HughesNet®

HN9200 Satellite Modem Installation Guide

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Understanding safety alert messages

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

Messages concerning personal injury

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

⚠ DANGER   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 also uses these symbols:

Indicates a safety alert message that concerns a potential electric shock hazard.

Indicates a safety alert message that concerns a potentially hazardous situation in which you could be exposed to radio frequency (RF) energy.

Chapter

1

Satellite modem overview

Topics:

The HN9200 satellite modem connects to a satellite network to provide Internet or intranet service or both to a host—typically a computer—or to multiple hosts on a wired (Ethernet) or wireless LAN. The modem has an Ethernet port so it can be connected to a computer or LAN.

The HN9200 can be used in either a Ka-band or Ku-band bent-pipe satellite network. This installation guide includes instructions for both Ka-band and Ku-band installations.

Figure 1: HN9200 satellite modem

Terminology

In this installation guide:

- *Satellite modem* and *modem* both refer to the HN9200 satellite modem.
- *Installer Support* refers to organizations that provide assistance to professional installers of Hughes satellite equipment. If you do not know who provides your support, contact your program manager.
- Acronyms are identified in *Acronyms used in this guide* on page 115.

Scope of this installation guide

This installation guide explains how to install, commission, activate, and troubleshoot the HN9200 satellite modem. It also contains certain reference information concerning operation of the satellite modem, such as troubleshooting information.

Audience

This guide is intended to be used by professional installers. It may also be useful for:

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

Satellite modem specifications

Table 1: Specifications for the HN9200 satellite modem

Weight	1.6 lb (0.73 kg)
Height	8.0 inches (20.3 cm)
Width	1.6 inches (4.1 cm); 2.4 inches (6.1 cm) at base
Depth	9.0 inches (22.9 cm)
Operating temperature range	41 ºF to 104 ºF (5 ºC to 40 ºC) Above 5,000 ft (1,524 m) altitude, the maximum temperature is reduced by 1 ºC per 1,000 ft (305 m).
Operating humidity range	5% to 90% non-condensing
Altitude	Up to 15,000 ft (4,572 m)
Cooling method	Convection
Protocol support	TCP/IP (Transmission Control Protocol / Internet Protocol) protocol suite
Supported frequency ranges	Ka-band or Ku-band
Network interface ports	RJ-45 Ethernet LAN port supporting 10BaseT or 100BaseT operation
Power supplies and power requirements	See *Power supply information* on page 7.

Chapter

2

Preparing for installation

Topics:

- *Installation summary*
- *Installation checklist*
- *Items required for installation*
- *Conducting a site survey*
- *Power supply information*
- *Computer and networking requirements*
- *Related components*

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 4.

To install the satellite modem, you need the *Installation Reference Sheet*, which contains installation parameters and other installation information specific to your installation site. Print the Installation Reference Sheet for your installation site from your installation support web site.

Installation summary

This guide explains how to install the HN9200 satellite modem. It includes *limited* information about other satellite terminal components. The *satellite modem* is the small indoor unit. The *satellite terminal* includes the satellite modem and the antenna, radio assembly, and IFL cables, as shown in *Figure 2: Satellite modem and related terminal components* on page 4.
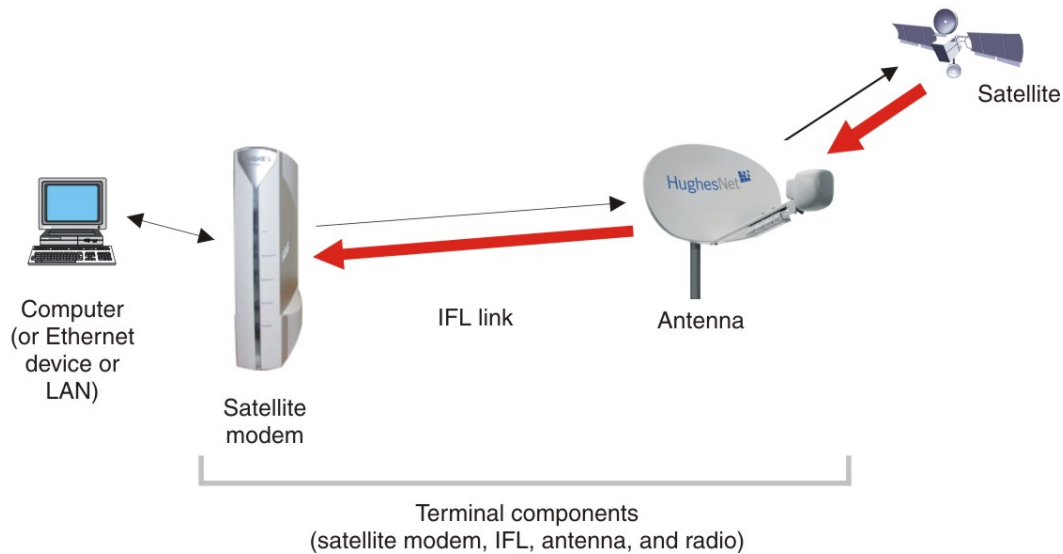
Figure 2: Satellite modem and related terminal components

This summary focuses on installation of the satellite modem, but also includes some information on related tasks such as antenna installation and pointing. The tasks listed below are the main installation tasks, *but these are not all* of the installation tasks.

Complete all steps in the order they are presented in this installation guide unless you have a specific reason for doing them in a different order. In any case, make sure all steps are completed. You must install the antenna before the satellite modem can be commissioned. Then you point the antenna as part of the modem commissioning procedure.

Details for the satellite modem installation tasks are included in later chapters in this guide.

Preparing for the installation

- Make sure you have all items required for installation, including the Installation Reference Sheet, all equipment to be installed, and required tools for the outdoor equipment.
- Make sure the customer's computer meets the requirements listed in *Computer and networking requirements* on page 8.
- Conduct a site survey.
- Assemble and install the antenna and radio as instructed in the antenna installation guide.

Installing the satellite modem

- Connect the transmit and receive cables.
- Connect the modem to the installer laptop.
- Connect the power supply.
- Power up the modem and observe the LEDs to verify normal operation.

Commissioning the modem and pointing the antenna

- Upload the sbc.cfg file (if you are instructed to upload it).

- Enter the antenna location and satellite and radio parameters.
- Point the antenna.
- Register the satellite modem.

Completing the installation

- Confirm that all files are current.
- Connect the modem to the customer's computer.

Installation checklist

To help ensure a successful installation, **pay careful attention to the items listed in the checklist below as you install the satellite modem, antenna, and IFL cables**.

IFL cables

For specific cable information see *Table 3: Related installation documents* on page 11.

☐ Use only Hughes-approved cables.

☐ Do not exceed maximum length for the ODU type (1 W or 2 W), cable type, and cable part number.

☐ Do not exceed the cable bend radius.

☐ Properly terminate cables.

Connectors and connections

☐ Use only connector types approved for cable type used. Check all connections for tightness.

Outdoors:

☐ Make sure F connectors connected to the radio assembly are tightened to 20 inch-lb torque.

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

Power source

Check AC power outlet for correct wiring

☐ Before connecting the modem power supply to the AC power source (using a surge protector), use an AC outlet tester to verify that the 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 you are not permitted to connect the system to a faulty outlet. Do not proceed with installation until a properly wired outlet is provided.

Check neutral-ground (N-G) voltage

☐ With a digital multimeter set to AC voltage, measure the voltage between neutral and ground at the AC power outlet. If the N-G voltage measures 2 VAC or greater, please advise the customer

to have an electrician evaluate the electrical power outlet. N-G voltages may have a negative impact on the performance of electronic equipment.

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 3: Related installation documents* on page 11.

Items required for installation

To install the HN9200 satellite modem, you need:

- HN9200 satellite modem
- Power supply (provided in the shipping carton)
- Surge protector (recommended), provided by the customer
- Cat-5 Ethernet cable
- sbc.cfg file (if you are instructed to upload it)
- Installation Reference Sheet (provided to the installer)
- *Welcome to HughesNet* quick start guide (1038043-0001) (to give to the customer)

Notes

sbc.cfg file – If needed, you can download the most current sbc.cfg file from your installation support web site.

SAN and PIN – Identification numbers are required to register the satellite modem. Customers who purchased their system from a Hughes retail channel in the United States or Canada receive an order confirmation e-mail containing their site account number (SAN) and personal identification number (PIN).

DC/DC power supply – If the site has a DC power source, it requires a DC/DC power supply. See *Table 2: Power supply specifications for the HN9200 satellite modem* on page 8. The installer must provide the wire required to assemble the DC input power cable.

Additional equipment

- Antenna
- Hughes antenna pointing tool (DAPT for Ka-band, DAPT or OPI for Ku-band)
- IFL cables, cable connectors, and ground blocks

For more information on these items, see *Related components* on page 9.

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)
- The installation guide for the antenna model you are installing

Conducting a site survey

Survey the customer site to confirm that the location meets the requirements for installation of the satellite modem. For complete site survey information, including site requirements, see the ***Antenna Site Preparation and Mount Installation Guide*** (1035678-0001).

The key site survey tasks related to installation of the satellite modem are:

1. Make sure there is an unobstructed line of sight to the satellite specified on the Installation Reference Sheet.
2. Review the Installation Reference Sheet for site-specific instructions.

Power supply information

See also

The power supply is included in the satellite modem shipping carton.
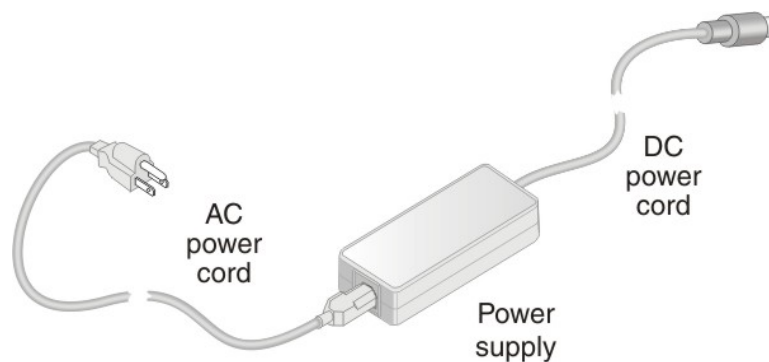
Figure 3: AC power supply for the HN9200 satellite modem

Before proceeding, make sure you have the correct power supply. Check the part number on the power supply and refer to *Figure 3: AC power supply for the HN9200 satellite modem* on page 7.

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 AC/DC power supply to a three-wire, grounded outlet with an input of 110/240 VAC. A suitable surge protector is recommended to protect the satellite modem from possible damage due to power surges.
*   Always connect the DC power cord to the HN9200 rear panel before applying power to the power supply. If you apply power to the power supply and then connect the DC power cord, the satellite modem may not perform properly and could be damaged.
*   Observe the power standards and requirements of the country where it is installed.

⚠ **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.

Table 2: Power supply specifications for the HN9200 satellite modem

Power supply type	Part number	Electrical requirements
AC/DC (64 W)	1500089-0001	Input line voltage: 90 to 264 VAC, 2 A maximum Input line frequency: 50 to 60 Hz AC Rated power consumption: 64 W
AC/DC (80 W)	1500185-0001	Input line voltage: 90 to 264 VAC, 2 A maximum Input line frequency: 50 to 60 Hz AC Rated power consumption: 80 W
DC/DC (65 W)	1033554-0001	Input line voltage: 12 to 24 VDC, 10 A maximum Rated power consumption: 65 W

All listed power supplies may be used with a 1 W or 2 W Ka-band or Ku-band radio. All have a detachable power cord.

Computer and networking requirements

This section lists the requirements for the computer or other device, network, and browser to be used with the satellite modem.

Computer requirements

The HN9200 satellite modem can be used with any device that supports IP and has a 10/100 BaseT Ethernet LAN port. Typically, the modem is connected to a customer's computer. However, the HN9200 is self-hosted; it does not require a computer for any of its functions.

Requirements for the computer to be used with the satellite modem are the same for the laptop computer you use to install the modem and the customer's computer that will be connected to the modem. In either case, the computer should meet the minimum requirements specified by

the computer operating system manufacturer and the following networking and browser requirements.

Make sure the installer laptop is configured to support DHCP.

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 and Internet browser requirements

- Ethernet port
- Ethernet NIC installed on at least one computer, 10/100 BaseT
- Ethernet cable (provided)
- A web browser such as Internet Explorer with proxy settings disabled

Connecting a network – If the customer wants to connect a network to the satellite modem, this requires an Ethernet hub or other such device. The customer must supply and configure the hub and cables. Required IP address information is obtained during commissioning.

Static IP address – The computer can be configured to use a static IP address if the HughesNet service plan provides for one or more static IP addresses. If the computer is configured to use a *specific* static IP address, disable DHCP.

⚠ CAUTION   Do not connect the power supply to the satellite modem, or connect the power supply to a power source until you are instructed to do so.

Related components

The satellite modem is the indoor component of the satellite terminal. The terminal also includes the (outdoor) antenna and IFL cables. This section presents information on the outdoor components and other related equipment. For additional information, see the applicable documents listed in *Table 3: Related installation documents* on page 11.

Antenna

You must assemble and install the antenna before you install the satellite modem. You *point* the antenna as part of the modem commissioning process.

⚠ CAUTION   Only a trained professional installer should install the outdoor antenna assembly. In the United States, the Federal Communications Commission (FCC) requires professional installation and service of the antenna assembly because it transmits radio frequency (RF) energy.

The HN9200 satellite modem can be used with a 0.74 m, 0 .98 m, 1.2 m, or 1.8 m two-way satellite antenna. The antenna assembly is shipped in a separate box.

The main source of information on the antenna is the antenna installation guide. Each antenna model has its own installation guide. If you do not have the antenna installation guide, find the

required antenna model on the Installation Reference Sheet; then locate the installation guide for that model on your installation support web site.

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

IFL cables

Before you can install the satellite modem, you must route the coaxial 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.

The routing path of the IFL cables between the modem and the antenna depends on the building configuration. Guidelines for installing IFL cables are included in the ***Antenna Site Preparation and Mount Installation Guide*** (1035678-0001).

Requirements for 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 3: Related installation documents* on page 11.

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

> **⚠ 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, property damage, and/or poor modem performance.

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.

Hub or similar network device

If the satellite modem is to be connected to a network, an Ethernet hub, modem, wireless base station, or other similar device is required. The customer must supply and configure the network device, including required cables, according to the device manufacturer's documentation. Required IP address information is obtained during modem commissioning.

Instructions for related components

This installation guide covers only installation of the satellite modem. For installation instructions for other components, see *Table 3: Related installation documents* on page 11. You can view or download these documents at https://dwayinstalls.hns.com/ (click **Installer Login Click Here!!**) or your installation support web site. If you cannot log in, contact Installer Support—or contact your program manager for access to these documents.

Table 3: 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)	For Ku-band installations: Field Service Bulletin (FSB), ***IFL Cable, Approved List (with lengths) for DW7x00, DW60xx, and DW40xx Domestic Installations*** (FSB__060316_01). (IFL cable specifications in this FSB apply to HN9200 Ka-band and Ku-band installations.)
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, antenna pointing Radio assembly	See the antenna installation guide for the specific antenna model you are installing. For Ka-band antennas, see also the ***Ka-Band Antenna Pointing Guide for Bent-Pipe Satellite Networks*** (1038764-0001). Antenna pointing for Ku-band antennas is covered in the antenna installation guide.

Chapter

3

Installing the satellite modem

Topics:

- *Prerequisites for installing the modem*
- *Selecting the modem installation location*
- *Modem operating position*
- *Connecting the transmit and receive cables*
- *Connecting the installer laptop to the modem*
- *Connecting the power supply*
- *Powering up the modem*
- *LEDS on power-up*

Installation of the HN9200 satellite modem consists of physical installation, followed by commissioning and registration. These processes prepare the modem for operation on the satellite network. Installation tasks include:

- Physical installation and power-up
- Entering parameters required for commissioning
- Commissioning, including antenna pointing

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 parameters.

Prerequisites for installing the modem

The following are required before you can install, commission, and register the satellite modem:

- The antenna and radio assembly must be installed, as instructed in the antenna installation guide. (However, you *point* the antenna as part of the modem commissioning process, which is explained later in this installation guide.)
- The IFL cables must be installed and connected to the satellite modem and to the radio assembly (LNB and transmitter).

See also *Items required for installation* on page 6 and *Related components* on page 9.

Selecting the modem installation location

Select a location for the satellite modem that will accommodate all required cable connections, including connection to the power source.

Ventilation and heat sources

Make sure the installation location meets the following requirements concerning ventilation and heat sources.

NOTICE

- Do not block any of the modem's ventilation openings.
- Leave 6 inches of space around the top and sides of the modem to ensure adequate ventilation and prevent overheating.
- Do not place the modem near a heat source such as direct sunlight, a radiator, heat register or vent, oven, stove, amplifier, or other apparatus that produces heat.

Modem operating position

NOTICE Install and operate the HN9200 modem only in the upright vertical position as shown in *Figure 4: HN9200 in vertical position* on page 15. Any other position could result in insufficient ventilation, overheating, and malfunction.

Figure 4: HN9200 in vertical position

Connecting the transmit and receive cables

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 5: Connecting the transmit and receive cables to the modem* on page 15.
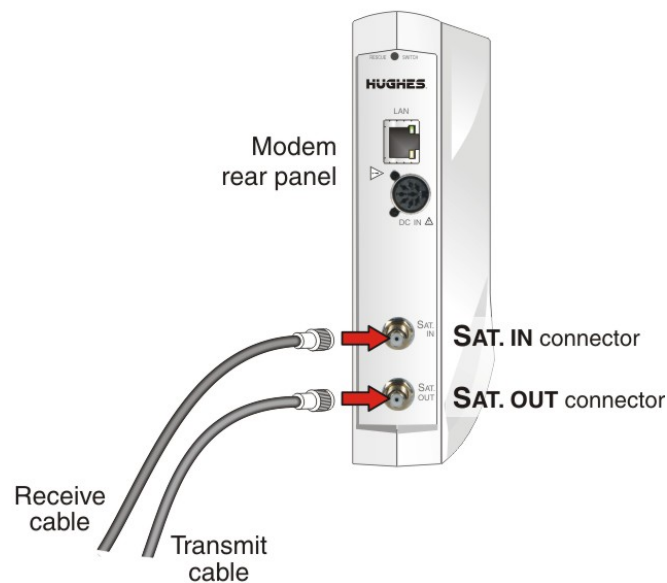
Figure 5: Connecting the transmit and receive cables to the modem

NOTICE   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 router or switch.

> **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.

Connecting the installer laptop to the modem

For this task you need an 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 or other device. 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 an Ethernet cable to connect your laptop computer *directly* to the modem's LAN port, as shown in *Figure 6: Connecting the installer laptop computer to the modem* on page 16.

Do not connect the installer laptop to the modem through an Ethernet router or switch.
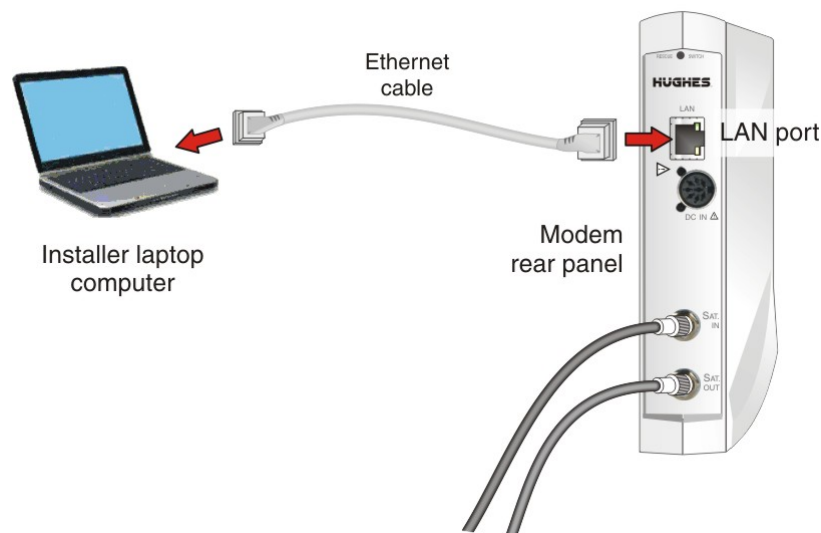
Figure 6: Connecting the installer laptop computer to the modem

2. Make sure that neither the satellite modem nor the customer's computer are connected to an Ethernet router or switch.

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.

Connecting the power supply

Follow the instructions in *Connecting an AC/DC power supply* on page 17 or *Connecting and assembling a DC/DC power supply* on page 18.

Connecting an AC/DC power supply

NOTICE   The following apply to the AC/DC power supplies:

- The input must be 120-240 VAC.
- A suitable surge protector is recommended to protect the modem from possible damage due to power surges.

The customer provides the surge protector. If a surge protector or power strip is not present, use a wall outlet or other power source.

In some countries, the modem may use a replacement AC power cord. Different countries have different standards and requirements that must be observed.

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.

Connect the power supply as follows:

1. Check *Power supply information* on page 7 to make sure you have the correct power supply.
2. Connect the DC power cord to the DC IN port on the modem, as shown in *Figure 7: Connecting an AC power supply* on page 18.

NOTICE   If you apply power to the power supply and then connect the DC power cord, the satellite modem may not perform properly and could be damaged.

3. Connect the AC power cord to the power supply.

Do not connect the AC power cord to the surge protector at this time. Wait until you are ready to observe the modem's LEDs upon power-up, as explained in *Powering up the modem* on page 19 and *LEDS on power-up* on page 19.
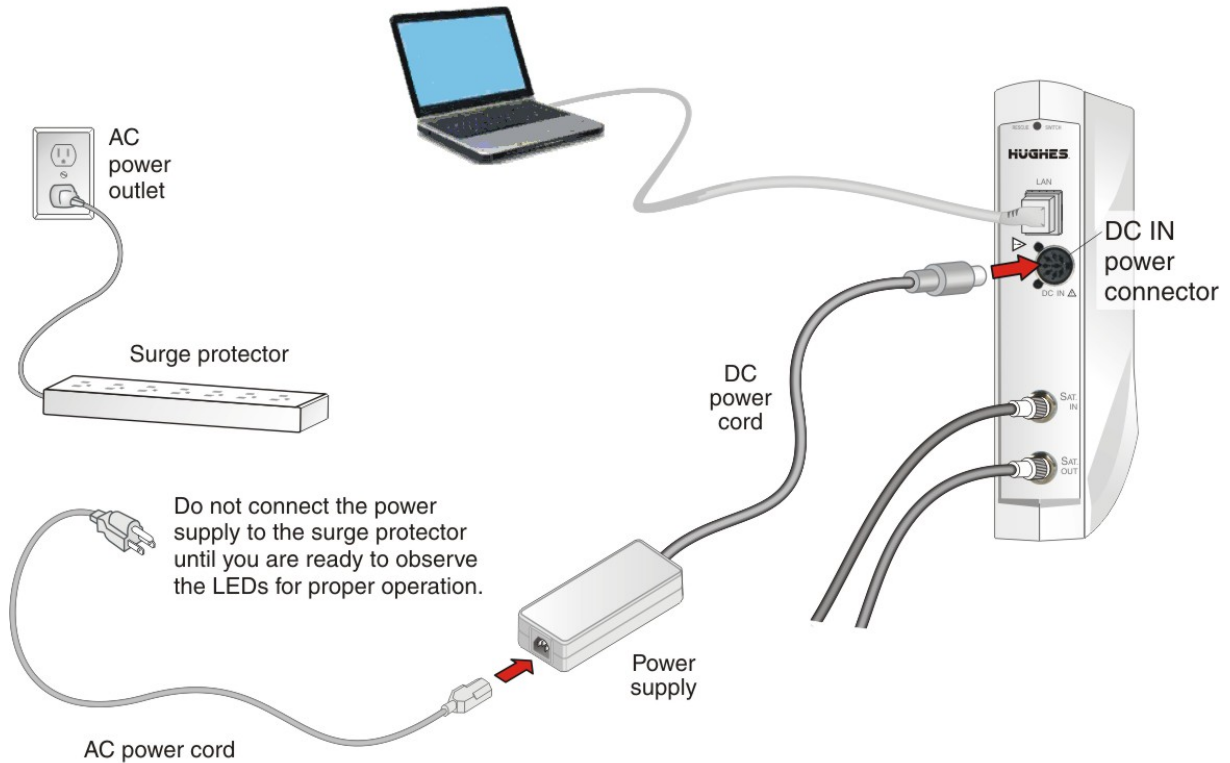
Figure 7: Connecting an AC power supply

Connecting and assembling a DC/DC power supply

Figure 8: DC/DC power supply on page 18 shows the DC/DC power supply used with the HN9200 modem.

(Not shown: Input power cable and connector)

DC cord

1033554-0001
(part of kit 1036088-0001)
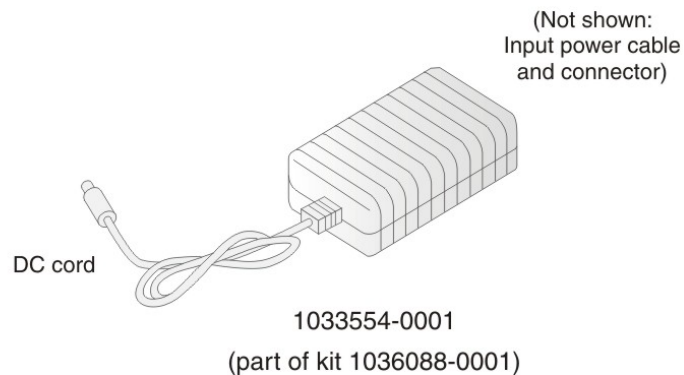
Figure 8: DC/DC power supply

Connect and assemble the DC/DC power supply as follows:

1. Connect the DC power cord to the DC IN port on the modem.

    Note: The input cable kit is included in the power supply kit. The cable kit contains an input power connector, connector pins, and a wiring diagram; it does not include wire.

