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# **HX90 Satellite Router User Guide**

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# Understanding safety alert messages

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

## Messages concerning personal injury

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

### DANGER

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

---

### WARNING

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

---

### CAUTION

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

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## Messages concerning property damage

A NOTICE concerns property damage only.

### NOTICE

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

---

## Safety symbols

The generic safety alert symbol calls attention to a potential personal injury hazard. It appears next to the DANGER, WARNING, and CAUTION signal words as part of the signal word label. Other symbols may appear next to DANGER, WARNING, or CAUTION to indicate a specific type of hazard (for example, fire or electric shock). If other hazard symbols are used in this document they are identified in this section.

### *Additional symbols*

This document also uses the following hazard symbols:



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



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

# Contact information

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If you experience a problem with your HX90 satellite router, first try the solutions offered in Chapter 4 – *Troubleshooting* on page 41. If you need assistance, use the contact information listed here.

If you need operational, warranty, or repair support, who you should contact depends on where you purchased your satellite router. You may be supported by Hughes Customer Care or another service provider. Please contact your customer service representative in accordance with your service agreement.

## **For satellite routers purchased from a retail channel or Hughes sales agent in the United States or Canada**

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 router.
2. Enter the web address [www.myhughesnet.com](http://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 these options helps you, call Hughes Customer Care at 1 (866) 347-3292.

## **For satellite routers purchased from a value-added reseller (VAR) in the United States or Canada**

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.



## Satellite router overview

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The HX90 satellite router connects to a satellite network to provide Internet or intranet service or both to a host—typically a computer—or to multiple hosts on a wired (Ethernet) or wireless local area network (LAN). The router has two Ethernet LAN ports so it can be connected to one or two LAN subnets. The HX90 satellite router is designed to meet the needs of enterprise business customers, small business users, and consumers.

The HX90 is an Internet Protocol (IP) router, and so it eliminates the need for an external router.



Figure 1: HX90 satellite router

After your HX90 satellite router has been installed, you can use a web browser on your computer to access the Internet or an intranet. You can use a LAN to extend Internet or intranet connectivity to multiple computers.

The satellite router has a System Control Center that provides access to system information such as the router's operating status and troubleshooting information. The System Control Center is described in Chapter 2 – *System Control Center* on page 17.

## Terminology

In this user guide:

- *Satellite router* and *router* both refer to the HX90 satellite router.
- Acronyms are identified in *Appendix C – Acronyms used in this guide*, on page 89

## Scope of this user guide

This user guide describes the features and operation of the HX90 satellite router, which provides you Internet access by satellite. This guide also provides certain reference information, such as the meaning of the router's front panel LEDs. The HX90 satellite router is designed to meet the needs of enterprise business customers, small business users, and consumers.

## Audience

This guide is intended for users of the HX90 satellite router.

## The satellite router's role

Figure 2 illustrates how the HX90 satellite router provides connectivity and functionality that allow a computer, Ethernet device, or LAN to connect to the Internet by satellite.

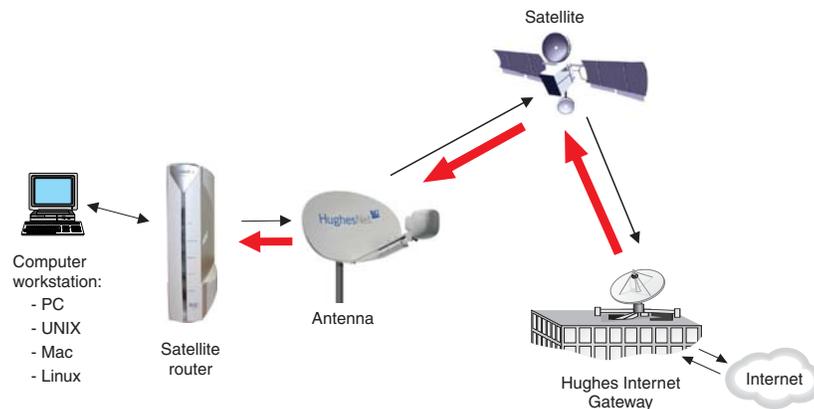


Figure 2: Role of the HX90 in a satellite network

This illustration shows the HX90 with a single computer host. However, the satellite router may also be used in a multiple-host configuration, in which hosts on a LAN share satellite Internet or intranet connectivity through an Ethernet hub, router, or wireless base station. A host may be a computer using Windows, Mac OS, or another supported operating system.

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

Even though the HX90 satellite router is typically connected to a host, it is *self-hosted*, meaning it can operate without a host. It does not depend on a computer to establish and maintain the Internet or intranet connection. However, the router must be connected to a satellite antenna.

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. The satellite transmits a signal to the antenna, which is passed to the satellite router to provide Internet connectivity.



This message applies if you use the HX90 satellite router in the United States: If servicing of the satellite router's outdoor antenna assembly is necessary, the FCC requires that the work must be done by a trained professional because the antenna assembly transmits RF energy.

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## Satellite router specifications

Table 1: Specifications for the HX90 satellite router

Weight	1.6 lb (0.73 kg)
Height	8.0 inches (20.3 cm)
Width	1.6 inches (4.1 cm); 2.4 inches (6.1 cm) at base
Depth	9.0 inches (22.9 cm)
Operating temperature range	32° F to 122° F (0° C to 50° C) Above 5,000 ft (1,524 m) altitude, the maximum temperature is reduced by 1° C per 1,000 ft (305 m).
Operating humidity range	5% to 90% non-condensing
Altitude	Up to 15,000 ft (4,572 m)
Cooling method	Convection
Protocol support	TCP/IP (Transmission Control Protocol/Internet Protocol) protocol suite
Supported frequency ranges	Ka-band or Ku-band
Network interface ports	Two RJ-45 Ethernet LAN ports supporting 10BaseT or 100BaseT operation
Power supplies and power requirements	See <i>Checking the power supply</i> on page 62.

## LAN port configuration

The satellite router's two LAN ports support the following configurations:

- Dual port, single subnet – Only one LAN port is configured with an IP address at the NOC, which means the router supports one subnet. This is the default configuration.
- Dual port, independent subnet – Each LAN port is configured with a separate IP address at the NOC, which means the router supports independent subnets.

## Router operating position

### **NOTICE**

Operate the HX90 router only in the upright vertical position as shown in Figure 3. Any other position could result in insufficient ventilation, overheating, and malfunction.

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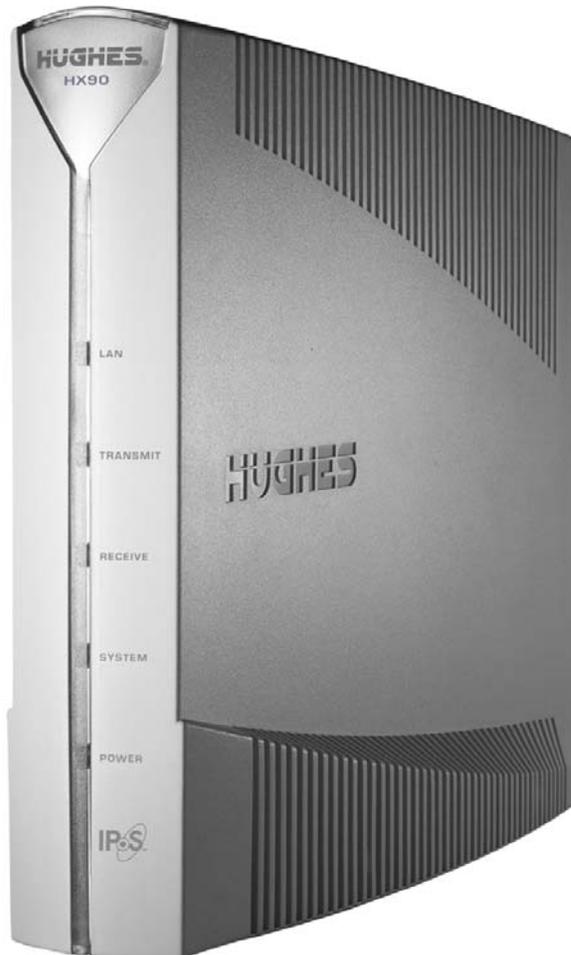


Figure 3: HX90 in vertical position

## Computer and networking requirements

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

### *Computer requirements*

The HX90 satellite router can be used with any device that supports IP and has a 10/100 BaseT Ethernet LAN port. Typically, the router is connected to a customer's computer. However, the HX90 is self-hosted; it does not require a computer for any of its functions.

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

### *Networking and Internet browser requirements*

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

**Connecting a network** – If you want to connect a network to the satellite router, this requires an Ethernet hub or other such device. You must supply and configure the hub and cables.

**Static IP address** – The computer can be configured to use a static IP address if the HughesNet service plan provides for one or more static IP addresses. If the computer is configured to use a *specific* static IP address, disable DHCP. For additional information see *Configuring a computer to use DHCP* on page 64.

## Care of your satellite router

- Leave the HX90 router powered on at all times. This allows automatic updates of the router's software whenever necessary.
- Leave 6 inches of space around the top and sides of the router to ensure adequate ventilation.
- If you dust the router, use a soft cloth.
- If you clean the router, do not use solvent or abrasive powder.

## Chapter 2

# System Control Center

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

### Accessing the System Control Center

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

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

1. Open a web browser such as Internet Explorer.
2. In the browser address bar, type **www.systemcontrolcenter.com** or **192.168.0.1** and press **Enter**.

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

The System Control Center home page appears as shown in *Figure 5 on page 18*. If you are unable to access the System Control Center, refer to *Cannot access the System Control Center* on page 52.

### *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:** You may already have a shortcut to the System Control Center on your desktop if your satellite router installer created one.

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

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

2. Drag the icon that appears in front of the address displayed in the browser to the computer desktop.



Figure 4: Icon used to create shortcut

## System Control Center home page

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

The button links at the top of the page appear on all System Control Center screens and are explained in *Button links* on page 21.

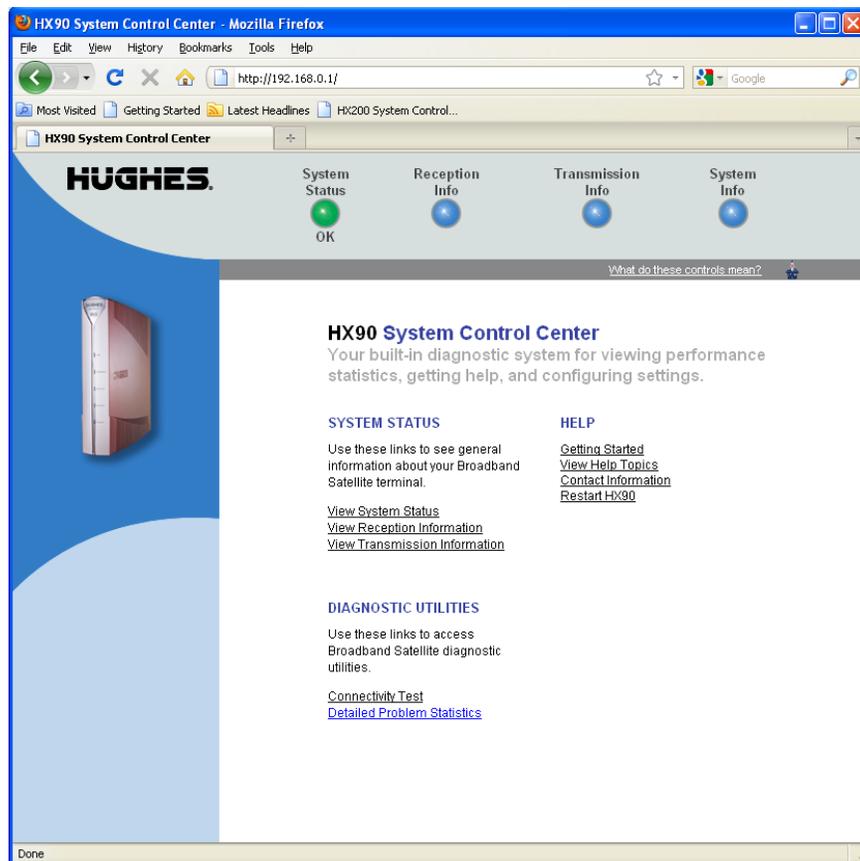


Figure 5: System Control Center home page

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

- Most screen illustrations show only the relevant part of the screen and do not include features such as browser menus, toolbars, and window borders.
- The screen illustrations are *examples*. You may see screens with different information. Do not apply information such as configuration values shown in the illustrations unless the instructions say to do so.
- On some screens and in some messages you may see the word *terminal* or the abbreviation *VSAT*. Both refer to the HX90 satellite router.
- *Screen* and *page* are both used to refer to a set of information from your computer or satellite router that is displayed on your computer monitor.

## ***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 router.
- [View Transmission Information](#) – Opens the Transmission Information page, which displays information on data transmitted by the satellite router.

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

### **Diagnostic utilities links**

[Connectivity Test](#) – Opens the Connectivity Test page, which you can use to test the connection between the satellite router and the NOC. See *Confirming NOC connectivity* on page 48.

[Detailed Problem Statistics](#) – Opens a screen you can use to view statistics concerning router operation. See *Viewing problem-related statistics* on page 60.

### **Help links**

[Getting Started](#) – Through this link you can find general operating instructions for the HX90 router, recommended settings for your browser and TCP/IP, answers to frequently asked questions, and troubleshooting information.

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

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

[Contact Information](#) – Opens to a page that provides contact information for assistance and additional information.

[Restart HX90](#) – Restarts the satellite router.

## myHughesNet

**Note:** [myHughesNet](#) links may or may not be present on your satellite router depending on the country where the router is used and your service plan.

[Go to myHughesNet](#) provides access to the HughesNet Web Portal, which contains a variety of useful tools, resources, and information. Access to the HughesNet portal is determined by your specific service plan or your organization's 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 or your organization's service plan.

