections and connectivity to the antenna. If the problem is not corrected, repoint the antenna.

Terminal Info parameters

The following table explains the parameters in the Terminal Info section, which is the common lower part of the two screen shown in *Figure 18: Terminal Pointing Info screen* on page 25 and *Figure 22: Terminal Initialization Sequence complete* on page 34.

Table 6: Parameters in Terminal Info section (appears on two installation screens)

Parameter	Possible values	Comments
Left column		
Terminal Operation State	Up Down	This is a summarized state. *Up* indicates satellite modem is healthy and able to transmit and receive. *Down* indicates the modem is not healthy or is unable to transmit because of its configuration.
Suspension State	Suspended Not Suspended	The NOCC may put the satellite modem in a suspended state, meaning user data traffic is suspended, but management traffic between modem and NOCC is not affected.
Desired State	In Service Out of Service Maintenance	The NOCC may put the modem in these states. In Service – No restrictions. Out of Service and Maintenance – User data traffic is blocked; management traffic between modem and NOCC is restricted (no unsolicited messages may be sent to the NOCC).
Tx Air Interface State	Up Down	Up – Modem is able to transmit data to the satellite.
Rx Air Interface State	Up Down	Up – Modem is able to receive data from the satellite.
ECL State	Disabled Tx Allowed Tx Prevented	The ECL function ensures that the modem uses a transmit power that falls within acceptable limits for correct operation of the terminal. Disabled – Checks are disabled. Tx Allowed – Modem is not being restricted by ECL. Tx Prevented – Modem is being restricted for short periods of time, in seconds, and is not transmitting to the satellite.
Rx Signal Strength (SQF)	0 – 255	Receive signal strength as measured by the modem.
Uplink Cell ID	1 – 112	Uplink cell in the system where the modem is currently installed.
SQF at azimuth 1 position	0 – 255	Receive signal strength with squinter in azimuth 1 position during antenna pointing.
SQF at elevation 1 position	0 – 255	Receive signal strength with squinter in elevation 1 position during antenna pointing.

Parameter	Possible values	Comments
Max SQF during AP	0 – 255	Maximum receive signal strength during any phase of antenna pointing.
AP pass/fail flag	Pass Fail	Antenna pointing validation result.
State code	1 – 35	State codes indicate the operational state of the satellite modem. Click the state code value on the screen to see what it means. All state codes are explained in *Table 17: State codes* on page 88.
Right column		
Security Keys	Valid Not Valid	Valid – Modem has current security keys and is able to transmit data.
Barred State	Terminal Individually Barred Group Barred Not Barred	Barred State indicates if the modem is barred from transmitting to the satellite. The modem can be barred individually or as part of a group of modems.
QoS Background State	Not Enabled Successful Failed	QoS stands for quality of service. This value indicates the state or results of background QoS tests that are being run.
BOD/HVUL Mode	Regular High Volume	To provide BOD, the modem communicates with the satellite and uses uplink bandwidth capacity as required and allocated to it by the satellite. High Volume – High Volume Uplink; modem is configured by NOCC for dedicated use of uplink bandwidth.
Packets Received from Satellite	{number}	Number of packets received from the satellite from the time the satellite modem was powered on. Includes system control traffic, not just user traffic addressed to the modem.
Packets Sent to Satellite	{number}	Number of packets sent to the satellite from the time the modem was powered on.
Downlink Polarization	RHCP LHCP	Polarization in which the downlink signal from the satellite is being received. (This is not the same as ODU polarization.)
SQF at azimuth 2 position	0 – 255	Receive signal strength with squinter in azimuth 2 position during antenna pointing.
SQF Center1	0 – 255	Receive signal strength without the squinter on the feed horn, measured at the start of the validation phase. Also known as the *center value*.
SQF at elevation 2 position	0 – 255	Receive signal strength with squinter in elevation 2 position during antenna pointing.

Troubleshooting installation problems

If you see an error message or other indication of a problem during commissioning or other phases of modem installation, try the solutions given in *Table 7: Guidelines for installation troubleshooting* on page 40. These are the most common installation problems and solutions.

Table 7: Guidelines for installation troubleshooting

Symptom	Possible cause	Corrective action and comments
Low signal strength	Antenna may not be pointed accurately.	Repoint the antenna.
	A cable may be improperly terminated.	Check cable connections and re-terminate if necessary.
Receive signal strength is 0 or 1.	LHCP or RHCP polarization setting may be incorrect.	Make sure ODU polarization is set to LHCP or RHCP as indicated on the Terminal Pointing Info screen (Setting for ODU Polarization).
	Transmit and receive cables may be swapped (connected to the wrong connectors).	Check the cables and reconnect them if necessary.
	Faulty receive cable.	Inspect the cable and re-terminate it if necessary.
System Status button on System Control Center screen is RED.	Bad weather.	Heavy rain or snow can interfere with the satellite signal. The site can be affected by weather that is overhead or by weather that is close but far enough away that it is not yet visible.
State code is 32 (Barred), 33 (Suspended), 34 (Maintenance) or 35 (Out of Service). Or a message indicates Security Keys Not Valid. Or Registration Last Fail Reason is NOCC-related.	NOCC restriction or NOCC problem.	Wait to see if the problem goes away.

For additional troubleshooting information, see *Troubleshooting* on page 99. If you have tried the appropriate troubleshooting actions but still cannot install and commission the modem, call Installer Support.

Chapter

6

Validating the installation

Topics:

- *A quick look at the validation procedure*
- *Prerequisites*
- *Accessing the OVT*

As part of every HN9000 installation **you are required to validate the overall installation (modem, antenna, cables, and connections) using the Onsite Validation Tool (OVT)**. This browser-based tool helps to ensure a high-quality installation. If the site performance is not satisfactory, the OVT suggests corrective actions you can take and then analyzes the results of your actions.

Important: Run the OVT on your installer laptop after the modem has completed commissioning and registration, but before the customer activates the HughesNet service.

The OVT helps you obtain the best possible performance for a newly installed site by comparing current measured values from the site with target values. **Before using the OVT, you must first complete the installation to the best of your ability.**

The OVT is automated, but it does require certain inputs from the installer. Online instructions and prompts guide the installer through the validation process.

The OVT logs the measured values and corrective actions taken by the installer (if any) to the Installer Support database. When you successfully complete the OVT process, the tool issues a sign-off code that you record on the Installation Reference Sheet.

A quick look at the validation procedure

This section summarizes how you use the OVT to evaluate the performance and quality of a newly installed HN9000 site. For detailed information on the OVT, see ***Installer's Guide to the Ka-Band Onsite Validation Tool (OVT)*** (1038091-0001).

The basic validation steps are:

1. With your installer laptop computer connected to the modem, use Internet Explorer to access and log onto the HughesNet Installation Portal.

   Specific steps for accessing the Portal are explained later.

2. Click the **Onsite Validation Tool** link.

3. Enter SAN and FSO numbers from the Installation Reference Sheet (which is also used for repairs) to identify the site.

4. A subsequent screen shows the latest and target values for selected performance parameters for the site, as shown in *Figure 23: Latest values compared to target values (partial screen)* on page 42. *If all target values for the performance parameters are met* (all difference values are green), click the **Sign Off** button (not shown in this Figure) and record the sign-off code.

   If the first screen after login shows that the site met the target values and you obtained the sign-off code, validation is complete. If any target values were not met, as indicated by a red difference value, continue.

	Last Timestamp	Uplink Power Word	SQF	Uplink SNR	PTP SNR
Target Values	------	[37-41]	153	14	10
Latest Values	10/10/2008 4:03:14 PM	38.5	167	15.6	15.8
Difference	------	0	14	1.6	

Figure 23: Latest values compared to target values (partial screen)

5. *If target values are not met,* follow the recommended actions displayed by the OVT.

   Examples of recommended actions are *Check line of sight to the satellite* or *Replace IDU*.

6. For each recommended action (they are displayed in succession, as appropriate), click the **Checked** or **Repaired** button.
   Depending on results, the OVT may display additional recommended actions.

7. When the target values are met (all difference values are green), click the **Sign Off** button and record the sign-off code.

The site performance and installation quality are validated when all target values have been met and you have obtained the sign-off code.

For validation procedure details, see the ***Installer's Guide to the Ka-Band Onsite Validation Tool (OVT)*** (1038091-0001).

Prerequisites

The following are prerequisites for using the OVT to validate VSAT site installation:

• The VSAT physical installation must be complete.

- Commissioning and registration must be complete, as indicated by state code 25, which means the modem is fully operational.
- To access the OVT software, you must:

  - Be able to log into the Installation Portal. This requires a registered user name (Installer ID) and password.

    If you are not registered, contact your dealer or distributor to create an account and obtain an Installer ID and password.

  - Know the site SAN and FSO numbers. These numbers appear on the Installation Reference Sheet.

    Note: SAN refers to the *site account number* or *master account number*. FSO refers to the *field service order number*.

Accessing the OVT

The IP address configuration on the installer laptop is critical for accessing the OVT. If the laptop is configured for a link-local IP address, you will not be able to access the OVT unless you remove the link-local address or unless you have 192.168.0.2 configured as an alternate private address. If you are not using the alternate private address option, make sure DHCP is enabled on the laptop. For detailed information, see *Configuring the installer laptop IP address* on page 13.

To access the OVT, click the **Validate** link that appears on the modem's System Control Center home page after commissioning completes, as shown in *Figure 24: Validate link on System Control Center page* on page 44.

If for any reason you cannot access or use the OVT, call Installer Support.

To access and start the OVT:

1. Make sure your laptop computer is connected to the modem's LAN port.
2. After commissioning and registration have completed, type www.systemcontrolcenter.com *or* 192.168.0.1 into the browser address bar, then press **Enter**.
   The System Control Center home page appears, as shown in *Figure 24: Validate link on System Control Center page* on page 44, displaying an **Activate** link and a **Validate** link.

Figure 24: Validate link on System Control Center page

3. Click **Validate**.
The HughesNet Installation Portal installer login screen opens, as shown in *Figure 25: Installation Portal, installer login screen* on page 45.
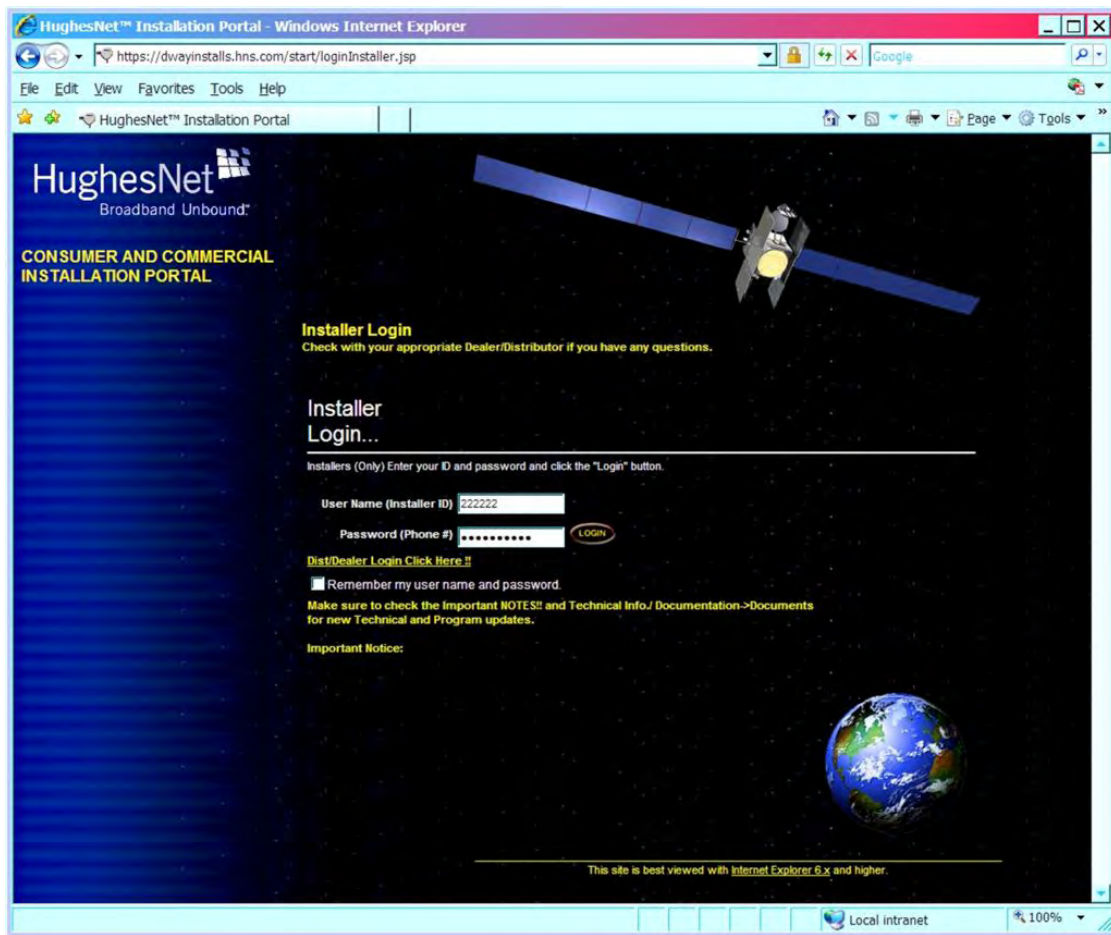
Figure 25: Installation Portal, installer login screen

4. Log in to the Installation Portal:

   a) Enter your Installer ID as the User Name.

   b) Enter your password (your phone number registered in the installer database).

   c) Click **LOGIN**.

If you have any problems logging in, contact Installer Support.

   📝 **Note:** Do not use the Installer IDs shown in the screen illustrations in this guide. These Installer IDs are used for illustration only; they are not real Installer IDs.

When you successfully log in to the Portal, the Welcome screen shown in *Figure 26: Installation Portal Welcome screen* on page 46 appears.
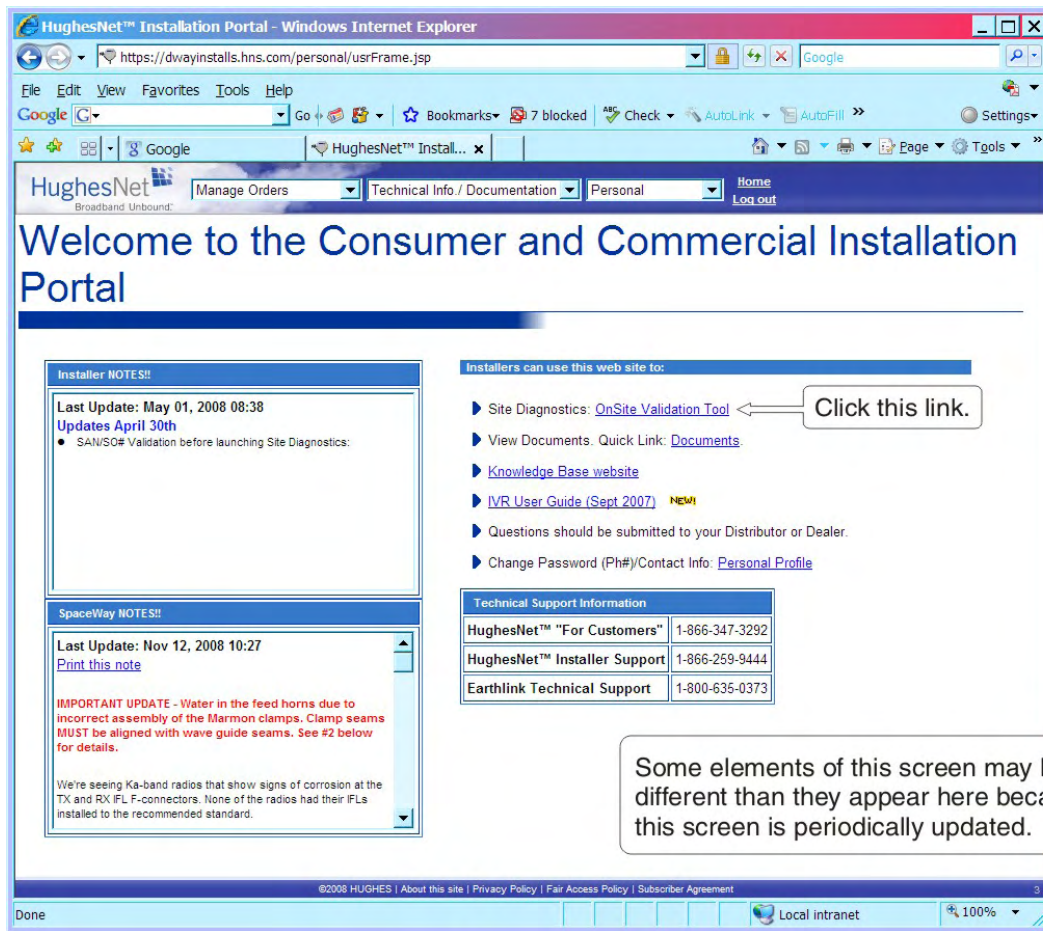
Figure 26: Installation Portal Welcome screen

5. Click the **Onsite Validation Tool** link (which is indicated by a label with an arrow in the Figure).
Your browser displays the screen shown in *Figure 27: Data Collection screen* on page 47.
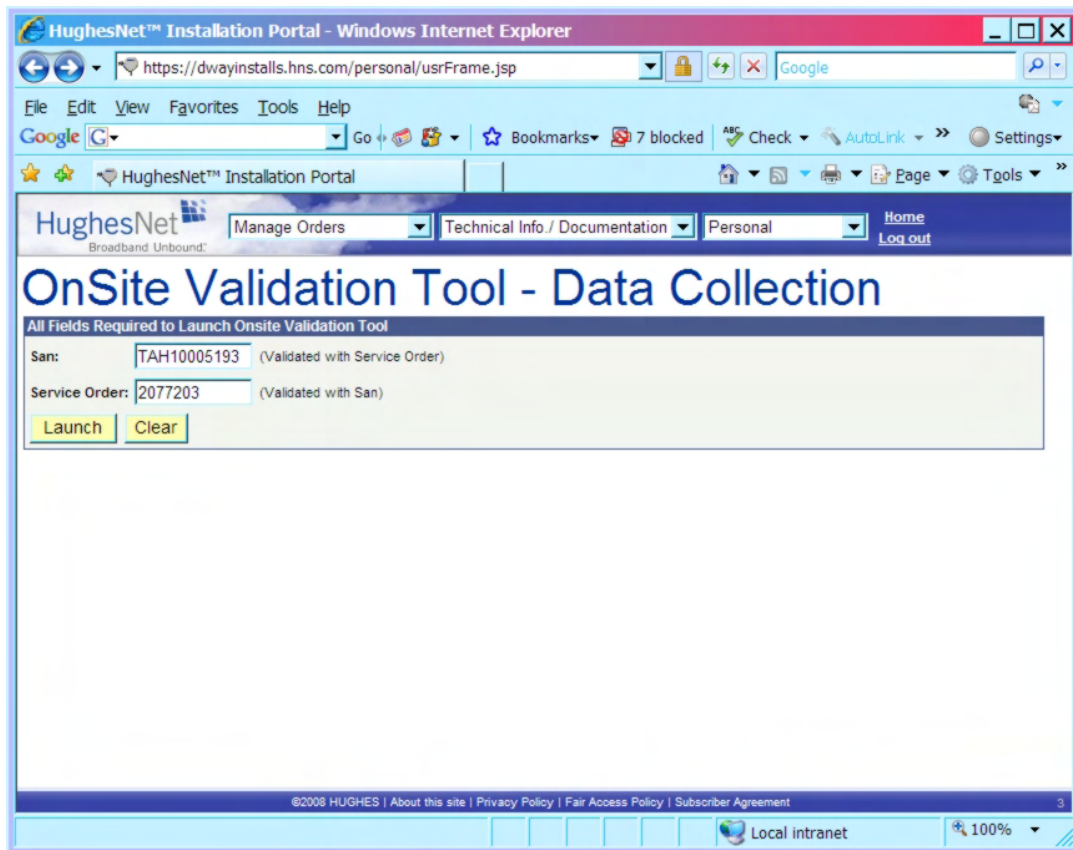
Figure 27: Data Collection screen

6. Enter the SAN and service order number (FSO) from the Installation Reference Sheet (top of the first page).

7. Click **Launch**.
   The OVT displays the screen shown in *Figure 28: Site and installer ID information* on page 48. This screen shows:

   - SAN
   - Installer Name
   - Installer ID
   - FSO

Figure 28: Site and installer ID information

The OVT automatically enters the information on this screen.

8. Check the displayed information.

You cannot edit this screen. If you entered the SAN or FSO number incorrectly, close the window, repeat the log in steps and enter the correct SAN and FSO numbers.

9. Click **Submit**.

Based on the FSO number you entered, the OVT:

• Determines whether the site is Ka-band or Ku-band and presents the appropriate OVT software.
• Displays a new screen showing the latest recorded performance parameter values (Latest Values), target values, and for each parameter, the difference between the latest values and the target values. These data are the basis for the validation process.

