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HN9000 Satellite Modem User Guide

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Trademarks

Contents

Understanding safety alert messages

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

Messages concerning personal injury

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

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

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

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

Messages concerning property damage

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

Safety symbols

The generic safety alert symbol ⚠ calls attention to a potential personal injury hazard. It appears next to the DANGER, WARNING, and CAUTION signal words as part of the signal word label. Other symbols may appear next to DANGER, WARNING, or CAUTION to indicate

a specific type of hazard (for example, fire or electric shock). If other hazard symbols are used in this document they are identified in this section.

Additional symbols

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

Contact information

If you experience problems with your Hughes satellite modem, first try the solutions offered in *Troubleshooting* on page 43. If you need assistance, use the contact information listed here.

If you need operational, warranty, or repair support, your contact information will vary depending on where you purchased your satellite modem. You may be supported by Hughes Customer Care or another service provider.

For modems purchased from a retail channel or Hughes sales agent

If you purchased this product through a retail channel or Hughes sales agent, you have several support options. Please try these options *in the order listed* until you find the help you need.

Begin at the HughesNet Customer Care page:

1. Open a web browser on a computer connected to the satellite modem.
2. Enter the web address www.myhughesnet.com.
3. Click the **HughesNet Customer Care** link.

The HughesNet Customer Care page opens. Options 1, 2, and 3 below are available on this page:

1. Search our Knowledge Base.

    a. In the Self help section, click **Knowledge Base Search**.
    b. Follow the on-screen instructions to find the information you need.

2. Email a Customer Care representative.

    a. In the Contact Hughes section, click **Email**.
    b. Complete the email form.
    c. Click **Email Us!**.

3. Chat with a Customer Care representative.

    a. In the Contact Hughes section, click Chat.
    b. Complete the chat form.
    c. Click **Chat with Us!**

4. Call a Customer Care representative.

    If none of the previous options helped you, call Hughes Customer Care at 1 (866) 347-3292.

For modems purchased from a value-added reseller

If you purchased this product from one of our VARs, do not contact Hughes. Contact your VAR for technical support according to the procedure supplied by them. They are trained to help you with any technical problem.

Chapter

1

Satellite modem overview

Topics:

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

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

Figure 1: HN9000 satellite modem

After your HN9000 satellite modem has been installed, you can use a web browser on your computer to access the Internet or an intranet. You can use a local area network (LAN) to extend Internet or intranet connectivity to multiple computers. This requires a properly configured NIC, an Ethernet cable or wireless connection to the LAN, and proper configuration of the computer's operating system network properties.

The modem has a System Control Center, which is described in *System Control Center* on page 9.

Terminology

In this user guide:

- *Satellite modem* and *modem* both refer to the HN9000 satellite modem.
- Acronyms are identified in *Acronyms used in this guide* on page 73.

Scope of this user guide

This user guide describes the features and operation of the Hughes HN9000 satellite modem, which provides Internet access by satellite. It also provides certain reference information, such as the meaning of the modem's front panel LEDs. The HN9000 is designed for consumers and small business users.

Audience

This guide is written for users in the United States and Canada.

Supported configurations

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

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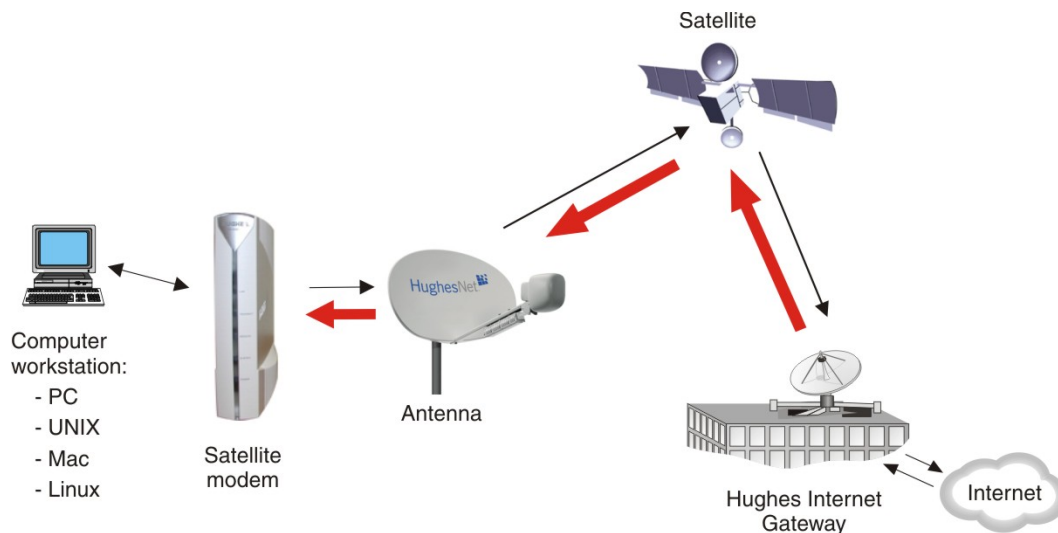
Figure 2: Single-host configuration

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

> **Note:** You must provide and configure hub, router, or wireless base station equipment if any of these are used.
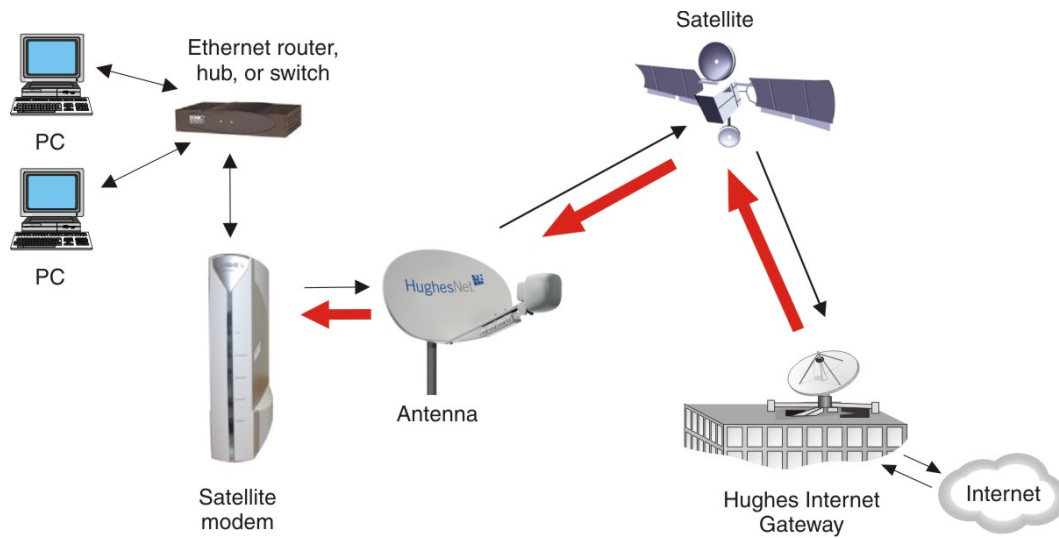
Figure 3: Multiple-host configuration in an Ethernet wired LAN

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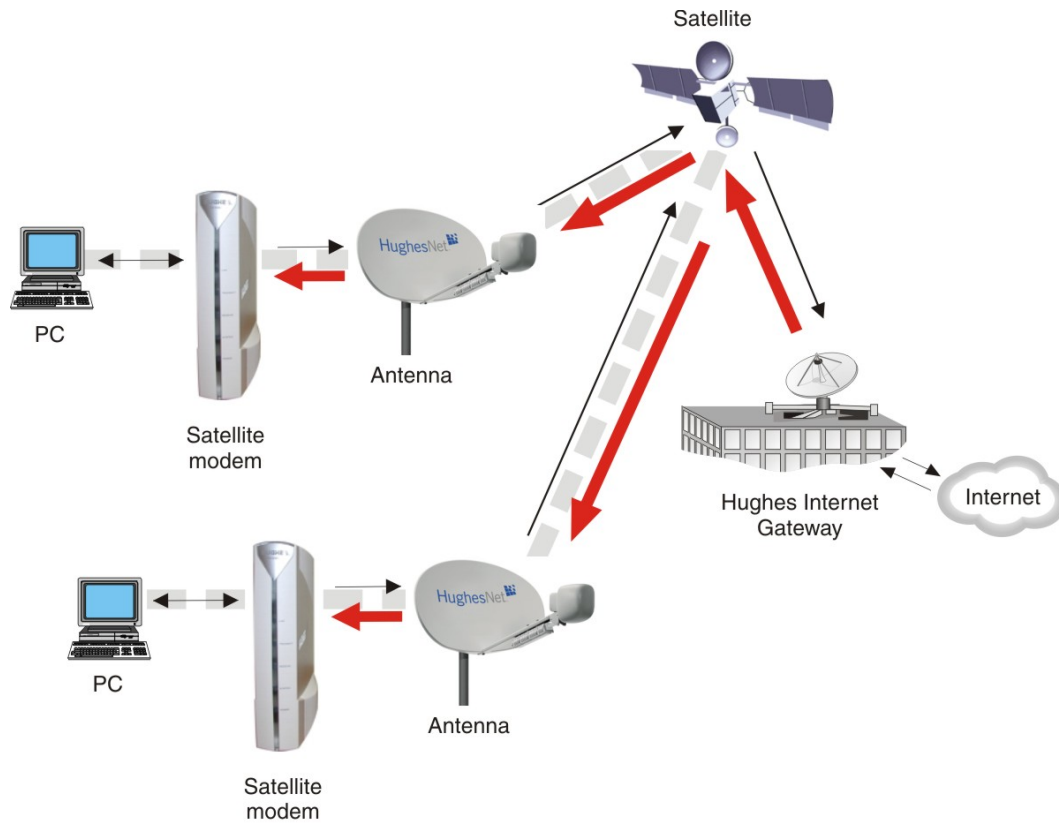
Figure 4: Private network configuration

Satellite modem specifications

Table 1: Specifications for the HN9000 satellite modem

Weight	1.6 lb (0.73 kg)
Width	8.0 inches (20.3 cm)
Height	1.6 inches (4.1 cm); 2.4 inches (6.1 cm) at base
Depth	9.0 inches (22.9 cm)
Safe operating temperature range	5 to 40º C (Above 5000 ft altitude, the maximum temperature is reduced by 1º C per 1000 ft.)
Safe operating humidity range	5% to 95% non-condensing
Safe altitude	Up to 10,000 ft
Cooling method	Convection
Protocol support	TCP/IP (Transmission Control Protocol / Internet Protocol) protocol suite
Interface ports	One Ethernet port supporting 10BaseT or 100BaseT operation, RJ-45-switched
Power supplies and power requirements	See *Power supply information* on page 4.

Power supply information

The power supply is included in the satellite modem shipping carton.
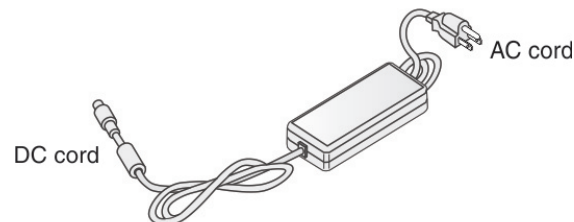
Figure 5: Power supply for the HN9000 satellite modem

NOTICE

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

Table 2: Power supply specifications for the HN9000 satellite modem

Power supply type and part number	Application	Electrical requirements	Power cord
AC/DC, 73 W P/N 1501006-0001	HN9000 satellite modem with 1 W or 2 W radio	Input line voltage: 100 – 130 V, 2 A maximum Input line frequency: 60 Hz AC Rated power consumption: 73 W	Detachable, for 110 VAC outlet type.
AC/DC, 46 W P/N 1502015-0001	HN9000 satellite modem with 1 W radio only	Input line voltage: 100 – 130 V, 1.5 A maximum Input line frequency: 60 Hz AC Rated power consumption: 46 W	Detachable, for 110 VAC outlet type.

Note: The satellite modem should be continuously powered on unless it will not be used for an extended period.

⚠ 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.

Operating environment

Observe the following requirements for the modem's operating environment.

Ventilation and heat sources

The modem must be adequately ventilated and kept away from sources of heat.

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

Operate the HN9000 modem only in a vertical position, that is, resting on its built-in base as shown in *Figure 6: HN9000 in vertical position* on page 6.

Figure 6: HN9000 in vertical position

NOTICE   Operate the HN9000 modem only in the upright vertical position as shown in *Figure 6: HN9000 in vertical position* on page 6. Any other position could result in insufficient ventilation, overheating, and malfunction.

Computer requirements

The computer that connects to the satellite modem should meet the minimum requirements specified by the computer operating system manufacturer and the following networking and browser requirements.

Networking requirements

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

    - Auto-negotiate
    - DHCP enabled (obtain an IP address automatically)

    Note: The computer can be configured to use a 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. For additional information see *Configuring a computer to use DHCP* on page 50.

Internet browser

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

- HTTP 1.1 or greater enabled
- Proxy settings disabled

Chapter

2

System Control Center

Topics:

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

Accessing the System Control Center

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

1. Open a web browser such as Internet Explorer.

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 8: System Control Center home page* on page 11.

   If you are unable to access the System Control Center, refer to *Cannot access the System Control Center* on page 44.

Creating a shortcut to the System Control Center

You can create a Windows shortcut on your computer desktop for easy access to the System Control Center home page.

Note: As part of the installation process, the person who installed your satellite modem creates a shortcut to the System Control Center, so there should already be a shortcut on your desktop—unless it has been deleted.

1. Open a web browser.

   Note: The method described here works for Internet Explorer. It may work with other browsers.

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

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

   The System Control Center home page appears.

