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DiREcWAY[®]

User Guide
DW6000 High-Speed Internet Modem
(International Version)

1034405-0001
Revision A
October 8, 2003

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Safety information

Notes, cautions, and warnings, defined as follows, are used throughout this guide to help you become familiar with possible safety and equipment hazards.

 DANGER
 Indicates an imminent shock hazard that, if not avoided, will result in death or severe personal injury caused by electric shock.
 WARNING
 Indicates a shock hazard or unsafe practice that, if not avoided, could result in death or severe personal injury.
 DANGER
 Indicates an imminent hazard or unsafe practice that, if not avoided, will result in death or severe personal injury.
 WARNING
 Indicates a hazard or unsafe practice that, if not avoided, could result in death or severe personal injury.
 CAUTION
 Indicates a hazard or unsafe practice that might result in moderate or minor personal injury.
CAUTION
Indicates a hazard or unsafe practice that might result in property damage.

Note: A note presents additional information.

Declaration of Conformity

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, Inc.

Address: 11717 Exploration Lane, Germantown, MD 20876

Telephone: 1-866-DIRECWAY (347-3292)

Trade Name: HUGHES, DIRECWAY

Type of Equipment: Two-Way DIRECWAY System

Model Numbers: DW6002 (1032021-0002) DW6000 (1032021-0001)

The Two-Way DIRECWAY System (DW6002 and DW6000) complies with the Canadian ICES-003, Class B standard.

For DW6002

Standards to which Conformity is declared: FCC Part 68

Part 68 Compliance -- This equipment (Two-Way DIRECWAY System: Model Numbers: DW6002) 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, a product identifier in the format US:5L4DT00B1032021. If requested, this information must be provided to the Telephone Company.

The Two-Way DIRECWAY 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.

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.

If the Two-Way DIRECWAY 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.

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.

If trouble is experienced with the Two-Way DIRECWAY System equipment, for repair or warranty information, please contact

DIRECWAY Technical Support

Address: 11717 Exploration Lane, Germantown, MD 20876

Web: <http://www.mydirecway.com>

(To send an e-mail, login to your user account on this Web site and then navigate to the Email page.)

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 Network Systems 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 modem. Return it to Hughes Network Systems.

No repairs can be made by customers. All repairs must be done by Hughes Network Systems Authorized Service Centers (ASCs). 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.

The DW6002 complies with the following telecom standards:

- FCC Part 68 standard for North America
- CTR-21 standard for Europe
- AS/ACIF S002 standard for Australia
- CS-03 standard for Canada

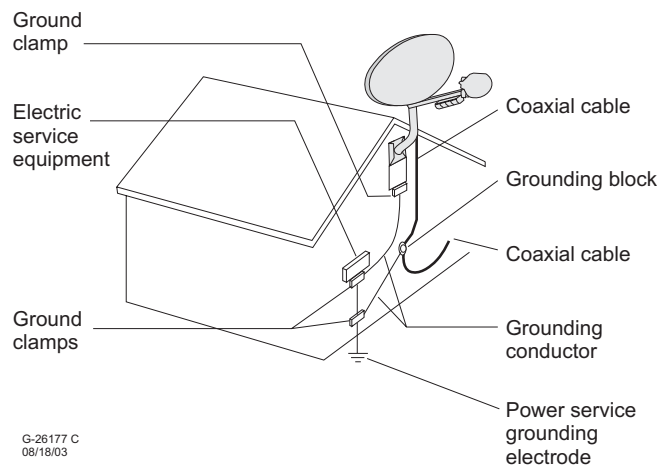
Telephone cord and the plug must be compliant with the corresponding telecom standard in a specific country/continent.

Satellite Dish Antenna Grounding

The outdoor satellite dish antenna used to receive satellite signals and the cable used to connect the satellite dish antenna to the indoor receiving unit are required to comply with local installation codes and the appropriate sections of the National Electric Code (NEC) and in particular Article 810-15, which covers proper installation and grounding of television receiving equipment, as well as to Article 820-33, which specifies that the satellite dish antenna cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical. These codes require proper grounding of the metal structure of the outdoor satellite dish antenna and grounding of the connecting cable at a point where it enters the house (or other building). If you are having a professional installer perform the installation, the installer must observe installation codes. This manual contains instructions on how to make the installation in compliance with the NEC. If additional local installation codes apply, contact local inspection authorities.

Example of Antenna Grounding according to the National Electrical Code instructions contained in "Radio and Television Equipment"

Note: The DIRECWAY Receiver must be grounded through the satellite/ local antenna cable before plugging into the power source, and it must remain grounded thereafter.