Figure 29: OVT screen comparing latest and target values on page 49 shows an example of an OVT screen showing the latest measured values and target values. In this example, all values meet the target values, meaning that the site can be validated and signed off.
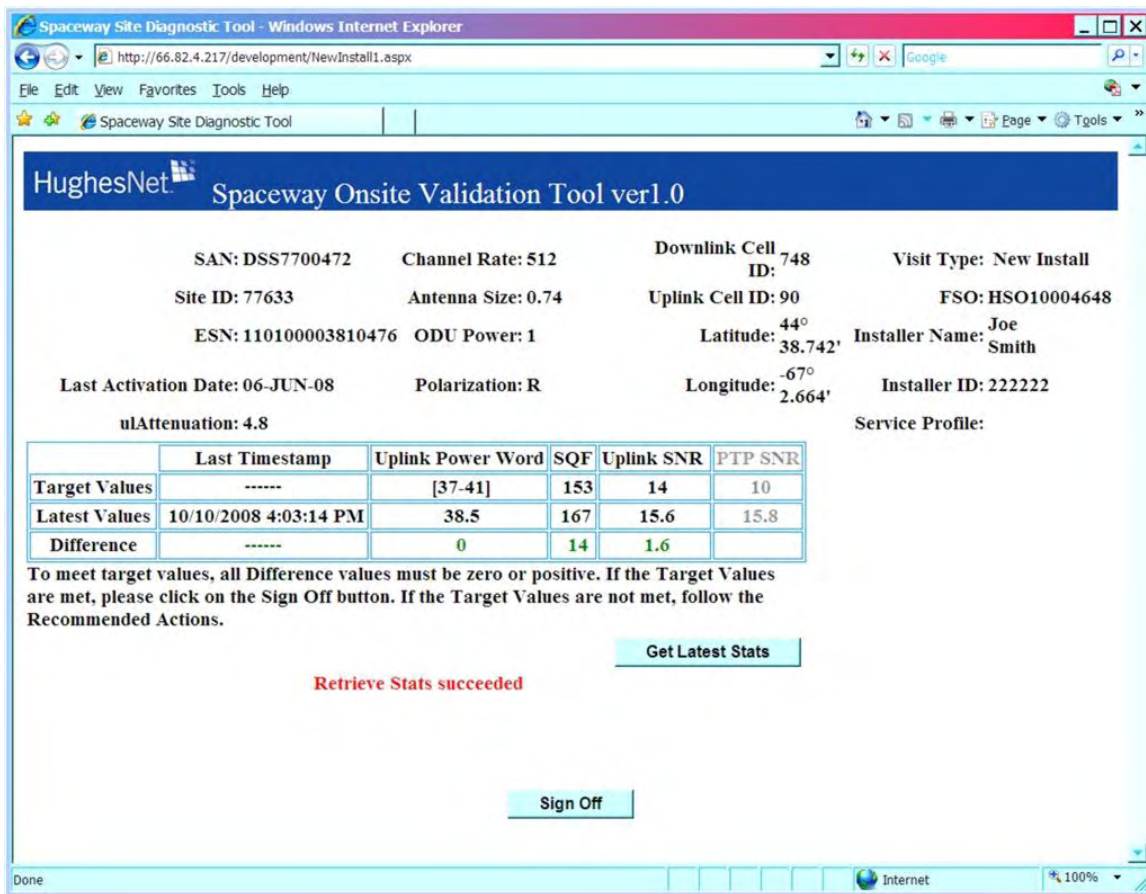
Figure 29: OVT screen comparing latest and target values

For detailed information about the OVT, see the ***Installer's Guide to the Ka-Band Onsite Validation Tool (OVT)*** (1038091-0001).

Chapter

7

Activating the HughesNet service

Topics:

- *Service activation prerequisites*
- *Connecting the satellite modem to the customer's computer*
- *Activation procedure*

Activating the HughesNet broadband service is the final step in installing the satellite modem. **The customer performs this step,** and at the same time accepts the HughesNet subscriber agreement.

You, the installer, prepare the customer for activation by connecting the satellite modem to the customer's computer. You are required to stay at the installation site until the customer can connect to the Internet so you can offer guidance and assistance if necessary.

You are guided through the activation process by instructions and prompts displayed on the computer that is connected to the satellite modem.

Service activation prerequisites

Before proceeding, make sure the modem and the customer's computer are ready for service activation. Prerequisites for service activation are:

- The modem must be commissioned.
- The modem must be connected to the customer's computer (next step.)
- The customer must have the SAN (a string that may include both numbers and letters) and PIN (a four-digit number) available to enter when the activation process prompts for them. Both numbers are provided in the Order Confirmation email and on the Installation Reference Sheet.
- The customer's computer must be configured for DHCP. If you need help in configuring DHCP, see *Configuring a computer to use DHCP* on page 109.

Connecting the satellite modem to the customer's computer

In this procedure you make sure the modem is ready for activation and then connect the modem to the customer's computer.

1. From the Terminal Initialization Sequence screen (*Figure 30: Terminal Initialization Sequence screen (top part)* on page 52) or other Advanced Pages screen, click the **Home** link in the upper right corner to open the screen that contains the **Activate** link.
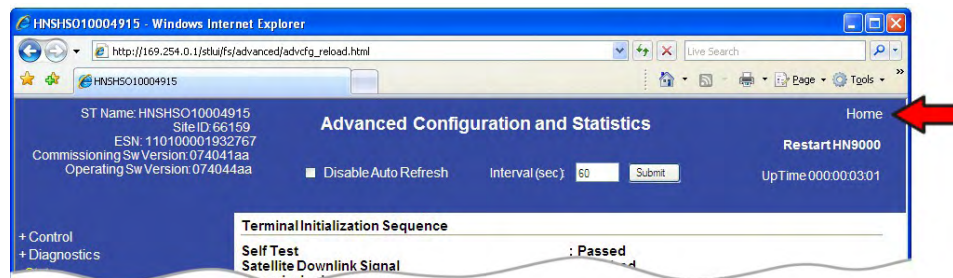
Figure 30: Terminal Initialization Sequence screen (top part)

The System Control Center home page appears, showing the **Activate** link below the HN9000 System Control Center screen title. See *Figure 31: Activate link indicating modem is ready for service activation* on page 53. **Do not click the link at this time.**

The **Activate** link indicates that the modem is ready for service activation. This link appears only on a new modem when the modem is ready to be activated (after commissioning is complete).
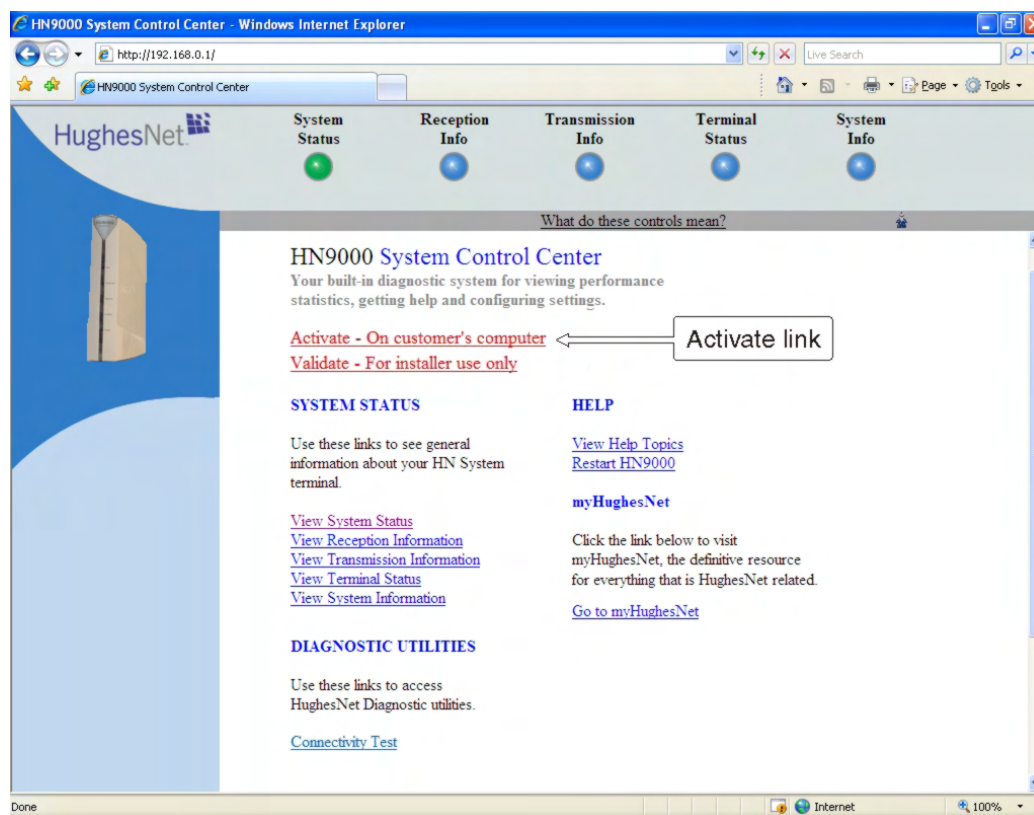
Figure 31: Activate link indicating modem is ready for service activation

2. Use an Ethernet cable to connect the satellite modem to the customer's computer as shown in *Figure 32: Connecting Ethernet cable to customer's computer or other device* on page 54.

a) Disconnect the Ethernet cable from the installer laptop computer.
    The Ethernet cable is already connected to the LAN port on the rear panel of the satellite modem.

b) Connect the Ethernet cable to the LAN port on the PC or other device as shown in *Figure 32: Connecting Ethernet cable to customer's computer or other device* on page 54.

Note: If the customer wants to connect the modem to a router, the router cannot be connected until activation is complete.
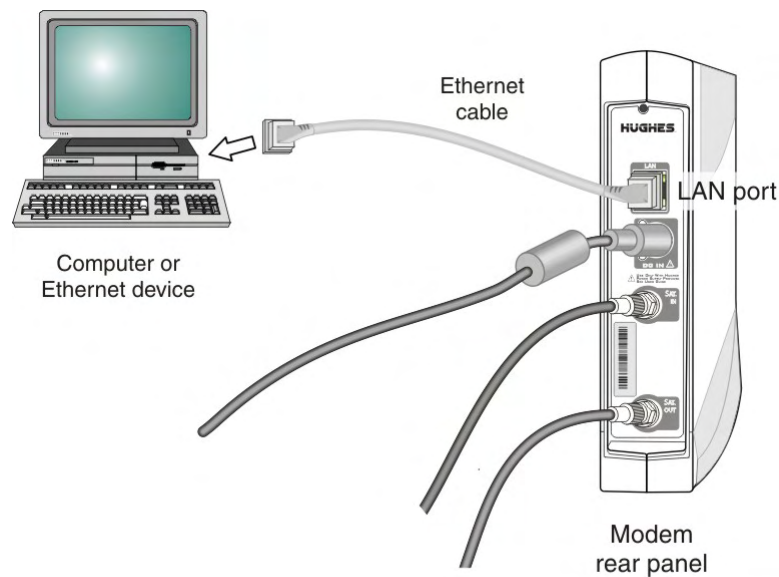
Figure 32: Connecting Ethernet cable to customer's computer or other device

Activation procedure

The customer, not the installer, activates the HughesNet service. A summary of the activation process is provided here, so that you, the installer, will know what the customer should expect. *This summary description is not a complete description of the activation process, and **it does not show all the screens** the customer will see during service activation.* The screens that follow are selected to give you an idea of what to expect during service activation.

The customer activates the HughesNet service on the customer's computer. Do not use the installer laptop for activation, unless the customer's computer is not working. If you use the installer laptop for activation, close your browser at the **Downloading Software** screen to prevent the HughesNet Tools from being downloaded to the installer laptop. If you have only the link-local IP address 169.254.10.10 configured on the installer laptop, you must enable DHCP to demonstrate Internet browsing to the customer.

1. Following the instructions in the *Quick Start Guide*, which is shipped with the modem, the customer opens a supported web browser, types www.systemcontrolcenter.com (or 192.168.0.1) into the address bar and presses **Enter**.

   The System Control Center home page appears, showing the **Activate** link below the HN9000 System Control Center screen title. See

   The **Activate** link appears only on a new modem when the modem is ready to be activated (after commissioning is complete). The **Activate** link is not present after activation is completed.

Figure 33: Activate link on the System Control Center home page

If you see a Page not found error, check the following:

- Make sure the modem is powered on.
- Check the Ethernet connection. The orange LED on the LAN port should blink if you send data from the computer to the modem.
- Make sure a router is not connected between the modem and the PC.

2. Before proceeding to the next step, make sure at least 5 minutes have passed since the Terminal Initialization Sequence screen showed Installation Complete.

This allows the modem to complete its final configuration.

3. Direct the customer to click the **Activate** link and then follow the on-screen directions.

From this point on, most customers should be able to complete the activation process without assistance.

Note: As a customer progresses through the activation screens, they may see Security Alert screens with messages about Internet site security certificates. The customer should click **Yes** to accept the certificate and continue.

4. To activate the service, the customer must agree to the HughesNet subscriber agreement (*Figure 34: Subscriber agreement* on page 56). If the customer declines, a link is displayed to exit the activation process.

Note: If the customer's browser cannot access the subscriber agreement screen, make sure the browser's pop-up blocker is disabled and that the browser's privacy setting is set to **Medium High** or lower.
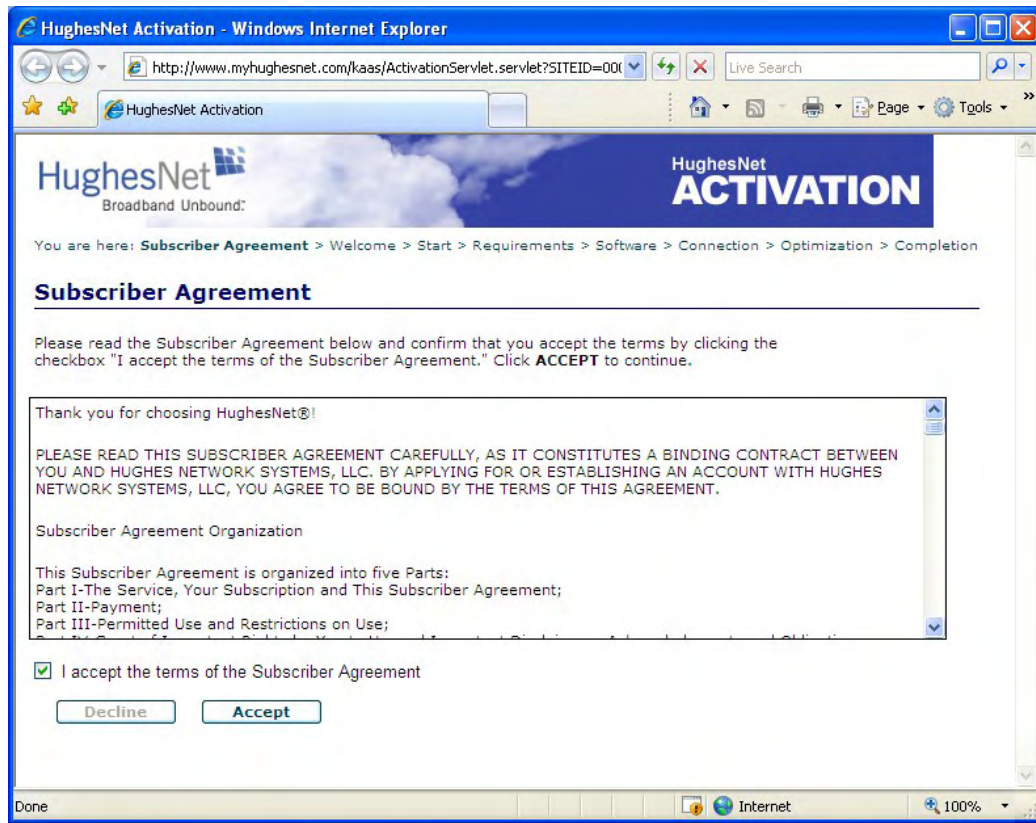
Figure 34: Subscriber agreement

5. When the customer clicks the *I accept . . .* checkbox and the **Accept** button, two fields are added to the bottom of the subscriber agreement screen, as shown in *Figure 35: Subscriber agreement with SAN and PIN fields* on page 56. The customer enters their SAN and PIN in these two fields. The SAN and PIN are provided on the customer's Order Confirmation email and on the Installation Reference Sheet. If the customer enters information incorrectly, they can try again.
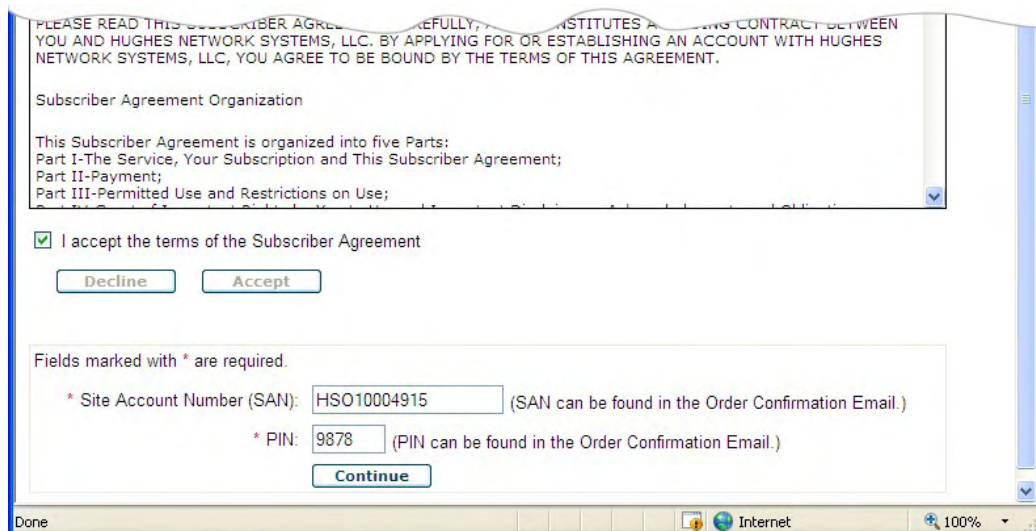
Figure 35: Subscriber agreement with SAN and PIN fields

6. After the SAN and PIN information is entered and validated, a welcome screen appears that includes the customer's name (*Figure 36: Welcome screen* on page 57).
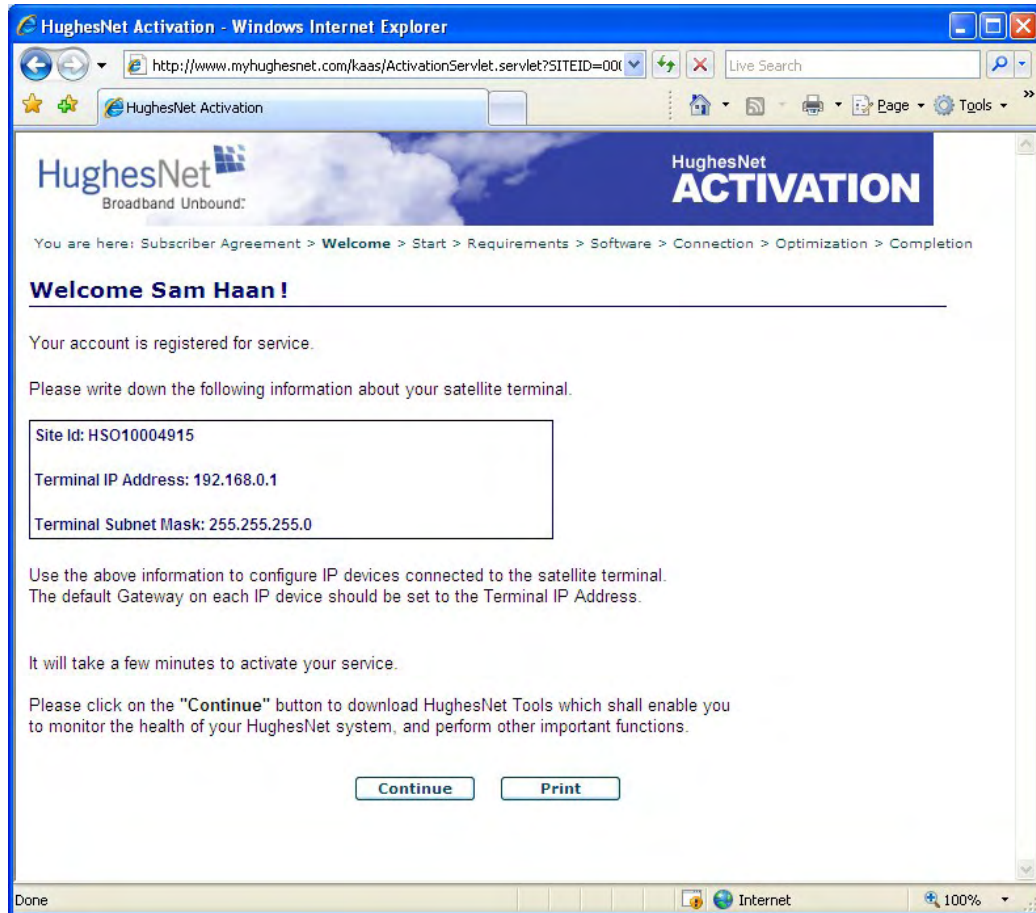
Figure 36: Welcome screen

The box near the middle of this screen displays the modem's Site ID, Terminal IP Address, and Terminal Subnet Mask. The customer should write down this information or use the **Print** button to print this screen for reference. If the customer is going to use a public IP address (also known as a *routable* address), this screen shows the address to use to configure the customer's computer or other IP devices connected to the satellite modem.

7. The **License Agreement** screen (not shown here) is an agreement to use the satellite modem activation software.

8. At one point a screen titled **Downloading Software** appears (*Figure 37: Downloading Software screen* on page 58). To continue the installation, the customer must click the yellow bar at the top of the screen. The add-on is an ActiveX Control. For additional information, see the text on the screen.
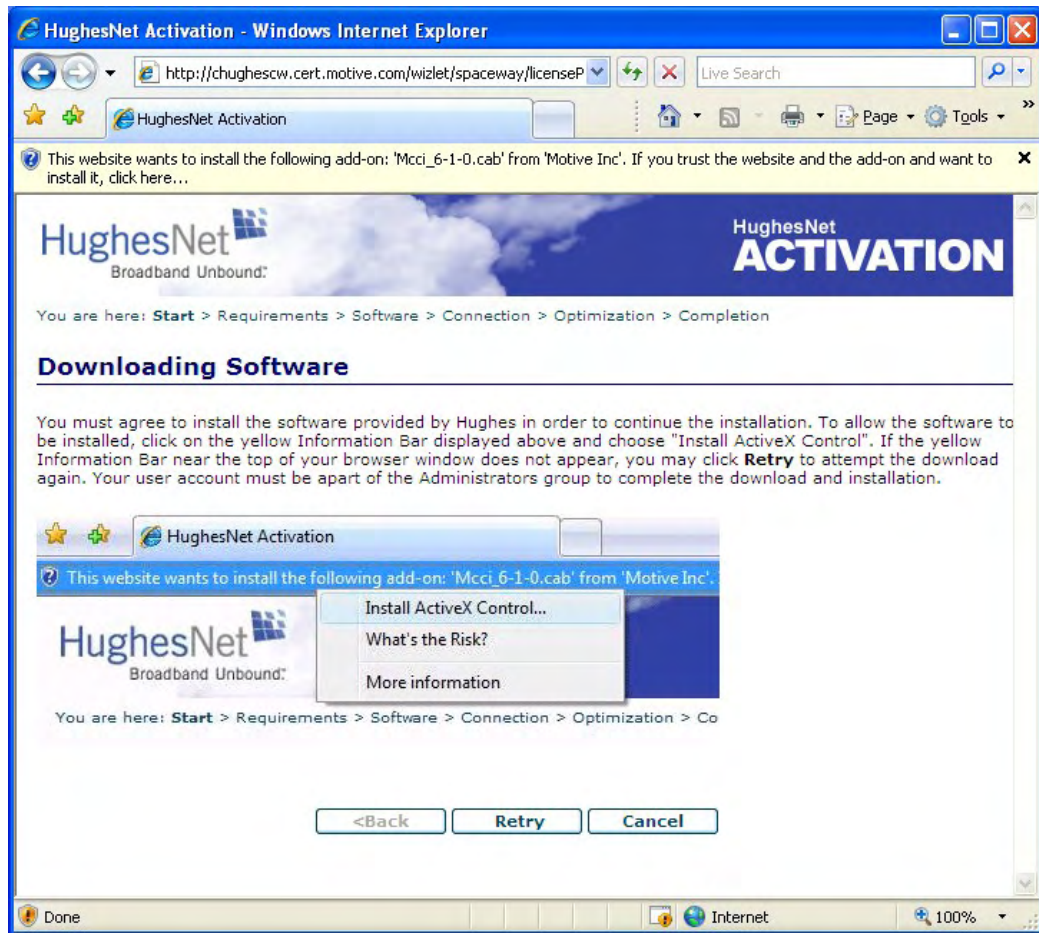
Figure 37: Downloading Software screen

9. The screen shown in *Figure 38: Computer verified screen* on page 59 lets you know the activation software has inspected the computer and verified that it meets the necessary requirements.

