

# HUGHES HN9800 USER MANUAL



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# HN System

## HN9800 Satellite Modem 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 indicates a potentially hazardous situation which, if not avoided, *will* result in death or serious injury.

---



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

---



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

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## Messages concerning property damage

A NOTICE concerns property damage only.



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

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## Safety symbols

The generic safety alert symbol



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

### ***Additional symbols***

This document uses the following symbol to indicate a safety alert message that concerns a potential electric shock hazard. This document uses the following hazard symbols:



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

# Chapter 1

## Overview

---

This user guide describes the features and operation of the HN9800 satellite modem, which provides Internet access by satellite. This guide also gives pertinent reference information.

This guide applies to users in the United States and Canada. In this user guide satellite modem and modem both refer to the HN9800 satellite modem.

### Description

The HN9800 satellite modem connects to a satellite network to provide Internet service. The modem has an Ethernet port so it can be connected to a computer or LAN. Figure 1 shows the front of the HN9800 satellite modem.

After your HN9800 satellite modem has been installed, you can use your computer's web browser to access the Internet or an intranet. The HN9800 supports local area networks (LANs) to extend Internet connectivity to multiple computers. This requires an Ethernet cable or a wireless or a wired connection to the LAN and proper configuration of the computer's operating system network properties.



Figure 1: HN9800 satellite modem

## Operating environment

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

### *Ventilation and heat sources*

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

#### **NOTICE**

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

### *Operating position*

Operate the HN9800 only in a vertical position, that is, resting on its built-in base as shown in Figure 1 on page 7.

## Computer requirements

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

### *Networking requirements*

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

### *Internet browser*

- Internet Explorer 7 or greater, Mozilla Firefox, Safari (for Windows and Mac)
- Browser settings:
  - HTTP 1.1 or greater enabled
  - Proxy settings disabled

## Contact information

If you need operational, warranty, or repair support, who you should contact depends on where you purchased your satellite modem. 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 modems 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 modem. Enter the web address [www.my.hughesnet.com](http://www.my.hughesnet.com).
2. 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 modems purchased from a value-added reseller (VAR) in the United States or Canada:**

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



## Chapter 2

# System Control Center

---

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

### Accessing the System Control Center

To access the System Control Center, a computer with a web browser installed must be connected to the satellite modem's LAN port. The System Control Center web site is hosted on the modem, consequently 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](http://www.systemcontrolcenter.com) and press **Enter**.

The System Control Center home page appears as shown in Figure 2.

## System Control Center home page

The System Control Center home page as shown in Figure 2 contains numerous links to satellite modem features and important information regarding operation of the satellite modem.

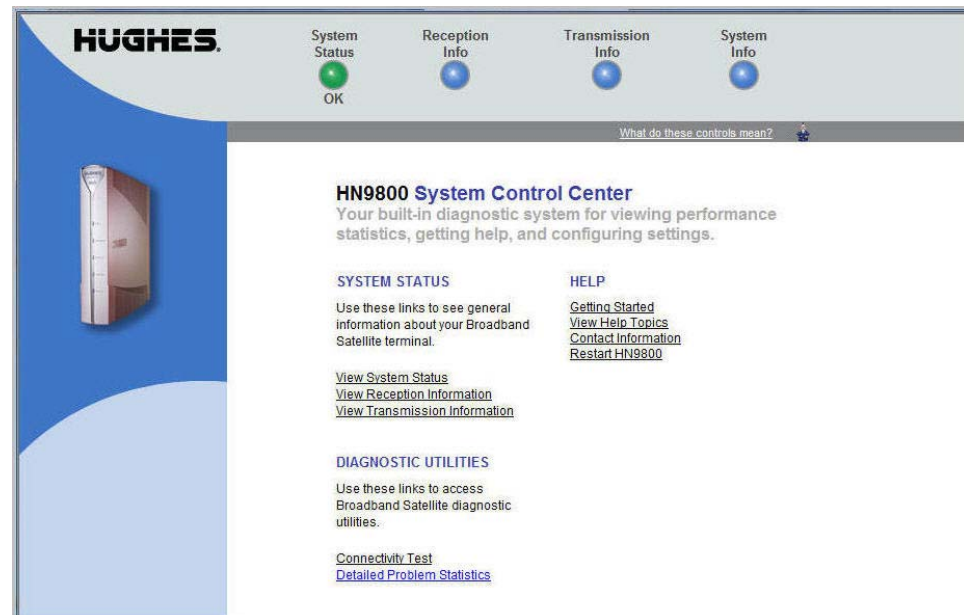


Figure 2: System Control Center home page

The button links at the top of the page (Figure 3) appear on all System Control Center screens. Refer to *Button links* on page 13.