Document Serial Number: 0079

DECLARATION OF CONFORMITY

Application of Council Directives:

RTTE Directive: 99/5/EC
Low Voltage Directive: 73/23/EEC with 93/68/EEC
EMC Directive: 89/336/EEC

Standards to which Conformity is declared:

Radio Spectrum (Art. 3.2): EN 301-428, V 1.2.1: 2001
EMC (Art. 3.1b): EN 301-489-12, V1.2.1: 2003
Safety (Art. 3.1a): EN 60950-1:2001
Health (Art. 3.1a): DIN VDE 0848-1:2000; FCC OET Bulletin No. 65: 1997

HNS Conformity Assessment Reports:

Radio Spectrum: HNS-29080
EMC: HNS-29075
Safety: HNS-29073
Health: HNS-24917
Telecom: HNS-29079

Product(s): Two-Way DIRECWAY System [VSAT Product Category]

Model Numbers: See Attached.
Serial Number: All
Year of Start Manufacture: 2003
Manufacturer's Name: Hughes Network Systems
Manufacturer's Address: 11717 Exploration Lane, Germantown, Maryland, USA 20876
Importer's Name: Hughes Network Systems
Importer's Address: Saxon Street, Linford Wood, Milton Keynes, United Kingdom MK14 6LD

The conformity assessment has been done by the following locations:

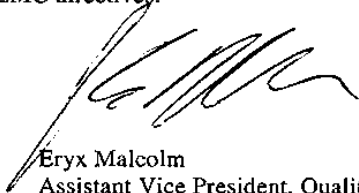
- Washington Laboratories, LTD, 7560 Lindbergh Drive, Gaithersburg, MD 20879, USA
- CETECOM ICT Services GmbH, Department: Radio/Satellite Communications, Untertuerkheimer Strasse 6-10, D-66, 117, Saarbruecken, Germany

The product carries the CE Mark:



I hereby declare that the above named product is in conformity to all essential requirements of R&TTE, Low Voltage and EMC directives.

Signature:


Eryx Malcolm
Assistant Vice President, Quality
Hughes Network Systems

Place: Germantown, Maryland
Date: August 12, 2003

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Document Serial Number: 0079

Table 1. IDU and Radio Assembly configurations

Item	Model Name	HNS Part Number
Tx/Rx IDU	IDU Model: DW6002	1032021
Tx/Rx IDU	IDU Model: DW6000	1032021
Radio Assembly #1	ISIS Radio Assembly ISIS Transmitter TRIA LNB Vertical Pol. Kit	1032009 1031106 1032353 1030923 1033809
Radio Assembly #2	ISIS-TG1 Radio Assembly ISIS Transmitter TRIA LNB MUX Kit Diplexer	1032552 1031106 1012440 1024572 1033270 1032688
Radio Assembly #3	ISIS-TG2 Radio Assembly ISIS Transmitter TRIA LNB	1032552 1031106 1012440 1024572
Radio Assembly #4	Tigris Radio Assembly TRIA LNB	1025901 1012440 1024572
Radio Assembly #5	Chinnon Radio Assembly Chinnon Transmitter TRIA LNB	1030731 1029635 1030766 1024572
LNB(s)	Intelsat America Eutelsat, Asiasat, Arabsat All bands	1024572 1024572 1024572 1030923
Transmitter	Extended Ku-Band ISIS	1031106
Delta 64W Power Supply	ADP-64AB B	1031105
Lead Year 64W Power Supply	ADP-0641-M2	1031105

Table 1. Antenna System

Reflector Size (m)	Reflector Shape	Manufacturer	Type Series
0.74	Elliptical Parabolic	Prodclin	1740-13x 1740-14x
0.74	Elliptical Parabolic	Prodclin HNS part no.	1032990-xxxx
0.89	Parabolic	Prodclin	1891-xxx 1892-xxx
0.98	Parabolic	Prodclin	1981-99x 1982-99x
1.2	Parabolic	Prodclin	1132-99x 1134-99x
1.2	Parabolic	Channel Master	124
1.8	Parabolic	Prodclin	1194-99x

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Congratulations on your purchase of a DIRECWAY® DW6000! After your unit has been professionally installed, you will be able to click on a browser and surf the Internet. You will also be able to operate a local area network (LAN) after you configure your computers with network interface cards (NICs), connect them with Ethernet cable or via a wireless base station, and configure your computers' operating system network properties.