3. Drag the icon that appears in front of the address displayed in the browser to the computer desktop.
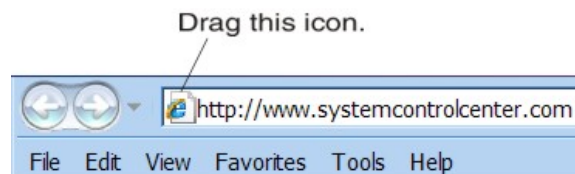
Figure 7: Icon for creating shortcut

System Control Center home page

The System Control Center home page contains numerous links to satellite modem features and important information regarding 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 13.
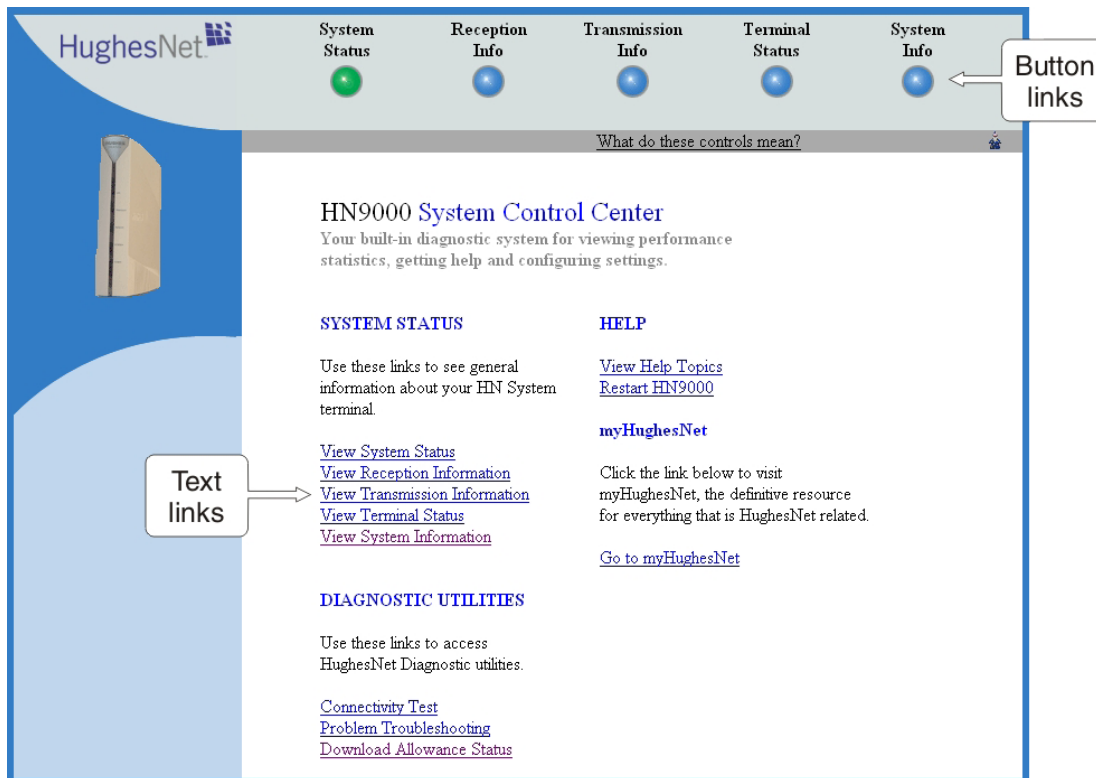
Figure 8: System Control Center home page

Note: The following apply to the screen illustrations in this user guide:

- The screen illustrations are *examples*. Values shown in these illustrations may not apply to your satellite modem. Do not use values shown to configure your modem unless you are specifically instructed to do so.
- Most screens shown in this guide are viewed with a browser such as Internet Explorer. However, in this guide, usually the browser is not shown (for example, toolbars and outside edges are not shown). Also, most screen illustrations show only the relevant part of the screen.
- On some screens and in some messages you may see the word *terminal* or the abbreviation *ST*. Both refer to the satellite modem.

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.
- **<u>View Terminal Status</u>** – Opens the Terminal Status page, which displays detailed information about the operational status of the satellite modem such as interface packet counts and acceleration statistics.
- **<u>View System Information</u>** – Opens the System Information page, which displays information such as modem identification information and IP address information.

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

Diagnostic utilities links

<u>Connectivity Test</u> – Opens the Connectivity Test page, which can be used to test the connection between the satellite modem and the satellite. See *Connectivity Test page* on page 37.

<u>Problem Troubleshooting</u> – Opens the Problem Troubleshooting page, a tool that can help you solve common problems you might encounter while using the satellite modem. For details see *Troubleshooting common problems* on page 44.

<u>Download Allowance Status</u> – Opens the Download Allowance Status screen, which shows how much remains of the daily download allowance. For details see *Checking download allowance status* on page 36.

Help link

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

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

myHughesNet

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

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

Common features on System Control Center screens

Certain features are common to some or all of the System Control Center screens, as shown in *Figure 9: Common features on System Control Center screens* on page 13. These features and other common features are explained in the following sections.
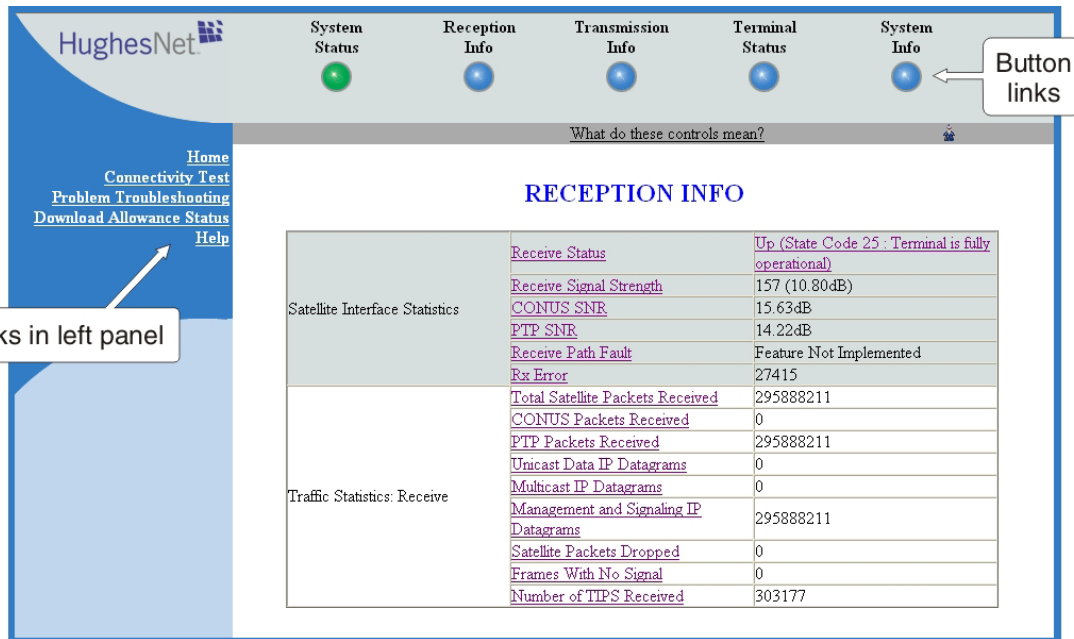
Figure 9: Common features on System Control Center screens

Button links

At the top of each System Control Center page are five round buttons with labels above them as shown in *Figure 10: System Control Center button links* on page 13. These five buttons appear at the top of every System Control Center page to provide an easy means of navigation. Each button is a link to the System Control Center page identified by the label—for example, the **System Status** button is a link to the System Status page.

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

Figure 10: System Control Center button links

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

The destination page for each button link is identified below:

Table 3: 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 17.
Reception Info	Reception Information page	Displays statistics about received data and receive connection status. For more information see *Reception Information page* on page 21.

Button	Destination	Description of destination page
Transmission Info	Transmission Information page	Displays statistics about the transmitted data and transmit connection status. For more information see *Transmission Information page* on page 24.
Terminal Status	Terminal Status page	Displays detailed information about the operational status of the satellite modem. For more information see *Terminal Status page* on page 26.
System Info	System Information page	Displays system information such as ST Name (assigned name of the satellite modem name) and operational software version. For more information see *System Information page* on page 28.

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 4: System Status button colors* on page 14. To see more detailed status information, click the System Status button to open the System Status page.

Table 4: System Status button colors

Button color	Meaning
Green	OK – The satellite modem is fully operational. The user can browse the Internet as long as on the modem has been activated for broadband service.
Yellow	Degraded – The modem is fully operational but in a degraded mode. Performance is slower than normal for any of the following reasons: • The modem is in fallback mode. • One or more TurboPage TTMP connections is not functioning. • Transmissions beyond a certain threshold number have not been received by the satellite (state code 30). This could be caused by weather conditions.
Orange	Degraded – The modem is fully operational, but performance is temporarily impaired because the daily download allowance has been exceeded. For more information see *Checking download allowance status* on page 36.
Red	There is an operational problem. The modem cannot access the satellite network.

If the System Status button is red ⬤ or yellow ⬤ , you can look for a red flag next to any value or values on the System Control Center information pages (those with tables listing parameters and values). The red flag indicates a problem related to the parameter listed next to the flagged value. Click the parameter name to see a pop-up window that may include helpful information, depending on what the problem is.

Links in the left panel

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

- **Home** – Opens the System Control Center home page.
- **Connectivity Test** – Opens the Connectivity Test page, which allows you to test the connection between the modem and the satellite. See *Connectivity Test page* on page 37.
- **Problem Troubleshooting** – Opens the Problem Troubleshooting page, a tool that can help you solve common problems you might encounter while using the satellite modem. For details see *Troubleshooting common problems* on page 44.
- **Download Allowance Status** – Opens the Download Allowance Status screen, which shows how much remains of the daily download allowance. For details see *Checking download allowance status* on page 36.
- **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

NOTICE   The System Control Center screens include a small icon as indicated by the arrow in *Figure 11: Small icon on System Control Center screens* on page 15.
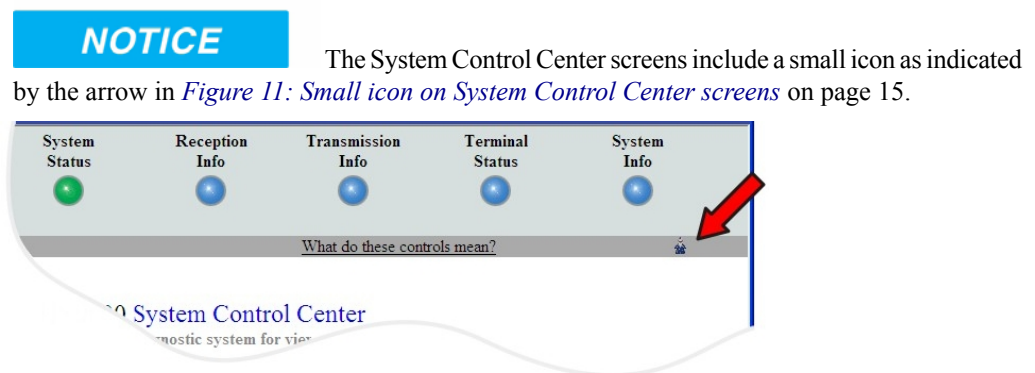
Figure 11: Small icon on System Control Center screens

Do not click this icon unless you are a qualified technician or unless a service provider representative instructs you to. You could cause the modem to become inoperable.

Status and information screens

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

- System Status page
- Reception Information page
- Transmission Information page
- Terminal Status page
- System Information page
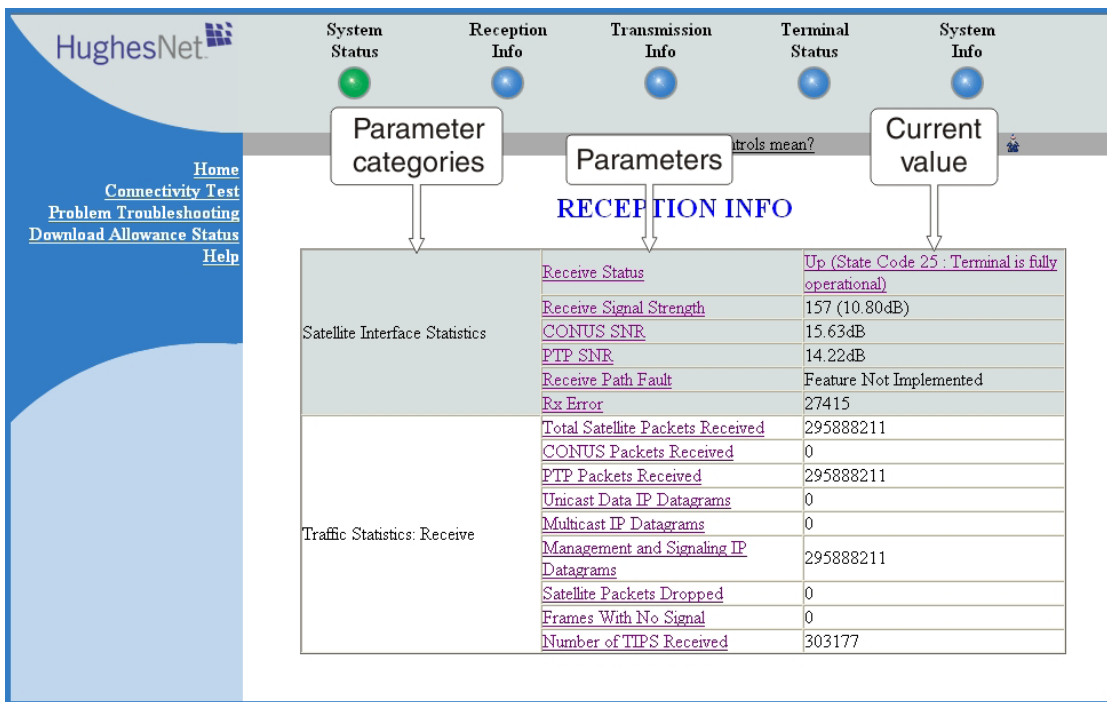
Figure 12: Format of status and information screens

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

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

State codes on status and information screens

A state code is a number that indicates the operational state of the satellite modem. State codes are displayed with an explanation in words, as shown in the following example. On the System Control Center status and information screens, state codes are shown next to selected parameters, as shown in *Figure 13: Example of a state code* on page 16, or next to a parameter that is related to an error condition.
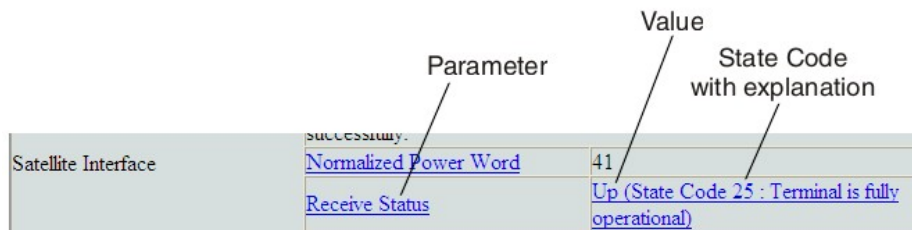
Figure 13: Example of a state code

For a list and explanation of all state codes, see *Table 12: State codes* on page 32.

Red flag indicator

On the status and information screens, a red flag next to a value indicates a problem related to the parameter listed in the same row where the flagged value appears. The flagged value appears

in the right column; the parameter appears in the middle column. The value indicates the current state of the parameter.
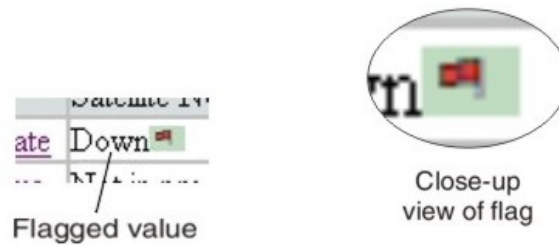
Figure 14: Red flag problem indicator

The red flag may help you or a service provider representative identify and troubleshoot a problem. If you see a red flag, click the parameter name. The pop-up window that appears may include troubleshooting information. For detailed troubleshooting information concerning red flag indicators, see:

- *Red flags on System Status page* on page 20
- *Red flags on Reception Information page* on page 23
- *Red flags on Transmission Information page* on page 26

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

System Status page

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

Available system status values may vary, depending on how the satellite modem is configured. Therefore, some options shown in *Figure 15: System Status page* on page 18 may not appear on your System Status screen.