Figure 3: Button links

### Text links

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

#### System Status links

- [View System Status](#) – Opens the System Status page, which displays general system status information such as signal strength and administrative status.
- [View Reception Information](#) - Opens the Reception Information page, which displays information on data received by the satellite modem.
- [View Transmission Information](#) – Opens the Transmission Information page, which displays information on data transmitted by the satellite modem.

**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 modem and the NOC.

[Detailed Problem Statistics](#) - Opens a screen you can use to view statistics concerning modem operation.

### Help links

[Getting Started](#) - Through this link you can find general operating instructions for the HN9800 modem, recommended settings for your browser and TCP/IP, answers to frequently asked questions, and troubleshooting information.

[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 HN9800](#) - Restarts the satellite modem.

## 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 4*. These features are explained in the following sections.

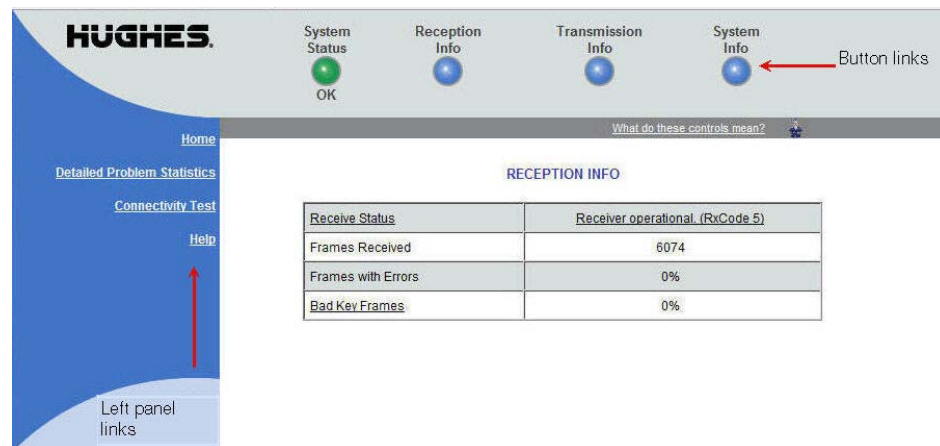


Figure 4: Common features on System Control Center screens

### Button links

At the top of each System Control Center page are four round buttons with labels above them as shown in *Figure 4*. 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 2*. The other three button links are links only; they are not indicators.