The DW6000 DIRECWAY System Control Center provides system information, such as your Site ID, DW6000 IP (Internet Protocol) address, and subnet mask, that is necessary for configuring your network. It also provides help files. The System Control Center is explained in Chapter 2 – *The DIRECWAY System Control Center*, on page 7.

Note: The instructions in this manual also apply to the enterprise-class DW6002. The DW6002 includes all DW6000 functionality in addition to being equipped with an internal telephone modem. The model number is on the back of the unit.

Contact information

Should you have questions about your installation or DW6000, contact your service provider.

System requirements

If your DW6000 seems to not be working optimally, check that your computer system meets the following requirements.

- Operating system
 - PC: Windows 98 SE, Windows Me, Windows 2000, Windows XP
 - MAC: 9.0 - 10.2 (excludes 10.0)
- Processor
 - PC: Pentium II 333 Mhz or faster
 - MAC: 300 Mhz or faster
- Memory
 - PC: 64MB RAM, Windows 98SE and Me; 128MB RAM Windows 2000 and XP.
 - MAC: 128MB
- Free hard drive space
 - PC: 100MB
 - MAC: 150MB

DW6000 components

Relocating the DW6000

Your DIRECWAY System was completely assembled by the professional installer. Should you need to move the DW6000 to another location, you would not have to disassemble it. You would simply disconnect the receive, transmit, and Ethernet cables and unplug it from the power strip or surge protector. Then move it to the new location and reconnect all the cables as shown in Figure 1.

Be aware that if you move the DW6000 you may have to reroute, or add to, the coaxial cable that runs from the ground block near the satellite antenna to where the DW6000 is installed. Check the cable requirements in the satellite antenna installation manual for your satellite antenna before you do this.

You may not service the coaxial cable that runs from the ground block to the satellite antenna, or the satellite antenna itself. Only certified professional installers are allowed to do that.

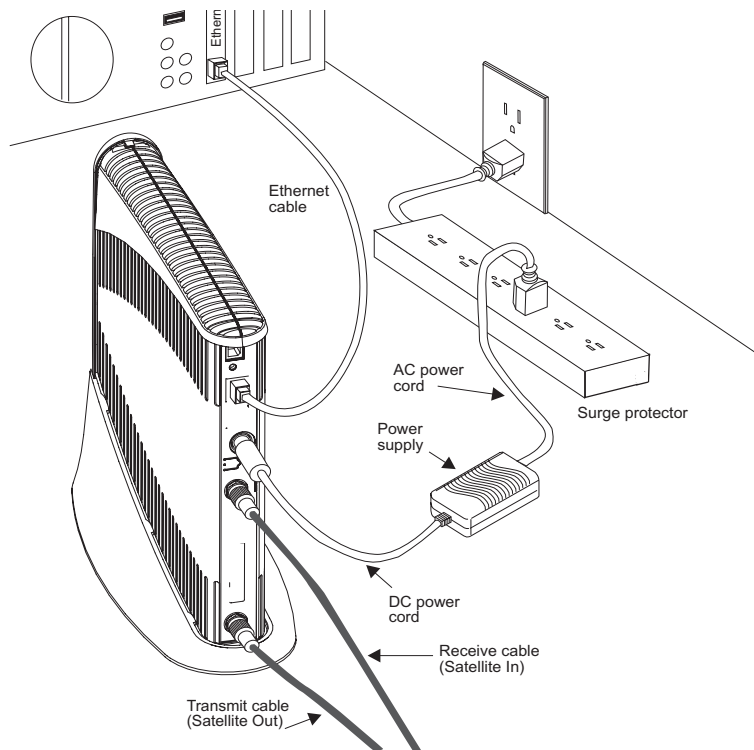


Figure 1: DW6000

Preventative maintenance

Keep the convection cooling vents free from blockage. Dust the unit as often as needed with a soft, damp cloth. Do not use solvent or abrasive powder when cleaning.

No internal cleaning or service is required. The DW6000 does not contain user serviceable parts. Opening or tampering with the unit will void its warranty.

Operating considerations

WARNING



- Do not insert objects through the vents.
- Inserting objects through the vents may result in severe personal injury or death due to electric shock.
- In addition, inserting objects through the vents may damage the DW6000.