2. Assemble the input power cable according to the wiring diagram included in the cable kit.

3. Connect the input power cable to the DC power source, but do not connect the input power connector to the power supply at this time.

   Do not connect the input power connector to the power supply until you are ready to observe the modem's LEDs upon power-up, as explained in *LEDS on power-up* on page 19.

Powering up the modem

Check *Power supply information* on page 7 to make sure you have the correct power supply.

Follow these instructions to power up the modem for the first time.

AC/DC power supply

Prerequisites:

- The power outlet has been tested, as described in *Connecting an AC/DC power supply* on page 17.
- According to previous instructions, the DC power cord is connected to the modem's rear panel, and the AC power cord is connected to the power supply.

1. Connect the AC power cord into the surge protector or wall outlet.
2. Observe the LEDs for proper operation. See *LEDS on power-up* on page 19.

DC/DC power supply

Prerequisites: The DC power cord is connected to the modem's rear panel, and the input power cable is assembled and connected to the DC power source.

1. Connect the input cable connector to the power supply.
2. Observe the LEDs for proper operation. See *LEDS on power-up* on page 19.

LEDS on power-up

As the modem powers up, observe the front panel LEDs to make sure the modem is working properly. When power is applied to the modem or after a modem reset, the LEDs light up in the following order, indicating normal power-up:

1. All LEDs light up for ½ sec while the modem performs a self-test.
2. The Power LED lights up and remains on, indicating the modem is powered up.
3. The Power LED and System LED light up for about 5 to 10 sec while the modem loads and prepares applications.
4. If the modem LAN port is connected to a network device, the LAN LED lights up within 30 sec, indicating that LAN connectivity is detected.
5. The Power LED blinks, indicating that the modem is not commissioned.

If the LEDs do not function as described, make sure you have the correct power supply. Refer to *Table 2: Power supply specifications for the HN9200 satellite modem* on page 8.

Chapter

4

Commissioning the satellite modem

Topics:

- *Satellite-based commissioning*
- *Manual commissioning*

Commissioning refers to a series of procedures to make the newly installed satellite modem ready for network operation and register the modem with the service provider's network.

Commissioning methods

Two methods are available for commissioning the HN9200 satellite modem:

Satellite-based commissioning is the preferred commissioning method. Use the manual commissioning method only if satellite-based commissioning is not available *and* if you are instructed to do so by the service provider.

Satellite-based commissioning

Satellite-based commissioning (SBC) is the preferred commissioning method. Using SBC, you use a web-based interface on the satellite modem to:

- Obtain an IP address from the modem
- Verify the Ethernet connection (ping test)
- Upload the sbc.cfg file to the modem
- Enter commissioning parameters
- Point the antenna
- Register the modem

The modem contains an SBC configuration file (sbc.cfg) that contains satellite information for SBC and the auto-commissioning server (ACS) used during commissioning. Occasionally, new satellites are activated to support broadband service. As a result, you may be required to upload an sbc.cfg file to the modem prior to installation or manually enter satellite parameters during modem installation.

If a new sbc.cfg file is available you are instructed to download the sbc.cfg file from an installation support web site. You must save the sbc.cfg file the installer laptop computer prior to commissioning so you can upload it to the modem.

If a new satellite is activated but a new sbc.cfg file is not available, the new satellite parameters are distributed to you in a technical update email or other communication. In this case you must manually enter the new satellite parameters.

Note: If the service provider has provided you with an sbc.cfg file, you must complete the procedures in *Uploading the sbc.cfg file to the satellite modem* on page 24 to upload the file to the modem.

If you need troubleshooting information concerning satellite-based commissioning, see the satellite modem's online Help. Access this information through the System Control Center **Help** link (**Help → Frequently Asked Questions**).

Obtaining an IP address from the satellite modem

1. Make sure the installer laptop is configured to support DHCP.
2. Verify that the installer laptop is connected to the modem with an Ethernet cable.
3. Open a command prompt or window on the installer laptop.
4. Type ipconfig /release.
5. Press **Enter**.
6. Type ipconfig /renew.
7. Press **Enter**.

   Note: To view all IP configuration commands, open a command prompt window, type ipconfig /help, and press **Enter**.

   If the modem does not assign IP address 192.168.0.2 to the installer laptop, restart the installer laptop to obtain the IP address.

Verifying the Ethernet connection

Execute a ping test to verify that the Ethernet connection between the satellite modem and the installer laptop is active:

1. Open a command prompt or window on the installer laptop.
2. Type ping 192.168.0.1.
3. Press **Enter**.

   If the ping is successful, the ping results show that all sent packets were received.

```
C:\Users>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\Users>_
```

Figure 9: Successful ping test

If the ping fails, the ping results show that packets were lost, and time-out messages may also appear.

```
C:\Users>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users>_
```

Figure 10: Failed ping test

4. If the ping test fails, make sure:

   • The laptop's network interface card (NIC) is properly installed
   • The laptop is configured to support DHCP

5. If the NIC is installed properly and the laptop is configured to support DHCP, make sure all cable connections are secure (properly aligned—not cross threaded; finger tight with no play).

6. If the connections are secure:
   a) Unplug the modem from the power source.
   b) Shut down and power off the computer.
   c) Plug the modem back in.
   d) Turn the computer back on.

⚠ **CAUTION** ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

7. Make sure an Ethernet router or switch is not connected to the satellite modem and to the customer's computer.

8. Try the ping test again.

9. If the ping test is unsuccessful, call Installer Support for assistance.

Uploading the sbc.cfg file to the satellite modem

The sbc.cfg file contains satellite information for SBC and the auto-commissioning server (ACS) to be used for the commissioning process. Once you have obtained the sbc.cfg file, save it on the installer laptop computer making sure to note the location where the file is saved.

If you do not need to upload an sbc.cfg file, go to *Entering the antenna location* on page 27.

To upload the sbc.cfg file:

1. Open a browser on the installer laptop.

2. Type http://192.168.0.1/fs/registration/setup.html in the address bar.

3. Press **Enter**.
    The Satellite Setup menu appears.

Figure 11: Satellite Setup menu

4. Click **Config File Upload**.

> **Note:** Do *not* click **Zip Code File Upload**—this button is used to update the ZIP code table in the modem.

> **Note:** The following apply to the screen illustrations in this installation guide:
>
> • Most screen illustrations show only the relevant part of the screen and do not include features such as browser menus, toolbars, and window borders.
> • The screen illustrations are *examples*. Values shown in these illustrations may not apply to the satellite modem you are installing. Do not use values shown to install or configure the modem unless the instructions say to do so.
> • On some screens and in some messages you may see the word *terminal* or the abbreviation *VSAT*. Both refer to the HN9200 satellite modem.
> • *Screen* and *page* are both used to refer to a set of information from your computer or satellite modem that is displayed on your computer monitor.

The Configuration File Upload screen appears.
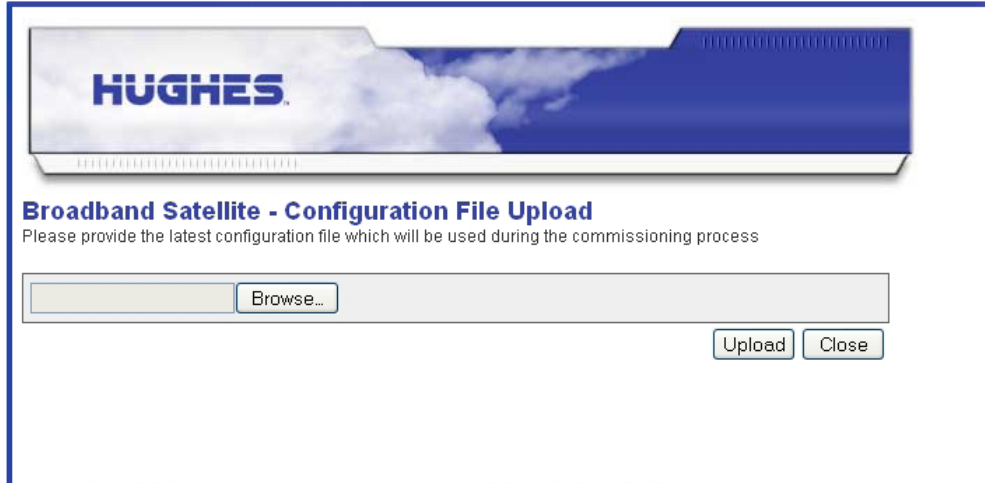
Figure 12: Configuration File Upload screen

5. Click **Browse** on the Configuration File Upload screen.

6. Navigate to the location on the installer laptop where you saved the sbc.cfg file.

7. Select the sbc.cfg file and click **Open**.

8. Click **Upload**, and wait for the upload to complete.

9. Wait to see the message shown in *Figure 13: Confirming the sbc.cfg file upload* on page 26, which indicates that the configuration has been transferred to the modem.
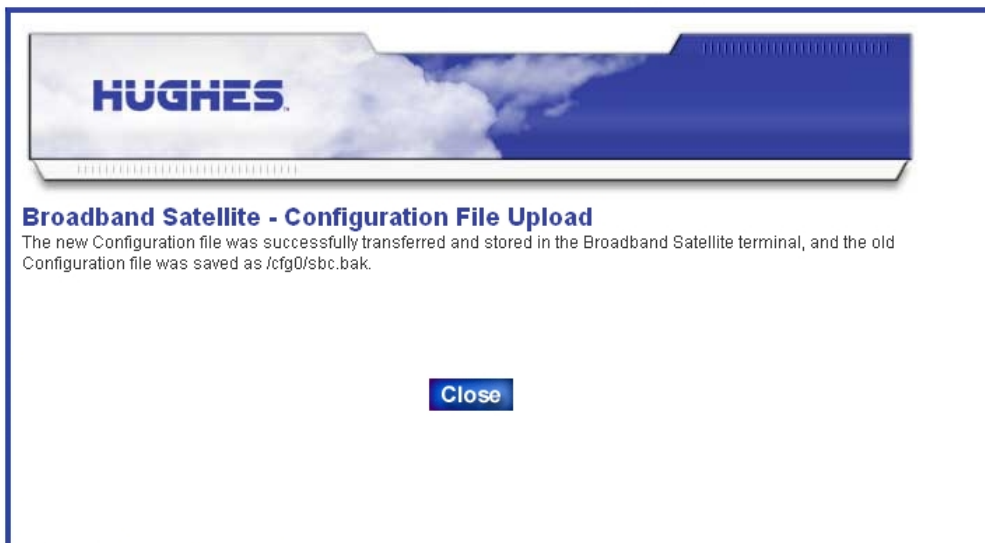
Figure 13: Confirming the sbc.cfg file upload

10. After the upload completes, click **Close** on the Configuration File Upload screen to return to the Satellite Setup menu.

Entering commissioning parameters

To commission the satellite modem you enter parameters for the antenna location, satellite, and radio. In some circumstances you may have to enter the antenna location and/or satellite parameters manually, as explained in the sections that follow.

Entering the antenna location

Begin commissioning by entering the antenna location:

1. Open a browser on the installer laptop.
2. Type http://192.168.0.1/fs/registration/setup.html in the address bar.
3. Press **Enter**.
   The Satellite Setup menu appears.
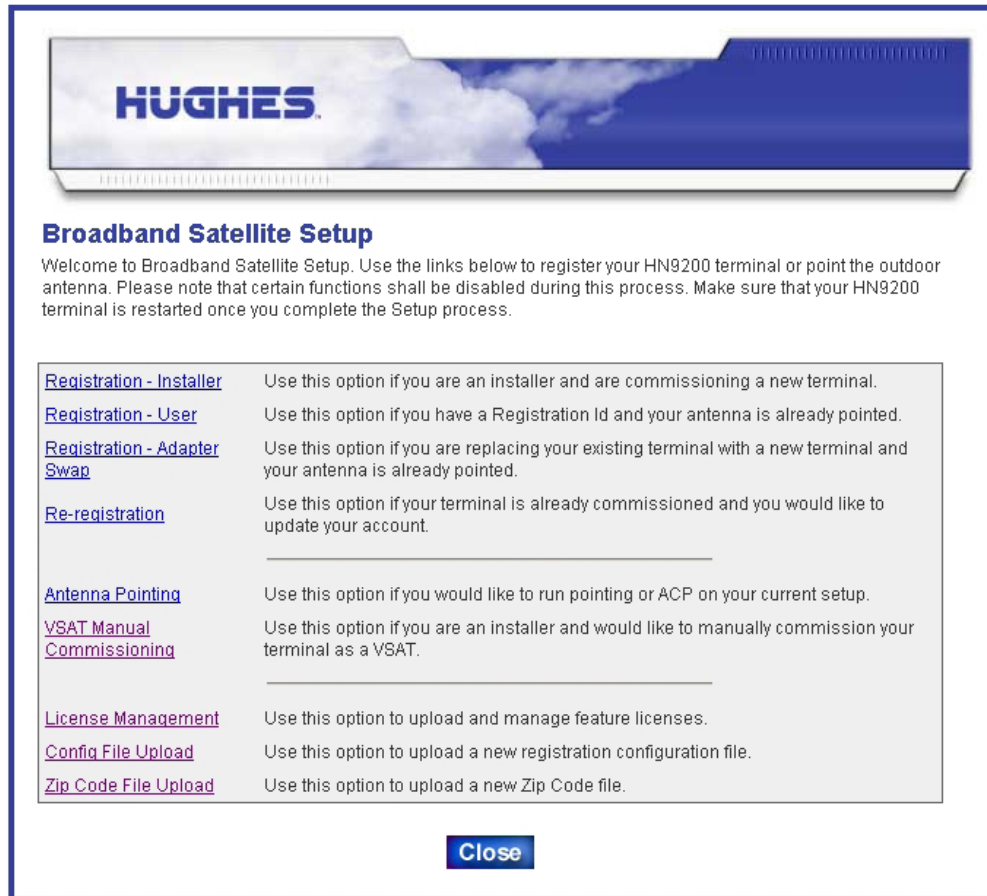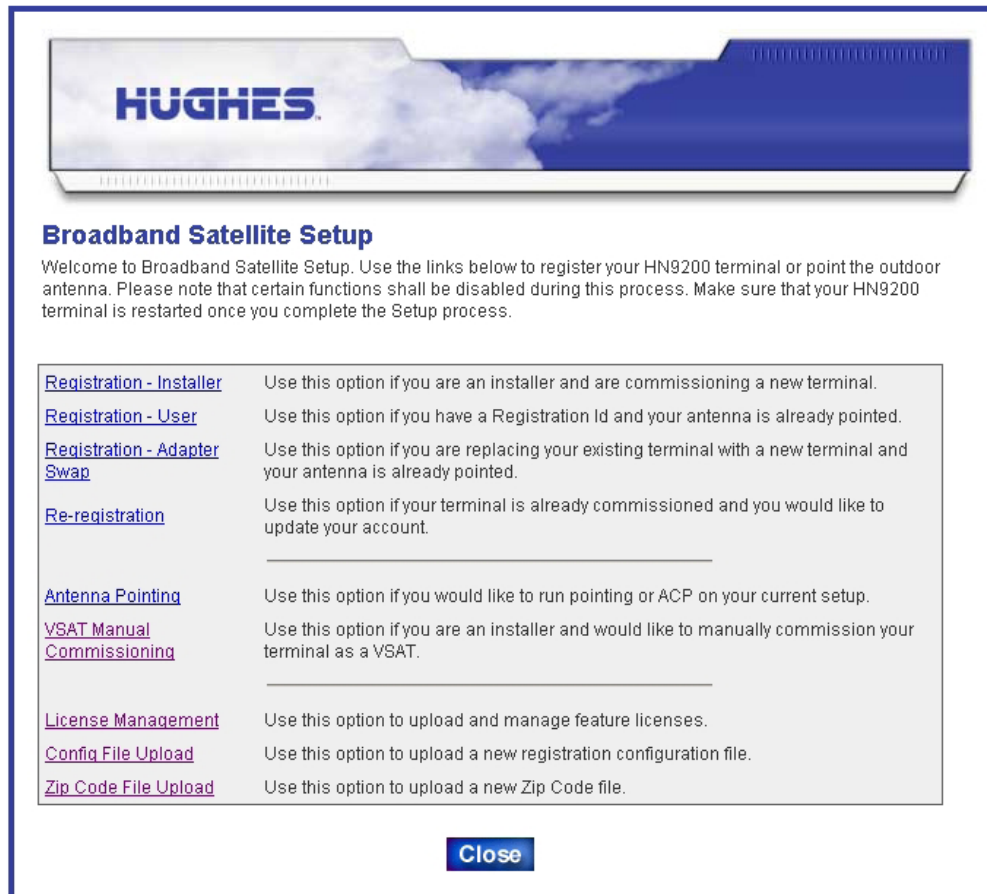

Figure 14: Satellite Setup menu

4. Click **Registration - Installer**.
5. *If you are installing the satellite modem outside of the United States or Canada,* go to *Entering the antenna location (manual entry)* on page 28. Follow the steps there to manually enter the antenna location.

   If you are installing the modem in the United States or Canada, continue to the next step.

6. On the Antenna Location screen, enter the ZIP code of the installation location, and click **Next**.

Figure 15: Antenna Location screen

> After you enter the ZIP code and click **Next**, the Verification of Antenna Location screen appears.

Figure 16: Verification of Antenna Location screen

> **7.** Verify that the displayed information is correct and click **Next**.

Entering the antenna location (manual entry)
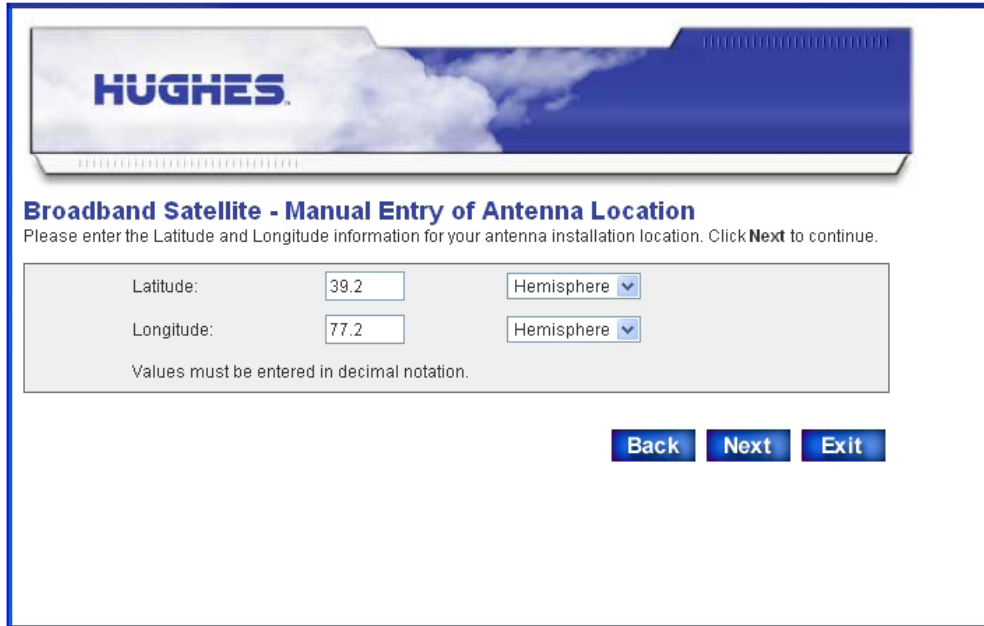
> This is an *alternate* method for entering the antenna location. Use it only if you need to manually enter the antenna location. Use this method for modem installations outside the United States or Canada.

Skip this section if you have entered a ZIP code for the antenna location.

1. On the Antenna Location screen (*Figure 15: Antenna Location screen* on page 28), click the Enter Location Manually checkbox.

   The Manual Entry of Antenna Location screen appears.

Figure 17: Manual Entry of Antenna Location screen

2. Enter the latitude and longitude for your location.
   Enter latitude and longitude in degrees, to the nearest tenth of a degree.
3. Be sure to select from the drop-down list boxes (Latitude: North or South, Longitude: East or West).
4. Click **Next**.

   Note: There is no verification screen when you manually enter the antenna location.

Entering satellite parameters

1. On the Satellite Parameters screen, click the Satellite Transponders drop-down list.
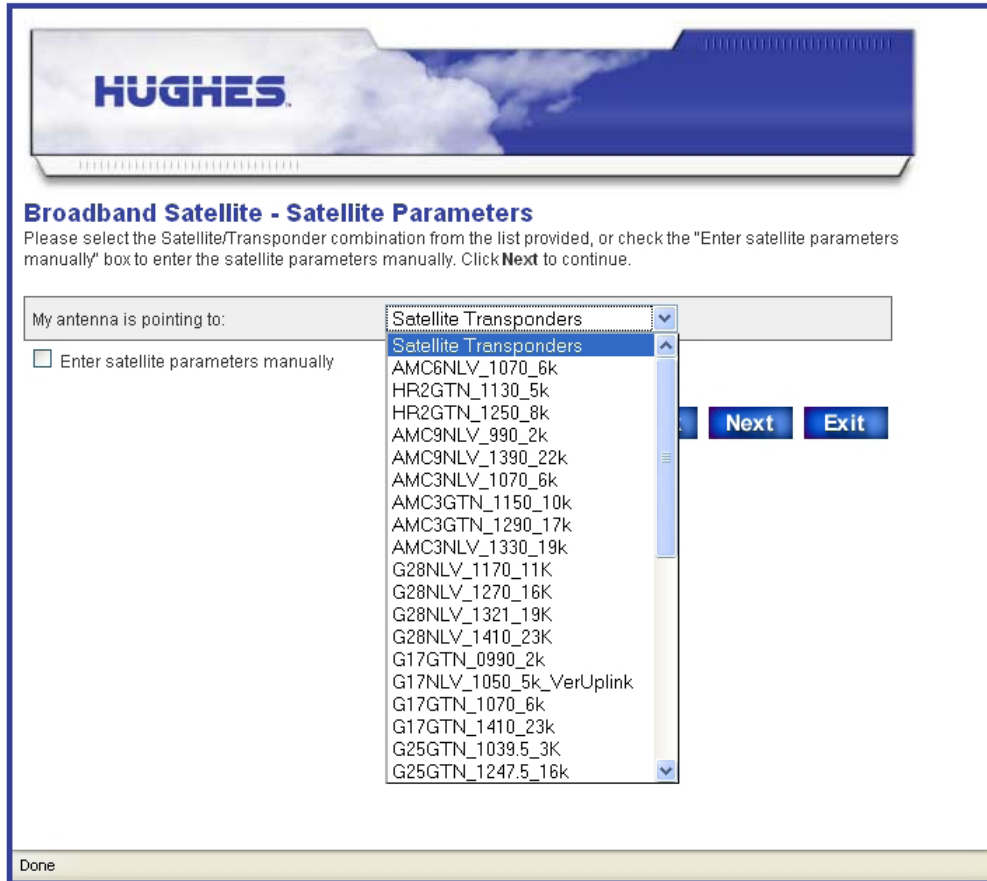
Figure 18: Satellite Parameters screen

2. From the list, select the satellite transponder listed on the Installation Reference Sheet; then click **Next**.

> **Note:** If your satellite transponder is not listed in the drop-down list, you must use the manual entry method. See *Entering the antenna location (manual entry)* on page 28.

> **Note:** The list of satellite transponders may be updated at any time, so you may see different transponders than those shown in *Figure 18: Satellite Parameters screen* on page 30.

The Verification of Satellite Parameters screen appears.

Figure 19: Verifying the satellite parameters screen

3. Verify that the displayed information is correct and click **Next**.
If the parameters are not correct for the installation, click **Back** to change the satellite transponder selection.

4. If you plan to use an antenna pointing tool, select DAPT, OPI, or N/A (for none) from the Antenna Pointing Tool drop-down list.
For Ka-band select DAPT; for Ku-band a DAPT or OPI may be used.

5. Click **Next**.

Entering satellite parameters (manual entry)

This is an *alternate* method for entering the satellite parameters. You must use this method if the satellite and transponder for your installation are not listed in the drop-down list in *Figure 18: Satellite Parameters screen* on page 30 *and* you were not provided with an sbc.cfg file.

Skip this section if you selected a satellite and transponder on the Satellite Parameters screen.

The satellite parameters are provided to you in a technical update email or other communication.

To enter the parameters:

1. On the Satellite Parameters screen, select the Enter satellite parameters manually checkbox shown in *Figure 18: Satellite Parameters screen* on page 30.

