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HN9000 Satellite Modem User Guide

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11717 Exploration Lane, Germantown, MD 20876 T: 301.428.5500 F: 301.428.1868/2830

Revision record

Revision	Date of issue	Scope
A	March 21, 2008	Initial release

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Understanding safety messages

Three types of safety messages are defined according to the severity of the possible hazard each type of message addresses.

This section explains the meaning of the safety alert symbol  and specific words that are used in this ***Guide*** to bring your attention to safety information.

Safety messages are identified by a label that includes the safety alert symbol and the word DANGER, WARNING, or CAUTION, as shown below. The safety alert symbol alerts you to a potential personal injury hazard. To avoid possible injury or death, read and comply with all safety messages that are designated by this symbol.

These words indicate the severity of the potential hazard, as follows:

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

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

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

The NOTICE label is used for advisory messages *not* related to personal injury. Failure to heed a NOTICE message could result in damage to the product or could cause it not to work properly. In some cases failure to heed a NOTICE message could result in damage to other property.

A notice is not a safety message but is defined here along with safety messages because notices use a label that looks similar to the safety message labels.

Additional safety symbols

In addition to the generic safety alert symbol  , other symbols may be used with safety messages to indicate the type of hazard.

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

Scope and audience

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.

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

Contact Information

If you experience problems with your Hughes satellite modem, first try the solutions offered in *Troubleshooting* on page 33. 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.

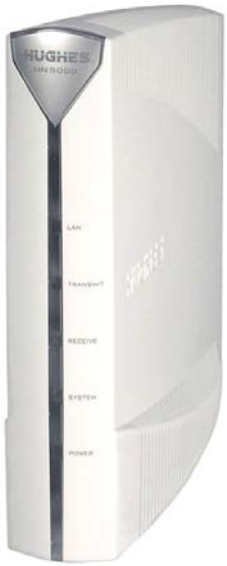


Figure 1: HN9000 satellite modem

Note: Acronyms used in this ***User Guide*** are identified in *Acronyms used in this Guide* on page lxv.

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 that provides access to system information such as the modem's IP address and subnet mask. You may need this information to configure a network. The System Control Center is described in *System Control Center* on page 7.

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.

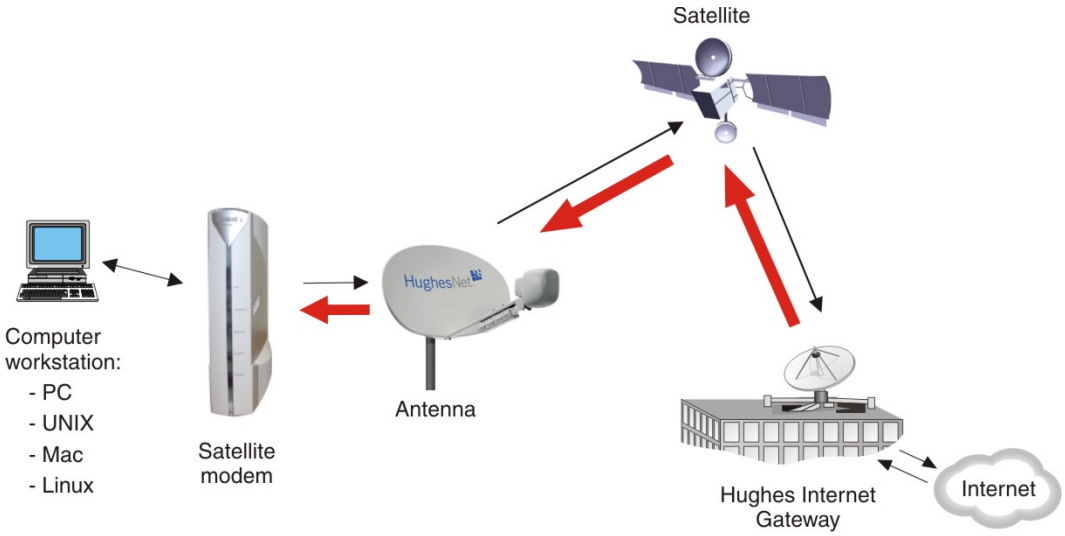


Figure 2: Single-host configuration

In a multiple-host configuration, the hosts on the LAN share satellite Internet or internet 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 2.

Note: You must provide and configure hub, router, or wireless base station equipment if any of these are used.

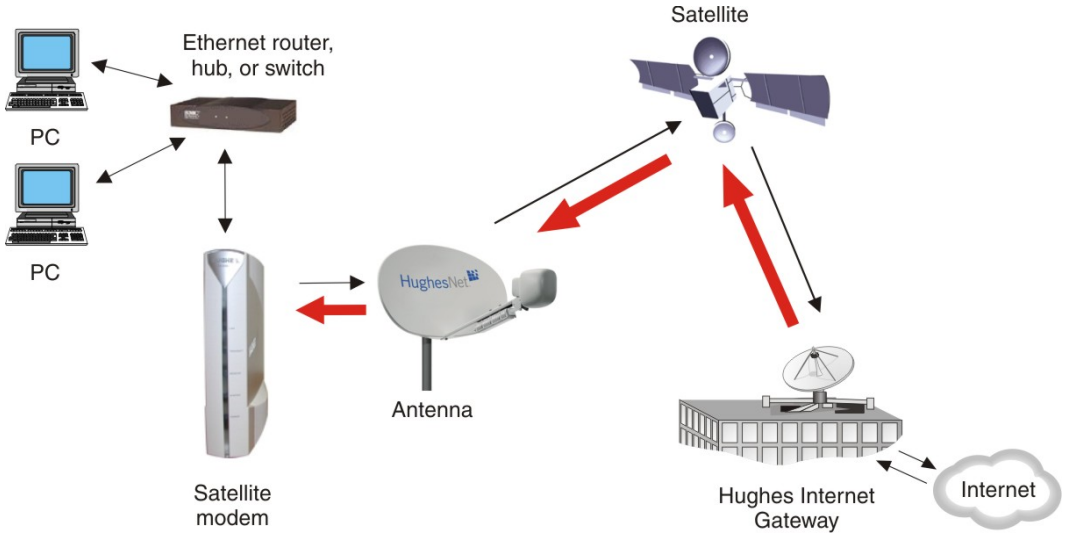


Figure 3: Multiple-host configuration in an Ethernet wired LAN

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.

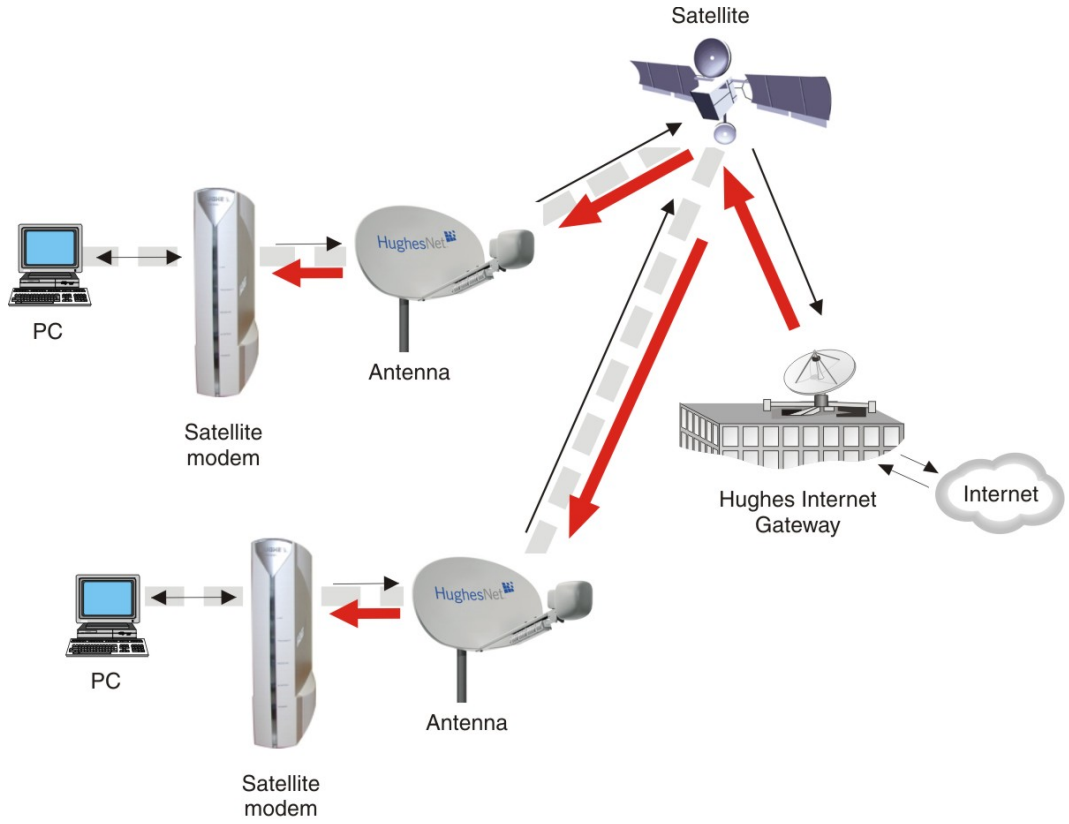


Figure 4: Private network configuration

Satellite modem specifications

Table 1: Specifications for the HN9000 satellite modem

Weight	1.6 lb (0.73 kg)
Width	2.4 inch (6.1 cm)
Height	7.8 inch (19.8 cm)
Depth	9.0 inch (22.9 cm)
Safe operating temperature range	5 to 40º C (Above 5000 ft altitude, the maximum temperature is reduced by 1º C per 1000 ft.)
Safe operating humidity range	5% to 95% non-condensing
Safe altitude	Up to 10,000 ft
Cooling method	Convection
Protocol support	TCP/IP (Transmission Control Protocol / Internet Protocol) protocol suite

Interface ports	One Ethernet port supporting 10BaseT or 100BaseT operation, RJ-45-switched
Power supplies and power requirements	See *Power supply information* on page 4.

Power supply information

The power supply is included in the satellite modem shipping carton.

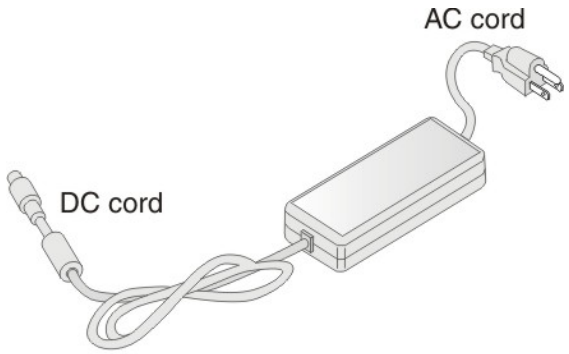


Figure 5: Power supply for the HN9000 satellite modem

Before proceeding, make sure you have the correct power supply. Check the part number on the power supply and refer to *Table 2: Power supply specifications for the HN9000 satellite modem* on page 4.

NOTICE

- Always use the power supply provided with the satellite modem. The modem's performance may suffer if the wrong power supply is used.
- The input must be 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.

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.

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 5. In any other position, the modem may overheat and malfunction because of inadequate ventilation.

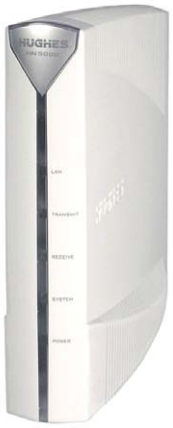


Figure 6: HN9000 in vertical position

NOTICE

To avoid overheating, operate the HN9000 modem only in the upright vertical position as shown in *Figure 6: HN9000 in vertical position* on page 5.

Computer requirements

The computer that connects to the satellite modem must meet the following minimum requirements. Requirements are listed by operating system.

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

The satellite modem may work with a computer that does not meet these requirements, but Hughes supports only computers that meet these requirements. When your HughesNet service was activated, the activation software automatically checked your computer to make sure it meets the minimum requirements. If it did not meet all requirements, but nearly did, you may have been given a choice to proceed with service activation anyway.

Microsoft Windows Vista Home Basic

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

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

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

Microsoft Windows XP, Professional or Home Edition

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

Microsoft Windows 2000, Professional Edition with Service Pack 4

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

Apple Mac 9.0-10.5 (excludes 10.0)

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

Networking requirements

- Ethernet port
- Ethernet cable (provided)
- Ethernet NIC, 10/100 Mbps, configured as follows:
  - Auto-negotiate
  - DHCP enabled
  - Obtain an IP address automatically

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

Internet browser

- Internet Explorer 6 or greater, Netscape Navigator, Mozilla Firefox, Safari (for Windows and Mac)
- Browser settings:
  - HTTP 1.1 or greater enabled
  - Proxy settings disabled

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

   Note: To use 192.168.0.1, the satellite modem must be configured for a private address, and 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 9.

   If you are unable to access the System Control Center, refer to *Cannot Access the System Control Center* on page 34.

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 and Netscape Navigator. It may work with other browsers.

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

   Note: To use 192.168.0.1, the satellite modem must be configured for a private IP address, and 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.