CAUTION



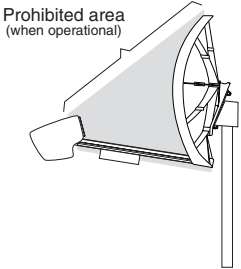
- Keep the DW6000 in a well-ventilated space. Do not place anything on top of it. Doing so may reduce heat dissipation and cause operational problems or damage the unit.
- Do not install near any heat sources, such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Never unplug the power cord from the DW6000 while it is powered on. Always disconnect the power cord from the wall outlet or surge protector.
- Do not place the DW6000 near equipment that produces dust. Certain copiers or computer printers produce carbon dust which can cause malfunctions.
- Position the DW6000 on a stable surface where it will not be bumped or dropped.
- Prevent moisture from getting inside the DW6000.

Professional installation or service requirement



Professional installation and service of the two-way antenna assembly is required by the Federal Communications Commission because the antenna transmits radio frequency (RF) energy.

The two-way antenna assembly must be installed in a location or manner not readily accessible to children.

The two-way antenna assembly must be installed at least 5 feet (1.5 meters) above ground level or any nearby surface on which a person could sit or stand.

 CAUTION	
	<ul style="list-style-type: none">• The two-way antenna assembly emits radio frequency energy when in the transmit mode.• Unplug indoor power connection before performing maintenance or adding upgrades to any antenna components.• To avoid risk of injury, do not place head or other body parts between feed horn and reflector when system is operational. <div style="text-align: right;"><p>Prohibited area (when operational)</p></div>

Grounding requirement

 WARNING	
	<p>The RG6 coaxial cable must be connected to a ground block. The ground block should be located at the point the coaxial cable enters the building. The ground wire must be connected to the ground block and routed to the earth ground.</p>

How the DW6000 works

Figure 1 shows how the DW6000 allows you to connect multiple computers to the Internet via satellite signals. The DW6000 is independent of operating platforms. Whether your computers use Windows® or Macintosh® operating systems, they can surf the Internet now that they are connected to the DW6000. Because the satellite access software is on the DW6000, there is no need to load any other software on your computer.

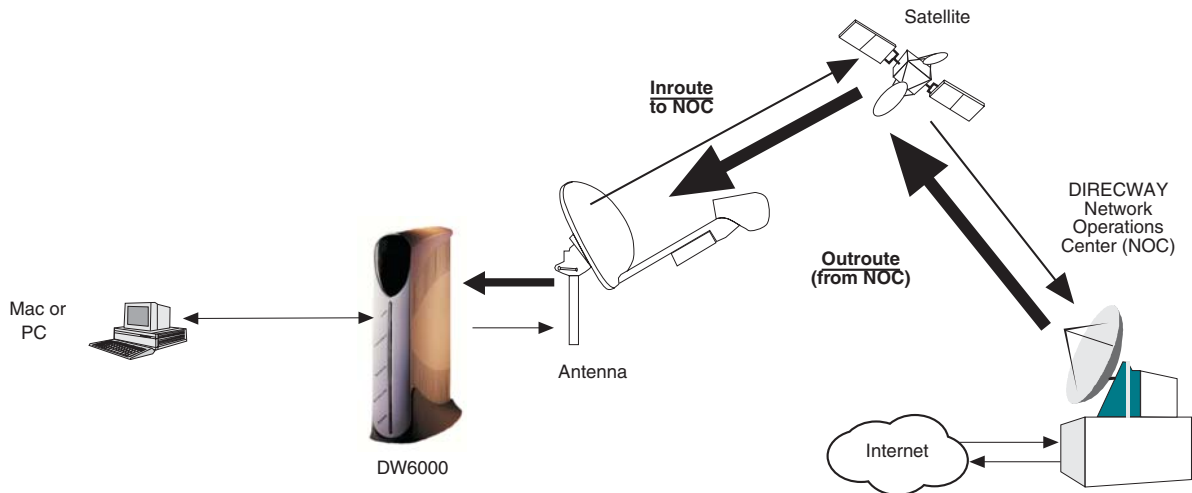


Figure 2: DW6000 DIRECWAY System

The DW6000, in combination with an antenna, can also provide satellite connectivity for multiple computers on a wireless or wired (Ethernet) local area network (LAN). After the DW6000 and network are installed, every computer on the network can surf the Internet. To learn more about using the DW6000 with a network, see Appendix B – , on page 61.

Note: Connect multiple home computers and laptops to a single DIRECWAY Internet connection at no additional cost. Home networking equipment required but not included. For network setup, support and configuration, contact your network hardware manufacturer and/or operating system software developer (HUGHES is not responsible for home network management and troubleshooting). Simultaneous use of high bandwidth applications by multiple users may result in degradation of speed. Actual speeds may vary. Speed and uninterrupted use of service are not guaranteed.