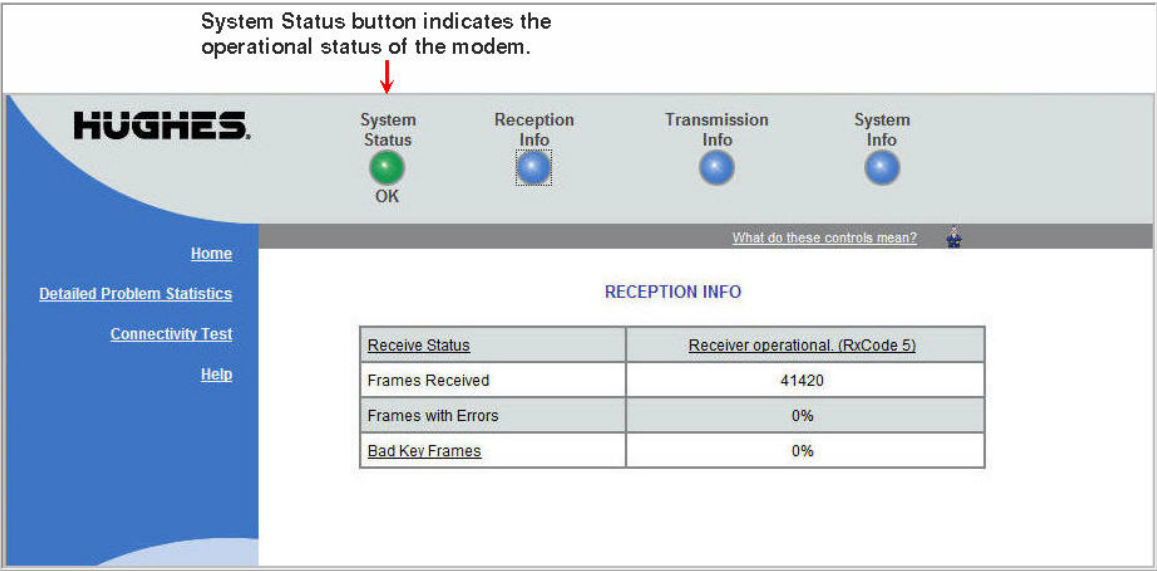


Figure 5: System Control Center button links

The table below identifies the destination for each button link.

Table 1: 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 18.              |
| Reception Info    | Reception Information page    | Displays statistics about received data. For more information see <i>Reception Information page</i> on page 19.                                                   |
| Transmission Info | Transmission Information page | Displays statistics about transmitted data. For more information see <i>Transmission Information page</i> on page 21.                                             |
| System Info       | System Information page       | Displays system information such as the satellite modem’s serial number and software version. For more information see <i>System Information page</i> on page 22. |

### System Status button

The System Status button (only) is a status indicator as well as a link. It changes color to indicate the satellite modem’s current status, as explained in *Table 2*. To see more

detailed status information, click the System Status button to open the System Status page.

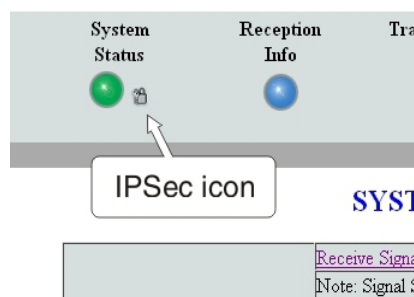
**Table 2: Status button colors**

| Button color                                                                             | Meaning                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  Green  | The satellite modem is operating normally. (OK appears beneath the <i>System Status button</i> on page 14.)                                                                                                                                                  |
|  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 modem may be temporarily using a backup configuration.</li> <li>• There may be virus activity.</li> </ul> |
|  Orange | Degraded – The modem is fully operational, but performance is temporarily impaired because the daily download allowance has been exceeded.                                                                                                                   |

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

### ***IPSec icon***

An icon that looks like a small lock next to the System Status button means IPSec is enabled. This icon is shown in *Figure 6*.



**Figure 6: IPSec icon**

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

two points. An IPSec tunnel is *up* when it has been established between two peers and is capable of carrying traffic. If it cannot carry traffic it is *down*.

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

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

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

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

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

- [Home](#) – Opens the System Control Center home page.
- [Problem Troubleshooting](#) – Opens the Problem Troubleshooting page, a tool that can help you solve common problems you could encounter while using the satellite modem.
- [Detailed Problem Statistics](#) – Opens a screen you can use to view statistics concerning modem operation.
- [Connectivity Test](#) – Opens the Connectivity Test page, which allows you to test the connection between the modem and the satellite.
- [Download Allowance Status](#) – Opens the Download Allowance Status screen, which shows how much remains of the daily download allowance.
- [Help](#) – Opens the Help page. Refer to the Help page, which includes a variety of topics such as getting started and recommended browser settings.

### ***Small icon on System Control Center screens***

The icon indicated by the arrow in the following illustration opens the Advanced Pages. This icon appears on all System Control Center pages.