## Common features on System Control Center screens

Certain features are common to some or all of the System Control Center screens, as shown in Figure 6. These features are explained in the following sections.

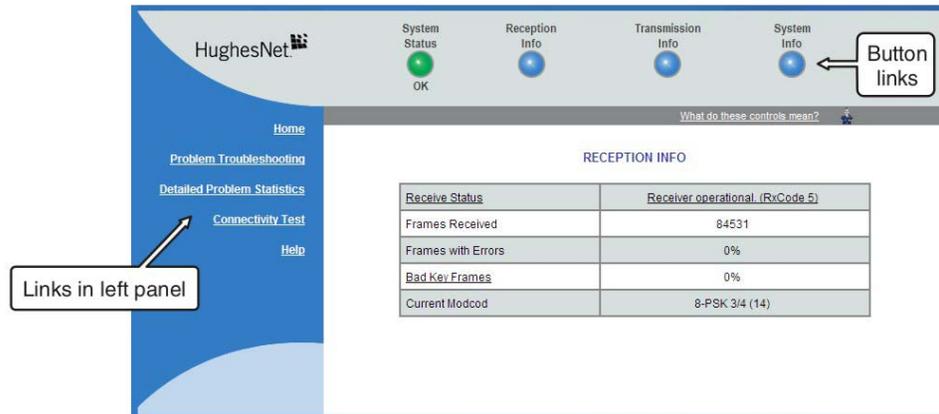


Figure 6: Common features on the System Control Center screens

## Button links

At the top of each System Control Center page are four round buttons with labels above them as shown in Figure 7 on page 21. Each button is a link to the System Control Center page identified by the label—for example, the *System Status* button is a link to the System Status page. Click the button to go to the page identified by the label. The System Status button link is also a status indicator, as explained in Table 3 on page 22. The other three button links are links only; they are not indicators.

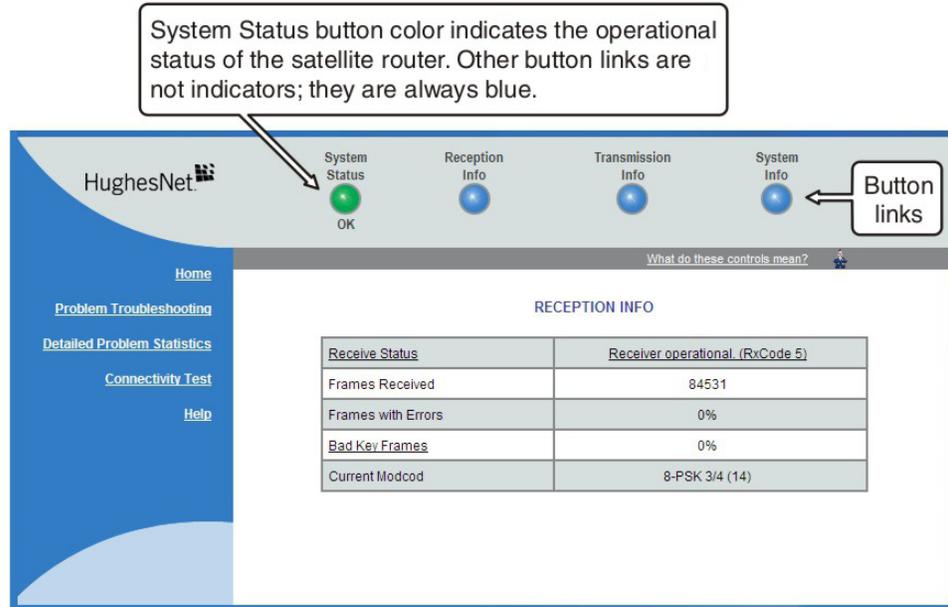


Figure 7: System Control Center button links

The destination page for each button link is identified below:

**Table 2: 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 <i>System Status page</i> on page 26.

**Table 2: Button links on System Control Center screens (Continued)**

Button	Destination	Description of destination page
Reception Info	Reception Information page	Displays statistics about received data. For more information see <i>Reception Information page</i> on page 28.
Transmission Info	Transmission Information page	Displays statistics about transmitted data. For more information see <i>Transmission Information page</i> on page 30.
System Info	System Information page	Displays system information such as the satellite router's serial number and software version. For more information see <i>System Information page</i> on page 32.

### ***System Status button***

The System Status button (only) is a status indicator as well as a link. It changes color to indicate the satellite router's current status, as explained in Table 3. To see more detailed status information, click the System Status button to open the System Status page.

**Table 3: System Status button colors**

Button color	Meaning
 Green	The satellite router is operating normally. ( <b>OK</b> appears beneath the System Status button.)
 Red	A problem has been detected.
 Yellow	Performance is temporarily impaired because: <ul style="list-style-type: none"> <li>• There may be a problem with Web Acceleration.</li> <li>• The router may be temporarily using a backup configuration.</li> <li>• There may be virus activity.</li> </ul>
 Orange	Degraded – The router is fully operational, but performance is temporarily impaired because: <ul style="list-style-type: none"> <li>• The daily download allowance has been exceeded. This allowance does not apply if your service plan has no download limit. For more information see <i>Checking download allowance status</i> on page 34.</li> <li>• Not all IPSec sessions are functioning. As a result, data will not flow between some destinations.</li> </ul>

If the System Status button is red  or yellow , look for a red flag next to any value or values on the System Control Center information pages (those with tables listing parameters and values). The red flag indicates a problem related to the parameter listed next to the flagged value. If the parameter name is underlined, click

the parameter name to see a message that may include helpful information, depending on what the problem is.

### ***IPSec icon***

An icon that looks like a small lock next to the System Status button means IPSec is enabled. This icon is shown in Figure 8.

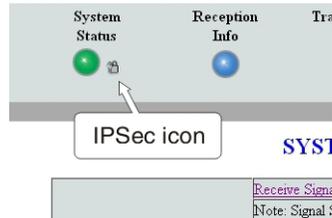


Figure 8: IPSec icon

IPSec (Internet Protocol Security) is a set of network protocols and services that provide security to IP networks by authenticating and encrypting each IP packet of a data stream. IPSec-protected packets travel through a virtual tunnel or path between two points. An IPSec tunnel is *up* when it has been established between two peers and is capable of carrying traffic. If it cannot carry traffic it is *down*.

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

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

### ***Links in the left panel***

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

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

- [Home](#) – Opens the System Control Center home page.
- [Detailed Problem Statistics](#) – Opens a screen you can use to view statistics concerning router operation. See *Viewing problem-related statistics* on page 60.
- [Connectivity Test](#) – Opens the Connectivity Test page, which allows you to test the connection between the router and the satellite. See *Confirming NOC connectivity* on page 48.
- [Download Allowance Status](#) – Opens the Download Allowance Status screen, which shows how much remains of the daily download allowance. For details see *Checking download allowance status* on page 34.
- [Help](#) – Opens the Help page. Refer to the Help page, which includes a variety of topics such as getting started and recommended browser settings.

## Small icon on System Control Center screens

### NOTICE

The System Control Center screens include a small icon as indicated by the arrow in Figure 9.

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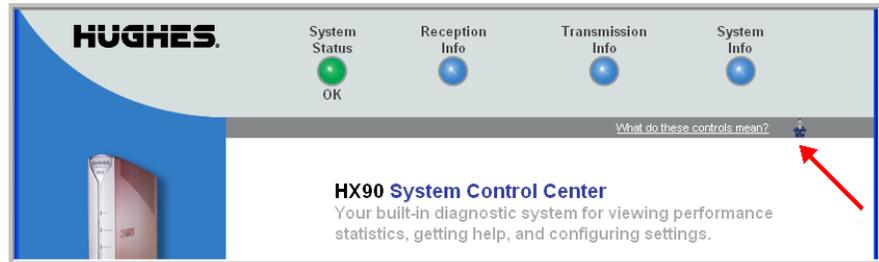


Figure 9: Small icon on System Control Center screens (arrow)

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

## Status and information screens

Several of the System Control Center screens list status and operational parameters and their current values in a tabular format. For example, the following illustration shows the Reception Information page. The left column list the parameters, and the right column shows the current value of the parameter listed in the left column. Parameters are listed in this format on these screens:

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

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

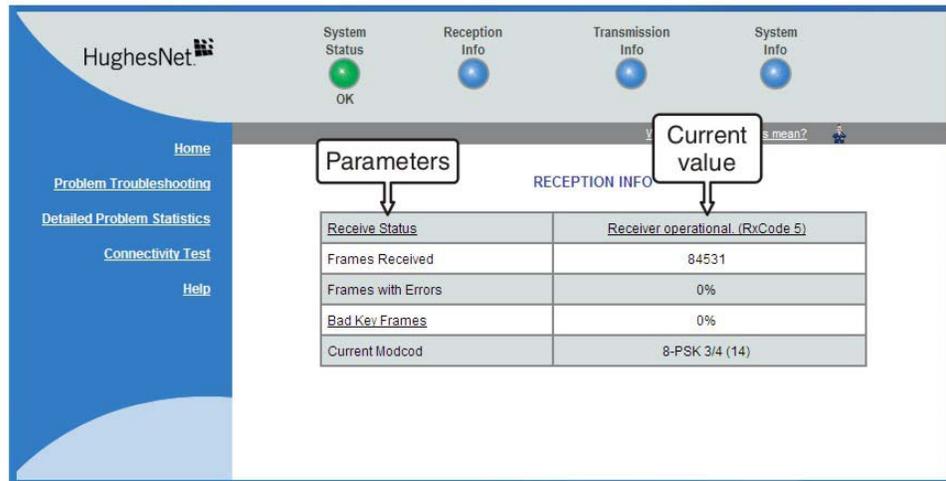


Figure 10: Format of status and information screens

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

- *System Status page* on page 26
- *Reception Information page* on page 28
- *Transmission Information page* on page 30
- *System Information page* on page 32

### Red flag indicator

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

SYSTEM STATUS	
Signal Strength	21
<i>Note: Signal Strength is not an indicator of browsing speed. Precipitation can affect Signal Strength. If you do not see a red flag next to any of the status messages on this page, you should be able to browse the Internet successfully.</i>	
<a href="#">Receive Status</a>	<a href="#">Receiver not locked to a signal. Receive cable fault suspected. (RxCode 6)</a>
<a href="#">Transmit Status</a>	<a href="#">Transmitter unavailable due to receive signal problems. (TxCode 6)</a>
<a href="#">Software Download Status</a>	Waiting for first h
<a href="#">Service Status</a>	Commissioned [Keys updated]
<a href="#">TCP Acceleration Status</a>	Disabled
<a href="#">Web Acceleration Status</a>	Inactive

Click the flagged parameter value to see more information.

Figure 11: Red flag problem indicator

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

## Features you may not see

You may see descriptions of certain features in the user guide that you do not see on your System Control Center screens. This is because some features may be enabled or disabled by the NOC depending on your service plan or your organization's requirements. If a feature is not enabled you will not see the screen or screens for that feature or links to it. Features that may be enabled or disabled by the NOC are:

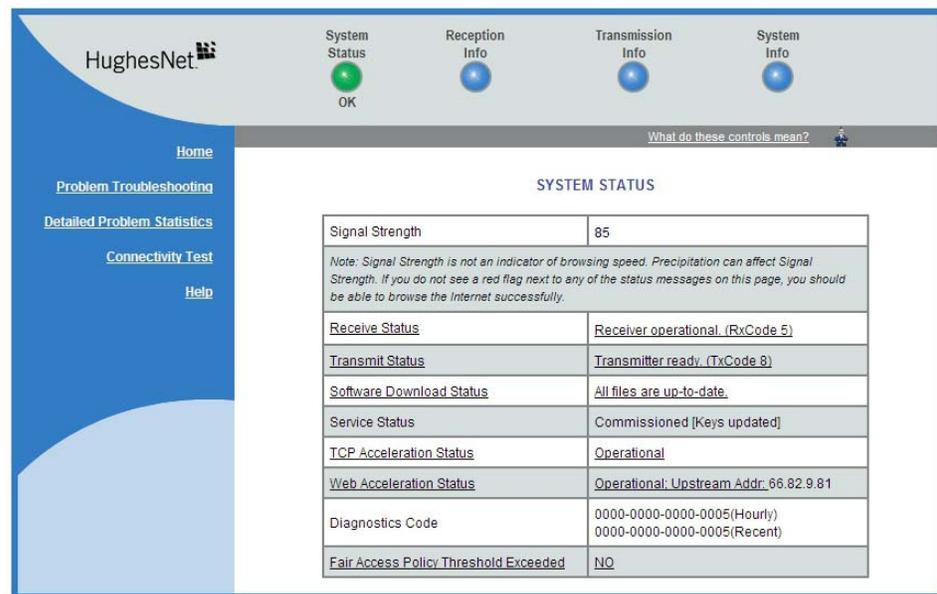
- Web Acceleration
- Detailed Problem Statistics
- Port Forwarding
- Download Allowance Status
- Browsing Optimization Utility

## System Status page

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

Available system status values may vary, depending on how the satellite router is configured. Therefore, some options shown in Figure 12 on page 26 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.