The DW6000 has an internal Web server that supports the DIRECWAY System Control Center. The System Control Center can be accessed from any computer connected to a DW6000 via a Web browser by going to www.direcwaysupport.com. It provides information about system status, system configuration, and online documentation. Access it to obtain status and status change information, if the DW6000 doesn't seem to be functioning properly, to find system information for configuring networks, or to check system performance.



Note: Each DW6000's software is updated periodically via satellite link. Always refer to System Control Center Help and the latest version of this manual for the latest information about the System Control Center and DW6000 software.

If you cannot access the System Control Center, refer to Chapter 5 – *DW6000 Troubleshooting*, on page 25.

How to access the System Control Center

The System Control Center is accessed through any browser, such as Internet Explorer or Netscape. A shortcut to the System Control Center should have been placed on your desktop during installation. Click on it and the **Home** screen in Figure 3 appears.

If no shortcut is present, follow the instructions below to access the System Control Center.

1. Go to *Start→Programs→Internet Explorer* (or Netscape). The browser interface appears.
2. Place the cursor in the Internet Explorer Address bar or the Netscape Location Bar.
3. Type **www.direcwaysupport.com**
4. Press **ENTER**. The System Control Center **Home** screen appears.

Another way to access the Control Center

If there is no shortcut on the desktop and www.direcwaysupport.com doesn't work, type **http://192.168.0.1** in the Explorer Address or Netscape Location bar and press **ENTER**. The Control Center should appear. If you cannot access the Control Center, see Chapter 5 – *DW6000 Troubleshooting*, on page 25.

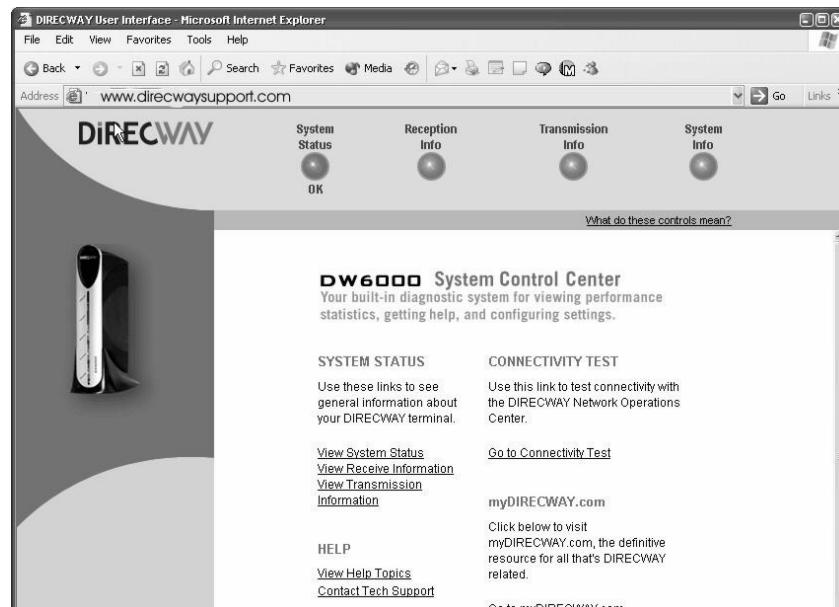


Figure 3: System Control Center Home screen

The Home screen

The **Home** screen has system indicators across the top. There are links in the main body of the page.

System indicators

The system indicators consist of the following. See Figure 4. Clicking on the indicator displays the corresponding screen.

Note: The System Status indicator may be colored RED or GREEN while other indicators are always blue.

- **System Status** reports on signal strength and transmit, receive, software download, commission, and TCP acceleration status. If the indicator is colored RED there is a problem with satellite connectivity. If the indicator is colored GREEN the satellite connection is operating properly.
- **Reception Info** reports data on DW6000 receive functions. Click on it to learn if the receive function is working properly.
- **Transmission Info** reports data on DW6000 transmit functions. Click on it to learn if the transmit function is working properly.
- **System Info** provides information such as the DW6000 IP address, subnet mask, site ID, and what features are enabled.

