Revision record

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<td>A</td>
<td>June 30, 2006</td>
<td>Initial release</td>
</tr>
<tr>
<td>B</td>
<td>August 11, 2006</td>
<td>To correct two chapters in wrong order.</td>
</tr>
<tr>
<td>C</td>
<td>February 14, 2007</td>
<td>Added information for HughesNet Activation CD, cautions concerning cable tightness, and other revisions.</td>
</tr>
<tr>
<td>D</td>
<td>August 13, 2007</td>
<td>Updated to support Release 5.6.</td>
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Important safety information

For your safety and protection, read this entire manual before attempting to install the remote terminal. In particular, read this safety section carefully. Keep this safety information where you can refer to it if necessary.

Types of warnings used in this manual

This section introduces the various types of warnings used in this manual to alert you to possible safety hazards.

⚠️ DANGER

Indicates an imminent electric shock hazard, which, if not avoided, will result in death or serious injury.

⚠️ WARNING

Indicates a potential electric shock hazard, which, if not avoided, could result in death or serious injury.

⚠️ DANGER

Indicates an imminently 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, may result in minor or moderate injury.

-----

⚠️ CAUTION

Indicates a situation or practice that might result in property damage.
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Chapter 1
Introduction

This chapter discusses these topics:

• Scope and audience on page 1
• Supported configurations on page 2
• Hardware specifications on page 4
• Commissioning methods on page 5
• Installation summary on page 6

Scope and audience

This manual explains how to install, commission, troubleshoot, and service Hughes HN7000S and HN7700S remote terminals. The manual also provides reference information for the installation and operation of the remote terminals.

This manual is intended for use by the following audiences:

• Professional installers
• Installer trainers, who prepare separate instructions for the installers
• Call center operators, who respond to customers’ calls
• Call center trainers, who train call center operators

This manual is intended for use in the United States and Canada and in other (international) countries. Certain information may vary depending on the customer’s location. This manual identifies such differences where applicable.

The HN7000S is a satellite-based remote terminal designed for Internet access for consumers and Small Office Home Office (SOHO) entrepreneurs. The HN7700S is an enterprise-class broadband communications solution used by enterprise customers, which are typically large businesses.

Note: Information in this guide is applicable for both the HN7000S and HN7700S. Figures illustrating the user interface show mostly HN7000S screens but are applicable to both.
In a single-host configuration, the remote terminal is directly connected to the host. A single-host configuration is shown in Figure 1.

In a multiple-host configuration, the hosts on the LAN share satellite Internet or internet connectivity through an Ethernet hub, router, or wireless base station. The remote terminal is connected to the hub, router, or wireless base station. Figure 2 on page 3 shows a multiple-host configuration that includes an Ethernet hub or router. Figure 3 on page 3 shows a multiple-host configuration that includes a wireless base station.

Note: The customer is required to provide and configure hub, router, or wireless base station equipment.

Connecting components to the remote terminal is discussed in Chapter 6 – *Completing the installation.*
Figure 2: Multiple-host configuration: Ethernet hub or router in a wired LAN (HN7000S only)

Figure 3: Multiple-host configuration: wireless base station in a wireless LAN (HN7000S only)
**Hardware specifications**

Table 1 lists general specifications for the remote terminal.

Table 1: General specifications for HN7000S and HN7700S remote terminals

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>2.4 lb (1.089 kg)</td>
</tr>
<tr>
<td>Width</td>
<td>1.7 inch (4.32 cm) \n 4.5 inch (11.43 cm) with pedestal base</td>
</tr>
<tr>
<td>Height</td>
<td>9.5 inch (24.13 cm) \n 9.75 inch (24.77 cm) with pedestal base</td>
</tr>
<tr>
<td>Depth</td>
<td>10.5 inch (26.67 cm)</td>
</tr>
<tr>
<td>Safe operating temperature range</td>
<td>5 to 40°C (Above 5000 ft altitude, reduce maximum temperature by 1°C per 1000 ft)</td>
</tr>
<tr>
<td>Safe operating humidity range</td>
<td>5% to 95% non-condensing</td>
</tr>
<tr>
<td>Safe altitude</td>
<td>10,000 ft</td>
</tr>
<tr>
<td>Cooling method</td>
<td>Convection</td>
</tr>
<tr>
<td>Main processor</td>
<td>133 MHz</td>
</tr>
<tr>
<td>Main memory</td>
<td>64 Mbyte</td>
</tr>
<tr>
<td>Flash memory</td>
<td>16 Mbyte</td>
</tr>
<tr>
<td>Protocol support</td>
<td>TCP/IP (Transmission Control Protocol/Internet Protocol) protocol suite</td>
</tr>
<tr>
<td>Interfaces/ports</td>
<td>HN7000S: \n  \n  - One Ethernet port supporting 10BaseT or 100BaseT operation, RJ45-switched</td>
</tr>
<tr>
<td></td>
<td>HN7700S: \n  \n  - Two Ethernet ports supporting 10BaseT or 100BaseT operation, RJ45-switched</td>
</tr>
<tr>
<td></td>
<td>\n  - Telephone line port</td>
</tr>
<tr>
<td></td>
<td>\n  - Serial port, DTE/DCE RS-232, which supports the following protocols:</td>
</tr>
<tr>
<td></td>
<td>\n  - VISA (Veriphone 3200 and 3300) (the asynchronous protocol of Vanguard International Service Association credit card)</td>
</tr>
<tr>
<td></td>
<td>\n  - X.25 International Telecommunication Union-Telecommunication Standards (ITU-T) protocol standard for WAN communications</td>
</tr>
<tr>
<td></td>
<td>\n  - XPAD (X.25 Packet Assembler/Disassembler)</td>
</tr>
<tr>
<td></td>
<td>\n  - SDLC (Synchronous Data Link Control)</td>
</tr>
<tr>
<td></td>
<td>\n  - LLC (Logical Link Control)</td>
</tr>
<tr>
<td>Power supplies and power requirements</td>
<td>See Table 2 on page 20.</td>
</tr>
</tbody>
</table>
Commissioning is the process of registering a remote terminal for service. There are two methods available to commission a remote terminal:

- Satellite-based commissioning
- Manual commissioning

**Satellite-based commissioning**

Satellite-based commissioning (SBC) is the preferred commissioning method. The installer uses a web-based interface on the remote terminal to complete the satellite-based commissioning process.

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

If a new satellite is activated and a new sbc.cfg file is available for installers, then installers are instructed to download the sbc.cfg file from an installation support web site. The sbc.cfg file must be saved on the installer laptop personal computer (PC) prior to commissioning and then uploaded to the remote terminal.

If a new satellite is activated and a new sbc.cfg file is not available, then the new satellite parameters are distributed to installers in a technical update email or in an installation specification. The satellite parameters must be manually entered.

**Note:** If the service provider has provided you with an sbc.cfg file, you must complete the procedures in *Uploading the sbc.cfg file to the remote terminal* on page 29 to upload the file to the remote terminal.

Satellite-based commissioning procedures are provided in Chapter 4 – *Commissioning the remote terminal*.

**Manual commissioning**

The installer may only use the manual commissioning method if instructed to do so by the service provider. The installer enters configuration parameters on the Manual Commissioning page of the terminal’s web-based interface. The installer then uses the interface to complete antenna pointing.

Manual commissioning procedures are provided in Chapter 4 – *Commissioning the remote terminal*.
Installation summary

The remote terminal installation consists of the following steps:

- Preparing for the installation:
  - Inventory the items required for installation.
  - Confirm the customer’s computer meets the requirements to use the service (not required for enterprise or international customers).
  - Conduct a site survey.

- Installing the hardware:
  - Assemble and point the antenna assembly.
  - Attach the remote terminal to the pedestal base.
  - Connect traffic and power cables.
  - Power up and observe the remote terminal’s LEDs.

- Commissioning the remote terminal:
  - Commission the terminal using satellite-based commissioning.
  - Commission the terminal using manual commissioning only if your service provider tells you to.

- Configuring the remote terminal for VADB operation

  Note: Configuring the remote terminal for VADB operation is applicable only to enterprise customers, which are typically large businesses. If you are installing the remote terminal for an enterprise customer, refer to the installation specification to determine if the customer requires configuration for VADB.

- Completing the installation:
  - Confirm that all files are current.
  - Connect the remote terminal to the customer’s computer.
  - Connect serial devices (if required) to the remote terminal.
  - Print the System Information page (may not be required for enterprise or international customers).
  - Create a shortcut to the System Control Center (may not be required for enterprise or international customers).
Chapter 2

Preparing for installation

This chapter discusses the following tasks:

- Items required for installation on page 8
- Verifying the antenna model and manual on page 10
- Confirming installer PC and site requirements on page 10
- Conducting a site survey on page 12
If you are installing a model HN7000S terminal, make sure you have all the items shown in Figure 4. The items shown are provided in the HN7000S shipping carton.

**Items provided in the remote terminal shipping carton**

- Cat-5 Ethernet cable
- Pedestal base
- Remote terminal
- Software Activation CD
- Warranty
- Welcome to HughesNet
- Quick Start Guide
- Installation specification or work order
- Optional 220-V power cord (for international use)
- sbc.cfg file (if you are instructed to upload it)

**Items provided by the installer**

Figure 4: HN7000S components
If you are installing a model HN7700S terminal, make sure you have all the items shown in Figure 5. The items shown are provided in the HN7700S shipping carton.

![HN7700S components](image)

**Figure 5: HN7700S components**

**Note:** The antenna assembly is shipped in a separate box. An outdoor pointing interface (OPI), available from Hughes, is recommended for pointing the antenna. The installation specification or work order are provided to you. Download the most current `sbc.cfg` file from your installation support web site.
Verifying the antenna model and manual

The remote terminal can be used with a 0.74 m, 0.98 m, 1.2 m, or 1.8 m two-way satellite antenna.

If you do not have the antenna installation manual, find the required antenna type and model on the work order or installation specification; then find the installation manual for the specified antenna on your installation support web site.

Confirming installer PC and site requirements

You must confirm that the installer laptop PC and the customer’s computer meet specific requirements before you install the remote terminal.

Installer laptop PC requirements

The installer laptop PC must meet the following requirements:

- Ethernet enabled network interface card (NIC) and Ethernet cable.
- Windows Vista, Windows XP, Windows 2000, or Windows 98 SE operating system with DHCP configured to automatically obtain IP addresses. See Appendix A – Configuring a computer to support DHCP, on page 135.
- Internet Explorer 5.5 or 6.0 with proxy settings disabled. See Appendix C – Disabling a web browser’s proxy connection, on page 161.
- The latest version of the .sbc.cfg file if you are instructed to install it.

Note: Customers who purchased their system from a Hughes retail channel receive an order confirmation e-mail containing their site account number (SAN) and personal identification number (PIN).

Note: If the site has a DC power source, it will require a DC/DC power supply. See Table 2 on page 20. The installer must provide the wire required to assemble the DC input power cable.
Customer site requirements

The HN7000S and HN7700S are self-hosted terminals that can be used with any device that supports IP and has a 10/100 BaseT Ethernet port. Typically, the remote terminal is connected to a customer’s computer. To run software that may be installed to support the terminal, the customer’s computer must meet the following requirements:

- **Operating system**
  - MAC: 10.1 and higher

- **Processor**
  - Vista PC: 800 Mhz or faster
  - All other PCs: Pentium II 333 Mhz or faster
  - MAC: 300 Mhz or faster

- **Memory**
  - Vista PC: 512MB or 1 GB RAM depending on version
  - All other PCs: 128MB RAM
  - MAC: 128MB

- **Free hard drive space**
  - PC: 100MB
  - MAC: 150MB

- **A functioning 10/100 BaseT Ethernet interface installed on at least one computer.**

The customer must provide a power strip or surge protector (recommended). If one of these is not present, use a wall outlet or other power source.

Note: If the customer wants to connect a network to the remote terminal, this must be accomplished with an Ethernet hub or other such device. The customer must supply and configure the hub and cables. Required IP address information is obtained during commissioning.

Note: Prior to starting the installation, confirm that the installer laptop PC is configured to support Dynamic Host Control Protocol (DHCP). See Appendix A – Configuring a computer to support DHCP on page 135. Make sure customers who purchased their system from a retail channel have their SAN and PIN.
Conducting a site survey

Survey the customer site to confirm that it fulfills the requirements to use the satellite broadband service. Check for an unobstructed line-of-sight to the appropriate satellite, and confirm that the customer’s computer meets the requirements listed on page 10. For additional site survey information, see the Antenna Site Preparation and Mount Installation Guide (1035678-0001).

If you are installing a remote terminal for an enterprise or international customer, review the installation specification or work order for site-specific instructions.

⚠️ CAUTION

Do not connect the power supply to the remote terminal, or connect the power supply to a power source until you are instructed to do so.

⚠️ CAUTION

- Do not block any ventilation openings. Do not install near heat sources such as radiators, heat registers, ovens, stoves, or other apparatus (including amplifiers) that produce heat.
- Recommended ventilation space around the top and sides of the remote terminal assembly is approximately 6 inches. Ventilation is necessary to avoid overheating.
Chapter 3
Installing the hardware

This chapter explains how to install the HN7000S and HN7700S remote terminals. Installation is the same for either terminal, except that the HN7700S has two LAN ports to support up to two subnets, a serial port for connecting a serial device, and a phone line connector to support VADB. To install the HN7700S for VADB, see Chapter 5 – Configuring the HN7700S for VADB.

This chapter includes the following topics:

- Assisting the customer with the Activation CD on page 13
- Installing the antenna on page 15
- Grounding requirement on page 16
- Using the pedestal base on page 16
- Selecting the terminal location on page 17
- Connecting the transmit and receive cables on page 18
- Connecting the Ethernet cable on page 19
- Connecting the power supply and powering up the terminal on page 20

Assisting the customer with the Activation CD

The HN7000S shipping carton contains a HughesNet Activation Software compact disc (CD). The activation software verifies that the customer's PC meets certain hardware and software requirements and automatically configures the PC for the HughesNet service. Use the Activation CD for all HN7000S consumer installations except:

- Installations done for EarthLink or Agristar
- Installations that use Macintosh computers

Note: Do not use the HughesNet Activation CD to install an HN7700S remote terminal.

Assist the customer with the Activation CD as follows:

1. Make sure the customer's PC is not connected to a network.
2. Give the customer the Activation CD and the Welcome to HughesNet Quick Start guide.
3. Have the customer run the Activation CD software.
If the activation software determines that the customer’s PC does not meet the minimum requirements and it cannot correct this situation, notify HughesNet Customer Care at 1-866-889-3234 or the customer’s service provider. The customer must accept the license agreement to proceed with the installation.

Note: To install the remote terminal, the following files are required: Microsoft Internet Explorer version 5.5 or higher, Microsoft Java Virtual Machine, and Macromedia Flash Player. If these programs are not present on the customer’s PC, the Activation CD software installs them automatically.

4. Instruct the customer to follow the on-screen instructions provided by the Activation CD and to stop when the Connect Your Modem via Ethernet screen appears as shown in Figure 6. **Do not connect the HN7000S Ethernet port to the customer’s PC until after this screen appears.** You will make the Ethernet connections later, after you commission the terminal, as explained in Connecting the terminal to the customer’s computer on page 76.

![Figure 6: Connect Your Modem via Ethernet screen](image)
5. After the activation software confirms that the customer's PC meets the minimum requirements, proceed with antenna installation, cabling, and IDU installation and commissioning, as explained in the following sections and chapters in this manual.

You will complete the activation process later, after you connect an Ethernet cable between the remote terminal and the customer’s computer, as explained in Completing the activation process on page 77.

---

**Installing the antenna**

The remote terminal can be used with a .74 m, .98 m, 1.2 m, or 1.8 m two-way satellite antenna. Assemble and install the antenna assembly according to the antenna installation manual.

---

**CAUTION**

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

---

**Approved cables**

For a list of approved cables for the inter-facility link (IFL) between the antenna and the remote terminal, see the Field Service Bulletin (FSB). *IFL Cable, Approved List (with lengths) for DW7x00, DW60xx, and DW40xx Domestic Installations* (FSB_060316_01A). This list applies to the HN7000S and HN7700S remote terminals. The FSB lists the maximum cable length for each approved cable type, for both 1-W and 2-W radios.