The screenshot shows the HughesNet System Status page. At the top, there are four status indicators: System Status (OK), Reception Info, Transmission Info, and System Info. Below these is a navigation menu with links for Home, Problem Troubleshooting, Detailed Problem Statistics, Connectivity Test, and Help. The main content area is titled 'SYSTEM STATUS' and contains a table with the following data:

Signal Strength	85
<i>Note: Signal Strength is not an indicator of browsing speed. Precipitation can affect Signal Strength. If you do not see a red flag next to any of the status messages on this page, you should be able to browse the Internet successfully.</i>	
<a href="#">Receive Status</a>	<a href="#">Receiver operational. (RxCode 5)</a>
<a href="#">Transmit Status</a>	<a href="#">Transmitter ready. (TxCode 8)</a>
<a href="#">Software Download Status</a>	<a href="#">All files are up-to-date.</a>
Service Status	Commissioned [Keys updated]
<a href="#">TCP Acceleration Status</a>	<a href="#">Operational</a>
<a href="#">Web Acceleration Status</a>	<a href="#">Operational: Upstream Addr: 66.82.9.81</a>
Diagnostics Code	0000-0000-0000-0005(Hourly) 0000-0000-0000-0005(Recent)
<a href="#">Fair Access Policy Threshold Exceeded</a>	<a href="#">NO</a>

Figure 12: System Status page

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

**Table 4: System Status page parameters**

Parameter	Explanation
Signal Strength	Receive signal strength. A value of 30 or less indicates a weak signal.
Receive Status	Indicates if the receive data path is operational or other status. Click the displayed RxCode for explanation of the displayed code.
Transmit Status	Indicates if the transmit data path is operational or other status. Click the displayed TxCode for corresponding Help information.
Software Download Status	Indicates if the satellite router's software and configuration are up to date.
Service Status	Indicates if the router has been commissioned (registered with the system). Click the <a href="#">Service History</a> link if you want to see a history of your customer account.
TCP Acceleration Status	Indicates if TCP Acceleration is operational or other status. TCP acceleration improves the router's performance.
Web Acceleration Status	Indicates if TCP Acceleration is operational or other status. TCP acceleration improves the router's performance. This field is present only if the NOC operator has enabled Web Acceleration on the satellite router.
Diagnostics Code	This code may be useful if you need technical assistance.
Fair Access Policy Threshold Exceeded	Indicates if you have exceeded the limit for downloads established by your service plan. Subscribers who exceed the download limit temporarily experience reduced download speeds.

## Reception Information page

The Reception Information page shown in Figure 13 displays information about data received by the satellite router.

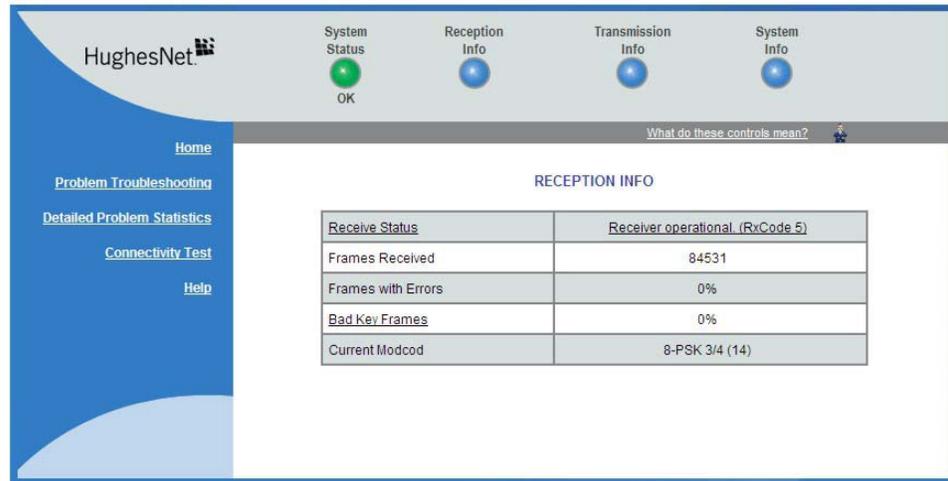


Figure 13: Reception Information page

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

**Table 5: Reception Information page parameters**

Parameter	Explanation
Receive Status	Indicates if the receive data path is operational or other status. Click the displayed RxCode for explanation of the displayed code.
Frames Received	Number of data messages received by the satellite router.
Frames with Errors	Percentage of received frames determined to be corrupted. Any number greater than zero indicates a problem except when adverse weather conditions are present. Frames may be corrupted in adverse weather conditions or if there is a problem with the receive cable or antenna assembly.
Bad Key Frames	Percentage of received frames that could not be decrypted successfully. All data received over the satellite is encrypted. Any number greater than zero indicates a problem except when adverse weather conditions are present. Bad key frames may indicate that the router is not commissioned.
Current Modcod	Level of encoding the router can accept based on the current signal quality. Lower Modcod numbers are used if signal impairments such as rain are present. Adaptive coding and modulation (Modcod) is a Hughes-developed technique that maximizes over-the-air bandwidth utilization.

## Examining receive status

You can check the Receive Status parameter to find out if the receive data path is operational or if there is a problem. Normal receive status is indicated by the message Receiver operational (RxCode5).

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

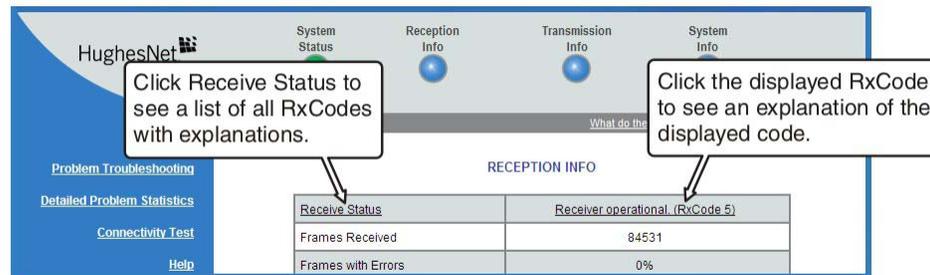


Figure 14: Finding additional Receive Status information

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

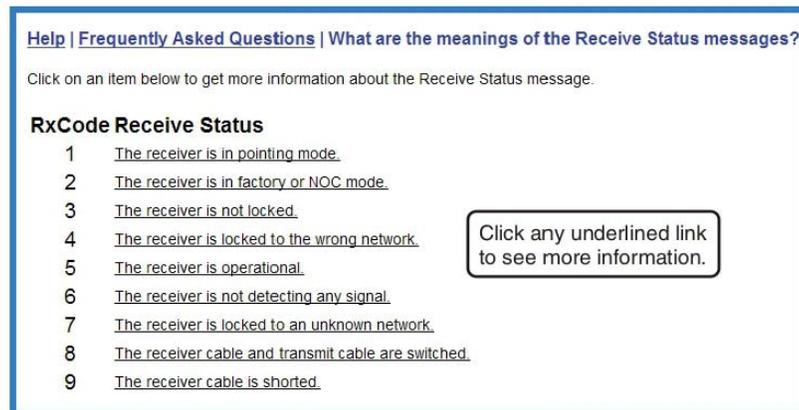


Figure 15: List of all RxCodes

## Transmission Information page

The Transmission Information page shown in Figure 16 displays information about data transmissions from the satellite router. The information on this screen may be useful to a service provider representative if you need help in resolving a problem.

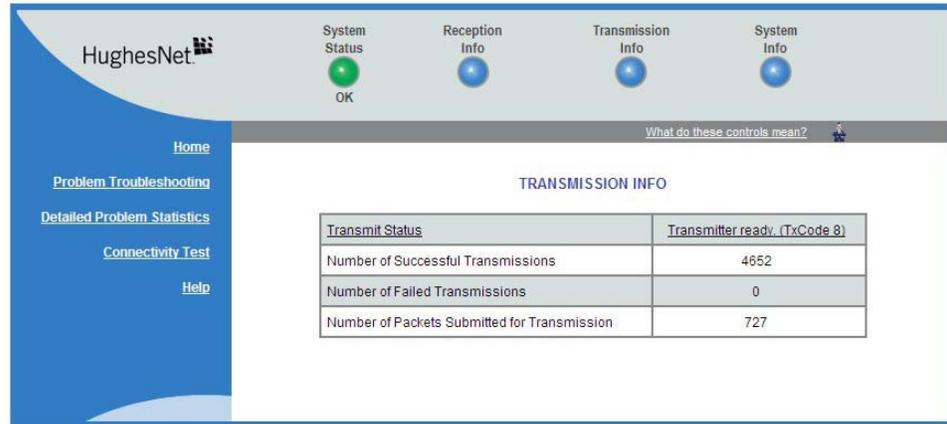


Figure 16: Transmission Information page

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

**Table 6: Transmission Information page parameters**

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

### ***Examining transmit status***

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

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

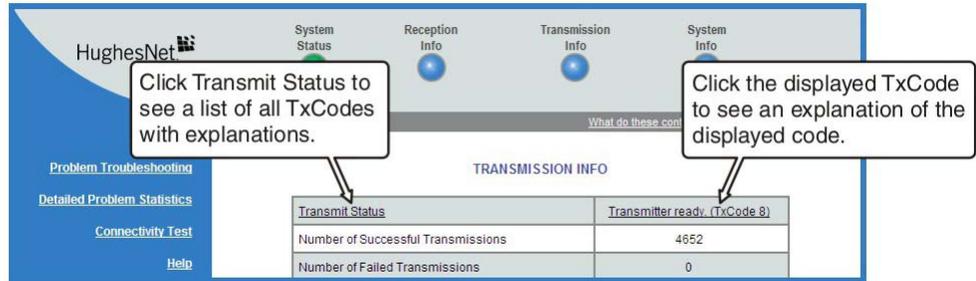


Figure 17: Finding additional Transmit Status information

The next illustration shows the list of all TxCodes. Click the explanation (link) next to the TxCode to see more information.

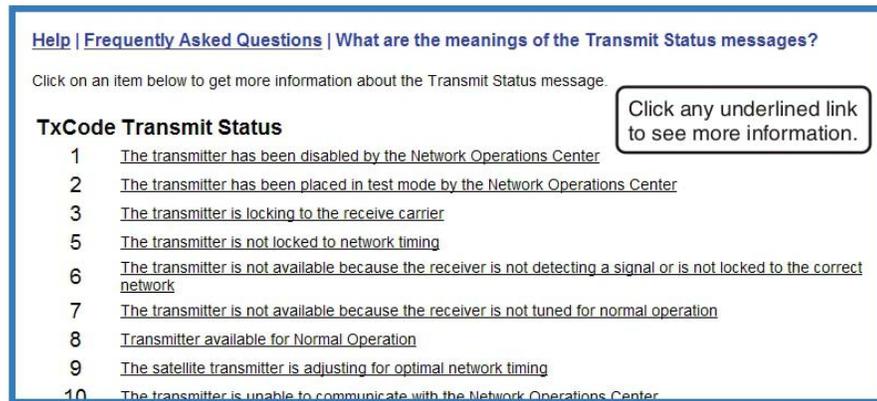


Figure 18: List of TxCodes (not all codes are shown)

## System Information page

The System Information page shown in Figure 19 provides system information for the satellite router such as Site ID and the release number of the router's operational software.

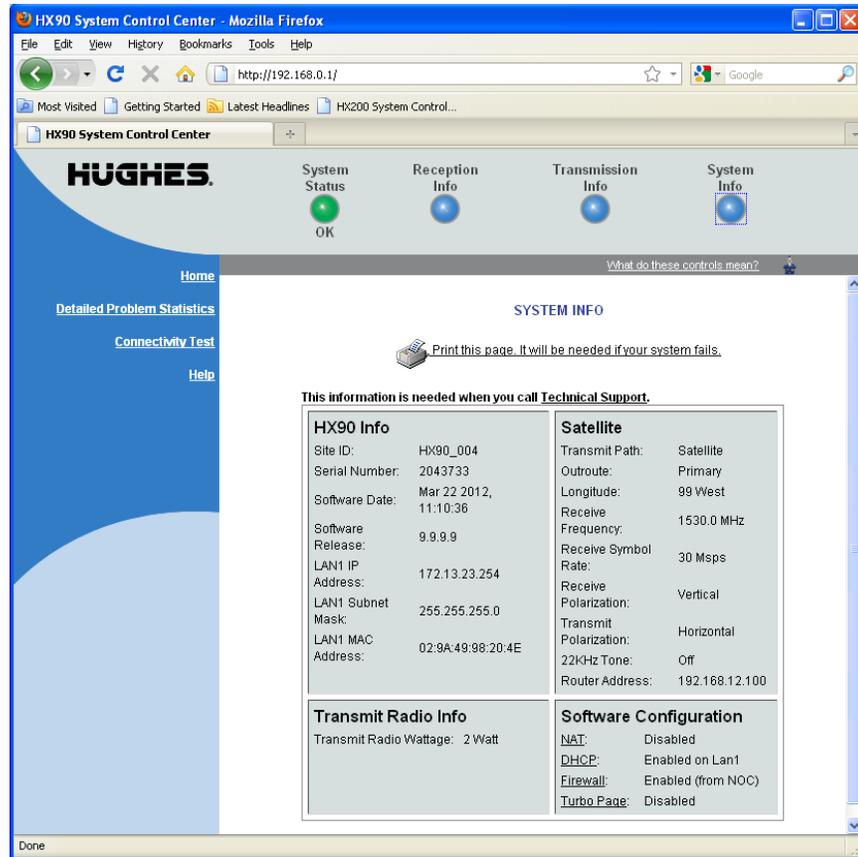


Figure 19: System Info page

**Note:** *Home and small office users:* 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 router this page may not be accessible. Information on this screen may be useful to a service provider representative in helping you to resolve the problem. (If a printer is not available, use **Alt-PrintScreen** to capture the screen image, then paste the image into a word processor or graphics file, and save the file.)

The parameters listed in the *HX90 Info* section of the System Information page are explained in the following table. Other sections of the screen (*Transmit Radio Info* and *Satellite*) provide additional information about the router installation and the router software (*Software Configuration*).

**Table 7: System Information page parameters – HX90 Info section**

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

## Port Forwarding Configuration page

**Note:** The Port Forwarding Configuration page and link are present on your HX90 only if they have been enabled by the NOC.

The Port Forwarding Configuration page and the link to it are present only if port forwarding has been enabled and made visible on the router by the NOC.

On this page you can define rules for allowing TCP and UDP traffic on the Internet to access servers on your network.