If **System Status** indicates a problem, click on it to display a screen that describes the problem and corresponding help information. For more information, see *System Status* on page 10

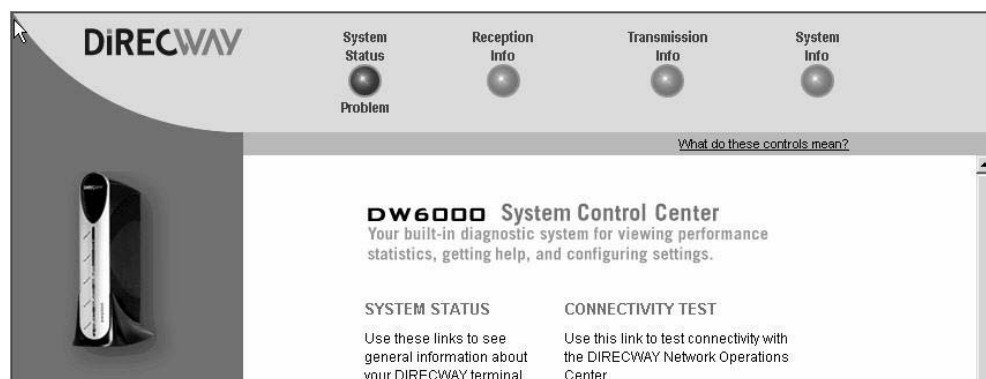


Figure 4: Problem is reported

Links The links consist of the following.

- **View System Status**- shows the same screen as when you click on the System Status indicator.
- **View Help Topics** - provides an extensive help library. This guide does not document everything in the System Control Center, which contains much useful information in its Help section.
- **Contact Tech Support** - this information directs you how to contact technical support. The information accessed may vary by service plan.
- **Connectivity Test** - this allows you to test DW6000 satellite connectivity with the Network Operations Center (NOC).

System Status

The **System Status** screen displays the fields described below.

- **Signal Strength** - receive signal strength. A value of 30 or less indicates an appropriate signal is not being received. Chapter 5 – *DW6000 Troubleshooting*, on page 25 or *Weather and Signal Strength* on page 15.
- **Transmit Status** - indicates whether the transmit data path is operational. Clicking on the status message displays corresponding help information.
- **Receive Status** - indicates if the receive data path is operational. Clicking on the status message displays corresponding help information.
- **Software Download Status** - indicates whether DW6000 software and configuration is up-to-date.
- **Commission Status** - indicates if unit is commissioned.
- **TCP Acceleration Status** - indicates if TCP Acceleration is operational. TCP acceleration should be operational for optimal performance on a DW6000.



Figure 5: System Status

Reception Info

The **Reception Info** screen displays the fields described below.

- **Receive Status** - reports the status of the receive data path. Clicking on the blue status message displays corresponding help information.
- **Frames Received**- reports the number of data messages received by the DW6000 over the satellite link.
- **Frames with Errors**- reports the percentage of received frames that were found to be corrupted. A continuously increasing value indicates problems in the receive path. This may happen in adverse weather conditions or if the receive cable or the antenna has some problem. However, if a low nonincreasing value is displayed and the system is functioning, there is no reason for concern. You do not need to do any troubleshooting or contact customer support.
- **Bad Key Frames**- indicates the percentage of received frames that could not be decrypted successfully. All data received over the satellite is encrypted. A continuously increasing value indicates the unit is not commissioned. Click on **System Status** and check the Commission Status line in the screen that appears. If it indicates the DW6000 is not commissioned, contact customer support.

The screenshot shows the DIRECWAY interface. At the top, there are four status indicators: System Status (OK), Reception Info, Transmission Info, and System Info. Below these is a link: [What do these controls mean?](#). The main content area is titled 'RECEPTION INFO' and contains a table with the following data:

Receive Status	Receiver operational. (RxCode 5)
Frames Received	144850
Frames with Errors	0%
Bad Key Frames	0%

Figure 6: Reception Info screen

Transmission Info

The **Transmission Info** screen displays the fields described below.

- **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 nonincreasing value is displayed and the system is functioning, there is no reason for concern. You do not need to do any troubleshooting or contact customer support.
- **Number of Packets submitted for transmission**- indicates total number of data queued for transmission to the satellite.