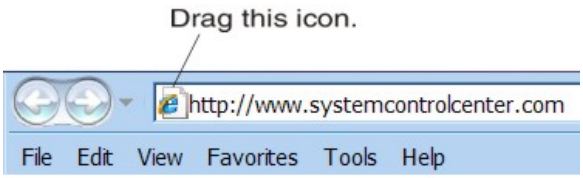


Figure 7: Icon for creating shortcut

System Control Center home page

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

The button links at the top of the page appear on all System Control Center screens and are explained in *Button links* on page 11.

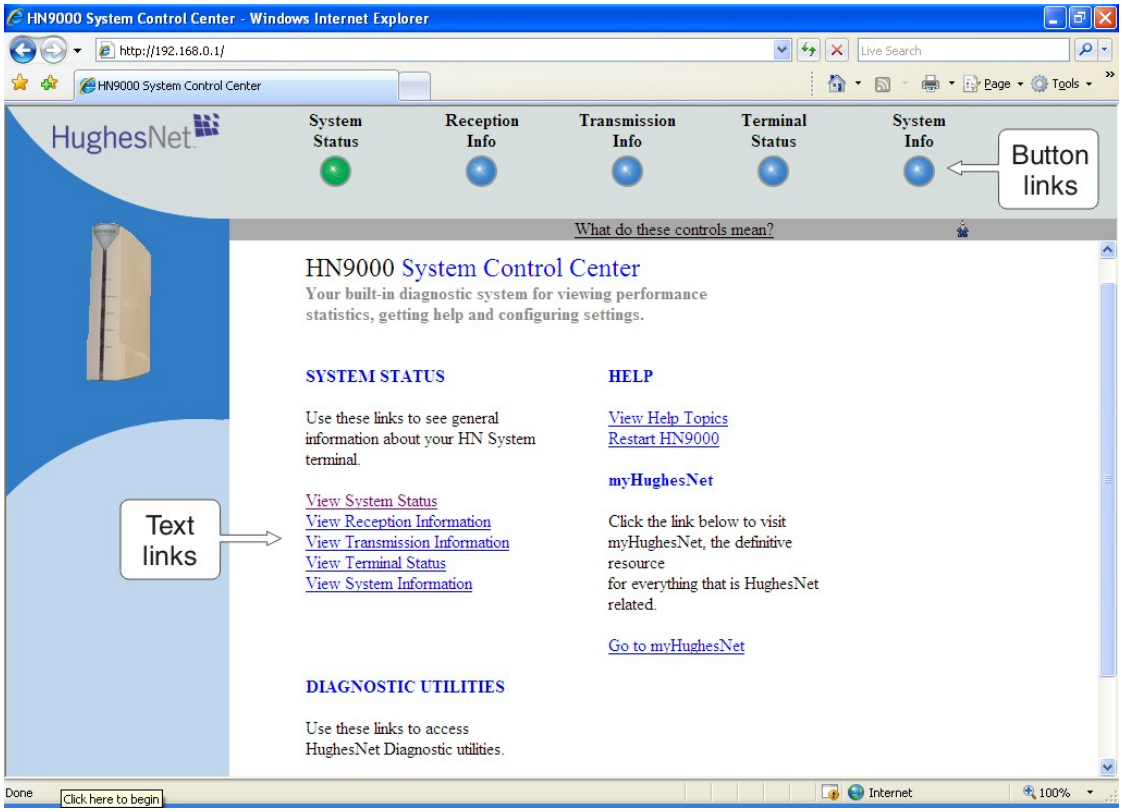


Figure 8: System Control Center home page

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

Text links

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

System Status links

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

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

Diagnostic utilities link

Connectivity Test – Opens the Connectivity Test page, which can be used to test the connection between the satellite modem and the satellite. If you can access the satellite, there is no problem with your physical site connectivity between the modem (inside) and the radio assembly and antenna (outside). See *Connectivity Test page* on page 23.

Help link

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

Restart HN9000 restarts the satellite modem.

myHughesNet

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

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

System Control Center common features

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 11. These features and other common features are explained in the following sections.

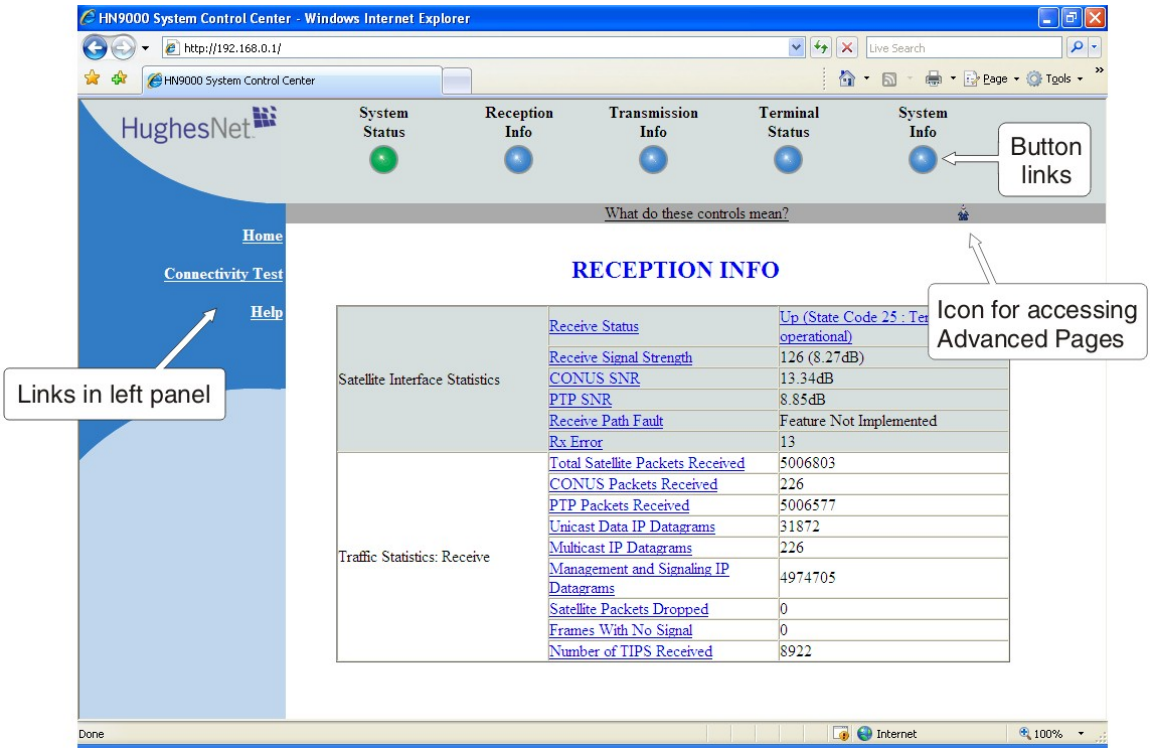


Figure 9: Common features on System Control Center screens

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 11. These five buttons appear at the top of every System Control Center page to provide an easy means of navigation. Each button is a link to the System Control Center page identified by the label—for example, the **System Status** is a link to the System Status page.

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

Figure 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 14.

Button	Destination	Description of destination page
Reception Info	Reception Information page	Displays statistics about received data and receive connection status. For more information see *Reception Information page* on page 15.
Transmission Info	Transmission Information page	Displays statistics about the transmitted data and transmit connection status. For more information see *Transmission Information page* on page 16.
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 17.
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 19.

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: Meaning of System Status button colors* on page 12. To see more detailed status information, click the System Status button to open the System Status page.

Table 4: Meaning of System Status button colors

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

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

Links in left panel

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

- **Home** – Opens the System Control Center home page.
- **Connectivity Test** – Opens the Connectivity Test page, which allows you to test the connection between the modem and the satellite. See *Connectivity Test page* on page 23.
- **Help** – Opens the Help page. Refer to the Help page, which includes a variety of topics such as getting started and recommended browser settings.

Status and information screens

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

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

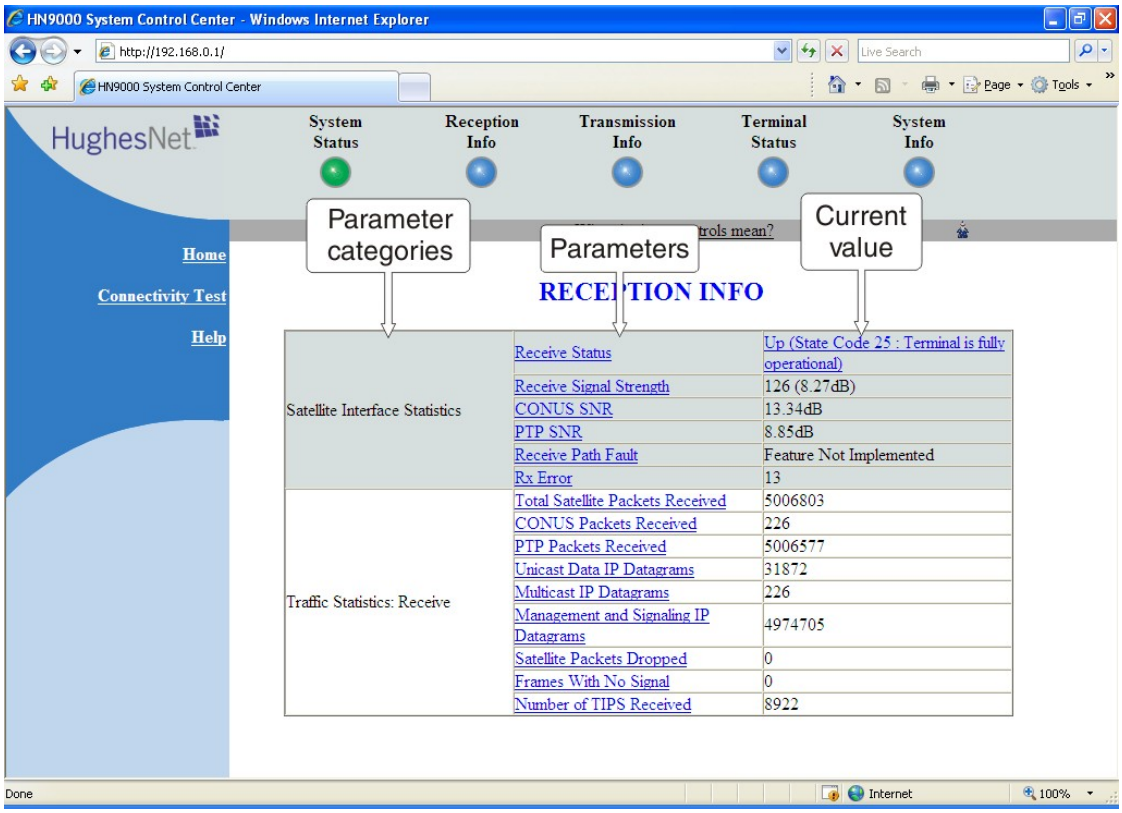


Figure 11: Format of status and information screens

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.

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 12: Example of a state code* on page 14, or next to a parameter that is related to an error condition.

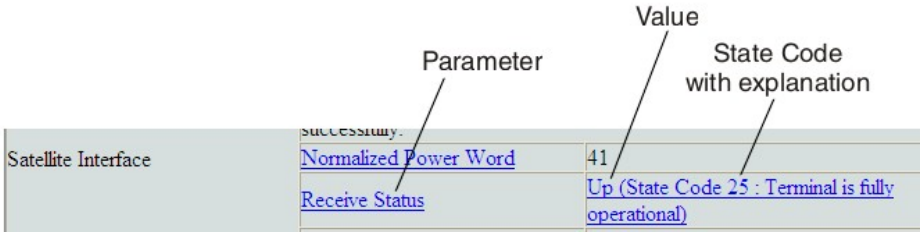


Figure 12: Example of a state code

For a list and explanation of all state codes, see *Table 5: State codes* on page 20.

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.

The red flag may help you or a Hughes Customer Care 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.

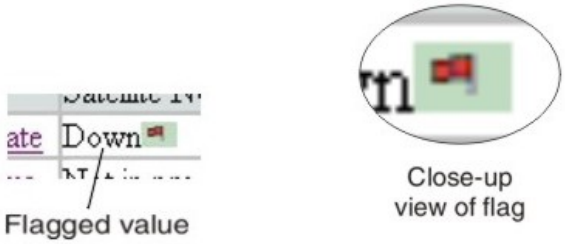


Figure 13: Red flag problem indicator

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 14: System Status page* on page 15 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.