2. Click **Next**.
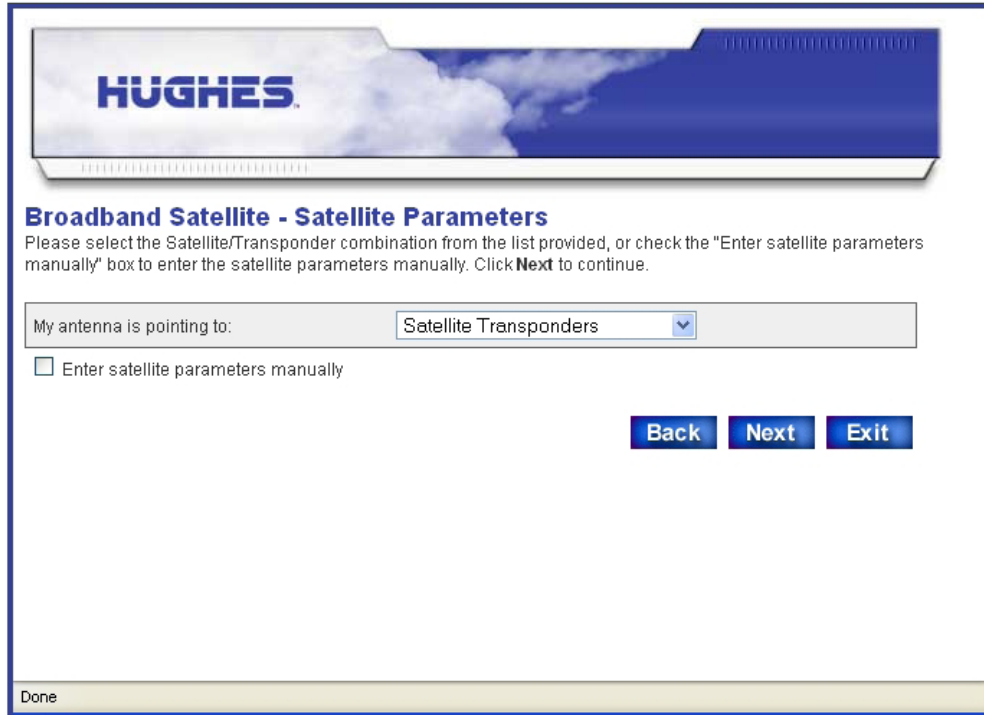
Figure 20: Satellite Parameters screen

The Manual Entry of Satellite Parameters screen appears.
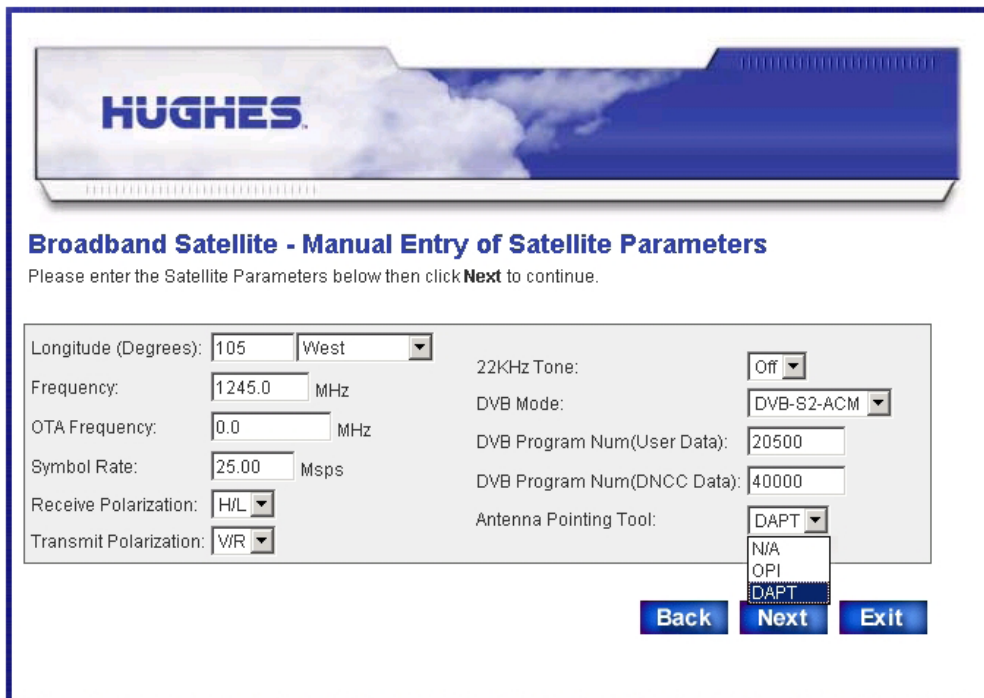
Figure 21: Manual Entry of Satellite Parameters screen

3. Enter or select the parameters.

4. If you plan to use an antenna pointing tool, select DAPT, OPI, or N/A (for none) from the Antenna Pointing Tool drop-down list.
For Ka-band select DAPT; for Ku-band a DAPT or OPI may be used.

5. Click **Next**.

> **Note:** There is no verification screen when you manually enter the satellite parameters.

Entering radio parameters

1. On the Receive LNB Selection screen, select the installed LNB from the Receive LNB drop-down list (*Figure 22: Receive LNB Selection screen—two variations* on page 34).

The list of LNBs you see depends on the how the modem is configured, based on its sbc.cfg file.

Select the LNB option that matches the part number or other identifier on the installed LNB. If you cannot find the LNB part number or identifier, refer to the LNB illustrations in *LNB selection reference* on page 107 for guidance. If you are not sure which LNB option to select, contact Installer Support.

> **NOTICE**   Make sure you select the correct LNB. If you select the wrong LNB, the satellite modem will not work.
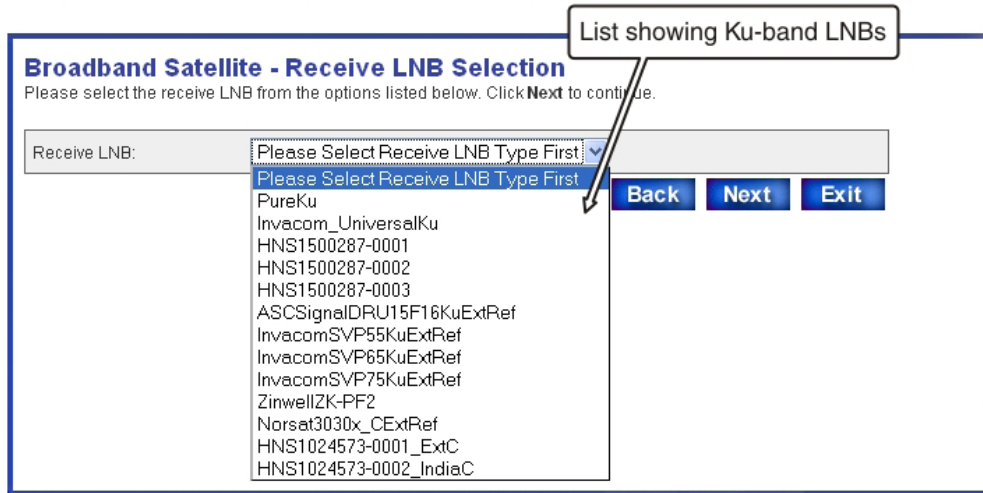
Figure 22: Receive LNB Selection screen—two variations

2. Click **Next**.
The Verification of Receive LNB Parameters screen appears, showing information for the selected LNB.
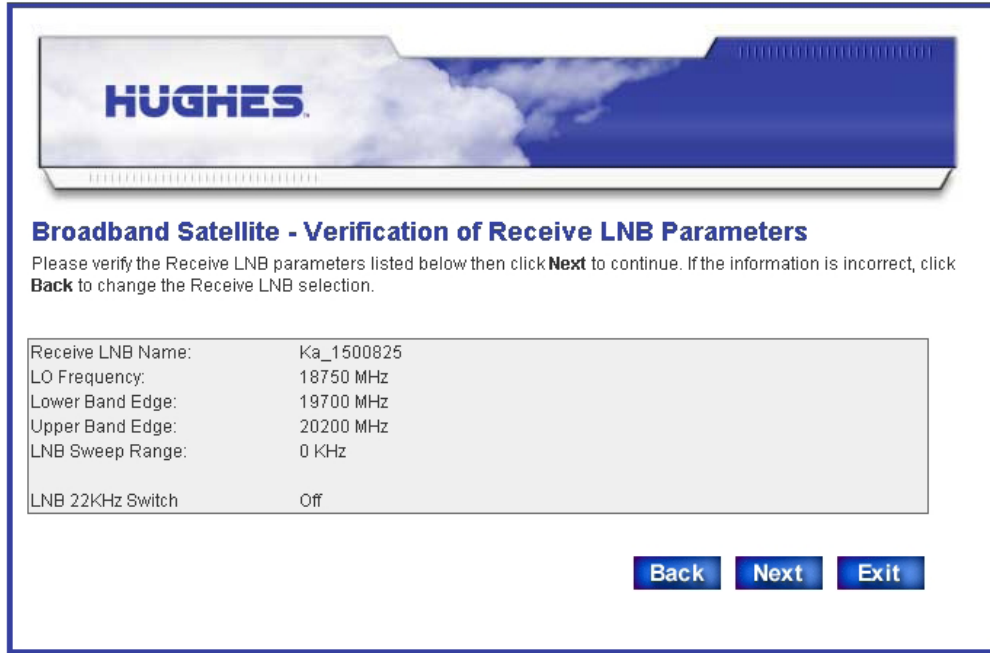
Figure 23: Verification of Receive LNB Parameters screen

3. Verify that the displayed information is correct and click **Next**.
   The Transmit Radio Parameters screen appears.
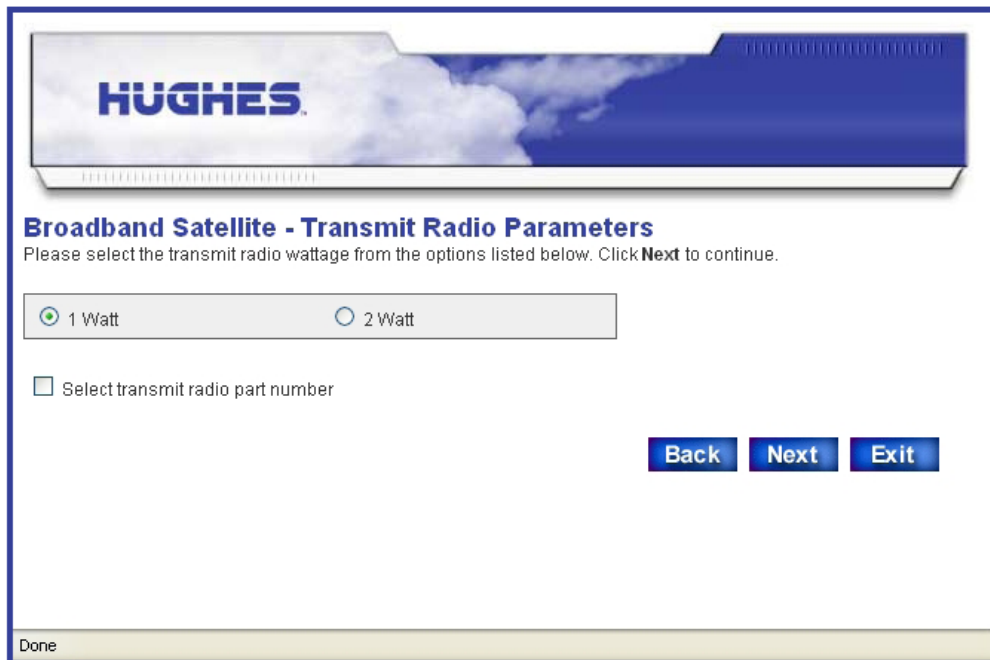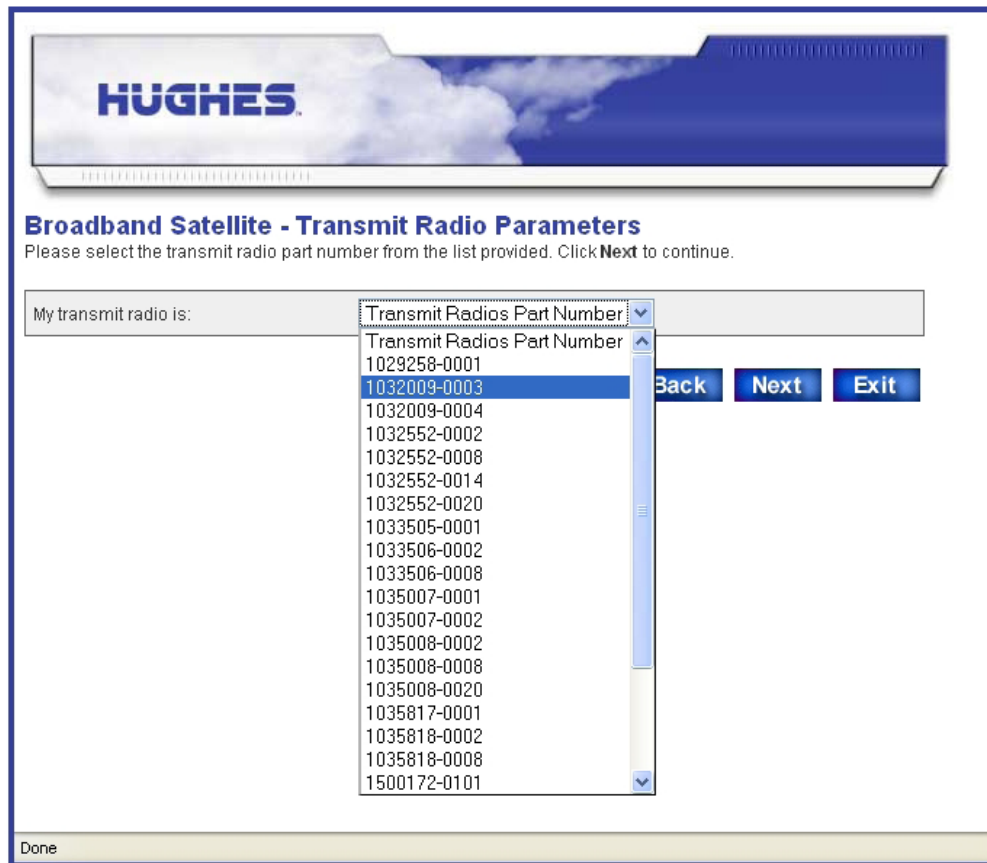
Figure 24: Transmit Radio Parameters screen

4. On the Transmit Radio Parameters screen, use the checkbox to select the radio part number if you know it—otherwise, select the transmit radio type (1 Watt or 2 Watt).

   The radio part number should be on the Installation Reference Sheet.

   If you know the radio part number:

    a) Click the Select transmit radio part number checkbox.

    b) Click the drop-down list and select the transmit radio part number.

Figure 25: Selecting the transmit radio by part number

5. Click **Next**.
The Verification of Transmit Radio Parameters screen appears.

> **Note:** The verification screen appears only if you selected the transmit radio by its part number.

> **Note:** The list of transmit radio part numbers may be updated at any time, so you may see different part numbers than those shown in *Figure 25: Selecting the transmit radio by part number* on page 36.
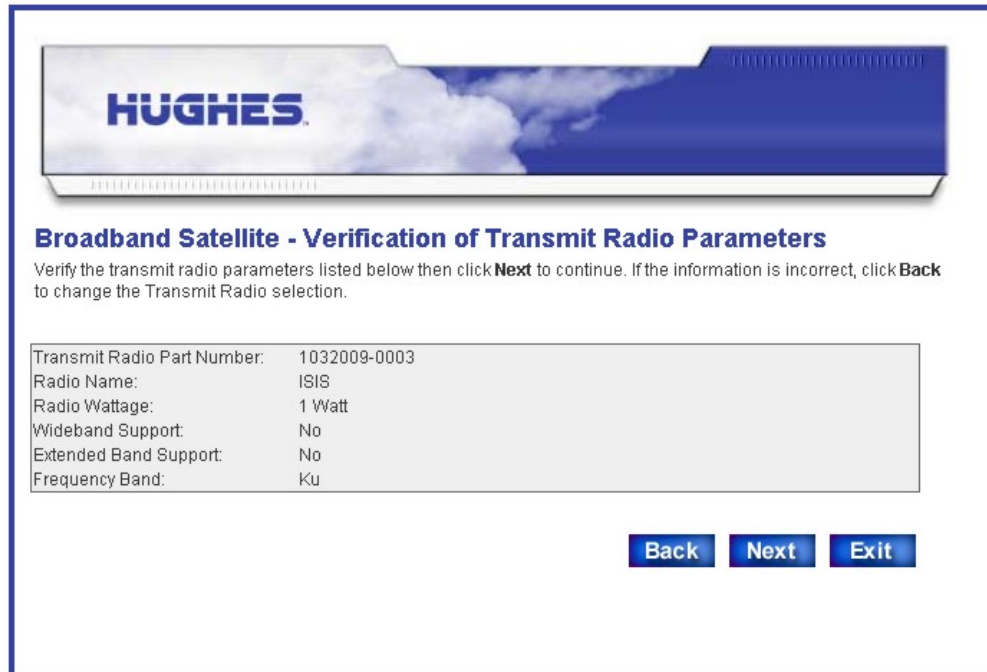
Figure 26: Verification of Transmit Radio Parameters screen

6. Verify that the displayed information is correct and click **Next**.
The Receive Antenna Pointing screen opens.

Receive antenna pointing – Ka-band

> 📝 **Note:** *This section applies to Ka-band installations only.* For Ku-band, skip this section; go to *Receive antenna pointing – Ku-band* on page 41.

To receive-point the antenna, you go the antenna location and point the antenna at its assigned satellite using a squinter and DAPT (both are pointing tools) and then validate pointing on the installer laptop as explained in this section.

The squinter blocks half the feed horn so you can measure Es/No at two azimuth positions and at two elevation positions. When the antenna is pointed correctly, the two azimuth Es/No values match, and the two elevation Es/No values match.

The DAPT displays SQF and Es/No values in real time and guides you through the pointing validation process. The DAPT values are replicated on the DAPT Antenna Pointing Status window (*Figure 28: DAPT Antenna Pointing Status window* on page 38), also in real time.

To receive-point the antenna, use the screens illustrated in this section, *and you must also follow* the procedure for squinter pointing that is documented in the ***Ka-Band Antenna Pointing Guide for Bent-Pipe Satellite Networks*** (1038764-0001).

To receive-point the antenna:

1. On the Receive Antenna Pointing screen, click **Display Signal Strength** (*Figure 27: Receive Antenna Pointing screen* on page 38) to open the DAPT Antenna Pointing Status window.
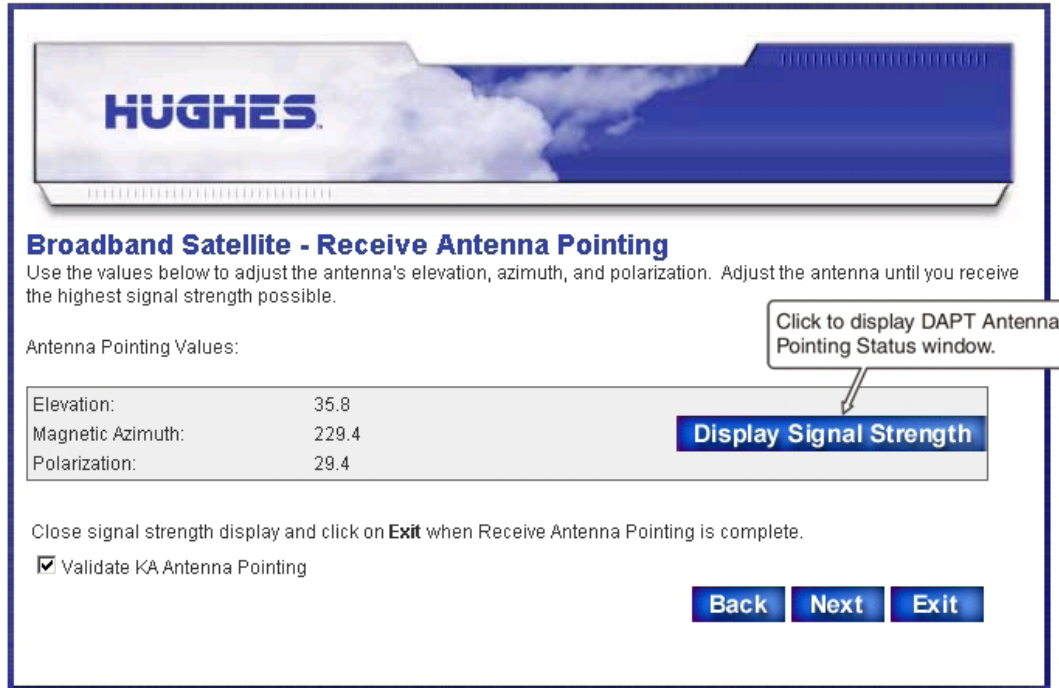
Figure 27: Receive Antenna Pointing screen

Keep the Receive Antenna Pointing screen open until antenna pointing is complete.

The Validate KA Antenna Pointing checkbox is checked by default. If you uncheck it (not recommended), pointing will not be validated.

If the radio assembly is Ka-band and the text next to this checkbox reads Perform ACP, you probably selected the wrong LNB. In this case go back to the Receive LNB Selection screen and select the correct LNB.
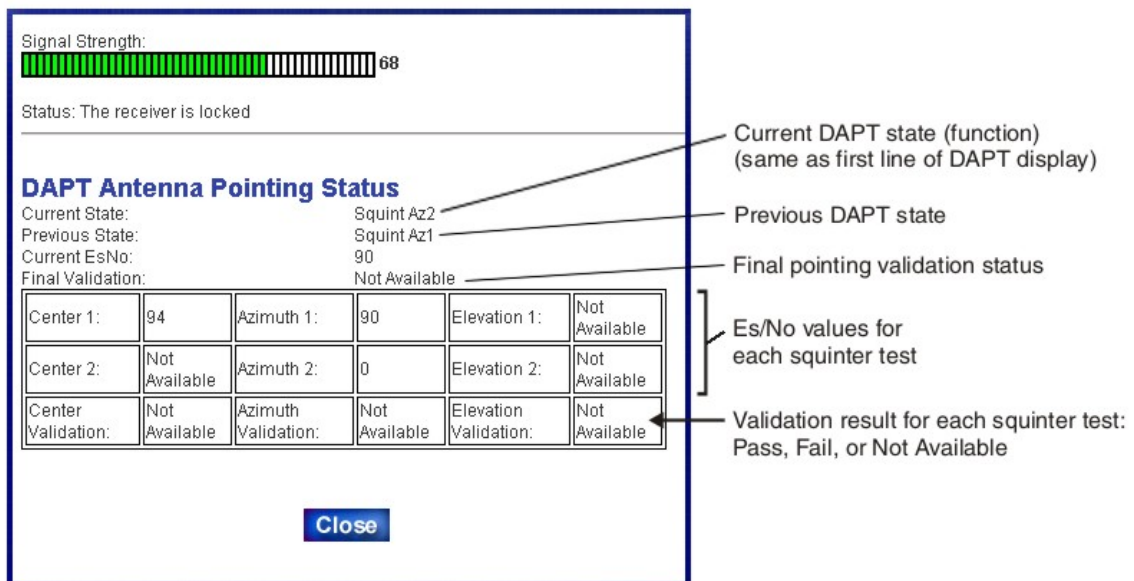
Figure 28: DAPT Antenna Pointing Status window

> **Note:** The DAPT Antenna Pointing Status window displays the DAPT test values as each pointing test is completed. If you click **Close** before antenna pointing is done, the values will be lost. Then you would have to click **Display Signal Strength** again on the Receive Antenna Pointing screen to reopen the DAPT Antenna Pointing Status window and begin pointing again.

2. Take the DAPT, squinter, and jumper cable to the antenna location.

   Refer to the pointing guide for other equipment you may need.

3. Point the antenna as explained in *Ka-Band Antenna Pointing Guide for Bent-Pipe Satellite Networks* (1038764-0001).

   Important: Squinter pointing is a multi-step process. Read and follow the pointing guide carefully. Make pointing adjustments to the antenna as instructed in the antenna installation guide.

   To complete squinter pointing, you must obtain a Pass value for:

   - Center validation
   - Azimuth validation
   - Elevation validation

   For each validation test you can see the Es/No values and Pass/Fail result on the DAPT Antenna Pointing Status window.

4. Perform the pointing validation steps described in the *Ka-Band Antenna Pointing Guide for Bent-Pipe Satellite Networks* (1038764-0001).

   Pointing is validated when *all four* validation fields show Pass, as shown in *Figure 30: KA Antenna Pointing Validation screen – final validation passed* on page 40.

   Validation is also indicated in the DAPT Antenna Pointing Status window, as shown in *Figure 29: DAPT Antenna Pointing Status window – final validation passed* on page 39.
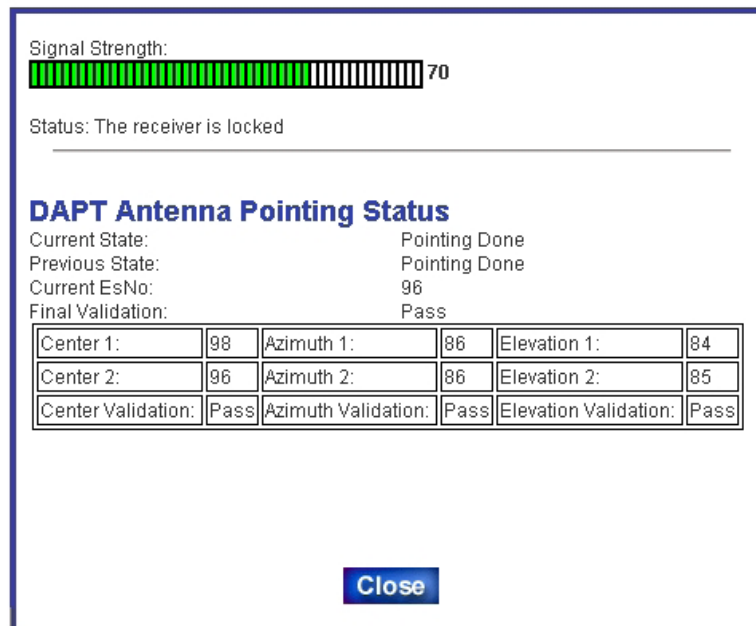
Figure 29: DAPT Antenna Pointing Status window – final validation passed

When antenna pointing (including validation) is complete, the DAPT displays a Pointing Done message, and the DAPT status window shows Current State: Pointing Done.