The System Status page and other System Control Center pages show information that may be particularly useful for advanced users and for troubleshooting.
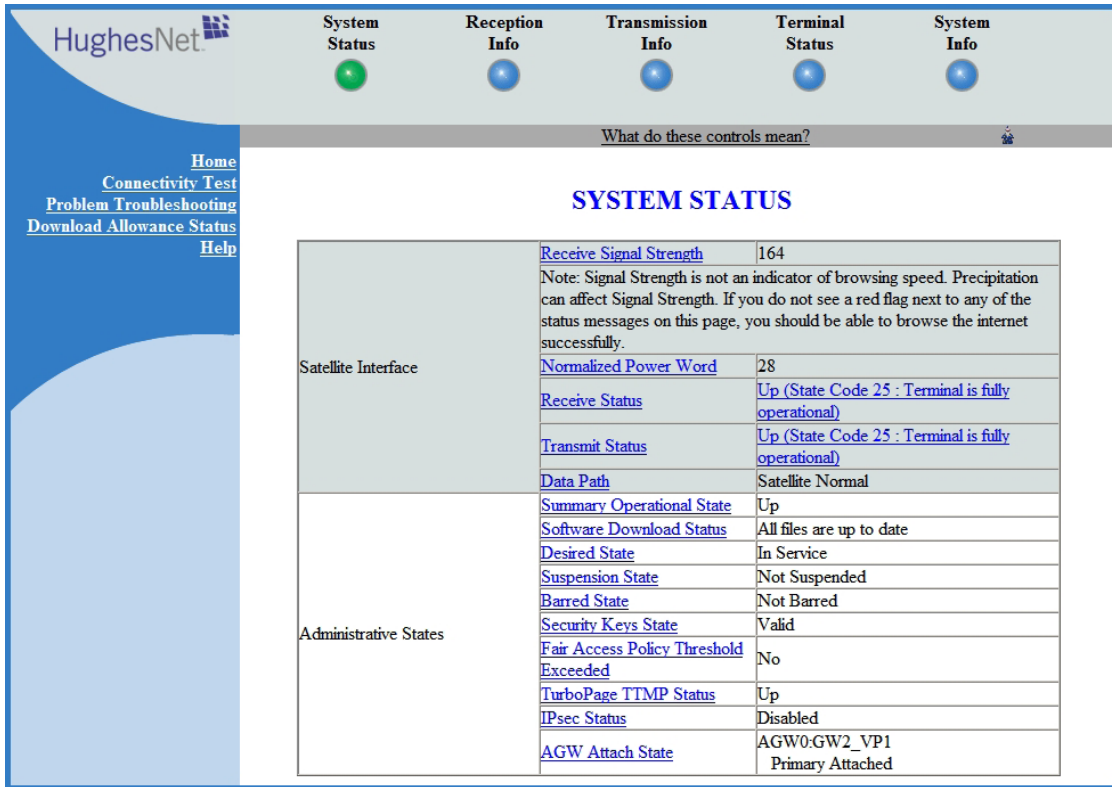
Figure 15: System Status page

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

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

Typical values for System Status parameters

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

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

Table 5: System Status parameters – typical values and range

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

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

Parameter	Typical values	Range of values
Fair Access Policy Threshold Exceeded	No	Yes – FAP threshold is exceeded, so transmission is reduced or disabled for a period of time. No – FAP threshold has not been exceeded.
TurboPage TTMP Status	Up	Up – TurboPage Server connection is up (all TTMP connections are up). Down – TurboPage Server connection is down (one or more TTMP connections is down). Disabled – TurboPage is disabled.
IPsec Status This parameter does not apply to the HN9000 modem.	Disabled	Not applicable.
AGW Attach State	Primary Attached	Primary Alternate Unattached

Red flags on System Status page

A red flag next to a value on the System Status page indicates a problem related to the parameter listed in the same row where the flagged value appears. For explanation, find the flagged parameter in this table. *If a state code is displayed next to the parameter,* refer to *State codes* on page 32 to identify the probable cause and possible solution.

Table 6: Red flags on System Status page

Flagged parameter	Probable cause	Possible solutions
Receive Status (or) Transmit Status	Various causes are indicated by state codes 26-35.	See *Table 12: State codes* on page 32.
	Probing failure (occurs only during commissioning).	There is a problem with the configured latitude and longitude. This problem must be corrected by a qualified installer.
	Registration failure (occurs only during commissioning).	This problem must be corrected by a qualified installer.
Data Path	Fallback – System is in fallback mode. The modem is experiencing severe weather conditions affecting the data rate. The data rate has been reduced to improve the transmission.	Wait for weather to improve.

Flagged parameter	Probable cause	Possible solutions
	(Note: For HN9000 the only Data Path values are Satellite Normal or Fallback.)	Not applicable.
Operational State	Modem is not fully operational.	Look for red flags next to other parameters.
Desired State	Modem is in an unknown state.	Look for red flags next to other parameters.
	Modem is out of service.	Call your service provider.
	Modem is under maintenance.	Call your service provider.
Suspension State	Modem is suspended by the NOCC.	Call your service provider.
Barred State	Modem has been barred individually or as part of a group by the NOCC.	Call your service provider.
Security Keys	Modem has not acquired security keys.	Wait to see if the flag goes away. If it does not, call your service provider.
FAP Status	The modem has greatly exceeded the FAP threshold, and so the modem's data rate is reduced for a period of time.	Wait for normal operation to resume.
TurboPage TTMP Status	TurboPage is enabled but the TTMP Status is down.	Wait until the modem re-establishes TurboPage TTMP.
IPsec Status\n\nThis parameter does not apply to the HN9000 modem.	Not applicable.	Not applicable.

Reception Information page

The Reception Information page shown in *Figure 16: Reception Information page* on page 22 displays information about data received by the satellite modem.
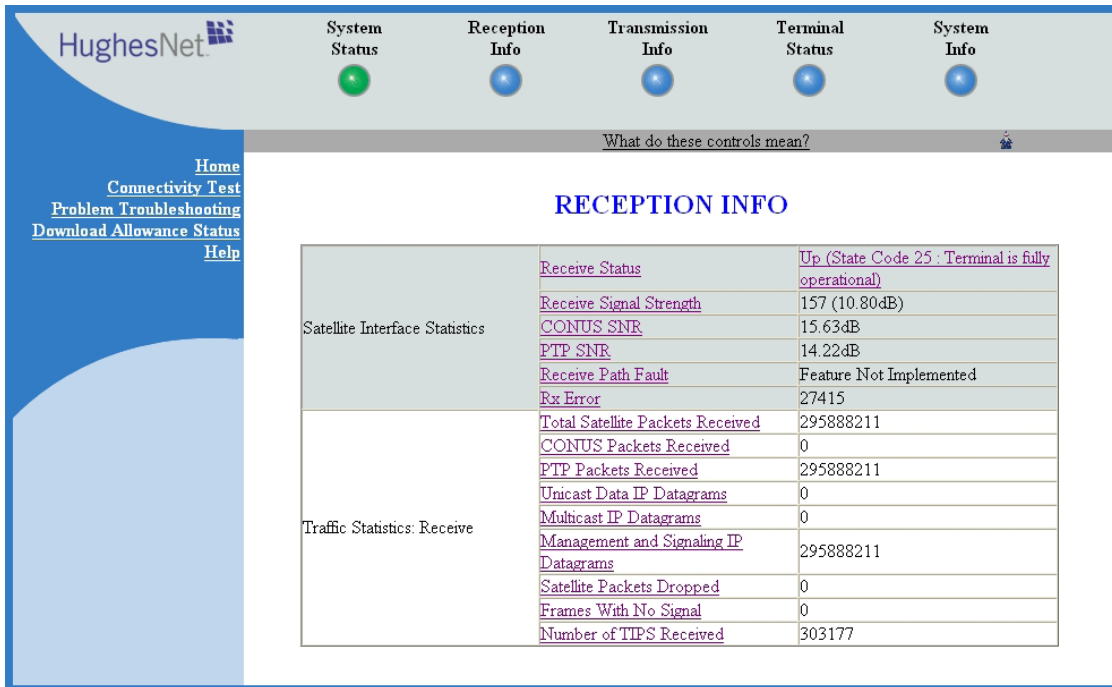
Figure 16: Reception Information page

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

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

Typical values for Reception Information parameters

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

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

Table 7: Reception Information parameters – typical values and range

Parameter	Typical values	Range of values
Satellite Interface Statistics (parameter category)		
Receive Status	Up	Up – The modem is receiving signals from the satellite. Down – The modem is not receiving signals from the satellite.
Receive Signal Strength	160–220	0–255.
CONUS SNR	16	4.5–18.0.
PTP SNR	14	4.5–18.0.

Parameter	Typical values	Range of values
Receive Path Fault	OK	Not applicable (parameter reserved for future use).
RX Error	≥ 0	Any whole number.
Traffic Statistics: Receive		
Total Satellite Packets Received	≥ 0	Any whole number.
CONUS Packets Received	≥ 0	Any whole number.
PTP Packets Received	≥ 0	Any whole number.
Unicast Data IP Datagrams	≥ 0	Any whole number.
Multicast IP Datagrams	≥ 0	Any whole number.
Management and Signaling IP Datagrams	≥ 0	Any whole number.
Satellite Packets Dropped	≥ 0	Any whole number.
Frames With No Signal	≥ 0	Any whole number.
Number of TIPS Received	≥ 0	Any whole number.

Red flags on Reception Information page

A red flag next to a value on the Reception Information page indicates a problem related to the parameter listed in the same row where the flagged value appears. For explanation, find the flagged parameter in this table. *If a state code is displayed next to the parameter,* refer to *Table 12: State codes* on page 32 identify the probable cause and possible solution.

Table 8: Red flags on Reception Information page

Flagged parameter	Probable cause	Possible solutions
Receive Status	Various causes are indicated by state codes 26–35.	See *Table 12: State codes* on page 32. Most of these problems must be corrected by a qualified installer.
	Probing failure (occurs only during commissioning).	There is a problem with the configured latitude and longitude. Make sure the entered latitude and longitude values are correct and in the correct format. This problem must be corrected by a qualified installer.
	Registration failure (occurs only during commissioning).	The problem must be corrected by a qualified installer.
Receive Signal Strength	No Beacon (or) SQF of 0 or 1.	Make sure the receive cable is tightly connected to the modem's rear panel. Any other cable connections must be checked by a qualified installer.

Flagged parameter	Probable cause	Possible solutions
		If all cable connections are tight, the antenna may need to be repointed by a qualified installer.
	Weather interference – occurs if rain, snow, or wind is heavy enough to interfere with signal reception.	Wait. When the weather clears, the signal strength should return to normal.
	Receive IFL cable is loose, faulty, or has been disconnected.	Make sure the receive cable is tightly connected to the modem's rear panel. Any other cable connections must be checked by a qualified installer.
	Antenna has been severely deflected.	Antenna pointing by a qualified installer is required.
	Foreign object is blocking the antenna	In most cases this problem must be corrected by a qualified installer or other professional (for example, a tree specialist).
	Wrong power supply	Make sure you are using the correct power supply. (See *Power supply information* on page 4.) If none of the solutions listed here corrects the problem, contact your service provider.
PTP SNR	Average SNR is too low. Severe weather condition.	Wait for the weather to improve. If PTP SNR is flagged and you experience service problems but the weather is good, contact your service provider.

Transmission Information page

The Transmission Information page shown in *Figure 17: Transmission Information page* on page 25 displays information about data transmissions from the satellite modem. The information on this screen may be useful to a service provider representative if you need help in resolving a problem.
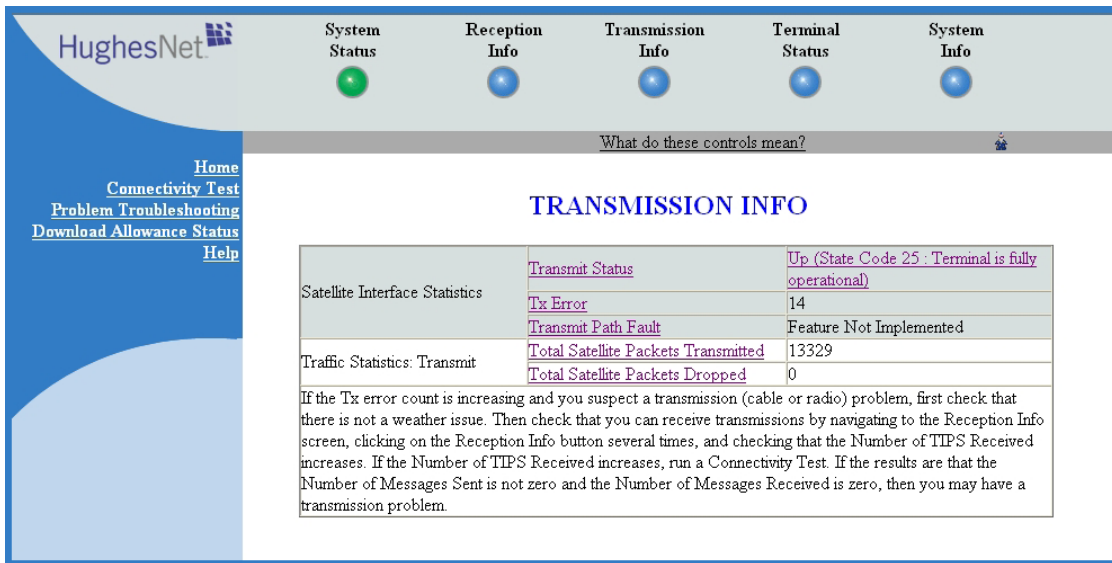
Figure 17: Transmission Information page

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

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

Typical values for Transmission Information parameters

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

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

Table 9: Transmission Information parameters – typical values and range

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

Red flags on Transmission Information page

If you see a red flag next to Transmit Status on the Transmission Information page, see Transmit Status in *Table 6: Red flags on System Status page* on page 20. The information for Transmit Status in that table also applies to the Transmission Information page.

Terminal Status page

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

Figure 18: Terminal Status page (top part)

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

- Overall Status – Shows the major features such as dial backup or acceleration. (Some listed features may not be included in your service plan.)
- Transport Interface Receive Statistics – Indicates messages received and decoded by the satellite modem from the satellite.
- Transport Interface Transmit Statistics – Indicates messages being queued up by the satellite modem for transmission to the satellite.
- LAN Interface Statistics – Shows traffic across the LAN interface to the satellite modem.
- IP Forwarding and Routing Statistics – These refer to system control messages.
- Local IP Interface Statistics – Sum of various counts of messages.
- Dial Backup Status – This category of parameters does not apply to the HN9000 modem.

- TCP Acceleration Statistics – Counts of messages and connections used between the satellite modem and its destination if the feature is enabled. (Some listed features may not be included in your service plan.)
- SSL Acceleration Statistics – Counts of SSL traffic if the feature is enabled. (Some listed features may not be included in your service plan.)
- DNS Caching Statistics – Counts on local storage of data if the feature is enabled. (Some listed features may not be included in your service plan.)
- Management Statistics – Various internal network management traffic counts.
- Turbo Page Statistics – Counts of various web page requests and objects if the feature is enabled. (Some listed features may not be included in your service plan.)