---

**Labeling the cables from the antenna**

Label the receive and transmit cables at the outdoor point-of-entry and at the indoor location where the remote terminal will be installed as follows:

- Wrap a small piece of *red* electrical tape around the receive cable, and mark *SAT IN* on the tape.
- Wrap a small piece of *blue* electrical tape around the receive cable, and mark *SAT OUT* on the tape.
Grounding requirement

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

⚠️ WARNING

The coaxial cables must be connected to a ground block. The ground block should be located at the point where the coaxial cables enter the building. The ground wire must be connected to the ground block and routed to earth ground.

Using the pedestal base

The pedestal base ensures that the remote terminal receives proper ventilation. Use it to mount the remote terminal in a vertical position.

The **HN7000S consumer terminal** is designed only for vertical positioning and **must** be mounted on the pedestal base. Removing the pedestal base and placing this unit in a horizontal orientation will cause the unit to overheat.

The **HN7700S enterprise terminal** can be oriented in two ways: in a vertical position with the pedestal base; or in a horizontal position without the pedestal base when mounted in a ventilated rack.

Attaching the base

To attach the base to the terminal:

1. Position the terminal and pedestal base as shown in Figure 7.
2. Starting with the terminal bottom about ½ inch from the bottom of the pedestal base, slide the terminal into the base until the terminal locks into position.

**Removing the base**
If you need to remove the terminal from the pedestal base:

1. Pull the release tab on the bottom of the base down. (See Figure 7.)
2. Slide the base away from the terminal.

**Selecting the terminal location**
Select a location for the remote terminal that will accommodate all required cable connections, including the power source. Place the terminal in the desired location.

**CAUTION**
- Do not block any ventilation openings. Do not place the remote terminal near heat sources such as radiators, heat registers, ovens, stoves, or other apparatus (including amplifiers) that produce heat.
- Leave 6 inches of space around the top and sides of the terminal to ensure ventilation and prevent overheating.
Connecting the transmit and receive cables

Connect the receive cable to the SAT IN connector on the remote terminal and the transmit cable to the SAT OUT connector as shown in Figure 8.

Figure 8: Connecting the receive and transmit cables to the remote terminal

⚠️ CAUTION
The transmit and receive cable connectors must be securely tightened.
- Make sure each connector is properly aligned (not cross-threaded).
- Finger tight with no connector play is adequate.

Note: The remote terminal 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 terminal is not an indication that the cables are adequately tightened.
Connecting the Ethernet cable

Connect the Ethernet cable:

1. Connect the remote terminal to the installer PC with an Ethernet cable, as shown in Figure 9.

![Figure 9: Connecting the Ethernet cable](image)

2. Make sure that neither the remote terminal nor the customer’s computer are connected to an Ethernet router or switch.

Note: Do not connect any devices to the remote terminal at this time. Serial and Ethernet devices may only be connected to the remote terminal after it is installed and commissioned.
Connecting the power supply and powering up the terminal

The power supply is shipped with the remote terminal. Before proceeding, make sure you have the correct power supply. Check the power supply part number and refer to Table 2 and Figures 10 and 12. Make sure you have the correct power supply type (AC/DC or DC/DC) and that you have the correct power supply for the radio to be used.

CAUTION

- Always use the power supply provided with the system. The terminal's performance may suffer if the wrong power supply is used.
- If the remote terminal is installed outside the United States or Canada, observe the power standards and requirements of the country where it is installed.

Table 2: Available power supplies for HN7000S and HN7700S remote terminals

<table>
<thead>
<tr>
<th>Application</th>
<th>Radio type</th>
<th>Power supply type</th>
<th>Part number</th>
<th>Electrical requirements</th>
<th>Power cord</th>
</tr>
</thead>
</table>
| HN7000S or HN7700S. | 1 W or 2 W | AC/DC (64 W)      | 1031105-0001 or 1500089-0001 | Input line voltage: 100 – 240 V, 2 A max.  
Input line frequency: 50 – 60 Hz AC  
Rated power consumption: 64 W | Detachable, for 110 VAC outlet type |
|                      | 1 W or 2 W | DC/DC             | 1033554-0001         | Input line voltage: 12.7 – 25 V, 10 A max.  
Rated power consumption: 64 W | Detachable power input cables and connector |
| For HN7000S only.    | 1 W        | AC/DC (45 W)      | 1500081-0001         | Input line voltage: 100 – 120 V, 2 A max.  
Input line frequency: 50 – 60 Hz AC  
Rated power consumption: 45 W | Attached, for 110 VAC outlet type |
Connecting an AC/DC power supply

Figure 10 shows the two types of AC/DC power supplies that are used with the HN7000S and HN7700S remote terminals.

![Available AC/DC power supplies](Image)

**CAUTION**

The following apply if you use an AC/DC power supply:

- **The input must be 110/240-VAC.**
- **A surge protector is recommended, whether you use an in-line power supply or wall unit.**

**In-line units**

The following instructions apply to AC/DC power supplies with part number 1031105-0001 or 1500089-0001. Refer to Figures 10 and 11. Connect the power supply as follows:

1. Connect the AC power cord to the power supply.
2. Connect the DC power cord to the DC IN port on the remote terminal, as shown in Figure 11 on page 22.
3. For an AC/DC power supply, make sure a suitable surge protector is available for the remote terminal.

**Note:** Protect the remote terminal with a suitable surge protector. Power surges are a common cause of failure for electronic devices.

Do not connect the AC power cord to the surge protector at this time. Wait until you are ready to observe the terminal’s LEDs upon power-up, as explained in *Powering up and observing the remote terminal LEDs* on page 24.
Figure 11 shows an AC/DC power supply connected to a remote terminal and to a surge protector.

Wall units

The following instructions apply to the AC wall unit power supply, P/N 15000081-0001 (shown in Figure 10):

1. Connect the DC power cord to the DC IN port on the remote terminal.
   
   Do not plug the terminal into the surge protector or wall outlet at this time. Wait until you are ready to observe the terminal’s LEDs upon power-up, as explained in Powering up and observing the remote terminal LEDs on page 24.
Connecting a DC/DC power supply

Figure 12 shows the DC/DC power supply used with the HN7000S and HN7700S remote terminals.

Connect the DC/DC power supply as follows:

1. Connect the DC power cord to the DC IN port on the remote terminal.
2. Assemble the input power cable according to the wiring diagram included in the cable kit.

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

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

Do not connect the input power connector to the power supply until you are ready to observe the terminal's LEDs upon power-up, as explained in Powering up and observing the remote terminal LEDs on page 24.
Powering up and observing the remote terminal LEDs

Power up the remote terminal and watch the LEDs for normal operation, as explained in this section.

**Powering up (AC/DC power supply)**

As a result of the steps in the previous section, the DC power cord is connected to the terminal, and, for in-line units, the AC power cord is connected to the power supply.

To power up the remote terminal:

1. **In-line unit:** Connect the AC power cord to the surge protector.
   
   **Wall unit:** Plug the AC connector into the surge protector or wall outlet.

2. Observe the LEDs, as explained in *LEDs on power-up* on page 24.

**Powering up (DC/DC power supply)**

As a result of the steps in the previous section, the DC power cord is connected to the terminal, and the input power cable is assembled and connected to the DC power source.

To power up the remote terminal,

1. Connect the input cable connector to the power supply.

2. Observe the LEDs, as explained in *LEDs on power-up* on page 24.

**LEDs on power-up**

As the remote terminal powers up, observe the LEDs as shown in Figure 13 to make sure that the remote terminal is working properly. When power is applied to the terminal or after a terminal reset, the LEDs light up in the following order, indicating normal operation:

1. All LEDs light up for ½ sec.
2. The power LED lights up and remains on, indicating the remote terminal is powered up.
3. The LAN LED lights up within 30 sec, indicating that LAN connectivity is detected.
4. The power LED blinks, indicating that the terminal is not commissioned.

If the LEDs do not function as described, make sure you have the correct power supply. Refer to Table 2 on page 20 and Figure 10 on page 21 and Figure 12 on page 23.
Powering down the terminal

Some installation and troubleshooting steps require you to power cycle the remote terminal. Always disconnect power in the manner described in the following paragraphs.

AC/DC power supply

When power cycling a remote terminal that uses an AC/DC power supply, always disconnect the AC power cord from the power source (surge protector or wall outlet).

**CAUTION**

- To remove power from a remote terminal that uses an AC/DC power supply, *always* unplug the AC power cord from the surge protector or power outlet. Do not pull the DC cord from the terminal.

DC/DC power supply

When power cycling a remote terminal that uses a DC/DC power supply, always disconnect the DC input cable connector from the power supply.

**CAUTION**

- Do not pull the DC power cord from the back of the remote terminal. Doing so could damage the plug’s pins and cause a short circuit.
- To remove power from a remote terminal that uses a DC/DC power supply, *always* unplug the DC input cable connector from the power supply.
Commissioning the remote terminal

This chapter explains how to register a remote terminal for service. Procedures are provided for the following commissioning methods:

- Satellite-based commissioning on page 27
- Manual commissioning on page 52

Satellite-based commissioning

Commissioning the remote terminal using SBC consists of the following tasks:

- Obtaining an IP address from the remote terminal
- Verifying the Ethernet connection (ping test) on page 28
- Uploading the sbc.cfg file to the remote terminal
- Commissioning procedures

Obtaining an IP address from the remote terminal

1. Make sure the installer laptop PC is configured to support the Dynamic Host Configuration Protocol (DHCP). Refer to Appendix A for instructions explaining how to configure the laptop PC to support DHCP.
2. Verify that the installer laptop PC is connected to the remote terminal with an Ethernet cable.
3. Open a command prompt or window on the installer PC.
4. Type `ipconfig /release`.
5. Press Enter.
6. Type `ipconfig /renew`.
7. Press Enter.

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

If the remote terminal does not assign IP address 192.168.0.2 to the installer PC, restart the installer PC to obtain the IP address.
Verifying the Ethernet connection (ping test)  Execute a ping test to verify that the Ethernet connection between the remote terminal and laptop PC is active:

1. Open a command prompt or window on the installer PC.
2. Type `ping 192.168.0.1`.
3. Press ENTER.

If the ping is successful, the ping results show that all sent packets were received, as in Figure 14.

![Figure 14: Successful ping test](image)

If the ping fails, the ping results show that packets were lost, as in Figure 15, and time-out messages may also appear.

![Figure 15: Failed ping test](image)

If the ping test fails, make sure the laptop PC’s network interface card (NIC) is properly installed and the laptop PC is properly configured to support DHCP.

If the NIC is installed properly and the laptop PC is configured properly, make sure all cable connections are secure. (See the
Caution statement that follows Figure 8 on page 18.) If the connections are secure:

1. Unplug the remote terminal from the power source
2. Shut down and power off the computer
3. Plug the remote terminal back in
4. Turn the computer back on.
5. Make sure an Ethernet router or switch is not connected to the remote terminal and customer’s computer, then try the ping test again. If it is unsuccessful, call Installer Support for assistance.

**Uploading the sbc.cfg file to the remote terminal**

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

Skip to *Commissioning procedures* on page 32 if you do not have to upload an `sbc.cfg` file to the remote terminal.

1. Open a browser on the installer laptop PC.
2. Type `http://192.168.0.1/fs/registration/setup.html` in the address bar.
3. Press **ENTER**.
4. Click **Config File Upload** on the Setup screen (Figure 16).

![Setup screen](image)

**Figure 16: Setup screen**

Note: Do not click **Zip Code File Upload** because this link is used to update the ZIP code table in the remote terminal.
5. Click **Browse** on the Configuration File Upload screen shown in Figure 17.

![Configuration File Upload screen](image)

**Figure 17:** Configuration File Upload screen

6. Navigate to the location on the installer PC where the `sbc.cfg` file is saved.
7. Select the `sbc.cfg` file and click **Open**.
8. Click **Upload**.
   Wait for the upload to complete.

9. After the upload completes, click **Close** on the Configuration File Upload screen shown in Figure 18 to return to the Setup screen.

![Configuration File Upload Screen](image)

**Figure 18:** Confirming *sbc.cfg* file upload to the remote terminal

### Commissioning procedures

Commissioning the remote terminal consists of the following tasks:

- Entering commissioning parameters
- Receive antenna pointing
- Transmit antenna pointing
- Registering the terminal

These tasks are explained in the sections that follow.

### Entering commissioning parameters

Begin commissioning by entering the commissioning parameters, as follows:

1. Open a browser on the installer laptop PC.
2. Type `http://192.168.0.1/fs/registration/setup.html` in the address bar.
3. Press **ENTER**.
4. Click **Registration - Installer** on the Setup screen. See Figure 19.

![Figure 19: Setup screen](image)

5. On the Antenna Location screen (shown in Figure 20), enter the ZIP code of the installation location, and click **Next**.

Note: If you are installing the remote terminal outside the United States or Canada, complete steps a through c on page 34 to manually enter the antenna location.

![Figure 20: Antenna Location screen](image)
Alternate method for installations outside the United States or Canada, instead of step 5: To manually enter the remote terminal location, follow steps a through c:

a. Click the Enter Location Manually check box on the Antenna Location screen shown in Figure 20, and click Next.

b. Enter the longitude and latitude for your location on the Manual Entry of Antenna Location screen shown in Figure 21. To convert latitude and longitude from decimal values to minutes, multiply the decimal fraction by 60, and round to the nearest whole minute. For example, if the longitude is 77.2396, multiply the decimal fraction 0.2396 by 60 = 14.376 minutes; then round to 14.

c. Click Next.

Figure 21: Entering location manually
If you entered the ZIP code (step 5), the Location of Antenna Verification screen appears as shown in Figure 22. If you manually entered the antenna location, the Verification screen does not appear.

![Image of Location of Antenna Verification screen]

Figure 22: Verifying the antenna location

6. Verify that the displayed information is correct (only if you entered a ZIP code), and click **Next**.
7. Click the **Satellite Transponders** drop-down menu on the Satellite Parameters screen shown in Figure 23 and select the satellite and transponder listed on the work order or in the installation specification; then click **Next**.

![Satellite Parameters Screen](image)

Figure 23: Selecting the satellite and transponder

*Alternate method—manual entry of satellite parameters—instead of step 7: If the satellite and transponder for your installation are not listed in the drop-down menu, and you were not provided with an `sbc.cfg` file, then you must complete steps a through d below to manually enter satellite parameters. The satellite parameters should have been provided to you in a technical update e-mail or in an installation specification.*

a. Select the **Enter satellite parameters manually** check box on the Satellite Parameters screen shown in Figure 23.

b. Click **Next**.
c. Enter or select the parameters on the Manual Entry of Satellite Parameters screen shown in Figure 24:
   - Longitude
   - Hemisphere
   - Frequency
   - Symbol rate
   - Receive polarization
   - Transmit polarization
   - 22 KHz tone
   - Frequency Band/Modulation
   - DVB Mode
   - DVB Program Num (User Data)
   - DVB Program Num (DNCC Data)
   - Enable OPI Display

d. Click Next.
If you selected the satellite and transponder from the drop-down box in step 7, the Verification of Satellite Parameters screen appears as shown in Figure 25. If you entered the satellite parameters manually, this screen does not appear.

![Figure 25: Verifying the satellite parameters](image)

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

Note: The **Enable OPI Display** box must be selected on the Verification of Satellite Parameters screen if an outdoor pointing interface (OPI) is used to point the antenna.
9. On the Transmit Radio Parameters screen shown in Figures 26 and 27, select the radio part number if you know it. The radio part number should be on the work order or installation specification. If you do not have the P/N, select the transmit radio type (1 Watt or 2 Watt).

To select the radio part number:

a. Click the Select transmit radio part number check box shown below (arrow) and in Figure 27, and click Next.

b. On the screen that appears, click the drop-down list and select the transmit radio part number; then click Next.

Figure 26: Selecting the transmit radio by part number
To select the transmit radio type, click either 1 Watt or 2 Watt.

![Image](image1.png)

**Figure 27:** Selecting the transmit radio by type (wattage)

10. Click **Next**.

**Receive antenna pointing** Follow these steps to receive-point the antenna using the displayed signal strength, as shown in Figure 28.

1. Click **Display Signal Strength** on the Receive Antenna Pointing screen to open the Signal Quality window.

![Image](image2.png)

**Figure 28:** Receive pointing screen
2. Use the Signal Quality indication to peak the receive pointing as instructed in the antenna installation manual.

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

3. Click Close to close the Signal Quality window after peaking the signal.

Transmit antenna pointing

Transmit-point the antenna, as follows:

1. Select the Perform ACP check box on the Receive Antenna Pointing screen if your service provider offers automatic cross-polarization (ACP).