The software advises if your computer does not meet the requirements. In some cases it may tell you that your computer does not meet all requirements, but that you can still proceed and use the satellite modem if you choose to.
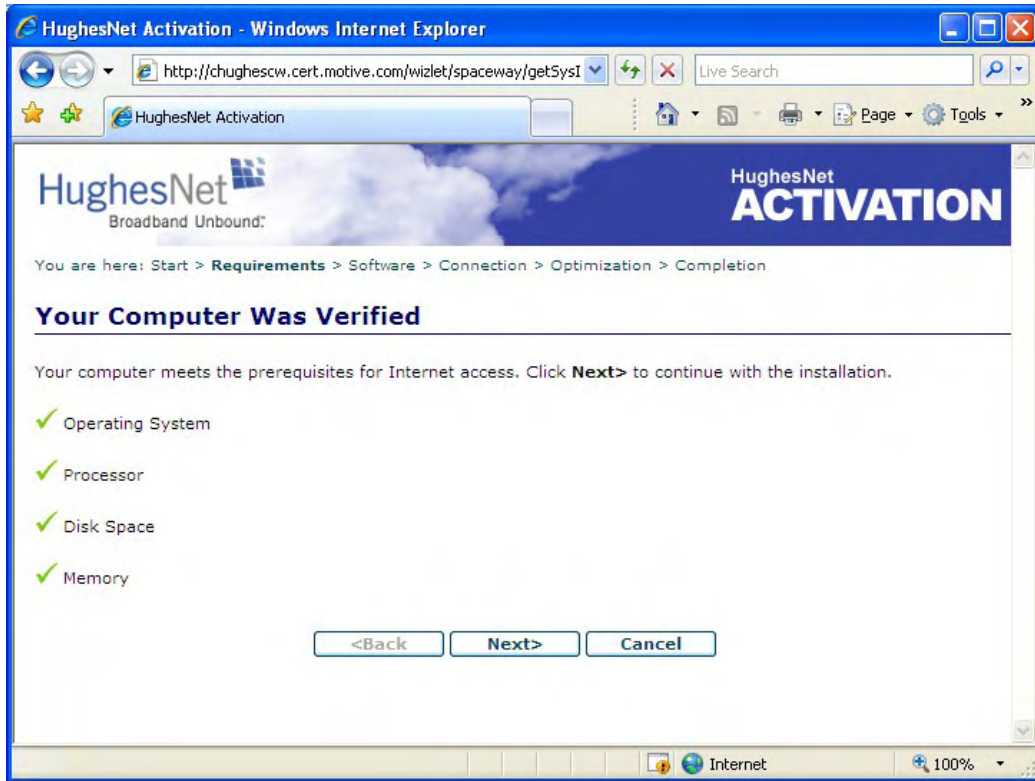
Figure 38: Computer verified screen

10. The **Configure Software** screen lets the customer know the activation software is about to install HughesNet Tools. HughesNet Tools is a suite of software tools that can help users solve Internet browsing problems and improve browsing performance and Internet security.
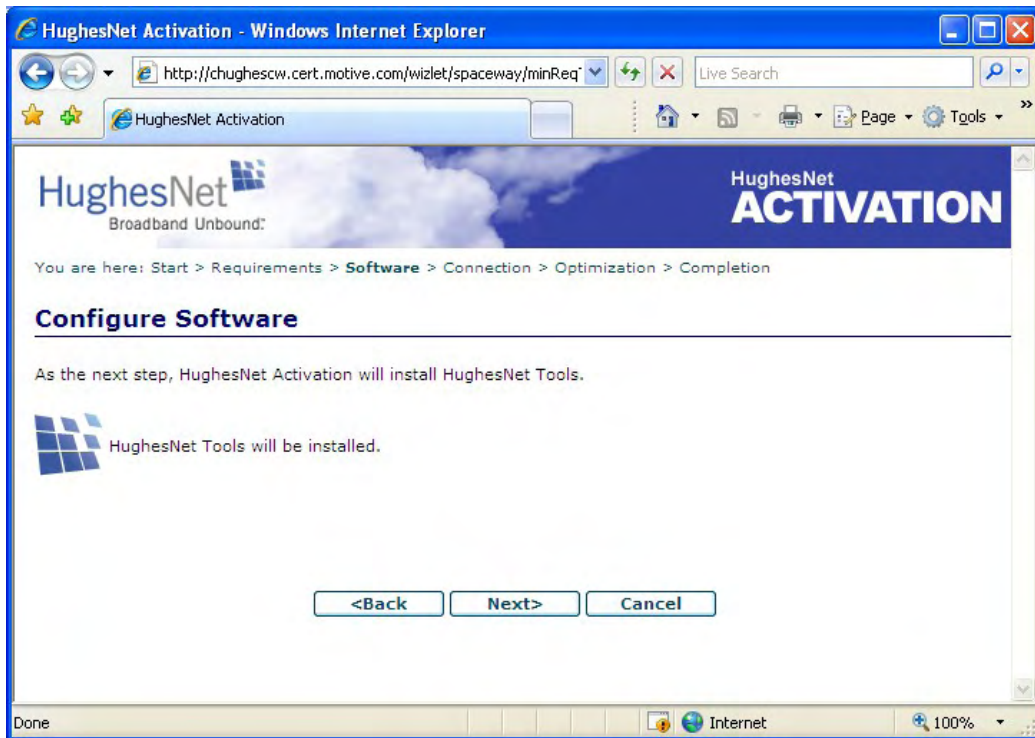
Figure 39: Configure Software (HughesNet Tools) screen

11. *This step only applies if the customer ordered a service plan with a public IP address option.* On the **Implement Public IP?** screen (*Figure 40: Implement Public IP? screen* on page 60), the customer clicks **Implement** to implement a public IP address or **Next** to configure a private IP address. For nearly all home installations, a private IP address is appropriate. You can only use a public IP address if your service plan provides for it.
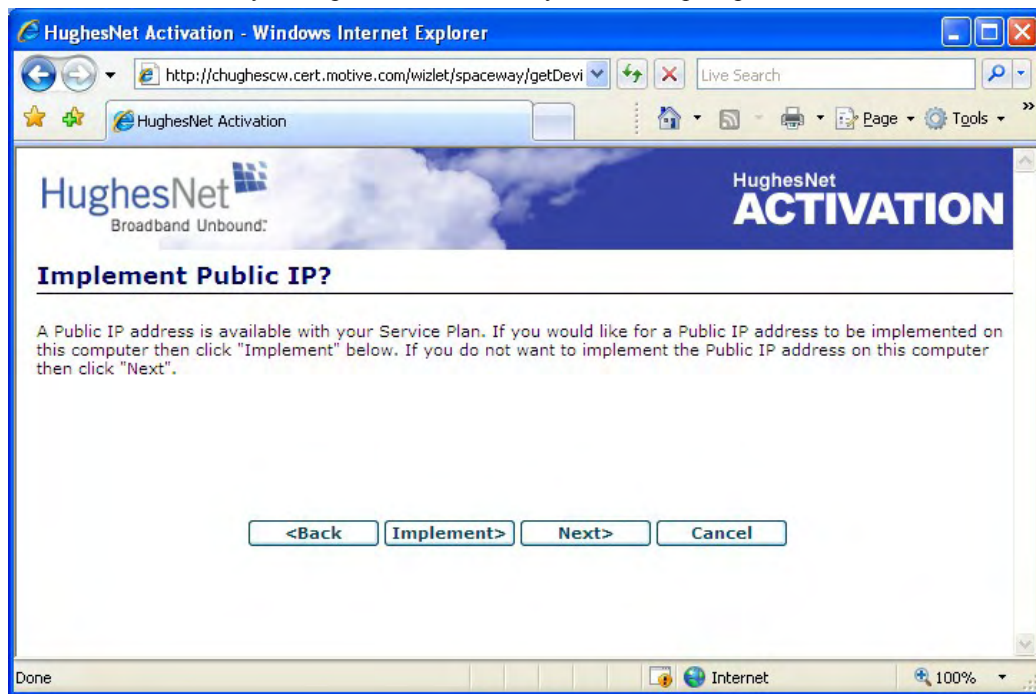
Figure 40: Implement Public IP? screen

Note: The Implement Public IP? screen appears only if the customer ordered a service plan with a public IP address option.

12. The **HughesNet Activation Complete** screen informs the customer that the activation process has completed.
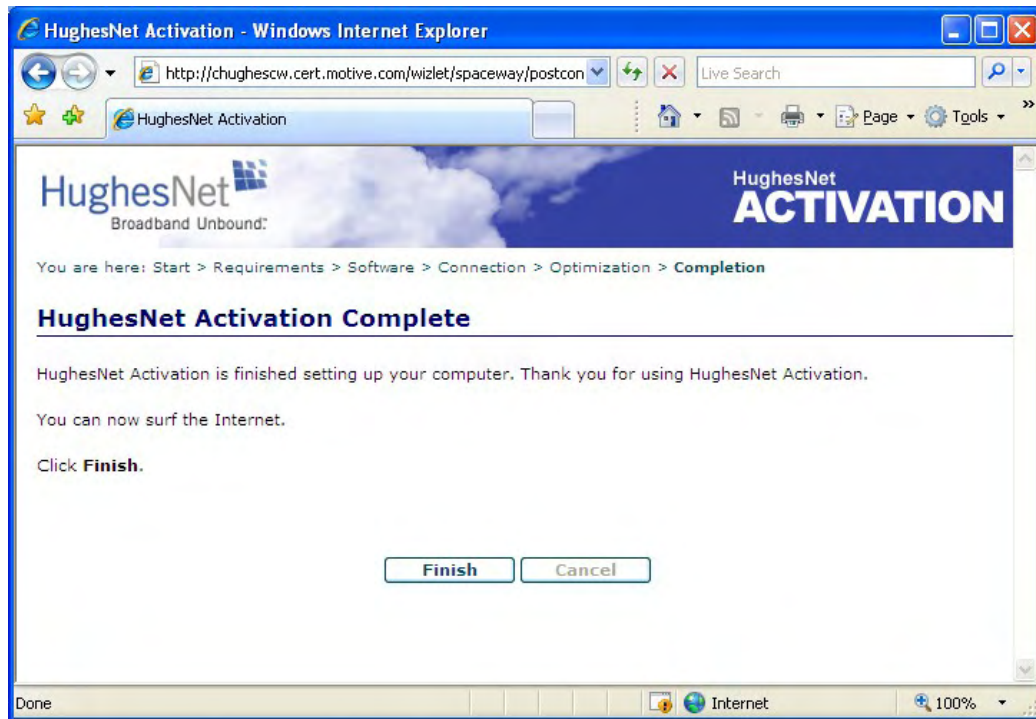
Figure 41: Activation Complete screen

When the customer clicks **Finish**, an Internet web page opens. Which page opens depends on how the service is configured.

The customer can now use the satellite modem to browse the Internet.

Many automatic processes occur during the activation process. Most are transparent to the user. Activities performed for the user by the activation agent software include:

- Check the customer's computer to make sure it meets minimum requirements. Some issues such as insufficient disk space will halt the activation process. In other cases, for example, if a computer does not meet the requirements but may be marginally suitable, the customer will be offered the choice to abort or continue.
- Install HughesNet Tools.
- Change the home page to www.myhughesnet.com.
- Configure browser and email settings for optimal operation over the HughesNet service.
- Implement a public IP address as the configured LAN IP address if the service plan allows it and if the customer desires.
- Perform connectivity tests. If connectivity to the agent software's server is not available, a 16-digit SXCode is made available to the user for use in calling Hughes Customer Care.
- Configure a list of browser favorites or bookmarks.

Service activation is a complex but mostly automated process. These are only some of the automatic processes that occur.

After activation, if you (the installer) want to use the installer laptop to access the satellite modem's System Control Center, enable DHCP on the installer laptop and type www.systemcontrolcenter.com *or* 192.168.0.1 on the browser, then press **Enter**. To use 192.168.0.1, the satellite modem must be using a service plan with private IP addressing, and DHCP must be enabled on the computer.

If for any reason the customer cannot download HughesNet Tools before you leave, tell the customer to download HughesNet Tools from www.myhughesnet.com when the computer is

working. Tell the customer to click the **HughesNet Customer Care** link and the look for the HughesNet Tools download link.

Chapter

8

Completing the installation

Topics:

- *Printing the System Information page*
- *Creating a shortcut to the System Control Center*
- *Installation and activation complete*

To complete the satellite modem installation:

- Print the System Control Center System Information page for the customer for future reference.
- Create a shortcut to the System Control Center for the customer to use.

Printing the System Information page

Help the customer print a copy of the System Control Center's System Information page, which contains important information about the status of the satellite modem. Explain to the user that they will need the information on this page if they ever contact Hughes Customer Care at a time when they cannot access the System Information page.

1. Show the customer how to open the System Control Center home page.
   If you need instructions, see *Accessing the System Control Center* on page 66.
2. Tell the customer to click the **System Info** link to open the System Information Page.
3. Tell the customer to click the **Print this page** link near the center of the screen.

The page should print. Tell the customer to keep it in a safe place.

> **Note:** If the you cannot print the page, you can capture the screen image by pressing **Alt+PrintScreen**. Paste the captured image into a word processing document or image editor program and then save the image in a file.

Creating a shortcut to the System Control Center

Create a desktop shortcut to the System Control Center home page on the customer's computer. If you need instructions for this, see *Creating a shortcut to the System Control Center* on page 66.

Installation and activation complete

At this point installation and activation of the satellite modem are complete. The remaining information in this manual is provided for reference or troubleshooting purposes. You may or may not need it.

Once the satellite modem is installed and activated, the customer may connect a router in the path using the IP information shown in *Figure 36: Welcome screen* on page 57.

Chapter

9

System Control Center

Topics:

The System Control Center is a set of screens and links you can use to monitor your broadband service and troubleshoot the satellite modem in the event of a problem. The System Control Center provides access to system status, configuration information, and online documentation through a web browser on the computer that is connected to the satellite modem. Use the System Control Center to find system information for configuring networks or to check system performance if the satellite modem does not seem to be functioning properly.

Accessing the System Control Center

To open the System Control Center on a web browser installed on a computer that is connected to the satellite modem, double-click the System Control Center shortcut on your computer desktop, or follow these steps:

1. Open a web browser such as Internet Explorer or Netscape.

2. In the browser address bar, type www.systemcontrolcenter.com *or* 192.168.0.1 and press **Enter**.

    > **Note:** To use 192.168.0.1, DHCP must be enabled on the computer.

    The System Control Center home page appears as shown in *Figure 43: System Control Center home page* on page 67.

    If you are unable to access the System Control Center, refer to *Cannot access the System Control Center* on page 100.

Creating a shortcut to the System Control Center

Create a shortcut to the System Control Center home page on the customer's Windows desktop.

1. Open a web browser.

    > **Note:** The method described here works for Internet Explorer and Netscape Navigator. It may work with other browsers.

2. Type www.systemcontrolcenter.com *or* 192.168.0.1 in the browser address bar and press **Enter**.

    > **Note:** To use 192.168.0.1, DHCP must be enabled on the computer.

    The System Control Center home page appears.

3. Drag the icon that appears in front of the address displayed in the browser to the computer desktop.
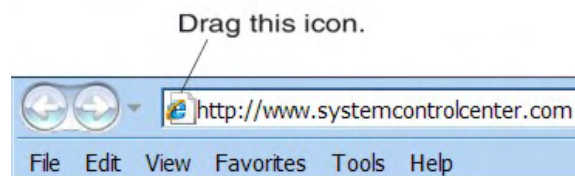
Figure 42: Icon for creating shortcut

System Control Center home page

The System Control Center home page contains numerous links to satellite modem features and important information regarding the operation of the satellite modem.

The button links at the top of the page appear on all System Control Center screens and are explained in *Button links* on page 69.
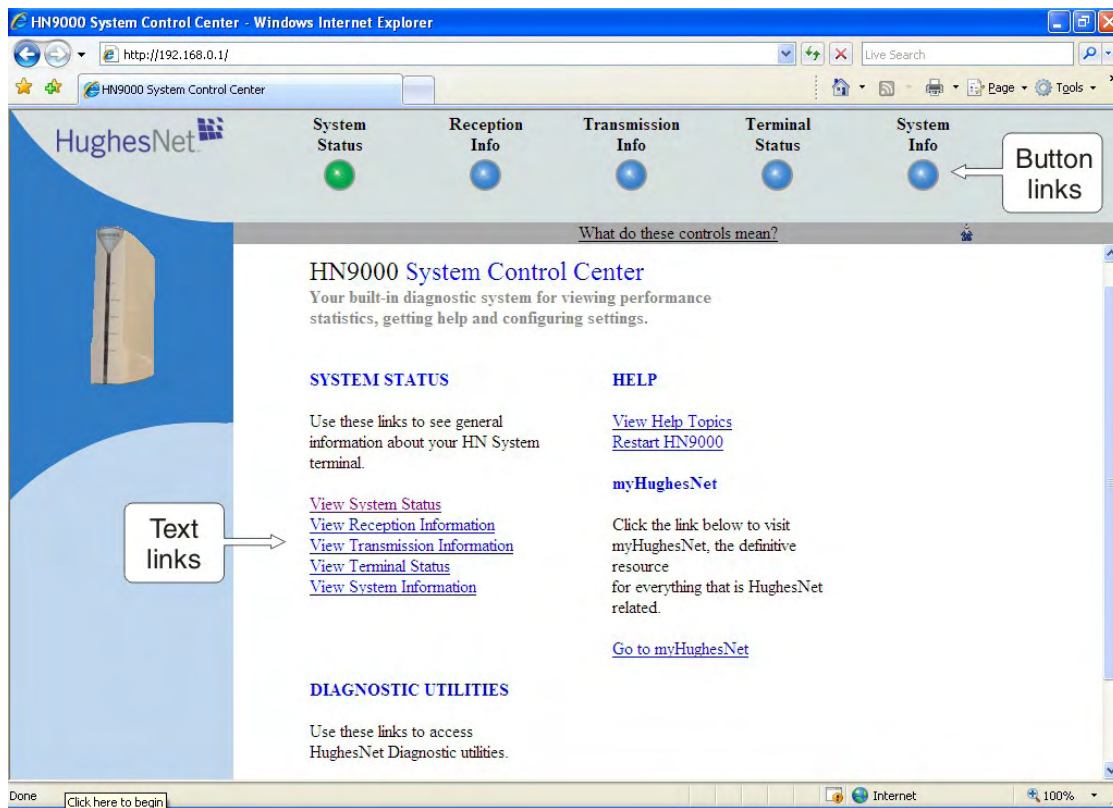
Figure 43: System Control Center home page

> **Note:** On some screens and in some messages you may see the word *terminal*. This word refers to the satellite modem.

Text links

The System Control Center home page includes the following text links:

System Status links

- **View System Status** – Opens the System Status page, which displays general system status information such as signal strength and administrative status.
- **View Reception Information** – Opens the Reception Information page, which displays information on data received by the satellite modem.
- **View Transmission Information** – Opens the Transmission Information page, which displays information on data transmitted by the satellite modem.
- **View Terminal Status** – Opens the Terminal Status page, which displays detailed information about the operational status of the satellite modem such as interface packet counts and acceleration statistics.
- **View System Information** – Opens the System Information page, which displays information such as modem identification information and IP address information.

> **Note:** These links take you to the same destinations as the button links at the top of each System Control Center page.

Diagnostic utilities link

<u>**Connectivity Test**</u> – Opens the Connectivity Test page, which can be used to test the connection between the satellite modem and the satellite. If you can access the satellite, there is no problem with your physical site connectivity between the modem (inside) and the radio assembly and antenna (outside). See *Connectivity Test page* on page 92.

Help link

<u>**View Help Topics**</u> – Opens the Help page, which includes a variety of topics such as recommended browser and TCP/IP settings.

<u>**Restart HN9000**</u> – Restarts the satellite modem.

myHughesNet

<u>**Go to myHughesNet**</u> provides access to the HughesNet Web Portal, which contains a variety of useful tools, resources, and information. Access to the HughesNet portal is determined by the service plan purchased by the customer.

From the HughesNet portal you can click the **HughesNet Customer Care** link to access a wide variety of support resources. For example, you can check online usage, test satellite speed, find troubleshooting scripts, manage passwords, access email, check your account and service plan information, and more. The specific portal information and available features are determined by the customer's service plan.