Typical values for Terminal Status parameters

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

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

Table 10: Terminal Status parameters – typical values and range
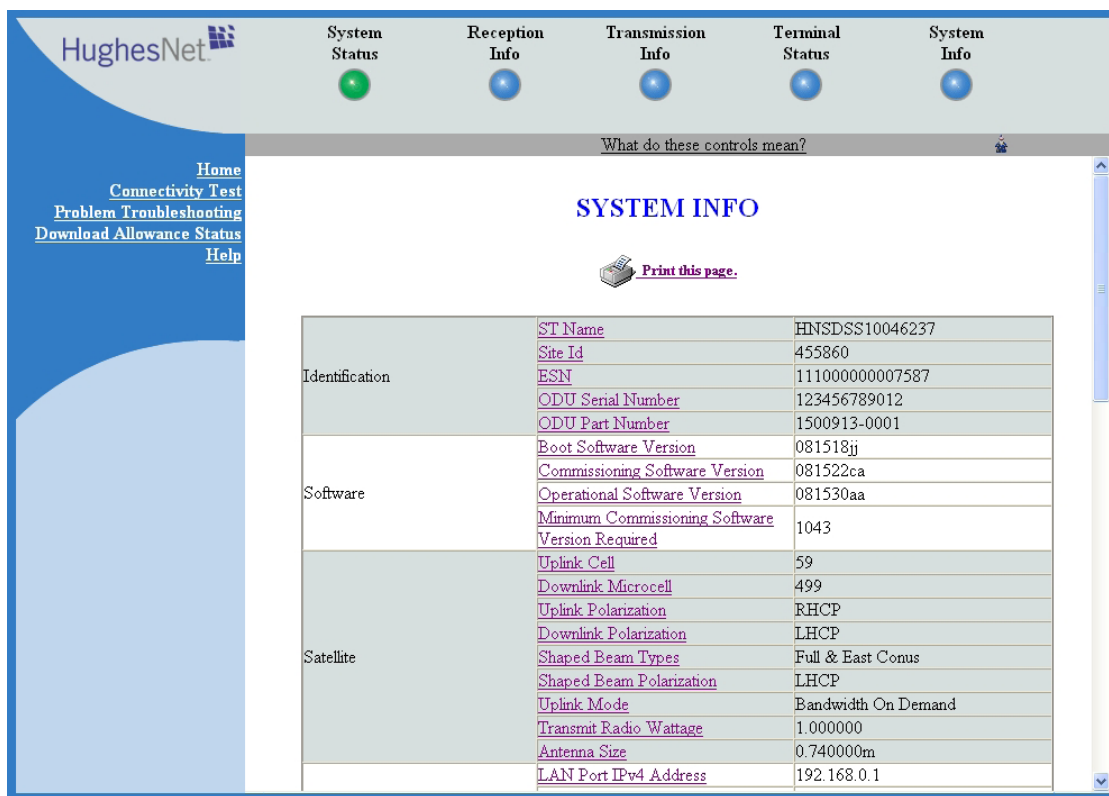
Parameter	Typical values	Range of values
Overall Status (parameter category)		
LAN Interface Status	Up	Up
		Down
		Out of Service
		Maintenance
		Unknown
Dial Backup Status This parameter does not apply to the HN9000 modem.	Disabled	Not applicable
TCP Acceleration Status	Enabled	Enabled
		Disabled
Turbo Page Status	Enabled	Enabled
		Disabled
SSL Acceleration Status	Disabled	Disabled
		Connected to Server
		Connecting to Server
		Disconnected from Server
DNS Acceleration Status	Enabled	Enabled
		Disabled

Parameter	Typical values	Range of values

> 📝 **Note:** The Terminal Status page also displays numerous statistics that are not listed in this table. These statistics are displayed by category, beginning with the Transport Interface Receive Statistics category. For all of the statistics not included in this table, the typical value is any whole number greater than zero.

System Information page

The System Information page shown in *Figure 18: Terminal Status page (top part)* on page 28 provides system information for the satellite modem such as ST name (modem name), Site ID (Site Id), and operational software version.

Figure 19: System Information page (top part)

> 📝 **Note:** Print the System Information page and save it. Click **Print this page** next to the printer icon. If you experience a problem with your satellite modem, this page may not be accessible. Information on this screen may be useful to a service provider representative in helping you to resolve the problem. (If a printer is not available, use Alt-PrintScreen to capture the screen image, then paste the image into a word processor or graphics file, and save the file.)

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

- Identification – Contains system ID information such as Site ID (installation site ID) and ST name (a unique name that identifies the satellite modem).

- Software – Contains version information on the various software applications resident on the satellite modem such as commissioning and operational software. (Commissioning refers to initial start-up of the modem.)
- Satellite – Contains information pertaining to communication with the satellite such as antenna size, transmit radio wattage, and uplink transmission mode.
- Addressing – Contains addressing information such as LAN port address and subnet mask and available static IP addresses (if any, depending on your service plan).
- Software Features – This section lists the optional features and provides information on whether they are currently active. These features are enabled or disabled per your service plan and cannot be changed locally.

Typical values for System Information parameters

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

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

Table 11: System Information parameters – typical values and range

Parameter	Typical values	Range of values
Identification (parameter category)		
ST Name	Characters and numbers	Not applicable
Site ID	A number	Not applicable
ESN	A number	Not applicable
ODU Serial Number	A number	Not applicable
ODU Part Number	A number	Not applicable
Software		
Boot Software Version	Characters and numbers	Not applicable
Commissioning Software Version	Characters and numbers	Not applicable
Operational Software Version	Characters and numbers	Not applicable
Minimum Commissioning Software Version Required	A number	Not applicable
Satellite		
Uplink Cell	A number	Not applicable
Downlink Microcell	A number	Not applicable
Uplink Polarization	Not applicable	RHCP LHCP
Downlink Polarization	Not applicable	RHCP LHCP
Shaped Beam Types	Not applicable	No Conus Full Conus

Parameter	Typical values	Range of values
		West Conus
		Full West Conus
		East Conus
		Full East Conus
Shaped Beam Polarization	Not applicable	RHCP
		LHCP
Uplink Mode	Regular	Regular
		High Volume
Transmit Radio Wattage	Small integer	1.000000
		2.800000 *(nominal 2 W radio)*
		5.000000 *(nominal 4 W radio)*
		13.000000 *(nominal 10 W power booster)*
Antenna Size	A real number	0.740000m
		0.980000m
		1.200000m
		1.800000m
IPv4 Addressing		
LAN Port IPv4 Address	An IPv4 address	Unassigned
		{IPv4 address}
LAN Port IPv4 Subnet Mask	An IPv4 address	Unassigned
		{IPv4 address}
Last Usable IPv4 IP Address	An IPv4 address	Unassigned
		{IPv4 address}
IPv4 Default Gateway	Satellite IPv4 address	Satellite
		{IP address}
IPv4 Local Address Domain ID	A real number	Not applicable
Address Translation Within Local Domain	An IPv4 address	Not applicable
Static Address Mapping Within Local Domain	An IPv4 address	Not applicable
Address Translation to External Domains	Not applicable	Not applicable
Static Address Mappings to External Domains	Not applicable	Not applicable

Parameter	Typical values	Range of values
Dynamic Address Translation to External Domains	Enabled	Not applicable
IPv6 Addressing		
LAN Port IPv6 Address	An IPv6 address	Unassigned *{IPv6 address}*
LAN Port IPv6 Prefix	An IPv6 address in slash notation	Unassigned *{IPv6 address/prefix length}*
IPv6 Default Gateway	An IPv6 address	Unassigned *{IPv6 address}*
IPv6 Local Address Domain ID	A real number	Not applicable
Software Features		
DHCP Mode	Server	Not applicable
DHCPv6 Mode	A list of DHCPv6 server IPv6 addresses	Disabled *{IPv6 address range}*
IRDP Preference	Disabled	Not applicable
RIP Mode	Disabled	Not applicable
RIPng Mode	Disabled	Not applicable
ND Router Advertisement Mode	Disabled	Not applicable
ISRP Mode	Disabled	Not applicable
ISRP Redirect Behavior	Disabled	Not applicable
IGMP Receive	Enabled	Not applicable
IGMP Send Mode	Enabled	Not applicable
H.323 Proxy	Disabled	Not applicable
Dialer Proxy	Disabled	Not applicable
TCP Acceleration	Enabled	Not applicable
HTTP GET Compression	Enabled	Not applicable
DNS Caching	Enabled	Not applicable
Turbo Page	Enabled	Not applicable
SSL Acceleration	Disabled	Not applicable
DSCP Mode	Disabled	Not applicable
VRRP	Disabled	Not applicable
PBR	Disabled	Not applicable
IPsec This parameter does not apply to the HN9000 modem.	Disabled	Not applicable

State codes

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

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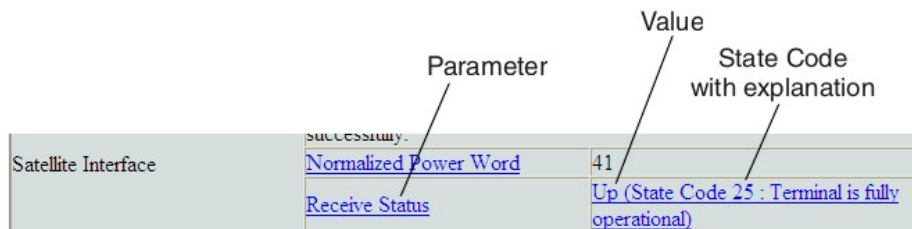

Figure 20: Examples of state codes

Table 12: State codes on page 32 lists and explains all HN9000 state codes. In this table, *modem* refers to the *satellite modem*.

Table 12: State codes

State code	State name	Explanation	Corrective action
Installation – Boot phase			
1	Starting Up in Boot	Satellite modem is starting up in boot phase.	Transient – No action is necessary.
2	Waiting for Installation Parameters	Modem has not been installed, and installation parameters have not been submitted.	Transient – No action is necessary.
3	Coarse Pointing in Progress	Antenna pointing is in progress (coarse or fine pointing). *Occurs during modem installation only.*	Transient – No action is necessary.
4	Acquiring Beacon in Boot	*Occurs during Auto modem replacement only:* Modem is searching for beacon.	Transient – No action is necessary.
5	Acquiring PTP SNR in Boot	*Occurs during Auto modem replacement only:* Modem is searching for point-to-point signal.	Transient – No action is necessary.
6	Waiting for Uplink Polarization Change	Modem is waiting for installer to switch uplink polarization at the radio assembly. *Occurs during installation only.*	Installer should switch polarization.
7	Downlink Established in Boot	Modem is in boot phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.

State code	State name	Explanation	Corrective action
8	Waiting for MIPs in Boot	Modem is in boot phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
9	Downloading Commissioning Software	Modem is in boot phase and is downloading commissioning software.	Transient – No action is necessary.
10	Waiting for Antenna Pointing Complete	Modem is waiting for antenna pointing validation to complete. *Occurs during installation only.*	Installer must complete validation.
Installation – Commissioning phase			
11	Starting Up in Commissioning	Modem is starting up in commissioning phase.	Transient – No action is necessary.
12	Downlink Established in Commissioning	Modem is in commissioning phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
13	Waiting for MIPs in Commissioning	Modem is in commissioning phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
14	Probing in Progress	Modem is in commissioning phase. Probing is in progress. *Occurs during installation only.*	Transient – No action is necessary.
15	Probing Failure	Modem is in commissioning phase. Probing has failed.	*Occurs during installation only.*
16	Registering ST	Modem is in commissioning phase. Modem is registering with the NOCC.	Transient – No action is necessary.
17	ST Registration Failure	Modem is in commissioning phase: registration with the NOCC has failed.	*Occurs during installation only.*
18	Waiting for Capacity Keys	Modem is in commissioning phase; modem is waiting for capacity keys from the NOCC.	Transient – No action is necessary.
19	Reconciling Profiles in Commissioning	Modem is in commissioning phase; modem is reconciling profiles with the NOCC.	Transient – No action is necessary.
20	Downloading Operational Software	Modem is in commissioning phase and is downloading operational software.	Transient – No action is necessary.

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

Operational phase

State code	State name	Explanation	Corrective action
21	Starting Up in Operation	Modem is starting up in operational phase.	Transient – No action is necessary.
22	Downlink Established in Operational	Modem is in operational phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
23	Waiting for MIPs in Operational	Modem is in operational phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
24	Reconciling Profile in Operational	Modem is in operational phase. Profiles are being distributed to various subsystems.	Transient – No action is necessary.
25	Fully Operational (normal operation)	Modem is fully operational.	Steady state – No action is necessary.
Error codes			
26	Rx Connectivity Down	Rx cable connectivity tests have failed.	Make sure the SAT. IN and SAT. OUT cable connections are finger tight. If the problem persists, call your service provider to verify cabling and pointing.
27	No Beacon	Modem is unable to track beacon.	Make sure the SAT. IN and SAT. OUT cable connections are finger tight. If the problem persists, call your service provider to verify cabling and pointing.
28	No TIPs	Modem is not receiving transmission information packets from satellite.	Make sure the SAT. IN and SAT. OUT cable connections are finger tight. If the problem persists, call your service provider to verify cabling and pointing.
29	Tx Connectivity Down	Tx cable connectivity tests have failed.	Make sure the SAT. IN and SAT. OUT cable connections are finger tight. If the problem persists, call your service provider to verify cabling and pointing.
30	Too Many Bad Slots	*Bad slots* are transmissions from the modem that are not received by the satellite. State code 30 indicates a percentage of bad slots within the last hour that exceeds a preset value.	Rain or snow can cause this condition. If it continues during clear weather, call your service provider to verify cabling and pointing.

State code	State name	Explanation	Corrective action
31	ECL Active	Transmitter has been shut down due to ECL. ECL measures total transmitted power over 30 minute periods and turns off the transmitter if the total power exceeds a preset limit imposed by the FCC.	Transient – No action is necessary. Because home installations use lower wattage radios, home users are not likely to see this condition.
Restricted states (NOCC-imposed restrictions)			
32	Barred	Modem has been barred from transmitting by the NOCC. Possible reasons for barring include interference isolation, uplink failure, or government order.	Call your service provider.
33	Suspended	Modem has been put in a suspended state by the NOCC. This occurs if a customer's bill is overdue or if service is terminated.	Call your service provider.
34	Maintenance	Modem has been put in maintenance state by the NOCC.	Call your service provider.
35	Out of Service	Modem has been put in out-of-service state by the NOCC.	Call your service provider.

Viewing the state codes list

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

1. Click the underlined state code number.

A pop-up window appears that briefly identifies each state code. If you do not see the pop-up window, it may be hidden by other windows; try minimizing other open windows.