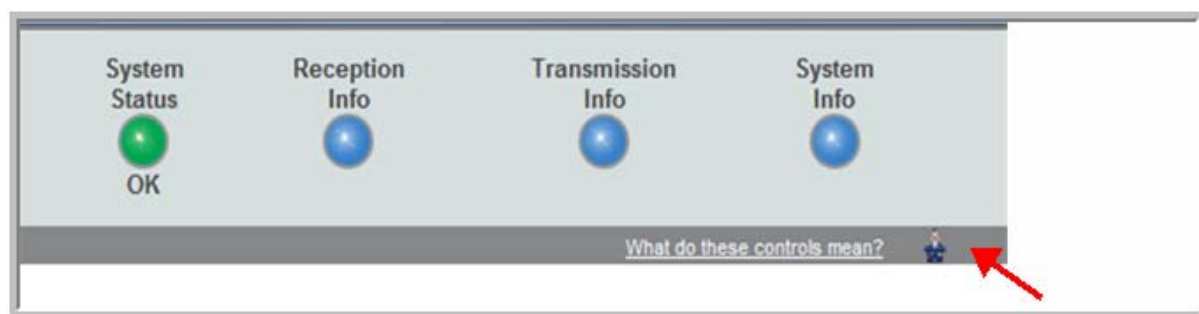


Figure 7: Icon for accessing the Advanced Pages

## Parameters and values

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 lists 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.

| Parameter             | Current value                           |
|-----------------------|-----------------------------------------|
| <u>Receive Status</u> | <u>Receiver operational. (RxCode 5)</u> |
| Frames Received       | 41420                                   |
| Frames with Errors    | 0%                                      |
| <u>Bad Key Frames</u> | 0%                                      |

Figure 8: Format of status and information screens

Refer to the sections below for an explanation of the parameters unique to each screen.

- *System Status page* on page 18
- *Reception Information page* on page 19
- *Transmission Information page* on page 21
- *System Information page* on page 22

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

## Features a customer may not see

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

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

## System Status page

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

Available system status values may vary, depending on how the satellite modem is configured. Therefore, some options shown in *Figure 9* may not appear on your System Status screen.

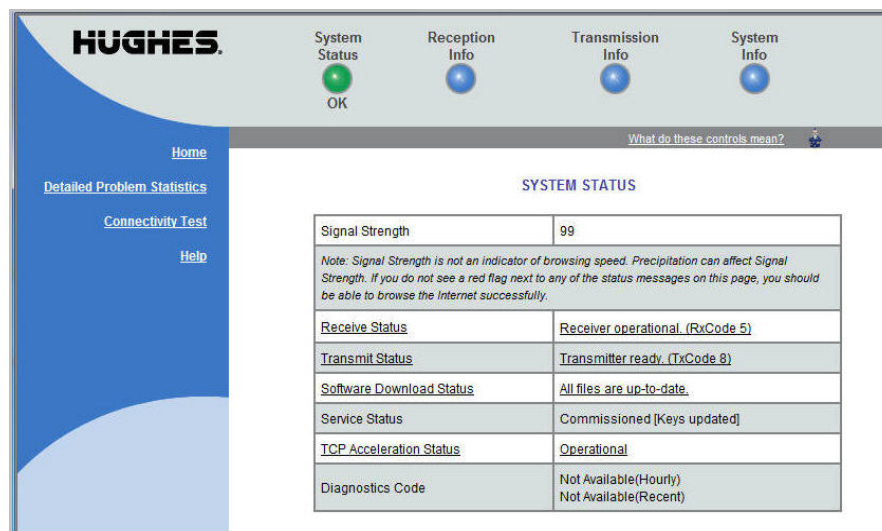


Figure 9: System Status page

## Reception Information page

The Reception Information page shown in *Figure 10* displays information about data received by the satellite modem.