Common features on System Control Center screens

Certain features are common to some or all of the System Control Center screens, as shown in *Figure 44: Common features on System Control Center screens* on page 69. These features and other common features are explained in the following sections.
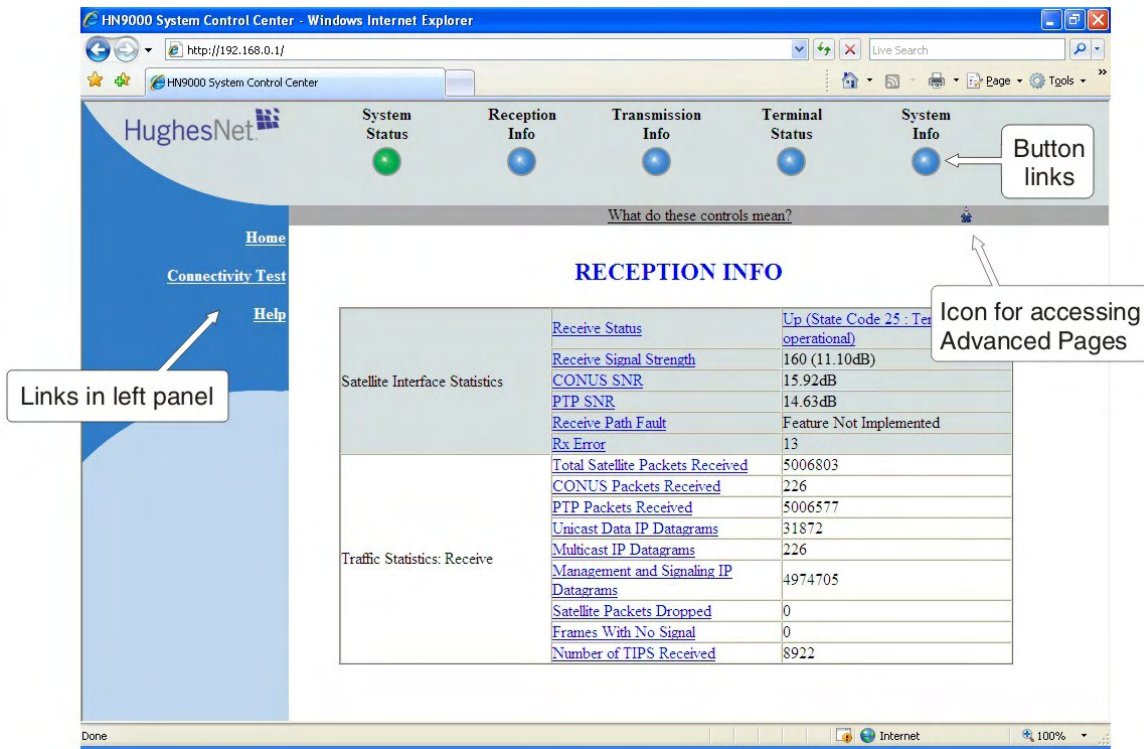
Figure 44: Common features on System Control Center screens

Button links

At the top of each System Control Center page are five round buttons with labels above them as shown in *Figure 45: System Control Center button links* on page 69. These five buttons appear at the top of every System Control Center page to provide an easy means of navigation. Each button is a link to the System Control Center page identified by the label—for example, the **System Status** is a link to the System Status page.

The System Status and System Info buttons are always visible; the remaining three buttons are visible only after the modem has been commissioned and is operational.

Figure 45: System Control Center button links

Click the button to go to the page identified by the label.

The destination page for each button link is identified below:

Table 8: Button links on System Control Center screens

Button	Destination	Description of destination page
System Status	System Status page	Displays general status information such as signal strength and commissioning status. For more information see *System Status page* on page 73.

Button	Destination	Description of destination page
Reception Info	Reception Information page	Displays statistics about received data and receive connection status. For more information see *Reception Information page* on page 77.
Transmission Info	Transmission Information page	Displays statistics about the transmitted data and transmit connection status. For more information see *Transmission Information page* on page 80.
Terminal Status	Terminal Status page	Displays detailed information about the operational status of the satellite modem. For more information see *Terminal Status page* on page 81.
System Info	System Information page	Displays system information such as ST Name (assigned name of the satellite modem name) and operational software version. For more information see *System Information page* on page 84.

System Status button

The System Status button (only) is a status indicator as well as a link. It changes color to indicate the satellite modem's current status, as explained in *Table 9: Meaning of System Status button colors* on page 70. To see more detailed status information, click the System Status button to open the System Status page.

Table 9: Meaning of System Status button colors

Button color	Meaning
Green	OK – The satellite modem is operating normally.
Yellow	Degraded – Degraded means performance is degraded for any of the following reasons: • The Web Acceleration not functioning or in progress. Web Acceleration may be temporarily inactive while you are browsing on a secure HTTP site (https). • The modem is in fallback mode. • A number of transmissions beyond a certain threshold have not been received by the satellite (state code 30). This could be caused by weather conditions.
Orange	FAP threshold exceeded – The satellite modem has exceeded the FAP threshold specified in the HughesNet service plan. Subscribers who exceed the threshold experience reduced download speeds for approximately 24 hr.
Red	Problem detected – There is a problem with satellite transmit or receive connectivity or both.

If the System Status button is red ⬤ or yellow ⬤ , you can look for a red flag next to any value or values on the System Control Center information pages (those with tables listing parameters

and values). The red flag indicates a problem related to the parameter listed next to the flagged value. Click the parameter name to see a pop-up window that may include helpful information, depending on what the problem is.

Links in left panel

The following links appear in the left panel of each System Control Center page (except the home page):

- **Home** – Opens the System Control Center home page.
- **Connectivity Test** – Opens the Connectivity Test page, which allows you to test the connection between the modem and the satellite. See *Connectivity Test page* on page 92.
- **Help** – Opens the Help page. Refer to the Help page, which includes a variety of topics such as getting started and recommended browser settings.

Icon to access Advanced Pages

The icon indicated by the arrow in the following illustration opens the Advanced Pages. This icon appears on all System Control Center pages. For more information on the Advanced Pages, see *Advanced Pages* on page 103.
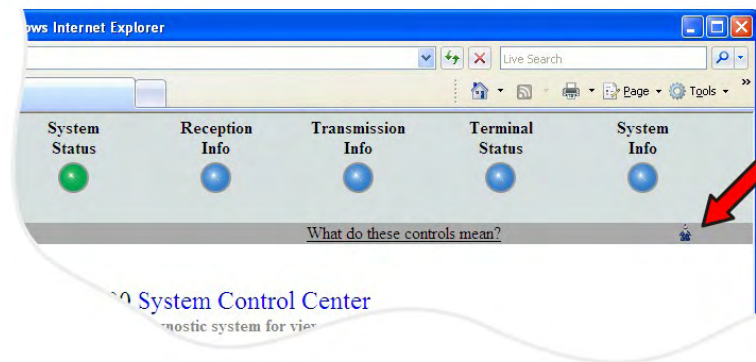
Figure 46: Icon for accessing the Advanced Pages

Status and information screens

Five of the System Control Center screens list status and operational parameters and their current values in a tabular format. For example, the following illustration shows the Transmission Information page. The left column identifies the parameter category, the middle column lists the parameters, and the right column shows the current value of the parameter listed in the middle column. Parameters are listed in this format on all five status and information screens, which are listed below:

- System Status page
- Reception Information page
- Transmission Information page
- Terminal Status page
- System Information page
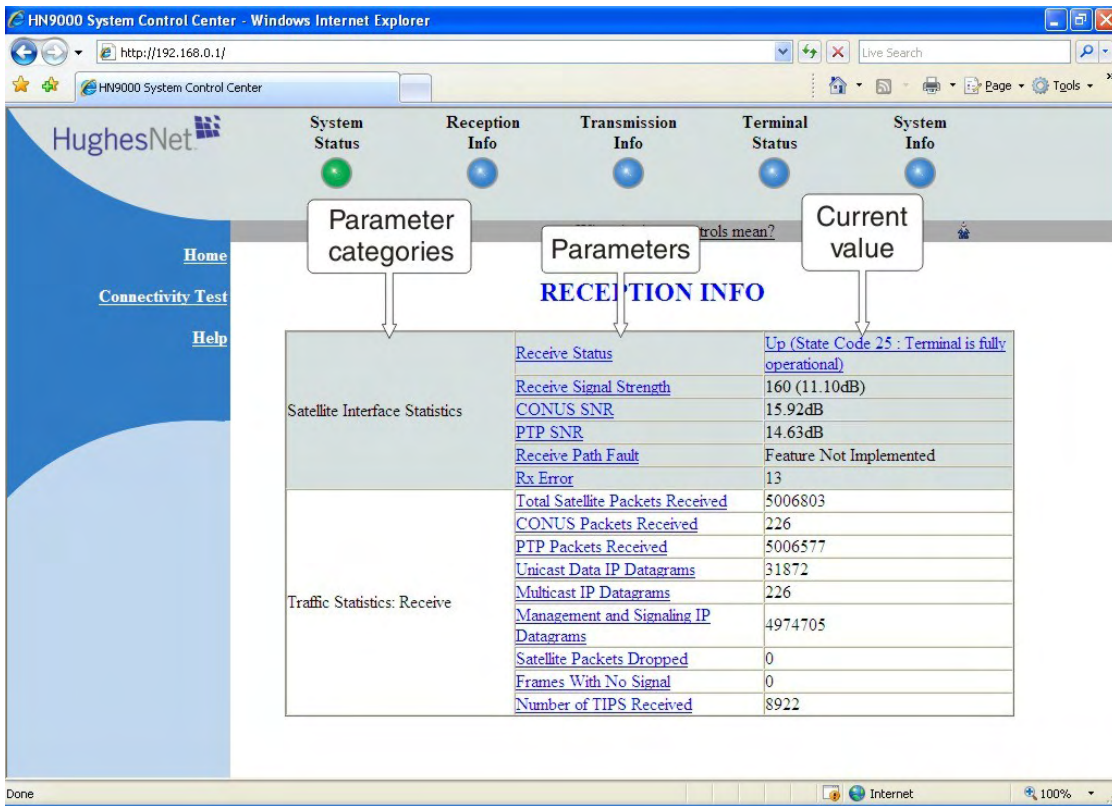
Figure 47: Format of status and information screens

Each status and information screen contains categories of parameters that relate to various aspects of satellite modem operation, as explained in the sections that follow for each status and information screen. To see a definition of any parameter, click the parameter name. The definition appears in a pop-up window. For many parameters this window also includes additional information. If you do not see the pop-up window, it may be hidden by other windows; in this case, minimize other open windows.

Count values such a count of errors or packets received may start at or revert to zero when they reach a maximum number or if the modem is restarted.

State codes on status and information screens

A state code is a number that indicates the operational state of the satellite modem. State codes are displayed with an explanation in words, as shown in the following example. On the System Control Center status and information screens, state codes are shown next to selected parameters, as shown in *Figure 48: Example of a state code* on page 72, or next to a parameter that is related to an error condition.

Figure 48: Example of a state code

For a list and explanation of all state codes, see *Table 17: State codes* on page 88.

Red flag indicator

On the status and information screens, a red flag next to a value indicates a problem related to the parameter listed in the same row where the flagged value appears. The flagged value appears in the right column; the parameter appears in the middle column. The value indicates the current state of the parameter.
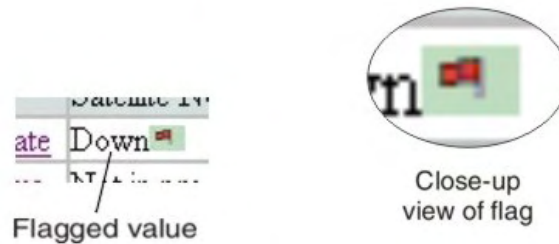
Figure 49: Red flag problem indicator

The red flag may help you identify and troubleshoot a problem.

If you see a red flag, click the parameter name. The pop-up window that appears may include troubleshooting information. For detailed troubleshooting information concerning red flag indicators, see:

- *Red flags on System Status page* on page 76
- *Red flags on Reception Information page* on page 78
- *Red flags on Transmission Information page* on page 81

In these three sections you can find the probable cause and possible solution for a red flag next to a specific parameter.

System Status page

The System Status page displays important information about the satellite modem's operational status.

Available system status values may vary, depending on how the satellite modem is configured. Therefore, some options shown in *Figure 50: System Status page* on page 74 may not appear on your System Status screen.
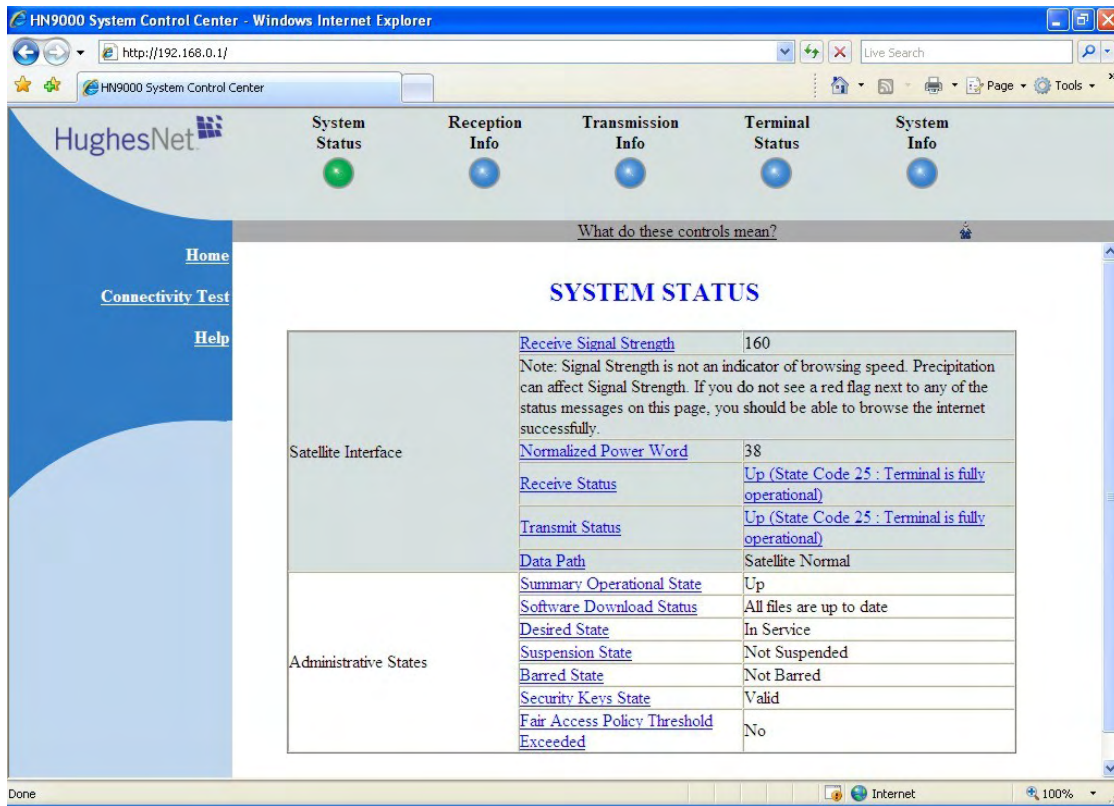
Figure 50: System Status page

The operational parameters listed on the System Status page are shown in a tabular format. The first (left) column identifies the parameter categories:

- Satellite Interface – Contains information on the receive status and signal strength, as well as error messages related to satellite modem receive information.
- Administrative States – Contains information on software downloads to this satellite modem, security keys, and other administrative functions.

Typical values for System Status parameters

The following table lists typical values and the range of values for parameters on the System Status page. This information may help you understand the values displayed by a customer's satellite modem.

To see the definition of any parameter, click the parameter name on the screen.

Table 10: System Status parameters – typical values and range

Parameter	Typical values	Range of values
Satellite Interface (parameter category)		
Receive Signal Strength (value is not displayed until about 2 minutes after certain events such as modem re-boot or antenna repointing)	160–220	0–255
Normalized Power Word (value is not displayed until about 2 minutes	29–45	20–65

Parameter	Typical values	Range of values
after certain events such as modem re-boot or antenna repointing)		
Receive Status	Up	Up – The modem is receiving signals from the satellite. Down – The modem is not receiving signals from the satellite.
Transmit Status	Up	Up – The modem is transmitting signals to the satellite. Down – The modem is not transmitting signals to the satellite.
Data Path	Satellite Normal	Satellite Normal – Usual value. Fallback – The data rate is reduced. VADB – The modem is in dial backup mode. This mode does not apply to the HN9000 modem.
Administrative States		
Summary Operational State	Up	Up – The modem is fully functional. Down – The modem is not functional. Startup – The modem is being commissioned.
Software Download Status	All files are up to date	In progress – Download in progress. All files are up to date.
Desired State	In Service	In Service Out of Service Maintenance Unknown
Suspension State	Not Suspended	Suspended Not Suspended
Barred State	Not Barred	Modem Individually Barred – The modem can receive but cannot transmit. Group Barred – Same as individually barred except barred as part of a group of modems. Not Barred

Parameter	Typical values	Range of values
Security Keys State	Valid	Valid – Security keys are valid. Not Valid – Security keys are invalid.
Fair Access Policy Threshold Exceeded	No	Yes – FAP threshold is exceeded, so transmission is reduced or disabled for a period of time. No – FAP threshold has not been exceeded.

Red flags on System Status page

A red flag next to a value on the System Status page indicates a problem related to the parameter listed in the same row where the flagged value appears. For explanation, find the flagged parameter in this table. *If a state code is displayed next to the parameter,* refer to *State codes* on page 88 to identify the probable cause and possible solution.

Table 11: Explanation of red flags on System Status page

Flagged parameter	Probable cause	Possible solutions
Receive Status (or) Transmit Status	Various causes are indicated by state codes 26-35.	See *Table 17: State codes* on page 88.
	Probing failure (occurs only during commissioning).	There is a problem with the configured latitude and longitude. Make sure the entered latitude and longitude values are correct and in the correct format.
	Registration failure (occurs only during commissioning).	See *Table 5: Reasons for registration errors and corrective actions* on page 36.
Data Path	VADB – System is in VADB mode. The Satellite link is down and the modem is using the dialup backup link.	VADB does not apply to the HN9000 modem.
	Fallback – System is in fallback mode. The modem is experiencing severe weather conditions affecting the data rate. The data rate has been reduced to improve the transmission.	Wait for weather to improve.
Operational State	Modem is not fully operational.	Look for red flags next to other parameters.
Desired State	Modem is in an unknown state.	Look for red flags next to other parameters.
	Modem is out of service.	Call Installer Support with site name to resolve the issue.

Flagged parameter	Probable cause	Possible solutions
	Modem is under maintenance.	Call Installer Support with site name to resolve the issue.
Suspension State	Modem is suspended by the NOCC.	Call Installer Support with site name to resolve the issue.
Barred State	Modem has been barred individually or as part of a group by the NOCC.	Call Installer Support with site name to resolve the issue.
Security Keys	Modem has not acquired security keys.	Wait to see if the flag goes away. If it does not, call Installer Support with site name to resolve the issue.
FAP Status	The modem has greatly exceeded the FAP threshold, and so the modem's data rate is reduced for a period of time.	Wait for normal operation to resume.

Reception Information page

The Reception Information page shown in *Figure 51: Reception Information page* on page 77 displays information about data received by the satellite modem.
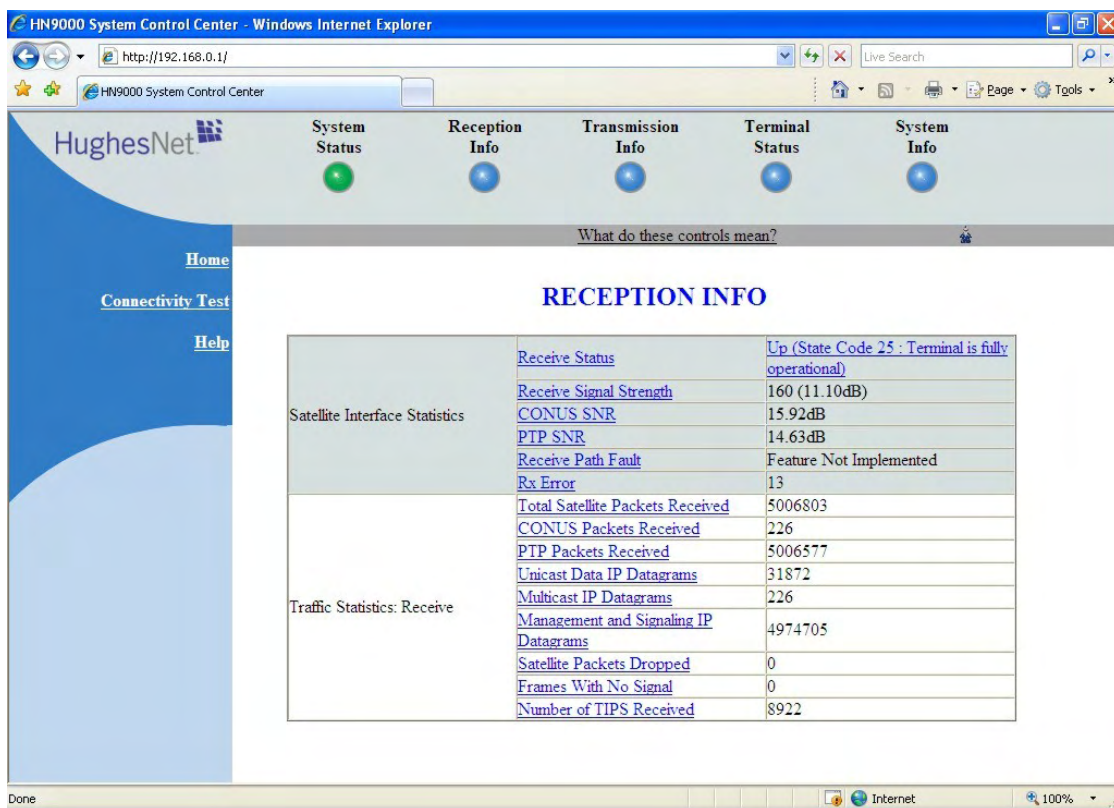

Figure 51: Reception Information page

The operational parameters listed on the Reception Information page are shown in a tabular format. The first (left) column identifies the parameter categories:

- Satellite Interface Statistics – Contains information on the receive status and signal strength, as well as error messages related to satellite modem receive information.
- Traffic Statistics: Receive – Contains statistical information on data received from the satellite including number of packets received or dropped, etc.

Typical values for Reception Information parameters

The following table lists typical values and the range of values for parameters on the Reception Information page. This information may help you understand the values displayed by a customer's satellite modem.

To see the definition of any parameter, click the parameter name on the screen.