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

Checking download allowance status

To ensure fair Internet access for all HughesNet subscribers, Hughes has established a Fair Access Policy (FAP). For each subscriber there is a limit on how much information can be downloaded daily, depending on the subscriber's service plan. If a subscriber exceeds the download limit, the modem's browsing and download speed is temporarily reduced.

To view your download allowance status:

Click the **Download Allowance Status** link on the System Control Center home page or in the left panel of other System Control Center pages.

The modem displays a screen that shows your daily download allowance and the amount of allowance remaining in bar graph form. The example screen shown in *Figure 21: Download Allowance Status screen* on page 36 indicates that the subscriber has 92% of the daily allowance left to use.
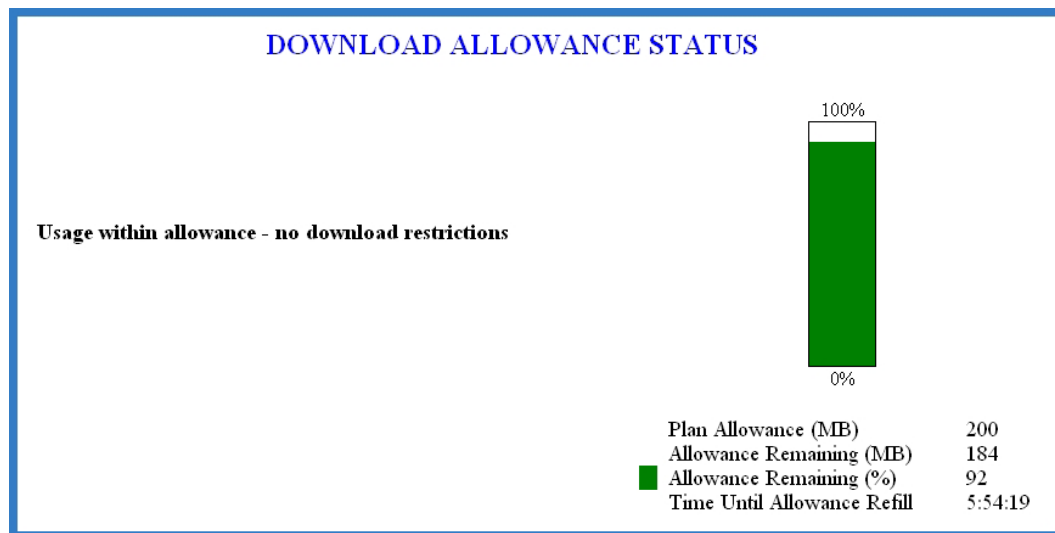

Figure 21: Download Allowance Status screen

The Download Allowance Status screen shows the following:

- Plan Allowance (MB) – How much data you can download daily, in megabytes, based on your service plan.
- Allowance Remaining (MB) – Amount remaining of your daily download allowance, in megabytes.
- Allowance Remaining (%) – Amount remaining of your daily download allowance, as a percentage of your daily plan allowance.
- Time Until Allowance Refill – Time remaining until your daily allowance is replenished or *refilled*.

If you exceed your daily allowance, the Download Allowance Status screen shows a download speed limited message, and your download speed is reduced until the download allowance is replenished.

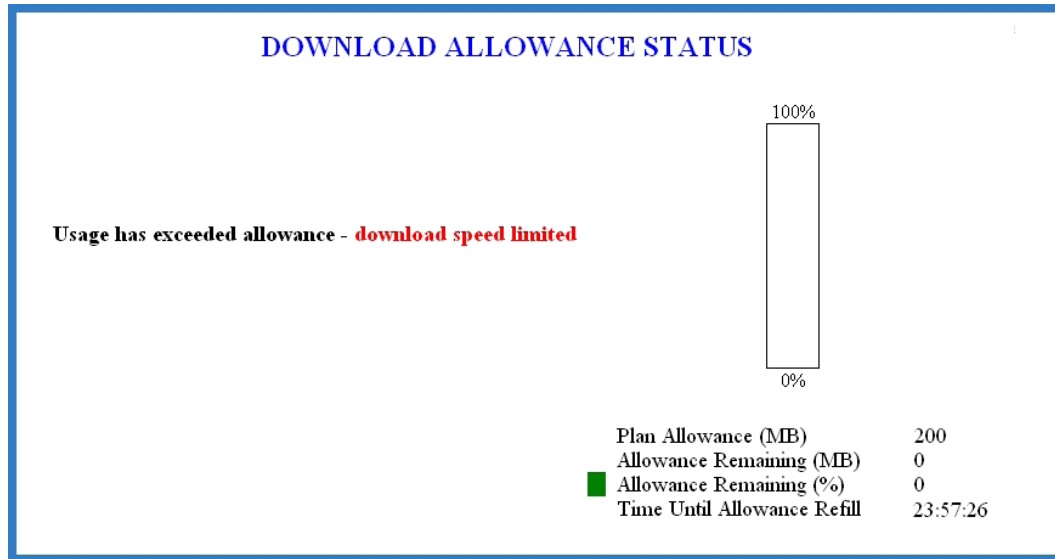Figure 22: Download allowance exceeded – speed limited

For additional information about the FAP, go to http://legal.hughesnet.com and click the **Fair Access Policy** link.

Connectivity Test page

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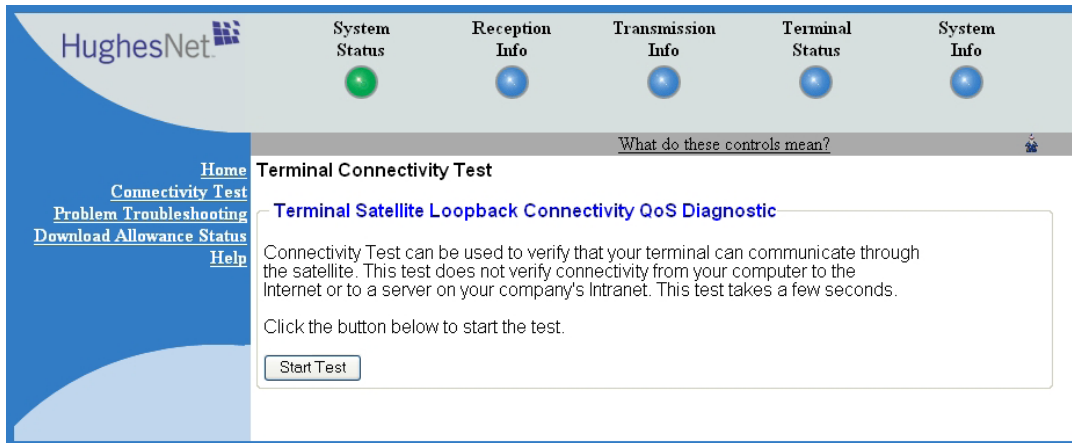

Figure 23: Terminal Connectivity Test page

For details about this test, see *Testing connectivity to the satellite* on page 45.

Chapter

3

LEDs

Topics:

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

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

Front panel LEDs

The satellite modem has five LEDs on the front panel, as shown in *Figure 24: Front panel LEDs on the HN9000 modem* on page 40. By their appearance—on, off, or blinking—the LEDs indicate the modem's operating status.
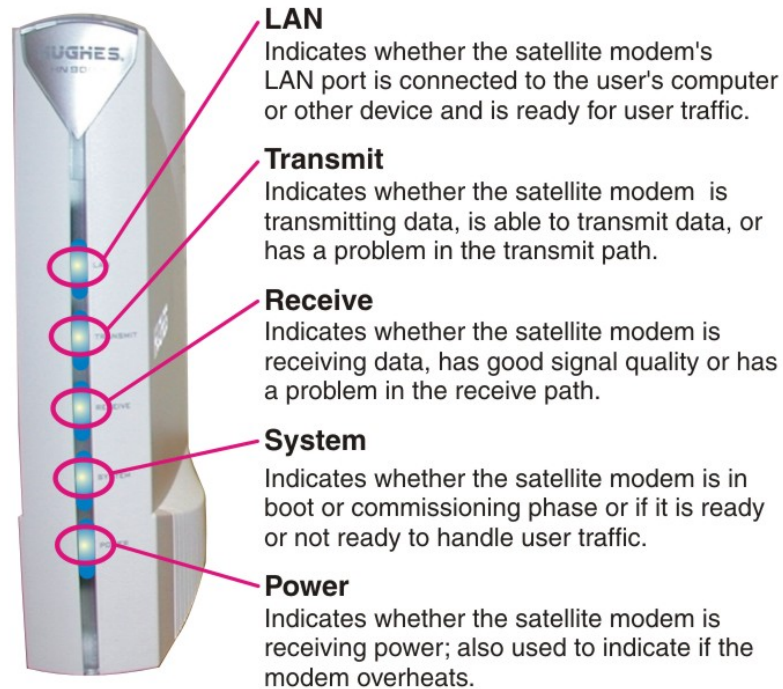

LAN
Indicates whether the satellite modem's LAN port is connected to the user's computer or other device and is ready for user traffic.

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

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

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

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

Figure 24: Front panel LEDs on the HN9000 modem

Table 13: Front panel LED indications on page 40 explains what the modem status is when the LEDs are on, off, or blinking. *On* means the LED is continuously lit. *Blinking* means the LED is usually on, but intermittently turns off briefly.

Table 13: Front panel LED indications

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

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

Bold type indicates LED appearance during normal operation.

LAN port LEDs

Green and orange LEDs on the LAN (Ethernet) port on the modem's rear panel indicate link status and speed, as explained in *Figure 25: LAN port LEDs* on page 41.

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
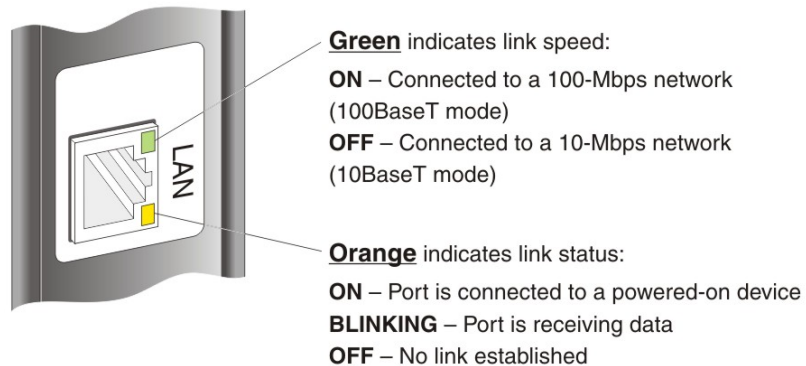
Figure 25: LAN port LEDs

Chapter

4

Troubleshooting

Topics:

- *Troubleshooting common problems*
- *Cannot access the System Control Center*
- *Testing connectivity to the satellite*
- *Hot cable connector*
- *Checking for viruses and firewall issues*

If you encounter a problem with the satellite modem, refer to the relevant troubleshooting procedure or procedures in the sections that follow. If you cannot correct the problem, contact your service provider for assistance.

For support options and contact information, see *Contact information* on page ix.

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

- For explanation of **state codes**, which appear on various screens, see *Table 12: State codes* on page 32.
- For explanation of **red flags**, see *Red flag indicator* on page 16.
- Improper **settings on the computer** connected to the satellite modem can cause problems. For instructions on configuring a computer to work properly with the modem see *Computer settings* on page 49.

If your browsing speed seems slow, you may have exceeded your daily download allowance. See *Checking download allowance status* on page 36.

Troubleshooting common problems

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. (An exception: On the System Control Center home page, the **Problem Troubleshooting** link is located below the DIAGNOSTIC UTILITIES heading.)
    The Problem Troubleshooting page opens (*Figure 26: Problem Troubleshooting page* on page 44).
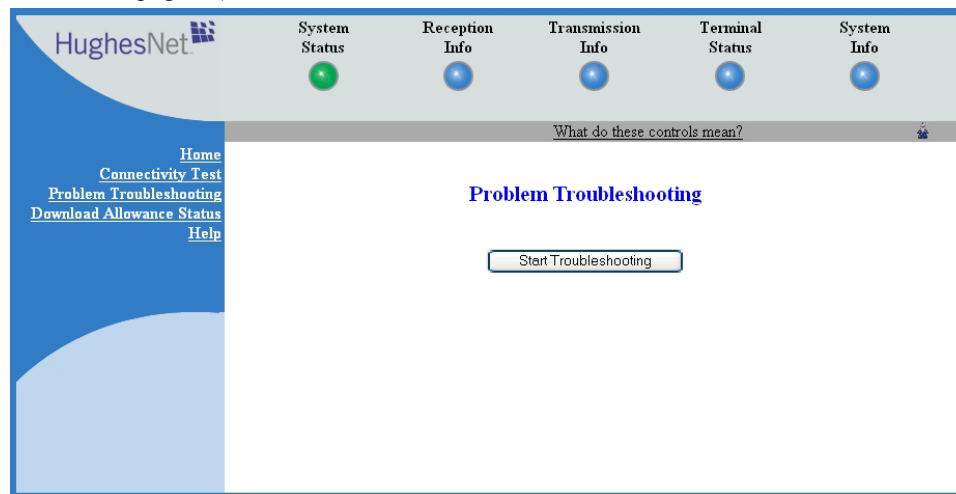
Figure 26: Problem Troubleshooting page

2. Click the **Start Troubleshooting** button.
    The System Control Center examines operational data and attempts to identify the problem. After a short wait it displays a Troubleshooting Results page with appropriate suggestions for correcting the problem.

3. Follow the instructions on the Troubleshooting Results page.

4. If these steps do not correct the problem, contact your service provider for assistance.

Cannot access the System Control Center

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

1. If the modem is using a dynamic IP address, confirm that DHCP is enabled on the computer. This procedure is explained in *Configuring a computer to use DHCP* on page 50.