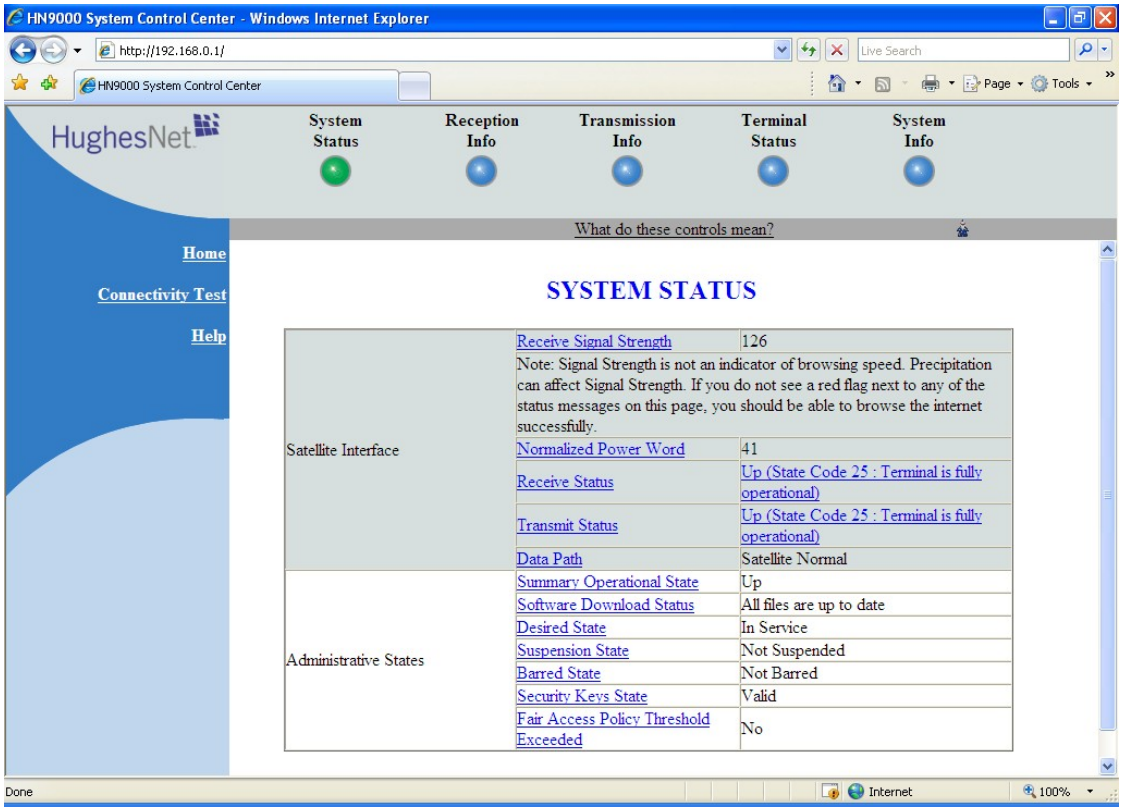


Figure 14: System Status page

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.

Reception Information page

The Reception Information page shown in *Figure 15: Reception Information page* on page 16 displays information about data received by the satellite modem.

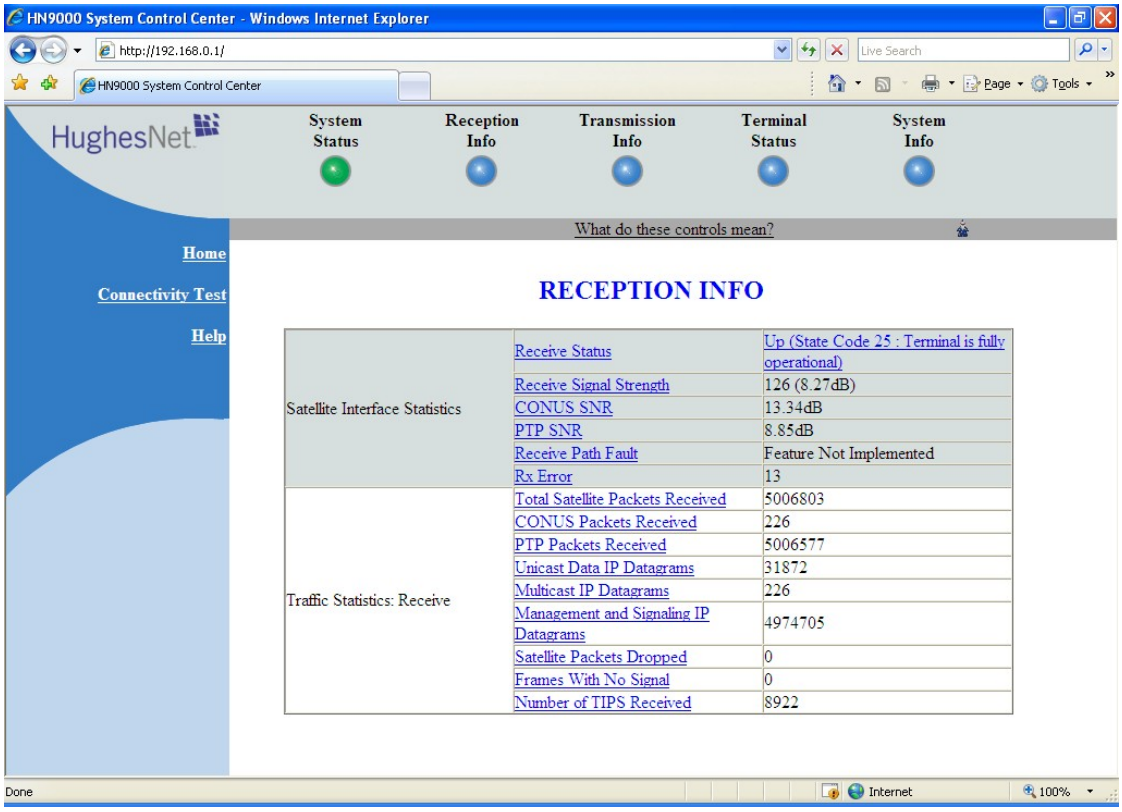


Figure 15: Reception Information page

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.

Information about selected parameters

This section provides information for selected parameters on the Reception Information page. Parameters that may be most useful for you to know about are listed.

Total Satellite Packets Received – An increasing count of Total Satellite Packets Received indicates that your satellite modem is successfully receiving data.

Transmission Information page

The Transmission Information page shown in *Figure 16: Transmission Information page* on page 17 displays information about data transmissions from the satellite modem. The information on this screen may be useful to a Hughes Customer Care representative if you need help in resolving a problem.

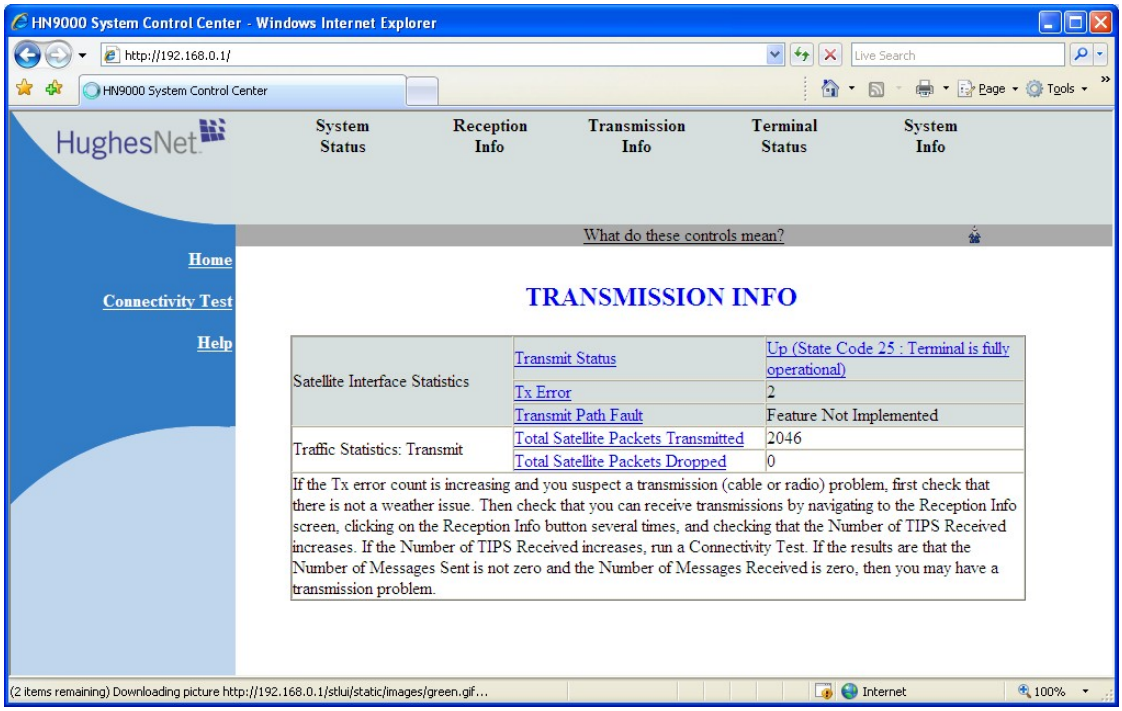


Figure 16: Transmission Information page

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.

Information about selected parameters

This section provides information for selected parameters on the Transmission Information page. Parameters that may be most useful for you to know about are listed.

Total Satellite Packets Transmitted – An increasing count of Total Satellite Packets Transmitted indicates that your satellite modem is successfully transmitting data.

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.

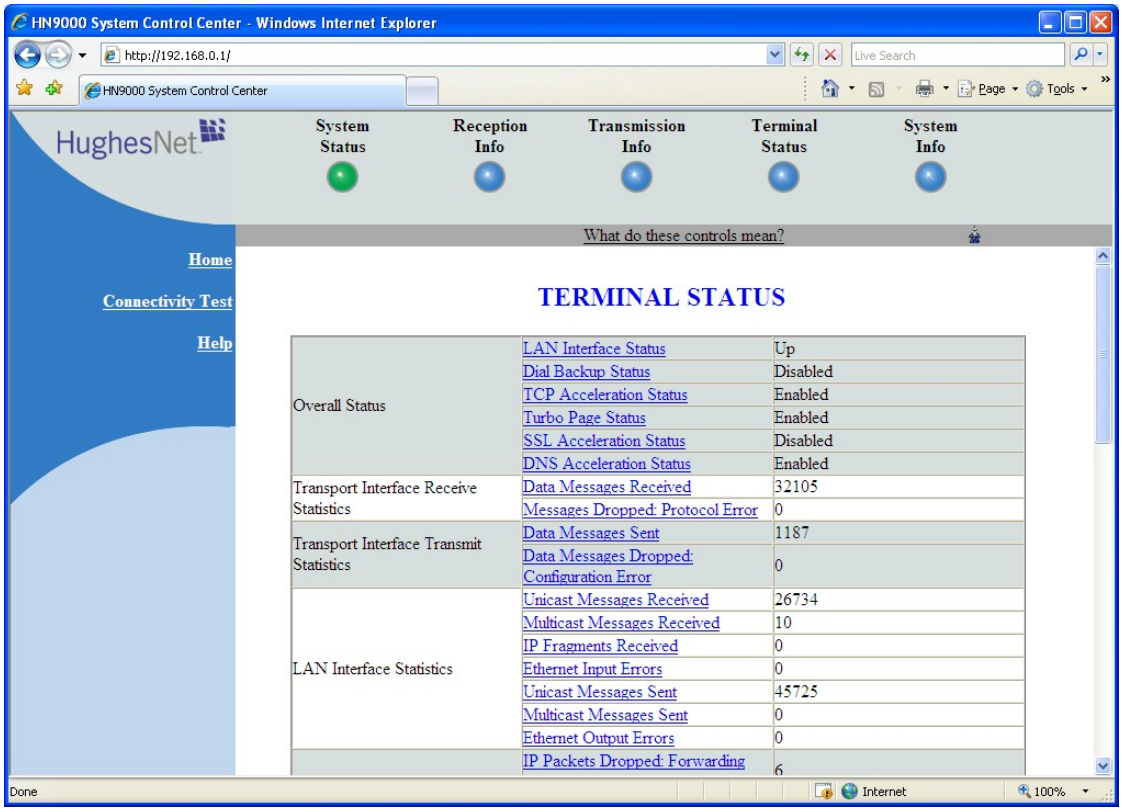


Figure 17: Terminal Status page (top part)

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

Information about selected parameters

This section provides information for selected parameters on the Terminal Status page. Parameters that may be most useful for you to know about are listed.

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

System Information page

The System Information page shown in *Figure 17: Terminal Status page (top part)* on page 19 provides system information for the satellite modem such as ST name (modem name), Site ID (Site Id), and operational software version.