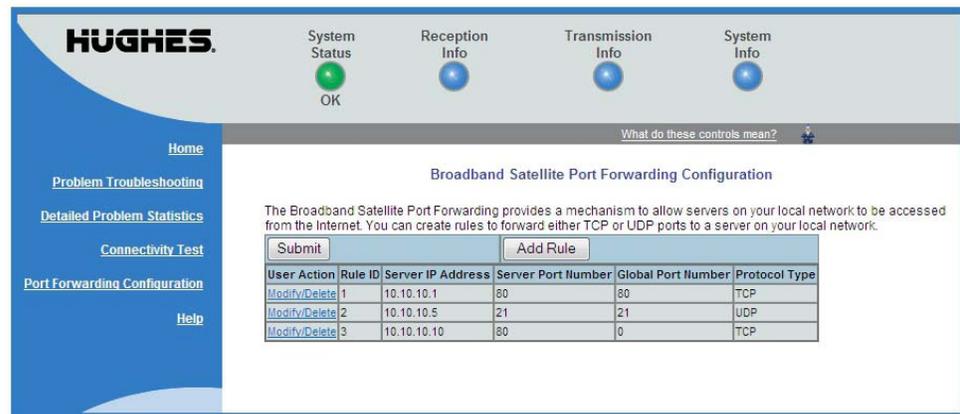


Figure 20: Port Forwarding Configuration page

**Note:** This figure is an example. Do not copy these values to your satellite router.

## Defining port forwarding rules

Follow these steps to define a port forwarding rule:

1. Click [Port Forwarding Configuration](#) on the System Control Center home page—or in the left panel of other System Control Center pages.

**Note:** The [Port Forwarding Configuration](#) link is only present if Port Forwarding has been enabled and made visible on your router by the NOC.

2. Click [Add Rule](#) on the Port Forwarding Configuration page. In the dialog box that appears (Figure 21), enter the appropriate values in the following fields: Rule ID, Server IP Address, Server port, and Global port.



Figure 21: Entering port forwarding rules

3. Select the appropriate protocol from the Protocol Type drop-down list.
4. Click **Save Rule**.

To define additional rules, repeat these steps.

## Checking download allowance status

**Note:** The Download Allowance Status link and screen are present on your HX90 only if they have been enabled by the NOC. Whether they are enabled or not depends on your service plan.

To ensure fair Internet access for all HughesNet subscribers, some HughesNet subscriber service plans include a limit on how much information can be downloaded daily. If a subscriber exceeds the download limit, the router's browsing and download speed is temporarily reduced.

To view your download allowance status:

Click the [Download Allowance Status](#) link on the System Control Center home page or in the left panel of other System Control Center pages.

The router displays a screen that shows your daily download allowance and the amount of allowance remaining in bar graph form. The example screen shown in Figure 22 indicates that the subscriber has 100% of the daily allowance left to use. As the download allowance is used, the green area grows smaller.

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

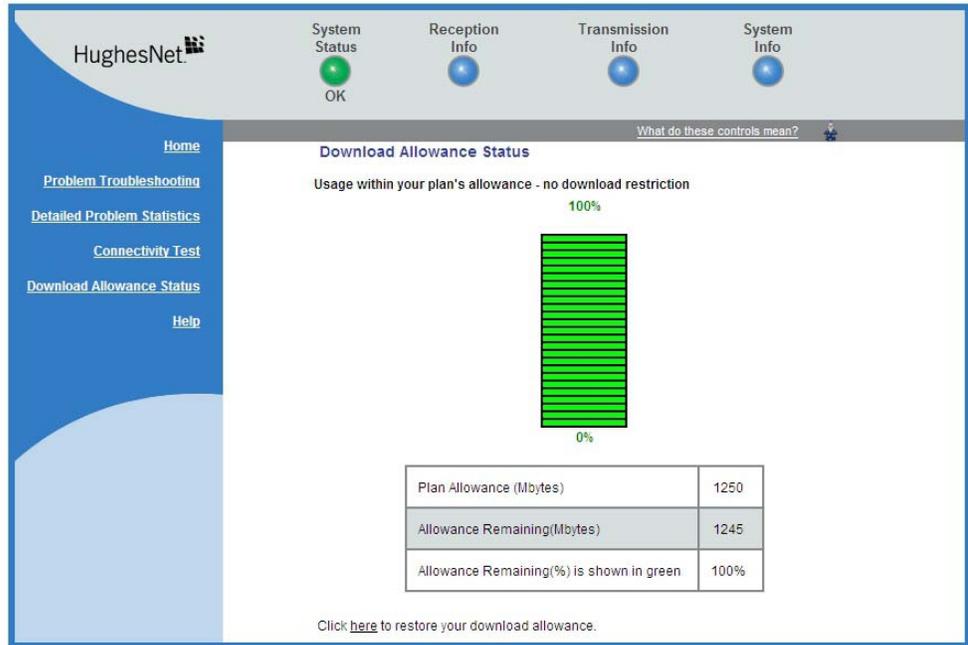


Figure 22: Download Allowance Status screen

The Download Allowance Status screen shows the following:

- Plan Allowance (MB) – How much data you can download daily, in megabytes, based on your service plan.
- Allowance Remaining (MB) – Amount remaining of your daily download allowance, in megabytes.
- Allowance Remaining (%) – Amount remaining of your daily download allowance, as a percentage of your daily plan allowance.

For additional information about download allowance, go to this Web site: <http://legal.hughesnet.com>.

## Help page

The System Control Center Help page (Figure 23) contains information to help you get started in using the satellite router, find contact information for assistance, and other helpful information. Review the Help page information to become familiar with the router.

To display the Help page:

- Click [View Help Topics](#) on the System Control Center home page.

or

- Click [Help](#) in the left panel of any System Control Center page.

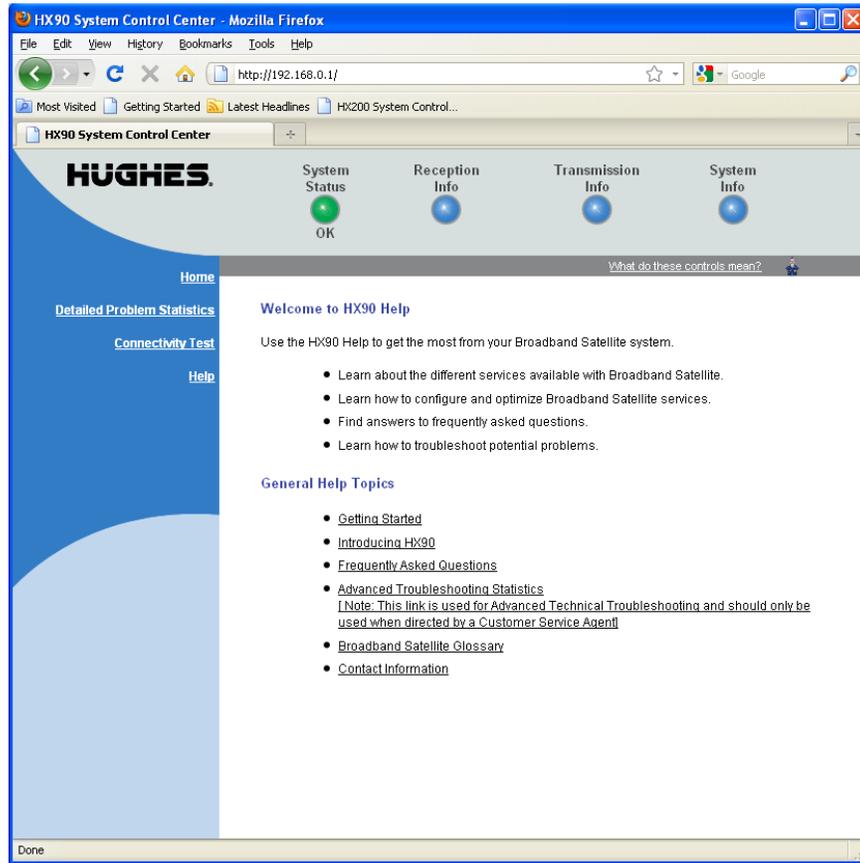


Figure 23: Help page

For additional product support information, go the online HughesNet Knowledge Base at <http://kb.hughesnet.com>.

## System Control Center tools for troubleshooting

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

- *Confirming NOC connectivity* on page 48
- *Viewing problem-related statistics* on page 60

The satellite router has five LEDs on the front panel and small LEDs on the LAN ports on the back of the router. The LEDs provide information about the satellite router's operating status.

### Front panel LEDs

The satellite router has five LEDs on the front panel, as shown in Figure 24. By their appearance—on, off, blinking, or flashing—the LEDs indicate the router's operating status. All are blue when lit. The front panel LEDs are all blue when lit.

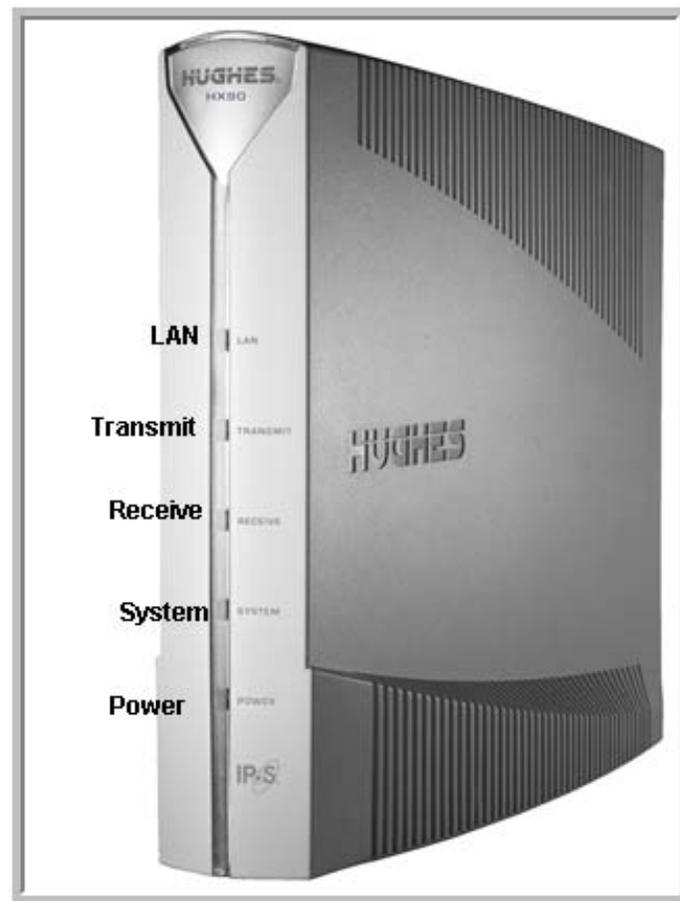


Figure 24: Front panel LEDs on the HX90 router

Table 8 on page 38 explains what the router status is when the LEDs are on, off, or blinking. *On* means the LED is continuously lit. *Blinking* means the LED is usually on, but intermittently turns off briefly. *Flashing* means the LED alternates between on and off for periods of ½ sec to 1 sec.

**Table 8: Front panel LED indications**

LED	Appearance	Satellite router status
LAN	On	Satellite router is connected to a computer network card or Ethernet device
	<b>Blinking</b>	Transmitting and/or receiving data
	Off	No device is connected to the LAN port or the device connected to the LAN port is not working properly
Transmit	On	OK – Transmit path is operational
	<b>Blinking, mostly on</b>	Transmitting data
	Blinking, mostly off	Ranging (The router is measuring the distance to the satellite to calibrate transmit timing and transmit power.)
	Off *	Condition preventing transmission
Receive	On	OK – Receive path is operational
	<b>Blinking</b>	Receiving data
	Off *	Condition preventing receipt of data
System	<b>On</b>	Ready to handle user traffic
	Blinking *	Virus protection blocking data
	Off *	Condition preventing full operation
Power	<b>On</b>	Power is on and the router is functioning normally
	Flashing	Operating with fallback.bin (backup) version of software
	Blinking	Router is not commissioned or has lost its configuration data
	Off *	No power

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

\*Indicates an operational problem.

If it appears the LEDs are not functioning properly, make sure you have the correct power supply. Refer to *Checking the power supply* on page 62 for detailed power supply information.

## LAN port LEDs

Green and orange LEDs on the each of the two LAN (Ethernet) ports on the router's rear panel indicate link status and speed, as explained in Figure 25.

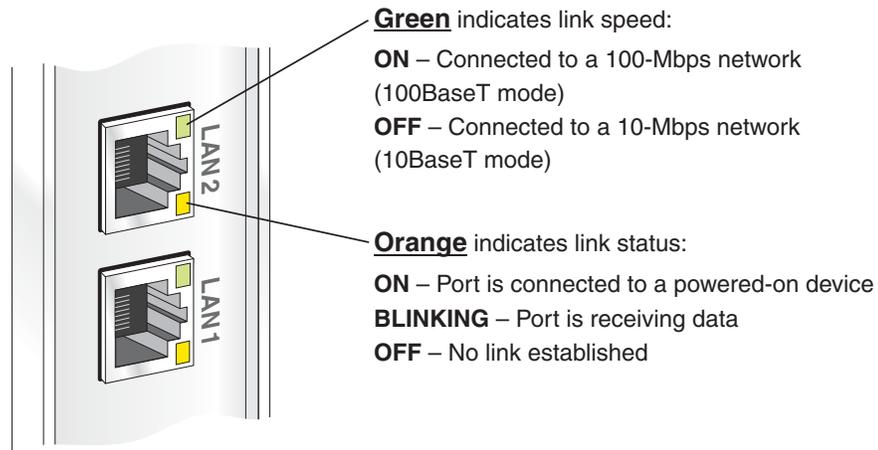


Figure 25: LAN port LEDs

## Using LEDs for troubleshooting

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

- *Using the front panel LEDs for troubleshooting on page 53*
- *Using the LAN port LEDs for troubleshooting on page 58*



## Chapter 4

# Troubleshooting

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

If you cannot correct the problem, contact your service provider.