Table 12: Reception Information parameters – typical values and range

Parameter	Typical values	Range of values
Satellite Interface Statistics (parameter category)		
Receive Status	Up	Up – The modem is receiving signals from the satellite. Down – The modem is not receiving signals from the satellite.
Receive Signal Strength	160–220	0–255.
CONUS SNR	16	4.5–18.0.
PTP SNR	14	4.5–18.0.
Receive Path Fault	OK	Not applicable (parameter reserved for future use).
RX Error	0	Any whole number.
Traffic Statistics: Receive		
Total Satellite Packets Received	0	Any whole number.
CONUS Packets Received	0	Any whole number.
PTP Packets Received	0	Any whole number.
Unicast Data IP Datagrams	0	Any whole number.
Multicast IP Datagrams	0	Any whole number.
Management and Signaling IP Datagrams	0	Any whole number.
Satellite Packets Dropped	0	Any whole number.
Frames With No Signal	0	Any whole number.
Number of TIPS Received	0	Any whole number.

Red flags on Reception Information page

A red flag next to a value on the Reception Information page indicates a problem related to the parameter listed in the same row where the flagged value appears. For explanation, find the

flagged parameter in this table. *If a state code is displayed next to the parameter,* refer to *Table 17: State codes* on page 88 identify the probable cause and possible solution.

Table 13: Explanation of red flags on Reception Information page

Flagged parameter	Probable cause	Possible solutions
Receive Status	Various causes are indicated by state codes 26–35.	See *Table 17: State codes* on page 88. Most of these problems must be corrected by a qualified installer.
	Probing failure (occurs only during commissioning).	There is a problem with the configured latitude and longitude. Make sure the entered latitude and longitude values are correct and in the correct format. This problem must be corrected by a qualified installer.
	Registration failure (occurs only during commissioning).	See *Table 5: Reasons for registration errors and corrective actions* on page 36.
Receive Signal Strength	No Beacon (or) SQF of 0 or 1.	Make sure the receive cable connected to the modem's rear panel is tightly connected. Any other cable connections must be checked by a qualified installer. If all cable connections are tight, the antenna may need to be repointed by a qualified installer.
	Weather interference – occurs if rain, snow, or wind is heavy enough to interfere with signal reception.	Wait. When the weather clears, the signal strength should return to normal.
	Receive IFL cable is loose, faulty, or has been disconnected.	Make sure the receive cable connected to the modem's rear panel is tightly connected. Any other cable connections must be checked by a qualified installer.
	Antenna has been severely deflected.	Antenna pointing by a qualified installer is required.
	Foreign object is blocking the antenna	In most cases this problem must be corrected by a qualified installer or other professional (for example, a tree specialist).
	Wrong power supply	Make sure you are using the correct power supply. (See *Power supply information* on page 10.)
PTP SNR	Average SNR is too low. Severe weather condition.	Wait for the weather to improve.

Transmission Information page

The Transmission Information page shown in *Figure 52: Transmission Information page* on page 80 displays information about data transmissions from the satellite satellite modem.
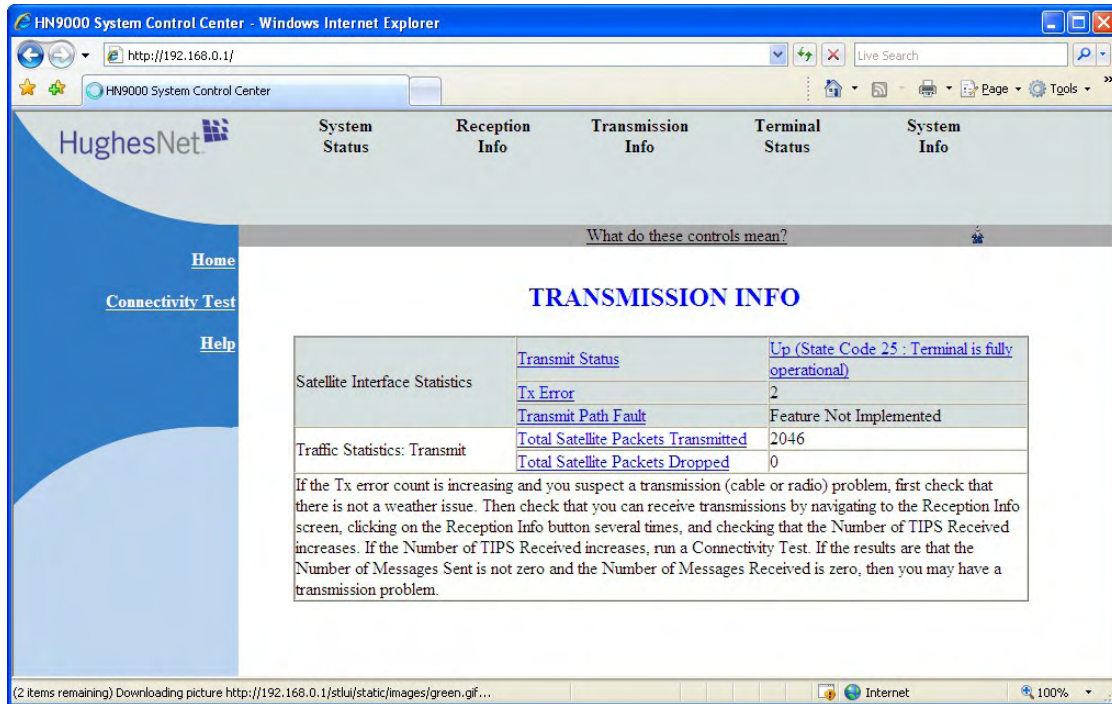
Figure 52: Transmission Information page

The operational parameters listed on the Transmission Information page are shown in a tabular format. The first (left) column identifies the parameter categories:

- Satellite Interface Statistics – Contains information on transmit status and signal strength, as well as transmission-related error messages.
- Traffic Statistics: Transmit – Contains statistical information on the specific data transmitted to the satellite from this satellite modem.

Typical values for Transmission Information parameters

The following table lists typical values and the range of values for parameters on the Transmission Information page. This information may help you understand the values displayed by a customer's satellite modem.

To see the definition of any parameter, click the parameter name on the screen.

Table 14: Transmission Information parameters – typical values and range

Parameter	Typical values	Range of values
Satellite Interface Statistics (parameter category)		
Transmit Status	Up	Up – The modem is transmitting signals to the satellite.

Parameter	Typical values	Range of values
		Down – The modem is not transmitting signals to the satellite.
Tx Error	0	Any whole number.
Transmit Path Fault	OK	Not applicable (parameter reserved for future use).
Traffic Statistics: Transmit		
Total Satellite Packets Transmitted	0	Any whole number.
Total Satellite Packets Dropped	0	Any whole number.

Red flags on Transmission Information page

If you see a red flag next to Transmit Status on the Transmission Information page, see Transmit Status in *Table 11: Explanation of red flags on System Status page* on page 76. The information for Transmit Status in that table also applies to the Transmission Information page.

Terminal Status page

The Terminal Status page displays information about the operational state of the satellite modem and operational statistics such as messages and packets sent, received, and dropped. It indicates whether acceleration is enabled and provides a count of traffic that moves across the LAN to the satellite modem.
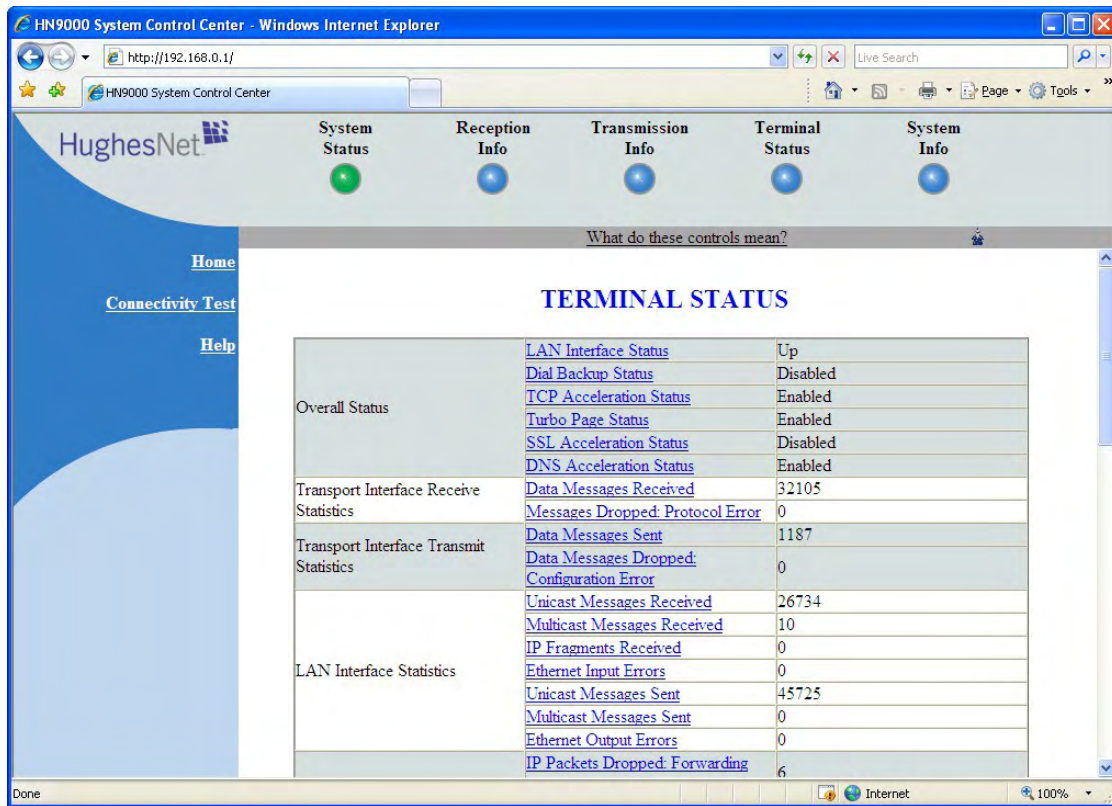
Figure 53: Terminal Status page (top part)

The operational parameters listed on the Terminal Status page are shown in a tabular format. The first (left) column identifies the parameter categories:

- Overall Status – Shows the major features such as dial backup or acceleration. (Some listed features may not be included in your service plan.)
- Transport Interface Receive Statistics – Indicates messages received and decoded by the satellite modem from the satellite.
- Transport Interface Transmit Statistics – Indicates messages being queued up by the satellite modem for transmission to the satellite.
- LAN Interface Statistics – Shows traffic across the LAN interface to the satellite modem.
- IP Forwarding and Routing Statistics – These refer to system control messages.
- Local IP Interface Statistics – Sum of various counts of messages.
- Dial Backup Status – Count of dial backup traffic if the feature is enabled. (Some listed features may not be included in your service plan.)
- TCP Acceleration Statistics – Counts of messages and connections used between the satellite modem and its destination if the feature is enabled. (Some listed features may not be included in your service plan.)
- SSL Acceleration Statistics – Counts of SSL traffic if the feature is enabled. (Some listed features may not be included in your service plan.)
- DNS Caching Statistics – Counts on local storage of data if the feature is enabled. (Some listed features may not be included in your service plan.)
- Management Statistics – Various internal network management traffic counts.
- Turbo Page Statistics – Counts of various web page requests and objects if the feature is enabled. (Some listed features may not be included in your service plan.)

Typical values for Terminal Status parameters

The following table lists typical values and the range of values for parameters on the Terminal Status page. This information may help you understand the values displayed by a customer's satellite modem.

To see the definition of any parameter, click the parameter name on the screen.

The Dial Backup Status parameter and Dial Backup Status category of parameters do not apply to the HN9000 satellite modem.

Table 15: Terminal Status parameters – typical values and range

Parameter	Typical values	Range of values
Overall Status (parameter category)		
LAN Interface Status	Up	Up Down Out of Service Maintenance Unknown
Dial Backup Status	Disabled	Disabled Connected Connecting: ... Disconnecting: ... Disconnected: ...
TCP Acceleration Status	Enabled	Enabled Disabled
Turbo Page Status	Enabled	Enabled Disabled
SSL Acceleration Status	Disabled	Disabled Connected to Server Connecting to Server Disconnected from Server
DNS Acceleration Status	Enabled	Enabled Disabled
Transport Interface Receive Statistics		
Data Messages Received	0	Any whole number
Messages Dropped: Protocol Error	0	Any whole number

Parameter	Typical values	Range of values
Transport Interface Transmit Statistics		
Data Messages Sent	0	Any whole number
Data Messages Dropped: Protocol Error	0	Any whole number
LAN Interface Statistics		
Unicast Messages Received	0	Any whole number
Multicast Messages Received	0	Any whole number
IP Fragments Received	0	Any whole number
Ethernet Input Errors	0	Any whole number
Unicast Messages Sent	0	Any whole number
Multicast Messages Sent	0	Any whole number
Ethernet Output Errors	0	Any whole number
IP Forwarding and Routing Statistics		
IP Packets Dropped : Forwarding Errors	0	Any whole number
ICMP Redirects Sent	0	Any whole number
ISRP Redirects Sent	0	Any whole number
Current Number of Static Routes	0	Any whole number
Current Number of RIP Routes	0	Any whole number
Current Number of Redirect Routes	0	Any whole number
Current Number of ISRP Routes	0	Any whole number
Local IP Interface Statistics		
IP Packets Received	0	Any whole number
IP Packets Sent	0	Any whole number
Dial Backup Status		
Data Packets Received	0	Any whole number

System Information page

The System Information page shown in *Figure 53: Terminal Status page (top part)* on page 85 provides system information for the satellite modem such as ST name (modem name), Site ID (Site Id), and operational software version.
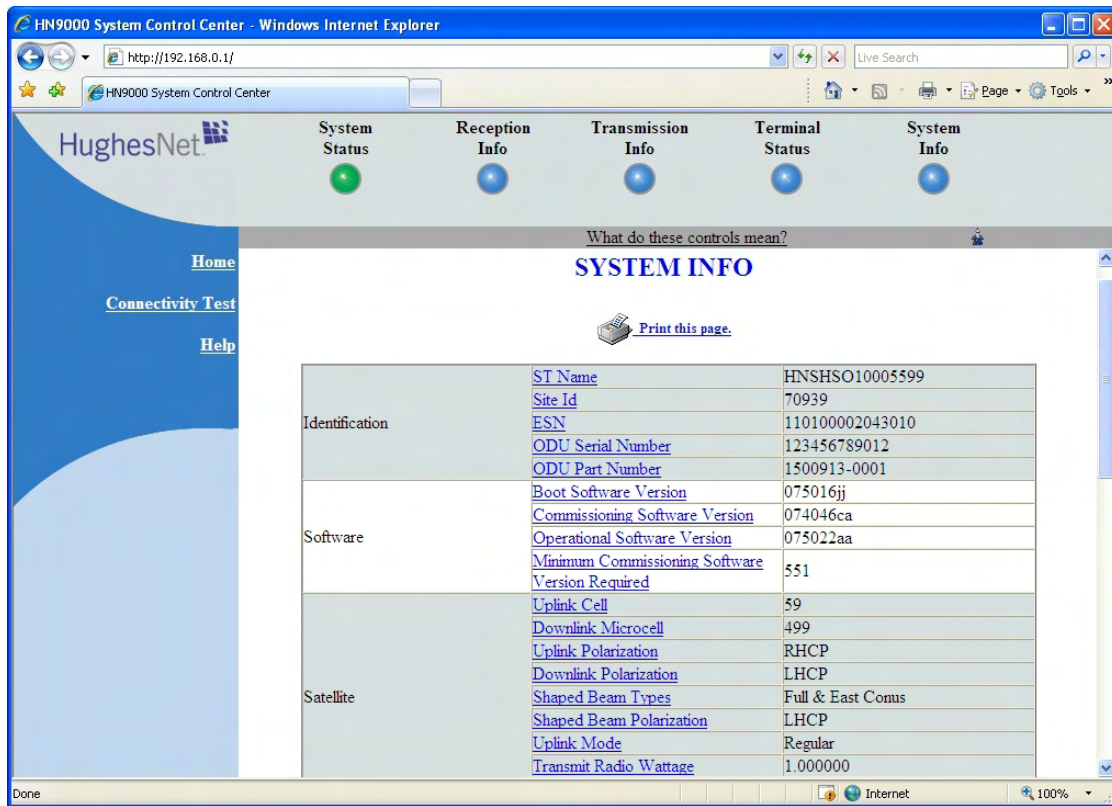
Figure 54: System Information page (top part)

📝 **Note:** Print the System Information page and tell the customer to save it. The customer might need it if they cannot access the System Control Center and they need to call Hughes Customer Care or their service provider for assistance. (If a printer is not available, tell the customer to capture the screen image and save it to a file. Provide assistance if necessary.)

The operational parameters listed on the System Information page are shown in a tabular format. The first (left) column identifies the parameter categories:

• Identification – Contains system ID information such as Site ID (installation site ID) and ST name (a unique name that identifies the satellite modem).
• Software – Contains version information on the various software applications resident on the satellite modem such as commissioning and operational software.
• Satellite – Contains information pertaining to communication with the satellite such as antenna size, transmit radio wattage, and uplink transmission mode.
• Addressing – Contains addressing information such as LAN port address and subnet mask and available public IP addresses (if any, depending on your service plan).
• Software Features – This section lists the optional features and provides information on whether they are currently active. These features are enabled or disabled according to the customer's service offering. The customer cannot use the satellite modem to change these features.

Typical values for System Information parameters

The following table lists typical values and the range of values for parameters on the System Information page. This information may help you understand the values displayed by a customer's satellite modem.

To see the definition of any parameter, click the parameter name on the screen.

Table 16: System Information parameters – typical values and range

Parameter	Typical values	Range of values
Identification (parameter category)		
ST Name	Characters and numbers	Not applicable
Site ID	A number	Not applicable
ESN	A number	Not applicable
ODU Serial Number	A number	Not applicable
ODU Part Number	A number	Not applicable
Software		
Boot Software Version	Characters and numbers	Not applicable
Commissioning Software Version	Characters and numbers	Not applicable
Operational Software Version	Characters and numbers	Not applicable
Minimum Commissioning Software Version Required	A number	Not applicable
Satellite		
Uplink Cell	A number	Not applicable
Downlink Microcell	A number	Not applicable
Uplink Polarization	Not applicable	RHCP LHCP
Downlink Polarization	Not applicable	RHCP LHCP
Shaped Beam Types	Not applicable	No Conus Full Conus West Conus Full West Conus East Conus Full East Conus
Shaped Beam Polarization	Not applicable	RHCP LHCP
Uplink Mode	Regular	Regular High Volume
Transmit Radio Wattage	Small integer	1.000000 2.800000 *(nominal 2-W radio)*

Parameter	Typical values	Range of values
		5.000000 *(nominal 4-W radio)*
		13.000000 *(nominal 10-W power booster)*
Antenna Size	A real number	0.740000m
		0.980000m
		1.200000m
		1.800000m
Addressing		
LAN Port Address	An IP Address	Unassigned *{IP Address}*
LAN Port Subnet Mask	An IP Address	Unassigned *{IP Address}*
Last Usable IP Address	An IP Address	Unassigned *{IP Address}*
Default Gateway	Satellite	Satellite *{IP Address}*
Local Address Domain ID	A real number	Not applicable
Address Translation Within Local Domain	An IP Address	Not applicable
Static Address Mapping Within Local Domain	An IP Address	Not applicable
Address Translation to External Domains	Not applicable	Not applicable
Static Address Mappings to External Domains	Not applicable	Not applicable
Dynamic Address Translation to External Domains	Enabled	Not applicable
Software Features		
DHCP Mode	Server	Not applicable
IRDP Preference	Disabled	Not applicable
RIP Mode	Disabled	Not applicable
ISRP Mode	Disabled	Not applicable
ISRP Redirect Behavior	Disabled	Not applicable
IGMP Receive	Enabled	Not applicable
IGMP Send Mode	Enabled	Not applicable
H.323 Proxy	Disabled	Not applicable
Dialer Proxy	Disabled	Not applicable
TCP Acceleration	Enabled	Not applicable
HTTP GET Compression	Enabled	Not applicable
DNS Caching	Enabled	Not applicable

Parameter	Typical values	Range of values
Turbo Page	Enabled	Not applicable
SSL Acceleration	Disabled	Not applicable

State codes

A state code is a number that indicates the operational state of the satellite modem. Some state codes indicate an error condition. State codes are identified as *State code* followed by a number from 1 – 35. They are displayed with an explanation in words, as shown in the following examples.

State codes appear on installation screens, on screens displayed during a hard reboot (when power is removed and then restored), and on System Control Center pages.

Example from an installation screen

Example from a System Control Center screen

Figure 55: Examples of state codes

Table 17: State codes on page 88 lists and explains all HN9000 state codes.

In the state code table, *modem* refers to the *satellite modem*.

Table 17: State codes

State code	State name	Explanation	Corrective action
Installation – Boot phase			
1	Starting Up in Boot	Satellite modem is starting up in boot phase.	Transient – No action is necessary.

State code	State name	Explanation	Corrective action
2	Waiting for Installation Parameters	Modem has not been installed, and installation parameters have not been submitted.	Transient – No action is necessary.
3	Coarse Pointing in Progress	Antenna pointing is in progress (coarse or fine pointing). *Occurs during modem installation only.*	Transient – No action is necessary.
4	Acquiring Beacon in Boot	*Occurs during Auto modem replacement only:* Modem is searching for beacon.	Transient – No action is necessary.
5	Acquiring PTP SNR in Boot	*Occurs during Auto modem replacement only:* Modem is searching for point-to-point signal.	Transient – No action is necessary.
6	Waiting for Uplink Polarization Change	Modem is waiting for installer to switch uplink polarization at the radio assembly. *Occurs during installation only.*	Installer should switch polarization.
7	Downlink Established in Boot	Modem is in boot phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
8	Waiting for MIPs in Boot	Modem is in boot phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
9	Downloading Commissioning Software	Modem is in boot phase and is downloading commissioning software.	Transient – No action is necessary.
10	Waiting for Antenna Pointing Complete	Modem is waiting for antenna pointing validation to complete. *Occurs during installation only.*	Installer must complete validation.
Installation – Commissioning phase			
11	Starting Up in Commissioning	Modem is starting up in commissioning phase.	Transient – No action is necessary.
12	Downlink Established in Commissioning	Modem is in commissioning phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
13	Waiting for MIPs in Commissioning	Modem is in commissioning phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
14	Probing in Progress	Modem is in commissioning phase. Probing is in progress. *Occurs during installation only.*	Transient – No action is necessary.

State code	State name	Explanation	Corrective action
15	Probing Failure	Modem is in commissioning phase. Probing has failed. *Occurs only during installation.*	See next row.