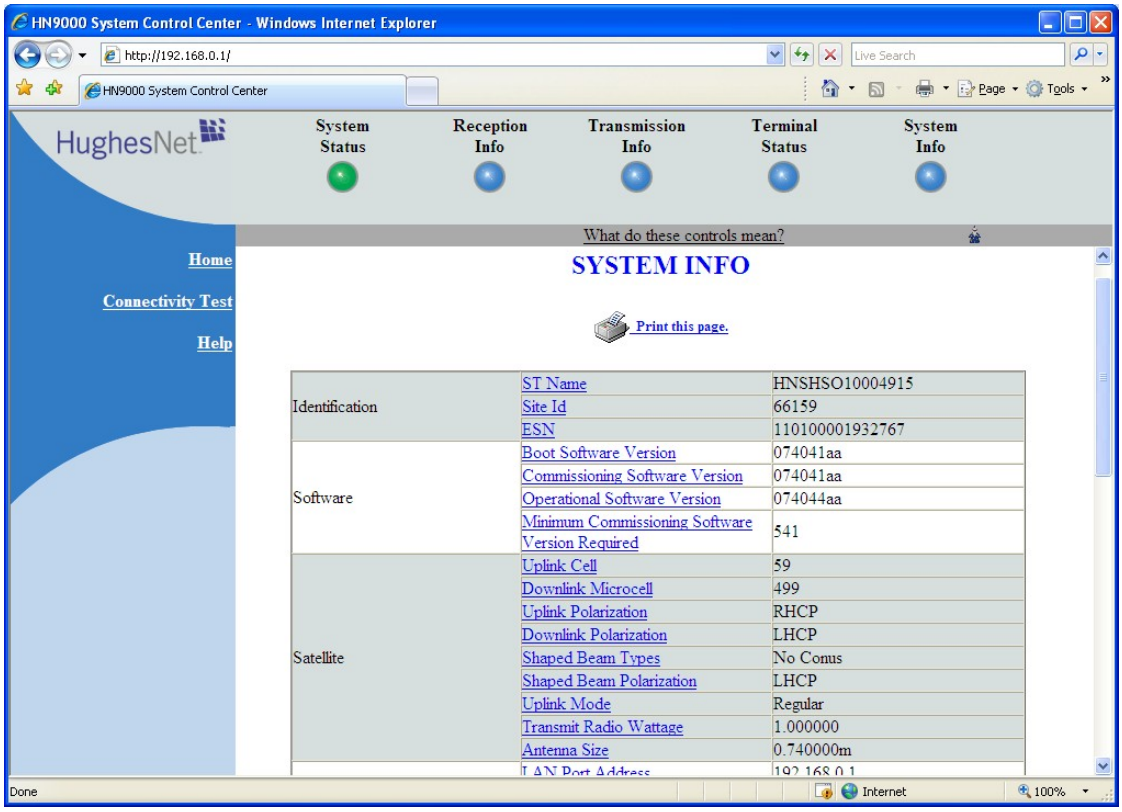


Figure 18: System Information page (top part)

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 Hughes Customer Care representative in helping you to resolve the problem.

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 public IP addresses (if any, depending on your service plan).
- Software Features – This section lists the optional features and provides information on whether they are currently active. These features are enabled or disabled per your service plan and cannot be changed locally.

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.

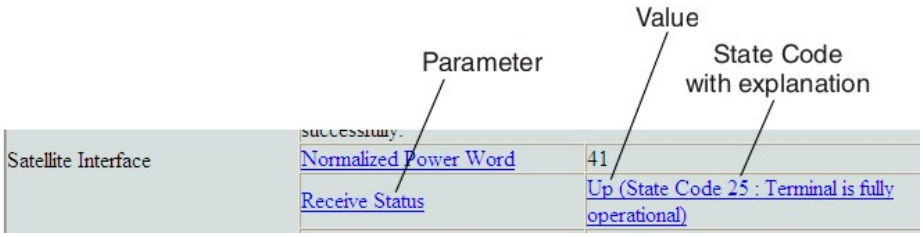


Figure 19: Examples of state codes

Table 5: State codes on page 20 lists and explains all HN9000 state codes.

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

Table 5: 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.

State code	State name	Explanation	Corrective action
7	Downlink Established in Boot	Modem is in boot phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
8	Waiting for MIPs in Boot	Modem is in boot phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
9	Downloading Commissioning Software	Modem is in boot phase and is downloading commissioning software.	Transient – No action is necessary.
10	Waiting for Antenna Pointing Complete	Modem is waiting for antenna pointing validation to complete. *Occurs during installation only.*	Installer must complete validation.
Installation – Commissioning phase			
11	Starting Up in Commissioning	Modem is starting up in commissioning phase.	Transient – No action is necessary.
12	Downlink Established in Commissioning	Modem is in commissioning phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
13	Waiting for MIPs in Commissioning	Modem is in commissioning phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
14	Probing in Progress	Modem is in commissioning phase. Probing is in progress. *Occurs during installation only.*	Transient – No action is necessary.
15	Probing Failure	Modem is in commissioning phase. Probing has failed.	*Occurs only during installation.*
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 only during installation.*
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).

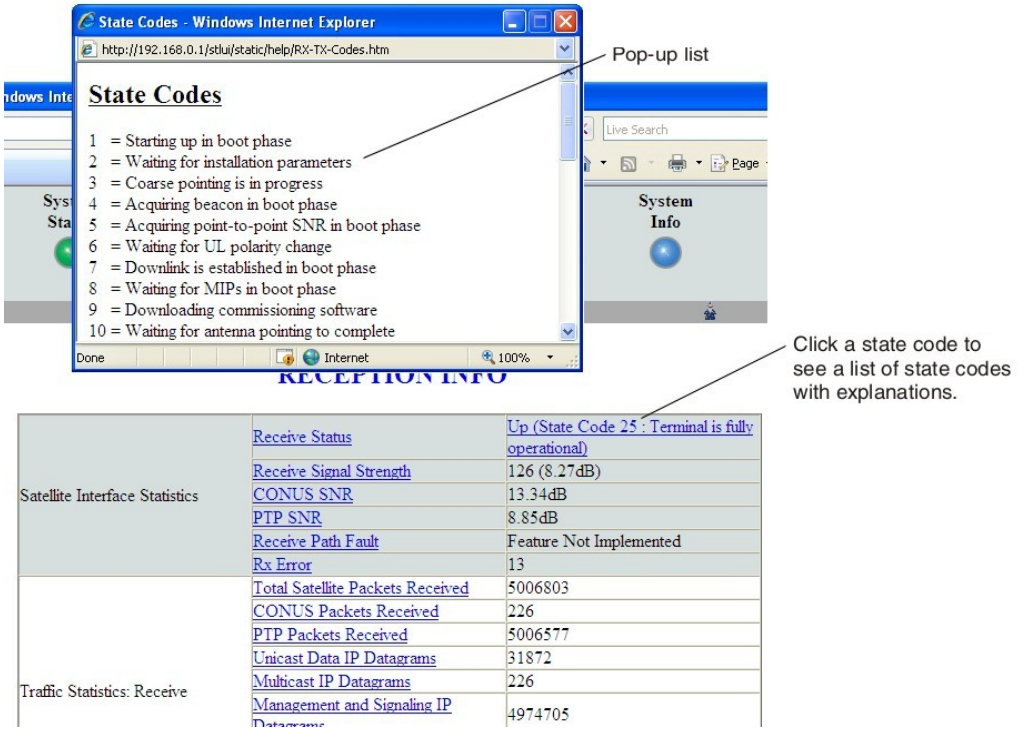
State code	State name	Explanation	Corrective action
Operational phase			
21	Starting Up in Operation	Modem is starting up in operational phase.	Transient – No action is necessary.
22	Downlink Established in Operational	Modem is in operational phase. Downlink has been established; that is, beacon is being tracked and transmission information packets are being received.	Transient – No action is necessary.
23	Waiting for MIPs in Operational	Modem is in operational phase and is waiting for indirect and direct management packets.	Transient – No action is necessary.
24	Reconciling Profile in Operational	Modem is in operational phase. Profiles are being distributed to various subsystems.	Transient – No action is necessary.
25	Fully Operational (normal operation)	Modem is fully operational.	Steady state – No action is necessary.
Error codes			
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.	Call your service provider to verify cabling and pointing.
28	No TIPs	Modem is not receiving transmission information packets from satellite.	Call your service provider to verify cabling and pointing.
29	Tx Connectivity Down	Tx cable connectivity tests have failed.	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.
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.

State code	State name	Explanation	Corrective action
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; if this happens, minimize other open windows.

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

Connectivity Test page

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

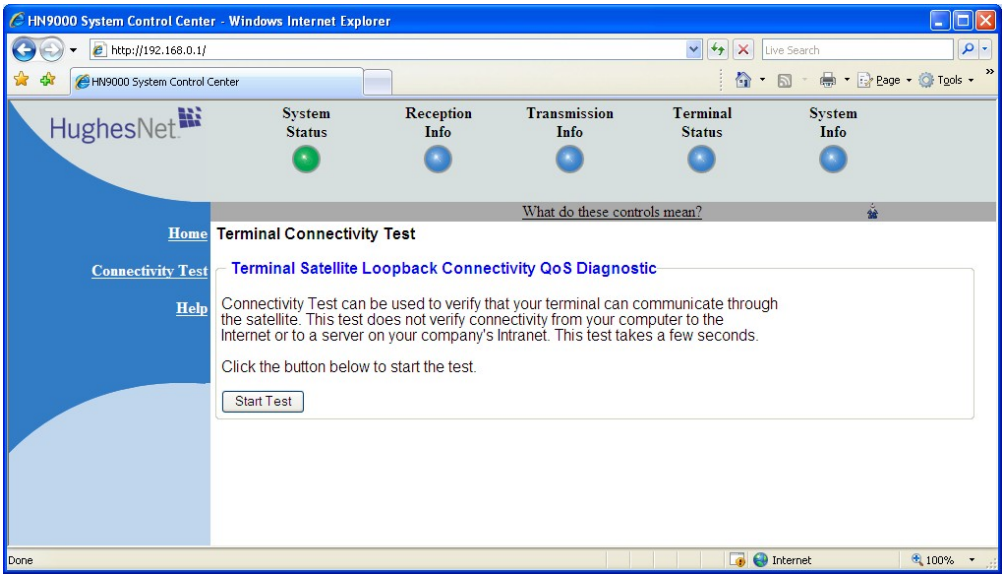


Figure 20: Terminal Connectivity Test page

For details about this test, see *Testing connectivity to the satellite* on page 34.

Chapter 3

HughesNet Tools

Topics:

HughesNet Tools is a suite of software tools installed on the computer that is connected to the satellite modem during service activation. If for any reason HughesNet Tools is not installed on your computer, you can download it from **www.myhughesnet.com**. (Click the HughesNet **Customer Care** link, click **Tools**, and then clink the link to download HughesNet Tools.)

HughesNet Tools:

- Can help you solve Internet browsing problems.
- Provides enhanced Internet security and improved performance for your computer.
- Provides convenient access to helpful support documents and phone numbers for contacting Hughes Customer Care.

Launching HughesNet Tools

To launch HughesNet Tools from the Windows Start menu, click **Start** □ **Programs** □ **HughesNet Tools**.

You can also launch HughesNet Tools by double-clicking the HughesNet Tools shortcut 

on your computer desktop or by double-clicking the similar icon in the system tray in the lower right corner of your computer screen.

The HughesNet Tools home page opens, as shown in *Figure 21: HughesNet Tools home page* on page 26.

HughesNet Tools home page

The HughesNet Tools home page includes links to several useful tools, utilities, and information sites. Several of the tools run automatic tests when you click the link.

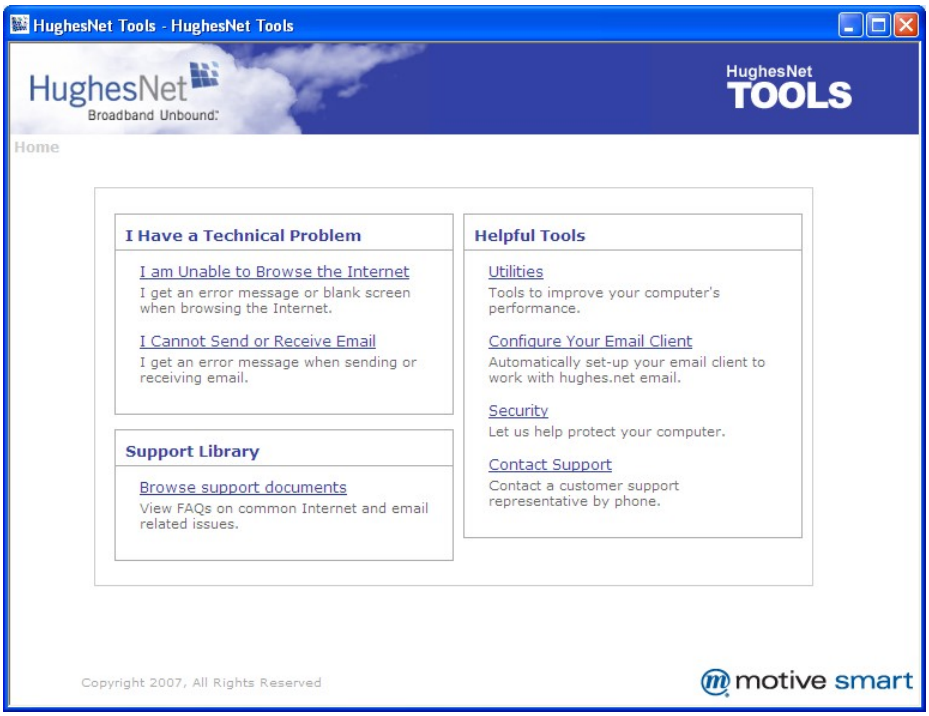


Figure 21: HughesNet Tools home page

I Have a Technical Problem

I Have a Technical Problem includes the following links:

I am Unable to Browse the Internet – This tool tests your Internet connection. If the test fails, the tool suggests options for solving the problem.