Note: The Perform ACP check box is automatically checked if ACP is enabled at the NOC. If it is not automatically checked, likely reasons are that ACP is not supported at the NOC or is not enabled at the NOC, or there is a problem with the ACP server.

Note: The ACP test is required for customers in the United States and Canada (Ku-band only). For international customers, it is optional.

2. Click Next.
3. Click **Manual** on the Transmit Antenna Pointing screen shown in Figure 29 to initiate the manual cross-polarization test.

![Figure 29: Executing a manual cross-polarization test](image)

Be ready to adjust the antenna (step 5).

4. Click **Continue** in the pop-up Warning dialog shown in Figure 30.

![Figure 30: Manual cross-polarization warning message](image)
The test status, isolation value, and the pass/fail result are displayed in the Cross Pol Test window as shown in Figure 31.

![Cross Pol Test window]

Figure 31: Manual cross-polarization test results

Note: The manual cross-polarization test times out 3 to 5 minutes after you click the Manual button. Make sure any antenna adjustments required to achieve maximum transmit isolation are completed within this time.

5. Adjust the antenna during the manual cross-polarization test to achieve maximum transmit isolation.
6. Bolt down the antenna adjustment when the terminal consistently passes the manual cross-polarization test.
7. Click Close to close the Cross Pol Test window.
8. Click Automatic on the Transmit Antenna Pointing screen to initiate the ACP test.
   Repeat steps 5 through 7 if the terminal fails the ACP test.
9. Click Close to close the Cross Pol Test Window if the terminal passes the ACP test.
Registering the remote terminal

Register the remote terminal with the service provider’s network, as follows:

1. Click Next on the Transmit Antenna Pointing screen.
2. Select a registration server from the drop-down menu on the Registration Server Selection screen shown in Figure 32. For enterprise and international installations, select SiteID_Registration. For U.S. and Canadian consumer installations, select SAN_and_PIN_Registration. If you are unsure which server to select, refer to the installation specification or work order.

You may also manually enter the registration server’s address by following these steps:

a. Select the Enter Registration Server address manually check box.
b. Enter the registration server’s address in the HTTP:// field.
c. Select the Secure HTTP Mode check box to enable a secure connection to the registration server.

3. Click Next.

Figure 32: Selecting the registration server
The Registration in Progress screen shown in Figure 33 appears. The screen displays registration status information.

4. Click **Next** on the Registration in Progress screen when prompted to do so.
5. Click **OK** on the pop-up window shown in Figure 34 to access the registration server.

Figure 33: Registration in Progress screen (authentication)

Figure 34: Accessing the registration server
6. If you see the Security Alert pop-up window shown in Figure 35, click Yes to accept the security certificate.

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

![Security Alert](image)

Figure 35: Accepting the security certificate
If you selected SAN_AND_PIN_Registration server in step 2, complete steps 7 and 8; then continue with step 10. (Skip step 9.)

If you selected SiteID_Registration server in step 2, go to step 9. (Skip steps 7 and 8.)

7. Ask the customer to review and accept the subscriber agreement shown in Figure 36.
   Scroll down to see the entire agreement.
   Only the customer can click the button at the end of the agreement to indicate acceptance. Do not click this button yourself. If the customer does not accept the agreement, you cannot continue with the installation.

![Registration](image)

**Registration**

**INSTALLER NOTICE!**

Only the customer is allowed to click the button below which indicates that he or she has read and accepted the terms and conditions of the Subscriber Agreement.

You MUST NOT click on this button yourself. You must ask the customer to accept the terms in the Subscriber Agreement on the next page. You CANNOT accept the terms of service on behalf of the customer. Only after the customer has clicked on the "I Agree" button may you continue with the installation.

**PLEASE ASK THE CUSTOMER TO BEGIN HERE**

**SUBSCRIBER AGREEMENT**

Figure 36: Accepting the subscriber agreement

Note: Subscriber agreements may vary by customer type.
8. *This step applies only to U.S. and Canadian consumer installations. If you are installing a terminal for an enterprise or international customer, go to step 9.*

Ask the customer to enter their site account number (SAN) and PIN and then click **Continue** on the consumer registration screen shown in Figure 37.

![Registration](image)

Figure 37: Registering a remote terminal – entering SAN and PIN
9. This step applies only to enterprise and international installations.

Enter the enterprise customer’s site ID on the enterprise registration screen and click **Continue**. See Figure 38.

![Figure 38: Registering a remote terminal – entering site ID](image)

10. Click **Continue** on the Registration Welcome screen shown in Figure 39.

![Figure 39: Registration Welcome screen](image)
The Registration screen appears as shown in Figure 40.

![Registration Screen](image)

**Figure 40: Completing registration**

11. If a printer is available, click **Print this Page** to print the Registration screen, then give the printout to the customer. They will need this information if they should ever need to contact either Hughes Customer Care or their service provider. If there is no printer available, record the information displayed on the screen in the customer's **Quick Start Guide**. Make sure the customer knows where this information is recorded.

12. Click **Continue** to download configuration parameters to the remote terminal.

The Registration in Progress screen appears as shown in Figure 41.
13. When the registration process is complete, click **Restart** on the Registration Complete screen shown in Figure 42 to restart the remote terminal.
14. Click **Close** on the Terminal Reset screen.

The remote terminal is now commissioned.

Continue with Chapter 5 – *Configuring the HN7700S for VADB*, on page 61 if you are installing the remote terminal for an enterprise customer that will use the Virtual Private Network Automatic Dial Backup (VADB) feature.

Continue with Chapter 6 – *Completing the installation*, on page 73 if the customer will not use the VADB feature.

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**Manual commissioning**

If there is no satellite communication available to the installation site (if, for example, you cannot connect to the registration server), you cannot use SBC and must therefore commission the remote terminal manually. However, *do not use the manual commissioning method unless you are instructed to do so by the service provider*.

Manual commissioning requires coordination between the Network Operations Center (NOC) and the installer. A technician enters parameters at the NOC, and the installer enters the same parameters at the terminal site. The NOC also downloads encryption keys and certain parameters to the remote.

The manual commissioning process consists of the following tasks:

- *Entering manual commissioning parameters*
- *Antenna pointing*

Note: The remote terminal’s serial number must be loaded at the NOC by a NOC representative in order to complete the manual commissioning process.
Entering manual commissioning parameters  Follow these steps to enter the manual commissioning parameters:

1. Open a web browser on the installer laptop.
2. Type \texttt{http://192.168.0.1/fs/registration/setup.html} in the browser address bar and press \texttt{ENTER}.
   The Broadband Satellite Setup screen appears as shown in Figure 43.

   \begin{figure}[h]
   \centering
   \includegraphics[width=\textwidth]{figure43.png}
   \caption{Broadband Satellite Setup screen}
   \end{figure}

3. Click \textbf{Manual Commissioning} to access the Manual Commissioning page shown in Figure 44.
4. Enter or select parameters on the Manual Commissioning page.
   The parameters may be provided to you in an installation specification, work order, or in another form of communication from your installation point-of-contact.
5. Click \textbf{Save Configuration}.
   The terminal reboots after saving the parameters.
Figure 44: Manual Commissioning page
**Antenna pointing**  
The antenna assembly manual explains how to make adjustments to point the antenna. You also use the screens shown in this section to complete antenna pointing, as follows:

1. Open a web browser on the installer laptop PC.
2. Type `http://192.168.0.1/fs/registration/setup.html` in the browser address bar and press **ENTER**. The Broadband Satellite Setup screen opens (Figure 43 on page 53).
3. Click **Antenna Pointing**. The Antenna Pointing screen appears as shown in Figure 45.
4. Click **Next**. Select the Enable OPI check box if an OPI is used to point the antenna.

![Antenna Pointing Screen](image)

**Figure 45:** Manual commissioning – antenna pointing screens
5. Click **Display Signal Strength** on the Receive Antenna Pointing screen shown in Figure 46 to open the Signal Quality window.

![Figure 46: Receive pointing](image)

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

6. Use the Signal Quality indication to peak the receive pointing as instructed in the antenna assembly installation manual.

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

7. Click **Close** to close the Signal Quality window after peaking the signal.
If you do not want to transmit-point the antenna, click **Exit** on the Receive Antenna Pointing screen to quit Antenna Pointing.

If you need to transmit-point the antenna, select the **Perform ACP** check box on the Receive Antenna Pointing screen and continue with step 8.

Note: To run the ACP test, there must be an ACP server in your NOC.

8. Click **Next**.

9. Click **Manual** on the Transmit Antenna Pointing screen shown in Figure 47 to initiate the manual cross-polarization test.

![Figure 47: Executing a manual cross-polarization test](image)

Be ready to adjust the antenna (step 11).
10. Click **Continue** on the pop-up Warning message shown in Figure 48.

![Manual cross-polarization warning message](image)

**Figure 48: Manual cross-polarization warning message**

When the test is completed, the test status, isolation value, and the pass/fail result appear in the Cross Pol Test window shown in Figure 49.

![Manual cross-polarization test results](image)

**Figure 49: Manual cross-polarization test results**

---

11. Adjust the antenna during the manual cross-polarization test to achieve maximum transmit isolation.
12. Bolt down the antenna adjustments when the terminal consistently passes the manual cross-polarization test.
13. Click **Close** to close the Cross Pol Test window.
14. Click **Automatic** on the Transmit Antenna Pointing screen to initiate the ACP test.
   Re-peak the transmit isolation in manual mode if the terminal does not pass the ACP test.

---

**Note:** The manual cross-polarization test times out 3-5 minutes after clicking on the Manual button. Make sure antenna adjustments are completed within this time frame.
15. Click **Close** to close the Cross Pol Test Window if the terminal passes the ACP test.
16. Click **Exit** on the Transmit Antenna Pointing screen to exit the Antenna Pointing feature.
Chapter 5

Configuring the HN7700S for VADB

This chapter explains how to configure the HN7700S for Virtual Private Network Automatic Dial Backup (VADB) operation. The following topics are discussed:

- **VADB overview** on page 61
- **Requirements for VADB** on page 62
- **Installing VADB** on page 62
- **LED appearance during VADB operation** on page 69
- **VADB troubleshooting** on page 70

Note: The HN7700S cannot be configured for VADB.

VADB overview

The VADB feature provides a phone-line backup capability to the HN7700S in case the satellite link fails or degrades below an acceptable threshold.

The HN7700S contains an internal modem to support VADB functionality. The HN7700S connects to a national network of dial access numbers, which are known as a Point of Presence (POP). Each POP acts as a Virtual Private Network (VPN) entry point into the customer’s network or the Internet. Packets are sent from the HN7700S through the POP to the Network Operations Center (NOC), which forwards the packets to the destination server.

VADB automatically switches the HN7700S to a terrestrial dialup telephone network with minimal interruption and loss of customer traffic. VADB introduces no additional load on the HN7700S and does not affect any existing HN7700S features, but it does cause the HN7700S to send and receive traffic at a slower rate.
Requirements for VADB

The following requirements must be fulfilled before VADB can be used:

- The HN7700S must be configured for VADB operation before the system is installed and commissioned.

Note: The HN7700S can be upgraded to support VADB operation after it is installed.

- The site must have an analog telephone line to support VADB operation. A dedicated telephone line is preferred but not required. The HN7700S can share the telephone line with other devices when it is connected to a splitter.

The following tasks must be completed for VADB to work properly:

- Before testing VADB functionality, the installer must use a phone handset to dial the VADB access phone number. For details, refer to Testing the telephone line on page 64.
- The telephone cable must be plugged into the TEL LINE port on the HN7700S and a telephone jack or splitter. (In some countries, a converter may be required to connect the cable to the phone jack.)

Installing VADB

Installing VADB consists of the following tasks:

- Verifying that the VADB profile is loaded
- Testing the telephone line
- Testing VADB functionality

Before beginning the installation, check the telephone line local dialing rules. If it does not match the sequence in the installation specification, or as shown in the Advanced Pages, (see VADB troubleshooting on page 70), contact Installer Support.
Verifying that the VADB profile is loaded

The VADB profile is a downloaded configuration file that sets up the HN7700S to support VADB. After the HN7700S is installed and commissioned, follow these steps to verify that the VADB profile is loaded:

1. Access the Advanced Configuration and Statistics pages shown in Figure 50 by typing **192.168.0.1/fs/advanced/advanced.html** in the browser address bar and pressing **ENTER**.
2. From the Advanced Menu, VADB section, click **Config Show** as shown in the figure.

![Figure 50: Verifying that the VADB profile is loaded](image)
3. Verify that `ENABLED` appears in the `vadb_net_enabled` and `vadb_rem_enabled` fields. If `ENABLED` does not appear in both fields, contact Installer Support and request that these options be enabled.

4. Verify that the VADB access phone numbers appear in the `prim phone_num` and `bkup phone_num` fields.

5. Make a note of the VADB gateway address. You will need this address to test VADB functionality.

A user name and password are automatically generated and downloaded with the VADB profile. The VADB feature uses this user name and password to automatically connect to the Internet if necessary.

Testing the telephone line

Follow these steps to test the telephone line to which the HN7700S will be connected:

1. Connect a telephone handset to the telephone jack or splitter.
2. Dial the VADB access phone number listed in the `prim phone_num` field.
3. Listen for modem tones, which indicate the connection is being established between the access number and the handset.

If you do not hear modem tones, you may need to modify the VADB access phone number to account for site-specific dialing rules. For example, if dialing an 8 or 9 is required to access an outside line at the site, you must add the required number to the VADB access phone number. Ask a site contact for site-specific dialing rules and then refer to the installation specification for instructions on how to modify the VADB access phone number.
Connecting the HN7700S to the telephone line

The HN7700S contains an internal modem; therefore, it is not necessary to connect an external modem to enable VADB functionality.

To connect the HN7700S to a telephone line, refer to Figure 51 and follow these steps:

1. Connect one end of the modem cable to the TEL LINE port on the HN7700.
2. Connect the other end of the modem cable to a telephone jack or to a splitter if other devices share the telephone line. (In some countries, a converter may be required to connect the cable to the phone jack.)
3. If you use a splitter, connect the splitter to a telephone jack (with a converter, if required).

The final configuration for VADB is shown in Figure 51.

Figure 51: VADB cable connections
Optional protection module

Some countries may require that a protection module is installed between the HN7700S remote terminal and the public switched telephone network (PSTN) telephone line. As of the date of this manual, Brazil is the only country that requires such a device. It is optional in all other countries.

The protection module (Hughes P/N 9012740-0001) is a high-speed electronic circuit protector that provides both over-voltage and over-current protection. The module includes a short telephone cable that connects to the telephone line port on the HN7700S and a grounding cable with a ring terminal that connects to the HN7700S backplane, as shown in Figure 52.

![Figure 52: VADB connections with protection module](T0155028)
Installing the protection module

To install a protection module, refer to Figures 52 through 54 and follow these instructions:

1. Connect the short telephone cable from the protection module MODEM port to the HN7700S TEL LINE port, as shown in Figure 53.

2. Remove the coaxial cable from the HN7700S SAT IN port. See Figure 54.

CAUTION

Do not remove or loosen the factory-installed hex nut on the HN7700S SAT IN port. Use the hex nut supplied with the protection module kit to secure the ring terminal attached to the protection module ground cable.

3. Slip the ring terminal at the end of the protection module grounding cable over the SAT IN terminal post.
4. Install the hex nut provided with the protection module on the SAT IN terminal post and tighten it.
5. Reconnect the coaxial cable to the SAT IN terminal post. Make sure the cable is securely tightened. (See the Caution statement that follows Figure 9 on page 16.)
6. Connect the longer phone cable from the LINE port on the protection module to the telephone jack (or to a splitter if other devices share the telephone line). See Figure 53.
7. If you use a splitter, connect the splitter to a telephone jack.

Verifying VADB functionality

Follow these steps to verify VADB functionality:

1. Open a web browser on the installer PC.
2. Access the System Control Center Advanced Pages by typing 192.168.0.1/fs/advanced/advanced.html in the browser address bar and pressing ENTER.
3. Verify that the VADB link is in use:
   a. From the Advanced Menu, VADB section, click Call status.
   b. Verify that VADBLINK appears in the Link in use field as shown in Figure 55.