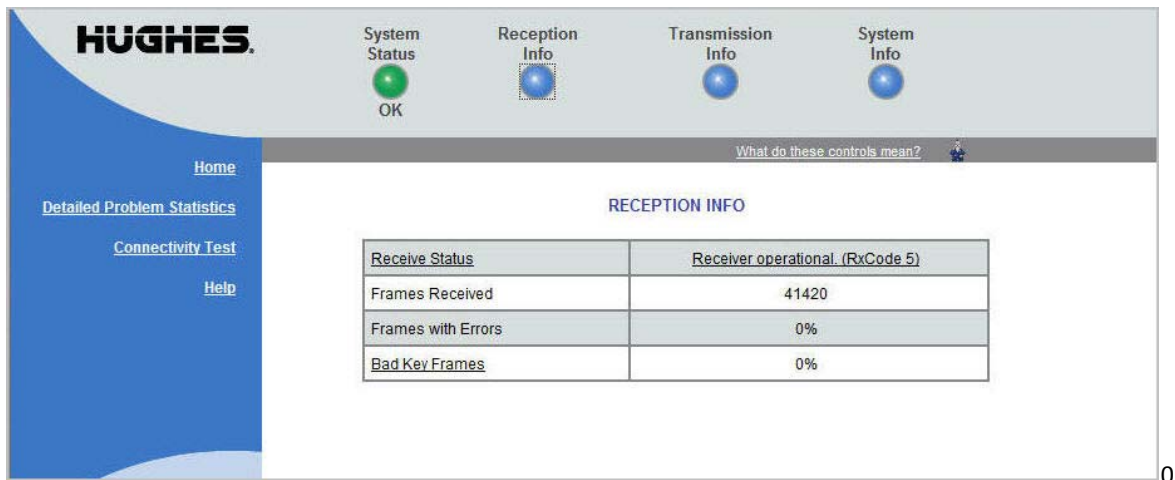


Figure 10: Reception Information page

The following table explains the parameters listed on the Reception Information page.

**Table 3: Reception Information page parameters**

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

## Examining receive status

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

The following illustration shows 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.

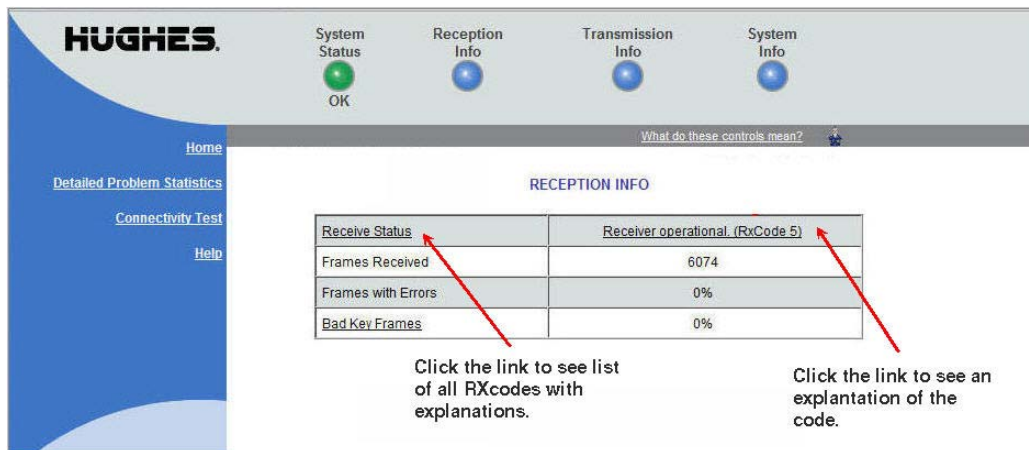


Figure 11: Finding additional Receive Status information

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

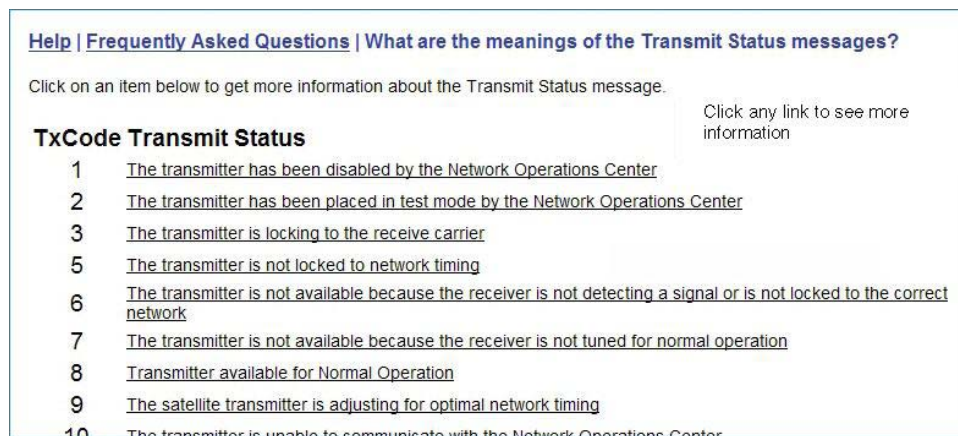


Figure 12: Sample list of all RxCodes

## Transmission Information page

The Transmission Information page shown in *Figure 13* displays information about data transmissions from the satellite modem.



Figure 13: Transmission Information page

The following table gives an explanation of the parameters on the Transmission Information page.