I Cannot Send or Receive Email – This tool tests your e-mail account, and attempts to correct the problem.

Support Library

In the *Support Library* area of the screen, the link **Browse All Support Documents** helps you navigate to support documents for Internet Explorer and Outlook Express and Hughes *How to* articles on various topics.

Helpful Tools

Helpful Tools includes the following links:

Utilities – These utilities can improve the performance of your computer and/or Internet browser.

Configure Your Email Client – This tool configures your computer to use any of several popular email programs.

Security – This tool takes certain steps to improve the security of your computer. It scans your computer to see what security software is installed. It asks you if you would like to install a trial subscription to the ZoneAlarm Security Suite.

Contact Support – If you click the **Contact Support** link, HughesNet Tools automatically runs tests to see if it can determine and correct any problems with your computer and Internet browser configuration. If it cannot find and correct any problems, HughesNet Tools presents a phone number you can call for assistance.

Chapter 4

LEDs

Topics:

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 22: Front panel LEDs on the HN9000 modem* on page 30. By their appearance—on, off, or blinking—the LEDs indicate the modem's operating status.

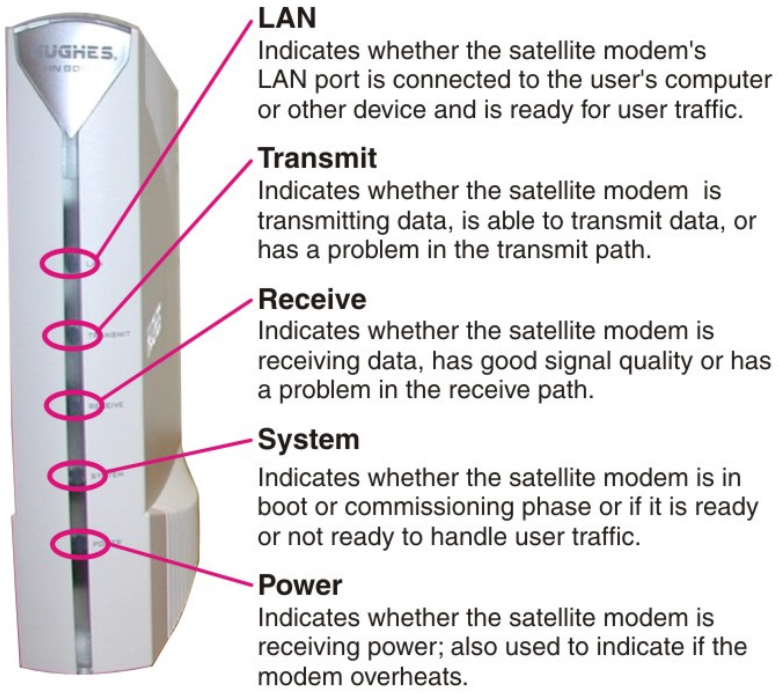


Figure 22: Front panel LEDs on the HN9000 modem

Table 6: Front panel LED indications on page 30 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 6: 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	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.	
	Blinking	The modem is receiving data packets from the satellite.	

LED	Appearance	Satellite modem status	Corrective action
	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 23: LAN port LEDs* on page 31.

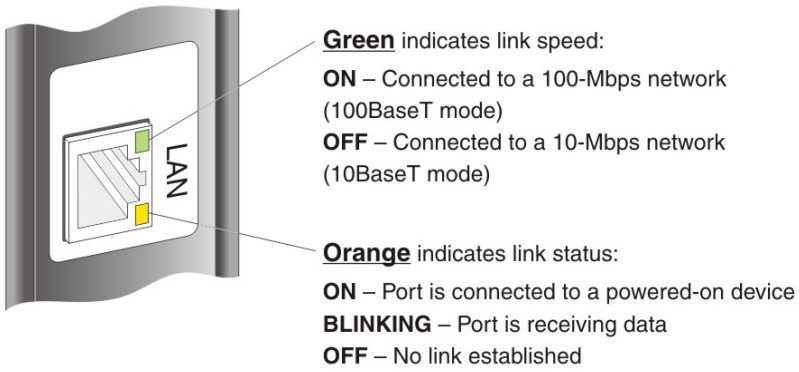


Figure 23: LAN port LEDs

Chapter 5

Troubleshooting

Topics:

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 Hughes Customer Care.

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

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 37.

Cannot Access the System Control Center

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

1. If the modem is using a private IP address, confirm that DHCP is enabled on the computer. This procedure is explained in *Configuring a computer to use DHCP* on page 39.
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, the satellite modem must be configured for a private IP address, and DHCP must be enabled on the computer.

   If the System Control Center does not appear, continue with the remaining steps.
4. Make sure that the satellite modem is powered up. The Power and LAN LEDs should be continuously lit—except that the LAN LED may blink if there is LAN activity.
5. Make sure the DC power cord adapter is securely attached to the satellite modem.
6. If the LEDs are off, make sure the Ethernet cable is securely attached to the satellite modem and the computer.
7. If you still cannot access the System Control Center, contact Hughes Customer Care 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 24: Satellite loopback connectivity test* on page 34. If the test succeeds, it verifies that the modem can connect to the satellite.

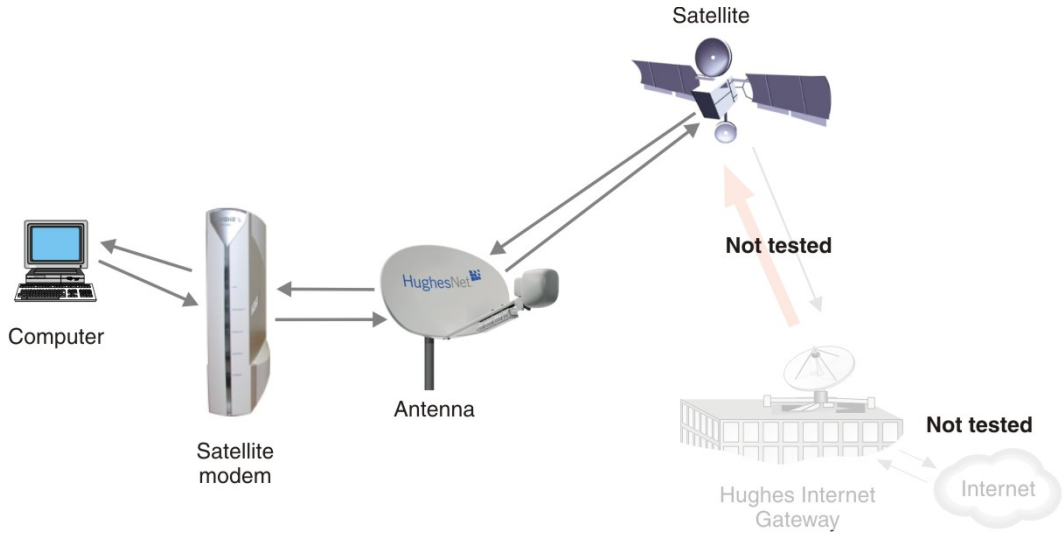


Figure 24: Satellite loopback connectivity test

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.

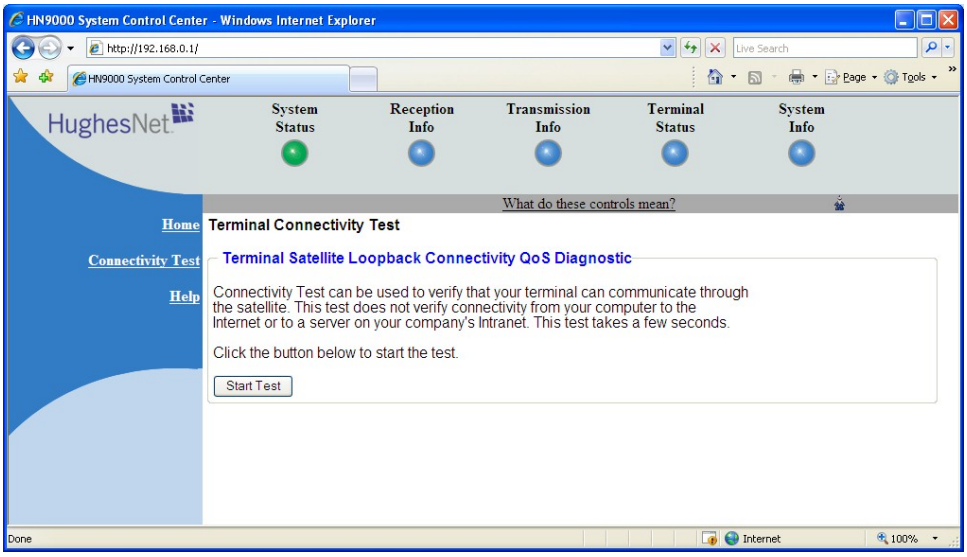


Figure 25: Terminal Connectivity Test page

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

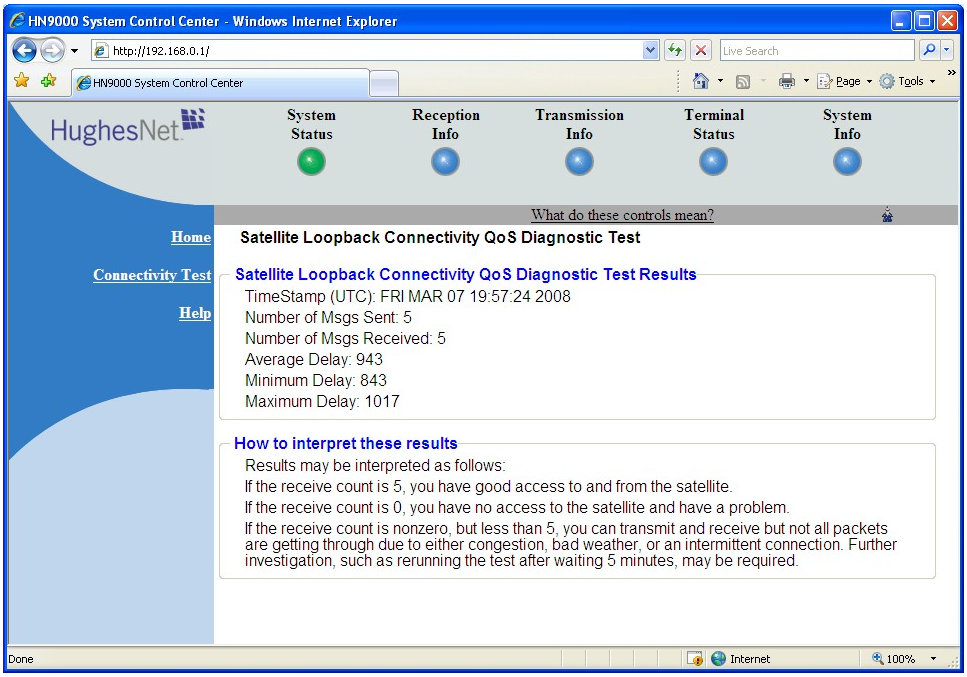


Figure 26: Connectivity Test results page

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.

Chapter 6

Computer settings

Topics:

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 public IP address
- Disabling a web browser's proxy connection

These procedures are explained in the sections that follow.

Understanding the modem address and computer address

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

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

To find specific address information, go to the System Control Center System Information page *Figure 17: Terminal Status page (top part)* on page 19. 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 *Figure 27: Example of Addressing parameters showing available private IP addresses* on page 38 is an example of System Information page address parameters for a satellite modem with a service plan that provides private IP addresses.

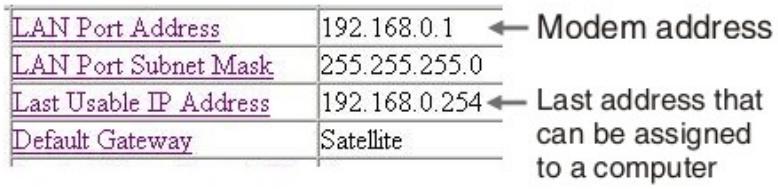


Figure 27: Example of Addressing parameters showing available private IP addresses

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

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

Public IP address

Figure *Figure 28: Example of Addressing parameters showing one available public IP address* on page 38 is an example of System Information page address parameters for a satellite modem with a service plan that provides one public IP address. Some service plans provide multiple public IP addresses.

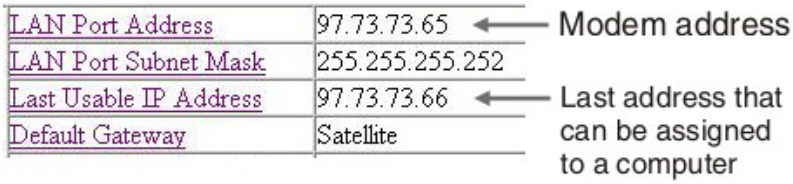


Figure 28: Example of Addressing parameters showing one available public IP address

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

For instructions on configuring a public IP address on your computer, see the applicable section in *Configuring a computer for a public IP address* on page 47. Find the section that applies to your computer operating system.