Figure 55: Verifying the VADB link
If the current_state field changes to SESSION INACTIVE and there is no connection to the satellite (you can’t browse), troubleshoot by verifying that the HN7700S can ping the VADB gateway:

1. Open the Run dialog box by selecting Start → Run.
2. Type Command.
3. Click OK.
4. Type ping <VADB gateway address> and press ENTER.

   The VADB gateway address appears on the VADB Config Show page (Figure 50 on page 63).
   If the client fails to ping the host, the computer reports no packets received. This indicates a problem with either the network hardware or configuration. Check the LAN connections and refer to the instructions that were provided with the network hardware, then retry the ping test.

LED appearance during VADB operation

The System LED steadily flashes when VADB is enabled. The System LED is on when the satellite link is enabled. The HN7700S LEDs are shown in Figure 56. Table 3 describes the appearance of the LEDs during VADB operation.

Figure 56: HN7700S LEDs
# VADB troubleshooting

If the HN7700S is unable to connect through VADB, or to authenticate with the server, use the troubleshooting procedure below described below.

Note: Before starting this procedure, verify that the HN7700S is commissioned.

1. Verify that the telephone cable is securely attached to the TEL LINE port on the HN7700S and the telephone jack or splitter.
2. Complete the instructions in Verifying that the VADB profile is loaded on page 63 to confirm that the VADB profile is loaded on the HN7700.
3. Connect a telephone handset to the telephone jack or splitter and dial the VADB access phone number listed in the phone_num field. (See Figure 50 on page 63.)
4. Make sure the access phone number is accessible from the site.
   If necessary, refer to the installation specification for instructions explaining how to change the access code required to obtain an outside telephone line or to change the area code.

5. Complete the instructions in Verifying VADB functionaity on page 68 to test VADB functionality.

6. Contact Installer Support if the VADB issue is not resolved after completing steps 1 through 5.
Chapter 6

Completing the installation

This chapter discusses tasks that must be completed after the remote terminal is installed and commissioned.

The following topics are discussed:

• Confirming files on page 73
• Connecting the terminal to the customer’s computer on page 76
• Connecting serial devices to the HN7700S terminal on page 80
• Printing the System Information page on page 82
• Creating a shortcut to the System Control Center on page 83

Confirming files

Use the remote terminal’s System Control Center to confirm that the terminal is operating with the most current version of software. See Chapter 7 – System Control Center on page 85 for more information on using the SCC.

1. Open a web browser such as Internet Explorer or Netscape.
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 as shown in Figure 57.
Figure 57: System Control Center home page
4. Click **System Status**. The System Status page appears as shown in Figure 58.

![System Status page](image)

Figure 58: System Status page

- Check the **Software Download Status** line message. If it reads **All files are up-to-date**, the terminal has been commissioned.

Wait 15 minutes after completing the registration process for all files to be downloaded to the terminal from the NOC.

If **All files are up-to-date** does not appear after 15 minutes, restart the terminal:

  - Go to the System Control Center home page.
  - In the Help section, click **Restart HN7000S** (or **Restart HN7700S**).
If restarting does not correct the problem, power cycle the terminal:

⚠️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

- Unplug the power cord from the power source.  
  (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
- Wait 30 sec.
- Plug the power cord back into the power source.  
  (If the power source is DC, plug the input cable back into the power supply.)
- If the message still does not appear after 15 minutes, contact Installer Support.

Connecting the terminal to the customer’s computer

Use an Ethernet cable to connect the remote terminal to the customer’s computer:

1. Make sure the Connect Your Modem via Ethernet screen appears on the computer display. This screen is part of the Activation CD software and is shown in Figure 6 on page 14.  
   Do not connect the HN7000S Ethernet port to the customer’s PC until after you see this screen.
2. Use an Ethernet cable to connect the terminal and computer as shown in Figure 59.
You can also connect an Ethernet hub, router, or switch to the remote terminal to support multiple computers on a LAN.

Completing the activation process

After you connect the Ethernet cable, the activation software detects the remote terminal and verifies that it has been installed. Follow these steps as the activation process completes:
1. When you see the Are You Upgrading Your Modem Hardware? screen shown in Figure 60, click **Next** to proceed.

![Figure 60: Are You Upgrading Your Modem Hardware? screen](image)

The activation software guides the user through the remainder of the activation process. It verifies that the terminal is commissioned, that its software is up to date, and configures a public IP address (if available with the customer's service plan).
2. When the Enter Technician Information screen appears as shown in Figure 61, enter your Technician ID and click **Next**.

![Figure 61: Enter Technician Information screen](image)

A browser window opens displaying the HughesNet welcome page. You may close this page.

*This completes the activation process.*

3. Leave the Activation CD with the customer.

**Troubleshooting**  
If the Activation CD software hangs during the installation process, click **Cancel** and restart the software.

If the Activation CD fails to load, call Installer Support.

**If the customer cannot browse**  
Configure the installer laptop so its network properties match those of the customer’s PC. Refer to Appendix D for detailed instructions on setting network properties. Then:

1. Connect the installer laptop to the remote terminal with an Ethernet cable.
2. Open a web browser on the installer PC.
3. Attempt to access the remote terminal’s System Control Center by typing in the browser’s address bar:

   - `www.systemcontrolcenter.com`
   - `192.168.0.1`
4. Press **ENTER**.
   If the remote terminal is functioning, the System Control Center appears.

5. Type **www.hughes.com** or some other known site in the browser address bar and press **ENTER**. If the site appears, the remote terminal is functioning.

The customer should refer to the contact information on the System Control Center Help page for technical assistance.

**Access the System Control Center as follows:**

1. Open a Web browser on a computer connected to the remote terminal.
2. Type in the browser’s address bar:
   
   - **www.systemcontrolcenter.com**
   - **192.168.0.1**
3. Press **ENTER**.
   Find contact information on the System Control Center home page by clicking on **Contact Information** under the HELP section.

---

**Connecting serial devices to the HN7700S terminal**

The HN7700S remote terminal has one DCE/DTE RS-232 serial port that supports any type of serial device. Common serial devices that may be connected to the HN7700S include:

- Point of sale (POS) devices
- Credit card readers
- Automatic Teller Machines (ATMs)

The serial port is programmable for synchronous or asynchronous operation. A single serial device can be connected to the port. A Hughes Serial Appliance connected to a remote terminal Ethernet port can support multiple serial devices.

The serial port supports a variety of protocols. See the service provider for a list of supported protocols.
Note: Hughes recommends that the installer work with a point of sale (POS) technician to verify the physical connection between the POS device and the serial appliance port. There are many serial port parameters that must be verified to ensure that the POS device and the serial appliance port are communicating properly. At a minimum, baud rate, parity, character bits, and stop bits must be matched. Hughes suggests using a break-out box with 25-pin ribbon cables to verify that the POS device and the serial appliance are communicating through the physical leads RTS, CTS, CD, DSR, and DTR.

Figure 62 illustrates typical serial device connections to the HN7700S remote terminal.

Some considerations for connecting devices to the HN7700S are:

- You do not need to power down the HN7700S remote terminal to connect devices or change devices.
- Most serial devices are not “plug and play.” A telecommunications technician may be required to configure devices.
Follow the steps below to assist the customer with printing a copy of the System Control Center’s System Information page. The System Information page may not be accessible if a problem occurs; the customer can use the printed copy of the page if they need to contact Hughes Customer Care or the service provider for assistance.

1. Have the customer access the System Control Center by typing `www.systemcontrolcenter.com` in a web browser address bar and pressing `ENTER`. The System Control Center appears (as shown in Figure 57 on page 74).

2. Click the **System Info** indicator near the top of the screen. The System Information page appears as shown in Figure 63.

Note: The fields and values on the System Information page vary, depending on the customer type and location.
3. Have the customer print the page. If they do not have a printer, they can press Alt+Print Sern to capture the screen image and paste it into a word processing, Microsoft Paint, or similar file.

Creating a shortcut to the System Control Center

With later versions of Windows you can create a shortcut from the customer’s computer desktop to the System Control Center home page as follows:

1. Enter 192.168.0.1 in the browser address bar and click Go.
   The System Control Center home page appears.
2. Drag the icon between Address and http (shown in Figure 64) to the computer desktop.

Alternate method

An alternate method for creating a shortcut to the System Control Center follows:

1. Right-click anywhere on the computer desktop and select New → Shortcut from the popup menu.
2. Type 192.168.0.1 in the Create Shortcut dialog as shown in Figure 65 and click Next.

Figure 64: Icon for creating a shortcut

Figure 65: Entering the URL in the Create Shortcut window
3. In the Select a Title for the Program dialog shown in Figure 66, type **System Control Center** and click **Finish** to save the shortcut to your desktop.

![Image of Select a Title for the Program dialog]

Figure 66: Entering the name of the shortcut

**Note:** You can also add the System Control Center to your browser’s Favorites or Bookmark list; refer to your browser’s documentation for instructions.
Chapter 7

System Control Center

The System Control Center is an interface that enables users to access remote terminal configuration, statistics, and status information using a web browser from any computer that has TCP/IP connectivity to the terminal.

The software in each remote terminal is periodically updated over the satellite link to the NOC. Refer to the System Control Center Help page for current information about the System Control Center and remote terminal software.

This chapter discusses:

- Accessing the System Control Center on page 86
- System Control Center home page on page 87
- System status page on page 91
- Reception information page on page 93
- Transmission information page on page 96
- System information page on page 101
- Connectivity test page on page 104
- Troubleshooting page on page 103
- Help page on page 106
- Advanced Pages on page 107
Accessing the System Control Center

You can access the System Control Center through a web browser installed on a computer connected to the remote terminal. Follow these steps:

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

The System Control Center home page appears as shown in Figure 67.

Note: If you are not able to access the System Control Center, refer to Cannot access the System Control Center on page 125.
The System Control Center home page includes links to remote terminal features and important information regarding operation of the remote terminal.

Near the top of all System Control Center pages are four round buttons with labels above them, as shown in Figure 68.

![Figure 68: Links to System Control Center pages](image)

If you click any of these buttons, the page associated with that button opens. For example, click the Reception Info button to see the Reception Information page.

The System Status button is an indicator button which changes color to indicate the current system status. The different colors indicate the following:

- **Green** - no problem detected, OK
- **Red** - problem detected
- **Yellow** - may be a problem with Web Acceleration.
- **Orange** - indicates the Fair Access Policy (FAP) has been exceeded.

Note: The System Status button may be green, red, yellow, or orange while other buttons are always blue.

Below is a description of the these four buttons.

- **System Status** provides access to the System Status page, which displays general status information such as signal strength and commissioning status. See *System status page* on page 91 for more information.
  - If the System Status indicator is green and **OK** appears below it, as shown in Figure 68, the satellite connection is operating properly.
  - If the indicator is yellow as shown in Figure 69, the system status is Degraded. This could indicate that the Web Acceleration feature is not functioning, or that the remote terminal is in VADB mode, using BACKUP configuration, or has detected virus activity on the LAN. Click the
indicator to access the System Status page to view status details and restore previous operating parameters.

– If the indicator is orange, as shown in Figure 71, the remote terminal has exceeded the Fair Access Policy (FAP) threshold (only applicable for HN7000S). Each HughesNet service plan has an established download threshold. Subscribers who exceed that threshold will experience reduced download speeds for approximately 24 hours. Click the indicator to access the System Status page to view details.

– If the indicator is red and Problem appears below it, as shown in Figure 71, there is a problem with satellite connectivity. Click the indicator to access the System Status page to view problem details.
• **Reception Info** provides access to the Reception Information page, which displays statistics about received data and receive connection status. See *Reception information page* on page 93.

• **Transmission Info** provides access to the Transmission Information page, which displays statistics about the transmitted data and transmit connection status. See *Transmission information page* on page 96.

• **System Info** provides access to the System Information page. The System Information page displays system information such as the remote terminal IP address, Site Account Number (SAN) for U.S. and Canadian consumers, and the site ID for enterprise and international customers. See *System information page* on page 101.

**Links**

The lower portion of the System Control Center home page contains four groups of links:

- System Status
- Diagnostic Utilities
- Help
- myHughesNet (visible only to HN7000S users in the United States who purchased their terminal through a retail channel)

**System status**

These links provide access to system status information:

- **View System Status** provides access to the System Status page, which displays general system status information such as signal strength and commissioning status. For more information, see *System status page* on page 91.

- **View Reception Information** provides access to the Reception Information page which displays information on data received by the remote terminal. For more information, see *Reception information page* on page 93.

- **View Transmission Information** provides access to the Transmission Information page, which displays information on data transmitted by the remote terminal. For more information, see *Transmission information page* on page 96.
Diagnostic utilities

The **Connectivity Test** link provides access to the Connectivity Test page, which can be used to test the connection between the remote terminal and the Network Operations Center (NOC). See *Connectivity test page* on page 104.

The **Problem Troubleshooting** link provides access to first-level troubleshooting procedures to use in case of a problem with the remote terminal. See *Troubleshooting page* on page 103.

Help

The following links provide access to help-related information:

- **Getting Started** explains how the remote terminal works and provides access to remote terminal operating instructions and recommended settings.
- **Browsing Optimization Utility** provides access to a utility that enhances web browsing performance by setting certain computer parameters to optimize communication performance for a satellite link.
- **View Help Topics** provides access to the Help page. Refer to the Help page for a variety of help topics ranging from an overview of the remote terminal to answers to frequently asked questions. See *Help page* on page 106.
- **View Help Topics** also includes a link for **Advanced Troubleshooting Statistics**, opens a screen of statistics that is intended for use by Hughes Customer Care or service provider representatives.
- **Contact Information** provides access to technical support information. Contact information may vary by service plan.
- **Restart HN7000S** (or **Restart HN7700S**) enables you to restart the terminal.

myHughesNet

The **Go to myHughesNet** link provides access to [hughesnet.myway.com](http://hughesnet.myway.com), a valuable resource for additional features and information. Access to [hughesnet.myway.com](http://hughesnet.myway.com) is determined by the service plan the customer purchased.

Note: **Go to myHughesNet** is visible only to HN7000S users in the United States who purchased their remote terminal through a retail channel.
The System Status page is shown in Figure 72. The fields on this page are described below the figure.

- **Signal Strength** – Displays the receive signal strength. A value of 30 or less indicates a weak signal.
- **Receive Status** – Indicates whether the receive data path is operational. Clicking the status message displays corresponding help information.
- **Transmit Status** – Indicates whether the transmit data path is operational. Clicking the status message displays corresponding Help information.
- **Software Download Status** – Indicates whether remote terminal software and configuration are up to date.
- **Service Status** – Indicates whether the terminal has been commissioned (registered with the system). From here, you can also access the service history for the remote terminal to determine if it has been de-commissioned at any time.

Note: The available system status options will vary, depending on how the remote terminal is configured. Therefore, some of the options listed below may not appear on the screen.
• TCP Acceleration Status – Indicates whether TCP Acceleration is operational. TCP acceleration provides the expected performance on a remote terminal.

• Web Acceleration Status – Indicates whether Web Acceleration is operational. Web Acceleration is operational if you are browsing HTTP-based web sites. Web Acceleration may be inactive if you are browsing on a secure HTTP site (as indicated by https).

• FAP Status – Indicates whether the user has exceeded the Fair Access Policy (FAP) threshold. The FAP indication may display one of the following three status messages:
  – YES: FAP threshold was exceeded and restrictions are in effect
  – NO: FAP threshold was not exceeded. No restrictions in effect.
  – UNKNOWN: No FAP indication received.

This field is present only if the FAP option is enabled.

• VADB Connection Status – Click the Detail link to access information about the VADB connection. This field is present only if the VADB connection option is enabled.

• Virus Detection Status – Indicates whether virus detection is active or inactive. This field is present only if the virus protection option is enabled.
The Reception Information page is shown in Figure 73. The page’s fields are described below the figure.

![Reception Information Page](image)

**Figure 73: Reception information**

- **Receive Status** – Reports the status of the receive data path. Clicking on the blue status message displays corresponding help information. Table 4 describes the RxCodes in detail.
- **Frames Received** – Reports the number of data messages received by the remote terminal over the satellite link.
- **Frames with Errors** – Reports the percentage of received frames found 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 the antenna assembly.
- **Bad Key Frames** – Indicates the 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 terminal is not commissioned.
- **Current Modcod** – Indicates the modulation and forward error correction coding method.
**Receive status messages** The following messages may appear in the Receive Status field. The Corrective actions section in Table 4 gives more information about each code and describes any possible corrective measures.