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

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

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

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

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

5. If the LEDs are off, make sure the DC power cord adapter is securely connected to the satellite modem.

6. Make sure the Ethernet cable is securely connected to the satellite modem and your computer.

7. If you still cannot access the System Control Center, contact your service provider for assistance.

Testing connectivity to the satellite

If you have problems connecting to the Internet, you can use the Connectivity Test page to test connectivity between the modem and the satellite. This connectivity test sends test messages on a loop from the modem to the satellite and back to the modem, as shown in *Figure 27: Satellite loopback connectivity test* on page 45 . If the test succeeds, it verifies that the modem can connect to the satellite. If you can access the satellite, there is no problem with your physical site connectivity between the modem (inside) and the radio assembly and antenna (outside).
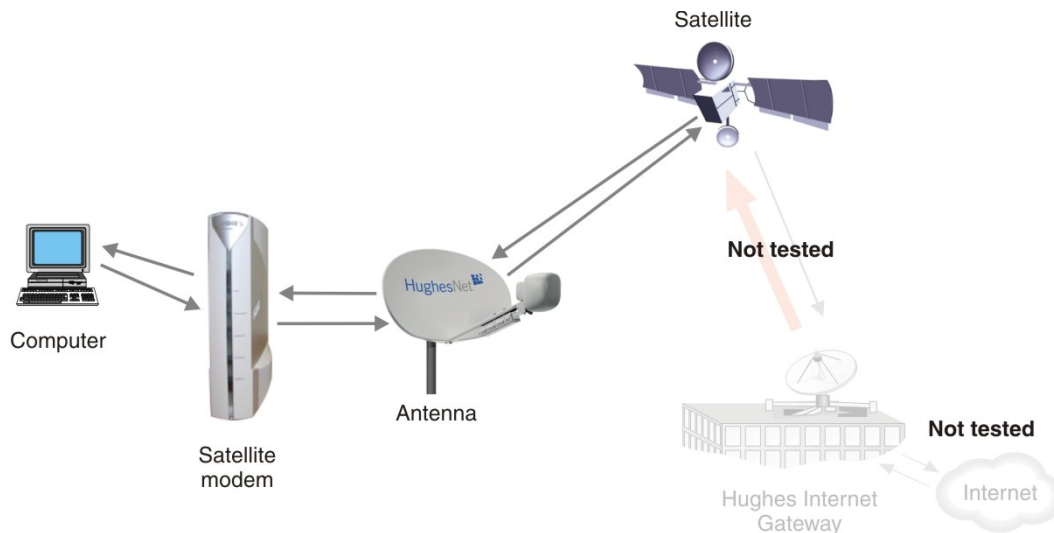
Figure 27: Satellite loopback connectivity test

1. To conduct this test from any System Control Center page, click **Connectivity Test** in the left panel.
The initial Terminal Connectivity Test page appears.
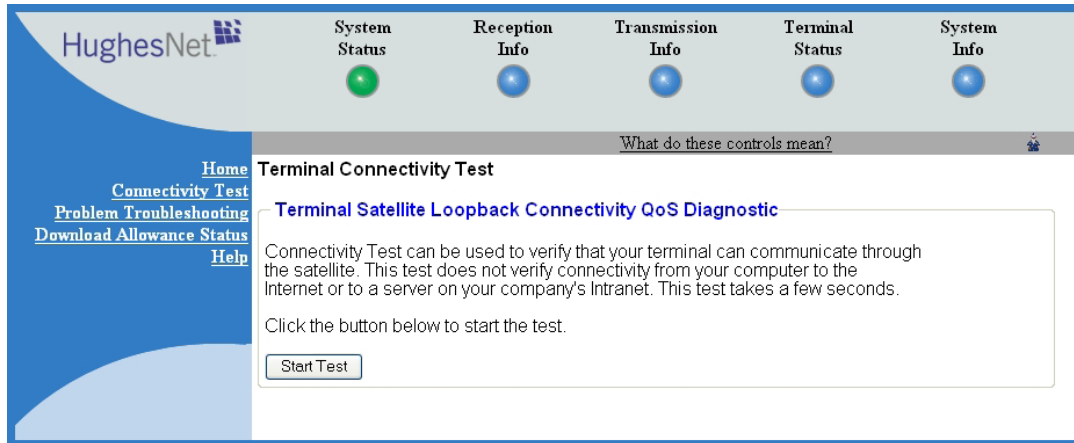
Figure 28: Terminal Connectivity Test page

2. Click **Start Test**.

You may see a screen that asks you to wait while the test is conducted. When the test finishes, the Connectivity Test results page appears.
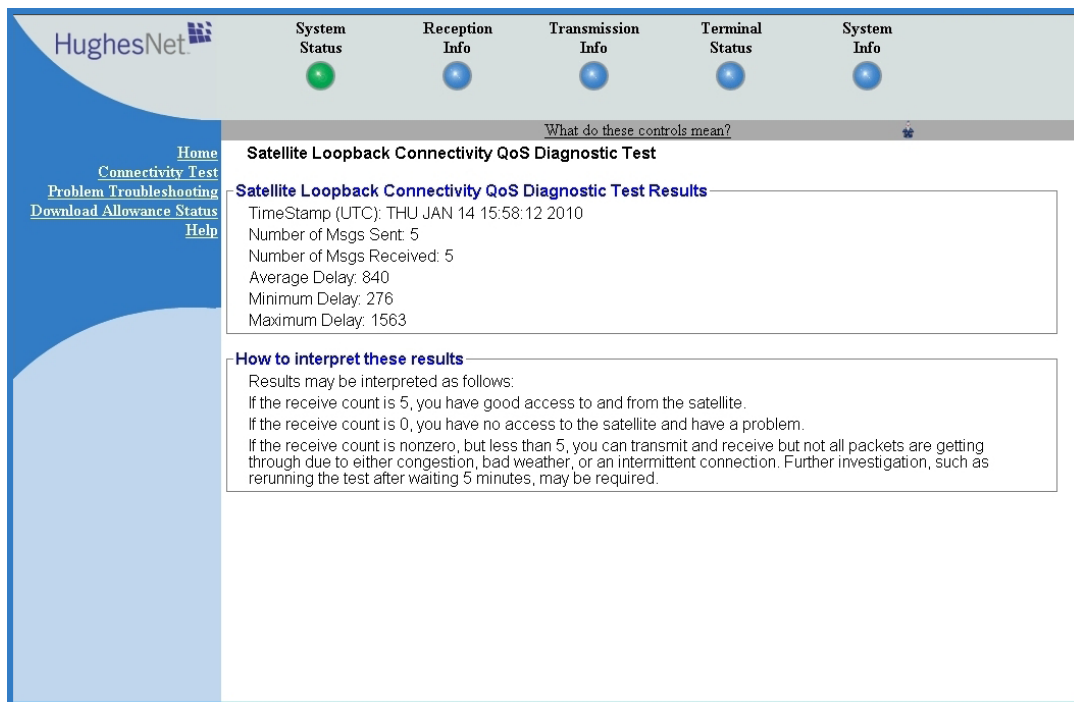
Figure 29: Connectivity Test results page

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

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

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

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

Hot cable connector

If the connector on either the transmit or receive cable feels hot to the touch, the connector may be loose or otherwise defective. Troubleshoot this problem as follows:

1. Remove power from the satellite modem by unplugging the power supply AC power cord from the surge protector or AC outlet.

    ⚠ **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.

2. Allow the cable connector to cool for at least 5 min.
3. Make sure the cable connector feels cool.
4. Make sure the connector is securely attached to the cable and properly aligned. If it is cross-threaded, remove it and reattach it. 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, correct operation of the modem is not an indication that the cables are adequately tightened.

5. Reapply power to the modem by plugging the power supply back into the surge protector or AC outlet.

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

6. Wait 5 min.
7. Check the connector to see if it is hot.
    If the connector is still hot, it may be defective and should be replaced.

Checking for viruses and firewall issues

If you have confirmed all connections but still cannot access the Internet, check the computer (and any 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.

Appendix

A

Computer settings

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

Instructions are provided for:

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

These procedures are explained in the sections that follow.

Understanding the modem address and computer address

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

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

To find specific address information, go to the System Control Center System Information page *Figure 18: Terminal Status page (top part)* on page 28. Scroll down until you see Addressing in the left column. Look at the first three parameters in the Addressing field, as shown in the following two examples.

Private IP addresses

Figure 30: Example of Addressing parameters showing available private IP addresses on page 50 is an example of System Information page address parameters for a satellite modem with a service plan that provides private IP addresses.

Figure 30: Example of Addressing parameters showing available private IP addresses

In this example, the satellite modem is assigned the private IP address (LAN Port IPv4 Address) 192.168.0.1.

There are 253 available private IP addresses that can be assigned to computers connecting to the satellite modem. These addresses are in the range from 192.168.0.2 to 192.168.0.254 (the Last Usable IPv4 Address).

Static IP address

Figure 31: Example of Addressing parameters showing one available static IP address on page 50 is an example of System Information page address parameters for a satellite modem with a service plan that provides one static IP address. Some service plans provide multiple static IP addresses.

Figure 31: Example of Addressing parameters showing one available static IP address

In this example, the satellite modem is assigned the static IP address (LAN Port IPv4 Address) 97.73.73.65. The modem's DHCP server has only one static IP address to assign to a connecting computer: 97.73.73.66 (the Last Usable IPv4 Address).

For instructions on configuring a static IP address on your computer, see the applicable section in *Configuring a computer for a static IP address* on page 57. Find the section that applies to your computer operating system.

Multiple static IP addresses

If a service plan provides more than one static IP address, the range (or difference) from the LAN Port IPv4 Address to the Last Usable IPv4 Address will be greater than one. For example, if the LAN Port IPv4 Address is 97.73.73.65 and the Last Usable IPv4 Address is 97.73.73.70, the range (or difference) is 5, meaning there are five available static IP addresses.

Configuring a computer to use DHCP

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

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

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

DHCP should be disabled on your PC if you have purchased a service plan with a static IP address(es) and want to use a static IP address.

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

If you are using the satellite modem as part of a network, you should have already installed either an Ethernet hub or a wireless base station and NICs in each computer on the LAN. If necessary, you should have also connected the computers to the Ethernet hub with an Ethernet cable. See *Home networking* on page 67 for more information.

Configuring Windows 7 to use DHCP

This section explains how to configure your computer to use DHCP if your computer operating system is Microsoft Windows 7.

1. From the Windows desktop, select **Start → Control Panel → Network and Sharing Center**.

2. Look for the Local Area Connection link indicated by the arrow in *Figure 32: Network and Sharing Center – Windows 7* on page 53.

   If you do not see a Local Area Connection link or if a red X appears next to the link, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.
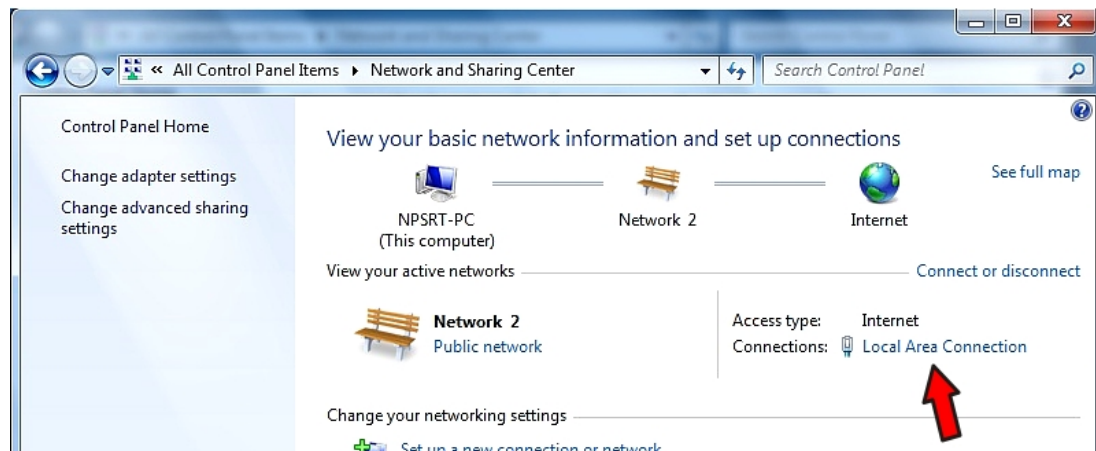
Figure 32: Network and Sharing Center – Windows 7

3. Click the Local Area Connection icon, which represents the satellite modem network connection.
   The Local Area Connection Status window opens.

4. Click **Properties.**
   The Local Area Connection Properties dialog appears, as shown in *Figure 33: Local Area Connection Properties – Windows 7* on page 52.

   📝 **Note:** Depending on the computer's security settings, a pop-up message may appear, requesting that you confirm the action before proceeding. If you see this message, click **Continue** to proceed.
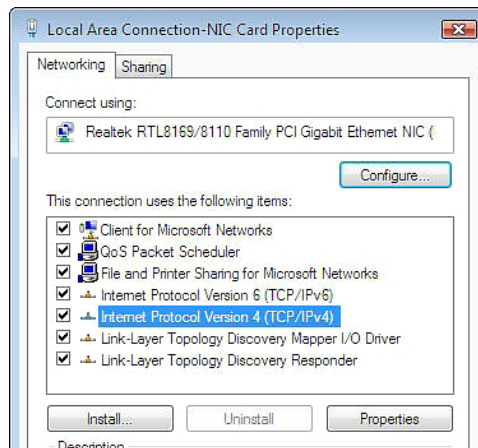
Figure 33: Local Area Connection Properties – Windows 7

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

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

7. Highlight the appropriate TCP/IP connection (usually Internet Protocol Version 4). Be careful not to uncheck the checkbox.

8. Click **Properties**.

   The Internet Protocol Properties dialog appears as shown in *Figure 34: Internet Protocol Properties – Windows 7* on page 52.
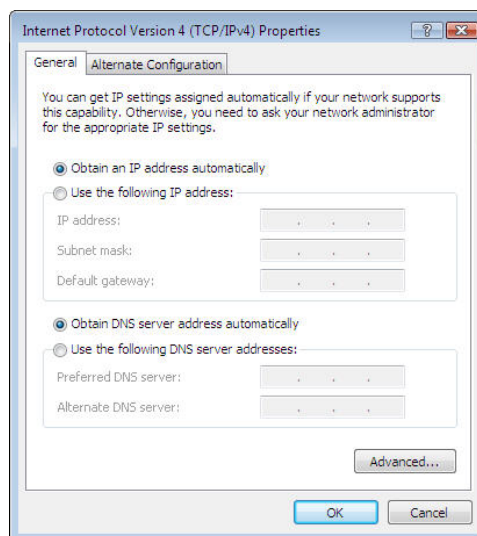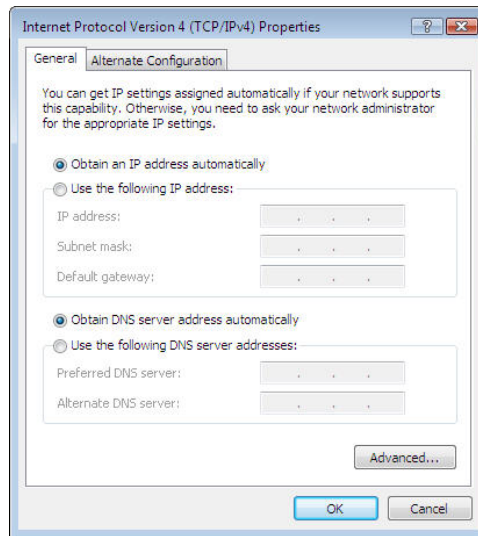

Figure 34: Internet Protocol Properties – Windows 7

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

10. Click **OK**.

11. Click **Close** to close the Local Area Connection Properties dialog.

12. Click **Close** to close the Local Area Connection status dialog.

13. Confirm that you have an IP address:

    a) Press **Win+R** (Windows key + R).

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

    c) In the command, type ipconfig/renew and press **Enter**.

    d) Make sure an IP address is shown on the line that starts with **IPv4 Address** or **IPv6 Address**.