Multiple public IP addresses

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

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

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

1. Use the Windows Control Panel on the connected computer to open the Local Area Connection Properties dialog and then the Internet Protocol (TCP/IP) Properties dialog. If you need more specific instructions, see *Configuring a computer for a public IP address* on page 47.
2. In the Internet Protocol Properties dialog, click Use the following IP address.
3. Enter the following:
   a) In the IP address field, type 169.254.10.10.
   b) Typically the Subnet mask field auto-populates to 255.255.0.0. If it does not, enter this value manually.
   c) In the Default gateway field, type 169.254.0.1.
   d) In the Preferred DNS server field, type 66.82.4.8.
   e) Click **OK** twice to close the Internet Protocol Properties dialog and the Network Connections dialog.
4. With the computer configured as instructed above, type 169.254.0.1 in your browser address window to open the System Control Center.
   If you click the link on the System Control Center home page for the System Information page, you can read the modem's IP address in the Addressing section. The LAN Port Address is the modem's IP address.
5. Record the LAN Port Address and the Last Usable IP Address.

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

   Alternatively, if you want to assign a particular public IP address to your computer, you can set that public IP address on your computer. To configure the public address, see *Configuring a computer for a public IP address* on page 47.

Configuring a computer to use DHCP

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

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

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

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

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

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 57 for more information.

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 29: Network connections – Windows Vista* on page 40. 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.

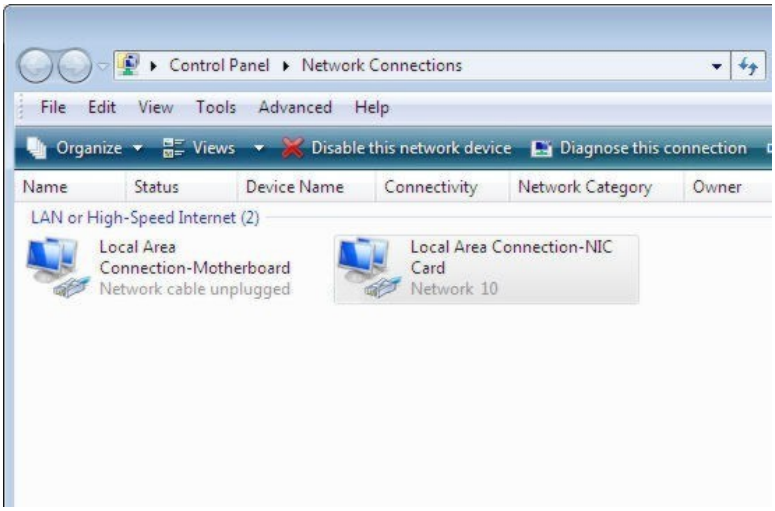


Figure 29: Network connections – Windows Vista

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

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

   The Local Area Connection-NIC Card Properties dialog appears as shown in *Figure 30: Local Area Connection Properties – Windows Vista* on page 41.

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.

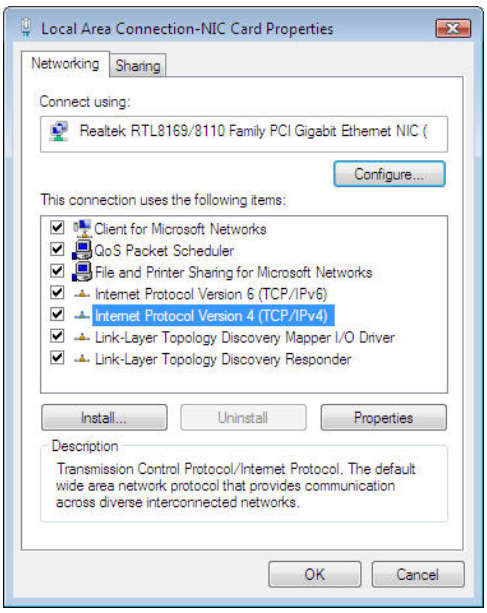


Figure 30: Local Area Connection Properties – Windows Vista

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 31: Internet Protocol Properties – Windows Vista* on page 41.

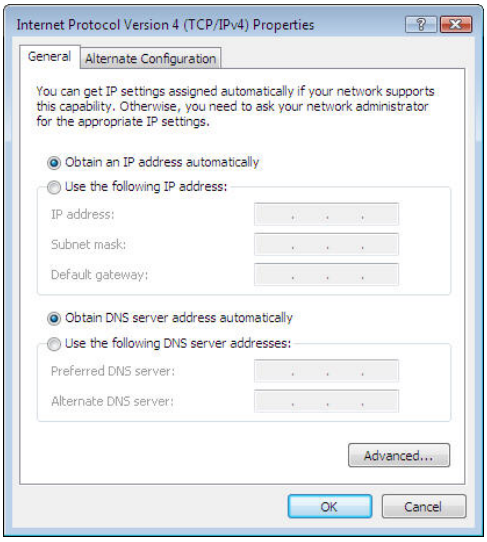


Figure 31: Internet Protocol Properties – Windows Vista

7. Ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected.
8. Click **OK**.
9. Confirm that you have an IP address:
   a) Click **Start** □ **Run**.
   b) Type cmd and click **OK**.

c) Type ipconfig/renew and press **Enter**.
d) Make sure an IP address is shown on the line that starts with IP Address.

Configuring Windows XP to use DHCP

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

1. From the Windows desktop, select **Start** □ **Settings** □ **Control Panel**.
2. Double-click the Network and Dialup Connections icon.

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

A list of network adapters appears as shown in *Figure 32: Network connections – Windows XP* on page 42. 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.

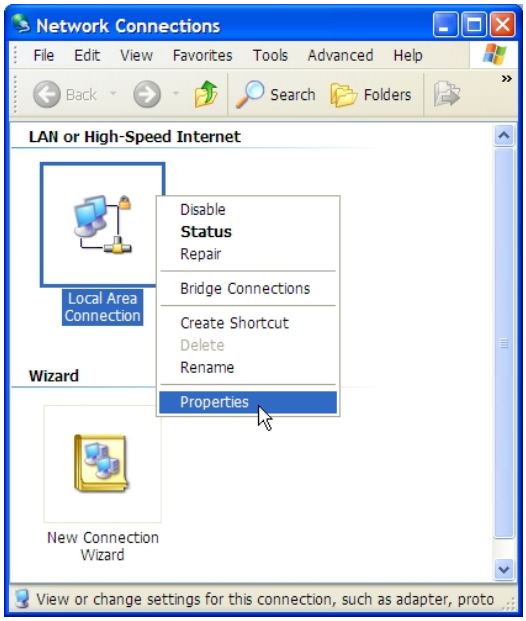


Figure 32: Network connections – Windows XP

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

3. Right-click the Local Area Connection icon that represents the network adapter connecting the computer to the Satellite Gateway, and select **Properties**.
The Local Area Connection Properties dialog appears as shown in *Figure 33: Local Area Connection Properties – Windows XP* on page 43.

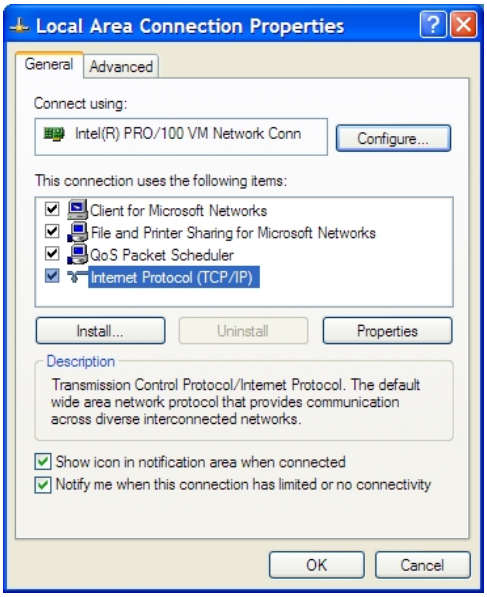


Figure 33: Local Area Connection Properties – Windows XP

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 34: Internet Protocol Properties – Windows XP* on page 43.

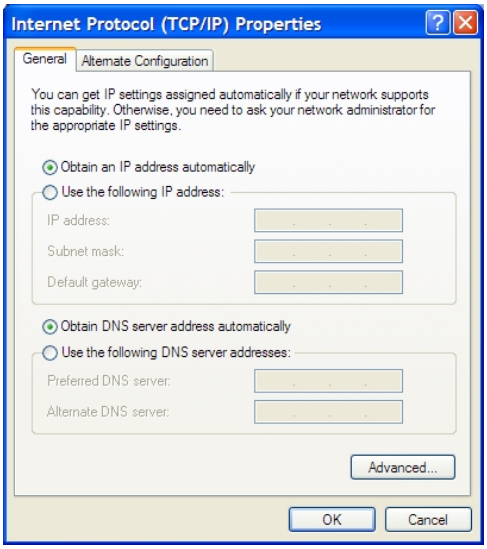


Figure 34: Internet Protocol Properties – Windows XP

8. On the General tab, ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected. If not, select them.
9. Click **OK**.
10. Confirm that you have an IP address:
    a) Click **Start** □ **Run**.
    b) Type cmd and click **OK**.

c) Type ipconfig/renew and press **Enter**.
d) Make sure an IP address is shown on the line that starts with IP Address.

Configuring Windows 2000 to use DHCP

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

1. From the Windows desktop, select **Start** □ **Settings** □ **Control Panel**.
2. Double-click the Network and Dialup Connections icon in the Control Panel window.

   A list of network connections appears. A Local Area Connection icon *must* appear on this page. If it does not, the network is not installed correctly.
3. Right-click the Local Area Connection icon that represents the satellite modem network connection, and select **Properties** as shown in *Figure 35: Accessing Local Area Connection Properties – Windows 2000* on page 51.

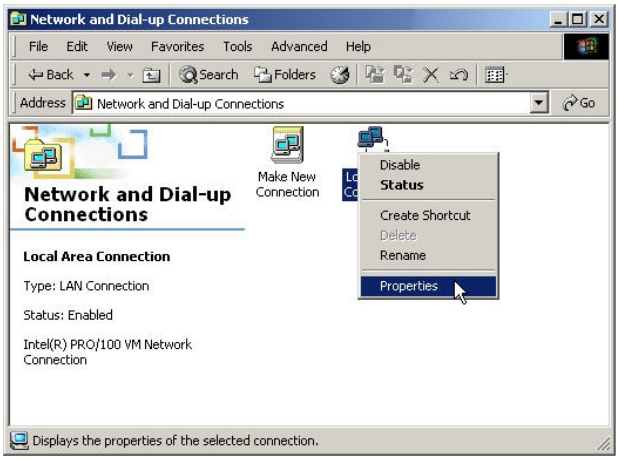


Figure 35: Accessing Local Area Connection Properties – Windows 2000

4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in *Figure 36: Local Area Connection Properties Dialog – Windows 2000* on page 52.

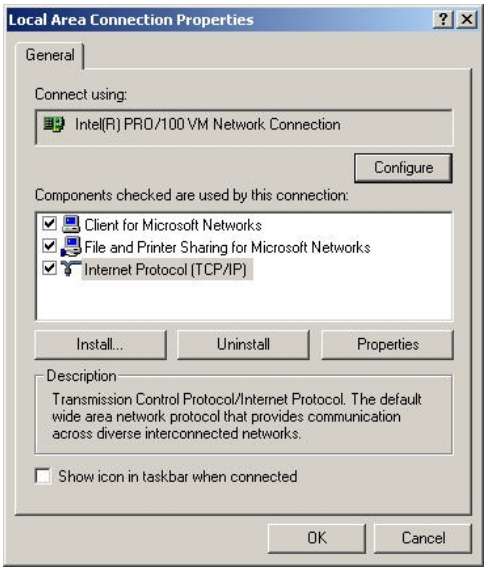


Figure 36: Local Area Connection Properties Dialog – Windows 2000

5. If NetBEUI is installed and checked, uncheck it or uninstall it.
6. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.
7. Click **Properties**.
   The Internet Protocol Properties dialog appears as shown in *Figure 37: Internet Protocol Properties – Windows 2000* on page 52.

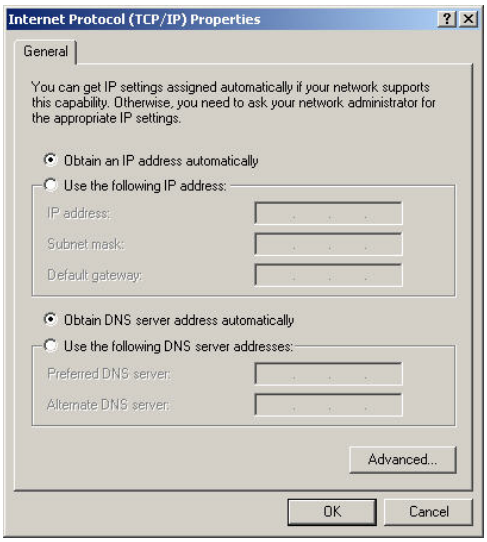


Figure 37: Internet Protocol Properties – Windows 2000

8. On the General tab, ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected. If not, select them.
9. Click **OK** to close the dialog box.
10. Click **OK** again to save the settings and close the Local Area Connection Properties dialog.
11. Confirm that you have an IP address:
    a) Click **Start** □ **Run**.
    b) Type cmd and click **OK**.
    c) Type ipconfig/renew and press **Enter**.
    d) Make sure an IP address is shown on the line that starts with IP Address.