Probing failure (code 15) corrective actions:

1. Latitude and/or longitude entered during installation may be incorrect or in wrong format. Verify and re-install.
2. Transmit cable from modem to antenna may be bad or disconnected. Verify and correct as necessary. Modem will keep retrying.
3. Radio may be unable to transmit. Replace it. If any changes are made to the antenna, it may become mispointed, so repoint it.

State code	State name	Explanation	Corrective action
16	Registering ST	Modem is in commissioning phase. Modem is registering with the NOCC.	Transient – No action is necessary.
17	ST Registration Failure	Modem is in commissioning phase: registration with the NOCC has failed.	See *Table 5: Reasons for registration errors and corrective actions* on page 36.
18	Waiting for Capacity Keys	Modem is in commissioning phase; modem is waiting for capacity keys from the NOCC.	Transient – No action is necessary.
19	Reconciling Profiles in Commissioning	Modem is in commissioning phase; modem is reconciling profiles with the NOCC.	Transient – No action is necessary.
20	Downloading Operational Software	Modem is in commissioning phase and is downloading operational software.	Transient – No action is necessary.

Note: State codes 1 – 20 appear only while the modem is being installed or during a hard reboot (resulting from power being removed and then restored).

|	**Operational phase**		
21	Starting Up in Operation	Modem is starting up in operational phase.	Transient – No action is necessary.
22	Downlink Established in Operational	Modem is in operational phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
23	Waiting for MIPs in Operational	Modem is in operational phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
24	Reconciling Profile in Operational	Modem is in operational phase. Profiles are being distributed to various subsystems.	Transient – No action is necessary.
25	Fully Operational (normal operation)	Modem is fully operational.	Steady state – No action is necessary.
	Error codes		

State code	State name	Explanation	Corrective action
26	Rx Connectivity Down	Rx cable connectivity tests have failed.	Verify cabling and pointing. If antenna has moved or been disturbed, repoint it.
27	No Beacon	Modem is unable to track beacon.	Verify cabling and pointing. If antenna has moved or been disturbed, repoint it.
28	No TIPs	Modem is not receiving transmission information packets from satellite.	Verify cabling and pointing. If antenna has moved or been disturbed, repoint it.
29	Tx Connectivity Down	Tx cable connectivity tests have failed.	Verify cabling and pointing. If antenna has moved or been disturbed, repoint it.
30	Too Many Bad Slots	*Bad slots* are transmissions from the modem that are not received by the satellite. State code 30 indicates a percentage of bad slots within the last hour that exceeds a preset value.	Rain or snow can cause this condition. If it continues during clear weather, verify cabling and pointing. If antenna has moved or been disturbed, repoint it.
31	ECL Active	Transmitter has been shut down due to ECL. ECL measures total transmitted power over 30-minute periods and turns off the transmitter if the total power exceeds a preset limit imposed by the FCC.	Transient – No action is necessary.
Restricted states (NOCC-imposed restrictions)			
32	Barred	Modem has been barred from transmitting by the NOCC. Possible reasons for barring include interference isolation, uplink failure, or government order.	Call Installer Support with site name to resolve the issue.
33	Suspended	Modem has been put in a suspended state by the NOCC. This occurs if a customer's bill is overdue or if service is terminated.	Call Installer Support with site name to resolve the issue.
34	Maintenance	Modem has been put in maintenance state by the NOCC.	Call Installer Support with site name to resolve the issue.
35	Out of Service	Modem has been put in out-of-service state by the NOCC.	Call Installer Support with site name to resolve the issue.

Viewing the state codes list

To view a list of state codes with an explanation of each code:

1. Click the underlined state code number.
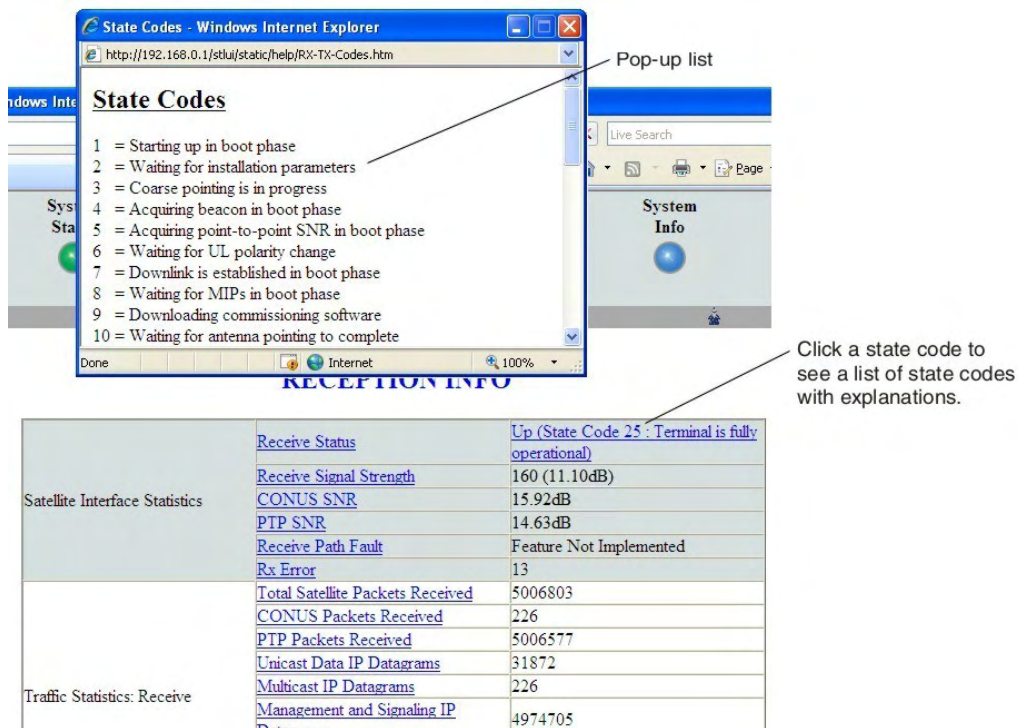
A pop-up window appears that briefly identifies each state code. If you do not see the pop-up window, it may be hidden by other windows; if this happens, minimize other open windows.

2. Scroll down to see the entire list of state codes.

Connectivity Test page

You can use the Connectivity Test page to test the connection between the satellite modem and the satellite. Instructions for the test are provided on the screen. No special configuration is required.
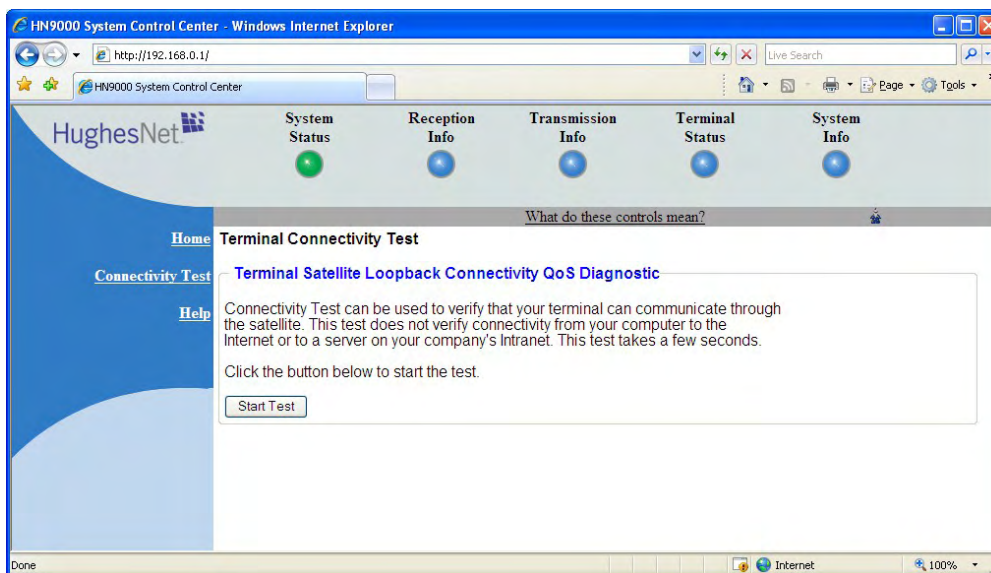

Figure 56: Terminal Connectivity Test page

For details about this test, see *Testing connectivity to the satellite* on page 100.

Chapter
10

LEDs

Topics:

- *Front panel LEDs*
- *LAN port LEDs*

The satellite modem has a vertical row of LEDs on the front panel and small LEDs on the Ethernet port on the back of the modem. The LEDs provide information about the satellite modem's operating status.

Front panel LEDs

The satellite modem has five LEDs on the front panel, as shown in *Figure 57: Front panel LEDs on the HN9000 modem* on page 96. By their appearance—on, off, or blinking—the LEDs indicate the modem's operating status.

LAN
Indicates whether the satellite modem's LAN port is connected to the user's computer or other device and is ready for user traffic.

Transmit
Indicates whether the satellite modem is transmitting data, is able to transmit data, or has a problem in the transmit path.

Receive
Indicates whether the satellite modem is receiving data, has good signal quality or has a problem in the receive path.

System
Indicates whether the satellite modem is in boot or commissioning phase or if it is ready or not ready to handle user traffic.

Power
Indicates whether the satellite modem is receiving power; also used to indicate if the modem overheats.

Figure 57: Front panel LEDs on the HN9000 modem

Table 18: Front panel LED indications on page 96 explains what the modem status is when the LEDs are on, off, or blinking. *On* means the LED is continuously lit. *Blinking* means the LED is usually on, but intermittently turns off briefly.

Table 18: Front panel LED indications

LED	Appearance	Satellite modem status	Corrective action
LAN	**On**	The modem's LAN port is connected to another network device such as the user's computer.	
	Off	LAN cable disconnected or other problem with the LAN configuration; requires user intervention.	Check network connections.
Transmit	**On**	The modem is able to transmit.	
	Blinking	The modem is transmitting data packets to the network satellite.	
	Off	Problem in the transmit path.	Check transmit cable connection.

LED	Appearance	Satellite modem status	Corrective action
Receive	**On**	Downlink beacon signal is locked; signal quality is good.	
	Blinking	The modem is receiving data packets from the satellite.	
	Off	Problem in the receive path.	Check receive cable connection.
System	**On**	Ready to handle user traffic.	
	Blinking	In boot or commissioning phase.	
	Off	Not ready to service user traffic.	
Power	**On – blue**	The satellite modem is receiving power from its power supply.	
	On – red	Modem temperature is too hot. (If the modem overheats, it turns off. When it cools it recovers to operational status.)	Make sure the environmental temperature is within range, that the modem is positioned vertically, and that its vents are not blocked.
	Off	Not receiving power.	Check power connection.

Bold type indicates LED appearance during normal operation.

LAN port LEDs

Green and orange LEDs on the LAN (Ethernet) port on the modem's rear panel indicate link status and speed, as explained in *Figure 58: LAN port LEDs* on page 97.

Green indicates link speed:

ON – Connected to a 100-Mbps network (100BaseT mode)
OFF – Connected to a 10-Mbps network (10BaseT mode)

Orange indicates link status:

ON – Port is connected to a powered-on device
BLINKING – Port is receiving data
OFF – No link established
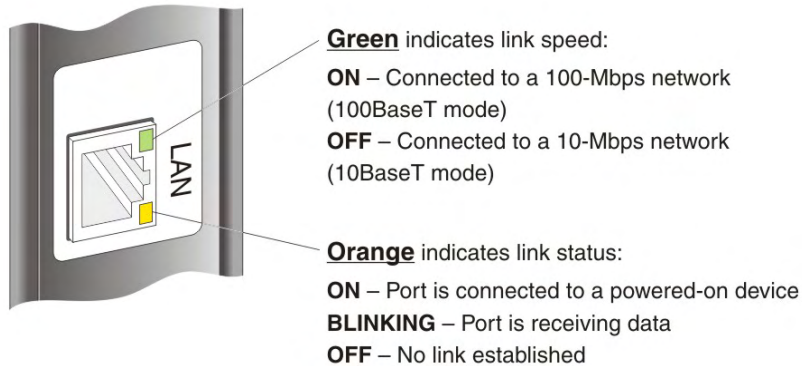
Figure 58: LAN port LEDs

Chapter

11

Troubleshooting

Topics:

- *Rescue switch*
- *Cannot access the System Control Center*
- *Testing connectivity to the satellite*

If you encounter a problem with the satellite modem, refer to the relevant troubleshooting procedure or procedures in the sections that follow. If you cannot correct the problem, contact Installer Support.

Other sections in this guide that contain troubleshooting information are listed below:

- For help on troubleshooting **installation problems**, see *Troubleshooting installation problems* on page 40.
- For explanation of **state codes**, which appear on various screens, see *Table 17: State codes* on page 88.
- For explanation of **red flags**, see *Red flag indicator* on page 73.
- Improper **settings on the computer** connected to the satellite modem can cause problems. For instructions on configuring a computer to work properly with the modem see *Computer settings* on page 107.

Rescue switch

NOTICE

Do not use the recessed rescue switch on the modem's rear panel unless you are a qualified technician. Pressing this switch could cause the modem to become inoperable.

Cannot access the System Control Center

Follow these steps if you cannot access the System Control Center after installation of the satellite modem.

1. If the modem is using a private IP address, confirm that DHCP is enabled on the customer's computer.
    This procedure is explained in *Configuring a computer to use DHCP* on page 109.

2. Open a web browser on a computer connected to the satellite modem.

3. In the browser address bar, type www.systemcontrolcenter.com or 192.168.0.1 and press **Enter**.

    Note: To use 192.168.0.1, DHCP must be enabled on the computer.

    If the System Control Center does not appear, continue with the remaining steps.

4. Make sure that the satellite modem is powered up. The Power and LAN LEDs should be continuously lit—except that the LAN LED may blink if there is LAN activity.

5. Make sure the DC power cord adapter is securely attached to the satellite modem.

6. If the LEDs are off, make sure the Ethernet cable is securely attached to the satellite modem and the customer's computer.

7. If you complete the installation and you still cannot access the System Control Center, contact Installer Support.

Testing connectivity to the satellite

If you have problems connecting to the Internet, you can use the Connectivity Test page to test connectivity between the modem and the satellite. This connectivity test sends test messages on a loop from the modem to the satellite and back to the modem, as shown in *Figure 59: Satellite loopback connectivity test* on page 101. If the test succeeds, it verifies that the modem can connect to the satellite.
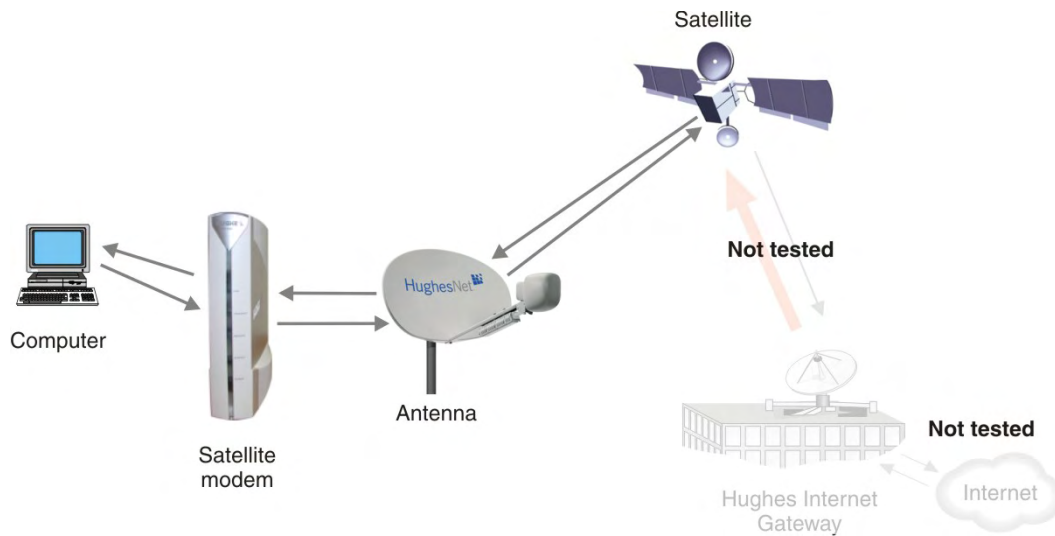
Figure 59: Satellite loopback connectivity test

1. To conduct this test from any System Control Center page, click **Connectivity Test** in the left panel.
   The initial Terminal Connectivity Test page appears.
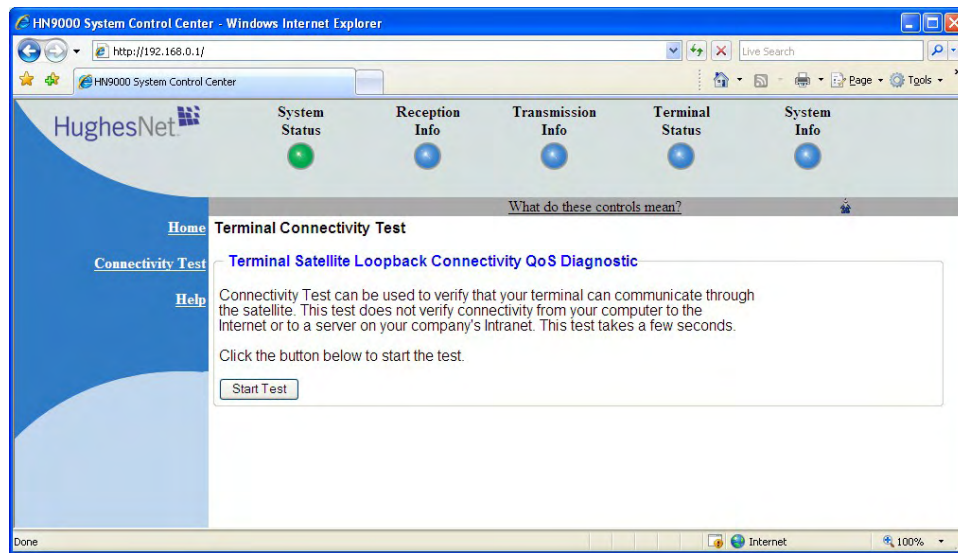
Figure 60: Terminal Connectivity Test page

2. Click **Start Test**.
   You may see a screen that asks you to wait while the test is conducted. When the test finishes, the Connectivity Test results page appears.
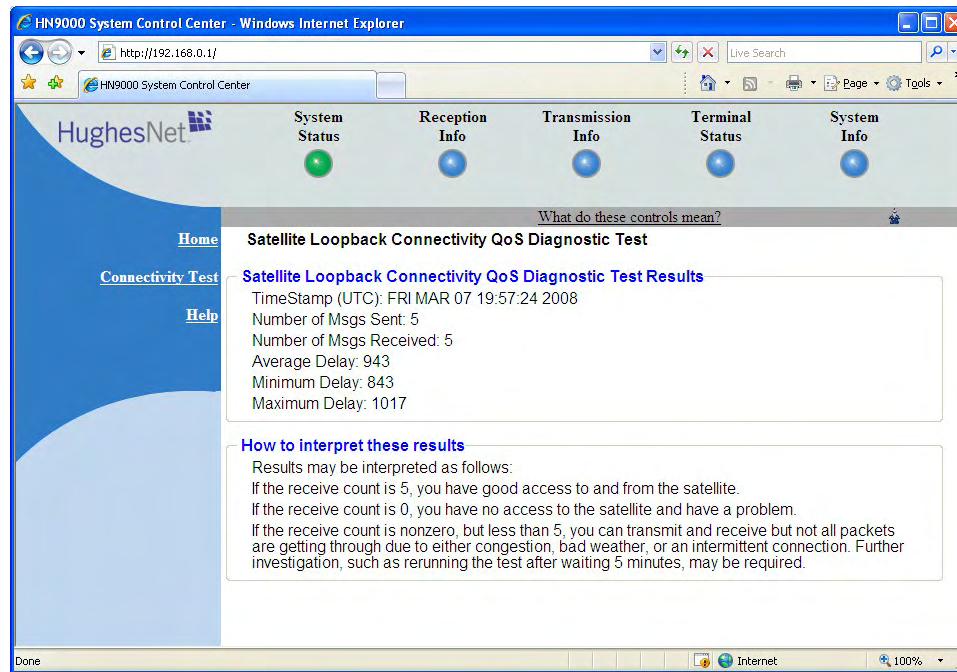
Figure 61: Connectivity Test results page

If the number of messages sent equals the number of messages received, the test is successful—there is good connectivity between the remote modem and the satellite.

If the number of messages received is greater than zero but not equal to the number of messages sent, you have physical connectivity to the satellite, but if this test result persists, you may have an access problem.

Typically the delay time (time message is sent until it is received) is approximately 1 second. The screen shows the minimum, average, and maximum delay times for the test messages in milliseconds. Most important is whether all messages are received or not.

For additional information, see **How to interpret these results** on the test results page.

Chapter

12

Advanced Pages

Topics:

- *Accessing the Advanced Pages*
- *Expanding and collapsing menus*
- *Opening the Installation sub-menu*

The Advanced Configuration and Statistics pages, also known as the *Advanced Pages*, contain a great deal of detailed information about the satellite modem—such as statistics, diagnostic information, logs, status, and operating parameters. You may need to access the Advanced Pages to find specific information or to configure special features.

Note: The Advanced Pages provide access to critical configuration parameters and other functions. Do not use these pages unless you are a qualified installer or other technician who thoroughly understands how the satellite modem operates or unless an Installer Support representative instructs you to access the Advanced Pages for troubleshooting purposes.

Accessing the Advanced Pages

To access the Advanced Pages:

1. Launch a web browser.

2. Type www.systemcontrolcenter.com *or* 192.168.0.1 in the browser address bar and press **Enter**.

   Note: To use 192.168.0.1, DHCP must be enabled on the computer.

   The System Control Center home page appears.

3. Click the small icon below the System Info button. This icon is indicated by the arrow in *Figure 62: Icon for accessing Advanced Pages* on page 104.
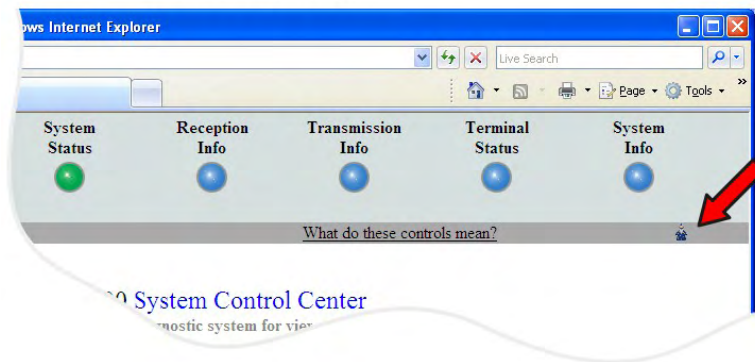
Figure 62: Icon for accessing Advanced Pages

The Advanced Configuration and Statistics screen appears, as shown in *Figure 63: Advanced Pages example showing the Advanced menu* on page 105.