Table 4: 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 frames transmitted to the satellite.                                                         |
| Number of Successful Transmissions           | Number of frames transmitted to the satellite.                                                                                                                                                                               |
| Number of Failed Transmissions               | Number of frames that could not be sent. A continuously increasing value indicates a transmission problem. If a low value is displayed and does not increase, and the system is functioning, there is no reason for concern. |
| Number of Packets Submitted for Transmission | Total number of data packets queued for transmission to the satellite since the modem was last restarted.                                                                                                                    |

### *Examining transmit status*

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

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

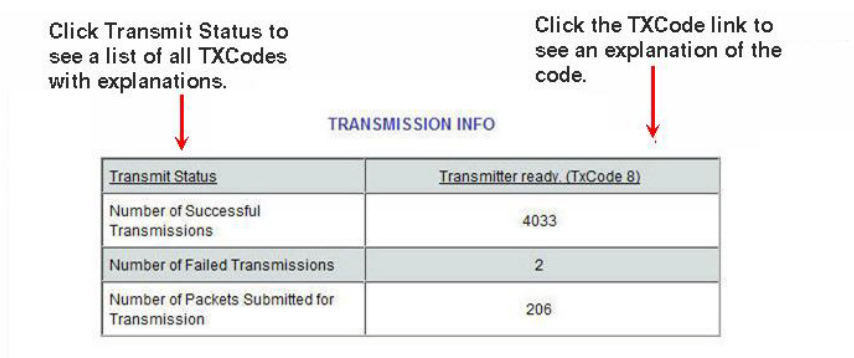


Figure 14: Finding additional Transmit Status information

## System Information page

The System Information page shown in *Figure 15* provides system information for the satellite modem such as Site ID and the release number of the modem’s operational software.

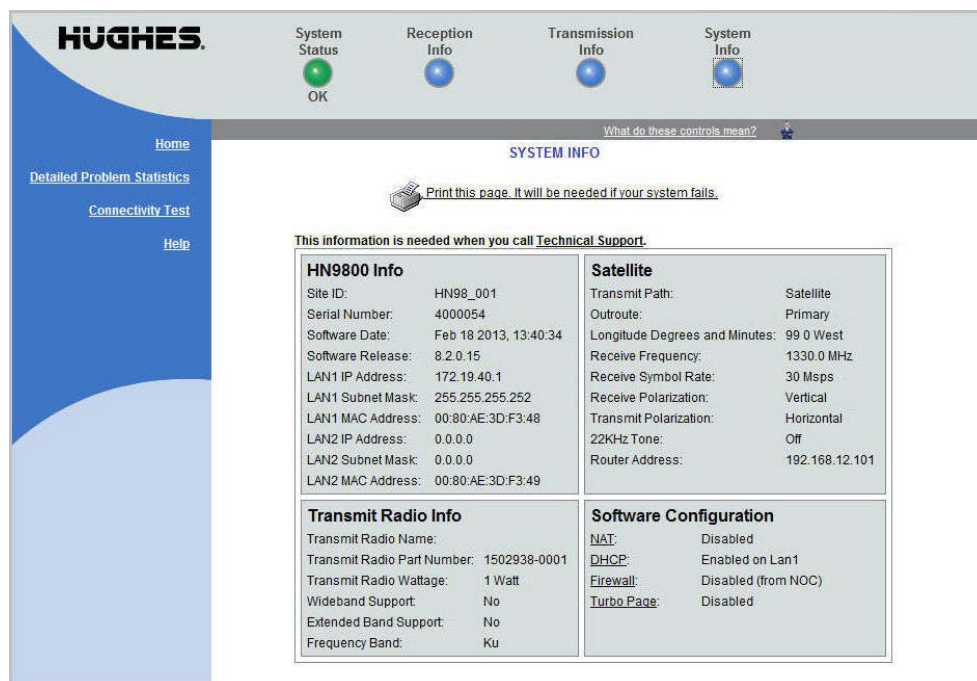


Figure 15: System Info page

## Help page

The System Control Center Help page (*Figure 16*) contains information to help the user get started in using the satellite modem, find contact information for assistance, and other helpful information.

To display the Help page:

- Click [View Help Topics](#) on the System Control Center home page.
- or
- Click [Help](#) in the left panel of any System Control Center page.