For support options and contact information, see Chapter – *Contact information* on page 9.

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

- For explanation of **red flags** on System Control Center screens, see *Red flag indicator* on page 25.
- Improper **settings on the computer** connected to the satellite router can cause problems. For instructions on configuring a computer to work properly with the router see Appendix A – *Computer settings*, on page 63.

In addition, the HX90 satellite router provides its own online Help, which includes substantial troubleshooting information. Access this information through the System Control Center [Help](#) link (**Help > Frequently Asked Questions**).

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

## Important troubleshooting information

### NOTICE

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

---

### NOTICE

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

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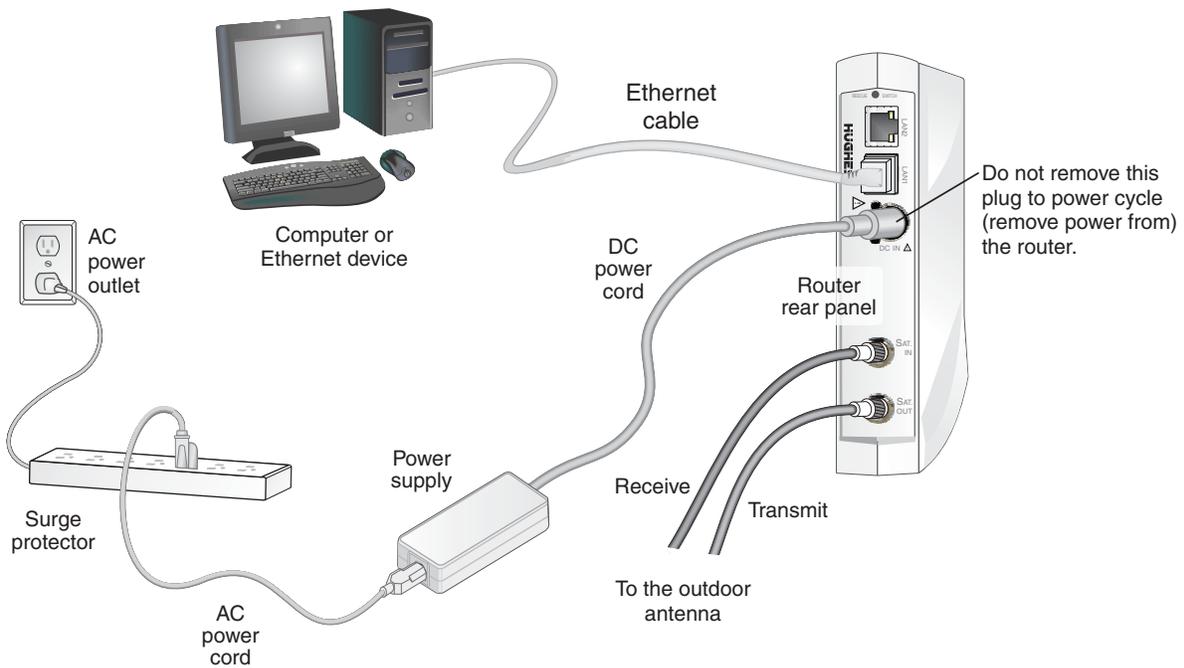
**CAUTION**



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

## Troubleshooting reference diagram

If you need to use any of the troubleshooting procedures provided in this chapter, you may find it useful to refer to Figure 26 on page 42. This diagram shows all power and cable connections for a properly installed HX90 satellite router.



This diagram shows an AC/DC power supply. If a DC/DC power supply is used, the configuration is similar but does not include a surge protector.

Figure 26: Troubleshooting reference diagram

## Cannot access the Internet

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

- *Confirming that the satellite router is commissioned* on page 43
- *Confirming the receive signal* on page 44
- *Confirming the transmit signal* on page 45
- *Confirming that TCP Acceleration is operational* on page 45
- *Confirming that Web Acceleration is operational* on page 47
- *Confirming NOC connectivity* on page 48
- *Confirming Internet connectivity* on page 51
- *Checking for viruses and firewall issues* on page 51

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

If you have tried all of these procedures and cannot access the Internet, try them all again. If you still cannot access the Internet, contact your service provider.

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

1. Open a web browser such as Internet Explorer.
2. In the browser's address bar, type **www.systemcontrolcenter.com** or **192.168.0.1**.
3. Press **Enter**.

The System Control Center home page opens.

### ***Confirming that the satellite router is commissioned***

To confirm that the router is commissioned:

1. At the System Control Center, click the [System Info](#) link.

The System Information page appears.

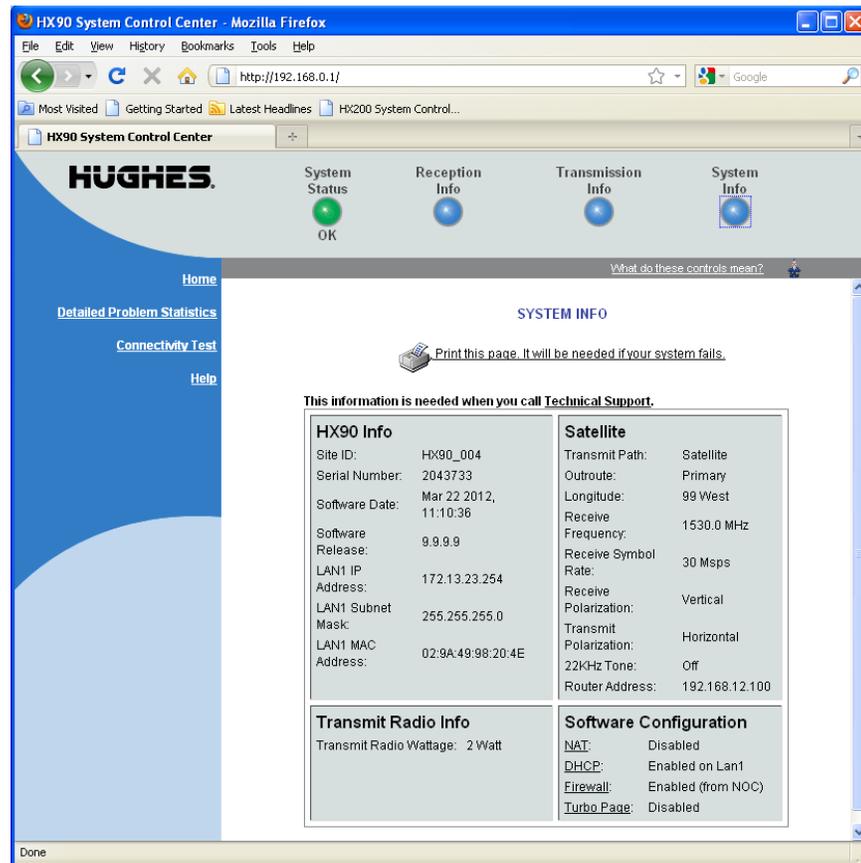


Figure 27: System Info page

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

2. In the **HX90** section, check the **Site ID** line.  
If the numeric site ID appears, the satellite router is commissioned. Proceed to *Confirming the receive signal* on page 44.  
If `Not_Commissioned` appears, the router is not commissioned. Contact your service provider.

### ***Confirming the receive signal***

To confirm that the router is properly receiving satellite signals:

1. At the System Control Center, click the [Reception Info](#) link.  
The Reception Information page appears.
2. In the *Receive Status* field, check the RxCode.

If the RxCode is *Receiver operational (RxCode 5)* the router is receiving signals properly; proceed to *Confirming the transmit signal* on page 45.

If any other RxCode appears, the router is not receiving signals properly. Click the RxCode, and follow the troubleshooting procedure that appears. Click the RxCode for explanation of the problem and/or troubleshooting information.

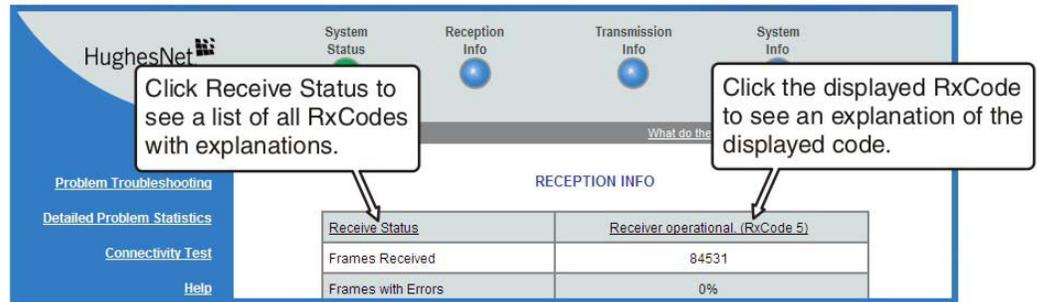


Figure 28: Reception Info page

**Note:** The RxCode shown is an example.

### Confirming the transmit signal

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

1. At the System Control Center, click the [Transmission Info](#) link. The Transmission Information page appears.
2. In the *Transmit Status* field, check the TxCode.

If the TxCode is *Transmitter Ready (RxCode 8)* the router is transmitting signals properly; proceed to *Confirming that TCP Acceleration is operational* on page 45. If any other TxCode appears, the router is not transmitting signals properly. Click the TxCode for explanation of the problem and/or troubleshooting information.

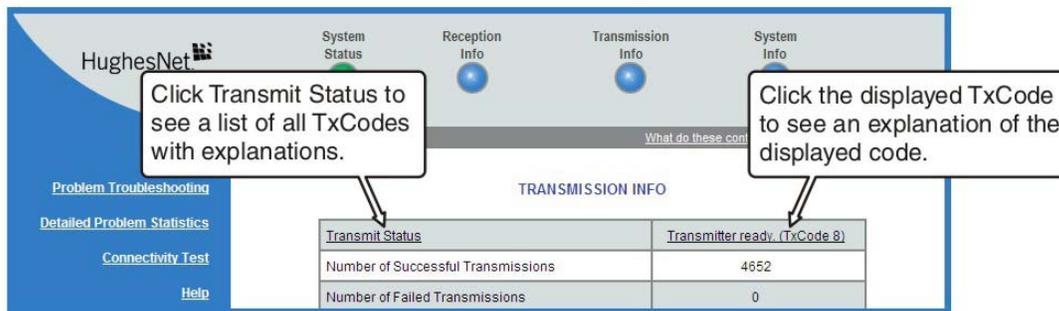


Figure 29: Transmission Info page

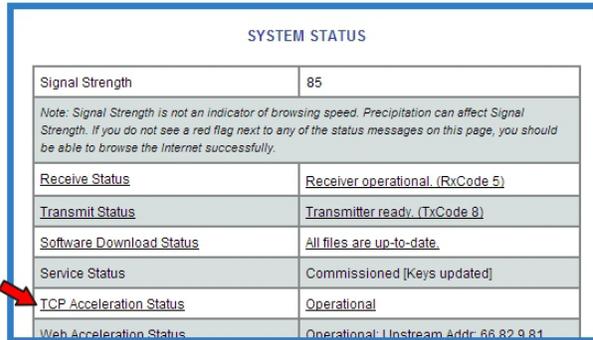
**Note:** The TxCode shown is an example.

### Confirming that TCP Acceleration is operational

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

To determine if TCP acceleration is operational:

1. At the System Control Center, click the [System Status](#) link.  
The System Status page appears.



The screenshot shows a table titled "SYSTEM STATUS" with the following content:

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

A red arrow points to the "TCP Acceleration Status" row, which shows "Operational".

Figure 30: Confirming that TCP Acceleration is operational

2. Check the *TCP Acceleration Status* field.  
If the TCP Acceleration Status is *Operational*, TCP Acceleration is enabled and working properly. Proceed to *Confirming that Web Acceleration is operational* on page 47.
3. If the TCP Acceleration Status is *Disabled*, restart the router:
  - a. Go to the System Control Center home page.
  - b. In the Help section, click [Restart HX90](#).
4. If TCP Acceleration is still disabled, power cycle the router:
  - a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the satellite router's power supply.
  - c. Wait 10 sec.
  - d. Plug the power cord back into the power source.
  - e. *If the power source is DC*, plug the input cable back into the power supply.



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

5. If TCP Acceleration is still disabled, power cycle the Ethernet device according to the device documentation.
6. If TCP Acceleration is still disabled, restart the computer.
7. Check the *TCP Acceleration Status* field again.

If TCP Acceleration is **enabled** but you still cannot access the Internet, go to *Confirming that TCP Acceleration is operational* on page 45.

If TCP Acceleration is still **disabled**, contact your service provider for assistance.

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

### ***Confirming that Web Acceleration is operational***

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

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

1. From any System Control Center page, observe the System Status button indicator.
  - If the indicator button is green, Web Acceleration is functioning normally.
  - If the indicator button is yellow, Web Acceleration may not be operational. Continue to the next step.
2. Click the [System Status](#) link to access the System Status page.
3. Observe the message in the *Web Acceleration Status* field.  
If the Web Acceleration Status is *Operational*, Web Acceleration is enabled. Proceed to *Confirming NOC connectivity* on page 48.

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

4. If the Web Acceleration Status is *Not operational*, Web Acceleration Status is disabled. Follow these steps:
  - a. Make sure the router is transmitting and receiving. See *Confirming the receive signal* on page 44 and *Confirming the transmit signal* on page 45. If necessary, troubleshoot as stated in these sections.
  - b. Wait 2 hr.
5. If Web acceleration is still disabled, restart the router:
  - a. Go to the System Control Center home page.
  - b. In the Help section, click [Restart HX90](#).
6. If Web acceleration is still disabled, power cycle the router:
  - a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the satellite router's power supply.
  - c. Wait 10 sec.

- d. Plug the power cord back into the power source.
- e. If the power source is DC, plug the input cable back into the power supply.