5. When pointing is complete, click **Close**.

6. Click **Next** on the Receive Antenna Pointing screen.

   The KA Antenna Pointing Validation screen opens, showing a summary of the squinter pointing results.
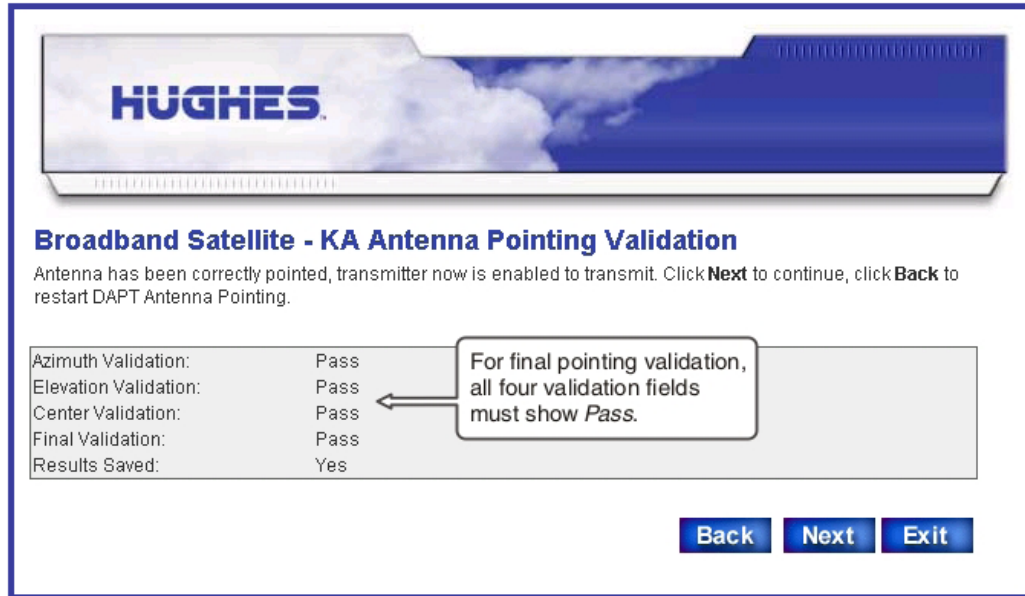
Figure 30: KA Antenna Pointing Validation screen – final validation passed

> **Note:** If you open the pointing validation screen before antenna pointing is complete, a message appears (instead of the text shown in the screen illustration above) asking you to wait until pointing is complete. The message advises that if you exit antenna pointing without passing final validation, **the transmitter will be disabled.**

> **Note:** The Results Saved field indicates whether you saved the pointing values or not when the DAPT prompted Store Results? near the end of the squinter pointing process.

7. This step depends on the validation test results:

   • If any validation test *fails,* click **Back** to restart DAPT antenna pointing; then re-test until all tests pass.

   • If you are using satellite-based commissioning and all four validation tests *pass,* click **Next** to continue.

   > **Note:** The **Next** button shown in *Figure 30: KA Antenna Pointing Validation screen – final validation passed* on page 40 is present only if final validation is successful. If any test failed, only the **Back** and **Exit** buttons are present.

   • If you are following the instructions for Ka-band manual commissioning and all four validation tests *pass,* this is the last step; click **Exit**.

   When all four validation tests have passed, Ka-band pointing is complete and validated.

Receive antenna pointing – Ku-band

> 📝 **Note:** *This section applies to Ku-band installations only.* For Ka-band, skip this section; go to *Registering the satellite modem* on page 43.

Follow these steps to receive-point the antenna using the displayed signal strength, as shown in *Figure 31: Receive pointing screen with signal quality window* on page 41. Adjust the antenna to point it as instructed in the antenna installation guide.

1. Click **Display Signal Strength** on the Receive Antenna Pointing screen to open the Signal Quality window.
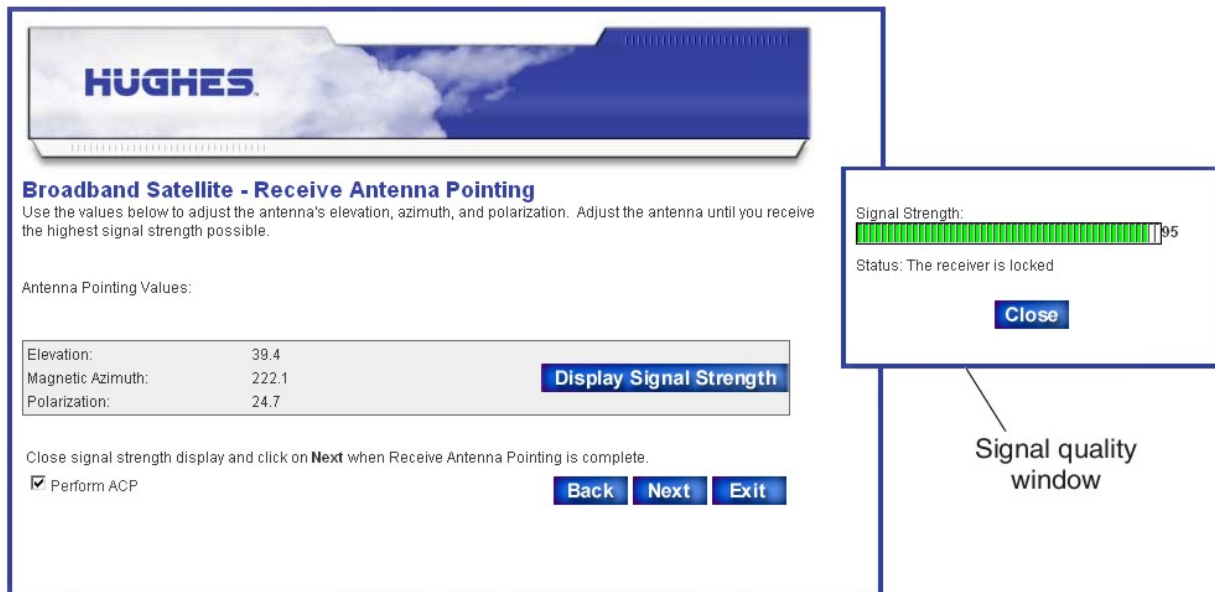
Figure 31: Receive pointing screen with signal quality window

> 📝 **Note:** The Signal Quality window is small and may not appear on top. If it is not on top, minimize other windows until you can see it.

If the radio assembly is Ku-band and the text next to this checkbox reads Validate KA Antenna Pointing, you probably selected the wrong LNB. In this case go back to the Receive LNB Selection screen and select the correct LNB.

2. Use the Signal Quality indication to peak receive pointing as instructed in the antenna installation guide.

> 📝 **Note:** You must peak the signal even if the antenna is locked to it. When the signal is locked, a check mark appears in the Perform ACP checkbox on the Receive Antenna pointing screen.

3. After you have peaked the signal, click **Close** to close the Signal Quality window.

Transmit antenna pointing – Ku-band

> 📝 **Note:** *This section applies to Ku-band installations only.*

1. On the Receive Antenna Pointing screen, select the Perform ACP checkbox if your service provider offers automatic cross-polarization (ACP).

> 📝 **Note:** The Perform ACP checkbox is automatically checked if ACP is enabled at the NOC. If it is not automatically checked, likely reasons are that the NOC does not support ACP, ACP is not enabled at the NOC, or there is a problem with the ACP server.

> 📝 **Note:** The ACP test is required for Ku-band customers in the United States and Canada; for customers outside the United States and Canada, it is optional.

2. Click **Next**.
3. On the Transmit Antenna Pointing screen, click **Manual** to initiate the manual cross-polarization test.
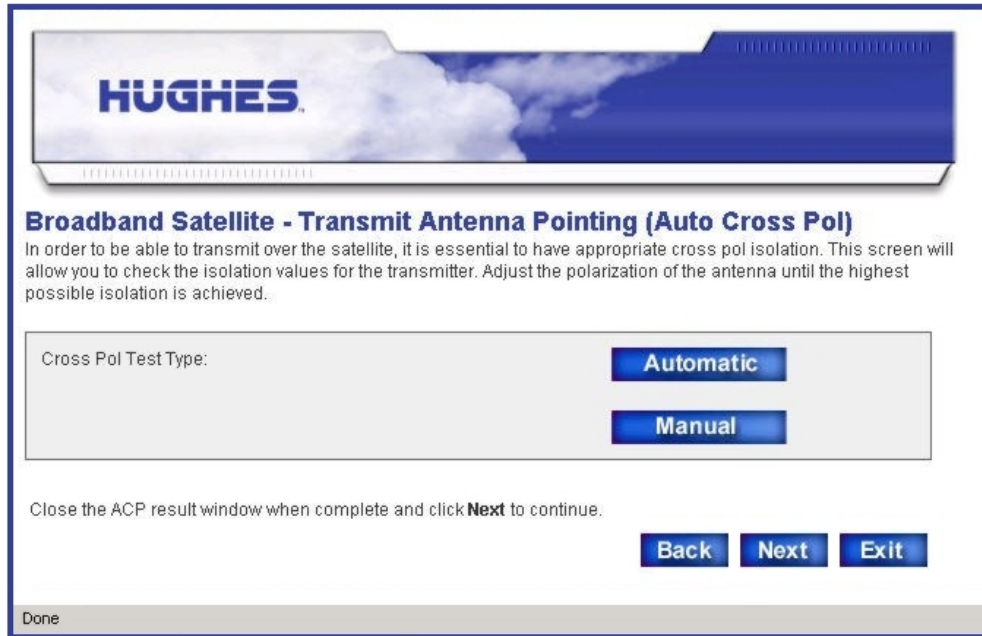
Figure 32: Initiating a manual cross-polarization test

Be ready to adjust the antenna. For antenna adjustment instructions, see the antenna installation guide.

> 📝 **Note:** The manual cross-polarization test times out 3 to 5 minutes after you click the **Manual** button. Therefore you must complete any antenna adjustments required to achieve maximum transmit isolation within this time.

4. In the Warning dialog that warns that the transmitter is actively powered on during the manual cross-polarization test, click **Continue**.

Figure 33: Manual cross-polarization warning message

The Cross Pol Test window displays the test status, isolation value, and pass/fail result.
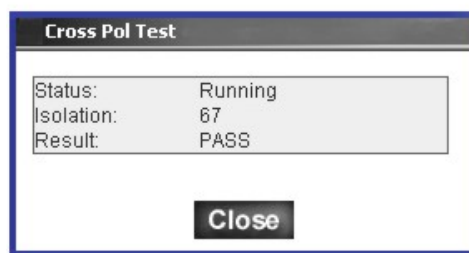
Figure 34: Manual cross-polarization test results

5. Adjust the antenna during the manual cross-polarization test to achieve maximum transmit isolation.

6. Lock down the antenna adjustment when the modem consistently passes the manual cross-polarization test.

7. Click **Close** to close the Cross Pol Test window.

8. On the Transmit Antenna Pointing screen, click **Automatic** to initiate the ACP test.

9. If the modem fails ACP, re-peak the transmit isolation in manual cross-polarization test mode.

10. If the modem passes ACP, click **Close** to close the Cross Pol Test window.

    Ku-band pointing is now complete.

11. What you do now depends on whether you are using satellite-based or manual commissioning:

    • If you are using satellite-based commissioning, click **Next** on the Transmit Antenna Pointing screen to continue.

    • If you are following the instructions for Ku-band manual commissioning, click **Exit**; then go to *Software download—manual commissioning* on page 53.

Registering the satellite modem

To register the satellite modem with the service provider's network, you select and access a registration server.

To register the satellite modem:

1. Click **Next** on the Transmit Antenna Pointing screen.

2. On the Registration Server Selection screen, select a registration server from the drop-down list.

- For U.S. and Canadian installations, select SAN_and_PIN_Registration.
- For installations outside of the United States and Canada, select SiteID_Registration.

If you are unsure which server to select, refer to the Installation Reference Sheet.

Figure 35: Selecting the registration server

If necessary, you can *manually* enter the registration server's address as follows:

a) Select the Enter Registration Server Address Manually checkbox.
b) Enter the registration server's address in the HTTP:// field.
c) Select the Secure HTTP Mode checkbox to enable a secure connection to the registration server.

3. Click **Next**.
The Registration in Progress screen appears, displaying registration status information.
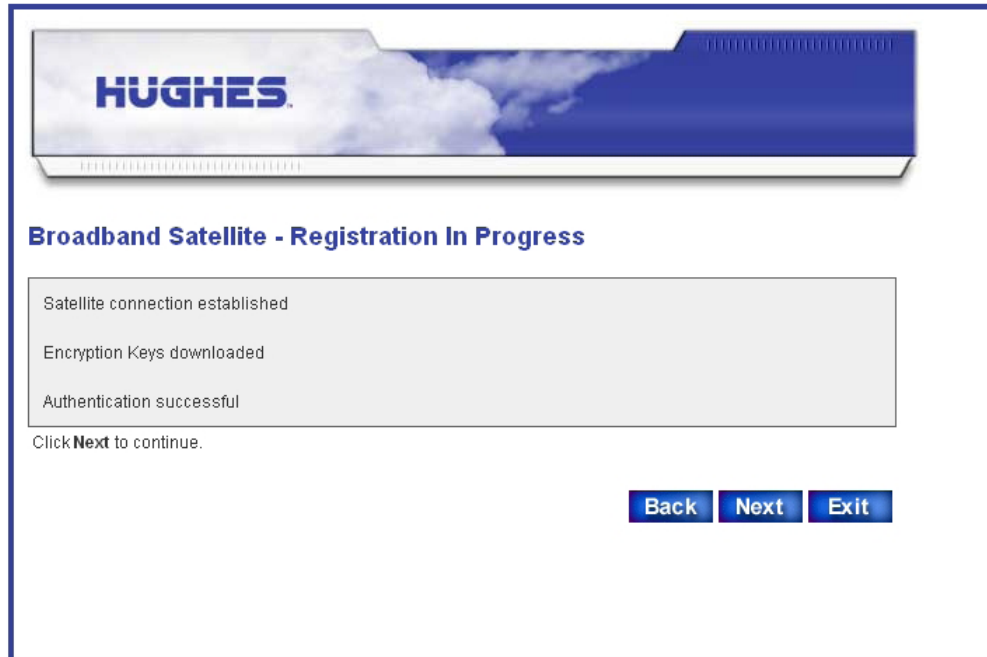
Figure 36: Registration in Progress screen

4. Click **Next** on the Registration in Progress screen when prompted to do so.

5. Click **OK** on the redirect notification message window (shown here) to access the registration server.
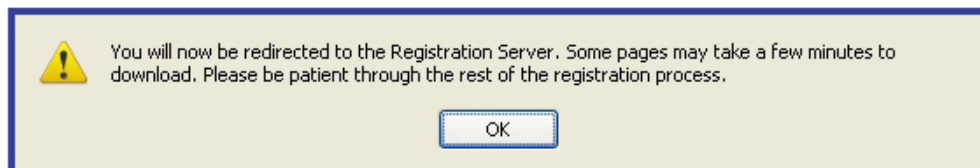
Figure 37: Redirect notification message

6. If you see a Security Alert message concerning the site security certificate, click **Yes** to accept the security certificate.

> **Note:** As you progress through the registration screens, you may see numerous Security Alert screens with messages about Internet site security certificates. Click **Yes** to accept the certificate and continue. You may see several of these security screens in a row.

7. Depending on your country location and type of installation, go to *Registering in the United States or Canada* on page 45 or *Registering outside the United States and Canada* on page 47.

Registering in the United States or Canada

This section applies only to installations in the United States or Canada.

1. Read the INSTALLER NOTICE! carefully.

2. Ask the customer to scroll down to review and accept the subscriber agreement.

If the customer does not accept the agreement, you cannot continue with the installation. Do not click the **Accept** button yourself.
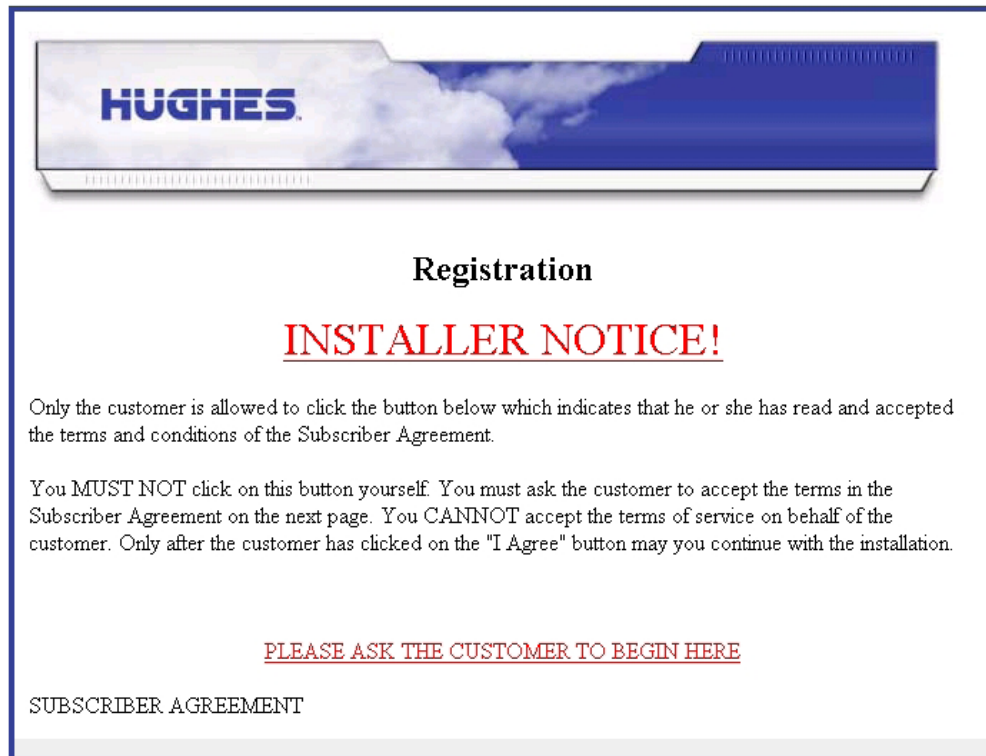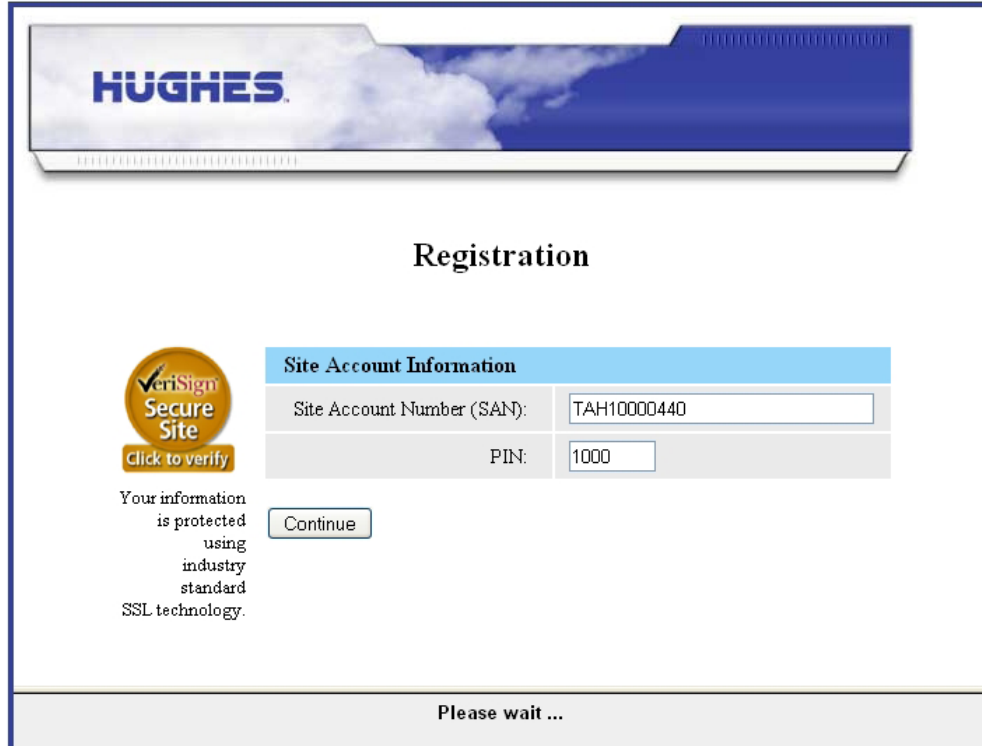
Figure 38: Installer notice and subscriber agreement screen

> **Note:** Subscriber agreements may vary by customer type.

3. On the registration screen shown in *Figure 39: Entering SAN and PIN* on page 47, ask the customer to enter their site account number (SAN) and PIN; then click **Continue**.

Figure 39: Entering SAN and PIN

4. Follow the steps in *Completing registration* on page 48.

Registering outside the United States and Canada

This section applies only to installations outside the United States and Canada.

1. Enter the customer's site ID on the registration screen (*Figure 40: Entering a site ID* on page 48) and click **Continue**.

Figure 40: Entering a site ID

2. Follow the steps in *Completing registration* on page 48.

Completing registration

These instructions apply to all modem installations.

Follow these instructions to complete modem registration:

1. On the Registration Welcome screen, click **Continue**.
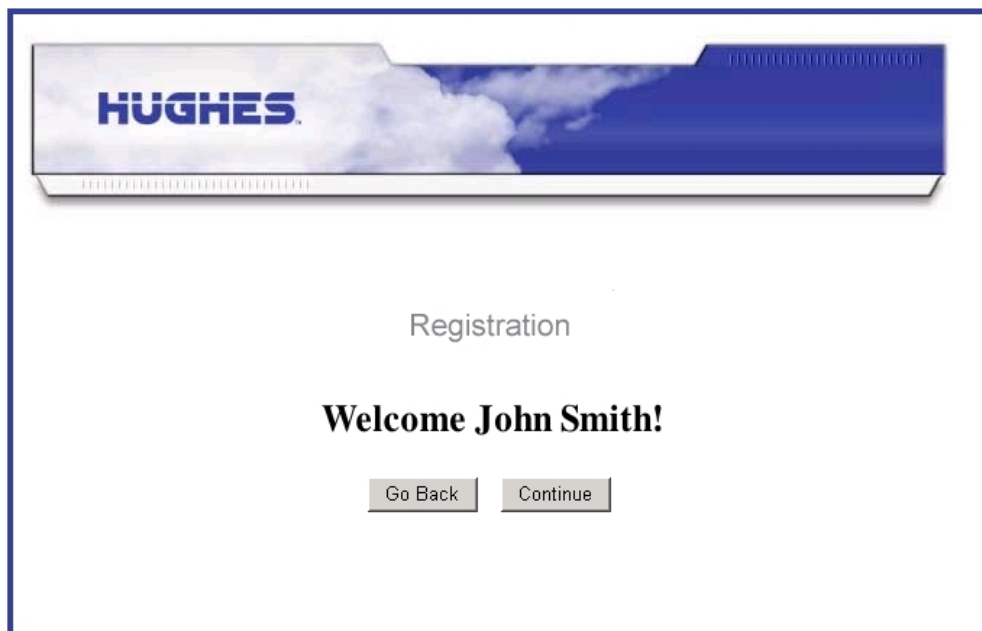
Figure 41: Registration Welcome screen

The Registration screen appears.

Figure 42: Registration screen with modem identification information

This screen shows the Site ID, the modem's IP address (Terminal IP Address), and the modem's subnet mask (Terminal Subnet Mask).

2. If a printer is available, click **Print this Page** to print the Registration screen.

3. Give the printout to the customer.

The customer will need this information if they ever need to contact their service provider for assistance. If no printer is available, advise the customer to record this information and make sure they know where it is recorded. Make sure the customer knows where this information is recorded.

4. Click **Continue** to download configuration parameters to the modem.
   A second Registration in Progress screen appears briefly (not shown here) while the configuration parameters are downloaded. Then the Registration Complete screen appears.

5. Click **Restart** on the Registration Complete screen.

   This restarts the satellite modem.
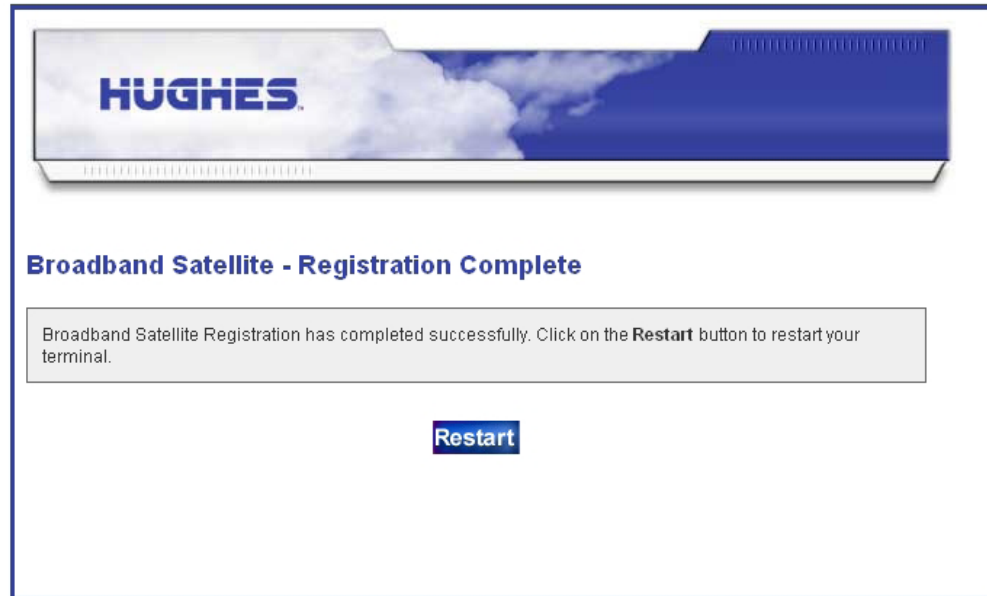
Figure 43: Registration complete – restarting the modem

The Terminal Reset screen appears. (It is not shown here.)

6. Click **Close** on the Terminal Reset screen.

The modem is now commissioned.

Manual commissioning

If satellite-based commissioning is not available, you must commission the modem manually. However, do not use the manual commissioning method unless you are instructed to do so by the service provider.

Manual commissioning requires coordination between you and the Network Operations Center (NOC). A technician enters parameters at the NOC, and you enter the same parameters at the installation site. The NOC also downloads encryption keys and certain parameters to the modem. Manual commissioning process consists of:

- Entering manual commissioning parameters
- Antenna pointing

For both tasks you use the satellite modem's web-based interface.

> 📝 **Note:** The satellite modem's serial number must be loaded at the NOC by a NOC representative to complete the manual commissioning process.

Entering parameters—manual commissioning

Follow these steps to enter the manual commissioning parameters:

1. Open a web browser on the installer laptop.
2. Type http://192.168.0.1/fs/registration/ setup.html in the browser address bar and press **Enter**.
   The Satellite Setup menu appears.

Broadband Satellite Setup

Welcome to Broadband Satellite Setup. Use the links below to register your HN9200 terminal or point the outdoor antenna. Please note that certain functions shall be disabled during this process. Make sure that your HN9200 terminal is restarted once you complete the Setup process.