Configuring Windows Vista to use DHCP

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

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

   A list of network adapters appears as shown in *Figure 32: Network and Sharing Center – Windows 7* on page 53. The Local Area Connection-NIC Card icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.
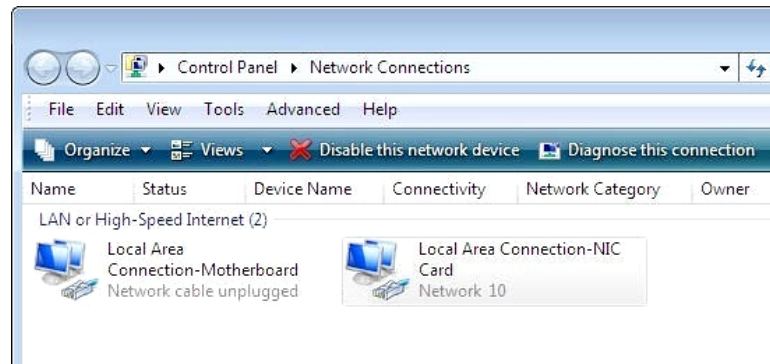
Figure 35: Network connections – Windows Vista

> **Note:** If a red X appears next to the Local Area Connection icon, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.

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

   The Local Area Connection-NIC Card Properties dialog appears as shown in *Figure 36: Local Area Connection Properties – Windows Vista* on page 53.

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

Figure 36: Local Area Connection Properties – Windows Vista

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

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

5. Highlight the appropriate TCP/IP connection (usually Internet Protocol Version 4). Be careful not to uncheck the checkbox.

6. Click **Properties**.

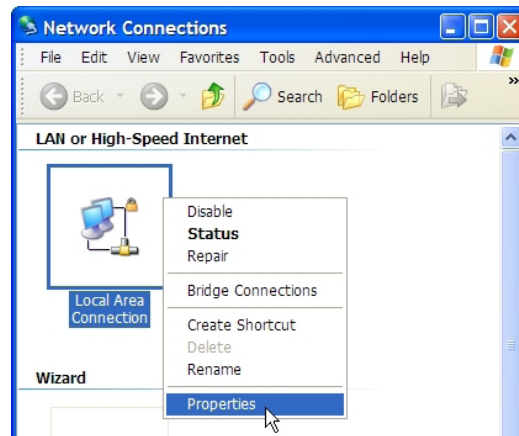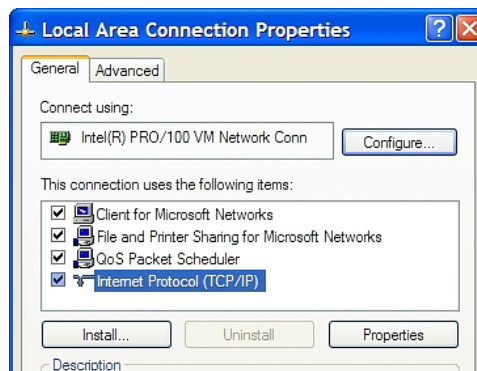   The Internet Protocol Properties dialog appears as shown in *Figure 37: Internet Protocol Properties – Windows Vista* on page 54.
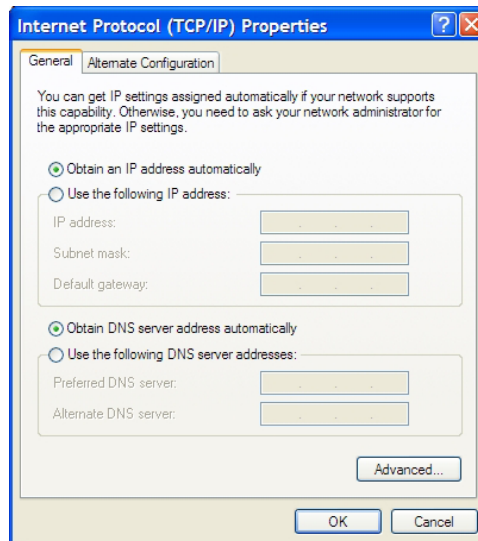

Figure 37: Internet Protocol Properties – Windows Vista

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

8. Click **OK**.

9. Confirm that you have an IP address:
   a) Press **Win+R**.
   b) Type cmd and click **OK**.
   c) Type ipconfig/renew and press **Enter**.
   d) Make sure an IP address is shown on the line that starts with IPv4 Address or IPv6 Address.

Configuring Windows XP to use DHCP

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

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

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

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

   A list of network adapters appears as shown in *Figure 38: Network connections – Windows XP* on page 55. A Local Area Connection icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.

Figure 38: Network connections – Windows XP

> **Note:** If a red X appears next to the Local Area Connection icon, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.

3. Right-click the Local Area Connection icon that represents the network adapter connecting the computer to the Satellite Gateway, and select **Properties**.
The Local Area Connection Properties dialog appears as shown in *Figure 39: Local Area Connection Properties – Windows XP* on page 55.

Figure 39: Local Area Connection Properties – Windows XP

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

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

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

7. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in *Figure 40: Internet Protocol Properties – Windows XP* on page 56.

Figure 40: Internet Protocol Properties – Windows XP

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

9. Click **OK**.

10. Confirm that you have an IP address:

    a) Click **Start → Run**.

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

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

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

Configuring a Mac computer to use DHCP

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

1. From the Mac interface, select **System Preferences**.
The System Preferences menu appears.

2. Under Internet & Network, click the Network icon.
The Network screen appears as shown in *Figure 41: Mac Network screen* on page 57.

Figure 41: Mac Network screen

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

4. Select Using DHCP from the Configure drop-down list as shown in *Figure 42: Select DHCP from the configure drop-down menu* on page 57.
The IP Address field becomes disabled.

Figure 42: Select DHCP from the configure drop-down menu

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

Configuring a computer for a static IP address

If it is desired or necessary for a computer to have a fixed or permanent IP address, the computer should be configured for a *static IP address*. For more information about IP addresses, see *Understanding the modem address and computer address* on page 49.

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

- IP address. You need a valid IP address for the computer. If the computer is part of a LAN, each computer on the LAN must have its own unique address.

- Subnet Mask. This is the subnet mask assigned to your satellite modem. You should have recorded this information in your *Quick Start Guide* during the registration process. You can also obtain it from the System Information page of the System Control Center.
- Default Gateway. This is the IP address of the satellite modem. You should have recorded this information in your *Quick Start Guide* during the registration process. You can also obtain it from the System Information page of the System Control Center.

Configuring Windows 7 to use a static IP address

1. From the Windows desktop, select **Start → Control Panel → Network and Sharing Center**.

2. Look for the Local Area Connection icon indicated by the arrow in *Figure 43: Network and Sharing Center – Windows 7* on page 58.

   If you do not see a Local Area Connection link or if a red X appears next to the link, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.
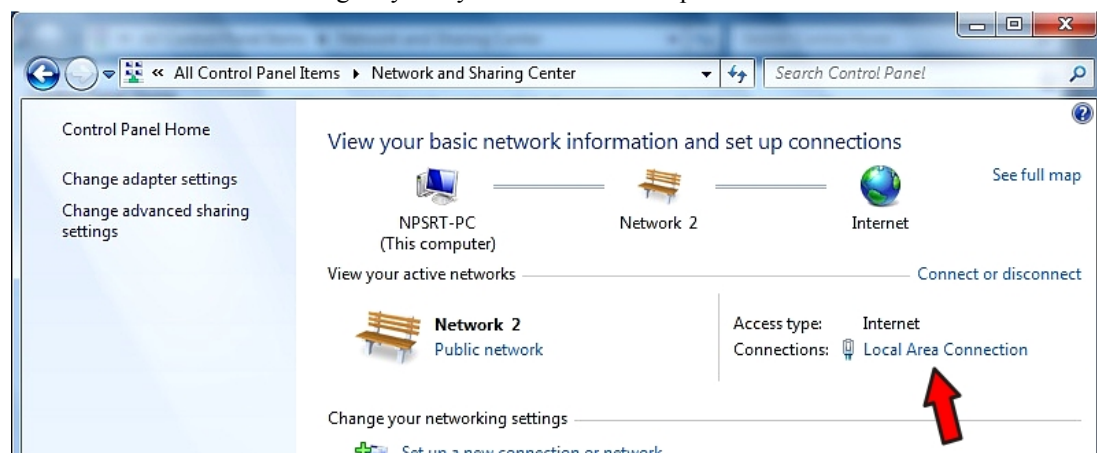
Figure 43: Network and Sharing Center – Windows 7

3. Click the Local Area Connection link, which represents the satellite modem network connection.
   The Local Area Connection Status window opens.

4. Click **Properties.**
   The Local Area Connection Properties dialog appears, as shown in *Figure 44: Local Area Connection Properties – Windows 7* on page 59.

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

Figure 44: Local Area Connection Properties – Windows 7

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

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

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

8. Click **Properties**.

   The Internet Protocol Properties dialog appears as shown in *Figure 45: Internet Protocol Properties – Windows 7* on page 59.
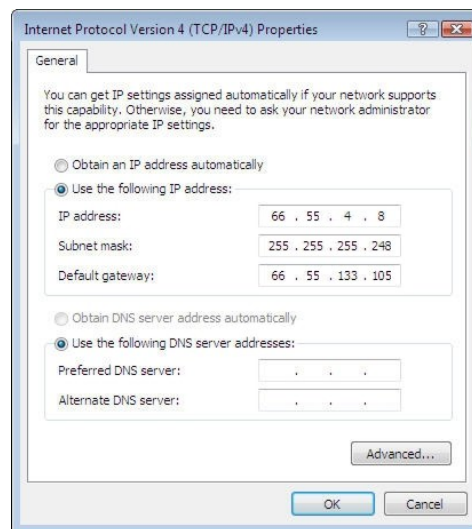
Figure 45: Internet Protocol Properties – Windows 7

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

10. Enter the IP address and subnet mask in the appropriate fields.
    If you do not know what static IP address or range of addresses is available for use, see *Understanding the modem address and computer address* on page 49.

11. Select Use the following DNS server addresses.

12. Enter 66.82.4.8 in the Preferred DNS server field.

13. Click **OK**.

14. Restart the computer.

Configuring Windows Vista to use a static IP address

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

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

    A list of network adapters appears as shown in *Figure 46: Network connections – Windows Vista* on page 60. A Local Area Connection-NIC Card icon *must* appear under the LAN or High-Speed Internet heading. If it does not, the network is not installed correctly.
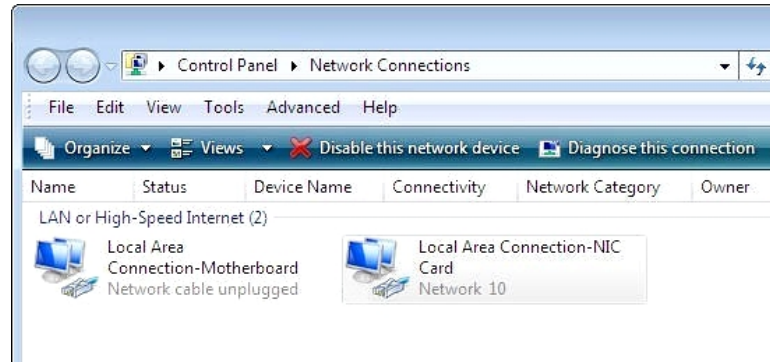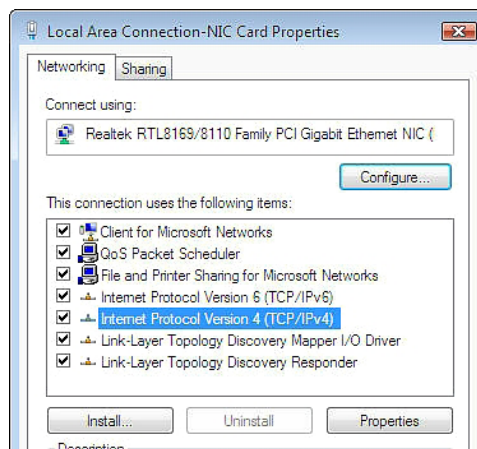

Figure 46: Network connections – Windows Vista

> **Note:** If a red X appears next to the Local Area Connection icon, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.

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

    The Local Area Connection-NIC Card Properties dialog appears as shown in *Figure 47: Local Area Connection Properties – Windows Vista* on page 60.

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


Figure 47: Local Area Connection Properties – Windows Vista

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

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

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

6. Click **Properties**.

   The Internet Protocol Properties dialog appears as shown in *Figure 48: Internet Protocol Properties – Windows Vista* on page 61.
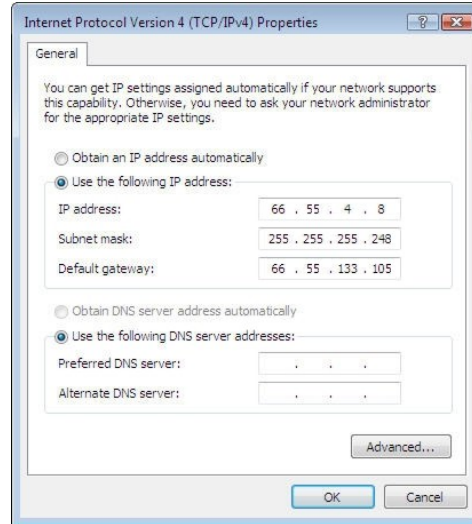
Figure 48: Internet Protocol Properties – Windows Vista

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

8. Enter the IP address and subnet mask in the appropriate fields.
   If you do not know what static IP address or range of addresses is available for use, see *Understanding the modem address and computer address* on page 49.

9. Select Use the following DNS server addresses.

10. Enter 66.82.4.8 in the Preferred DNS server field.

11. Click **OK**.

12. Restart the computer.

Configuring Windows XP to use a static IP address

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

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

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

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

3. Right-click the Local Area Connection icon that represents the satellite modem network connection, and select **Properties** as shown in *Figure 49: Accessing Local Area Connection Properties – Windows XP* on page 62.
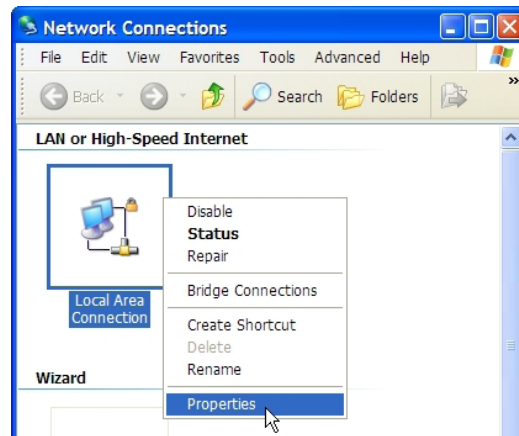
Figure 49: Accessing Local Area Connection Properties – Windows XP

> **Note:** If a red X appears next to the Local Area Connection icon, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.