If corrective measures do not solve a problem, contact Installer Support.

RxCode 5 indicates the receiver is working properly. This code appears most of the time.

Table 4: Receive code (RxCode) messages and corrective actions

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
<th>Corrective actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The receiver is in pointing mode</td>
<td>This condition indicates the installer is performing antenna pointing. In this mode, the transmitter is disabled for safety reasons because the installer is working near the antenna assembly. If this occurs during normal operation, try restarting the terminal using the Restart link on the System Control Center home page. If this doesn’t correct the problem, unplug the power cord from the power source (or if DC, unplug the input connector from the terminal power supply), wait 30 sec, then plug it back in.</td>
</tr>
<tr>
<td>2</td>
<td>The receiver is in factory or NOC mode</td>
<td>This status is for remote terminal testing purposes only. You should never see it. If this occurs during normal operation, try restarting the terminal using the Restart link on the System Control Center home page. If this doesn’t correct the problem, unplug the power cord from the power source (or if DC, unplug the input connector from the terminal power supply), wait 30 sec, then plug it back in.</td>
</tr>
<tr>
<td>3</td>
<td>The receiver is not locked to a signal</td>
<td>If the remote terminal had been operating previously, this status is probably due to inclement weather conditions and may be corrected when the weather improves. This condition can also indicate that the terminal is unable to receive the signal from the NOC. This is also associated with a signal level less than 30. This occurs if there is a weather outage at the user location, a NOC outage due to inclement weather or other reasons, a misaligned or faulty antenna assembly, or faulty cabling. If this keeps happening under normal weather conditions, make sure the power supply is the correct type. See Table 2 on page 20. If the power supply type is correct, try restarting the terminal using the Restart link on the System Control Center home page. If this doesn’t correct the problem, unplug the power cord from the power source (or if DC, unplug the input connector from the terminal power supply), wait 30 sec, then plug it back in.</td>
</tr>
<tr>
<td>4</td>
<td>The receiver is locked to the wrong network</td>
<td>This condition should only be seen during installation and occurs when the receiver is locked to an incorrect satellite. This could also happen if the installer enters incorrect information during manual pointing. If this occurs during normal operation, it may be due to the user changing satellite parameters, or the antenna becoming misaligned. Make sure the antenna is aimed at the correct satellite and verify that the correct satellite parameters were entered or selected during the registration process.</td>
</tr>
<tr>
<td>5</td>
<td>The receiver is operational</td>
<td>This is the normal operating state where the receiver is receiving data from the NOC. The transmitter operates correctly only when the receiver is in this state.</td>
</tr>
</tbody>
</table>
The receiver is not detecting a signal

This condition occurs when the terminal is not detecting any type of radio signal from the antenna assembly. This could indicate that the cabling between the receiver and the antenna assembly is faulty or that the receiver itself is faulty. Check that the cables are securely connected on the remote terminal. (See the Caution statement that follows Figure 8 on page 18.) Also, make sure the power supply is the correct type. See Table 2 on page 20. Try restarting the terminal using the Restart link on the System Control Center home page. If this doesn't correct the problem, unplug the power cord from the power source (or if DC, unplug the input connector from the terminal power supply), wait 30 sec, then plug it back in.

The receiver is locked to an unknown network

This condition should only be seen during installation and occurs when the receiver is locked to the wrong satellite. In rare cases it may be due to a transient outage at the NOC. If this occurs during pointing or commissioning, the antenna has not been pointed correctly. If it occurs during normal operation, it may be due to the user changing satellite parameters, or the antenna becoming misaligned. The former condition can be corrected by re-commissioning the site. The latter requires antenna repointing.

The receiver cable and transmit cable are switched

Indicates that the receive cable is plugged into the “SAT OUT” connection and transmit cable is plugged into the “SAT IN” connection. Swap the cables.

The receiver cable is shorted.

Indicates that the receive cable is shorted. This occurs when the center (inner) conductor is touching the external braid (outer conductor). It could also indicate internal hardware failure.

• If new install, inspect and replace the receive cable.
• If the problem persists, replace the remote.

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
<th>Corrective actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>The receiver is not detecting a signal</td>
<td>This condition occurs when the terminal is not detecting any type of radio signal from the antenna assembly. This could indicate that the cabling between the receiver and the antenna assembly is faulty or that the receiver itself is faulty. Check that the cables are securely connected on the remote terminal. (See the Caution statement that follows Figure 8 on page 18.) Also, make sure the power supply is the correct type. See Table 2 on page 20. Try restarting the terminal using the Restart link on the System Control Center home page. If this doesn't correct the problem, unplug the power cord from the power source (or if DC, unplug the input connector from the terminal power supply), wait 30 sec, then plug it back in.</td>
</tr>
<tr>
<td>7</td>
<td>The receiver is locked to an unknown network</td>
<td>This condition should only be seen during installation and occurs when the receiver is locked to the wrong satellite. In rare cases it may be due to a transient outage at the NOC. If this occurs during pointing or commissioning, the antenna has not been pointed correctly. If it occurs during normal operation, it may be due to the user changing satellite parameters, or the antenna becoming misaligned. The former condition can be corrected by re-commissioning the site. The latter requires antenna repointing.</td>
</tr>
<tr>
<td>8</td>
<td>The receiver cable and transmit cable are switched</td>
<td>Indicates that the receive cable is plugged into the “SAT OUT” connection and transmit cable is plugged into the “SAT IN” connection. Swap the cables.</td>
</tr>
<tr>
<td>9</td>
<td>The receiver cable is shorted.</td>
<td>Indicates that the receive cable is shorted. This occurs when the center (inner) conductor is touching the external braid (outer conductor). It could also indicate internal hardware failure. • If new install, inspect and replace the receive cable. • If the problem persists, replace the remote.</td>
</tr>
</tbody>
</table>

⚠️ CAUTION

Do not unplug the DC power cord from the remote terminal while it is powered on. If the remote terminal uses an AC/DC power supply, always disconnect the AC power cord from the power strip, wall outlet, or surge protector. If the remote terminal uses a DC/DC power supply, always disconnect the DC input cable connector from the power supply.
The Transmission Information page is shown in Figure 74. The page’s fields are described below the figure.

- **Transmit Status** – Reports the status of the transmit data path. Clicking on the blue status message displays corresponding help information.
- **Number of Successful Transmissions** – Reports the number of frames transmitted to the satellite.
- **Number of Failed Transmissions** – Reports the number of frames that could not be sent. A continuously increasing value indicates a problem with transmitting. However, if a low non-increasing value is displayed and the system is functioning, there is no reason for concern. You do not need to do any troubleshooting or contact Installer Support.
- **Number of Packets Submitted for Transmission** – Indicates total number of data packets queued for transmission to the satellite since the terminal was last restarted.
Transmit status messages

The following messages may appear in the Transmit field. The Corrective Actions section gives more information about each code, and describes any possible corrective measures.

If corrective measures do not solve a problem, contact Installer Support.

TxCode 8 indicates that the transmitter is working properly. This code will appear most of the time.

Table 5: Transmit code (TxCode) messages and corrective actions

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
<th>Corrective actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The transmitter has been disabled by the Network Operations Center</td>
<td>This condition occurs when the transmitter is not enabled. A transmitter may be disabled for short periods of time by the NOC for service or troubleshooting. It may also be disabled if the user discontinues the satellite service. If this condition persists, it can only be corrected by requesting that the terminal be enabled.</td>
</tr>
<tr>
<td>2</td>
<td>The transmitter has been placed in test mode by the Network Operations Center</td>
<td>This status requires no user action and this test usually completes in 15 minutes or less. This condition occurs when the NOC places the transmitter into special transmission modes to measure the performance of the transmitter. When in this mode, the terminal is unable to transmit normal user data to the NOC.</td>
</tr>
<tr>
<td>3</td>
<td>The transmitter is locking to the receive carrier</td>
<td>This condition occurs during initial startup or when the receiver is locking to the receive signal. It is normal for this condition to persist for up to 10 sec. If this condition persists for more than 10 sec, try disconnecting and reconnecting the receiver cable and wait 30 sec. If the situation still persists, then the remote terminal may need to be replaced.</td>
</tr>
<tr>
<td>5</td>
<td>The transmitter is not locked to the network timing</td>
<td>No action is necessary if this condition occurs from time to time and quickly resolves itself. If this issue persists, it is likely due to a NOC-related service issue. The condition may also be due to remote terminal failure; in rare cases, the terminal may fail and may have to be replaced.</td>
</tr>
<tr>
<td>6</td>
<td>The transmitter is not available because the receiver is not detecting a signal or is not locked to the correct network</td>
<td>If this condition lasts less than 1 sec, it is not a problem. If it lasts for 1 sec or more, check your receive signal. This condition occurs when the remote terminal is not detecting a good signal. The receiver must be locked to the correct network for the transmitter to operate. If the receiver is not locked (no signal) or is locked to the wrong network, the transmitter is unable to transmit data. Verify that you have a good signal strength by going to the System Status page. This condition could also be caused by inclement weather.</td>
</tr>
<tr>
<td>7</td>
<td>The transmitter is not available because the satellite receiver is not tuned for normal operation</td>
<td>This condition occurs when the transmitter is disabled for safety reasons. If this happens during installation or commissioning, the installer closes the antenna pointing program and resolves the condition.</td>
</tr>
<tr>
<td>8</td>
<td>The transmitter is available</td>
<td>This is the normal operational state and indicates that the transmitter is ready to transmit data.</td>
</tr>
<tr>
<td>9</td>
<td>The transmitter is adjusting for optimal network timing</td>
<td>This condition typically occurs when the remote terminal is first commissioned or the first time it is used for data traffic. This must occur before the remote terminal is able to transmit successfully. Typically, this process usually takes less than a minute.</td>
</tr>
</tbody>
</table>
The transmitter is unable to communicate with the Network Operations Center

This condition indicates that the terminal has stopped attempting to transmit user data because there were a number of failures in sending data to the NOC over the satellite link. This could be the result of weather conditions causing lost packets or, rarely, return channel equipment failures in the NOC.

The transmitter is not available because the receiver software is out of date

This condition indicates that the installed software version is not recent enough to operate on the network. New software is required from time to time due to network infrastructure and capability upgrades and in order to maintain network efficiency and fix any known problems. The system automatically updates the software version to make sure you can enjoy uninterrupted operation. If you do not use the remote terminal for a long period of time and miss the updates, you may need to contact your service provider.

The transmitter is not receiving network control messages from the Network Operations Center

This condition indicates a NOC equipment outage. This should be a transient condition and the system should recover automatically.

The transmitter is unable to range because it cannot communicate with the Network Operations Center

Ranging is the process that adjusts the satellite transmitter timing and power. The satellite transmitter conducts ranging as needed to ensure that it can communicate successfully with the Network Operations Center. This condition can indicate any of the following:

- The NOC is not receiving ranging information from the transmitter. This may indicate a transmit problem at the NOC. This should get cleared in a few minutes.
- The transmitter is unable to achieve enough transmit power to send ranging information to the NOC. Make sure the power supply is the correct type. See Table 2 on page 20.
- The transmitter is sending incorrect timing data because incorrect ZIP code or incorrect latitude/longitude information was entered during installation.
- The outdoor unit (ODU)—that is, the antenna assembly—is not operating properly or is not properly connected to the remote terminal. Make sure the transmit cable is securely fastened to the satellite OUT connector. (See the Caution statement that follows Figure 8 on page 18.)

The transmitter is not available because ranging has failed

This condition indicates the transmitter is not operational because ranging has failed. Ranging is the process that adjusts the satellite transmitter timing and power. The satellite transmitter conducts ranging as needed to ensure that it can communicate successfully with the Network Operations Center. The ranging failure may happen due to the antenna becoming misaligned or if repeated attempts to range do not succeed. This condition may also be caused due to adverse weather conditions. In rare cases, this may also indicate NOC issues but should clear within a few minutes. If the system was operational in the past and you see these messages repeatedly, you can try to force range by performing the Connectivity Test.

The transmitter is waiting for a ranging request to be processed by the Network Operations Center

This condition occurs if the system is busy adjusting power and timing for other users. This process may take up to a minute or more.
Table 5: Transmit code (TxCode) messages and corrective actions (Continued)

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
<th>Corrective actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>The transmitter is waiting for a transmit request to be processed by the Network Operations Center</td>
<td>This condition occurs when the system is unable to provide transmit bandwidth. This occurs when many users sign-on simultaneously. It should clear in a few minutes automatically.</td>
</tr>
<tr>
<td>17</td>
<td>The satellite transmitter is unable to obtain an available transmission rate</td>
<td>This condition occurs if the transmitter cannot successfully range. Ranging is the process that adjusts the satellite transmitter timing and power. The satellite transmitter conducts ranging as needed to ensure that it can communicate with the Network Operation Center. A possible cause is that the transmitter could not achieve enough power to transmit. This is likely caused because the antenna is not accurately pointed. However, it may also be a transmitter power problem. Make sure the power supply is the correct type. See Table 2 on page 20. Also, this condition may be caused by incorrect bit rate mask usage.</td>
</tr>
<tr>
<td>18</td>
<td>The transmitter is requesting a transmit pointing test</td>
<td>This condition can occur during installation when the antenna pointing program requests that the transmitter perform a transmit pointing test. This condition persists until the NOC responds that the transmitter is either actively performing the pointing test or is queued to perform the test when test resources become available in the NOC. This is a normal condition for initial installation. The transmitter may also periodically go into this condition for short periods of time (less than 5 sec) to perform periodic transmit pointing tests. These periodic tests are performed to ensure that the antenna is pointed accurately.</td>
</tr>
<tr>
<td>19</td>
<td>The transmitter is queued for a transmit pointing test</td>
<td>This condition can occur during installation when the antenna pointing software requests a transmit pointing test and the NOC has responded that the transmitter is queued for the next available test time. It may also occur when the transmitter is performing periodic background transmit pointing tests at the same time that other users on the network have requested tests. This is a normal state after initial installation.</td>
</tr>
</tbody>
</table>
| 20   | The transmitter is performing a transmit pointing test                   | This condition occurs when:  
  • During installation, the antenna pointing software requests that the transmitter perform a transmit pointing test. This condition persists until the pointing software exits from the transmit pointing test mode.  
  • The remote terminal performs a periodic background transmit pointing test to make sure that the antenna is still pointed correctly. This periodic test takes less than 5 sec.  
If the problem persists, try restarting the terminal using the Restart link on the System Control Center home page. If this doesn’t correct the problem, unplug the power cord from the power source (or if DC, unplug the input connector from the terminal power supply), wait 30 sec, then plug it back in. |
| 21   | The transmitter is disabled because a transmit pointing test failed      | This condition occurs when the transmitter fails a transmit pointing test. This indicates that the transmitter did not meet the minimum specifications required. This is likely due to an antenna installation problem. The antenna installer needs to fine-point the antenna. The transmitter does not transmit until the transmit pointing test passes. |
### Table 5: Transmit code (TxCode) messages and corrective actions (Continued)

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
<th>Corrective actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>The transmitter is disabled pending a transmit pointing test</td>
<td>This condition occurs when the transmitter is required to perform a periodic background transmit pointing test, but has not been able to perform the test within the time window required. The transmitter is expected to be in this condition for no more than two minutes at random periodic intervals. This condition can also occur after the transmitter is first powered on after it has been powered off for more than a day. If the terminal remains in this condition for more than 2 minutes, then the automated transmit pointing components in the NOC are likely experiencing problems. This condition should clear in a few minutes.</td>
</tr>
<tr>
<td>23</td>
<td>The transmitter is disabled because a transmit pointing test cannot be performed</td>
<td>This condition occurs when the transmitter cannot perform the transmit pointing test when initially installed or when the transmitter is required to range. The condition indicates that the NOC components needed to perform the transmit pointing test are not operational.</td>
</tr>
<tr>
<td>24</td>
<td>The transmit cable is disconnected</td>
<td>This message is displayed if the remote terminal is not able to detect the transmit cable connection. Make sure the transmit cable is securely attached to the remote terminal and to the transmitter on the antenna assembly. (See the Caution statement that follows Figure 8 on page 18.) Inspect the transmit cable and the antenna assembly to make sure they are not damaged.</td>
</tr>
<tr>
<td>25</td>
<td>Uplink reset is in progress</td>
<td>Under certain error conditions, the uplink sequencer needs to be reset. This does not cause the entire VSAT to reset. This uplink reset should happen quickly, but if there are problems with the reset, the terminal shows TxCode 25. If this code persists, contact Installer Support.</td>
</tr>
<tr>
<td>26</td>
<td>No inroute groups support closed loop timing</td>
<td>This is a problem that requires NOC action. If this code persists, contact Installer Support.</td>
</tr>
<tr>
<td>27</td>
<td>The transmit cable and receive cable are switched.</td>
<td>The transmit cable and receive cable are switched. This occurs if the receive cable is connected to the SAT OUT port and the transmit cable is connected to the SAT IN port. Swap the cables.</td>
</tr>
<tr>
<td>28</td>
<td>Danube Synthesizer is locked</td>
<td>This condition occurs during initial startup or when the receiver is locking to the receive signal. It is a temporary condition that may persist for up to 10 seconds. If the problem persists, please contact Technical Support.</td>
</tr>
</tbody>
</table>
The System Information page is shown in Figure 75. The most important items on the page are described in the bulleted list that follows.