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

---

- 7. Check the *Web Acceleration Status* field again.

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

### ***Confirming NOC connectivity***

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

- 1. Click [Connectivity Test](#) on the System Control Center page to access the Connectivity Test page.

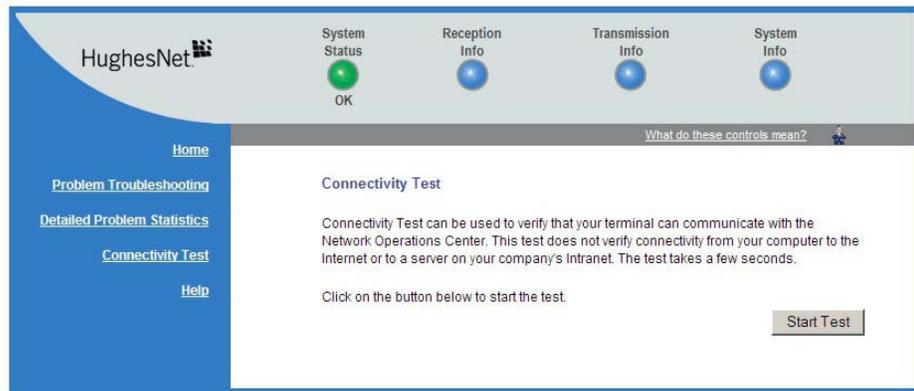


Figure 31: Connectivity Test – initial page

2. Click **Start Test**. The Connectivity Test results page appears.

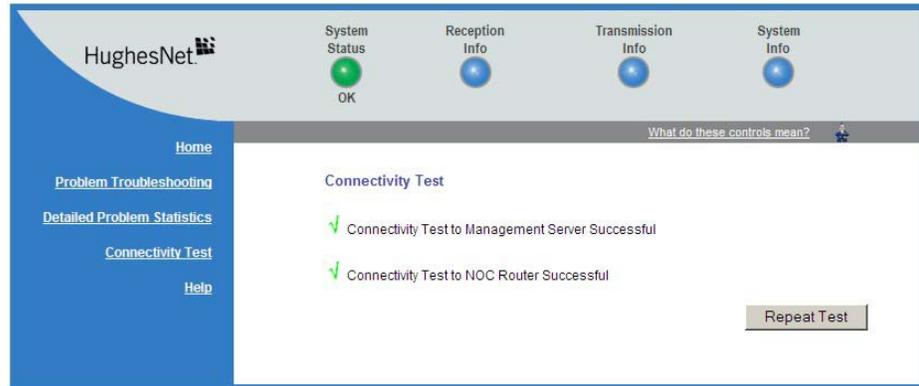


Figure 32: Connectivity Test – results page

3. If the connectivity test succeeds but you still cannot access the Internet, follow these steps to ping the router address from your computer.
  - a. At the System Control Center, click the [System Info](#) link. The System Information page appears.
  - b. Record the router address listed in the **HX90 Info** section.
  - c. On the Windows desktop, go to **Start > Run**. The **Run** box appears.
  - d. In the *Open* field, type **command**.
  - e. Click **OK**. The Command window appears.
  - f. At the prompt, type **ping** followed by a space and the router address. For example, if the router address is 172 . 19 . 19 . 1, type **ping 172 . 19 . 19 . 1**.
  - g. Press **Enter**.

If pinging the router address succeeds but you still cannot access the Internet, skip to *Confirming Internet connectivity* on page 51.

### ***Confirming NOC connectivity (Static IP Address)***

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

If pinging the router address fails, and DHCP is disabled on the router, the default gateway address is probably not set correctly in the computer's operating system settings. The default gateway address should be the router IP address as displayed on the System Information page **HX90 Info** section, in the LAN1 IP Address field.

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

For information on the ping test, see *Confirming NOC connectivity* on page 48.
3. If the ping test fails, restart the satellite router:

- a. Go to the System Control Center home page.
  - b. In the Help section, click **Restart HX90**.
4. If restart does not correct the problem, power cycle the satellite router:
- a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the router's power supply.
  - c. Wait 10 sec.
  - d. Plug the power cord back into the power source.
  - e. *If the power source is DC*, plug the input cable back into the power supply.



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

---

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

## ***Confirming Internet connectivity***

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

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

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

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

If the ping test is successful but you still cannot browse the Internet, complete the procedures in *Checking the DNS setting* on page 51.

If the ping test fails, contact your service provider for assistance.

## ***Checking the DNS setting***

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

1. On the Windows task bar, click **Start > Run**.
2. In the Run window, type **command**.
3. Click **OK**.
4. Type **ipconfig/all** and press **Enter**.
5. Locate the DNS addresses in the *DNS Servers* field.
6. For customers who have their own NOC, verify that the customer-specific DNS address appears in the *DNS Servers* field.
7. Close the Command window.

If the DNS address is correct, wait a while and try to access a web site again. There may be a temporary Internet connection outage. If you are still cannot access a web site after waiting, complete the procedures in *Checking for viruses and firewall issues* on page 51. If the DNS address is not correct, contact your service provider for assistance.

## ***Checking for viruses and firewall issues***

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

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

## Cannot access the System Control Center

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

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

### *Satellite router connected directly to a computer*

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

1. On the computer desktop, double-click the System Control Center shortcut icon.
2. If the System Control Center does not appear, open a web browser.
3. Type [www.systemcontrolcenter.com](http://www.systemcontrolcenter.com) in the browser's address bar.
4. Press **Enter**.
5. If the System Control Center does not appear, type **192.168.0.1** in the browser's address bar.
6. Press **Enter**.
7. If the System Control Center does not appear, check the LAN cable connections at the satellite router and at the computer. Check the physical connections and look for LED activity on both LAN ports.

If there is no LED activity, there could be a problem with the connection or NIC.

If the System Control Center does not appear, repeat these steps. If it still does not appear, contact your service provider.

### *Satellite router connected to an Ethernet device*

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

1. Disconnect the Ethernet cable from the device.
2. Using an Ethernet cable you know is good, connect the satellite router LAN port directly to the Ethernet port on the computer.  
This temporarily bypasses the Ethernet device as a way to help determine where and what the problem is.
3. Power cycle the satellite router:
  - a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the satellite router's power supply.
  - c. Wait 10 sec.
  - d. Plug the power cord back into the power source.
  - e. *If the power source is DC*, plug the input cable back into the power supply.



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

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4. Attempt to access the System Control Center by completing the steps in *Satellite router connected directly to a computer* on page 52.
5. If you cannot access the System Control Center, restart your computer.
6. Try again to access the System Control Center.

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

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

## Using the front panel LEDs for troubleshooting

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

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

### NOTICE

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

---

**Note:** The router may operate correctly when first installed even if the transmit and receive cable connectors are not adequately tightened. However, problems could develop later. Therefore, correct operation of the satellite router's is not an indication that the cables are adequately tightened.

### ***Power LED off and one or more LEDs flashing***

If after power-up or a reset the Power LED is off and one or more of the other LEDs is flashing, the router could have a fatal error and may have to be replaced. If *all* LEDs are flashing, go to *All LEDs flashing* on page 54.

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

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

- d. Plug the power cord back into the power source.
- e. *If the power source is DC*, plug the input cable back into the power supply.



To remove power from the satellite router, 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 router's rear panel. Doing so could result in an electrical shock or damage to the router.

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The router may recover.

2. If the fatal error indication continues, the router must be replaced. Contact your service provider.

### ***All LEDs flashing***

If all LEDs are flashing simultaneously, this indicates that the satellite router's firmware is corrupted. A router in this state cannot be recovered. Contact your service provider for assistance.

### ***All LEDs off***

If all LEDs on the front panel are off:

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



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

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4. Test the power outlet to make sure there is not a problem with the power source.
5. If the LEDs do not turn on, contact your service provider.

## Checking the Power LED

If the Power LED is off, check the power supply connections. (The router does not have an off/on switch.) If the Power LED is on, proceed to *Checking the LAN LED* on page 55.

## Checking the LAN LED

If the front panel LAN LED is off:

1. Disconnect and reconnect the Ethernet cable from the router and from the computer.  
Make sure the cable is securely connected to the router LAN port and to the computer's LAN port.
2. If the LAN LED is still off, power cycle the satellite router:
  - a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the satellite router's power supply.
  - c. Wait 10 sec.
  - d. Plug the power cord back into the power source.
  - e. *If the power source is DC*, plug the input cable back into the power supply.



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

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3. If the LAN LED is still off, check the LAN port LEDs on the back panel.
  - If the Orange LED is on and the front panel LAN LED is not, contact your service provider for assistance.
  - If both the Orange LED and the front panel LAN LED are off, check all network equipment that connects the computer with the router, including the computer's Ethernet card, Ethernet cable(s) and any switch or hub. Replace one or more of the items to try to isolate the problem.
4. If the front panel LAN LED is still off, check the Windows Device Manager to see if the computer's NIC or *network adapter* is installed correctly.
  - a. In Windows XP, for example, click **Start > Settings > Control Panel > System > Hardware > Device Manager**.  
A screen appears listing all the devices installed on the computer.
  - b. Look for Network adapters.  
If the NIC is not properly installed, a red X appears next to its listing.
  - c. If a red X is present, troubleshoot the NIC installation using the manufacturer's instructions and Windows documentation.

5. If the LAN LED is still off, follow this step **only if the satellite router is connected to a hub, router, or other network device (that is, not connected directly to the computer)**. Connect the computer directly to the satellite router (to bypass the network device) as follows:
  - a. Disconnect the Ethernet cable from the device.
  - b. Using an Ethernet cable you know is good, connect the satellite router LAN port directly to the Ethernet port on the computer.  
This temporarily bypasses the Ethernet device as a way to help determine where and what the problem is.
  - c. Check the router's LAN LED.  
  
If the LAN LED is on, but was off before you made this direct connection, there is probably a problem with your network device or the connections to it. Check those connections. If the LAN LED is still off after checking the connections, contact the manufacturer of the network device for assistance.
6. If you have not found any problem so far, but the LAN LED is still off, power cycle the router again.
7. If the LAN LED is still off, power cycle the Ethernet device according to the device documentation.
8. If the LAN LED is still off, restart the computer.
9. If the LAN LED is still off, try connecting the satellite router to another computer.

If the front panel LAN LED is now on, there may be a problem with the computer that was connected to the satellite router.

If the LAN LED is still off, contact your service provider.

## Problem with a connected device

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

- *Transmit LED is off* on page 56
- *Receive LED is off* on page 57
- *System LED is off* on page 57

### ***Transmit LED is off***

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

1. Check the router's cable connections.  
Make sure the cable connections are secure (properly aligned-not cross threaded; finger tight with no play).

**Note:** The router may operate correctly when first installed even if the transmit and receive cable connectors are not adequately tightened. However, problems could develop later. Therefore, correct operation of the satellite router is not an indication that the cables are adequately tightened.

2. If the LED is still off, check the cable for breaks.
3. If the problem persists, contact your service provider.

### ***Receive LED is off***

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

1. Check the router's cable connections.  
Make sure the cable connections are secure (properly aligned-not cross threaded; finger tight with no play).

**Note:** The router may operate correctly when first installed even if the transmit and receive cable connectors are not adequately tightened. However, problems could develop later. Therefore, correct operation of the satellite router is not an indication that the cables are adequately tightened.

2. If the LED is still off, restart the router:
  - a. Go to the System Control Center home page.
  - b. In the Help section, click **Restart HX90**.
3. If the LED is still off, power cycle the satellite router:
  - a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the router's power supply.
  - c. Wait 10 sec.
  - d. Plug the power cord back into the power source.
  - e. *If the power source is DC*, plug the input cable back into the power supply.



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

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4. If the problem persists, contact your service provider.

### ***System LED is off***

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

1. Wait 15 minutes.  
If there is a problem at the NOC, it may soon be corrected and the System LED comes on. You can then resume normal operation.
2. If the LED does not turn on after 15 minutes, power cycle the satellite router:
  - a. Unplug the power cord from the power source.
  - b. *If the router is connected to a DC power source*, unplug the DC input cable from the router's power supply.
  - c. Wait 10 sec.

- d. Plug the power cord back into the power source.
- e. *If the power source is DC*, plug the input cable back into the power supply.



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

---

3. If the problem persists, contact your service provider.

## Using the LAN port LEDs for troubleshooting

Each LAN port on the router's rear panel has two small LEDs (green and orange) as illustrated in Figure 25 on page 39. This section explains how to use the LAN port LEDs to troubleshoot a LAN port problem.

### ***Orange LED and the front panel LAN LED are both off***

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

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



To remove power from the satellite router, 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 router's rear panel. Doing so could result in an electrical shock or damage to the router.

---

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

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

## Troubleshooting other problems

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

### *Hot cable connector*

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

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



To remove power from the satellite router, 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 router's rear panel. Doing so could result in an electrical shock or damage to the router.

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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 router 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 router is not an indication that the cables are adequately tightened.

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

### **NOTICE**

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

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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.

## *Slow speed or intermittent operation*

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

## Viewing problem-related statistics

**Note:** The Detailed Problem Statistics page and link are present on your HX90 only if they have been enabled by the NOC.

You can use the Detailed Problem Statistics page to view selected operational statistics recorded over a recent specific hourly time frame. Very likely you will not understand all of the statistics presented. The statistics displayed are primarily intended for use by a service provider representative who may be assisting you in troubleshooting a specific problem.

To view statistics:

1. Click [Detailed Problem Statistics](#) on the System Control Center home page—or in the left panel of other System Control Center pages. The Detailed Problem Statistics page appears.