An alternate way to open the Advanced Pages is to type www.systemcontrolcenter/stlui/fs/advanced in the browser address bar and press **Enter**.

Figure 63: Advanced Pages example showing the Advanced menu on page 105 shows one of the many available Advanced Pages, the Terminal Initialization Sequence screen, which appears during installation. This Figure shows the Advanced menu in the left panel. Many other Advanced Pages are available through the Advanced menu.
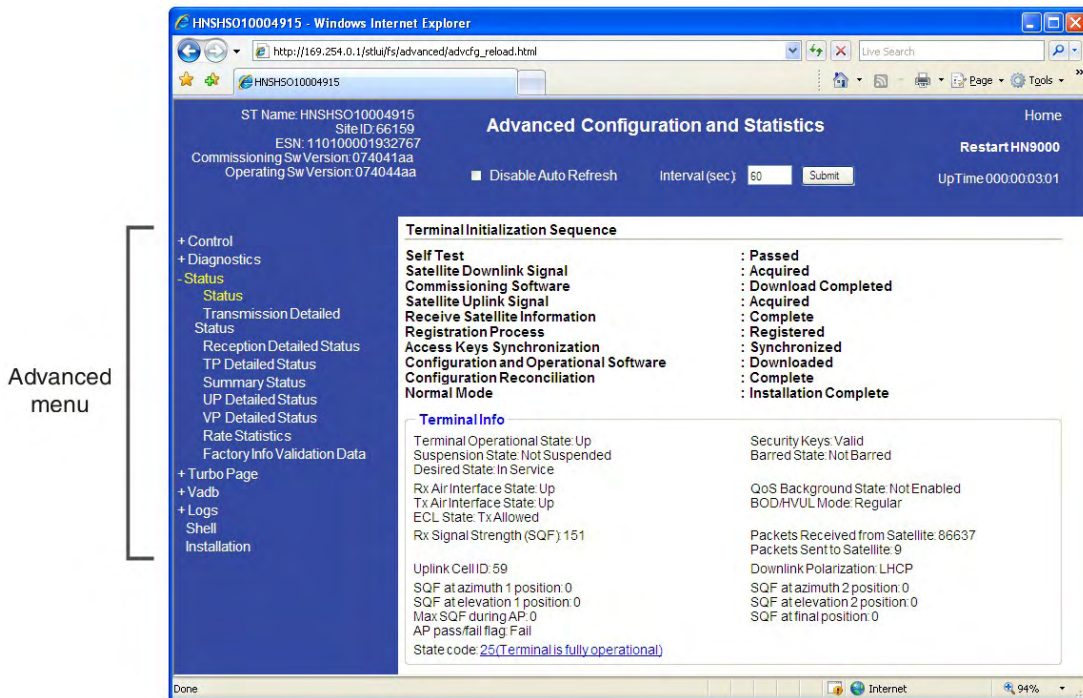
Figure 63: Advanced Pages example showing the Advanced menu

Expanding and collapsing menus

To expand the Advanced Menu on the left side of the screen to show additional selections, click the + sign next to a menu item. If you expand another menu item, the previously expanded menu item collapses.

Opening the Installation sub-menu

Advanced Pages of particular interest to installers are listed in the **Installation** sub-menu. To open this sub-menu, click + next to **Installation**.

Appendix

A

Computer settings

For proper operation of the satellite modem, you may have to change certain settings on the computer that is connected to the modem.

Do not change any settings on a customer's computer unless you first obtain permission to do so.

Instructions are provided for:

- Configuring a computer to support DHCP
- Configuring a computer to use a public IP address
- Disabling a web browser's proxy connection

These procedures are explained in the sections that follow.

Understanding the modem address and computer address

The satellite modem and any computer or computers that connect to it must each have their own identifying network address. This network address is known as an *IP address*. An IP address may be *dynamic*, meaning that it can change, or *static,* meaning that it is fixed—it does not change. An IP address may also be public (or *routable*), meaning that it can be used on the Internet. A *private* IP address works on an internal network but not over the Internet. However, to gain access to the Internet, private addresses may be converted by a network address translation (NAT) service to a public IP address that can be used on the Internet. Both private and public addresses can be dynamic or static, although typically a private IP address is dynamic and a typically a public IP address is static.

Both the modem and a connected computer can have either type of address—private or public. The type used depends on requirements a customer might have and their service plan. A public IP address or addresses are available only if they are specified in the service plan. Typically home users use a private IP address, but some home users use a public IP address.

To find specific address information, go to the System Control Center System Information page *Figure 53: Terminal Status page (top part)* on page 85. Scroll down until you see Addressing in the left column. Look at the first three parameters in the Addressing field, as shown in the following two examples.

Private IP addresses

Figure 64: Example of Addressing parameters showing available private IP addresses on page 108 is an example of System Information page address parameters for a satellite modem with a service plan that provides private IP addresses.

Figure 64: Example of Addressing parameters showing available private IP addresses

In this example, the satellite modem is assigned a private IP address (LAN Port Address) of 192.168.0.1.

There are 253 available private IP addresses that can be assigned to computers connecting to the satellite modem. These addresses are in the range from 192.168.0.2 to 192.168.0.254 (the Last Usable IP Address).

Public IP address

Figure 65: Example of Addressing parameters showing one available public IP address on page 108 is an example of System Information page address parameters for a satellite modem with a service plan that provides one public IP address. Some service plans provide multiple public IP addresses.

Figure 65: Example of Addressing parameters showing one available public IP address

In this example, the satellite modem is assigned the public IP address (LAN Port Address) 97.73.73.65. The modem's DHCP server has only one public IP address to assign to a connecting computer: 97.73.73.66 (the Last Usable IP Address).

For instructions on configuring a public IP address on your computer, see the applicable section in *Configuring a computer for a public IP address* on page 117. Find the section that applies to your computer operating system.

Multiple public IP addresses

If a service plan provides more than one public IP address, the range (or difference) from the LAN Port Address to the Last Usable IP Address will be greater than one. For example, if the LAN Port Address is 97.73.73.65 and the Last Usable IP Address is 97.73.73.70, the range (or difference) is 5, meaning there are five available public IP addresses.

If you don't know the modem's public IP address…

To access the satellite modem when the service plan provides a public IP address, you need to know the public IP address of the satellite modem (the LAN Port Address). If you do not know the LAN Port Address (and you cannot access the System Information page), you can set a *link local* address on your computer as explained below:

1. Use the Windows Control Panel on the connected computer to open the Local Area Connection Properties dialog and then the Internet Protocol (TCP/IP) Properties dialog. If you need more specific instructions, see *Configuring a computer for a public IP address* on page 117.

2. In the Internet Protocol Properties dialog, click Use the following IP address.

3. Enter the following:

    a) In the IP address field, type 169.254.10.10.

    b) Typically the Subnet mask field auto-populates to 255.255.0.0. If it does not, enter this value manually.

    c) In the Default gateway field, type 169.254.0.1.

    d) In the Preferred DNS server field, type 66.82.4.8.

    e) Click **OK** twice to close the Internet Protocol Properties dialog and the Network Connections dialog.

4. With the computer configured as instructed above, type 169.254.0.1 in your browser address window to open the System Control Center.
   If you click the link on the System Control Center home page for the System Information page, you can read the modem's IP address in the Addressing section. The LAN Port Address is the modem's IP address.

5. Record the LAN Port Address and the Last Usable IP Address.

   Now you can enable DHCP on your computer (by selecting Obtain an IP Address automatically in the Internet Protocol Properties dialog). Then, the modem will dynamically assign a public IP address to the computer.

   Alternatively, if you want to assign a particular public IP address to your computer, you can set that public IP address on your computer. To configure the public address, see *Configuring a computer for a public IP address* on page 117.

Configuring a computer to use DHCP

DHCP is a protocol that allows a computer to obtain its IP address from a DHCP server on a network when the computer connects to the network. This type of IP address is called a *dynamically assigned* IP address because it can change when the computer disconnects from the network and later re-connects.

The satellite modem incorporates a DHCP server (always enabled) to assign IP addresses to computers that connect to it. The modem can assign *private* IP addresses or *public IP addresses*, depending on the service plan purchased by the satellite modem customer.

In most cases, DCHP should be enabled on a computer or computers that connect to the satellite modem so the computer(s) can ask for and receive an IP address (private or public) from the satellite modem DHCP server.

DHCP should be disabled on the customer's PC if the customer has purchased a service plan with a public IP address(es) and wants to use a particular public IP address.

The following sections explain how to configure computers with various operating systems to use DHCP in the event that DHCP is disabled on the computer. To enable DHCP, use the instructions for your specific computer operating system.

Configuring Windows Vista to use DHCP

This section explains how to configure your computer to use DHCP if your computer operating system is Microsoft Windows Vista.

1. From the Windows desktop, select **Start → Settings → Network Connections**.

   A list of network adapters appears as shown in *Figure 66: Network connections – Windows Vista* on page 110. The Local Area Connection-NIC Card icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.
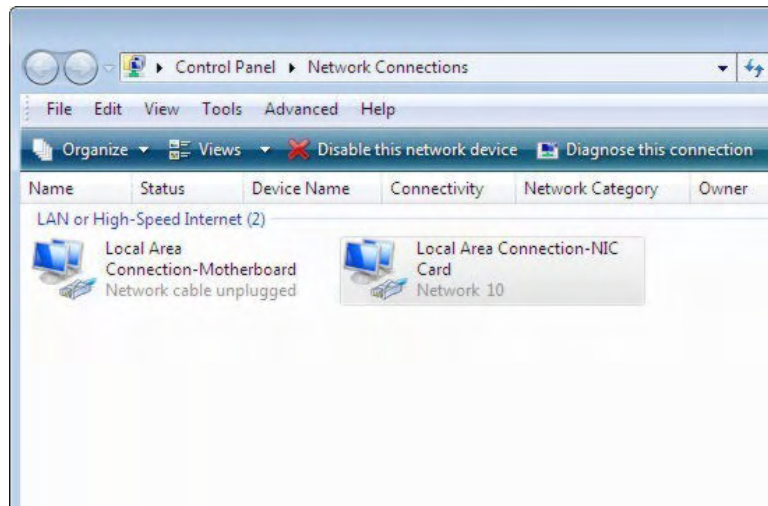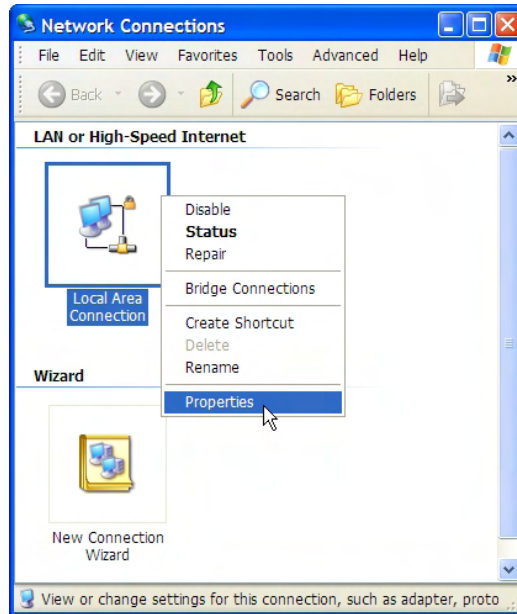
Figure 66: Network connections – Windows Vista

> **Note:** If a red X appears next to the Local Area Connection icon, check your connections. You cannot successfully configure your system if the red X is present.

2. Right-click the Local Area Connection-NIC Card icon, which represents the satellite modem network connection, and select **Properties**.

The Local Area Connection-NIC Card Properties dialog appears as shown in *Figure 67: Local Area Connection Properties – Windows Vista* on page 110.

> **Note:** Depending on the computer's security settings, a pop-up User Account Control message may appear, requesting that you confirm the action before proceeding. If you see this message, click **Continue** to proceed.
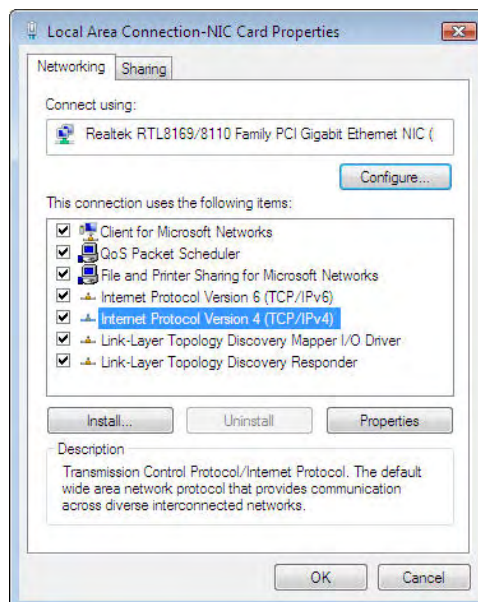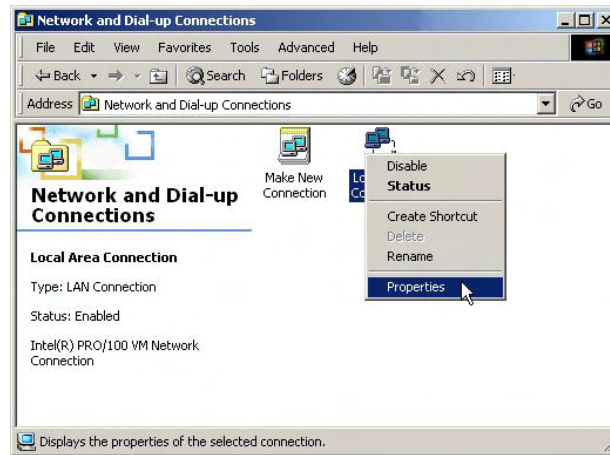

Figure 67: Local Area Connection Properties – Windows Vista

3. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown.

4. If NetBEUI is installed and checked, uncheck it or uninstall it.

5. Highlight the appropriate TCP/IP connection. Be careful not to uncheck the checkbox.

6. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in *Figure 68: Internet Protocol Properties – Windows Vista* on page 111.
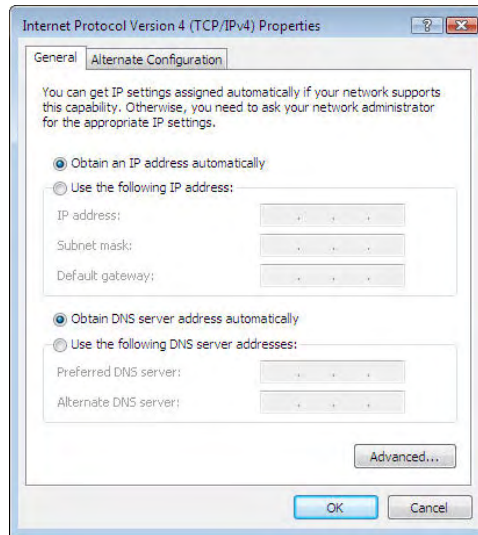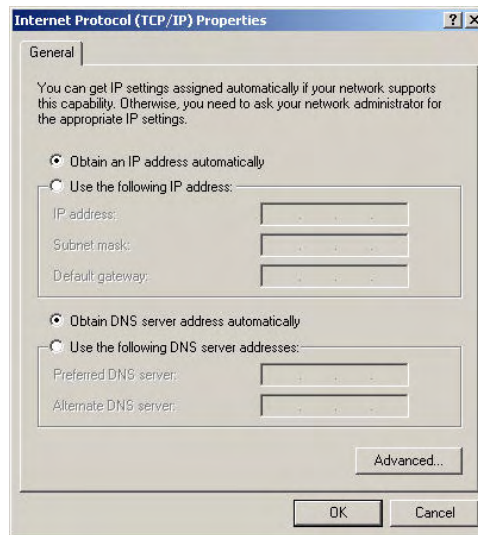

Figure 68: Internet Protocol Properties – Windows Vista

7. Ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected.

8. Click **OK**.

9. Confirm that you have an IP address:

a) Click **Start → Run**.

b) Type cmd and click **OK**.

c) Type ipconfig/renew and press **Enter**.

d) Make sure an IP address is shown on the line that starts with IP Address.

Configuring Windows XP to use DHCP

This section explains how to configure your computer to use DHCP if your computer operating system is Microsoft Windows XP.

1. From the Windows desktop, select **Start → Settings → Control Panel**.

2. Double-click the Network and Dialup Connections icon.

> **Note:** If Control Panel is in category view, select **Network and Internet Connections**; then select **Network Connections**.

A list of network adapters appears as shown in *Figure 69: Network connections – Windows XP* on page 112. A Local Area Connection icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.

Figure 69: Network connections – Windows XP

> **Note:** If a red X appears next to the Local Area Connection icon, check your connections. You cannot successfully configure your system if the red X is present.

3. Right-click the Local Area Connection icon that represents the network adapter connecting the computer to the Satellite Gateway, and select **Properties**.
The Local Area Connection Properties dialog appears as shown in *Figure 70: Local Area Connection Properties – Windows XP* on page 112.
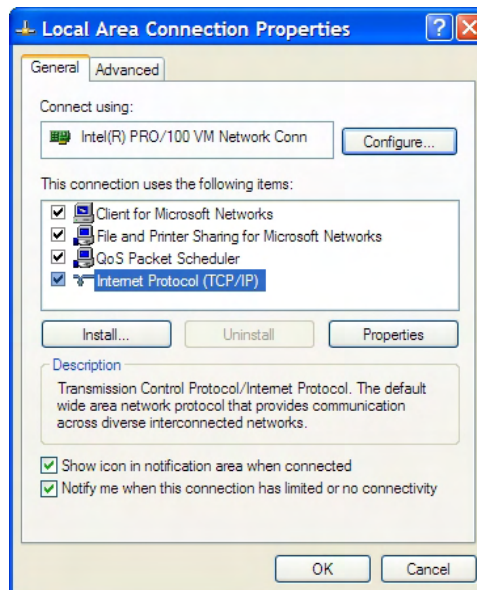
Figure 70: Local Area Connection Properties – Windows XP

4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown.

5. If NetBEUI is installed and checked, uncheck it or uninstall it.

6. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.

7. Click **Properties**.

   The Internet Protocol Properties dialog appears as shown in *Figure 71: Internet Protocol Properties – Windows XP* on page 113.
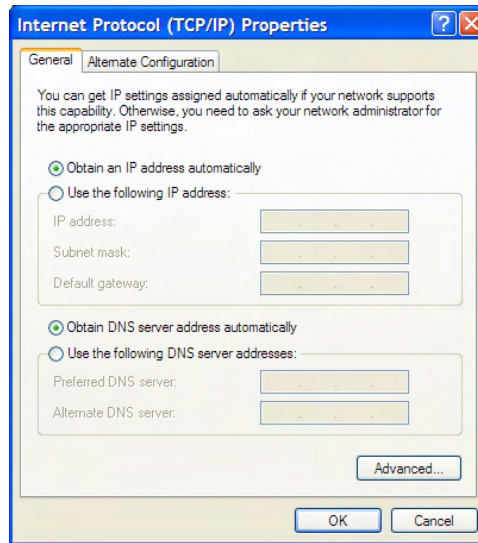
Figure 71: Internet Protocol Properties – Windows XP

8. On the General tab, ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected. If not, select them.

9. Click **OK**.

10. Confirm that you have an IP address:
    a) Click **Start → Run**.
    b) Type cmd and click **OK**.
    c) Type ipconfig/renew and press **Enter**.
    d) Make sure an IP address is shown on the line that starts with IP Address.

Configuring Windows 2000 to use DHCP

This section explains how to configure your computer to use DHCP if your computer operating system is Microsoft Windows 2000.

1. From the Windows desktop, select **Start → Settings → Control Panel**.

2. Double-click the Network and Dialup Connections icon in the Control Panel window.

   A list of network connections appears. A Local Area Connection icon *must* appear on this page. If it does not, the network is not installed correctly.

3. Right-click the Local Area Connection icon that represents the satellite modem network connection, and select **Properties** as shown in *Figure 72: Accessing Local Area Connection Properties – Windows 2000* on page 122.

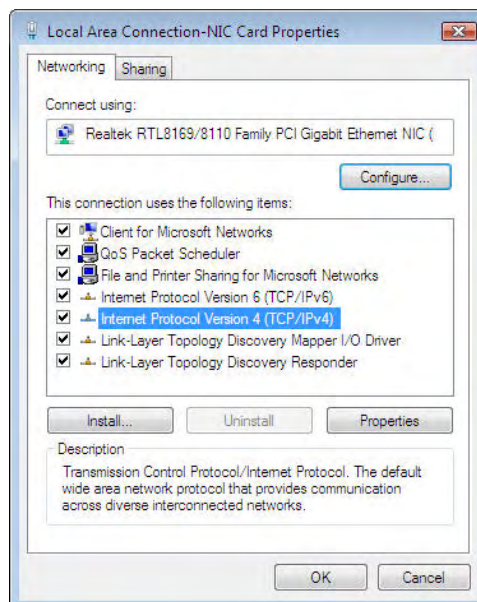Figure 72: Accessing Local Area Connection Properties – Windows 2000

4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in *Figure 73: Local Area Connection Properties Dialog – Windows 2000* on page 122.
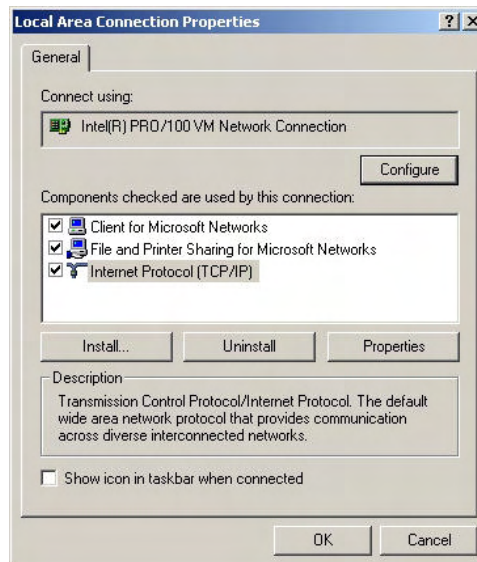
Figure 73: Local Area Connection Properties Dialog – Windows 2000

5. If NetBEUI is installed and checked, uncheck it or uninstall it.

6. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.