4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in *Figure 50: Local Area Connection Properties Dialog – Windows XP* on page 62.
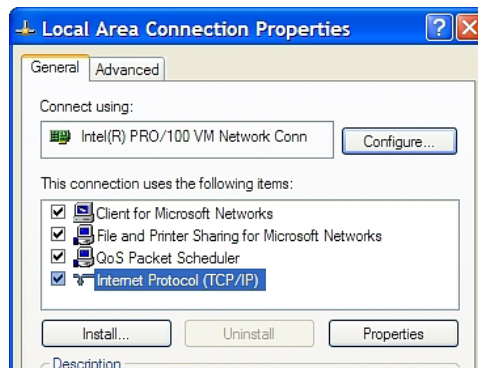
Figure 50: Local Area Connection Properties Dialog – Windows XP

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

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

7. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in *Figure 51: Internet Protocol Properties – Windows XP* on page 63.
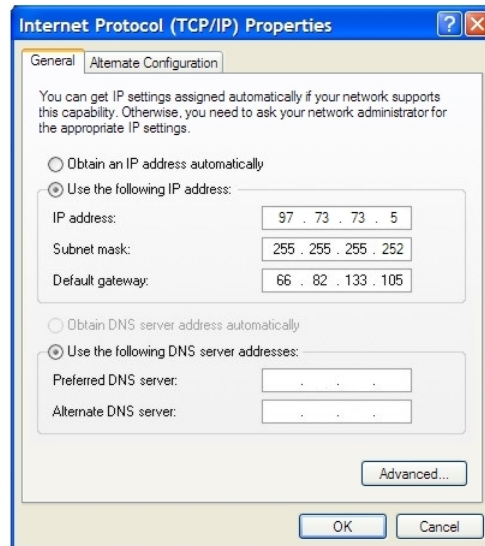
Figure 51: Internet Protocol Properties – Windows XP

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

9. Enter the IP address, subnet mask, and default gateway in the appropriate fields.
    If you do not know what static IP address or range of addresses is available for use, see
    Understanding the modem address and computer address on page 49.

10. Select Use the following DNS server addresses. Enter 66.82.4.8 in the Preferred DNS server field.

11. Click **OK**.

12. Restart the computer.

Configuring a Mac computer to use a static IP address

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

1. From the Mac interface, select **System Preferences**.
    The System Preferences menu appears.

2. Under Internet & Network, click the Network icon.
    The Network screen appears as shown in *Figure 52: Mac Network screen* on page 64.

Figure 52: Mac Network screen

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

4. Select Manually from the Configure drop-down list as shown in *Figure 53: Select Manually from the configure drop-down menu* on page 64.
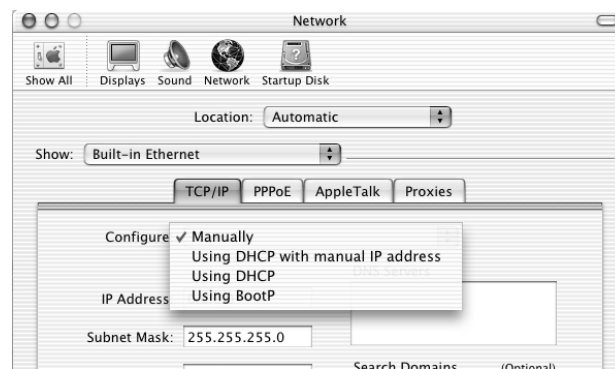

Figure 53: Select Manually from the configure drop-down menu

5. Select the desired IP address. There may be only one address available or a range of available addresses, depending on your service plan.
For additional information, see *Understanding the modem address and computer address* on page 49.

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

Configuring proxy settings

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

Configuring Internet Explorer to not use a proxy server

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

1. Turn the computer on and open Internet Explorer.

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

3. Select the Connections tab and click LAN settings.
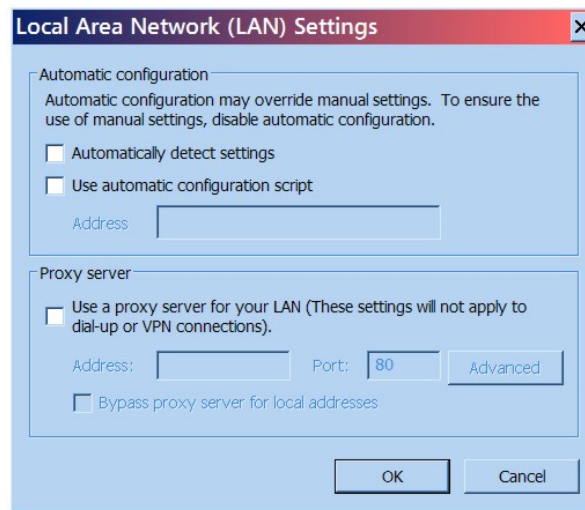   The LAN settings dialog appears.

Figure 54: LAN settings – Internet Explorer

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

5. Click **OK**.

6. Close Internet Explorer and re-launch it to make sure the changes take effect.

Appendix

B

Home networking

This information about networking is provided for home users.

You can connect multiple home computers to a single Internet connection. When connected to a properly aligned antenna assembly, a satellite modem can provide satellite connectivity for multiple computers by using an Ethernet or wireless LAN. Once the satellite modem and network are installed, every computer on the LAN can access the Internet through the satellite signal.

> **Note:** For home networking you need additional equipment other than the satellite modem that is not included with the modem. For network setup, support and configuration, contact the network hardware manufacturer and/or operating system software developer. Hughes is not responsible for home network installation, management, or troubleshooting. Simultaneous use of high bandwidth applications by multiple users may result in speed degradation. Speed and uninterrupted use of service are not guaranteed. Actual speeds may vary.

If you connect your satellite modem to a LAN, you must:

- Install and configure an Ethernet hub, router, or wireless network base station.
- Install and configure a NIC in each computer to be connected. The NICs must be set to auto-negotiate. Refer to the manufacturer's installation instructions.
- For wired networks, connect the computers to the Ethernet hub with Ethernet cable.

> **Note:** You must complete these instructions for *each* computer or device that is to access the Internet over the LAN.

Wireless network basics

A wireless network is typically easy to install because it connects to a wireless base station through radio waves rather than cables. A wireless NIC must be installed in each computer. Wireless base stations and NICs are available at most computer supply stores. Many laptop computers have built-in wireless capability.
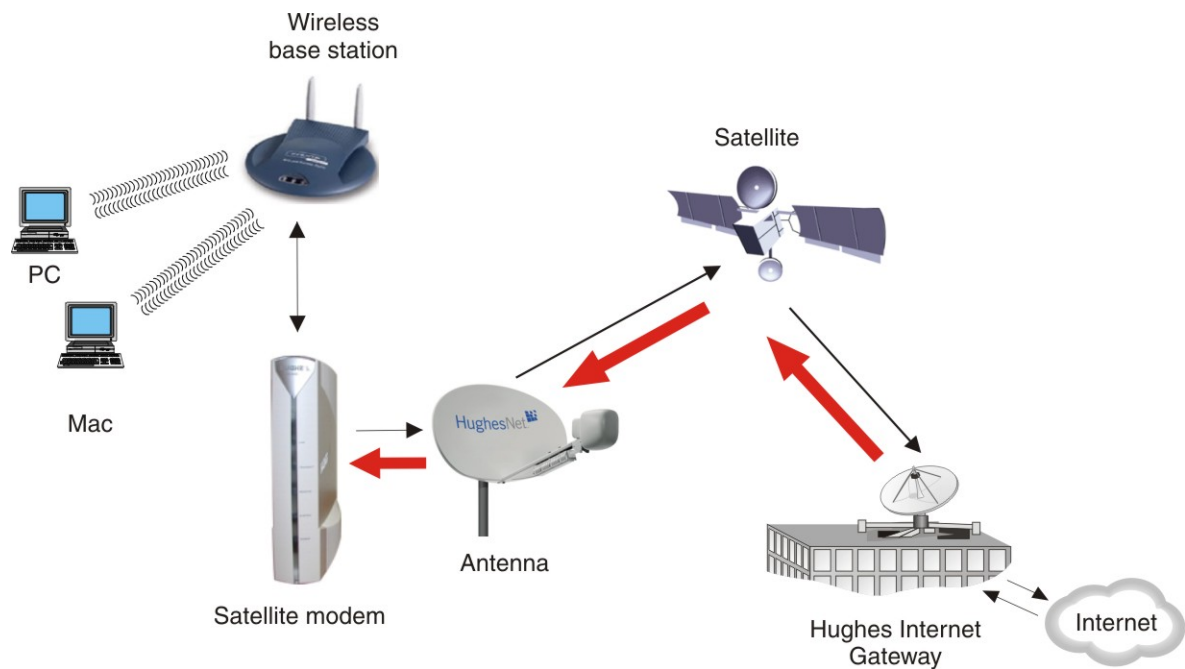
Figure 55: Satellite modem in a wireless home network

A wireless base station is particularly advantageous when using laptops because you can easily take the laptop from room to room without any need to disconnect and reconnect any cables.

Multiple PCs on a LAN must be configured to communicate with the base station. Refer to the base station documentation for instructions.

Base station broadcasting ranges vary. When you purchase a base station, make sure its range suits your needs.

Ethernet (wired) network basics

You can purchase an Ethernet hub, cables, and NICs at most computer supply stores. This equipment is relatively inexpensive and easy to install. When selecting an Ethernet hub, consider the number of computers you intend to connect to the network and how fast you need or want the data connection to be. If the users on your network share large files, you may need a faster hub, a switch, or a router.

The Ethernet NIC must support the auto-negotiate feature, which enables compatibility and inter-operability among Ethernet devices.
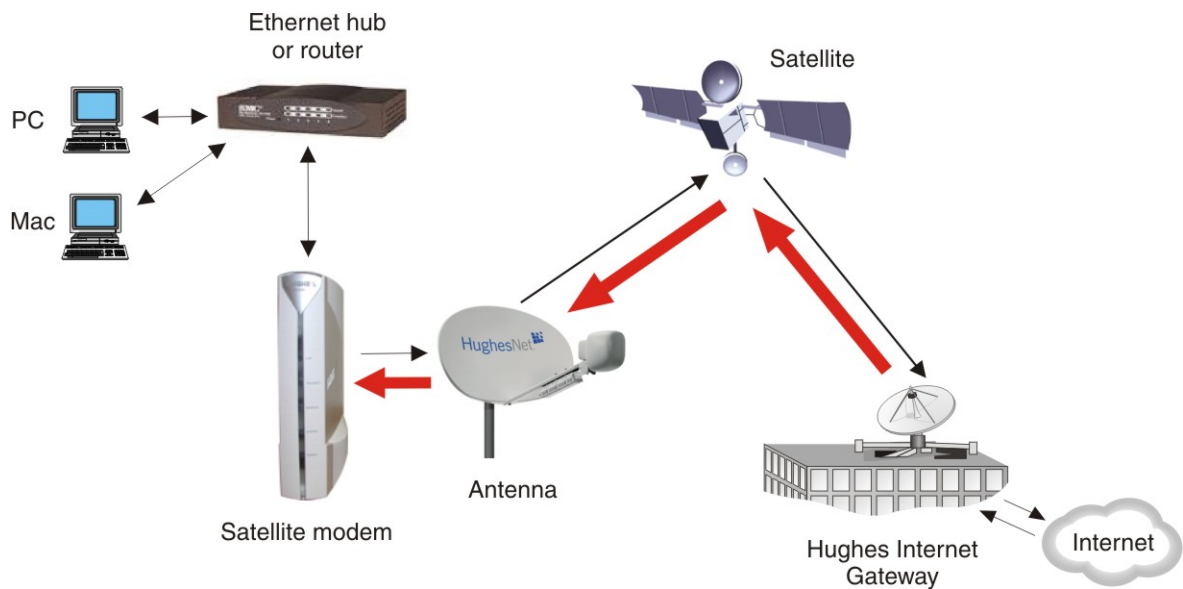
Figure 56: Satellite modem in a wired Ethernet home network

Use at least a Category 5 Ethernet cable. You may consider using Category 5e to accommodate future enhancements. Ethernet cable with RJ-45 connectors at each end is usually available in lengths up to 50 ft. If you need a longer cable, you must terminate the cable using a kit that can be purchased at an electronics, computer, or home supply store. If you feel unsure about installing Ethernet cable, contact a professional installer.

Run Ethernet cables behind walls whenever possible or secure them to floor baseboards and doorway frames. Do not use staples to secure Ethernet cable.

Leave enough slack in the cable to accommodate possible future repair splices or moving of equipment.

Appendix
C

Standards compliance

The HN9000 satellite modem has been certified to conform to the standards shown in *Table 14: HN9000 standards compliance* on page 71. Additional information follows the table.

Table 14: HN9000 standards compliance

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

Electromagnetic interference (EMI)

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

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

FCC Part 15

This section applies to the HN9000 satellite modem.

Standards to which Conformity is declared: FCC Part 15

The modem complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible party's name: Hughes Network System, LLC

Address: 11717 Exploration Lane, Germantown, MD 20876

Telephone: (301) 428-5500

Trade name: HUGHES

Type of equipment: Two-way Hughes system

Model numbers: HN9000 (1500826-xxxx)

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

Canada Class B warning

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

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

Operational and safety requirements for Canada

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

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

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

Repairs in Canada

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

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

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

Appendix

D

Acronyms used in this guide

AC	Alternating current
AWG	American Wire Gauge
CAN	Canada
CONUS	Continental United States
CSA	Canadian Standards Association
DC	Direct current
DHCP	Dynamic Host Configuration Protocol
DSCP	Differentiated services code point
DNS	Domain Name System
ECL	Emission Control Logic
EU	European Union
EMI	Electromagnetic Interference
ESN	Electronic serial number
EU	European Union
FAP	Fair access policy
FCC	Federal Communications Commission
HTTP	HyperText Transfer Protocol
ICES	Interference-Causing Equipment Standard
ICMP	Internet Control Message Protocol
ID	Identifier
IFL	Inter-facility link
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPSec	Internet Protocol security
IRDP	Internet Router Discovery Protocol
ISP	Internet service provider
ISRP	A Hughes proprietary routing protocol
LAN	Local area network
LHCP	Left-hand circular polarization

LLC	Limited Liability Company
MIP	Management information packet
NAT	Network address translation
ND	Neighbor discovery
NetBEUI	Extended User Interface (network transfer protocol)
NIC	Network interface card
NOC	(Hughes) Network Operations Center
NOCC	(Hughes) Network Operations Control Center
PBP	PEP Backbone Protocol (PEP – Performance Enhancing Proxy)
PBR	Policy based routing
PC	Personal computer
POS	Point-of-sale device
PTP	Point-to-point
RHCP	Right-hand circular polarization
RIP	Routing Information Protocol
RIPng	Routing Information Protocol (next generation)
SNR	Signal-to-noise ratio
SQF	Signal quality factor
SSL	Secure Sockets Layer (security protocol)
ST	Satellite terminal (an alternate name for *satellite modem*; used on some software screens)
TCP	Transmission Control Protocol
TIP	Transmission information packet
TTMP	TCP Transaction Multiplexing Protocol
UL	Uplink, Underwriters Laboratory
VAC	Voltage, alternating current
VAR	Value added reseller
VRRP	Virtual Router Redundancy Protocol

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