Registration - Installer	Use this option if you are an installer and are commissioning a new terminal.
Registration - User	Use this option if you have a Registration Id and your antenna is already pointed.
Registration - Adapter Swap	Use this option if you are replacing your existing terminal with a new terminal and your antenna is already pointed.
Re-registration	Use this option if your terminal is already commissioned and you would like to update your account.
Antenna Pointing	Use this option if you would like to run pointing or ACP on your current setup.
VSAT Manual Commissioning	Use this option if you are an installer and would like to manually commission your terminal as a VSAT.
License Management	Use this option to upload and manage feature licenses.
Config File Upload	Use this option to upload a new registration configuration file.
Zip Code File Upload	Use this option to upload a new Zip Code file.

Close

Figure 44: Satellite Setup menu

3. Click **VSAT Manual Commissioning** to access the Manual Commissioning page.

Figure 45: Manual Commissioning page

4. Enter or select parameters on the Manual Commissioning page. The parameters may be provided to you in the Installation Reference Sheet or in another form of communication from your installation point-of-contact.

5. When you are finished, click **Save Configuration**.

The modem saves the parameters and reboots.

Manually accessing the antenna pointing screens

To manually access the antenna pointing screens.

1. Open a web browser on the installer laptop.
2. Type http://192.168.0.1/fs/registration/ setup.html in the browser address bar and press **Enter**. The Satellite Setup menu opens (*Figure 44: Satellite Setup menu* on page 51).
3. Click **Antenna Pointing**. The Antenna Pointing screen appears as shown in *Figure 46: Antenna pointing screen* on page 53.
4. Select the antenna pointing tool you will use—DAPT, OPI, or N/A (none).
5. Click **Next**.
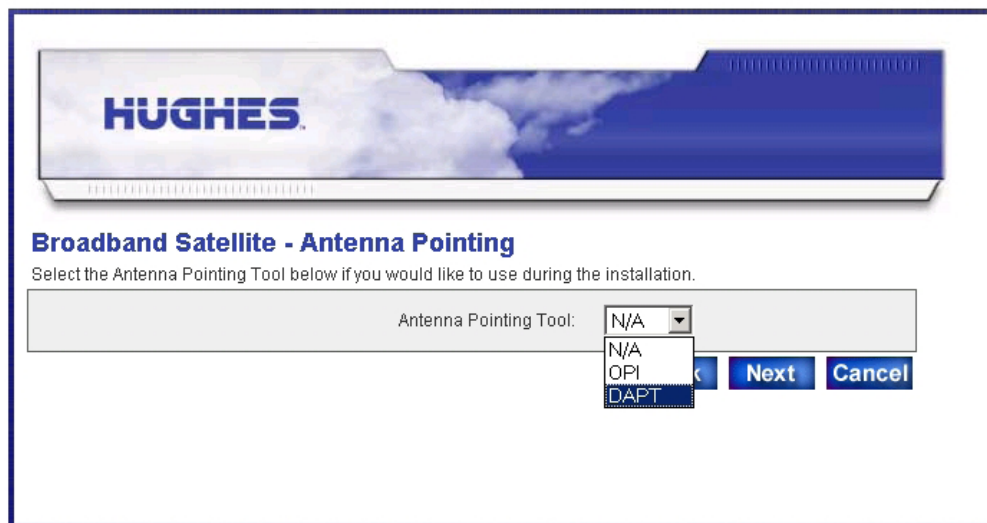
Figure 46: Antenna pointing screen

6. To continue manual commissioning, follow the steps in:

   - *Receive antenna pointing – Ka-band* on page 37 (Ka-band only)
   - *Receive antenna pointing – Ku-band* on page 41 (Ku-band only)
   - *Transmit antenna pointing – Ku-band* on page 41 (Ku-band only)

Software download—manual commissioning

Prerequisite: Antenna pointing must be completed and validated.

1. Wait for the modem's operational software to download.
   This may take about 15 minutes.
2. To confirm that the download is complete, follow the steps in *Confirming that the satellite modem's files are up to date* on page 56.

The modem is now commissioned.

Chapter

5

Completing the installation

Topics:

- *Confirming that the satellite modem's files are up to date*
- *Connecting the satellite modem to the customer's computer*
- *Verify that the customer can browse the Internet*
- *Printing the System Information page*
- *Creating a shortcut to the System Control Center*
- *Installation complete*

This chapter describes the tasks you perform after commissioning to complete the satellite modem installation.

Confirming that the satellite modem's files are up to date

Use the System Control Center to confirm that the satellite modem is operating with the most current version of software.

1. Open a web browser such as Internet Explorer.
2. In the browser's address bar, type www.systemcontrolcenter.com or 192.168.0.1.
3. Press **Enter**.
   The System Control Center home page appears in the browser window.
4. Click the **System Status** link.

   The System Status page appears.

Figure 47: System Status page

5. Check the Software Download Status.
   If it reads All files are up-to-date, the modem has been commissioned.
6. Wait 15 minutes after completing registration for all files to be downloaded from the NOC to the modem.
7. If All files are up-to-date does not appear after 15 minutes, restart the modem:
   a) Go to the System Control Center home page.
   b) In the Help section, click **Restart HN9200**.
8. If you do not see the All files are up-to-date message, power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the modem's power supply.
   c) Wait 5 sec.
   d) Plug the power cord back into the power source.

e) *If the power source is DC,* plug the input cable back into the power supply.

> ⚠ **CAUTION**   ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

Connecting the satellite modem to the customer's computer

Use an Ethernet cable to connect the modem to the customer's computer as shown in *Figure 48: Connecting the HN9200 to the customer's computer* on page 57.
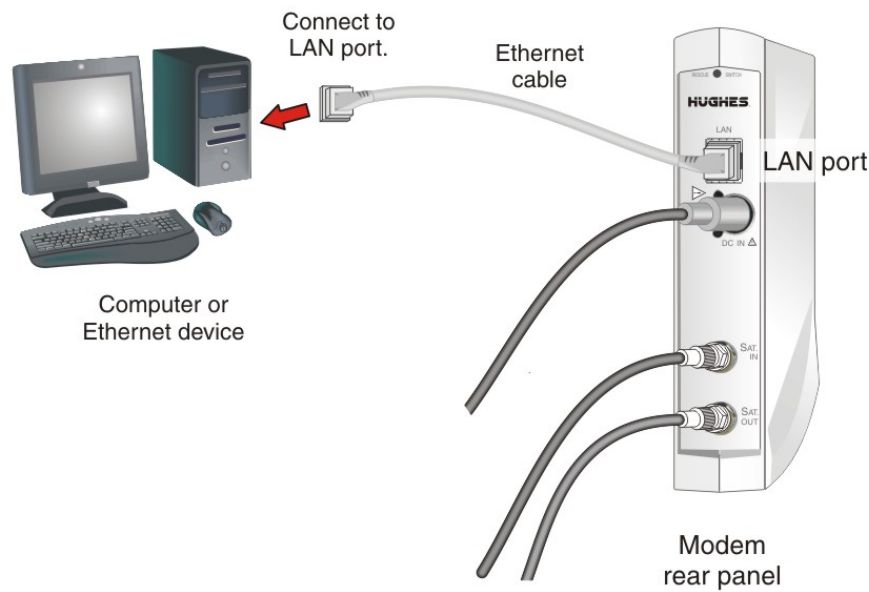
Figure 48: Connecting the HN9200 to the customer's computer

Verify that the customer can browse the Internet

You (the installer) are required to stay at the installation site until the customer can connect to the Internet so you can offer assistance if necessary.

After you have installed and registered the satellite modem, verify that the customer can browse the Internet. If the customer cannot browse the Internet:

1. Configure the installer laptop so its network properties match those of the customer's computer.
2. Connect the installer laptop to the satellite modem with an Ethernet cable.
3. Open a web browser on the installer laptop.
4. Try to access the modem's System Control Center by typing in the browser's address bar: www.systemcontrolcenter.com or 192.168.0.1.

5. Press **Enter**.

6. If the modem is functioning, the System Control Center appears.

7. Type www.hughes.com or some other known site in the browser address bar and press **Enter**.

    If the site appears, the modem is functioning. The customer should refer to the contact information (click **Contact Information**) on the System Control Center Help page for technical assistance.

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 need technical assistance 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 62.

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 for any reason 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 shortcut to the System Control Center home page on the customer's Windows desktop.

1. Open the System Control Center home page in a web browser.

   > **Note:** The method described here works for Internet Explorer. For other browsers see the browser's instructions for creating a shortcut to a URL.

2. Drag the icon that appears in front of the address displayed in the browser to the computer desktop.
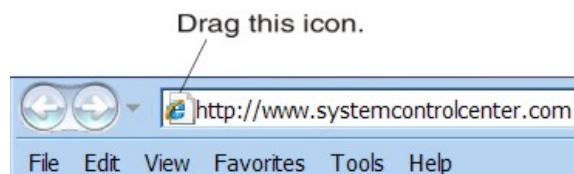
Figure 49: Icon used to create shortcut

Installation complete

If you have successfully followed all previous instructions, at this point the satellite modem is installed, commissioned, and activated. **The remaining information in this installation guide is provided for reference or troubleshooting purposes. You may or may not need it.**

Once the satellite modem installation is complete, the customer can connect an Ethernet hub, router, or switch to the HN9200 modem to support multiple computers on a LAN, using the address information shown in on the System Information page (*Figure 64: System Information page* on page 75).

Chapter

6

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 a computer 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

Prerequisites: To access the System Control Center, a computer with a web browser installed must be connected to the satellite modem's LAN port. (Because the System Control Center web site is hosted on the modem, the computer does not have to be connected to the Internet.)

To open the System Control Center, double-click the System Control Center shortcut on your computer desktop, or follow these steps:

1. Open a web browser such as Internet Explorer.
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 50: System Control Center home page* on page 63.

   If you are unable to access the System Control Center, refer to *Cannot access the System Control Center* on page 94.

System Control Center home page

The System Control Center home page contains numerous links to satellite modem features and important information regarding 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 65.
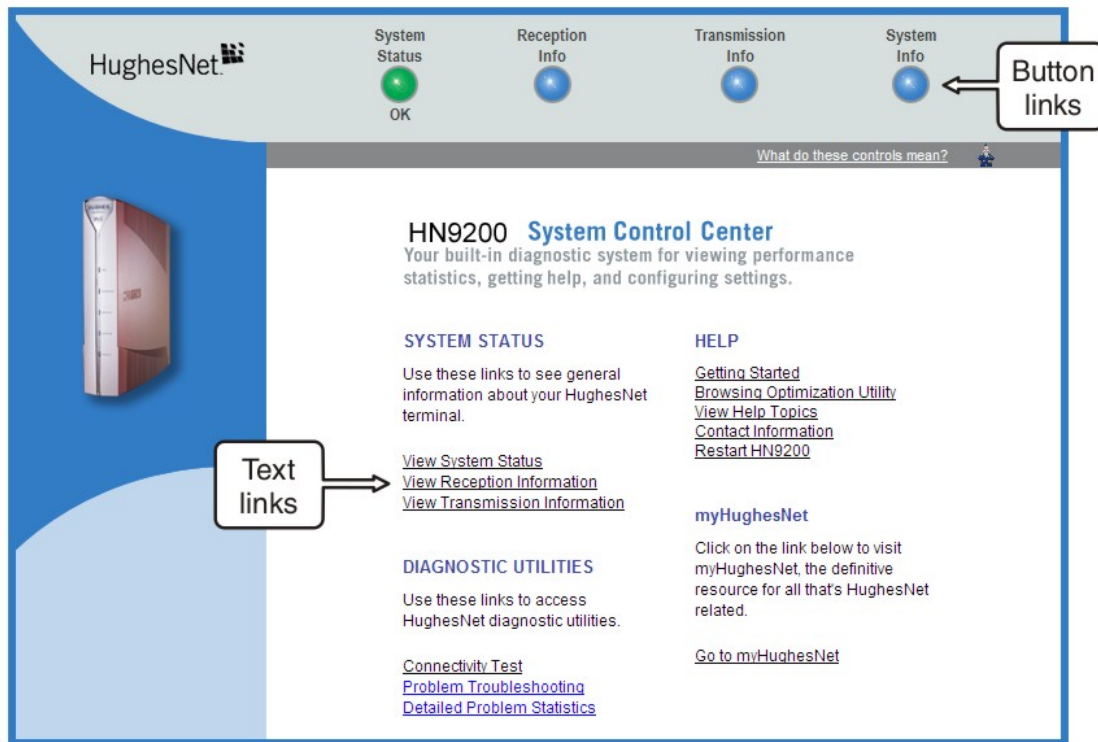
Figure 50: System Control Center home page

Text links

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

System Status links

- **<u>View System Status</u>** – Opens the System Status page, which displays general system status information such as signal strength and administrative status.
- **<u>View Reception Information</u>** – Opens the Reception Information page, which displays information on data received by the satellite modem.
- **<u>View Transmission Information</u>** – Opens the Transmission Information page, which displays information on data transmitted by the satellite modem.

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

Diagnostic utilities links

<u>Connectivity Test</u> – Opens the Connectivity Test page, which you can use to test the connection between the satellite modem and the NOC. See *Confirming NOC connectivity* on page 91.

<u>Problem Troubleshooting</u> – See *Troubleshooting common problems* on page 85.

<u>Detailed Problem Statistics</u> – Opens a screen you can use to view statistics concerning modem operation. See *Viewing problem-related statistics* on page 101.

Help links

Getting Started – Through this link you can find general operating instructions for the HN9200 modem, recommended settings for your browser and TCP/IP, answers to frequently asked questions, and troubleshooting information.

Browsing Optimization Utility – The Browser Optimization Utility is a software utility you can download that configures certain settings on your Windows computer to improve your Internet browsing performance. (This link is only present if it has been enabled by the NOC.)

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

Contact information – Opens to a page that provides contact information for assistance and additional information.

Restart HN9200 – Restarts the satellite modem.

myHughesNet

📝 **Note:** **myHughesNet** links may or may not be present on the satellite modem depending on the country where the modem is used and the customer's service plan.

Go to myHughesNet 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.

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 51: Common features on System Control Center screens* on page 64. These features are explained in the following sections.
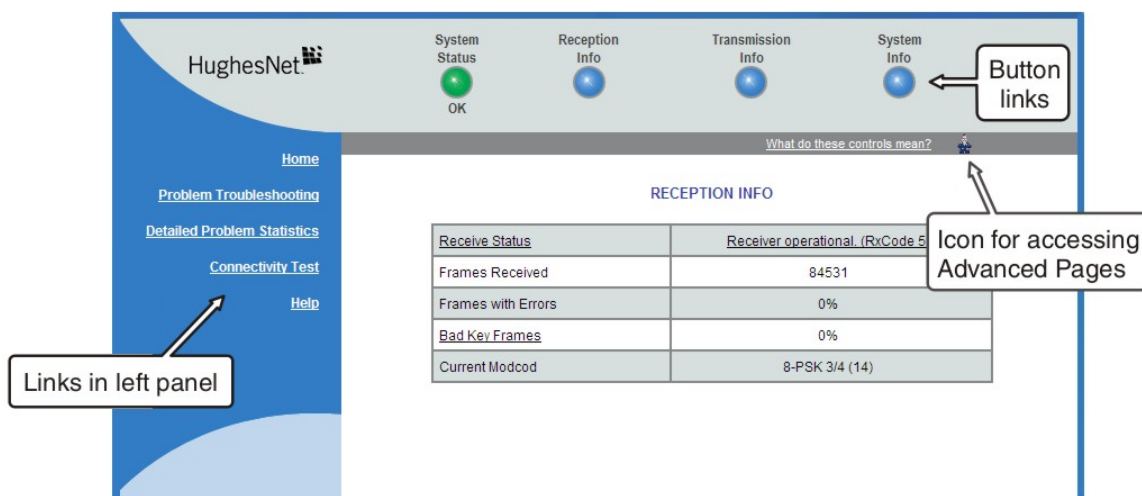
Figure 51: Common features on System Control Center screens

Button links

At the top of each System Control Center page are four round buttons with labels above them as shown in *Figure 52: System Control Center button links* on page 65. Each button is a link to the System Control Center page identified by the label—for example, the **System Status** button is a link to the System Status page. Click the button to go to the page identified by the label. The System Status button link is also a status indicator, as explained in *Table 5: System Status button colors* on page 66. The other three button links are links only; they are not indicators.
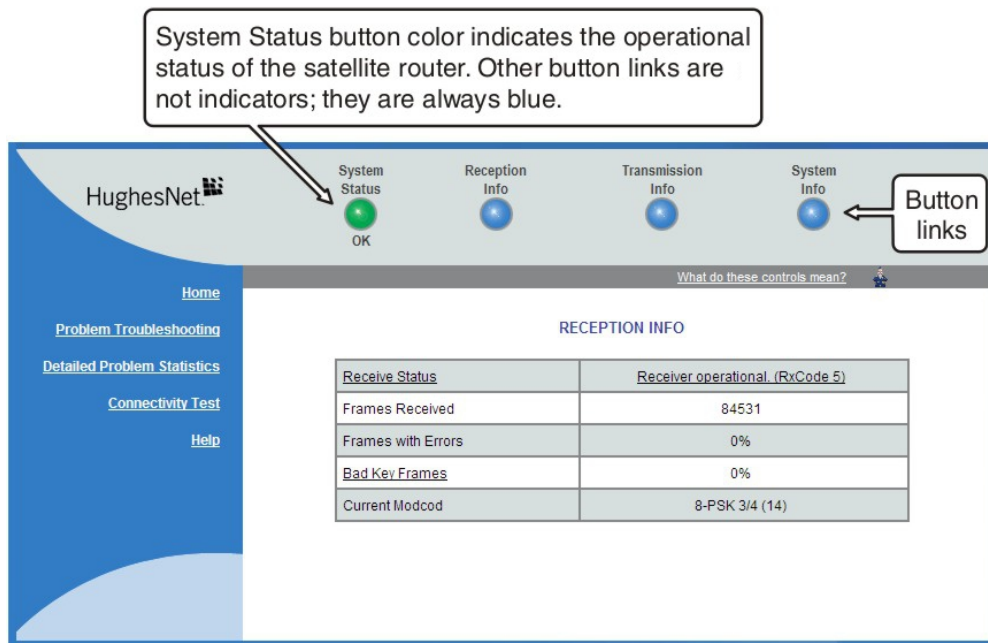
Figure 52: System Control Center button links

The destination page for each button link is identified below:

Table 4: 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 69.
Reception Info	Reception Information page	Displays statistics about received data. For more information see *Reception Information page* on page 71.
Transmission Info	Transmission Information page	Displays statistics about transmitted data. For more information see *Transmission Information page* on page 73.
System Info	System Information page	Displays system information such as the satellite modem's serial number and software version. For more information see *System Information page* on page 74.

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 5: System Status button colors* on page 66. To see more detailed status information, click the System Status button to open the System Status page.

Table 5: System Status button colors

Button color		Meaning
	Green	The satellite modem is operating normally. (**OK** appears beneath the System Status button.)
	Red	A problem has been detected.
	Yellow	Performance is temporarily impaired because: • There may be a problem with Web Acceleration. • The modem may be temporarily using a backup configuration. • There may be virus activity.
	Orange	Degraded – The modem is fully operational, but performance is temporarily impaired because the daily download allowance has been exceeded.

If the System Status button is red 🔴 or yellow 🟡 , 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. If the parameter name is underlined, click the parameter name to see a message that may include helpful information, depending on what the problem is.

IPSec icon

An icon that looks like a small lock next to the System Status button means IPSec is enabled. This icon is shown in *Figure 53: IPSec icon* on page 66.
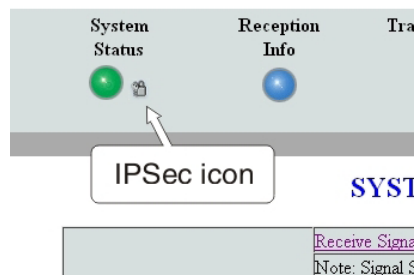
Figure 53: IPSec icon

IPSec (Internet Protocol Security) is a set of network protocols and services that provide security to IP networks by authenticating and encrypting each IP packet of a data stream. IPSec-protected packets travel through a virtual tunnel or path between two points. An IPSec tunnel is *up* when

it has been established between two peers and is capable of carrying traffic. If it cannot carry traffic it is *down*.

When IPSec is enabled (IPSec icon present), the modem attempts to establish all configured tunnels. The status of all configured tunnels at any given time (if IPSec is enabled) is one of the following:

- All tunnels are established (green System Status button).
- Some tunnels are established (orange System Status button).
- No tunnels are established (red System Status button).

Links in the left panel

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

📝 **Note:** Some of these links may not appear because they are not enabled by the NOC.

- **Home** – Opens the System Control Center home page.
- **Problem Troubleshooting** – Opens the Problem Troubleshooting page, a tool that can help you solve common problems you could encounter while using the satellite modem. For details see *Troubleshooting common problems* on page 85.
- **Detailed Problem Statistics** – Opens a screen you can use to view statistics concerning modem operation. See *Viewing problem-related statistics* on page 101.
- **Connectivity Test** – Opens the Connectivity Test page, which allows you to test the connection between the modem and the satellite. See *Confirming NOC connectivity* on page 91.
- **Download Allowance Status** – Opens the Download Allowance Status screen, which shows how much remains of the daily download allowance.
- **Help** – Opens the Help page. Refer to the Help page, which includes a variety of topics such as getting started and recommended browser settings.

Small icon on System Control Center screens (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.
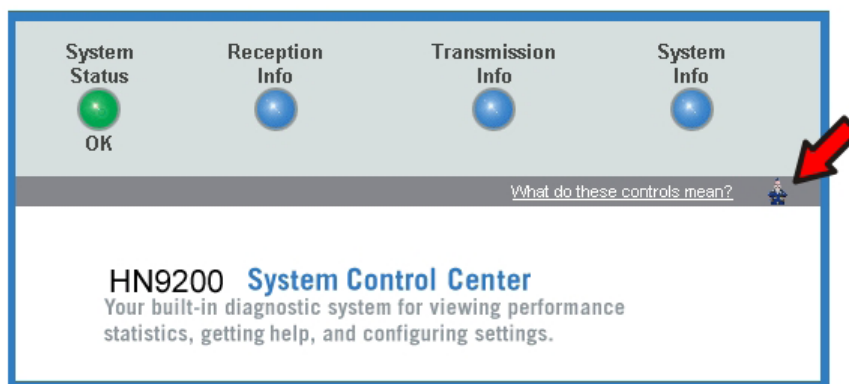
Figure 54: Icon for accessing the Advanced Pages

Status and information screens

Several 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 Reception Information page. The left column list the parameters, and the right column shows the current value of the parameter listed in the left column. Parameters are listed in this format on these screens:

- System Status page
- Reception Information page
- Transmission Information page

On any of these screens, if a parameter name or the current value of a parameter is underlined, you can click the name or value to see an explanation of it.

Figure 55: Format of status and information screens

The parameters listed on each screen are explained in this guide in the section for each screen:

- *System Status page* on page 69
- *Reception Information page* on page 71
- *Transmission Information page* on page 73
- *System Information page* on page 74

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 left column. The value indicates the current state of the parameter.

Figure 56: Red flag problem indicator

If you see a red flag, you can click the underlined parameter value in the right column to see additional information about the problem.

Features a customer may not see

A customer may see descriptions of certain features in the satellite modem user guide that do not appear on their System Control Center screens. This is because some features may be enabled or disabled by the NOC depending on the customer's service plan or customer-specific requirements. If a feature is not enabled the screen or screens for that feature or links to it do not appear. Features that may be enabled or disabled by the NOC are:

- Web Acceleration
- Problem Troubleshooting
- Detailed Problem Statistics
- Port Forwarding
- Download Allowance Status
- Browsing Optimization Utility

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 57: System Status page* on page 70 may not appear on your System Status screen.

Figure 57: System Status page

The parameters listed on the System Status page are explained in the following table.

Table 6: System Status page parameters

Parameter	Explanation
Signal Strength	Receive signal strength. A value of 30 or less indicates a weak signal.
Receive Status	Indicates if the receive data path is operational or other status. Click the displayed RxCode for explanation of the displayed code.
Transmit Status	Indicates if the transmit data path is operational or other status. Click the displayed TxCode for corresponding Help information.
Software Download Status	Indicates if the satellite modem's software and configuration are up to date.
Service Status	Indicates if the modem has been commissioned (registered with the system). You can determine if the modem has ever been de-commissioned by clicking the Service History link.
TCP Acceleration Status	Indicates if TCP Acceleration is operational or other status. TCP acceleration improves the modem's performance.
Web Acceleration Status	Indicates if Web Acceleration is operational or other status. Web acceleration improves web browsing performance. This field is present only if the NOC operator has enabled Web Acceleration on the satellite modem.
Diagnostics Code	If you need technical assistance, this code may be useful to Installer Support.

Parameter	Explanation
Fair Access Policy Threshold Exceeded	Indicates if a subscriber has exceeded the limit for downloads established by the subscriber's service plan. Subscribers who exceed the download limit temporarily experience reduced download speeds.