- **HN7000S/HN7700S Info section**
  - **Site ID** – Identifies the customer’s site.
  - **SAN** – Identifies the customer’s site account number.
  - **Serial number** – The terminal’s serial number. The terminal’s serial number may be required to troubleshoot.
  - **Software Date** – Software build date.

Note: Print the System Information page and tell the customer to save it. The customer might need it if they cannot access the System Control Center and they need to call Hughes Customer Care or their service provider for assistance.
– Software Release – Version of the software on the remote terminal. This is typically the factory-installed software version. However, if the NOC downloads a newer version of the Gateway software to the remote terminal, the newer version is displayed.
– LAN1 IP Address – The address of the remote terminal.
– LAN1 Subnet Mask – Defines range of addresses assigned to the remote terminal.
– LAN2 IP Address – Address available for HN7700S only, for a second LAN connection.
– LAN2 Subnet Mask – Subnet mask available for HN7700S only, for a second LAN connection.

• Transmit Radio Info section
  – Transmit Radio Wattage – Wattage of the transmit radio. This field may list the transmit radio part number instead of the wattage if the radio was selected during commissioning.

• Satellite section
  – Transmit Path – The path used for transmissions is either Satellite, LAN1/LAN2, or None.
  – Outroute – Primary or secondary outroute.
  – Longitude – Satellite’s longitude.
  – Receive frequency – Transponder frequency configured for the remote terminal.
  – Transmit Polarization – Transmit polarization orientation (horizontal or vertical).
  – 22KHz Tone - The terminal may be switched to a higher or lower frequency band for different types of low-noise blocks (LNBs).
  – Router Address – IP address of the primary router at the NOC used to route data sent by the remote terminal.

• Software Configuration section - Network address translation (NAT), DHCP, Turbo Page, and Firewall features are enabled or disabled as per a customer’s service offering. The customer cannot use the terminal to change these features.
  – Network Address Translation (NAT) – Typically used to allow multiple computers to share a single address on the Internet. It also allows pre-configured remote networks to be integrated easily with the Hughes network.
  – Dynamic Host Configuration Protocol (DHCP) if enabled, simplifies the network configuration of the computers. The
computers just need to be set up to *Obtain IP address automatically*.

- **Firewall** – If enabled, allows the user to specify packet filtering rules.
- **Turbo Page** – If enabled, speeds web browsing.

**Troubleshooting page**

The System Control Center Problem Troubleshooting page, shown in Figure 76 provides access to troubleshooting procedures for some common user problems. This page provides access to a drop-down menu containing a list of common problems from which the user can select.

To display the Troubleshooting page, click **Problem Troubleshooting** on the System Control Center home page; then select the appropriate problem and time that the problem occurred from the drop-down lists.

![Figure 76: Problem Troubleshooting page](image)
Once you have selected the appropriate information, the system attempts to diagnose the problem and offers possible solution advice as shown in Figure 77.

![Figure 77: Problem diagnosis help](image)

**Connectivity test page**

The Connectivity Test page may be used to test the connection between the remote terminal and the NOC. Instructions for executing this test are provided in *Confirming NOC connectivity* on page 121.

**Port forwarding configuration page**

The Port Forwarding Configuration Page (Figure 78) is available only on the HN7700S terminal and is present only if Port Forwarding has been enabled on your terminal by the NOC.

Note: This feature is not available for the HN7000S terminal.
This page allows you to define rules for allowing TCP and User Datagram Protocol (UDP) traffic on the Internet to access servers on your network.

**Defining port forwarding rules**  Follow these steps to use the Port Forwarding Configuration page to define port forwarding rules:

1. Open a Web browser on a computer connected to the HN7700S. You may also use a computer on the LAN if the HN7700S is connected to an Ethernet device, such as a hub or router.
2. Type `www.systemcontrolcenter.com` in the browser’s address bar and press **ENTER**.
3. Click Port Forwarding Configuration on the System Control Center home page or in the left frame of the page you are currently on.
4. Click **Add Rule** on the Port Forwarding Configuration page. See Figure 78.
5. Enter the appropriate values in the following fields: Rule ID, Server IP Address, Server port, and Global port. See Figure 79.

**Figure 78: Port Forwarding Configuration page**

**Figure 79: Entering port forwarding rules**
6. Click the **Protocol Type** drop-down menu and select the appropriate protocol.
7. Click **Save Rule**.

Repeat steps 1 through 7 to define additional rules.

**Help page**

The System Control Center Help page (Figure 81) contains information to help you get started in using the remote terminal, a utility to help you optimize browsing performance, contact information if you need assistance, and other helpful information. Review the Help page information to become familiar with the remote terminal.

To display the Help page:

- Click **View Help Topics** on the System Control Center home page
  or
- Click **Help** on the left side of any System Control Center page.

![Figure 80: Help page](image-url)
Advanced Pages

The Advanced Configuration and Statistics pages, also known as the Advanced Pages, contain a great deal of detailed information about the terminal—such as statistics, logs, status, operating parameters. Figure 81 shows one of the many available Advanced Pages. You may need to access the Advanced Pages to communicate with Installer Support or to configure special features, such as Virtual Private Network Automatic Dial Backup (VADB).

Note: The Advanced Pages provide access to critical configuration parameters and other functions. Do not use these pages unless you are a qualified technician who thoroughly understands how the terminal operates or unless an Installer Support representative instructs you to access the Advanced Pages for troubleshooting purposes.
Accessing the Advanced Pages  You can access the Advanced Pages using either of the following methods:

- On the System Control Center home page, click the small icon shown in Figure 82. (The icon looks like a small cartoon-character man. It is a link to the Advanced Pages.)
- Type 192.168.0.1/fs/advanced/advanced.html in the browser’s address bar and press ENTER.

Expanding and collapsing menus  To expand the Advanced Menu on the left side of the screen to show additional selections, click the + sign next to a menu item. To collapse menu entries, click the – sign next to a menu item.

Opening the Installation sub-menu  Advanced Pages of particular interest to installers are listed in the Installation sub-menu. To open this sub-menu, click + next to Installation.
Chapter 8
Remote terminal LEDs

The LEDs provide information about the remote terminal’s operating status. If the LEDs are not functioning as described in this chapter, refer to Using the terminal LEDs for troubleshooting on page 127.

This chapter describes the following LEDs:

- Front panel LEDs on page 109
- Ethernet port LEDs on page 111

Front panel LEDs

The remote terminal has five LEDs on the front panel, as shown in Figure 83. This section explains what it means when the LEDs are on, off, blinking, or flashing. (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 6 provides additional information about the LEDs and what they indicate.

### Table 6: Remote terminal front panel LED operation

<table>
<thead>
<tr>
<th>LED</th>
<th>Appearance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN</td>
<td>On</td>
<td>The terminal is connected to the computer’s Ethernet card.</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>The terminal is transmitting and/or receiving data.</td>
</tr>
<tr>
<td>Transmit</td>
<td>On</td>
<td>OK.</td>
</tr>
<tr>
<td></td>
<td>Blinking, mostly on</td>
<td>Transmitting data.</td>
</tr>
<tr>
<td></td>
<td>Blinking, mostly off</td>
<td>The terminal is ranging (measuring the distance to the satellite to calibrate transmit timing and transmit power).</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Condition preventing transmission.</td>
</tr>
<tr>
<td>Receive</td>
<td>On</td>
<td>OK.</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Receiving data.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Condition preventing acquisition of outroute (preventing receipt of data).</td>
</tr>
<tr>
<td>System</td>
<td>On (HN7000S and HN7700S)</td>
<td>The terminal has established a connection with the NOC.</td>
</tr>
<tr>
<td></td>
<td>Flashing (HN7700S)</td>
<td>System is operating normally and is connected through Virtual Private Network Automatic Dial Backup (VADB).</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Condition preventing full operation.</td>
</tr>
<tr>
<td>Power</td>
<td>Solid</td>
<td>Power is on and the terminal is functioning normally.</td>
</tr>
<tr>
<td></td>
<td>Flashing</td>
<td>Terminal is operating with the <code>fallback.bin</code> (backup) version of software.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No power.</td>
</tr>
</tbody>
</table>

Shaded cells – Operational problem indicated.
Unshaded cells – Normal operation.

**Startup LED test** Immediately after power-up or reset, all LEDs are on for 1 sec while the terminal performs a self-test. After the self-test, the LEDs should appear as described in the next section, Normal operation.

**Normal operation** When the terminal is powered on and transmitting or receiving data, the LEDs should appear as follows:

- **LAN, Transmit, and Receive LEDs** – *Mostly on, but blinking intermittently* as the terminal receives and transmits data.
- **System LED** – *On*, indicating that the terminal has established communication with the NOC. On an HN7700S, this LED blinks steadily when the HN7700S is connected through VADB.
- **Power LED** – *On*. 
If the LEDs do not function properly as described in this chapter, make sure you have the correct power supply. Refer to Table 2 on page 20 for detailed power supply information.

**Fatal error indication**

After the self-test, if the Power LED is off and one or more of the other LEDs is flashing, the terminal could have a fatal error and may have to be replaced. See *Fatal error indication* on page 128. If the Power LED is flashing but no other LED is flashing, this does not indicate a problem. (See Table 6.)

**Power LED flashing**

If the Power LED flashes, the terminal is operating with a backup version of software named *fallback.bin*. This usually happens when the terminal is first installed. The terminal operates with *fallback.bin* until the primary version of software, *main.bin*, successfully downloads over the satellite link.

**Ethernet port LEDs**

The HN7000S remote terminal has one Ethernet port. The HN7700S has two Ethernet ports. Green and orange LEDs on each port indicate link status and Ethernet mode, as explained in Figure 84.

![Figure 84: Ethernet port LEDs](image)

**Green** indicator:
- **BLINKING** – Valid link to Ethernet device
- **OFF** – Invalid link

**Orange** indicator:
- **ON** – 100BaseT mode
- **OFF** – 10BaseT mode
This chapter provides general troubleshooting procedures.

The following situations and topics are discussed:

- Can access the System Control Center but not the Internet on page 114
- Cannot access the System Control Center on page 125
- Using the terminal LEDs for troubleshooting on page 127
- Problems with connected device other than a computer on page 132
- Troubleshooting other problems on page 134

⚠️ CAUTION
This Installation Guide contains some procedures that instruct you to power cycle the remote terminal, meaning to remove and then re-apply power. To do this, if the terminal uses an AC/DC power supply, disconnect the AC power cord from the power source (power strip, wall outlet, or surge protector). If the terminal uses a DC/DC power supply, disconnect the DC input cable connector from the terminal’s power supply. In both cases (AC/DC or DC/DC), do not unplug the power cord from the back of the remote terminal while it is powered on.
Can access the System Control Center but not 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 the following troubleshooting procedures:

- Confirming that the terminal is commissioned on page 114
- Confirming the receive signal on page 116
- Confirming the transmit signal on page 117
- Confirming that TCP acceleration is operational on page 118
- Confirming that Web acceleration is operational on page 119
- Confirming NOC connectivity on page 121
- Confirming Internet connectivity on page 123
- Checking for viruses and firewall problems on page 125

These procedures are described in the sections that follow.

If you implement a troubleshooting procedure but still cannot access the Internet, proceed to the next procedure.

Access the remote terminal’s System Control Center using a web browser on a computer connected to the remote terminal, as follows:

1. Open a web browser such as Internet Explorer or Netscape.
2. In the browser’s address bar, type
   - www.systemcontrolcenter.com
   - 192.168.0.1
3. Press ENTER.
   The System Control Center home page opens.

Confirming that the terminal is commissioned

Follow these steps to confirm that the remote terminal is commissioned:

1. At the System Control Center, click the System Info link.
   The System Information page appears. See Figure 85 on page 115.
2. In the HN7000S Info box (or HN7700S Info box), check the Site ID line.
   If the numeric site ID appears, the terminal is commissioned.
   Proceed to Confirming the receive signal on page 116.
   If Not Commissioned appears, the remote terminal is not commissioned. Contact Installer Support.
Figure 85: System Information Page

Note: Figure 85 depicts a System Information page for a customer whose terminal was registered with a SAN and PIN. The System Information page for your installation may show different fields and values.
Confirming the receive signal

Follow these steps to confirm that the remote terminal is properly receiving satellite signals:

1. At the System Control Center, click the Reception Info link. The Reception Information page appears. See Figure 86.
2. In the Receive Status field, check the Rx Code.
   - If the Rx Code is Receiver operational (RxCode 5) the remote terminal is receiving signals properly. Proceed to Confirming the transmit signal on page 117.
   - If any other Rx Code appears, the remote terminal is not receiving signals properly. Click the Rx Code. Follow the troubleshooting procedure that appears.

Figure 86: Reception information
Confirming the transmit signal

Follow these steps to confirm that signals are properly transmitted to the satellite:

1. At the System Control Center, click the **Transmission Info** link. The Transmission Information page appears. See Figure 87.
2. In the Transmit Status field, check the Tx Code.
   - If the Tx Code is **Transmitter ready (TxCode 8)** the remote terminal is transmitting signals properly. Proceed to *Confirming that TCP acceleration is operational* on page 118.
   - If any other Tx Code appears, the remote terminal is not transmitting signals properly. Click the Tx Code. Follow the troubleshooting procedure that appears.

Note: The transmit code shown in Figure 87 is an example.

---

![Figure 87: Transmission information](image-url)
TCP Acceleration is a proprietary protocol provided by Hughes. It optimizes performance for TCP/IP-based applications, including faster downloads over satellite.

1. At the System Control Center, click the System Status link.
   The System Status page appears as shown in Figure 88.

![Figure 88: Confirming that TCP Acceleration is operational](image)

2. Check the message in the TCP Acceleration Status field.
   If the message says Operational, TCP Acceleration is enabled and working properly. Proceed to Confirming that Web acceleration is operational on page 119.
   If the message says Disabled, perform the following steps:
   a. Restart the terminal:
      – Go to the System Control Center home page.
      – In the Help section, click Restart HN7000S
         (or Restart HN7700S).
b. If restarting the terminal does not correct the problem, power cycle the terminal:

⚠️ **CAUTION**

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

- Unplug the power cord from the power source. (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
- Wait 30 sec.
- Plug the power cord back into the power source. (If the power source is DC, plug the input cable back into the power supply.)

c. Check the TCP Acceleration Status field again.
- If it is enabled but you still cannot access the Internet, proceed to Confirming that Web acceleration is operational on page 119.
- If TCP Acceleration is still disabled, contact Installer Support for assistance.

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

### Confirming that Web acceleration is operational

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

1. From any System Control Center page, observe the System Status indicator.
   - If the indicator is green, Web Acceleration is functioning normally. If the indicator is yellow, Web Acceleration may not be operational. Continue with step 2.

2. Click the System Status link to access the System Status page as shown in Figure 89.
3. Observe the message in the Web Acceleration Status field. If the message says Operational, Web Acceleration is enabled. Proceed to Confirming NOC connectivity on page 121. If the message says Inactive, Web Acceleration is disabled. Instruct the customer to refer to the Remote Terminal User Guide, Models: HN7000S, HN7700S (1037073-0001) for troubleshooting procedures.
Confirming NOC connectivity

Use the Connectivity Test link 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 90).