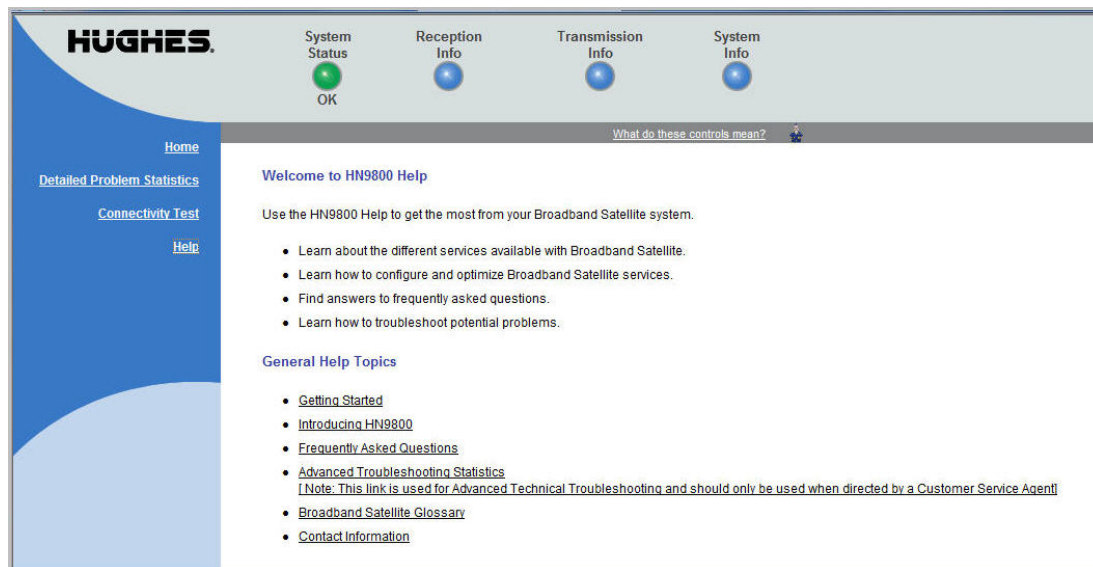


Figure 16: Help page



# Chapter 3

## LEDs

The satellite modem has five LEDs on the front panel, as shown in Figure 17. By their appearance (on, off, blinking, or flashing) the LEDs indicate the modem's operating status. The front panel LEDs are all blue when lit.

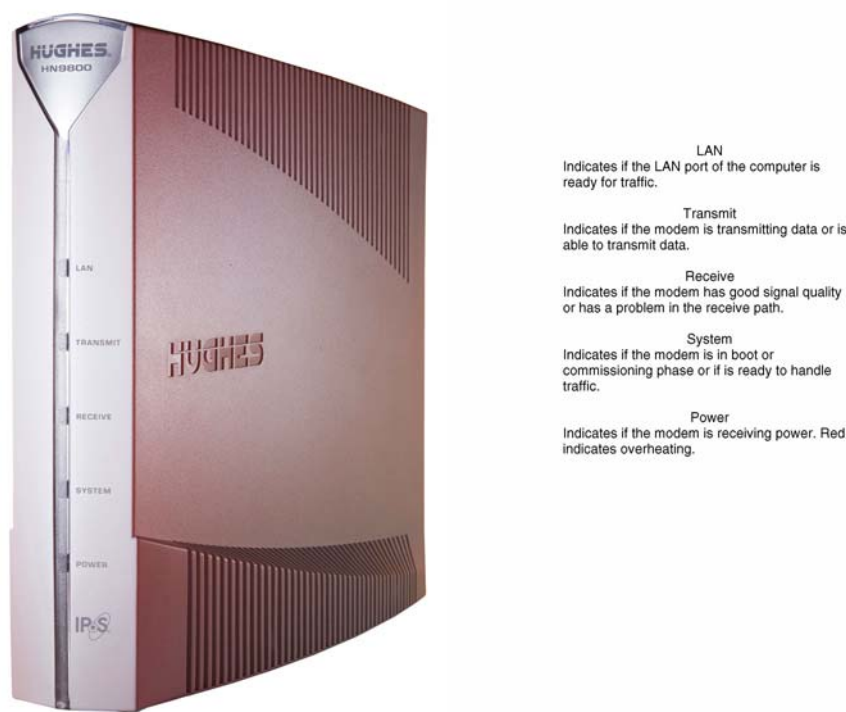


Figure 17: Front panel LEDS on the HN9800

Table 5 explains what the modem status is when the LEDs are on, off, or blinking. On means the LED is continuously lit. Blinking means the LED is usually on, but

intermittently turns off briefly. Flashing means the LED alternates between on and off for periods of ½ sec to 1 sec.