Reception Information page

The Reception Information page shown in *Figure 58: Reception Information page* on page 71 displays information about data received by the satellite modem.
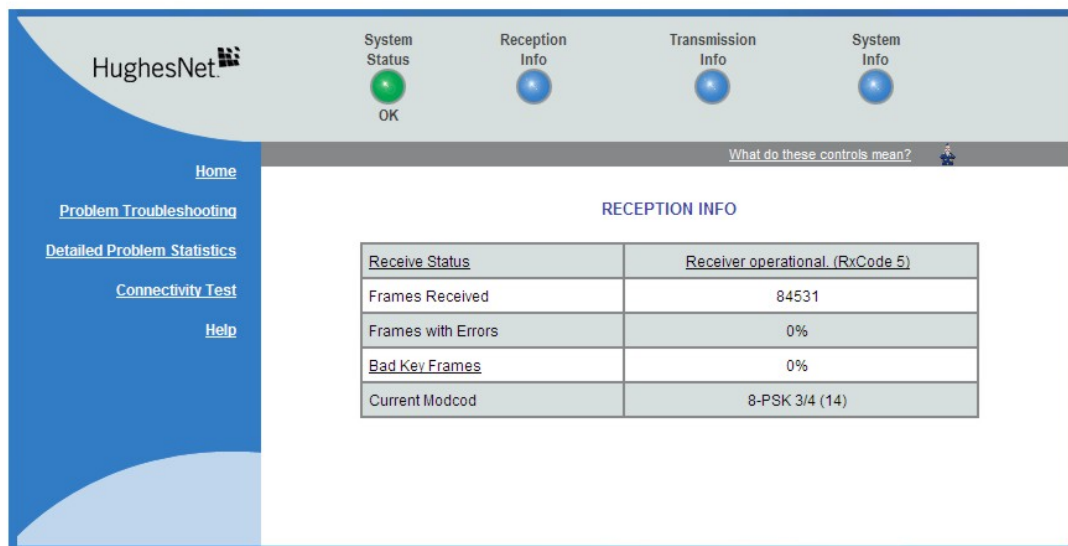
Figure 58: Reception Information page

The parameters listed on the Reception Information page are explained in the following table.

Table 7: Reception Information page parameters

Parameter	Explanation
Receive Status	Indicates if the receive data path is operational or other status. Click the displayed RxCode for explanation of the displayed code.
Frames Received	Number of data messages received by the satellite modem.
Frames with Errors	Percentage of received frames determined to be corrupted. Any number greater than zero indicates a problem except when adverse weather conditions are present. Frames may be corrupted in adverse weather conditions or if there is a problem with the receive cable or antenna assembly.
Bad Key Frames	Percentage of received frames that could not be decrypted successfully. All data received over the satellite is encrypted. Any number greater than zero indicates a problem except when adverse weather conditions are present. Bad key frames may indicate that the modem is not commissioned.

Parameter	Explanation
Current Modcod	Level of encoding the modem can accept based on the current signal quality. Lower Modcod numbers are used if signal impairments such as rain are present. Adaptive coding and modulation (Modcod) is a Hughes-developed technique that maximizes over-the-air bandwidth utilization.

Examining receive status

You can check the Receive Status parameter to find out if the receive data path is operational or if there is a problem. Normal receive status is indicated by the message Receiver operational. (RxCode 5).

The following two illustrations show how you can view a list of all RxCodes or see an explanation of the currently displayed RxCode. Each RxCode—except RxCode 5—indicates a specific problem in the receive path.
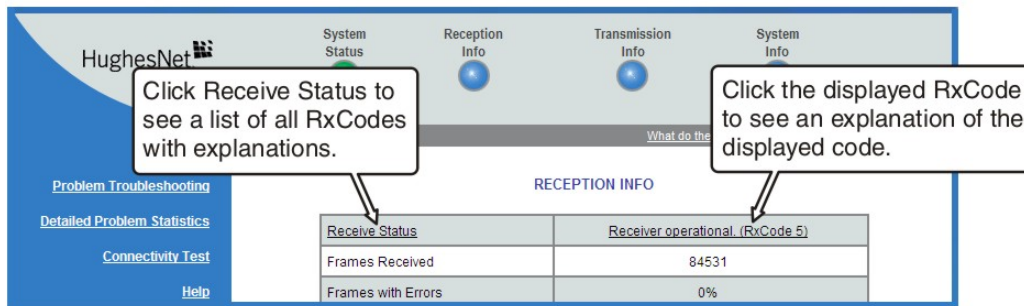
Figure 59: Finding additional Receive Status information

The next illustration shows the list of all RxCodes. Click the explanation (link) next to the RxCode to see more information.
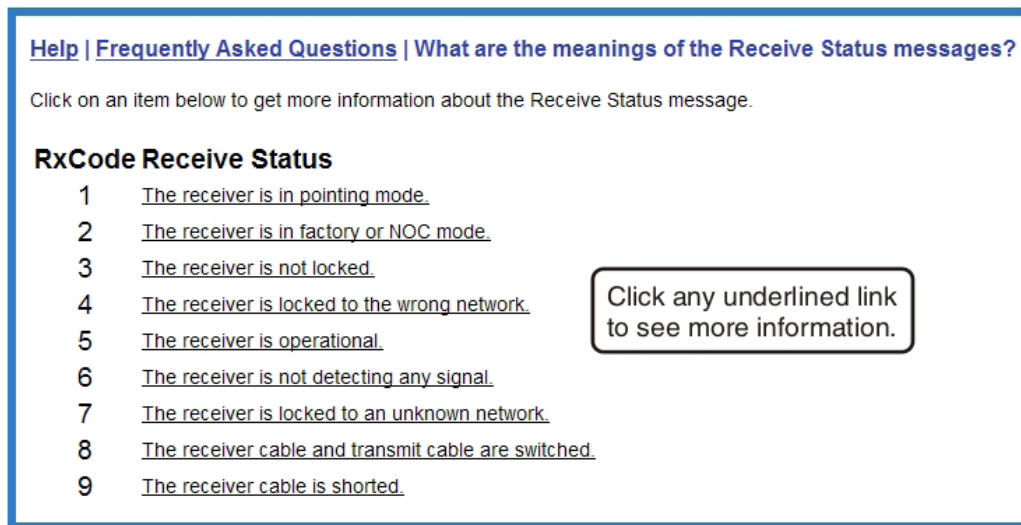
Figure 60: List of all RxCodes

Transmission Information page

The Transmission Information page shown in *Figure 61: Transmission Information page* on page 73 displays information about data transmissions from the satellite modem.
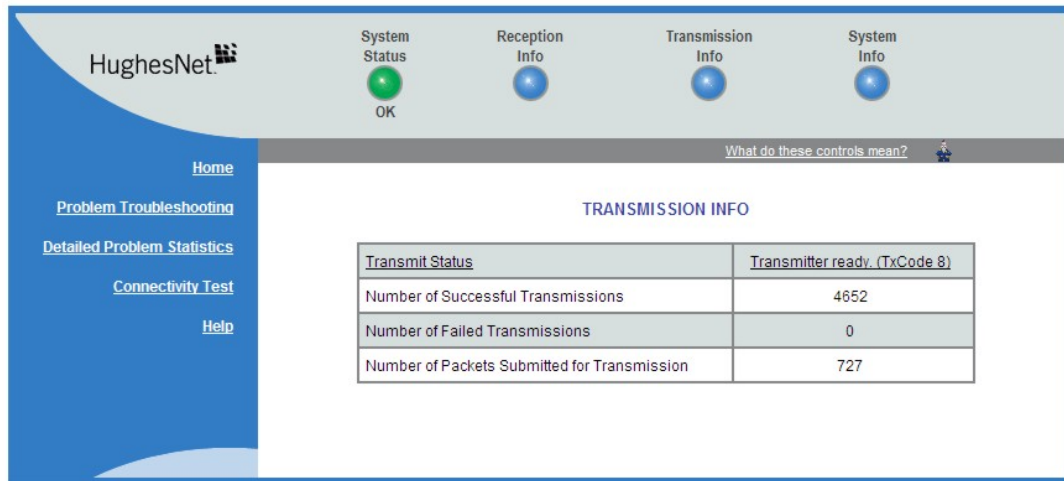
Figure 61: Transmission Information page

The parameters listed on the Transmission Information page are explained in the following table.

Table 8: Transmission Information page parameters

Parameter	Explanation
Transmit Status	Indicates if the transmit data path is operational. Click the displayed TxCode for explanation of the displayed code.
Number of Successful Transmissions	Number of frames transmitted to the satellite.
Number of Failed Transmissions	Number of frames that could not be sent. A continuously increasing value indicates a transmission problem. If a low value is displayed and does not increase, and the system is functioning, there is no reason for concern.
Number of Packets Submitted for Transmission	Total number of data packets queued for transmission to the satellite since the modem was last restarted.

Examining transmit status

You can check the Transmit Status parameter to find out if the transmission data path is operational or if there is a problem. Normal transmit status is indicated by the message Transmitter ready. (TxCode 8).

The following two illustrations show how you can view a list of all TxCodes or see an explanation of the currently displayed TxCode. Each TxCode—except TxCode 8—indicates a specific problem in the transmission path.
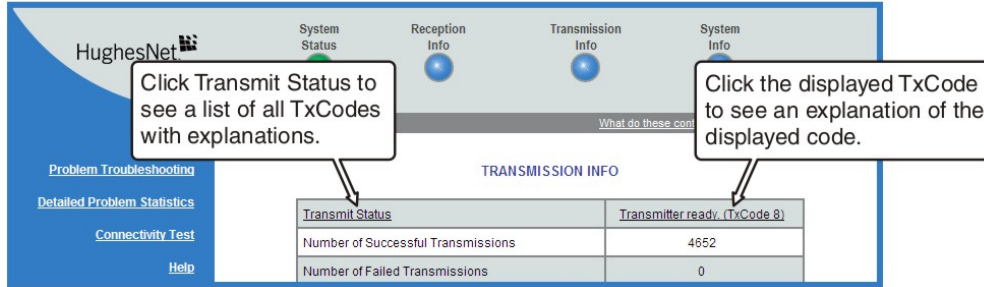
Figure 62: Finding additional Transmit Status information

The next illustration shows the list of all TxCodes. Click the explanation (link) next to the TxCode to see more information.
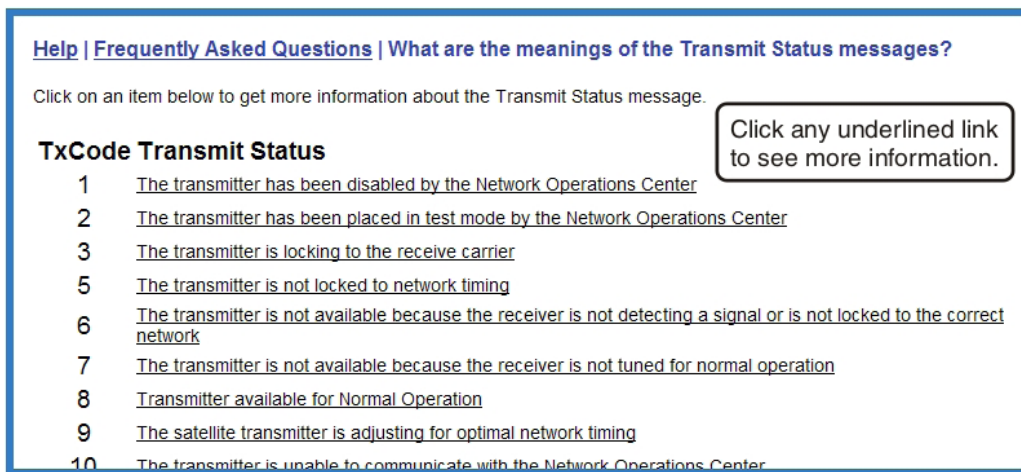
Figure 63: List of TxCodes (not all codes are shown)

System Information page

The System Information page shown in *Figure 64: System Information page* on page 75 provides system information for the satellite modem such as Site ID and the release number of the modem's operational software.
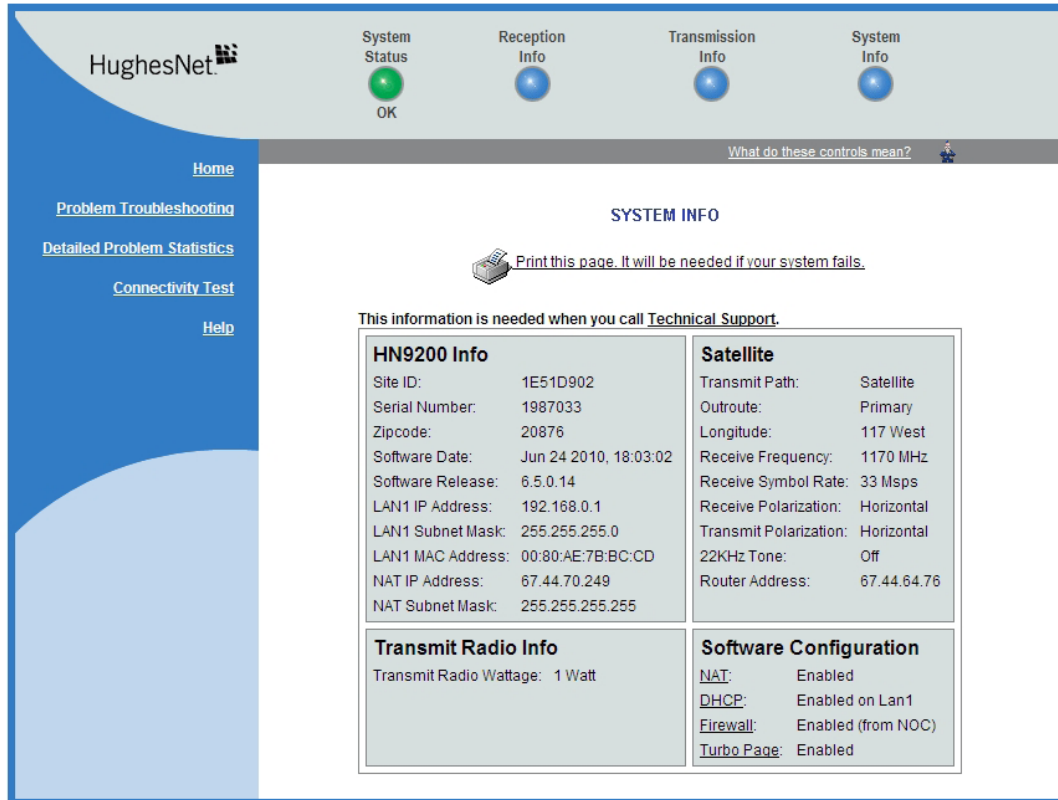
Figure 64: System Information page

The parameters listed in the **HN9200 Info** section of the System Information page are explained in the following table. Other sections of the screen (**Transmit Radio Info** and **Satellite**) provide additional information about the modem installation and the modem software (**Software Configuration**).

Table 9: System Information page parameters – HN9200 Info section

Parameter	Explanation
Site ID	Identifies the site where the modem is installed.
Serial number	The modem's serial number. The serial number may be required for troubleshooting.
Zipcode	ZIP code of the modem site.
Software Date	Software build date.
Software Release	Version of the modem's software. This is typically the factory-installed software version. However, if the NOC downloads a newer version of Gateway software to the modem, the newer version number is displayed.
LAN1 IP Address	The satellite modem address. The default modem address is 192.168.0.1. A different modem address can be configured.
LAN1 Subnet Mask	Range of addresses available to the satellite modem.
LAN1 MAC Address	MAC address for the satellite modem.

Parameter	Explanation
LAN2 IP Address	Address available for a second LAN connection.
LAN2 Subnet Mask	Subnet mask (range of available addresses) available for a second LAN connection.
LAN2 MAC Address	MAC address a second LAN connection.
NAT IP Address	The Internet routable public IP address assigned to the modem. NAT translates this address to local private addresses in the range 192.168.0.*x* that can be used by the devices on your local network (where *x* = 0–9).
NAT Subnet mask	The NAT subnet mask (range of available addresses) assigned to the modem is always 255.255.255.255.

Help page

The System Control Center Help page (*Figure 65: Help page* on page 77) contains information to help the user get started in using the satellite modem, find contact information for assistance, and other helpful information.

To display the Help page:

- Click **View Help Topics** on the System Control Center home page.

  or

- Click **Help** in the left panel of any System Control Center page.
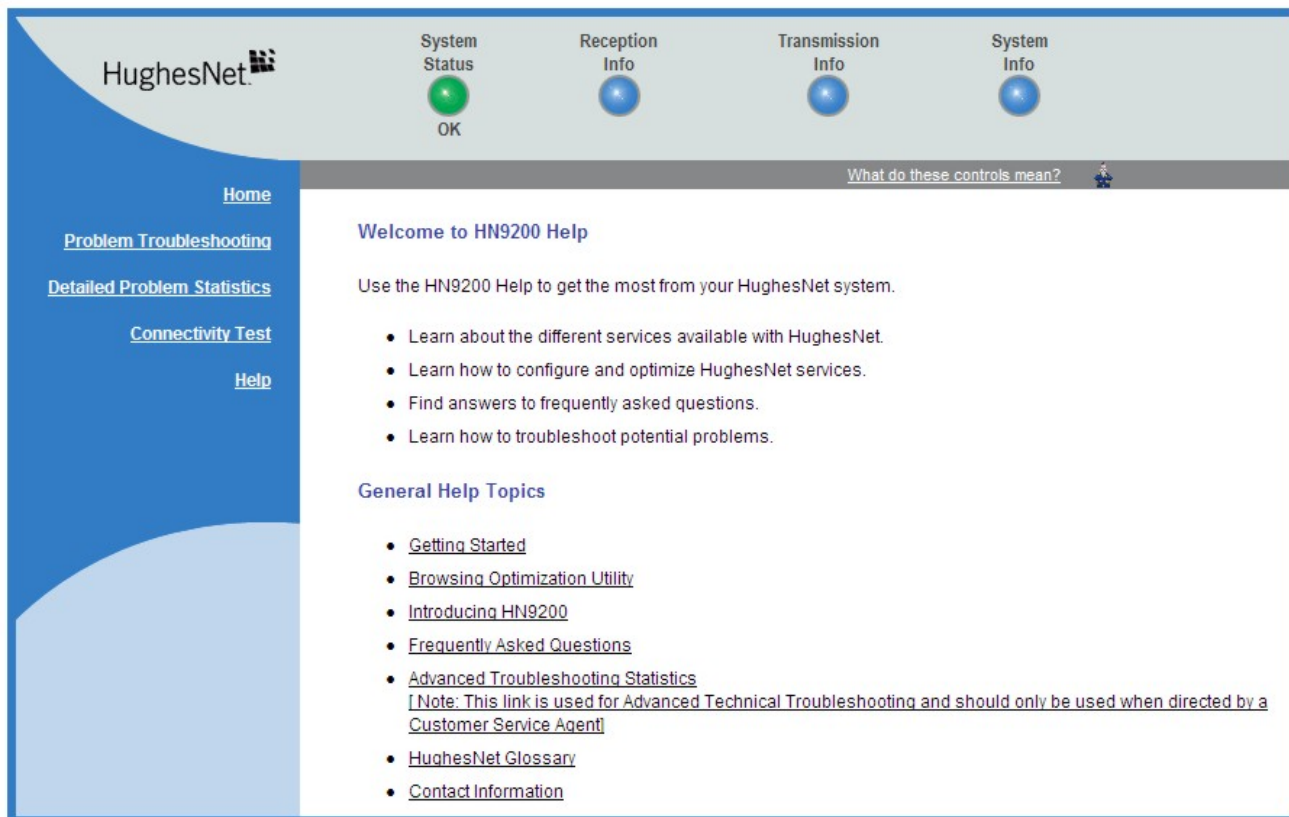
Figure 65: Help page

System Control Center tools for troubleshooting

The System Control Center includes screens that are useful for troubleshooting. For details see:

- *Troubleshooting common problems* on page 85
- *Confirming NOC connectivity* on page 91
- *Viewing problem-related statistics* on page 101

Chapter

7

LEDs

Topics:

- *Front panel LEDs*
- *LAN port LEDs*
- *Using LEDs for troubleshooting*

The satellite modem has five LEDs on the front panel and small LEDs on the LAN 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 66: Front panel LEDs on the HN9200 modem* on page 80. By their appearance—on, off, blinking, or flashing—the LEDs indicate the modem's operating status. All are blue when lit. The front panel LEDs are all blue when lit.
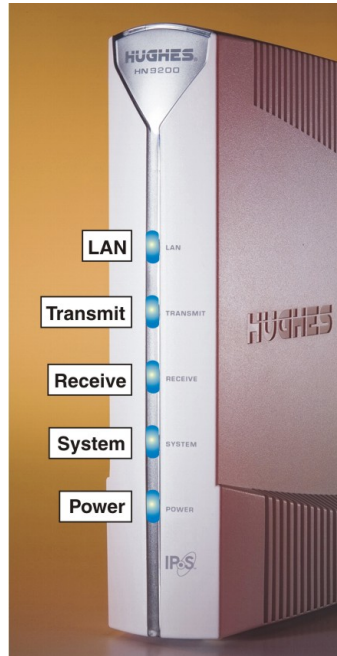
Figure 66: Front panel LEDs on the HN9200 modem

Table 10: Front panel LED indications on page 80 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. *Flashing* means the LED alternates between on and off for periods of ½ sec to 1 sec.

Table 10: Front panel LED indications

LED	Appearance	Satellite modem status
LAN	On	Satellite modem is connected to a computer network card or Ethernet device
	Blinking	Transmitting and/or receiving data
	Off	No device is connected to the LAN port or the device connected to the LAN port is not working properly
Transmit	On	OK – Transmit path is operational
	Blinking, mostly on	Transmitting data
	Blinking, mostly off	Ranging (The modem is measuring the distance to the satellite to calibrate transmit timing and transmit power.)
	Off *	Condition preventing transmission
Receive	On	OK – Receive path is operational

LED	Appearance	Satellite modem status
	Blinking	Receiving data
	Off *	Condition preventing receipt of data
System	**On**	Connection established with the NOC
	Blinking *	Virus protection blocking data
	Off *	Condition preventing full operation
Power	**On**	Power is on and the modem is functioning normally
	Flashing	Operating with fallback.bin (backup) version of software
	Blinking	Modem is not commissioned or has lost its configuration data
	Off *	No power

Bold type indicates LED appearance during normal operation when the satellite modem is transmitting or receiving data.

*Indicates an operational problem.

If it appears the LEDs are not functioning properly, make sure you have the correct power supply. Refer to *Table 2: Power supply specifications for the HN9200 satellite modem* on page 8 for detailed power supply information.

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 67: LAN port LEDs* on page 81.

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
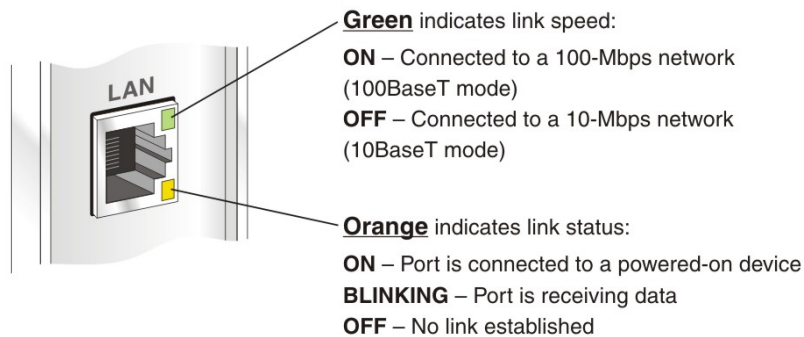
Figure 67: LAN port LEDs

Using LEDs for troubleshooting

For information on using the satellite modem's LEDs for troubleshooting, see:

- *Using the front panel LEDs for troubleshooting* on page 95
- *Using the LAN port LEDs for troubleshooting* on page 100

Chapter

8

Troubleshooting

This chapter provides troubleshooting procedures. Most section headings describe a problem you could encounter (such as **System LED is off**) or they describe troubleshooting procedures for correcting a problem (such as **Confirming Internet connectivity**). To correct a problem, find the description that matches your problem, then find the troubleshooting procedure or procedures for your problem.

If you cannot correct the problem, contact Hughes Installer Support.

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

- For explanation of **red flags** on System Control Center screens, see *Red flag indicator* on page 68.
- The **Advanced Pages** contain diagnostic and other information that may help in troubleshooting. See *Advanced Pages* on page 103.

In addition, the HN9200 satellite modem provides its own online Help, which includes substantial troubleshooting information (including troubleshooting commissioning problems). Access this information through the System Control Center **Help** link (**Help → Frequently Asked Questions**).

Another valuable source of troubleshooting information is the HughesNet Knowledge Base, available online at http://kb.hughesnet.com.

Important troubleshooting information

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.

NOTICE   This installation guide contains some procedures that instruct you to restart the modem using the Restart function in the System Control Center. When so instructed, do not power cycle the modem. Doing so will destroy data that may be useful for troubleshooting.

⚠ CAUTION   When this installation guide instructs you to power cycle the modem, you should remove and then re-apply power. If the satellite modem uses an AC/DC power supply, disconnect the AC power cord from the power source (power strip, wall outlet, or surge protector). If the satellite modem uses a DC/DC power supply, disconnect the DC input cable connector from the modem's power supply. In either case (AC/DC or DC/DC), *do not unplug the power cord from the satellite modem's rear panel.* Doing so could result in static electricity discharge that could shock you and/or damage the modem.