7. Click **Properties**.
The Internet Protocol Properties dialog appears as shown in *Figure 74: Internet Protocol Properties – Windows 2000* on page 123.

Figure 74: Internet Protocol Properties – Windows 2000

8. On the General tab, ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected. If not, select them.

9. Click **OK** to close the dialog box.

10. Click **OK** again to save the settings and close the Local Area Connection Properties dialog.

11. Confirm that you have an IP address:
   a) Click **Start → Run**.
   b) Type cmd and click **OK**.
   c) Type ipconfig/renew and press **Enter**.
   d) Make sure an IP address is shown on the line that starts with IP Address.

Configuring a Mac computer to use DHCP

This section explains how to configure your computer to use DHCP if you are using an Apple Mac computer.

1. From the Mac interface, select **System Preferences**.
The System Preferences menu appears as shown in *Figure 75: Mac System Preferences menu* on page 116.

Figure 75: Mac System Preferences menu

2. Under Internet & Network, click the Network icon (shown circled in the figure).
The Network screen appears as shown in *Figure 72: Accessing Local Area Connection Properties – Windows 2000* on page 122.
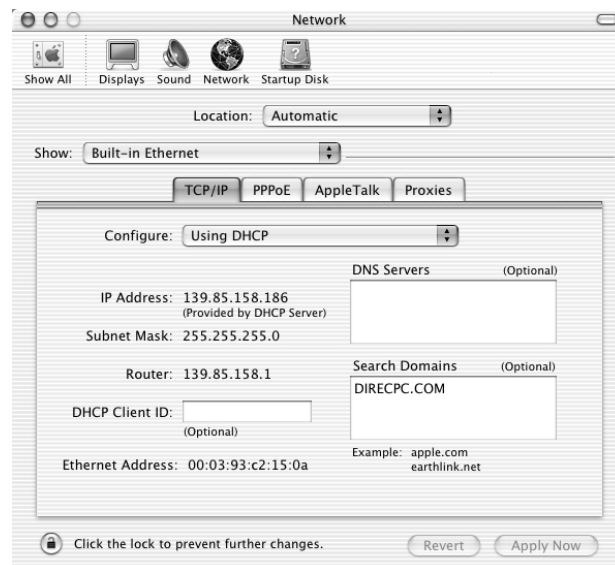
Figure 76: Mac Network screen

3. Ensure that the TCP/IP tab is selected.

4. Select Using DHCP from the Configure drop-down list as shown in *Figure 77: Select DHCP from the configure drop-down menu* on page 117.
The IP Address field becomes disabled.

Figure 77: Select DHCP from the configure drop-down menu

5. Click **Apply Now** to close the screen.

Configuring a computer for a public IP address

If it is desired or necessary for a computer to have a fixed or permanent public IP address, the computer should be configured for a *public IP address*. For more information about IP addresses, see *Understanding the modem address and computer address* on page 107.

To configure the computer to use a public IP address, you manually enter the following information:

- IP address. You need a valid IP address for the computer. If the computer is part of a LAN, each computer on the LAN must have its own unique address.
- Subnet Mask. This is the subnet mask assigned to your satellite modem. You should have recorded this information in your **Quick Start Guide** during the registration process. You can also obtain it from the System Information page of the System Control Center.
- Default Gateway. This is the IP address of the satellite modem. You should have recorded this information in your **Quick Start Guide** during the registration process. You can also obtain it from the System Information page of the System Control Center.

Configuring Windows Vista – Public IP address

Perform the following procedures to configure a computer running on Windows Vista for a public IP address.

1. Connect the installer laptop to the satellite modem using an Ethernet cable.

2. From the Windows desktop on the installer laptop, select **Start → Settings → Network Connections**.

A list of network adapters appears as shown in *Figure 78: Network connections – Windows Vista* on page 118. A Local Area Connection-NIC Card icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.

Figure 78: Network connections – Windows Vista

> **Note:** If a red X appears next to the Local Area Connection icon, check your
> connections. You cannot successfully configure your system if the red X is present.

3. Right-click the icon that represents the satellite modem network connection, and select
Properties.

The Local Area Connection-NIC Card Properties dialog appears as shown in *Figure 79:
Local Area Connection Properties – Windows Vista* on page 118.

> **Note:** Depending on your security settings, a pop-up User Account Control message
> may appear, requesting that you confirm the action before proceeding. If you see this
> message, click **Continue** to proceed.

Figure 79: Local Area Connection Properties – Windows Vista

4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed
and checked as shown.

5. If NetBEUI is installed and checked, uncheck it or uninstall it.

6. Highlight the appropriate TCP/IP connection. Be careful not to uncheck the checkbox.

7. Click **Properties**.

    The Internet Protocol Properties dialog appears as shown in *Figure 80: Internet Protocol Properties – Windows Vista* on page 119.
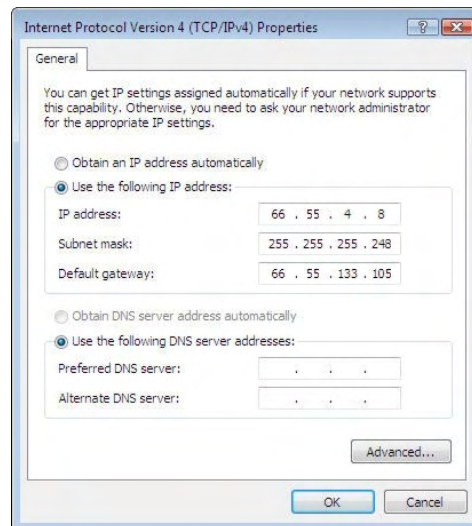
Figure 80: Internet Protocol Properties – Windows Vista

8. On the General tab, select Use the following IP address.

9. Type the desired address in the IP address field.
    If you do not know what public IP address or range of addresses is available to you, see *Understanding the modem address and computer address* on page 107.

10. Type the desired subnet mask in the Subnet mask field.

    Note: If you are configuring a computer for use with a newly installed satellite modem, you do not need to enter information in the Default gateway, Preferred DNS server, or Alternate DNS server fields.

11. Click **OK**.

Configuring Windows XP – Public IP address

Perform the following procedures to configure a computer running on Windows XP for a public IP address.

1. Connect the installer laptop to the satellite modem using an Ethernet cable.

2. From the Windows desktop, select **Start → Settings → Control Panel**.

3. Double-click the Network Connections icon in the Control Panel window.

    A list of network adapters appears. A Local Area Connection icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.

4. Right-click the Local Area Connection icon that represents the satellite modem network connection, and select **Properties** as shown in *Figure 81: Accessing Local Area Connection Properties – Windows XP* on page 120.
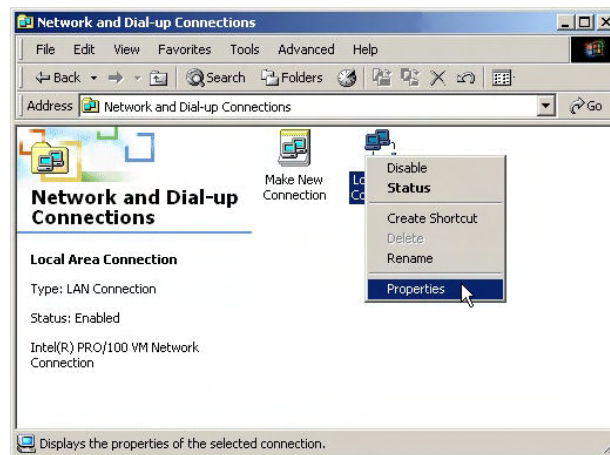
Figure 81: Accessing Local Area Connection Properties – Windows XP

> **Note:** If a red X appears next to the Local Area Connection icon, check your connections. You cannot successfully configure your system if the red X is present.

5. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in *Figure 82: Local Area Connection Properties Dialog – Windows XP* on page 120.
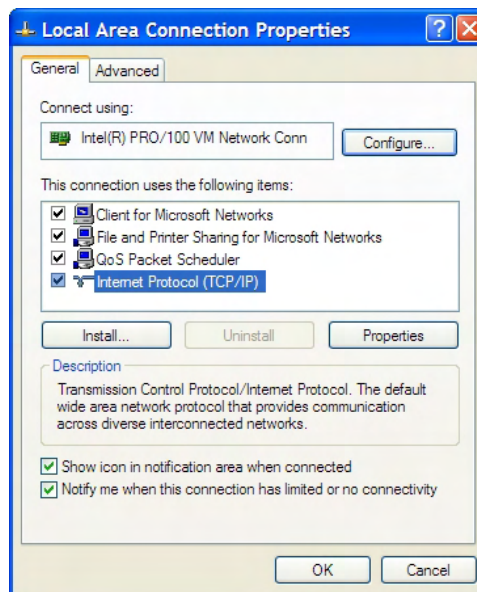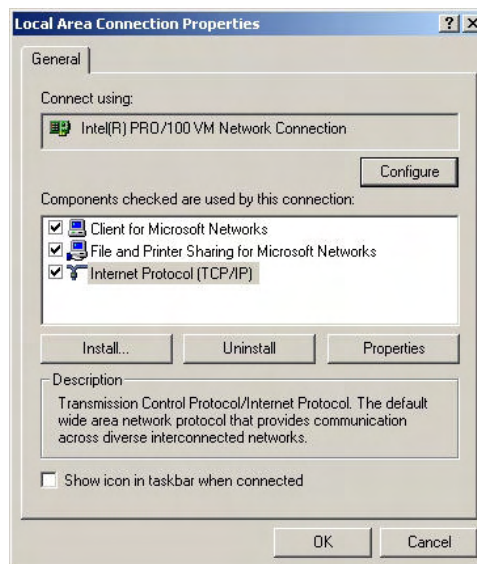

Figure 82: Local Area Connection Properties Dialog – Windows XP

6. If NetBEUI is installed and checked, uncheck it or uninstall it.

7. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.

8. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in *Figure 83: Internet Protocol Properties – Windows XP* on page 121.
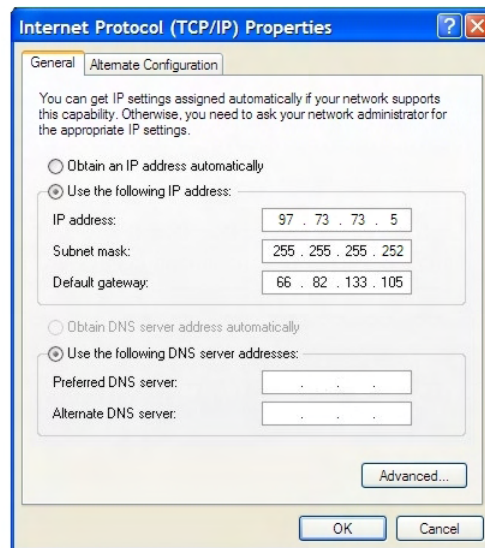
Figure 83: Internet Protocol Properties – Windows XP

9. On the General tab, select Use the following IP address.

10. Type the desired address in the IP address field.
If you do not know what public IP address or range of addresses is available to you, see *Understanding the modem address and computer address* on page 107.

11. Type the desired subnet mask in the Subnet mask field.

> **Note:** If you are configuring a computer for use with a newly installed satellite modem, you do not need to enter information in the Default gateway, Preferred DNS server, or Alternate DNS server fields.

12. Click **OK**.

Configuring Windows 2000 – Public IP address

Perform the following procedures to configure a computer running on Windows 2000 for a public IP address.

1. Connect the installer laptop to the satellite modem using an Ethernet cable.

2. From the Windows desktop, select **Start → Settings → Control Panel**.

3. Double-click the Network and Dialup Connections icon in the Control Panel window.
A list of network adapters appears. A Local Area Connection icon *must* appear on the page. If it does not, the network is not installed correctly.

4. Right-click the Local Area Connection icon that represents the satellite modem network connection, and select **Properties** as shown in *Figure 72: Accessing Local Area Connection Properties – Windows 2000* on page 122.

Figure 84: Accessing Local Area Connection Properties – Windows 2000

5. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in *Figure 73: Local Area Connection Properties Dialog – Windows 2000* on page 122.

Figure 85: Local Area Connection Properties Dialog – Windows 2000

6. If NetBEUI is installed and checked, uncheck it or uninstall it.

7. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.

8. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in *Figure 74: Internet Protocol Properties – Windows 2000* on page 123.
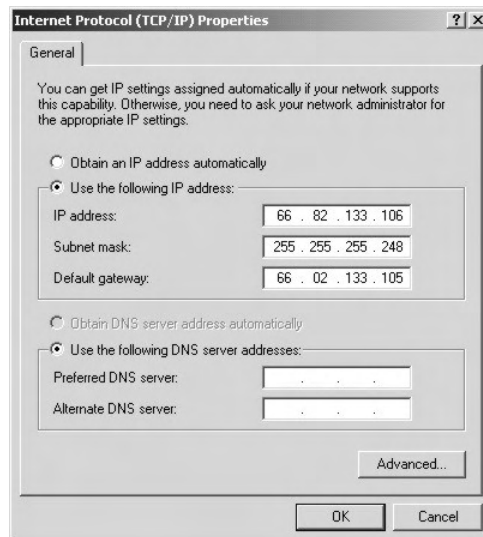
Figure 86: Internet Protocol Properties – Windows 2000

9. On the General tab, select Use the following IP address.

10. Type the desired address in the IP address field.
If you do not know what public IP address or range of addresses is available to you, see *Understanding the modem address and computer address* on page 107.

11. Type the desired subnet mask in the Subnet mask field.

> **Note:** If you are configuring a computer for use with a newly installed satellite modem, you do not need to enter information in the Default gateway, Preferred DNS server, or Alternate DNS server fields.

12. Click **OK** to close the dialog box.

13. Click **OK** again to save the settings and close the Local Area Connection Properties dialog.

Configuring a Mac computer – Public IP address

Perform the following procedures to configure a Mac system for a public IP address.

1. From the Mac interface, select **System Preferences**.
The System Preferences menu appears as shown in *Figure 87: Mac System Preferences menu* on page 124.

Figure 87: Mac System Preferences menu

2. Under Internet & Network, click the Network icon (shown circled in the figure).
The Network screen appears as shown in *Figure 88: Mac Network screen* on page 124.

Figure 88: Mac Network screen

3. Ensure that the TCP/IP tab is selected.

4. Select Manually from the Configure drop-down list as shown in *Figure 89: Select Manually from the configure drop-down menu* on page 125.

Figure 89: Select Manually from the configure drop-down menu

5. Select the desired IP address. There may be only one address available or a range of available addresses, depending on the customer's service plan.
For additional information, see *Understanding the modem address and computer address* on page 107.

6. Click **Apply Now** to close the screen and complete the configuration.

Configuring proxy settings

If your web browser cannot connect to the Internet, check the browser's proxy settings. If the browser is configured for the computer to use a proxy server to connect to the Internet, try changing the setting to *not* use a proxy server.

Configuring Internet Explorer to not use a proxy server

Follow these steps to configure Internet Explorer to not use a proxy server.

1. Turn the computer on and open Internet Explorer.

2. Select **Tools → Internet Options** .

3. Select the Connections tab and click LAN settings.
The LAN settings dialog appears.
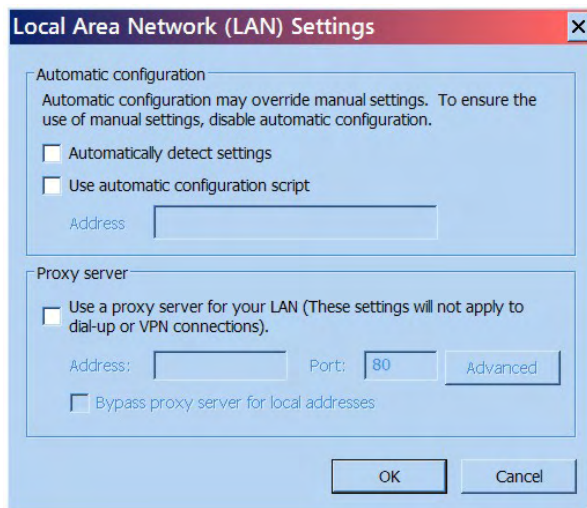
Figure 90: LAN settings – Internet Explorer

    4. Uncheck the check box next to Use a proxy server for your LAN.

    5. Click **OK**.

    6. Close Internet Explorer and re-launch it to enable the changes.

Configuring Netscape to not use a proxy server

Follow these steps to configure Netscape Navigator to not use a proxy server.

    1. Turn the computer on and open Netscape.

    2. Select **Edit → Preferences** .
        The Preferences window appears.

    3. In the Category pane on the left side of the window, select **Advanced → Proxies** .
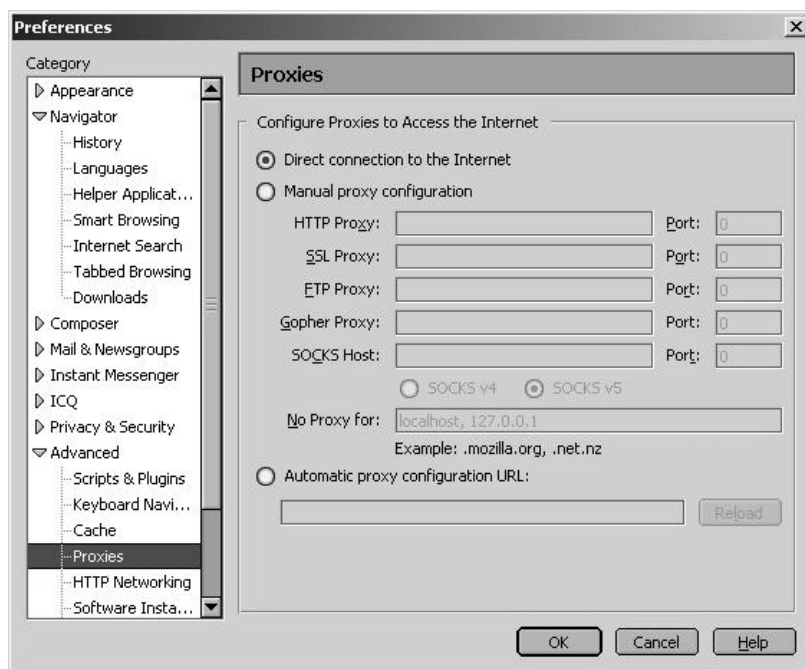
Figure 91: Proxy settings in Netscape Preferences window

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4. In the Proxies pane on the right side of the window, select Direct connection to the Internet.
5. Click **OK**.
6. Close Netscape and re-launch it to enable the changes.

Appendix

B

Conformance with standards and directives

The HN9000 satellite modem has been certified to conform to the standards shown in *Table 19: HN9000 standards compliance* on page 129. Additional information follows the table.

Table 19: HN9000 standards compliance

Category	Standard
Electromagnetic Interference (EMI) standards	FCC Part 15 for the United States
	ICES-003 for Canada
Safety standards	UL60950-1 for the United States
	CAN/CSA-C22.2 No. 60950-1 for Canada

Electromagnetic interference (EMI)

This product conforms to EMI standards of the U.S. FCC and Canadian CSA. To ensure compliance with these standards, installers and users must follow the installation, maintenance, and configuration procedures in the installation guide and user guide.

NOTICE

This is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC Part 15

This section applies to the HN9000 satellite modem.

Standards to which Conformity is declared: FCC Part 15

The modem 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.

Responsible party's name: Hughes Network System, LLC

Address: 11717 Exploration Lane, Germantown, MD 20876

Telephone: 1 (866) 347-3292

Trade name: HUGHES

Type of equipment: Two-way Hughes system

Model numbers: HN9000 (1500826-xxxx)

The two-way Hughes system (HN9000) complies with the Canadian ICES-003, Class B standard.

Canada Class B warning

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme á la norme NMB-003 du Canada.

Operational and safety requirements for Canada

In addition to the warnings and safety guidelines listed in this document, the following operating conditions apply to the modem when used in Canada:

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee that the equipment will operate to the user's satisfaction.

Before installing the equipment, users should make sure they are permitted connect to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs in Canada

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Users should not attempt to make electrical ground connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

Appendix
C

Acronyms used in this guide

AC	Alternating current
AP	Antenna pointing
AWG	American Wire Gauge
BOD	Bandwidth on demand
CAN	Canada
CONUS	Continental United States
CSA	Canadian Standards Association
DAPT	DiSeqC antenna pointing tool
DC	Direct current
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
ECL	Emission Control Logic
EU	European Union
EMI	Electromagnetic Interference
ESN	Electronic serial number
EU	European Union
FAP	Fair access policy
FCC	Federal Communications Commission
FSB	Field service bulletin
FSO	Field service order
GPS	Global Positioning System
HTTP	HyperText Transfer Protocol
HVUL	High volume uplink
ICES	Interference-Causing Equipment Standard
ICMP	Internet Control Message Protocol
ID	Identifier
IDU	Indoor unit (satellite modem)
IFL	Inter-facility link
IGMP	Internet Group Management Protocol

IP	Internet Protocol
IRDP	Internet Router Discovery Protocol
ISP	Internet service provider
ISRP	A Hughes proprietary routing protocol
LAN	Local area network
LHCP	Left-hand circular polarization
LLC	Limited Liability Company
LNB	Low-noise block
MIP	Management information packet
NAT	Network address translation
NetBEUI	Extended User Interface (network transfer protocol)
NIC	Network interface card
NOC	(Hughes) Network Operations Center
NOCC	(Hughes) Network Operations Control Center
NSP	Network service provider
ODU	Outdoor unit (antenna and radio assembly)
OVT	Onsite validation tool
PBP	PEP Backbone Protocol (PEP – Performance Enhancing Proxy)
PC	Personal computer
PIN	Personal identification number
POS	Point-of-sale device
PTP	Point-to-point
QoS	Quality of service
RHCP	Right-hand circular polarization
SAM	Security access module
SAN	Site account number
SAT IN	Satellite in
SAT OUT	Satellite out
SNR	Signal-to-noise ratio
SQF	Signal quality factor
SSL	Secure Sockets Layer (security protocol)
ST	Satellite terminal (an alternate name for *satellite modem*; used on some software screens)
TCP	Transmission Control Protocol
TIP	Transmission information packet
UL	Uplink
	Underwriters Laboratory
VAC	Voltage, alternating current

VAR	Value added reseller
VSAT	Very small aperture terminal

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