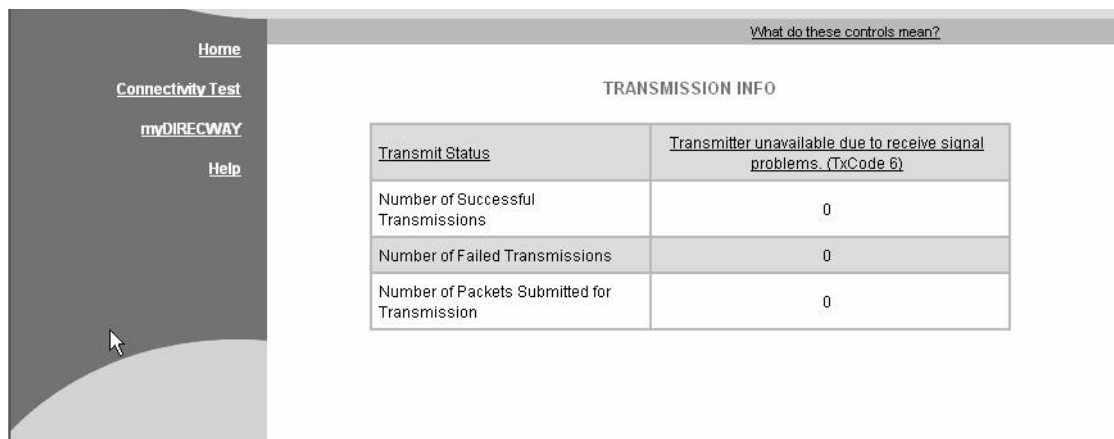


Figure 7: Transmission Info screen

System Information

The **System Information** screen displays a number of fields. While all the information may be useful at some time, the most important is discussed below.

Note: Print the System Information screen and save it. It will be needed should you need to call your service provider and not be able to access it.

- **DW6000 Info section**
 - Serial Number - needed to identify customer's unit when troubleshooting.
 - Software Creation Date - software build date.
 - Software Release Number - version of the software on the DW6000.
 - IP Address - the IP address of computers connected to the DW6000.
 - Subnet Mask - defines the range of addresses assigned to the DW6000.
 - Site ID - Site identification number.
- **Satellite section**
 - Longitude - displays the satellite's longitude.
 - Receive Frequency - transponder frequency configured for the DW6000.
 - Receive Polarization - polarization orientation, which is either horizontal or vertical.
 - Router Address - IP address of the primary router used to route data sent by the DW6000.
- **Software Configuration section-** Turbo Page, NAT, and DHCP are enabled or disabled as per a customer's service offering and cannot be changed by the customer.
 - Network Address Translation (NAT) - typically used to allow multiple computers to share a single address on the Internet. It also allows preconfigured remote networks to be integrated easily with the DIRECWAY network.
 - Dynamic Host Configuration Protocol (DHCP) if enabled, this simplifies the network configuration of the computers. The computers just need to be set up to "Obtain IP address automatically."
 - Turbo Page - if enabled, speeds Web surfing.

DIRECWAY System Status: OK Reception Info Transmission Info System Info

Home
Connectivity Test
myDirecway
Help

What do these controls mean?

SYSTEM INFO

Print this page. It will be needed if your system fails.

This information is needed when you call **Technical Support**.

DW6000 Info		Satellite	
Serial Number:	3000148	Transmit Path:	Satellite
Software Creation Date:	Aug 4 2003, 18:34:31	Outroute:	Primary
Software Release Number:	4.2.0.89	Longitude:	117 West
IP Address:	192.168.0.1	Receive Frequency:	1130 MHz
Subnet Mask:	255.255.255.0	Receive Symbol Rate:	30 MSps
NAT IP Address:	66.82.243.46	Receive Polarization:	Horizontal
NAT Subnet Mask:	255.255.255.255	Transmit	

Figure 8: System Information; print and save this screen

The Connectivity Test Link

The Connectivity Test link is used to test the DW6000's connectivity to the NOC. You may lose connectivity to a particular server on the Internet server due to the Internet or the satellite network being heavily loaded, or due to that server being down. If possible, check connectivity to some other server on the Internet to ensure it is not a server-specific problem.

Use the Connectivity Test when performing the troubleshooting procedures described in Chapter 5 – *DW6000 Troubleshooting*, on page 25.

The Help Menu

The **Help Menu** contains information about receive and transmit status messages, installation, troubleshooting, and other topics. Review it to become familiar with the System Control Center and with the DW6000. Access it by clicking on **Help**.

Note: Print the answer to the entry in the System Control Center Troubleshooting page, "I am unable to access the DW6000 System Control Center." The information on this page will help you if for some reason you have problems accessing the System Control Center in the future. To access the page, click on the *Troubleshooting* entry on the **Help Menu**, and then click on the entry.