**Table 5: Front panel LED indications**

| LED      | Appearance                 | Status                                                                                                          |
|----------|----------------------------|-----------------------------------------------------------------------------------------------------------------|
| LAN      | On                         | Satellite modem 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 modem is measuring the distance to the satellite to calibrate transmit timing and transmit power.) |
|          | Off*                       | Condition preventing transmission                                                                               |
| Receive  | ON                         | OK - Receive path is operational                                                                                |
|          | <b>Blinking</b>            | Receiving data                                                                                                  |
|          | Off*                       | Condition preventing receipt of data                                                                            |
| System   | <b>ON</b>                  | Connection established with the NOC                                                                             |
|          | Off*                       | Condition preventing full operation                                                                             |
| Power    | <b>On</b>                  | Power is on and the modem is functioning normally                                                               |
|          | Red color**                | **Indicates a fault condition                                                                                   |
|          | Flashing                   | Operating with fallback.bin (backup) version of software                                                        |
|          | Off*                       | No power                                                                                                        |

Bold type indicates LED appearance during normal operation when the satellite modem is transmitting or receiving data. \*Indicates an operational problem.

## LAN port LEDs

Green and orange LEDs on the LAN (Ethernet) port on the modem's rear panel indicate link status and speed, as explained in Figure 18.

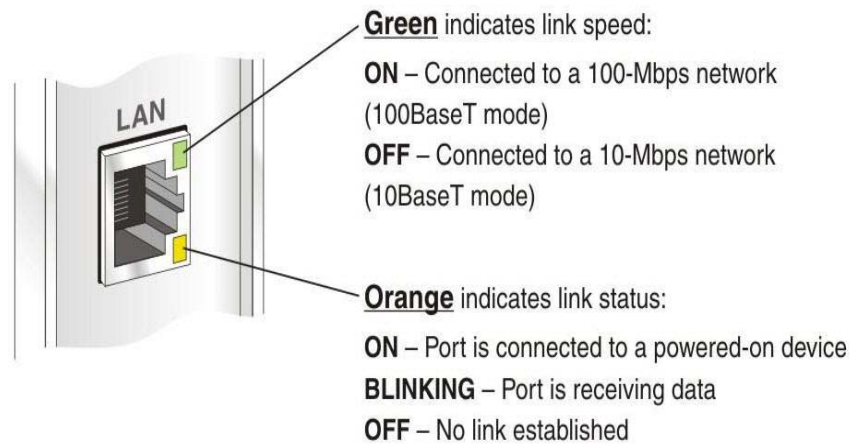


Figure 18: LAN port LEDs



## Appendix A

# Standards compliance

The HN9800 satellite modem has been certified to comply with the standards listed in Table 6. Additional information follows the table.

**Table 6: HN9800 standards compliance**

| Category                            | Standard                                  |
|-------------------------------------|-------------------------------------------|
| Safety                              | UL60950-1 for the USA, International      |
|                                     | 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 HN9800 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 HN9800 satellite modem.

Standards to which conformity is declared: FCC Part 15

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

Responsible party's name: Hughes Network System, LLC

Address: 11717 Exploration Lane, Germantown, MD 20876

Telephone: 1 (866) 347-3292

Trade name: HUGHES

Type of equipment: Two-way Hughes system

Model number: HN9800 (1502573)

# Acronyms and abbreviations

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## *C*

---

CAN – Canada

CSA – Canadian Standards Association

## *D*

---

DHCP – Dynamic host configuration protocol

## *E*

---

EMI – Electromagnetic Interference

EU – European Union

## *I*

---

IPSec – Internet Protocol security

## *L*

---

LAN – Local area network

LLC – Limited Liability Company

## *N*

---

Networking requirements

## *V*

---

VAR – Valued-added reseller



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