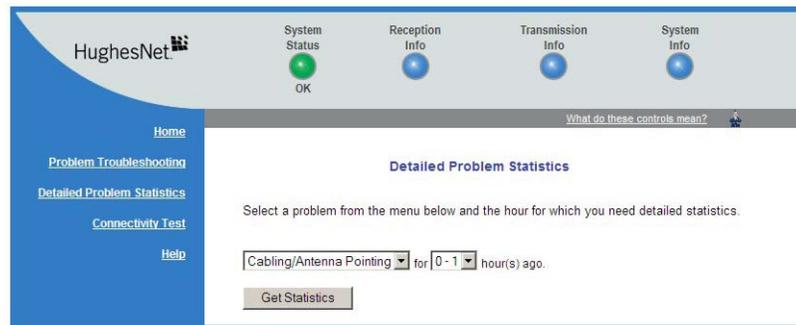


Figure 33: Detailed Problem Statistics

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

If a service provider representative is assisting you, the representative will tell you which statistics to select.

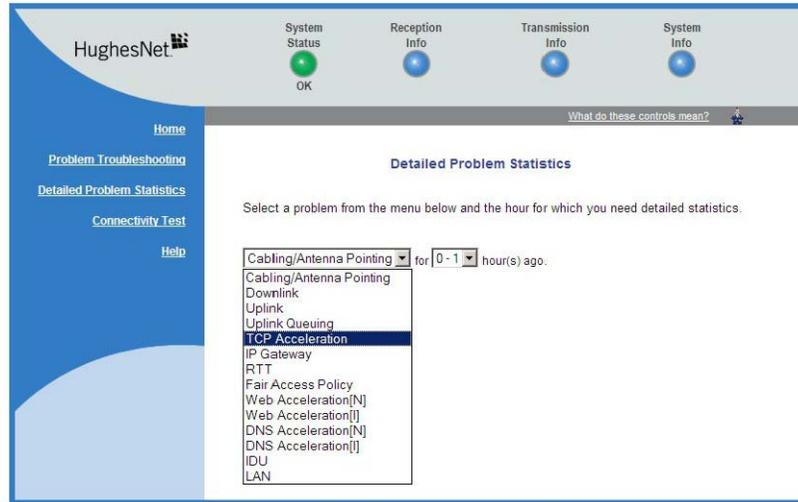


Figure 34: Selecting a category of statistics

3. Select a time period (for example, 0–1 hour ago).
4. Click **Get Statistics**.  
The System Control Center displays the statistics you requested.

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

## Weather and signal strength

Rain or snow can interfere with signal strength. If the interference is strong enough, the router may stop receiving signals from the satellite and stop transmitting. If this happens, the Transmit and Receive LEDs both turn off.

Antenna reception may be degraded by heavy rain or snow or by a buildup of moisture, snow, or ice on the antenna. Similar conditions at the NOC can interfere with signals for brief periods of time. Signal strength is restored when rain or snow subsides.

In weather conditions such as these, wait to see if normal operation resumes when the weather returns to normal.

## Checking the power supply

Use only the power supply that was enclosed with the satellite router when it was shipped from the factory.

### **NOTICE**

- Always use the power supply provided with the satellite router. The router's performance may suffer if the wrong power supply is used.
  - Connect the AC/DC power supply to a three-wire, grounded outlet with an input of 110/240 VAC. A suitable surge protector is recommended to protect the satellite router from possible damage due to power surges.
  - Observe the power standards and requirements of the country where it is installed.
- 

If the LEDs do not function properly as described in this chapter, check the label on the power supply and verify that you have the correct power supply.

If your power supply has any other part number, contact your service provider.

## Appendix A

# Computer settings

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

Instructions are provided for:

- Configuring a computer to use DHCP
- Configuring a Computer to use a static IP address
- Configuring proxy settings

These procedures are explained in the sections that follow.

## Understanding the router address and computer address

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

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

To find specific address information for the satellite router, go to the System Control Center System Information page, which is shown in Figure 19 on page 32. For instructions on setting IP addresses, see:

- The HX90 satellite router's online Help. Click **Help > Frequently Asked Questions > How do I configure IP Addresses on my computer? and What IP Address(es) can I configure on the computers connected to my HX90 terminal?**
- *Configuring a computer to use a static IP address* on page 71

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

### *How do I know if DHCP should be enabled?*

The service plan you purchased with the HX90 satellite router determines what kind of network address a connected computer or computers should use and whether or not DHCP should be enabled on the computer.

To determine the correct DHCP and address configuration for a computer or computers to be connected to the satellite router, determine if DHCP is enabled or disabled *on the satellite router* by following the steps below.

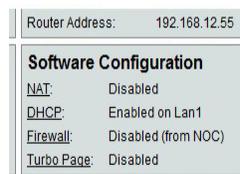
1. Connect a single computer to the satellite router's LAN port (LAN1).
2. Open a web browser.
3. In the browser address bar, type **www.systemcontrolcenter.com** and press **Enter**.

The System Control Center home page appears.

4. Click the **System Info** button near the top of the page.

The System Information page appears.

5. In the **Software Configuration** section, observe the value in the DHCP field.



Router Address:	192.168.12.55
<b>Software Configuration</b>	
NAT:	Disabled
DHCP:	Enabled on Lan1
Firewall:	Disabled (from NOC)
Turbo Page:	Disabled

- If DHCP is *enabled* on the satellite router, you must configure the computer to support DHCP. Then the computer uses a dynamic address that is automatically assigned by the satellite router.
- If DHCP is *disabled* on the satellite router, the computer must be configured for a static IP address. The process for configuring a static IP address also disables DHCP.

**Note:** If the satellite router is connected to a LAN, you must configure each computer or device that accesses the Internet over the LAN as stated above.

Subsequent sections explain how to enable DHCP and how to configure a static IP address.

## Configuring Windows 7 to use DHCP

1. From the Windows desktop, select **Start > Control Panel > Network and Sharing Center**.
2. Look for the Local Area Connection link indicated by the arrow in Figure 35. If you do not see a Local Area Connection link or if a red X appears next to the link, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.

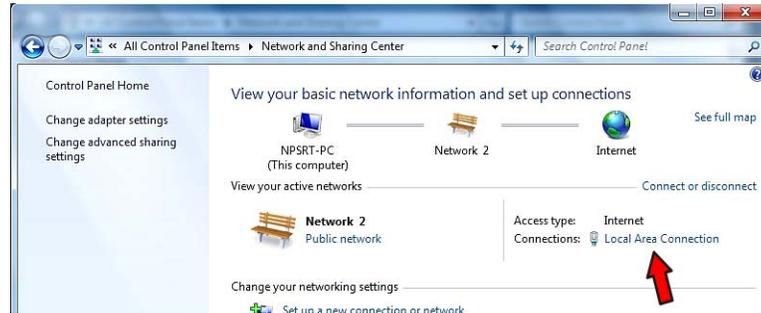


Figure 35: Network and Sharing Center – Windows 7

3. Click the **Local Area Connection** icon, which represents the satellite router network connection.  
The Local Area Connection Status window opens.
4. Click **Properties**.  
The Local Area Connection Properties dialog appears, as shown in Figure 36.

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

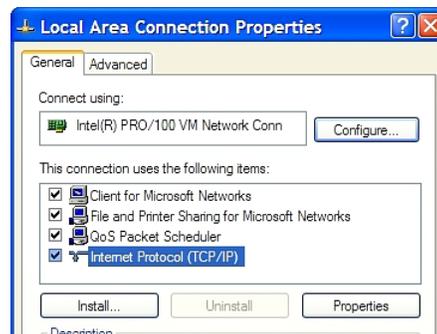


Figure 36: Local Area Connection Properties – Windows 7

5. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown.
6. If NetBEUI is installed and checked, uncheck it or uninstall it.
7. Highlight the appropriate TCP/IP connection (usually Internet Protocol Version 4). Be careful not to uncheck the checkbox.

8. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in Figure 37.

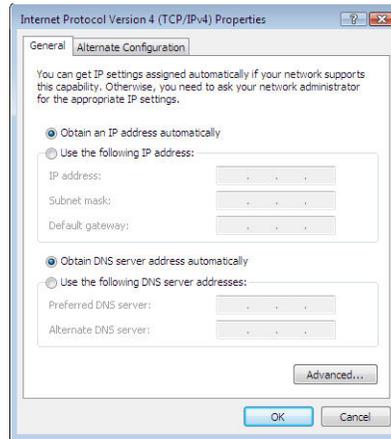


Figure 37: Internet Protocol Properties – Windows 7

9. Ensure that both the *Obtain an IP address automatically* and *Obtain DNS server address automatically* options are selected.
10. Click **OK**.
11. Click **Close** to close the Local Area Connection Properties dialog.
12. Click **Close** to close the Local Area Connection status dialog.
13. Confirm that you have an IP address:
  - a. Press **Win+R** (Windows key + R).
  - b. Type **cmd** and click **OK**.
  - c. In the command, type **ipconfig/renew** and press **Enter**.
  - d. Make sure an IP address is shown on the line that starts with IPv4 Address or IPv6 Address.

### ***Configuring Windows Vista to use DHCP***

1. From the Windows desktop, select **Start > Settings > Network Connections**. A list of network adapters appears as shown in Figure 35. 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 38: 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 router network connection, and select **Properties**.  
The Local Area Connection-NIC Card Properties dialog appears as shown in Figure 39.

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

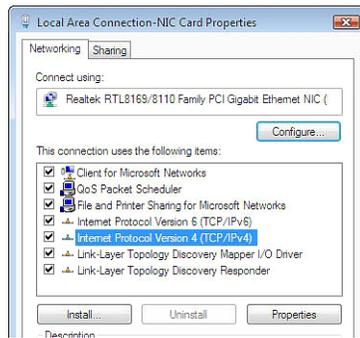


Figure 39: Local Area Connection Properties – Windows Vista

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 40.

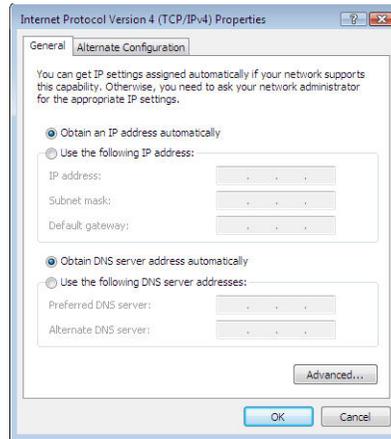


Figure 40: Internet Protocol Properties – Windows Vista

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***

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 41. 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.

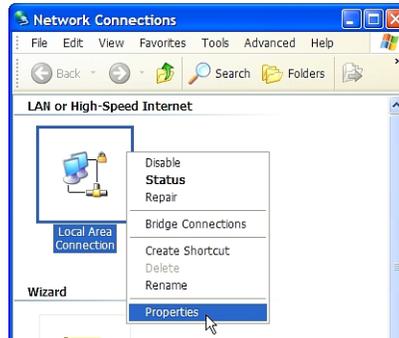


Figure 41: Network Connections – Windows XP

**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 42.

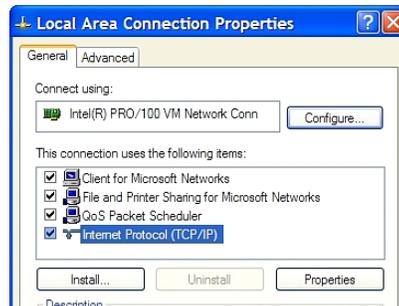


Figure 42: Local Area Connection Properties – Windows XP

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 43.

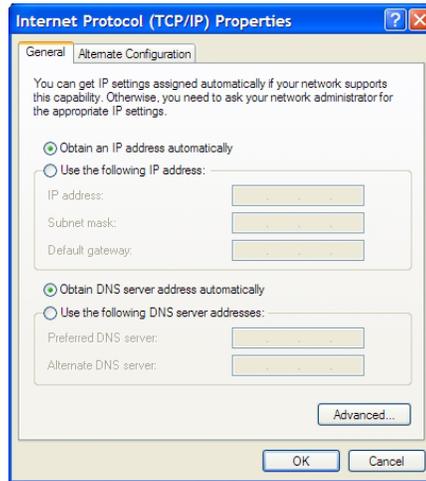


Figure 43: Internet Protocol Properties – Windows XP

8. On the General tab, ensure that both the *Obtain an IP address automatically* and *Obtain DNS server address automatically* options are selected. If not, select them.
9. Click **OK**.
10. Confirm that you have an IP address:
  - a. Click **Start > Run**.
  - b. Type **cmd** and click **OK**.
  - c. Type **ipconfig/renew** and press **Enter**.
  - d. Make sure an IP address is shown on the line that starts with IP Address.

### ***Configuring a Mac computer to use DHCP***

1. From the Mac interface, select **System Preferences**.  
The System Preferences menu appears.
2. Under *Internet & Network*, click the **Network** icon.

The Network screen appears as shown in Figure 44.



Figure 44: 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 45. The IP Address field becomes disabled.



Figure 45: Select Using DHCP from the configure drop-down list

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

## Configuring a computer to use a static IP address

If it is desired or necessary for a computer to have a fixed or permanent static IP address, the computer should be configured for a *static IP address*. For more information about IP addresses, see *Understanding the router address and computer address* on page 63.

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

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

- Subnet Mask. This is the subnet mask assigned to your satellite router. You can obtain the subnet mask from the System Information page of the System Control Center.
- Default Gateway. This is the IP address of the satellite router. You can obtain this address from the System Information page of the System Control Center.

### ***Configuring Windows 7 to use a static IP address***

1. From the Windows desktop, select **Start > Control Panel > Network and Sharing Center**.
2. Look for the Local Area Connection icon indicated by the arrow in Figure 46. If you do not see a Local Area Connection link or if a red X appears next to the link, the network is not installed correctly. Check your network configuration and connections. You cannot configure your system if the red X is present.