Troubleshooting reference diagram

If you need to use any of the troubleshooting procedures provided in this chapter, you may find it useful to refer to *Figure 68: Troubleshooting reference diagram* on page 85. This diagram shows all power and cable connections for a properly installed HN9200 satellite modem.
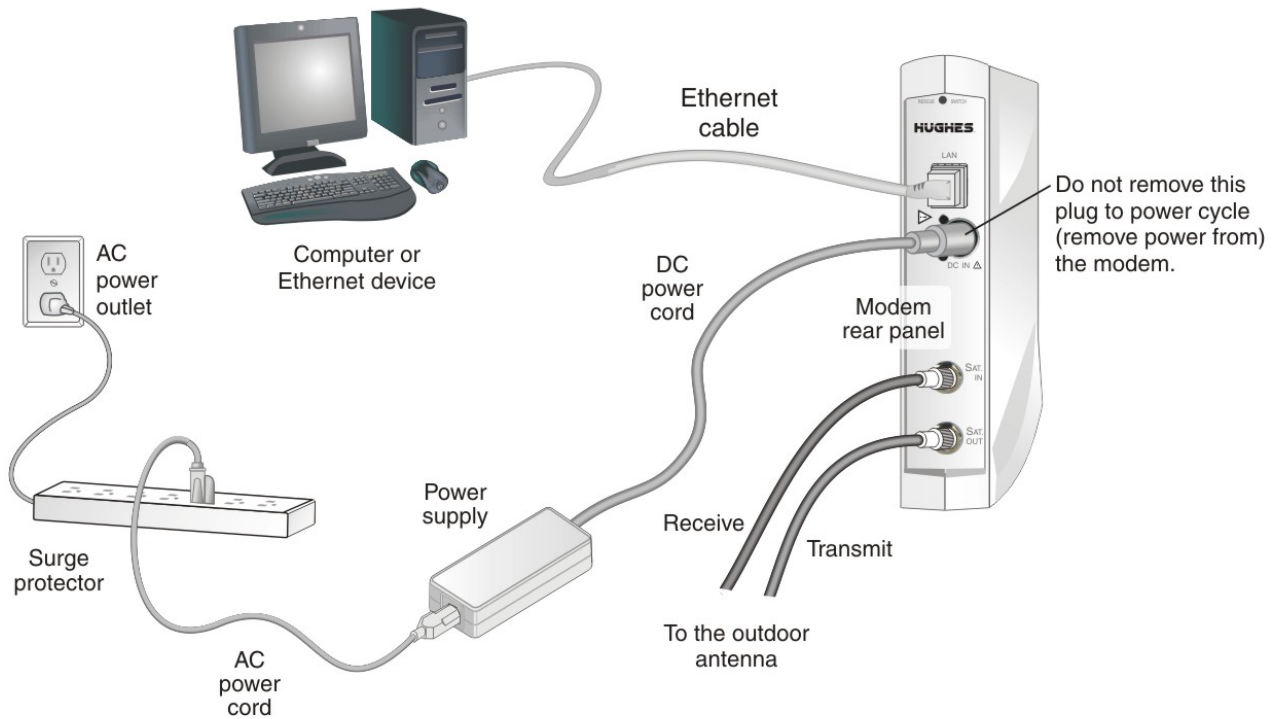
Figure 68: Troubleshooting reference diagram

Troubleshooting common problems

> 📝 **Note:** *The Problem Troubleshooting page and link are present on your HN9200 only if they have been enabled by the NOC.*

The Problem Troubleshooting page helps you correct problems you could encounter while using the satellite modem. Follow these steps to use the Problem Troubleshooting page to diagnose and correct a problem:

1. Click the **Problem Troubleshooting** link in the left panel of any System Control Center page—except, on the System Control Center home page, the **Problem Troubleshooting** link is located below the DIAGNOSTIC UTILITIES heading.
   The Problem Troubleshooting page opens (*Figure 69: Problem Troubleshooting page* on page 86).
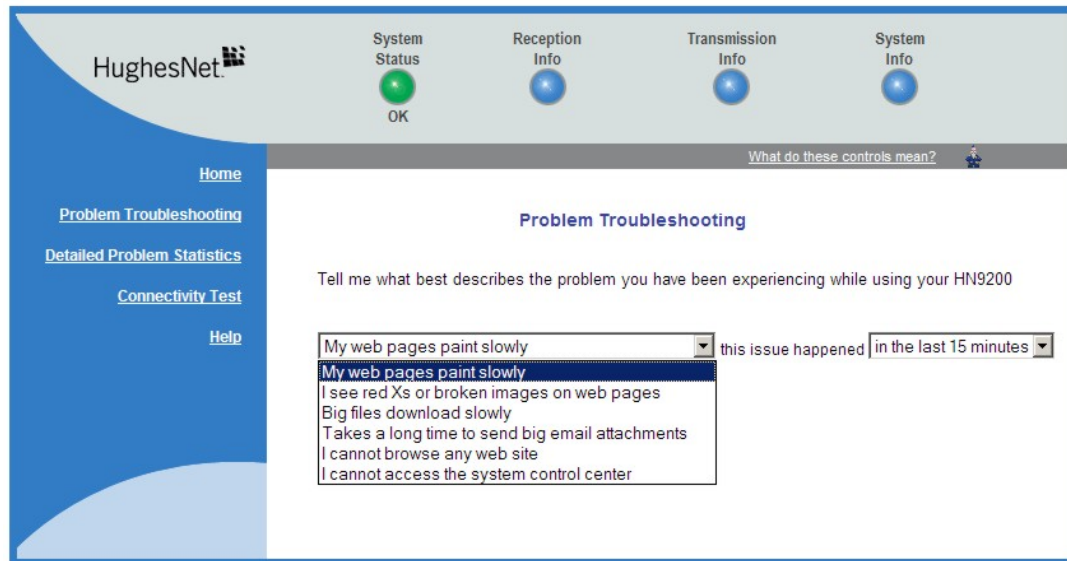
Figure 69: Problem Troubleshooting page

2. From the drop-down list to the left, select the symptom that best describes the problem you are experiencing.

3. From the drop-down list to the right, select how long ago you experienced the problem.

4. Click **Diagnose**.

5. A screen appears, identifying the problem.
   For example, one problem you could see is **Uplink Queuing**. The problem is underlined, indicating that this is a link. If an asterisk appears next to the problem link, this means the problem occurred in previous hours as well.

6. Click the problem link.
   A screen explains the problem and possible remedial actions.

7. Follow the troubleshooting instructions on the screen.

8. If these steps do not correct the problem, contact Installer Support.

Cannot access the Internet

If you can access the System Control Center but you cannot access the Internet, you may be able to resolve the problem by performing some or all of the following troubleshooting procedures:

- *Confirming that the satellite modem is commissioned* on page 87
- *Confirming the receive signal* on page 88
- *Confirming the transmit signal* on page 88
- *Confirming that TCP Acceleration is operational* on page 89
- *Confirming that Web Acceleration is operational* on page 90
- *Confirming NOC connectivity* on page 91
- *Confirming Internet connectivity* on page 93
- *Checking for viruses and firewall issues* on page 94

Try each procedure in the order they are presented. After each procedure, try to access the Internet. If you cannot access the Internet, continue to the next procedure.

If you have tried all of these procedures and cannot access the Internet, try them all again. If you still cannot access the Internet, contact Hughes Installer Support.

For most of these troubleshooting procedures you use the modem's System Control Center. To access the System Control Center on a computer connected to the modem:

1. Open a web browser such as Internet Explorer.

2. In the browser's address bar, type www.systemcontrolcenter.com or 192.168.0.1.

3. Press **Enter**.
   The System Control Center home page opens.

Confirming that the satellite modem is commissioned

To confirm that the modem is commissioned:

1. At the System Control Center, click the **System Info** link.

   The System Information page appears.
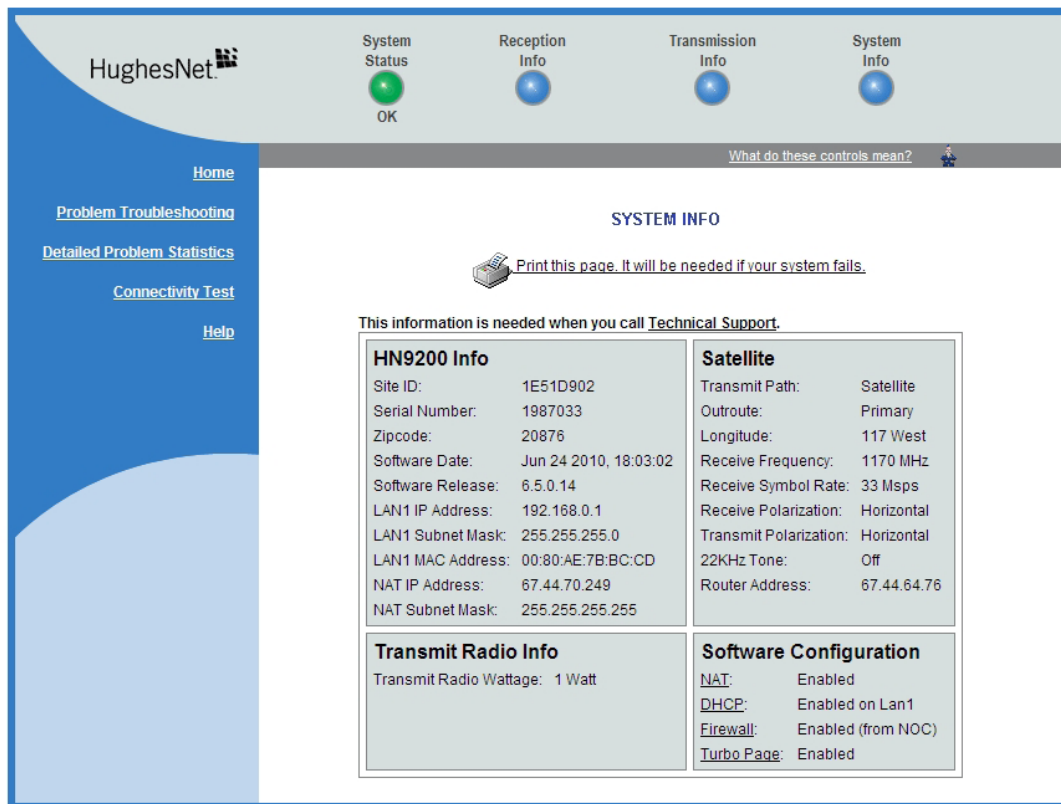
Figure 70: System Info page

Note: The System Info page for your installation may show different fields and values.

2. In the **HN9200** section, check the Site ID line.

   If the numeric site ID appears, the satellite modem is commissioned. Proceed to *Confirming the receive signal* on page 88.

   If Not_Commissioned appears, the modem is not commissioned. Contact Installer Support.

Confirming the receive signal

To confirm that the modem is properly receiving satellite signals:

1. At the System Control Center, click the **Reception Info** link.
   The Reception Information page appears.

2. In the Receive Status field, check the RxCode.

   If the RxCode is Receiver operational (RxCode 5) the modem is receiving signals properly; proceed to *Confirming the transmit signal* on page 88.

   If any other RxCode appears, the modem is not receiving signals properly. Click the RxCode, and follow the troubleshooting procedure that appears. Click the RxCode for explanation of the problem and/or troubleshooting information.
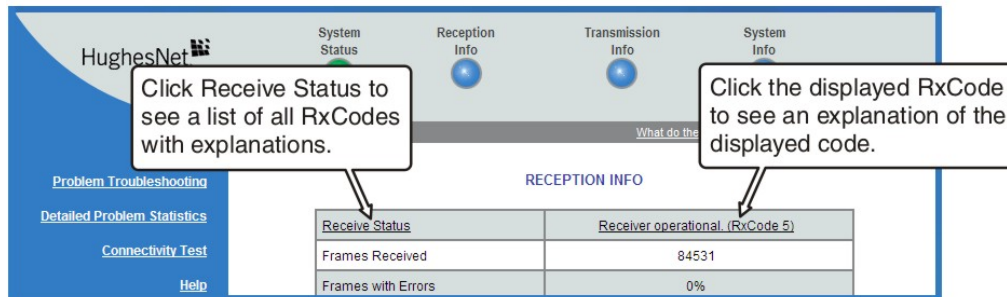
Figure 71: Reception Info page

Note: The RxCode shown is an example.

Confirming the transmit signal

To confirm that the modem is properly transmitting signals to the satellite:

1. At the System Control Center, click the **Transmission Info** link.
   The Transmission Information page appears.

2. In the Transmit Status field, check the TxCode.

   If the TxCode is Transmitter Ready (RxCode 8) the modem is transmitting signals properly; proceed to *Confirming that TCP Acceleration is operational* on page 89.

   If any other TxCode appears, the modem is not transmitting signals properly. Click the TxCode for explanation of the problem and/or troubleshooting information.
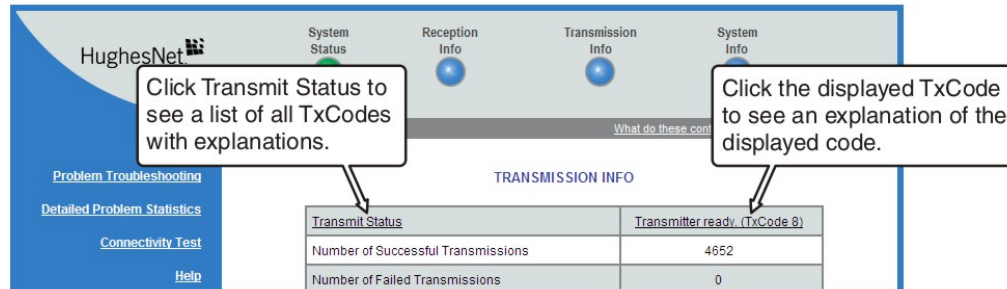
Figure 72: Transmission Info page

Note: The TxCode shown is an example.

Confirming that TCP Acceleration is operational

TCP Acceleration is a proprietary Hughes protocol that optimizes performance for TCP/IP-based applications, including faster downloads over satellite.

To determine if TCP acceleration is operational:

1. At the System Control Center, click the **System Status** link.
   The System Status page appears.

SYSTEM STATUS

Signal Strength	85
Note: Signal Strength is not an indicator of browsing speed. Precipitation can affect Signal Strength. If you do not see a red flag next to any of the status messages on this page, you should be able to browse the Internet successfully.	
Receive Status	Receiver operational. (RxCode 5)
Transmit Status	Transmitter ready. (TxCode 8)
Software Download Status	All files are up-to-date.
Service Status	Commissioned [Keys updated]
TCP Acceleration Status	Operational
Web Acceleration Status	Operational: Upstream Addr: 66.82.9.81

Figure 73: Confirming that TCP Acceleration is operational

2. Check the TCP Acceleration Status field.

   If the TCP Acceleration Status is Operational, TCP Acceleration is enabled and working properly. Proceed to *Confirming that Web Acceleration is operational* on page 90.

3. If the TCP Acceleration Status is Disabled, restart the modem:
   a) Go to the System Control Center home page.
   b) In the Help section, click **Restart HN9200**.

4. If TCP Acceleration is still disabled, power cycle the modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

⚠ **CAUTION** ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity

discharge that could shock you and/or damage the modem.

5. If TCP Acceleration is still disabled, power cycle the Ethernet device according to the device documentation.

6. If TCP Acceleration is still disabled, restart the computer.

7. Check the TCP Acceleration Status field again.

   If TCP Acceleration is **enabled** but you still cannot access the Internet, go to *Confirming that Web Acceleration is operational* on page 90.

   If TCP Acceleration is still **disabled**, contact Installer Support for assistance.

   Note: TCP Acceleration Status may also be Not Operational (problem with the receive or transmit link) or Impaired. Impaired status may result from a number of factors; in many cases it clears within a minute or two.

Confirming that Web Acceleration is operational

Note: This section applies only if the NOC operator has enabled Web Acceleration on the satellite modem.

Web Acceleration is a Hughes feature that enhances browsing performance on non-secure web sites. Follow these steps to confirm that Web Acceleration is operating properly:

1. From any System Control Center page, observe the System Status button indicator.

   • If the indicator button is green, Web Acceleration is functioning normally.
   • If the indicator button is yellow, Web Acceleration may not be operational. Continue to the next step.

2. Click the **System Status** link to access the System Status page.

3. Observe the message in the Web Acceleration Status field.

   If the Web Acceleration Status is Operational, Web Acceleration is enabled. Proceed to *Confirming NOC connectivity* on page 91.

   Note: Web Acceleration Status may be Operational or Inactive during normal operation. Connecting does not indicate a problem unless it persists for more than a few seconds.

4. If the Web Acceleration Status is Not operational, Web Acceleration Status is disabled. Follow these steps:

   a) Make sure the modem is transmitting and receiving. See *Confirming the receive signal* on page 88 and *Confirming the transmit signal* on page 88. If necessary, troubleshoot as stated in these sections.

   b) Wait 2 hr.

5. If Web acceleration is still disabled, restart the modem:

   a) Go to the System Control Center home page.

   b) In the Help section, click **Restart HN9200**.

6. If Web acceleration is still disabled, power cycle the modem:

   a) Unplug the power cord from the power source.

   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.

   c) Wait 10 sec.

   d) Plug the power cord back into the power source.

   e) *If the power source is DC,* plug the input cable back into the power supply.

> **⚠ CAUTION** ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

7. Check the Web Acceleration Status field again.

If Web Acceleration is still not operational, contact your service provider for assistance.

Confirming NOC connectivity

Use the Connectivity Test page to check connectivity to the Hughes Network Operations Center (NOC). You may want to open a second web browser to access the Help page while you execute a connectivity test.

1. Click **Connectivity Test** on the System Control Center page to access the Connectivity Test page.
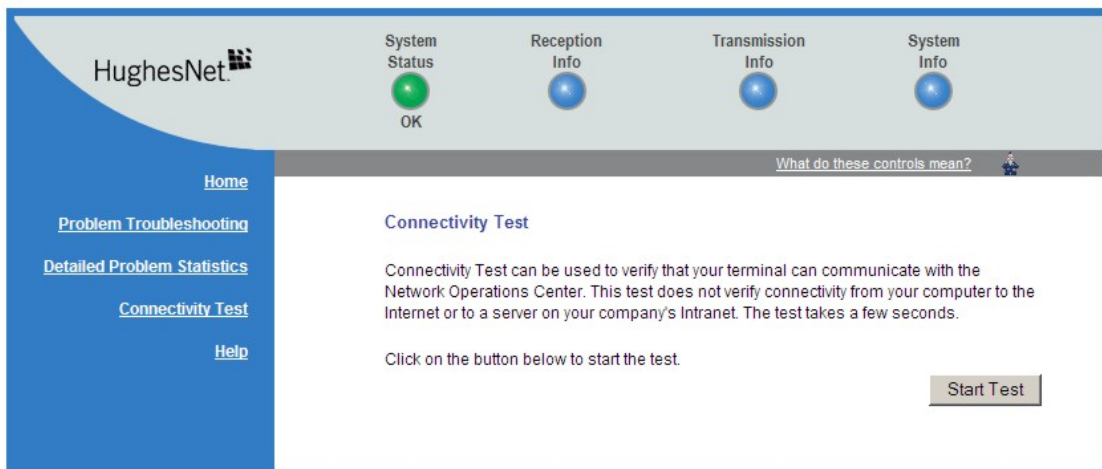
Figure 74: Connectivity Test – initial page

2. Click **Start Test**. The Connectivity Test results page appears.
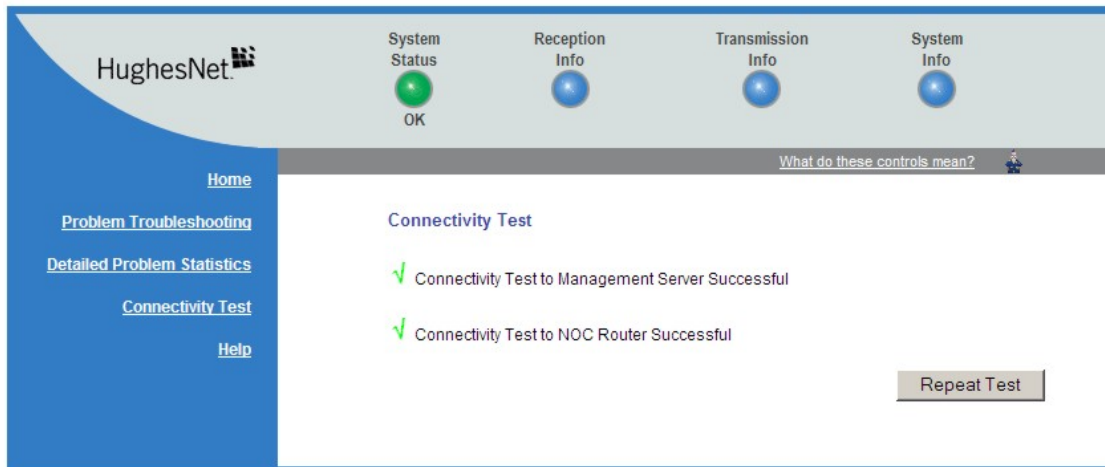
Figure 75: Connectivity Test – results page

3. If the connectivity test succeeds but you still cannot access the Internet, follow these steps to ping the modem address from your computer.

   For more information on the ping test, see *Verifying the Ethernet connection* on page 23.

   a) At the System Control Center, click the **System Info** link.
      The System Information page appears.

   b) Record the modem address listed in the **HN9200 Info** section.

   c) On the Windows desktop, go to **Start → Run**.
      The **Run** box appears.

   d) In the Open field, type command.

   e) Click **OK**.
      The Command window appears.

   f) At the prompt, type ping followed by a space and the modem address.
      For example, if the modem address is 172.19.19.1, type ping 172.19.19.1.

   g) Press **Enter**.

   If pinging the modem address succeeds but you still cannot access the Internet, skip to *Confirming Internet connectivity* on page 93.

Confirming NOC connectivity (Static IP Address)

This section applies only if the modem is using a static IP address.

If pinging the modem address fails, and DHCP is disabled on the modem, the default gateway address is probably not set correctly in the computer's operating system settings. The default gateway address should be the modem IP address as displayed on the System Information page **HN9200 Info** section, in the LAN1 IP Address field.

1. Check the default gateway address in the computer operating system's network properties settings; make sure it is the same as the satellite modem's IP address (LAN1 IP Address).

2. Ping the modem address from your computer.

   For information on the ping test, see *Verifying the Ethernet connection* on page 23.

3. If the ping test fails, restart the satellite modem:

   a) Go to the System Control Center home page.

   b) In the Help section, click **Restart HN9200**.

4. If restart does not correct the problem, power cycle the satellite modem:
    a) Unplug the power cord from the power source.
    b) *If the modem is connected to a DC power source,* unplug the DC input cable from the modem's power supply.
    c) Wait 10 sec.
    d) Plug the power cord back into the power source.
    e) *If the power source is DC,* plug the input cable back into the power supply.

    ⚠ **CAUTION**   ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

5. If you still cannot access the Internet, contact your service provider.

Confirming Internet connectivity

To troubleshoot Internet connectivity issues for customers whose service providers offer Internet connectivity:

If you lose access to the Internet, this could be a result of a temporary Internet problem or a problem with the site you are trying to access. If you lose Internet connectivity, try these troubleshooting steps:

1. Open a command prompt on a computer connected to the modem.
2. Ping the HughesNet web server:
    a) Type ping www.hughesnet.com (or other server address provided by the customer).
    b) Press **Enter**.

    If the ping test succeeds, there may be a temporary problem with the web site you originally tried to access. Wait a while and then try to access the web site again. If the ping test fails, continue with these steps.

3. Ping the test server:
    a) Type ping 198.77.116.39.
    b) Press **Enter**.

    If the ping test is successful but you still cannot browse the Internet, complete the procedures in *Checking the DNS setting* on page 93.

    If the ping test fails, contact Installer Support for assistance.

Checking the DNS setting

If you can ping the test server but cannot browse the Internet, follow these steps to check the DNS settings on your computer. The steps may vary slightly based on your computer's operating system.

1. On the Windows task bar, click **Start → Run.**
2. In the Run window, type **command**.
3. Click **OK**.
4. Type ipconfig /all and press **Enter**.
5. Locate the DNS addresses in the DNS Servers field.

6. For customers who have their own NOC, verify that the customer-specific DNS address appears in the DNS Servers field.

7. Close the Command window.
   If the DNS address is correct, wait a while and try to access a web site again. There may be a temporary Internet connection outage. If you are still cannot access a web site after waiting, complete the procedures in *Checking for viruses and firewall issues* on page 94. If the DNS address is not correct, contact Installer Support for assistance.

Checking for viruses and firewall issues

If you have confirmed all connections but still cannot access the Internet, check the computer (and all other computers on the same network) for viruses. If you find a virus, delete or disable it, then try to browse the Internet again.

If you are using a firewall, refer to the firewall documentation and make sure none of its settings are blocking access to either the Internet or the Hughes servers. Make sure you are using the latest version of any anti-virus and/or firewall software.

Cannot access the System Control Center

If you cannot access the System Control Center, follow the troubleshooting procedure that corresponds to your hardware configuration:

- Satellite modem connected directly to a computer
- Satellite modem connected to an Ethernet device

Satellite modem connected directly to a computer

Follow the steps below if the modem is connected directly to a computer.

1. On the computer desktop, double-click the System Control Center shortcut icon.

2. If the System Control Center does not appear, open a web browser.

3. Type www.systemcontrolcenter.com in the browser's address bar.

4. Press **Enter**.

5. If the System Control Center does not appear, type 192.168.0.1 in the browser's address bar.

6. Press **Enter**.

7. If the System Control Center does not appear, check the LAN cable connections at the satellite modem and at the computer. Check the physical connections and look for LED activity on both LAN ports.
   If there is no LED activity, there could be a problem with the connection or NIC.

If the System Control Center does not appear, repeat these steps. If it still does not appear, contact Installer Support.

Satellite modem connected to an Ethernet device

If the satellite modem is connected to an Ethernet device such as a router or a wireless base station, follow these steps:

1. Disconnect the Ethernet cable from the device.

2. Using an Ethernet cable you know is good, connect the satellite modem LAN port directly to the Ethernet port on the computer.

   This temporarily bypasses the Ethernet device as a way to help determine where and what the problem is.

3. Power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

   ⚠ CAUTION ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

4. Attempt to access the System Control Center by completing the steps in *Satellite modem connected directly to a computer* on page 94.
5. If you cannot access the System Control Center, restart the computer.
6. Try again to access the System Control Center.

If you still **cannot** access the System Control Center, contact your service provider.

If you **can** now access the System Control Center, your Ethernet device may not be properly configured. Refer to the documentation for your Ethernet device to configure it properly. Be sure to re-connect the satellite modem to the Ethernet device before attempting to access the System Control Center.

Using the front panel LEDs for troubleshooting

This section explains how to use the satellite modem's front panel LEDs to recognize and troubleshoot problems.

Before proceeding, make sure the transmit and receive cables are securely tightened.

NOTICE

- Make sure each connector is properly aligned (not cross-threaded).
- Finger tight with no connector play is adequate.

📝 **Note:** The 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, correct operation of the satellite modem's is not an indication that the cables are adequately tightened.

Power LED off and one or more LEDs flashing

If after power-up or a reset the Power LED is off and one or more of the other LEDs is flashing, the modem could have a fatal error and may have to be replaced. If *all* LEDs are flashing, go to *All LEDs flashing* on page 96.