![Image of System Control Center](image)

Figure 90: Connectivity Test – Initial page

2. Click Start Test.

The Connectivity Test results page appears (Figure 91).
3. If the connectivity test succeeds but you still cannot access the Internet, ping the router address from your computer.
   If you are not familiar with the ping test, see Verifying the Ethernet connection (ping test) on page 28.
   a. At the System Control Center, click the System Info link.
      The System Information page appears.
   b. Record the router address listed in the HN7000S Info box (or HN7700S Info box).
   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 66.82.158.75, as shown in Figure 63 on page 82, type ping 66.82.158.75.
   g. Press ENTER.
If pinging the router address succeeds but you still cannot access the Internet, skip to Confirming Internet connectivity.

This paragraph applies only if the remote terminal is using a static IP address: If pinging the router address fails, and DHCP is disabled on the terminal, the default gateway address is probably not set correctly in the computer’s operating system settings. The default gateway address should be the remote terminal IP address as displayed on the System Information page HN7000S Info box (or HN7700S Info box), in the LAN1 IP Address field. Check the default gateway address in the computer operating system’s network properties settings; make sure it is the same as the terminal IP address (LAN1 IP Address). Then repeat steps 3a through 3g above.

If the tests still fail:

1. Restart the terminal:
   a. Go to the System Control Center home page.
   b. In the Help section, click Restart HN7000S (or Restart HN7700S).

2. If this does not correct the problem, power cycle the terminal:

   ☢️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

- a. Unplug the power cord from the power source.
   (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
- b. Wait 30 sec.
- c. Plug the power cord back into the power source.
   (If the power source is DC, plug the input cable back into the power supply.)

Confirming Internet connectivity

This section explains how to troubleshoot Internet connectivity issues for customers whose service providers offer Internet connectivity.

1. Open a command prompt on a computer connected to the terminal.
2. Ping the web server:
b. Press `ENTER`.

Note: If you are installing the terminal for an international customer or for a domestic customer who has their own NOC, obtain the address to ping from the customer (don’t ping `www.hughesnet.com`).

If the ping test succeeds, there may be a temporary problem with the web server for 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 step 3.

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 DNS settings*.

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

### Checking DNS settings

Follow the steps below to check the DNS settings on your computer if you can ping the test server but cannot browse the Internet. The steps may vary slightly based on your computer’s operating system, but they may be used as a guideline.

1. On the Windows task bar, click **Start → Run**.
2. Type `command` in the Run window.
3. Click **OK**.
4. Type `ipconfig /all` at the command prompt and press `ENTER`.
5. Locate the DNS addresses in the **DNS Servers** field.
   - For U.S. and Canadian customers, verify that `66.82.4.8` appears in this field.
   - For international customers or domestic customers who have their own NOC, verify that the customer-specific DNS address appears in this field.
6. 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 unable to access a web site after waiting, complete the procedures in *Checking for viruses and firewall problems* on page 125.
If the DNS address is not correct, contact Installer Support for assistance.

**Checking for viruses and firewall problems**

If you have completed all the steps in this section and still cannot browse the Internet, check the computer for viruses. Also check all computers on the same network for viruses. If you find a virus, delete or disable it and try to browse again.

If a firewall is used, make sure none of its settings are blocking access to the Internet or to 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**

Follow these steps if you cannot access the System Control Center:

1. Confirm that the customer’s computer is configured to support DHCP.
   Refer to Appendix A for instructions explaining how to configure a computer to support DHCP.

2. Open a web browser on a computer connected to the remote terminal.

3. In the browser’s address bar, type
   ```
   www.systemcontrolcenter.com
   ```
   or
   ```
   192.168.0.1
   ```

4. Press **ENTER**.
   If the System Control Center does not appear, continue with step 5.

5. Make sure the remote terminal is powered up. The Power and LAN LEDs should be solidly illuminated.

   **Note:** The LAN LED may blink if there is LAN activity.

6. Make sure the DC power cord adapter is securely attached to the remote terminal.

7. If the LEDs are off:
   a. Restart the terminal, power cycle the terminal:

---

⚠️ **CAUTION**

*Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.*
– Unplug the power cord from the power source.
   (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
– Wait 30 sec.
– Plug the power cord back into the power source.
   (If the power source is DC, plug the input cable back into the power supply.)

b. If the LEDs do not turn on after power cycling the terminal, contact Installer Support.
   If the LEDs turn on, continue with step 8.

8. Make sure the Ethernet cable is securely attached to the remote terminal and customer’s computer.
9. Ping the remote terminal:
   a. Open a command prompt or window.
   b. Type `ping 192.168.0.1`.
   c. Press ENTER.
      If the ping test is successful, you should be able to access the System Control Center.

10. If the ping results show request timed out, power cycle the terminal:

    a. Unplug the power cord from the power source.
       (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
    b. Wait 30 sec.
    c. Plug the power cord back into the power source.
       (If the power source is DC, plug the input cable back into the power supply.)

    If you are still unable to access the System Control Center, repeat steps 1 through 10 before contacting Installer Support for assistance.

⚠️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.
Using the terminal LEDs for troubleshooting

This section explains how to use the LEDs to troubleshoot problems. As you follow these procedures, refer to Figure 92 for HN7000S cable connections and Figure 93 for HN7700S connections.

**CAUTION**

The transmit and receive cable connectors must be securely tightened.

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

Note: The remote terminal 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 terminal is not an indication that the cables are adequately tightened.
Make sure the cable connections are tight. See the Caution statement that follows Figure 92 on page 127.

**Fatal error indication** If after power-up or a reset the Power LED is off and one or more of the other LEDs is flashing, the terminal could have a fatal error and may have to be replaced. If you do not see these LED indications, proceed to *All LEDs flashing* on page 129.

If there is a fatal error indication (Power LED off and other LED or LEDs flashing, try power cycling the terminal:

---

**CAUTION**

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

---

1. Unplug the power cord from the power source.
   (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
2. Wait 30 sec.
3. Plug the power cord back into the power source.
   (If the power source is DC, plug the input cable back into the
   power supply.)

The terminal may recover. If the fatal error indication continues,
the terminal must be replaced. Contact Installer Support.

All LEDs flashing
If all LEDs are flashing simultaneously, this is an indication that
the terminal’s firmware is corrupted. A terminal in this state
cannot be recovered. The firmware cannot be re-imaged.

All LEDs off
If all the 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 remote
terminal:
   a. Unplug the power cord from the power source.
      (If the terminal is connected to a DC power source, unplug
      the DC input cable from the terminal’s power supply.)
   b. Wait 30 sec.
   c. Plug the power cord back into the power source.
      (If the power source is DC, plug the input cable back into
      the power supply.)
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 Installer Support.

CAUTION
Do not power cycle the terminal by unplugging the power
cord from the back of the terminal. This could shock you
and/or damage the terminal.

Checking the Power LED
If the Power LED is on, proceed to Checking the LAN LED.

Checking the LAN LED
If the LAN LED is off, perform the following steps:
1. Check that the Ethernet cable is connected to the remote
terminal LAN port and to the computer’s Ethernet port.
2. If the LAN LED is still off, power cycle the terminal:

⚠️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

- Unplug the power cord from the power source.
  (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
- Wait 30 sec.
- Plug the power cord back into the power source.
  (If the power source is DC, plug the input cable back into the power supply.)

3. If the LAN LED is still off, check the Windows Device Manager to see if your computer's NIC is installed correctly.
   a. In Windows 2000, for example, right-click My Computer on the desktop and choose
      Properties → Hardware → Device Manager. A screen appears listing all the devices installed on the computer.
   b. If the NIC is not properly installed, a red X appears next to its listing. Troubleshoot the NIC installation using the manufacturer’s instructions and Windows documentation.
   If the My Computer icon is not available, click Start → Settings → Control Panel → Administrative Tools → Computer Management → System Tools → Device Manager.

4. If the LAN LED is still off after fixing any NIC problems, check the back panel LEDs.
   a. If the Orange LED is on and the front panel LAN LED is not, contact Installer Support for further assistance.
   b. If both the Orange LED and the front panel LAN LED are off, check all network equipment that connects the computer with the remote terminal, including the computer's Ethernet card, Ethernet cable(s) and any switch
or hub. Swap out one or more of the items to isolate the problem.

c. If all the equipment appears to be OK, power cycle the terminal:

\[\text{CAUTION}\]

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

– Unplug the power cord from the power source.
  (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
– Wait 30 sec.
– Plug the power cord back into the power source.
  (If the power source is DC, plug the input cable back into the power supply.)

5. If the LAN LED is still off, follow this step only if the remote terminal is connected to a hub, router, or other network device, (that is, not connected directly to the computer):

Connect the computer directly to the terminal (to bypass the network device) as follows:

a. Locate the cable that connects the computer to the network device.
b. Disconnect the cable end that connects to the network device.
c. Connect this cable to the terminal’s LAN port.
   The computer should now be connected directly to the computer.
d. Check the terminal’s LAN LED.
e. 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, contact the manufacturer of the network device for assistance.
   If the LAN LED is off, go to step 6.

6. If the LAN LED is still off, try connecting the remote terminal to another computer.

If the Power and LAN LEDs are on, the problem is with the customer’s computer. If they are off, contact Installer Support.
Problems with connected device other than a computer

If a device other than a computer is connected to the terminal, the System Control Center is probably never accessible. However, you can troubleshoot using the following LED conditions:

- Transmit LED is off
- Receive LED is off
- System LED is off

Transmit LED is off

If the remote terminal is not operating normally and the transmit LED is off, follow these steps:

1. Check all cable connections from the remote terminal to the outdoor satellite antenna, and tighten any connections that seem loose.
   (See the Caution statement that follows Figure 92 on page 127.)

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

Note: The remote terminal 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 terminal is not an indication that the cables are adequately tightened.

Receive LED is off

If the remote terminal is not operating normally and the receive LED is off, follow these steps:

1. Check all cable connections, from the remote terminal to the outdoor satellite antenna, and tighten any connections that seem loose.
   (See the Caution statement that follows Figure 92 on page 127.)

2. If the LED is still off, restart the terminal:
   a. Go to the System Control Center home page.
   b. In the Help section, click Restart HN7000S (or Restart HN7700S).

Note: The remote terminal 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 terminal is not an indication that the cables are adequately tightened.
3. If the LED is still off, power cycle the terminal:

⚠️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

- a. Unplug the power cord from the source.
   (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
- b. Wait 30 sec.
- c. Plug the power cord back into the power source.
   (If the power source is DC, plug the input cable back into the power supply.)

If the problem persists, contact Installer Support.

Note: Often, if the Receive LED is off, the other LEDs may not be on either.

System LED is off

If the System LED is not on, 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 terminal:

⚠️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

- a. Unplug the power cord from the power source.
   (If the terminal is connected to a DC power source, unplug the DC input cable from the terminal’s power supply.)
- b. Wait 30 sec.
- c. Plug the power cord back into the power source.
   (If the power source is DC, plug the input cable back into the power supply.)
If the problem persists, contact Installer Support.

**Troubleshooting other problems**

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

**Hot cable connector**

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

1. Remove power from the terminal by unplugging the power supply's AC power cord from the surge protector or AC outlet.
2. Allow the cable connector to cool for at least 5 min.
3. Make sure the connector feels cool.
4. Make sure the cable connector is finger tight with no play. (See the Caution statement that follows Figure 92 on page 127.)
5. Reapply power to the terminal by plugging the power supply cord into the surge protector or AC outlet. A surge protector is recommended.
6. Wait 5 min.
7. Check the connector.
   - If the connector is hot, it may be defective and should be replaced.

**Slow transmission speed or intermittent operation**

If you notice that the terminal’s transmission speed is slow or that operation is intermittent, make sure the transmit and receive cable connectors are finger tight. (See the Caution statement that follows Figure 92 on page 127.)
Appendix A

Configuring a computer to support DHCP

This appendix explains how to configure a computer to support Dynamic Host Configuration Protocol (DHCP). All HN7000S and HN7700S remote terminals come from the factory with DHCP enabled. Therefore, the computer must have DHCP enabled and set to obtain IP addresses automatically.

This appendix covers the following topics:

- Windows Vista on page 135
- Windows XP on page 138
- Windows 2000 on page 141
- Windows 98SE and Me on page 143

Windows Vista

1. From the Windows desktop, select Start → Settings → Network Connections.
A list of network adapters appears as shown in Figure 97. The Local Area Connection-NIC Card must appear under the LAN
or High-Speed Internet heading. If it does not, the network is not installed correctly.

![Network Connections - Windows Vista](image)

**Figure 94: 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 that represents the terminal network connection, then click **Properties**. The Local Area Connection-NIC Card Properties dialog appears as shown in Figure 95.

Note: Depending on your security settings, a popup User Account Control message may appear, requesting that you confirm the action before proceeding. Click **Continue** to proceed.
3. Ensure that Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown in the figure. If NetBEUI is installed, uninstall it.
4. Highlight the appropriate Internet Protocol (TCP/IP) connection. Be careful not to uncheck the checkbox.
5. Click **Properties**. The Internet Protocol Properties dialog appears as shown in Figure 96.

Figure 95: Local Area Connection Properties - Windows Vista

Figure 96: Internet Protocol Properties - Windows Vista
6. Ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected. If not, select them.
7. Click OK to close the dialog boxes and finish the configuration.
8. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.

Windows XP

1. From the Windows desktop, select **Start → Settings → Control Panel**. 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 97. The **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 97: Network Connections - Windows XP](image-url)
2. Right-click the Local Area Connection icon that represents the Network adapter connecting the computer to the Satellite Gateway, and select Properties.

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. Ensure that Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown in Figure 98. If NetBEUI is installed, uninstall it.

![Figure 98: Local Area Connection Properties - Windows XP](image)

4. Highlight Internet Protocol (TCP/IP). Be careful not to uncheck the check box.
5. Click **Properties**. The Internet Protocol Properties dialog appears as shown in Figure 99.

![Internet Protocol Properties - Windows XP](image)

Figure 99: Internet Protocol Properties - Windows XP

6. Ensure that both the Obtain an IP address automatically and Obtain DNS server address automatically options are selected. If not, select them.

7. Click **OK** to close the dialog boxes and finish the configuration.

8. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.
1. From the Windows desktop, select **Start** → **Settings** → **Control Panel** and double-click **Network and Dial-up Connections**.

A list of network connections appears as shown in Figure 100. The **Local Area Connection** icon must appear on the page. If it does not, the network is not installed correctly.

![Network and Dial-up Connections - Windows 2000](image1)

Figure 100: Network and Dial-up Connections - Windows 2000

2. Right-click the **Local Area Connection** icon that represents the terminal network connection and select **Properties** from the popup menus. The **Local Area Connections Properties** window appears as shown in Figure 101.

![Local Area Connection Properties - Windows 2000](image2)

Figure 101: Local Area Connection Properties - Windows 2000
3. Ensure that Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked. If NetBEUI is installed, uninstall it.

4. Select Internet Protocol (TCP/IP). Be careful not to uncheck the check box.

5. Click Properties. The Internet Protocol Properties window appears as shown in Figure 102.

![Internet Protocol Properties - Windows 2000](image)

Figure 102: Internet Protocol Properties - Windows 2000

6. Ensure that both Obtain an IP Address Automatically and Obtain DNS Server Address Automatically are selected. If not, select them.

7. Click OK to close the dialog boxes and finish the configuration.

8. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.
Windows 98SE and Me

1. From the Windows desktop, select **Start → Settings → Control Panel**, then double-click **Network**. See Figure 103.

![Control Panel - Windows 98SE and Me](image)

**Figure 103: Control Panel - Windows 98SE and Me**

Note: On computers running on Windows Me, choose **View All Control Panel Options** to see the Network icon.

A list of network components appears as shown in Figure 104.
2. Select the TCP/IP entry associated with the Network Interface Card (NIC), then click **Properties**. The TCP/IP Properties window appears as shown in Figure 105.
3. On the IP Address tab, select the **Obtain an IP address automatically** radio button.

4. Select the Gateway tab. Remove any installed gateways by selecting them and clicking **Remove**. See Figure 106.

![Gateway tab - Windows 98SE and Me](image)

**Figure 106: Gateway tab - Windows 98SE and Me**

5. Select the **Disable DNS** radio button on the DNS Configuration tab.

6. Click **OK** to accept the updates for the TCP/IP properties.

7. Click **OK** to close the list of network components. Windows may request the installation CD-ROM to complete updating the TCP/IP settings.

8. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.
Appendix B

Updating the remote terminal software

This appendix explains how to use the Fallback Updater utility to update the remote terminal `fallback.bin` file with the current software release. Use the procedures in this appendix only when instructed to do so by Hughes.