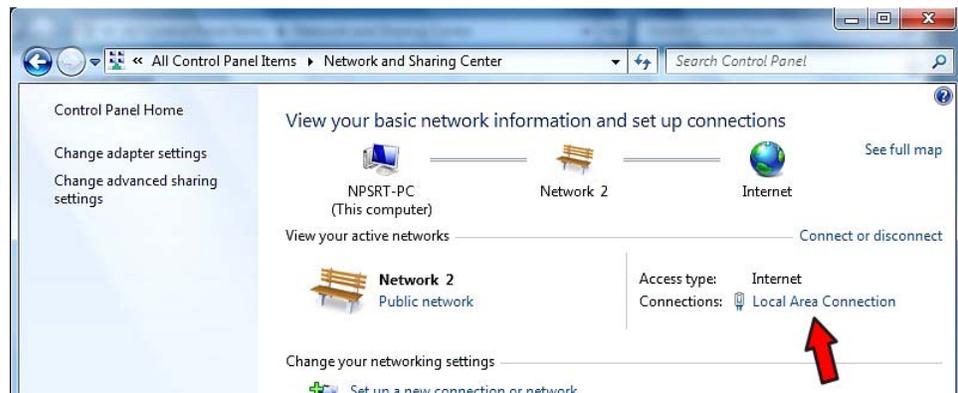


Figure 46: Network and Sharing Center – Windows 7

3. Click the **Local Area Connection** link, which represents the satellite router network connection.  
The Local Area Connection Status window opens.
4. Click **Properties**.  
The Local Area Connection Properties dialog appears, as shown in Figure 47 on page 73.

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

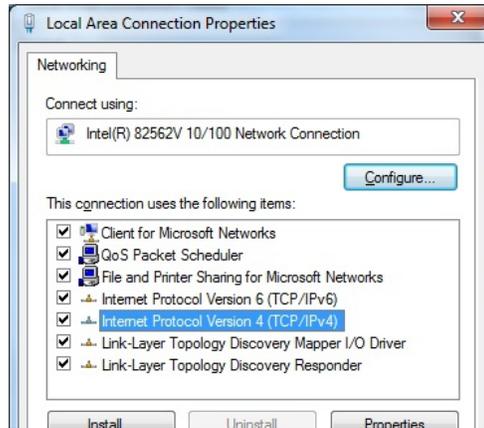


Figure 47: Local Area Connection Properties – Windows 7

5. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown.
6. If NetBEUI is installed and checked, uncheck it or uninstall it.
7. Highlight the appropriate TCP/IP connection. Be careful not to uncheck the checkbox.
8. Click **Properties**.

The Internet Protocol Properties dialog appears as shown in Figure 48.

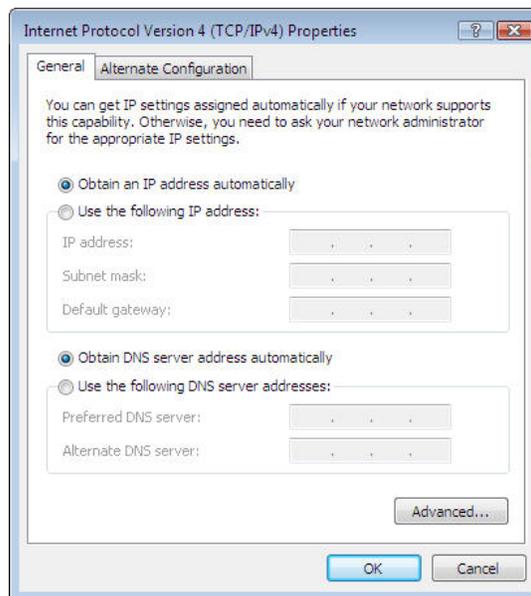


Figure 48: Internet Protocol Properties – Windows 7

9. On the General tab, select **Use the following IP address**.
10. Enter the IP address and subnet mask in the appropriate fields.  
If you do not know what static IP address or range of addresses is available for use, see *Understanding the router address and computer address* on page 63.
11. Select **Use the following DNS server addresses**.
12. Enter **66.82.4.8** in the Preferred DNS server field.
13. Click **OK**.
14. Restart the computer.

### ***Configuring Windows Vista to use a static IP address***

1. From the Windows desktop, select **Start > Settings > Network Connections**. A list of network adapters appears as shown in Figure 49. 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 49: 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 router network connection, and select **Properties**.  
The Local Area Connection-NIC Card Properties dialog appears as shown in Figure 50 on page 75.

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

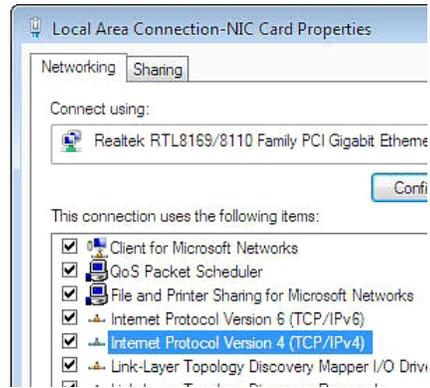
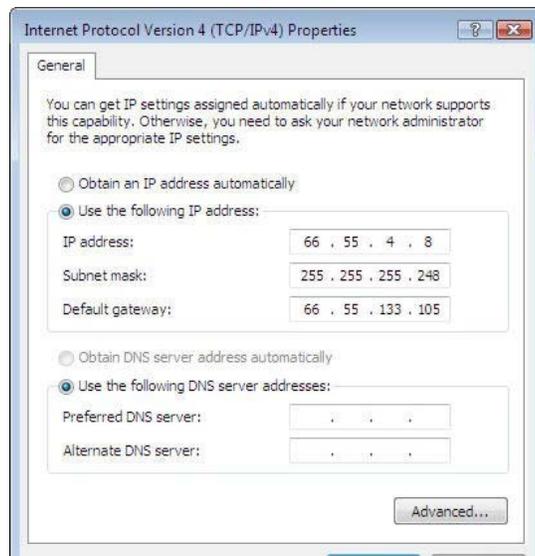


Figure 50: Local Area Connection Properties – Windows Vista

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 51.



This is an *example* the dialog with add information entered. Do not copy these numbers.

Figure 51: Internet Protocol Properties – Windows Vista

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

8. Enter the IP address and subnet mask in the appropriate fields.  
If you do not know what static IP address or range of addresses is available for use, see *Understanding the router address and computer address* on page 63.
9. Select **Use the following DNS server addresses**.
10. Enter **66.82.4.8** in the Preferred DNS server field.
11. Click **OK**.
12. Restart the computer.

### ***Configuring Windows XP to use a static IP address***

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 router network connection, and select Properties as shown in Figure 52.

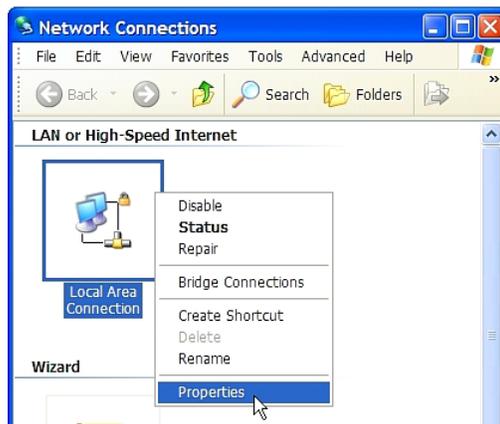


Figure 52: Accessing Local Area Connection Properties – Windows XP

**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.

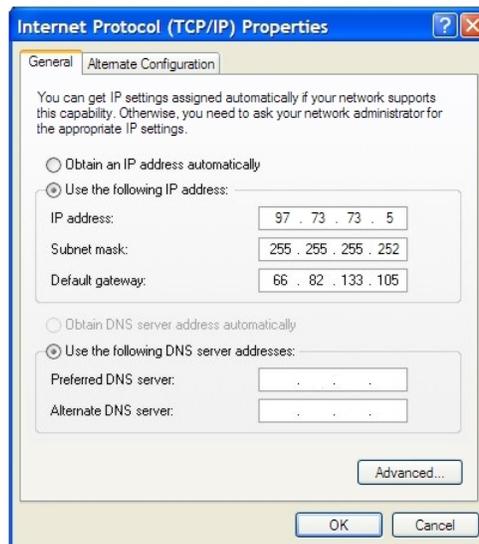
4. Ensure that both Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked in the Local Area Connection properties dialog as shown in Figure 53.



Figure 53: 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 54.



This is an *example* of the dialog with address information entered. Do not copy these numbers.

Figure 54: Internet Protocol Properties – Windows XP

8. On the General tab, select **Use the following IP address**.
9. Enter the IP address, subnet mask, and default gateway in the appropriate fields.  
If you do not know what static IP address or range of addresses is available for use, see *Understanding the router address and computer address* on page 63.
10. Select **Use the following DNS server addresses**.
11. Enter **66.82.4.8** in the *Preferred DNS server* field.
12. Click **OK**.
13. Restart the computer.

### ***Configuring a Mac computer to use a static IP address***

1. From the Mac interface, select *System Preferences*.  
The System Preferences menu appears.
2. Under Internet & Network, click the Network icon.  
The Network screen appears as shown in Figure 55.



Figure 55: 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 56.

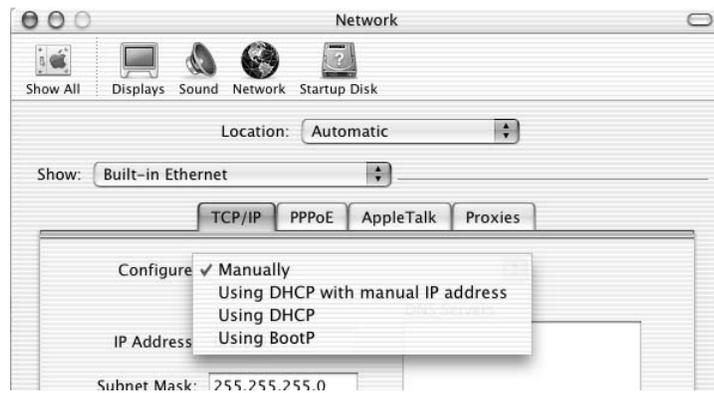


Figure 56: Select Manually from the configure drop-down list

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 router address and computer address* on page 63.
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.

These steps explain how 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.

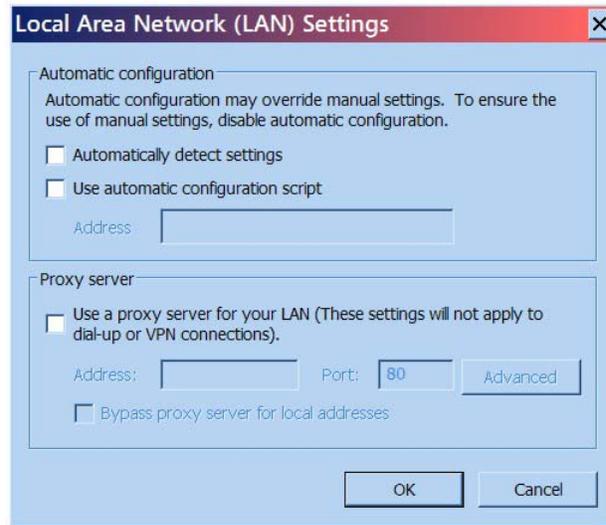


Figure 57: LAN settings – Internet Explorer

4. Uncheck the checkbox next to *Use a proxy server for your LAN*.
5. Click **OK**.
6. Close Internet Explorer and re-launch it to make sure the changes take effect.

# Standards compliance

The HX90 satellite router has been certified to comply with the standards listed in Table 9. Additional information follows the table.

**Table 9: HX90 standards compliance**

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

## Safety - Operating conditions for Canada

In addition to the warnings and safety guidelines listed in this document, the following operating conditions apply to the HX90 when used in Canada:

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

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

### *Repairs in Canada*

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

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



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

---

## Electromagnetic interference (EMI)

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

### NOTICE

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

---

### ***FCC Part 15***

This section applies to the HX90 satellite router.

Standards to which conformity is declared: FCC Part 15

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

Responsible party's name: Hughes Network System, LLC

Address: 11717 Exploration Lane, Germantown, MD 20876

Telephone: 1 (866) 347-3292

Trade name: HUGHES

Type of equipment: Two-way Hughes system

Model number: HX90 (1502573-xxxx)

### ***Canada Class B warning***

The two-way Hughes system (HX90) complies with the Canadian ICES-003, Class B standard.

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

### ***R&TTE (EU)***

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

## **Electromagnetic compatibility (EMC)**

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

### **NOTICE**

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

---

### ***R&TTE (EU)***

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

## **IPoS**

The Hughes HX90 system is compliant with IPoS, ratified by the Telecommunications Industry Association (TIA-1008), first published in October 2003 and issued as Revision A in May 2006.



Figure 58: IPoS symbol



# Acronyms and abbreviations

---

## ***A***

---

AC – Alternating current

## ***C***

---

CAN – Canada

CSA – Canadian Standards Association

## ***D***

---

DC – Direct current

DHCP – Dynamic Host Configuration Protocol

DNS – Domain Name System

## ***E***

---

EMC – Electromagnetic compatibility

EMI – Electromagnetic Interference

EU – European Union

## ***F***

---

FCC – Federal Communications Commission

## ***I***

---

ICES – Interference-Causing equipment Standard

ID – Identifier

IP – Internet Protocol

IPSec - Internet Protocol Security

## ***L***

---

LAN – Local area network

LED – Light emitting diode

LLC – Limited Liability Company

## ***N***

---

NAT - Network address translation

NetBEUI – Extended User Interface (network Transfer protocol)

NIC – Network interface card

NOC – (Hughes) Network Operations Center

## ***R***

---

R&TTE – Radio Equipment and Telecommunications Terminal Equipment

RF – Radio frequency

## ***T***

---

TCP – Transmission Control Protocol

## ***U***

---

UDP – User Datagram Protocol

URL – Uniform resource locator

## ***V***

---

VAC – Volts, alternating current

VAR – Value added reseller

VSAT – Very small aperture terminal

## ***Z***

---

ZIP – Zone improvement plan (U.S. Postal Service)



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