> **Note:** If the Power LED is flashing but no other LED is flashing, this does not indicate a problem.

1. If the Power LED is off and one or more of the other LEDs is flashing, try power cycling the modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

   ⚠ **CAUTION**   ⚡ 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 to the modem.

   The modem may recover.

2. If the fatal error indication continues, the modem must be replaced. Contact Installer Support.

All LEDs flashing

If all LEDs are flashing simultaneously, this indicates that the satellite modem's firmware is corrupted. A modem in this state cannot be recovered. Contact Installer Support for assistance.

All LEDs off

If all LEDs on the front panel are off:

1. Make sure all power connections are secure.
2. If the AC power cord is connected to a power strip or surge protector, make sure the power strip or surge protector is turned on.
3. If the power connections are secure, power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

   ⚠ **CAUTION**   ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static

electricity discharge that could shock you and/or damage the modem.

4. Test the power outlet (with a lamp, for example) to make sure there is not a problem with the power source.

5. If the LEDs do not turn on, contact Installer Support.

Checking the Power LED

If the Power LED is off, check the power supply connections. (The modem does not have an off/on switch.) If the Power LED is on, proceed to *Checking the LAN LED* on page 97.

Checking the LAN LED

If the front panel LAN LED is off:

1. Disconnect and reconnect the Ethernet cable from the modem and from the computer. Make sure the cable is securely connected to the modem LAN port and to the computer's LAN port.

2. If the LAN LED is still off, power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

   ⚠ CAUTION Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

3. If the LAN LED is still off, check the LAN port LEDs on the back panel.
   - If the Orange LED is on and the front panel LAN LED is not, contact Installer Support for assistance.
   - If both the Orange LED and the front panel LAN LED are off, check all network equipment that connects the computer with the modem, including the computer's Ethernet card, Ethernet cable(s) and any switch or hub. Replace one or more of the items to try to isolate the problem.

4. If the front panel LAN LED is still off, check the Windows Device Manager to see if the computer's NIC or *network adapter* is installed correctly.
   a) In Windows XP, for example, click **Start** → **Settings** → **Control Panel** → **System** → **Hardware** → **Device Manager**.
      A screen appears listing all the devices installed on the computer.
   b) Look for Network adapters.
      If the NIC is not properly installed, a red X appears next to its listing.
   c) If a red X is present, troubleshoot the NIC installation using the manufacturer's instructions and Windows documentation.

5. If the LAN LED is still off, follow this step *only if the satellite modem is connected to a hub, router, or other network device (that is, not connected directly to the computer).* Connect the computer directly to the satellite modem (to bypass the network device) as follows:

a) Disconnect the Ethernet cable from the device.

b) Using an Ethernet cable you know is good, connect the satellite modem LAN port directly to the Ethernet port on the computer.

This temporarily bypasses the Ethernet device as a way to help determine where and what the problem is.

c) Check the modem's LAN LED.

If the LAN LED is on, but was off before you made this direct connection, there is probably a problem with your network device or the connections to it. Check those connections. If the LAN LED is still off after checking the connections, contact the manufacturer of the network device for assistance.

6. If you have not found any problem so far, but the LAN LED is still off, power cycle the modem again.

7. If the LAN LED is still off, power cycle the Ethernet device according to the device documentation.

8. If the LAN LED is still off, restart the computer.

9. If the LAN LED is still off, try connecting the satellite modem to another computer.

If the front panel LAN LED is now **on**, there may be a problem with the customer's computer that was connected to the satellite modem.

If the LAN LED is still **off**, contact Installer Support.

Problem with a connected device

If a device *other than a computer* is connected to the satellite modem, the System Control Center is probably never accessible. However, you can troubleshoot based on the following LED conditions. For details, go to the listed page.

- *Transmit LED is off* on page 98
- *Receive LED is off* on page 99
- *System LED is off* on page 99

Transmit LED is off

If the satellite modem is not operating normally and the Transmit LED is off, follow these steps:

1. Check all cable connections, from the satellite modem to the outdoor satellite antenna, and tighten any connections that seem loose.
Make sure cable connections to the modem are secure (properly aligned—not cross threaded; finger tight with no play).

   Note: The 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, correct operation of the satellite modem is not an indication that the cables are adequately tightened.

2. If the LED is still off, check the cable for breaks.
3. If the problem persists, contact Installer Support.

Receive LED is off

If the satellite modem is not operating normally and the Receive LED is off, follow these steps:

1. Check all cable connections, from the satellite modem to the outdoor satellite antenna, and tighten any connections that seem loose.
Make sure cable connections to the modem are secure (properly aligned—not cross threaded; finger tight with no play).

   > **Note:** The 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, correct operation of the satellite modem is not an indication that the cables are adequately tightened.

2. If the LED is still off, restart the modem:
   a) Go to the System Control Center home page.
   b) In the Help section, click **Restart HN9200**.

3. If the LED is still off, power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

   > **⚠ CAUTION** ⚠ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

4. If the problem persists, contact Installer Support.

System LED is off

If the System LED is off, but the Transmit and Receive LEDs are on, there may be a problem at the NOC. Take the following steps.

1. Wait 15 minutes.

   If there is a problem at the NOC, it may soon be corrected and the System LED comes on. You can then resume normal operation.

2. If the LED does not turn on after 15 minutes, power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

⚠ **CAUTION** ⚡ Do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

3. If the problem persists, contact Installer Support.

Using the LAN port LEDs for troubleshooting

The LAN port on the modem's rear panel has two small LEDs (green and orange) as illustrated in *Figure 67: LAN port LEDs* on page 81. This section explains how to use the LAN port LEDs to troubleshoot a LAN port problem.

Orange LED and the front panel LAN LED are both off

If both the orange LED and the front panel LAN LED are off:

1. Check all network equipment that connects the satellite modem with the computer, including the computer's network card, network cable(s), and switch or hub if used.
2. If possible, replace any of these items one at a time to try to isolate the problem.
3. If the equipment seems to be OK, power cycle the satellite modem:
   a) Unplug the power cord from the power source.
   b) *If the modem is connected to a DC power source,* unplug the DC input cable from the satellite modem's power supply.
   c) Wait 10 sec.
   d) Plug the power cord back into the power source.
   e) *If the power source is DC,* plug the input cable back into the power supply.

⚠ **CAUTION** ⚡ 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 to the modem.

Orange LED is on but the front panel LAN LED is not

If the orange LAN port LED is on but the front panel LAN LED is not, contact your service provider for assistance.

Troubleshooting other problems

This section provides troubleshooting help for possible problems that are not included in the preceding troubleshooting sections.

Slow speed or intermittent operation

If you notice that the modem's transmission speed is slow or that operation is intermittent, make sure the transmit and receive cable connectors are finger tight. (Make sure connectors are properly aligned—not cross threaded, and finger tight with no play.)

Viewing problem-related statistics

> **Note:** *The Detailed Problem Statistics page and link are present on your HN9200 only if they have been enabled by the NOC.*

You can use the Detailed Problem Statistics page to view selected operational statistics recorded over a recent specific hourly time frame.

To view statistics:

1. Click **Detailed Problem Statistics** on the System Control Center home page—or in the left panel of other System Control Center pages.
   The Detailed Problem Statistics page appears.
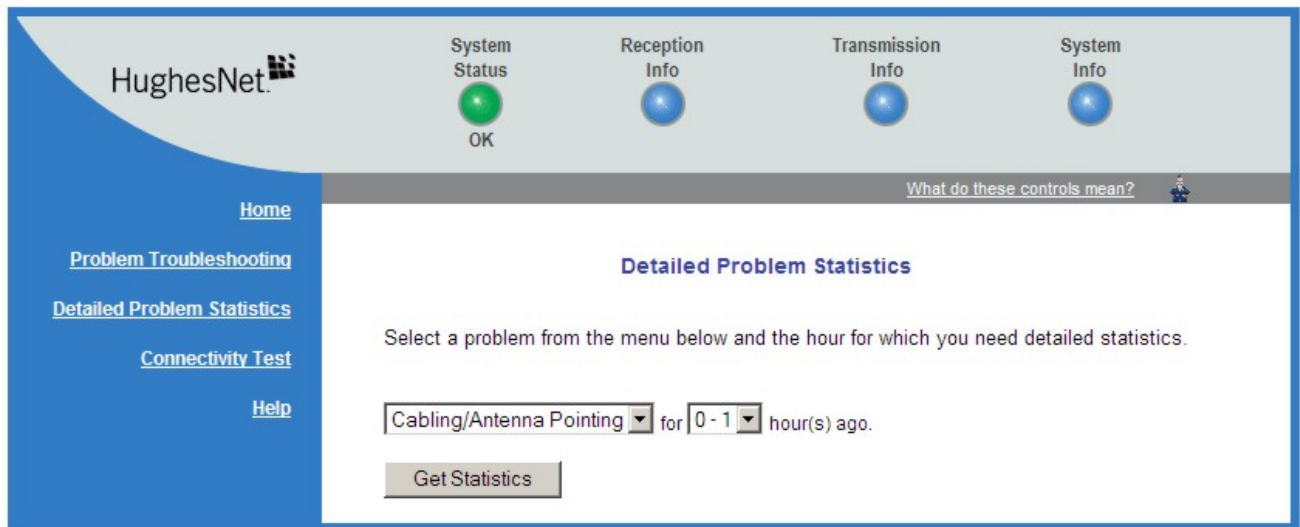
Figure 76: Detailed Problem Statistics

2. From the drop-down list above the **Get Statistics** button, select a category of statistics (for example, TCP Acceleration).
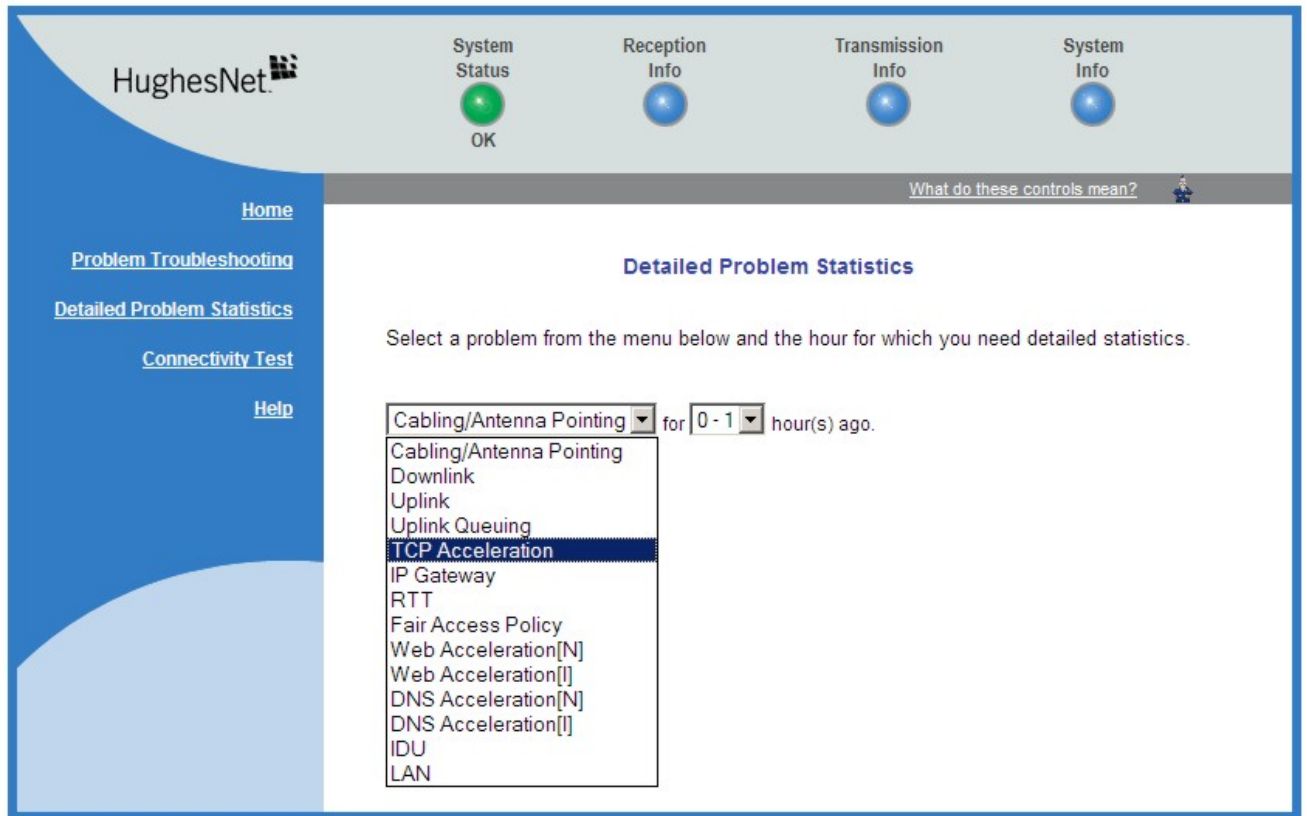
Figure 77: Selecting a category of statistics

3. Select a time period (for example, 0 - 1 hour ago).

4. Click **Get Statistics**.
    The System Control Center displays the statistics you requested.

Note: Most of the displayed statistical information is very technical and requires interpretation by a trained technician.

Checking for possible AC outlet problems

If you are troubleshooting a problem and you have tried other steps but they have not solved the problem, there could be a problem with the AC power outlet. Check the outlet wiring, and measure the voltage between neutral and ground at the AC outlet, as explained in *Power source* on page 5.

Chapter

9

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

You can access the Advanced Pages using either of the following methods:

- On the System Control Center home page, click the small icon indicated by the arrow in *Figure 78: Icon for accessing Advanced Pages (arrow)* on page 104. The icon is a link to the Advanced Pages.
- Type 192.168.0.1/fs/advanced/advanced.html in the browser's address bar and press **Enter.**
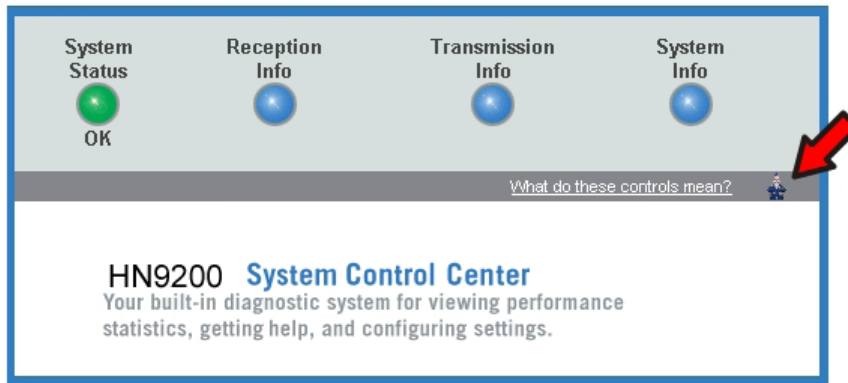
Figure 78: Icon for accessing Advanced Pages (arrow)

Figure 79: Advanced Pages example showing the Advanced menu on page 104 shows an example, one of the many available Advanced Pages. Other Advanced Pages are available through the Advanced menu in the left panel.
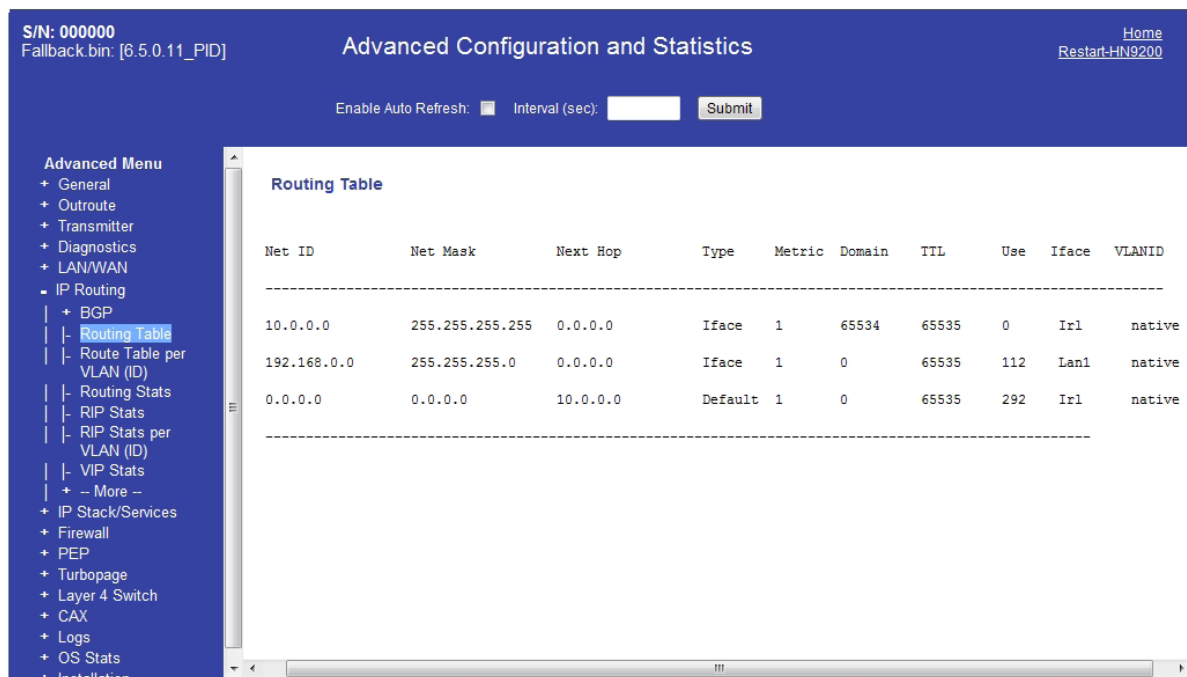
Figure 79: Advanced Pages example showing the Advanced menu

Expanding and collapsing menus

To expand the Advanced Menu on the left side of the screen to show additional selections, click 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 **Installation**.

Appendix

A

LNB selection reference

This appendix applies to the commissioning task of entering the radio parameters (*Entering radio parameters* on page 33). As part of this task you select the LNB for your installation from a drop-down list.

If you are not sure which LNB to select on the Receive LNB Selection screen (*Figure 22: Receive LNB Selection screen—two variations* on page 34), the illustrations in this appendix may help you identify the installed LNB and therefore which option you should select from the drop-down list. The list of LNBs you see depends on the how the modem is configured.
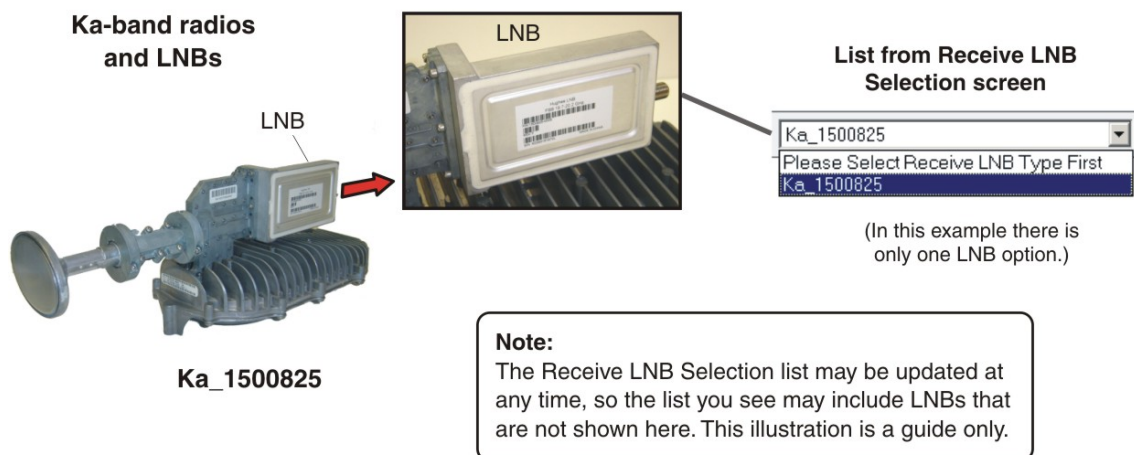
Figure 80: Selection aid for Ka-band LNBs

For some antennas this housing is not used.

LNB

LNB

PureKu

Ku-band radios and LNBs

LNB

LNB

Invacom_UniversalKu

List from Receive LNB Selection screen

Please Select Receive LNB Type First
Please Select Receive LNB Type First
PureKu
Invacom_UniversalKu
HNS1500287-0001
HNS1500287-0002
HNS1500287-0003
ASCSignalDRU15F16KuExtRef
InvacomSVP55KuExtRef
InvacomSVP65KuExtRef
InvacomSVP75KuExtRef
ZinwellZK-PF2
Norsat3030x_CExtRef
HNS1024573-0001_ExtC
HNS1024573-0002_IndiaC

Do not select any of these LNBs.

Label with LNB part number

LNB

LNB

Note:
The Receive LNB Selection list may be updated at any time, so the list you see may include LNBs that are not shown here. This illustration is a guide only.

For the TG radio type shown at left, select the part number that appears on the LNB label.

But, if the part number is...	Select...
1024572-0001	HNS1500287-0001 (Intelsat)
1024572-0002	HNS1500287-0002 (U.S. and Canada)
1024572-0003	HNS1500287-0003 (Asia/Eutelsat)

TG style with part numbers listed at right

Figure 81: Selection aid for Ku-band LNBs

Appendix

B

Updating the modem software

The Fallback Updater utility updates the modem's fallback.bin file with the current software release. Update the fallback.bin file only if you are instructed to do so by Hughes.

The Fallback Updater is typically distributed to installers, when it is needed, as a .ZIP file in an email message and may also be available for download from your installation support web site. If you need the web site address, contact Installer Support.

Extracting files

These are general instructions for extracting the Fallback Updater files.

1. Create a folder for the Fallback Updater on your installer laptop.
2. Copy the .ZIP file to the folder you created.
   This file contains the Updater utility and all supporting files.

3. Extract the files from the .ZIP file to the same folder or to another folder.
   It is recommended that you extract the files to a folder that will contain only the extracted files.

Update instructions

The files extracted with the Fallback Updater include instructions for using the Fallback Updater. To ensure success, follow the provided instructions exactly.

The instructions may include troubleshooting information.

⚠ CAUTION   ⚠   If troubleshooting instructions tell you to power cycle the modem, do not power cycle the satellite modem by unplugging the power cord from the modem's rear panel. Doing so could result in static electricity discharge that could shock you and/or damage the modem.

Appendix

C

Standards compliance

The HN9200 satellite modem has been certified to comply with the standards listed in *Table 11: HN9200 standards compliance* on page 111. Additional information follows the table.

Table 11: HN9200 standards compliance

Category	Standard
Safety	UL60950-1 for the USA
	CAN/CSA-C22.2 No. 60950-1 for Canada
	EN60950-1 for the EU
Electromagnetic Interference (EMI)	FCC Part 15 for the USA
	ICES-003 for Canada
Electromagnetic Compatibility (EMC)	EN 301 489-1 and EN 301 489-12 for the EU
Telecommunications	TIA IPoS

Safety – Operating conditions for Canada

In addition to the warnings and safety guidelines listed in this document, the following operating conditions apply to the HN9200 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 to 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.

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

Electromagnetic interference (EMI)

This product conforms to EMI standards of the U.S. FCC, Canadian CSA, and European Union (EU), as detailed in the following sections. The installation and maintenance procedures in the installation guide must be followed to ensure compliance with these regulations.

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 HN9200 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 number: HN9200 (1502573-xxxx)

Canada Class B warning

The two-way Hughes system (HN9200) complies with the Canadian ICES-003, Class B standard.

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

R&TTE (EU)

This product is within the scope of the EU Radio Equipment and Telecommunications Terminal Equipment (R&TTE) Directive.

Electromagnetic compatibility (EMC)

This product conforms to the EMC standards of the European Union (EU). The installation and maintenance procedures in the installation guide must be followed to ensure compliance with these regulations.

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.

R&TTE (EU)

This product is within the scope of the EU Radio Equipment and Telecommunications Terminal Equipment (R&TTE) Directive.

IPoS

The Hughes HN9200 system is compliant with IPoS, ratified by the Telecommunications Industry Association (TIA-1008), first published in October 2003 and issued as Revision A in May 2006.

Figure 82: IPoS symbol

Appendix

D

Acronyms used in this guide

AC	Alternating current
ACP	Automatic cross-polarization
ACS	Auto-commissioning server
CAN	Canada
CD	Compact disc
CSA	Canadian Standards Association
DAPT	DiSeqC antenna pointing tool
DC	Direct current
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DOS	Disk Operating System
EMC	Electromagnetic compatibility
EMI	Electromagnetic Interference
Es/No	Energy per symbol per noise power spectral density
EU	European Union
FCC	Federal Communications Commission
FSB	Field service bulletin
HTTP	HyperText Transfer Protocol
ICES	Interference-Causing Equipment Standard
ID	Identifier
IDU	Indoor unit (satellite modem)
IFL	Inter-facility link
IP	Internet Protocol
IPSec	Internet Protocol security
ISP	Internet service provider
ISRP	A Hughes proprietary routing protocol
LAN	Local area network
LED	Light emitting diode
LLC	Limited Liability Company

LNB	Low-noise block
NAT	Network address translation
NetBEUI	Extended User Interface (network transfer protocol)
NIC	Network interface card
NOC	(Hughes) Network Operations Center
NSP	Network service provider
ODU	Outdoor unit (antenna and radio assembly)
OPI	Outdoor pointing interface
OVT	Onsite validation tool
PEP	Performance enhancing proxy
PIN	Personal identification number
RF	Radio frequency
RTT	Round trip time
R&TTE	Radio Equipment and Telecommunications Terminal Equipment
SAN	Site account number
SBC	Satellite-based commissioning
SGWFC	Satellite gateway flow control
SAT IN	Satellite in
SAT OUT	Satellite out
SQF	Signal quality factor
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UL	Underwriters Laboratory
URL	Uniform resource locator
VAC	Volts, alternating current
VDC	Volts, alternating current
VSAT	Very small aperture terminal
ZIP	Zone improvement plan (U.S. Postal Service)

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