Configuring a Mac computer to use DHCP

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

1. From the Mac interface, select **System Preferences**.
   The System Preferences menu appears as shown in *Figure 38: Mac System Preferences menu* on page 46.

Figure 38: Mac System Preferences menu

2. Under Internet & Network, click the Network icon (shown circled in the figure).
   The Network screen appears as shown in *Figure 35: Accessing Local Area Connection Properties – Windows 2000* on page 51.

Figure 39: 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 40: Select DHCP from the configure drop-down menu* on page 47.
   The IP Address field becomes disabled.

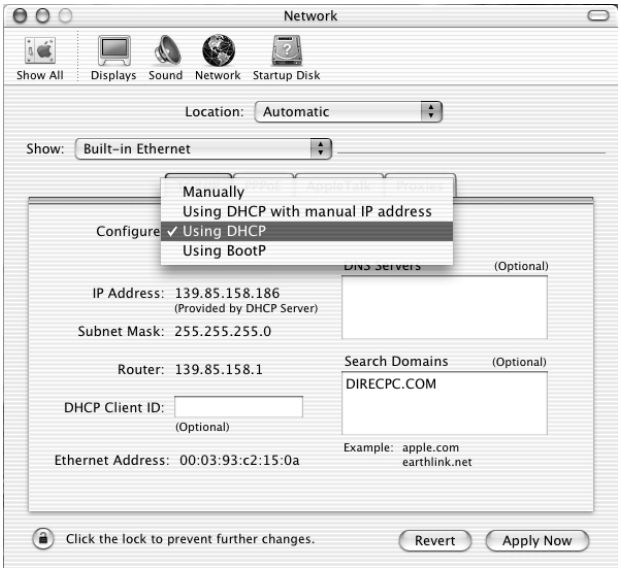


Figure 40: Select DHCP from the configure drop-down menu

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

Configuring a computer for a public IP address

If it is desired or necessary for a computer to have a fixed or permanent IP address, the computer should be configured for a *public IP address*. For more information about IP addresses, see *Understanding the modem address and computer address* on page 38.

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

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

Note: If your satellite modem is to be connected to a router, you must also configure the router with the public IP address. Refer to the router's instructions. You must then configure support for DHCP on all computers that are connected to the router.

Configuring Windows Vista – Public IP address

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

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

   A list of network adapters appears as shown in *Figure 41: Network connections – Windows Vista* on page 48. 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.

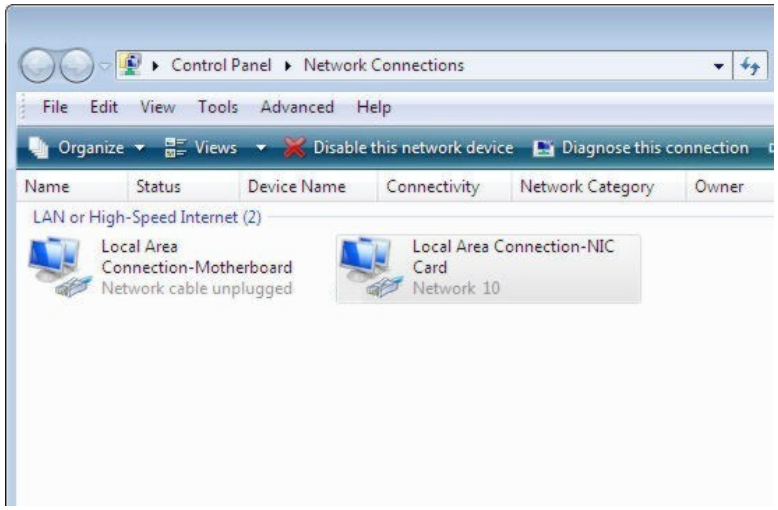


Figure 41: Network connections – Windows Vista

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

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

   The Local Area Connection-NIC Card Properties dialog appears as shown in *Figure 42: Local Area Connection Properties – Windows Vista* on page 48.

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.

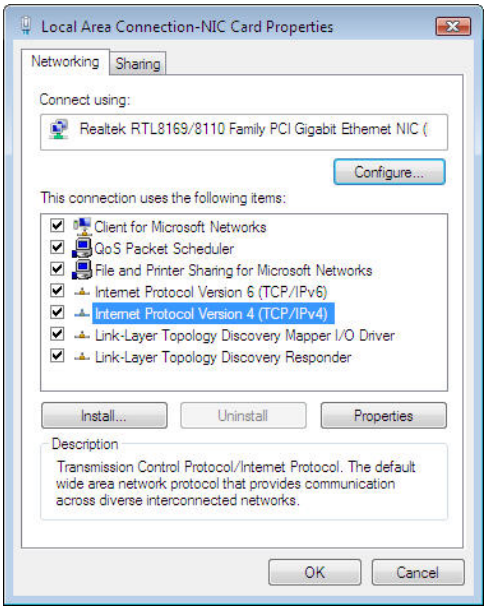


Figure 42: Local Area Connection Properties – Windows Vista

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 43: Internet Protocol Properties – Windows Vista* on page 49.

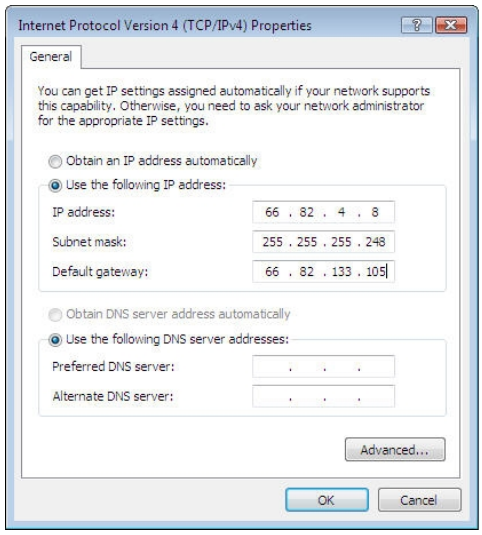


Figure 43: Internet Protocol Properties – Windows Vista

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 public IP address or range of addresses is available for use, see *Understanding the modem address and computer address* on page 38.
9. Select Use the following DNS server addresses.
10. Enter 66.82.4.8 in the Preferred DNS server field.
11. Click **OK**.

Configuring Windows XP – Public IP address

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

1. 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 44: Accessing Local Area Connection Properties – Windows XP* on page 50.

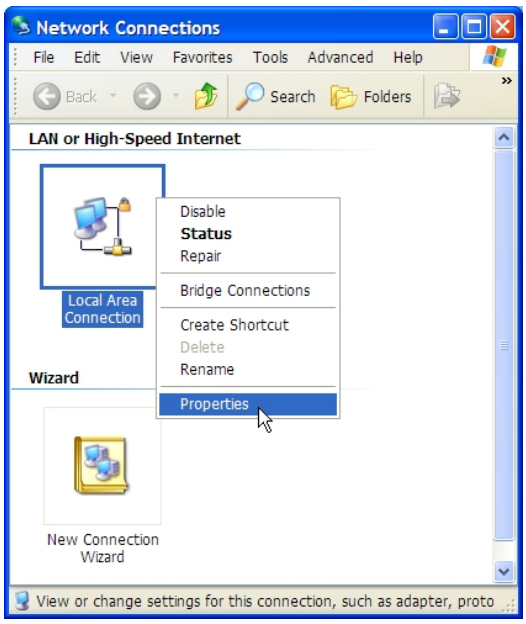


Figure 44: Accessing Local Area Connection Properties – Windows XP

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

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 45: Local Area Connection Properties Dialog – Windows XP* on page 50.

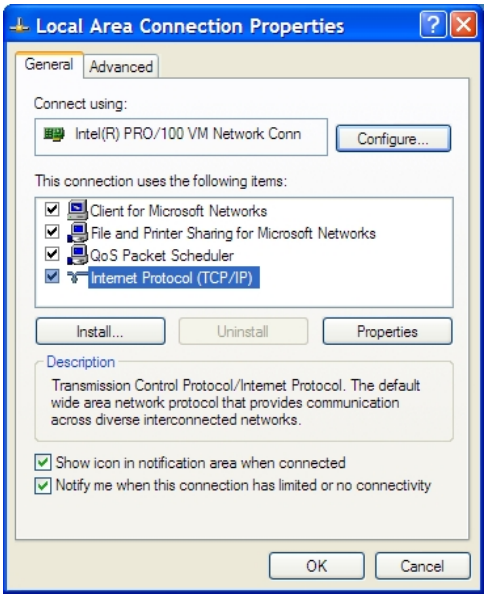


Figure 45: Local Area Connection Properties Dialog – Windows XP

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 46: Internet Protocol Properties – Windows XP* on page 51.

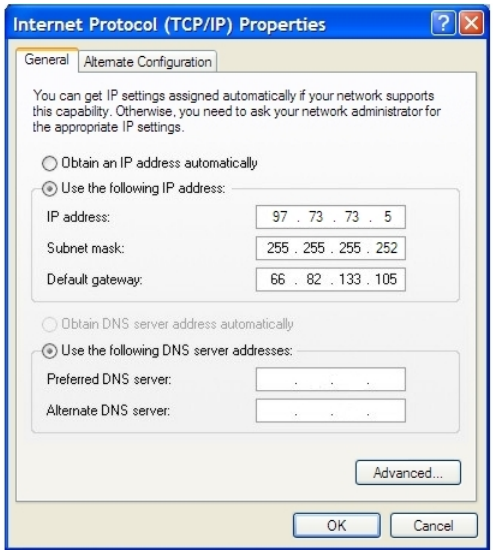


Figure 46: Internet Protocol Properties – Windows XP

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 public IP address or range of addresses is available for use, see *Understanding the modem address and computer address* on page 38.
10. Select Use the following DNS server addresses. Enter 66.82.4.8 in the Preferred DNS server field.
11. Click **OK**.

Configuring Windows 2000 – Public IP address

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

1. From the Windows desktop, select **Start** □ **Settings** □ **Control Panel**.
2. Double-click the Network and Dialup Connections icon in the Control Panel window.
   A list of network adapters appears. A Local Area Connection icon *must* appear on the page. If it does not, the network is not installed correctly.
3. Right-click the Local Area Connection icon that represents the satellite modem network connection, and select **Properties** as shown in *Figure 35: Accessing Local Area Connection Properties – Windows 2000* on page 51.

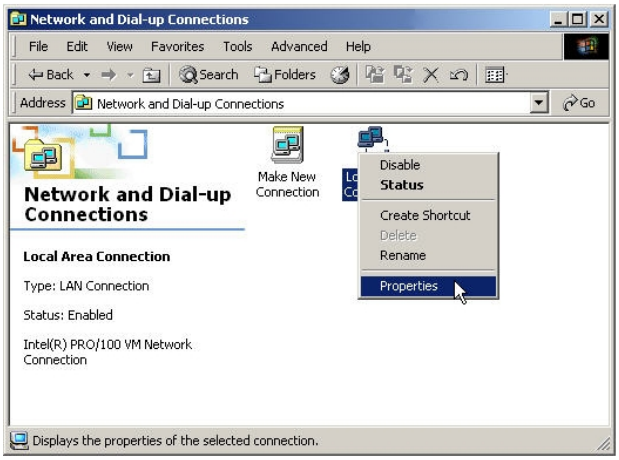


Figure 47: Accessing Local Area Connection Properties – Windows 2000

4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in *Figure 36: Local Area Connection Properties Dialog – Windows 2000* on page 52.

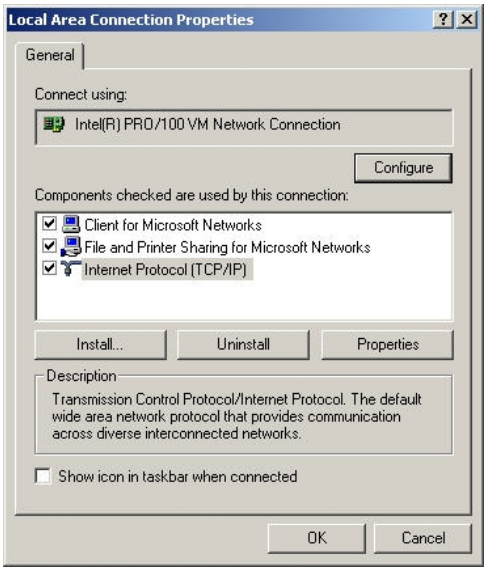


Figure 48: Local Area Connection Properties Dialog – Windows 2000

5. If NetBEUI is installed and checked, uncheck it or uninstall it.
6. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.
7. Click **Properties**.

   The Internet Protocol Properties dialog appears as shown in *Figure 37: Internet Protocol Properties – Windows 2000* on page 52.