Before updating the `fallback.bin` file and installing the remote terminal, you must first copy the Fallback Updater utility to the installer laptop. The utility is distributed to installers in an e-mail message and is also available for download from the Hughes installation support web site. Contact Installer Support for the web site address, if necessary.

This appendix covers the following topics:

- Saving the utility on the installer laptop on page 147
- Configuring TCP/IP properties on the installer laptop on page 148
- Updating the `fallback.bin` file on page 158
- Troubleshooting on page 159

Saving the utility on the installer laptop

Follow these steps to save the Fallback Updater utility on the installer laptop:

1. Obtain the self-extracting file containing the utility and its supporting files from either the e-mail message or the installation support web site.
2. Copy the self-extracting file to the installer laptop.
3. Open the self-extracting file. The Self Extractor dialog appears as shown in Figure 107.

![Figure 107: Saving the Fallback Updater utility](image)

4. Use the **Browse** button to select a location in which to unzip and save the utility and its supporting files.

Note: Make a note of the location in which the utility and its supporting files are saved. You will need to know the location of these files to use the utility.

5. Click **Unzip**.

---

**Configuring TCP/IP properties on the installer laptop**

Before using the Fallback Updater utility, you must first manually configure the TCP/IP properties on the installer laptop. This section explains how to configure TCP/IP properties for Windows Vista, Windows XP, Windows 2000, Windows 98 Second Edition (SE), and Windows Millennium Edition (Me) operating systems.

Note: You must connect your installer laptop to the remote terminal with an Ethernet cable before configuring TCP/IP properties.

**Windows Vista**

1. Connect the installer laptop to the remote terminal with an Ethernet cable.
2. From the Windows desktop on the installer laptop, select **Start → Settings → Network Connections**.
   - A list of network adapters appears as shown in Figure 108.
   - 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.

3. Right-click the Local Area Connection-NIC Card icon that represents the terminal network connection and select Properties. The Local Area Connection-NIC Card Properties dialog appears as shown in Figure 109.

Note: Depending on your security settings, a popup User Account Control message may appear, requesting that you confirm the action before proceeding. Click Continue to proceed.
4. Ensure that Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown in the figure. If NetBEUI is installed, uninstall it.

5. Highlight the appropriate Internet Protocol (TCP/IP) connection. Be careful not to uncheck the check box.

6. Click Properties. The Internet Protocol Properties dialog appears as shown in Figure 110.

7. Select Use the following IP address.
8. Type **192.168.0.2** in the IP address field.
9. Type **255.255.255.252** in the Subnet mask field.

Note: You do not need to enter information in the Default gateway, Preferred DNS server, or Alternate DNS server fields.

10. Click **OK**.
11. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.

**Windows XP**

1. Connect the installer laptop to the remote terminal with an Ethernet cable.
2. From the Windows desktop on the installer laptop, select **Start → Settings → Control Panel**, then 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 111. The 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 111: Network Connections - Windows XP

3. Right-click the Local Area Connection icon that represents the Network adapter connecting the computer to the remote terminal and select Properties.

Note: If a red X appears next to the Local Area Connection icon, check your connections. You cannot successfully configure TCP/IP properties if the red X is present.
4. Ensure that Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked as shown in Figure 112. If NetBEUI is installed, uninstall it.

Figure 112: Local Area Connection Properties - Windows XP

5. Select Internet Protocol (TCP/IP). Be careful not to uncheck the check box.

6. Click Properties. The Internet Protocol Properties dialog appears as shown in Figure 113.

Figure 113: Internet Protocol Properties - Windows XP
7. Select Use the following IP address.
8. Type 192.168.0.2 in the IP address field.
9. Type 255.255.255.252 in the Subnet mask field.

Note: You do not need to enter information in the Default gateway, Preferred DNS server, or Alternate DNS server fields.

10. Click OK.

11. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.

Windows 2000

1. Connect the installer laptop to the remote terminal with an Ethernet cable.

2. From the Windows desktop on the installer laptop, select Start → Settings → Control Panel, then double-click the Network and Dial-up Connections icon. A list of network adapters appears as shown in Figure 114. A Local Area Connection icon must appear on the page. If it does not, the network is not installed correctly.

3. Right-click the Local Area Connection icon that represents the network adapter connecting the computer to the remote terminal and select Properties. The Local Area Connections Properties window appears as shown in Figure 115.
4. Ensure that Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked. If NetBEUI is installed, uninstall it.

5. Select Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.

6. Click Properties. The Internet Protocol Properties window appears as shown in Figure 116.
7. Select Use the following IP address.
8. Type 192.168.0.2 in the IP address field.
9. Type 255.255.255.252 in the Subnet mask field.

Note: You do not need to enter information in the Default gateway, Preferred DNS server, or Alternate DNS server fields.

10. Click OK.
11. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.

Windows 98 SE and Me
1. Connect the installer laptop to the remote terminal with an Ethernet cable.
2. From the Windows desktop on the installer laptop, select Start → Settings → Control Panel, then double-click Network as shown in Figure 117.

![Control Panel - Windows 98SE and Me]

Note: For computers running on Windows Me, choose View All Control Panel Options to see the Network icon.
A list of network components appears as shown in Figure 118.

![Network window - Windows 98SE and Me](image)

Figure 118: Network window - Windows 98SE and Me

3. Select the TCP/IP entry associated with the installer laptop Network Interface Card (NIC) and click Properties. The TCP/IP Properties window appears as shown in Figure 119.

![TCP/IP Properties - Windows 98SE and Me](image)

Figure 119: TCP/IP Properties - Windows 98SE and Me

4. On the IP Address tab, select Specify an IP address.
5. Type **192.168.0.2** in the IP Address field.
6. Type **255.255.255.252** in the Subnet Mask field.
7. Click **OK**.
8. Restart the computer even if Windows does not require you to do so. This ensures that the network settings are automatically reset.

### Updating the fallback.bin file

Follow the steps below to update the `fallback.bin` file. During this process, the files containing the current software release are transferred to the remote terminal, overwriting the older files.

1. Confirm that the installer laptop Ethernet cable is connected to the remote terminal by performing a ping test:
   a. Open a DOS command window on the installer laptop PC.
   b. Type `ping 192.168.0.1`.
   c. Press **ENTER**.

   If the ping test is successful, continue with step 2. If the ping test fails, refer to *Troubleshooting* on page 159.

2. Navigate to the location on the laptop where you previously saved the Fallback Updater utility and its supporting files in Step 4 of *Saving the utility on the installer laptop* on page 147.

3. Launch the Fallback Updater utility by opening the `hughes_updater.exe` file.

4. Type `192.168.0.1` in the IP address field on the Fallback Updater window as shown in Figure 120. This is the remote terminal’s IP address.

![HUGHES Fallback Updater](image)

Figure 120: Entering the remote terminal's IP address

5. Click **OK**.

During the update process, status messages will appear in the message window between the address field and the **OK** button. When the update is complete, the utility automatically closes and the remote terminal reboots.

Refer to *Troubleshooting* on page 159 if the utility does not automatically close or the remote terminal fails to reboot.
Troubleshooting

Perform these troubleshooting procedures if you are unable to update the *fallback.bin* file using the Fallback Updater utility:

1. Observe the message in the Fallback Updater window. Continue with step 2 if one of the following messages appears in the message window:
   - Waiting for remote to come up...
   - Unable to get login prompt

2. Test LAN connectivity between the installer laptop and remote terminal by performing a ping test:
   a. Open a DOS command window on the installer laptop.
   b. Type `ping 192.168.0.1`.
   c. Press ENTER.
   If the ping test fails, verify that the Ethernet cable is securely attached to the installer laptop and remote terminal. If the test still fails, continue with step 3.

3. Verify that the installer laptop has an IP address of 192.168.0.2.
   If the address is incorrect or blank, refer to *Configuring TCP/IP properties on the installer laptop* on page 148 for instructions on how to assign an IP address.

4. After verifying that the installer laptop is connected to the remote terminal and its TCP/IP properties are properly configured, restart the remote terminal:
   a. Navigate to the System Control Center home page.
   b. In the Help section, click *Restart HN7000S* (or *Restart HN7700S*).

5. If this does not correct the problem, power cycle the remote terminal:
   a. Unplug the power cord from the power source.
   b. Wait 30 sec.
   c. Plug the power cord back into the power source.

6. Restart the Fallback Updater utility and repeat the instructions in *Updating the fallback.bin file* on page 158.

⚠️ CAUTION

Do not power cycle the terminal by unplugging the power cord from the back of the terminal. This could shock you and/or damage the terminal.

   a. Unplug the power cord from the power source.
   b. Wait 30 sec.
   c. Plug the power cord back into the power source.

6. Restart the Fallback Updater utility and repeat the instructions in *Updating the fallback.bin file* on page 158.
7. If you are unable to update the `fallback.bin` file on the remote terminal after completing steps 1 through 6, contact Installer Support.
Appendix C

Disabling a web browser’s proxy connection

This appendix explains how to configure Internet Explorer and Netscape web browsers not to connect to the Internet through a proxy server. The procedures may be used to configure the browser on your installer laptop PC or the customer’s computer.

Users should be aware that it is rare to enable a proxy server. Most users disable proxy servers.

This appendix covers the following topics:

- Internet Explorer on page 161
- Netscape on page 163

Internet Explorer

To disable the proxy connection if you are using Internet Explorer:

1. Turn the computer on.
2. Open Internet Explorer.
3. Select Tools → Internet Options.
4. Select the Connections tab as shown in Figure 121.

![Figure 121: Selecting the Connections tab]

5. Click **LAN Settings** to access the dialog box shown in Figure 122.

![Figure 122: Accessing LAN settings]

6. Click to remove the check mark from the box next to **Use a proxy server for your LAN**.

7. Click **OK**.

8. Close Internet Explorer.

9. Relaunch Internet Explorer to enable the changes.
To disable the proxy connection if you are using Netscape:
1. Turn the computer on.
2. Open Netscape.
3. Select Edit → Preferences to access the Preferences window shown in Figure 123.

![Figure 123: Accessing proxy settings: Netscape](image)

4. In the Category window, select Advanced → Proxies.
5. Select Direct connection to the Internet.
6. Click OK.
7. Close Netscape.
8. Relaunch Netscape to enable the changes.
Appendix D

Conformance with standards and directives

The HN7000S and HN7700S remote terminals have been certified to conform to the standards shown in Table 7. Additional information follows the table.

Table 7: HN7000S and HN7700S standards compliance

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard</th>
<th>HN7000S</th>
<th>HN7700S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety standards</td>
<td>UL60950-1 for the United States</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>CAN/CSA-C22.2 No. 60950-1 for Canada</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>(See additional information below.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EN60950-1 for the European Union</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Electromagnetic interference (EMI)</td>
<td>FCC Part 15 for the United States</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>standards</td>
<td>(See additional information below.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ICES-003 for Canada</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Electromagnetic compatibility (EMC)</td>
<td>EN301-489-12 for the European Union</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>standards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecommunications standards</td>
<td>TIA IPoS (See additional information below.)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>FCC Part 68 for the United States</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>(See additional information below.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CS-03 standard for Canada</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>TBR-21 and CTR-21 standards for the European Union</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Safety – operating conditions for Canada

In addition to the warnings and safety guidelines listed in this document, the following operating conditions apply to the HN7000S and HN7700S remote terminals used in Canada:

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

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

Repairs in Canada

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

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

⚠️ CAUTION

Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.
Electromagnetic compatibility (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 and configuration guide must be followed to ensure compliance with these standards.

⚠️ CAUTION

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 HN7000S and HN7700S remote terminals.

Standards to which Conformity is declared: FCC Part 15

This device 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 Systems, LLC
Address: 11717 Exploration Lane, Germantown, MD 20876
Telephone: 1-866-347-3292
Trade Name: HUGHES
Type of Equipment: Two-Way Hughes System
Model Numbers:
HN7000S (1500097-xxxx and 1036599-xxxx)
HN7700S (1500139-xxxx)
The Two-Way Hughes System (HN7000S and HN7700S) complies with the Canadian ICES-003, Class B standard.
Canada Class B warning  This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme 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.

Telecommunications standards  This section explains compliance with the IP over Satellite standard (IPoS) and FCC Part 68.

IPoS  The Hughes 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.

FCC Part 68  This section applies to the HN7700S remote terminal only.

Standards to which Conformity is declared: FCC Part 68

Part 68 Compliance -- This equipment (Two-Way Hughes System: Model Number: HN7700S) complies with Part 68 of the FCC rules and requirements adopted by the ACTA. On the rear panel of this equipment is a label that contains, among other information, the product part number (P/N) in the format XXXXXXXX-XXXX and an eight digit Electronic Serial Number (ESN). If requested, this information must be provided to the Telephone Company.

The Two-Way Hughes system needs to be installed according to the instructions. Coaxial cables (Rx and Tx) need to be grounded at the point of entry. A plug and jack used to connect this equipment to the premises wiring and telephone network must
comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant 26 Gauge telephone cord and modular plug is provided with this product. It is required to be terminated with a plug type 605 or a FCC plug type 6 position for Australia.

⚠️ CAUTION

To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord.

Ringer equivalence number (REN)  This section applies to the HN7700S remote terminal only.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the local Telephone Company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:5L4DT##B1032021.

The digits represented by the ## are the REN without the decimal point (e.g., 00 is a REN of 0.0). For earlier products, the REN is separately shown on the label.

Discontinuance of service  This section applies to the HN7700S remote terminal only.

If the Two-Way Hughes System causes harm to the telephone network, the Telephone Company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn’t practical, the Telephone Company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

If phone service is discontinued and you believe it is due to the HN7700S terminal, please contact Hughes Customer Care or your service provider.

Telephone Company changes  This section applies to the HN7700S remote terminal only.

The Telephone Company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the Telephone
Company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted service.

**Repairs in the United States**

If trouble is experienced with the Two-Way Hughes System equipment, for repair or warranty information, contact your service provider.

If the equipment is causing harm to the telephone network, the Telephone Company may request that you disconnect the equipment until the problem is resolved.

Hughes must make any necessary repairs to the modem portion of this equipment in order to maintain valid FCC registration. Do not attempt to repair or service your remote terminal. Return it to Hughes.

No repairs can be made by customers. All repairs must be done by a Hughes authorized service center. This equipment cannot be used on public coin service provided by the Telephone Company. Connection to Party Line Service is subject to state tariffs. Contact the state public utility commission, public service commission or corporate commission for information.

**Canada – equipment attachment limitations**

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirement Documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Note: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation IC before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Before installing this 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 might not prevent degradation of service in some situations.
## Acronyms and abbreviations

**A**
- AC – Alternating current
- ACP – Automatic cross-polarization
- ACS – Auto-commissioning server
- ATM – Automatic teller machine
- AWG – American Wire Gauge

**C**
- C – Celsius
- CD – Compact disc
- CD-ROM – Compact disk - read only memory

**D**
- DC – Direct current
- DCE – Data communication equipment
- DHCP – Dynamic Host Configuration Protocol
- DNS – Domain Name System
- DTE – Data terminal equipment

**E**
- EMC – Electromagnetic compatibility
- EMI – Electromagnetic interference
- ESN – Electronic serial number
- EU – European Union

**F**
- FCC – Federal Communications Commission
- ft – Foot

**H**
- HTTP – HyperText Transfer Protocol

**I**
- ID – Identification
- IP – Internet Protocol
- IPoS – IP over Satellite standard
- ITU-T – Union-Telecommunication Standardization Sector

**K**
- kg – Kilogram

**L**
- lb – Pound
- LED – Light-emitting diode
- LNB – Low-noise blocks

**M**
- max. – Maximum
- Mbyte – Megabyte
- MHz – Megahertz

**N**
- NAT – Network address translation
- NIC – Network interface card
- NOC – Network Operations Center

**O**
- OPI – Outdoor pointing interface
PC – Personal computer
PIN – Personal identification number
POP – Point of Presence
PSTN – Public switched telephone network

R&TTE – Radio Equipment and
Telecommunications Terminal Equipment
REN – Ringer equivalence number
Rx – Receive

SAN – Site account number
SBC – Satellite based commissioning

TCP – Transmission Control Protocol
Tx – Transmit

U.S. – United States

VAC – Volt. alternating current
VADAB – Virtual Private Network Automatic Dial Backup
VAR – Value added reseller
VPN – Virtual Private Network

ZIP – Zone Improvement Plan
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