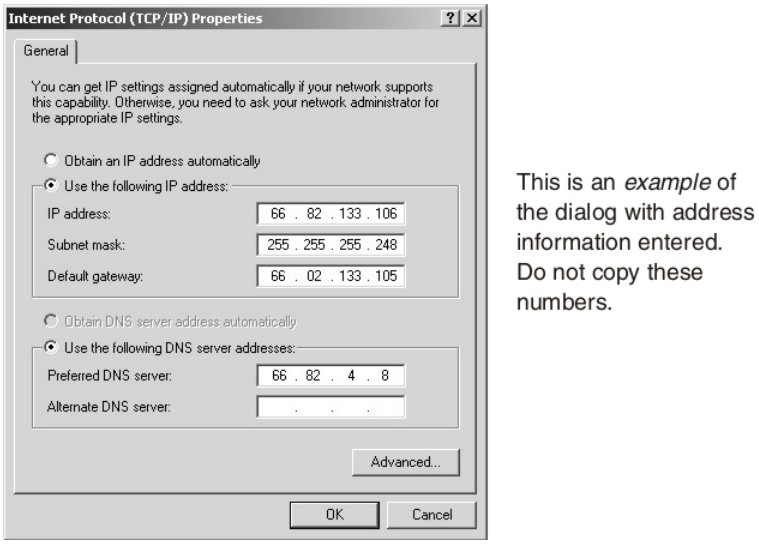


Figure 49: Internet Protocol Properties – Windows 2000

8. On the General tab, select Use the following IP address.
9. Enter the IP address and Subnet mask.
   If you do not know what public IP address or range of addresses is available for use, see *Understanding the modem address and computer address* on page 38.
10. Enter the satellite modem IP address in the Default Gateway field.

11. Enter 66.82.4.8 in the Preferred DNS server field.
12. Click **OK** to close the dialog box.
13. Click **OK** again to save the settings and close the Local Area Connection Properties dialog.

Configuring a Macintosh – Public IP address

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

1. From the Mac interface, select **System Preferences**.
   The System Preferences menu appears as shown in *Figure 50: Mac System Preferences menu* on page 53.

Figure 50: Mac System Preferences menu

2. Under Internet & Network, click the Network icon (shown circled in the figure).
   The Network screen appears as shown in *Figure 51: Mac Network screen* on page 54.

Figure 51: 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 52: Select Manually from the configure drop-down menu* on page 54.

Figure 52: 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 38.
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.

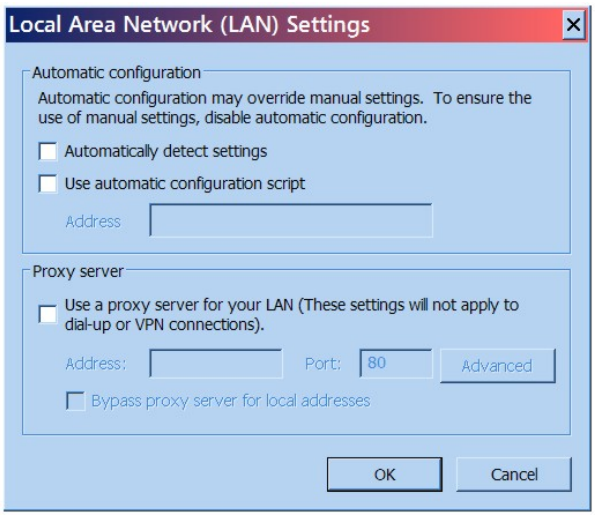


Figure 53: LAN settings – Internet Explorer

4. Uncheck the check box next to Use a proxy server for your LAN.
5. Click **OK**.
6. Close Internet Explorer and re-launch it to enable the changes.

Configuring Netscape to not use a proxy server

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

1. Turn the computer on and open Netscape.
2. Select **Edit** □ **Preferences** .
   The Preferences window appears.
3. In the Category pane on the left side of the window, select **Advanced** □ **Proxies** .

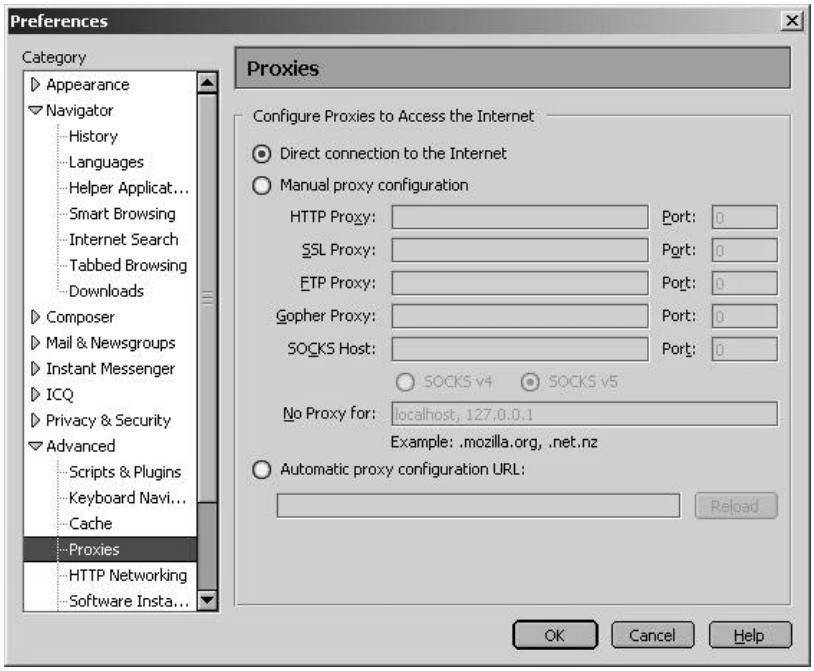


Figure 54: Proxy settings in Netscape Preferences window

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

Chapter 7

Home networking

Topics:

This information about networking is provided for home users.

You can connect multiple home computers and laptops 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: Required home networking equipment other than the satellite modem is not included. For network setup, support and configuration, contact the network hardware manufacturer and/or operating system software developer. Hughes is not responsible for home network 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.

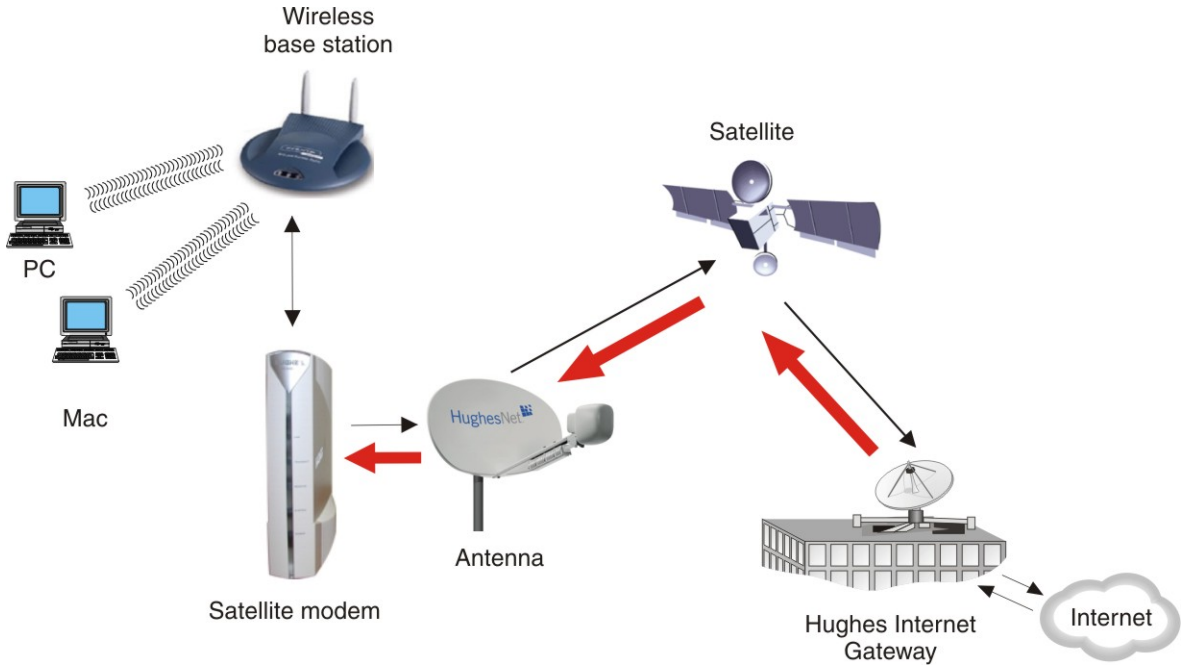


Figure 55: Satellite modem in a wireless home network

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.

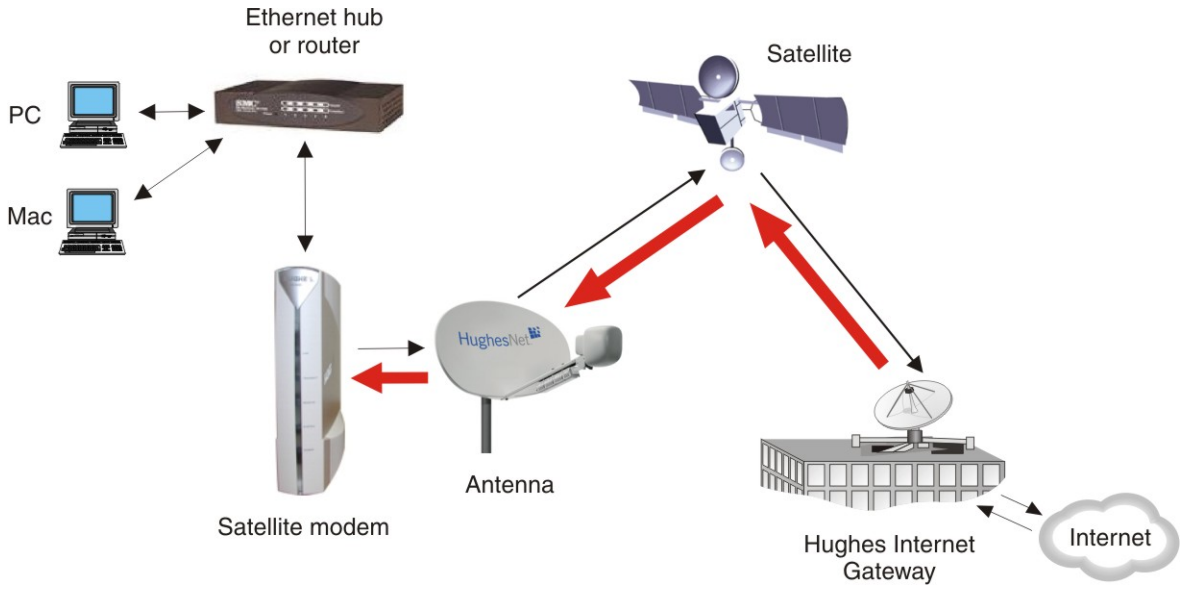


Figure 56: Satellite modem in a wired Ethernet home network

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.

Chapter 8

Conformance with standards and directives

Topics:

The HN9000 satellite modem has been certified to conform to the standards shown in *Table 7: HN9000 standards compliance* on page 61. Additional information follows the table.

Table 7: HN9000 standards compliance

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

Operational and safety requirements for Canada

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

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

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

Repairs in Canada

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

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

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

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.

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

FCC Part 15

This section applies to the HN9000 satellite modem.

Standards to which Conformity is declared: FCC Part 15

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

Responsible party's name: Hughes Network System, LLC

Address: 11717 Exploration Lane, Germantown, MD 20876

Telephone: 1 (866) 347-3292

Trade name: HUGHES

Type of equipment: Two-way Hughes system

Model numbers: HN9000 (1500826-xxxx)

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

Canada Class B warning

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

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

Acronyms used in this Guide

AC	Alternating current
AWG	American Wire Gauge
CAN	Canada
CSA	Canadian Standards Association
DC	Direct current
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
ECL	Emission Control Logic
EU	European Union
EMI	Electromagnetic Interference
ESN	Electronic Serial Number
EU	European Union
FAP	Fair access policy
FCC	Federal Communications Commission
HTTP	HyperText Transfer Protocol
ICES	Interference-Causing Equipment Standard
ID	Identifier
IP	Internet Protocol
LAN	Local area network
LLC	Limited Liability Company
MIP	Management information packet
NAT	Network address translation
NetBEUI	Extended User Interface (network transfer protocol)
NIC	Network interface card
NOC	(Hughes) Network Operations Center
NOCC	(Hughes) Network Operations Control Center
ODU	Outdoor Unit (antenna and radio assembly)
PC	Personal computer
POS	Point of sale device
PTP	Point-to-Point
SNR	Signal-to-noise ratio
SSL	Secure Sockets Layer (security protocol)
ST	Satellite terminal (an alternate name for *satellite modem*; used on some software screens)

TCP	Transmission Control Protocol
TIP	Transmission information packet
UL	Uplink
	Underwriters Laboratory
VAC	Voltage, alternating current
VAR	Value added reseller

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