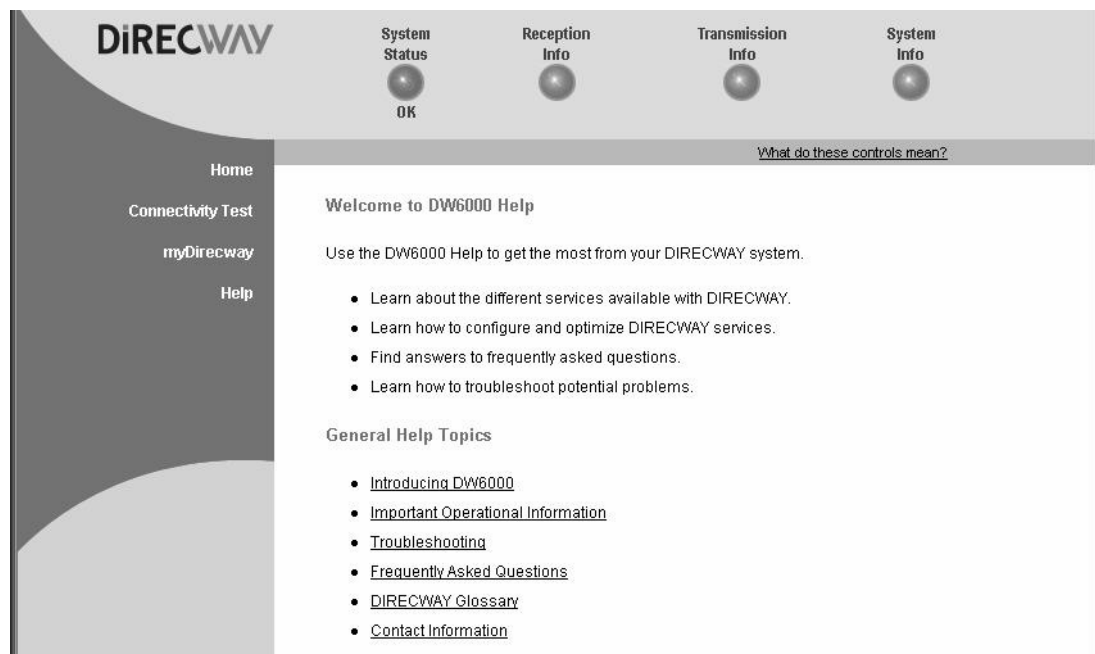


Figure 9: Help Menu

myDIRECWAY

If it is part of your service plan, you can click on **myDIRECWAY** to go to myDIRECWAY.com. Members get access to a variety of interactive tools and can check usage online, test satellite speed, manage passwords, check their account and service plan information, and more.

The DW6000 LEDs provide information about operating status. This chapter describes the LEDs' appearance during normal DW6000 operation.

If the LEDs are not functioning as described in this chapter, refer to Chapter 5 – *DW6000 Troubleshooting*, on page 25.

The DW6000 LEDs

The DW6000 has five LED indicators on the front panel. They are listed below.

Note: Whenever the LEDs do not function properly as described below, check to be sure you have the correct power supply, PN 1031105-0001.

- **LAN** - The LAN indicator shows whether the LAN is connected and usable, and whether there is receive or transmit activity.
- **Transmit** - The Transmit indicator shows whether the DW6000 can transmit or is transmitting, or if some condition is preventing transmission.
- **Receive** - The Receive indicator shows whether the DW6000 has acquired the correct outroute, is receiving, or if some condition is preventing reception.
- **System** - The System indicator shows whether the DW6000 is completely operational or not.
- **Power** - The Power indicator shows if the DW6000 is powered on and operating normally.

The DW6000 also has two LED indicators on the back panel, at the Ethernet port. These indicate whether the Ethernet connection is functional and if the port is passing data.

Fatal Error Indication

If the Power LED is off and one or more of the other LEDs is flashing, the unit may have to be replaced.

First try power cycling the DW6000 by disconnecting the power from the surge protector or other power source and then plugging it back in. The unit may recover.

If the fatal error indication continues, the unit must be replaced. Please contact customer support.

Weather and Signal Strength

Rain or snow can make the DW6000 signal strength drop to 30 or below. At that level the DW6000 will stop receiving satellite signals, and the Receive LED will go blank.

Heavy rain or snow can interfere with the antenna's reception of the signal. In addition, buildup of moisture, snow, or ice on the antenna can interfere with the signal. Similar conditions at the Network Operations Center (NOC) can interfere with signals for brief periods.

Severe weather conditions may interfere with signal reception intermittently. Signal strength is restored as the rain or snow subsides.

DW6000 LED operation

This section describes the LEDs' appearance during typical DW6000 operation. Refer to Figure 11 for the LED's locations.



Note: If the Power LED blinks, the DW6000 is running the fallback.bin. This will usually happen when the unit is first installed. The unit may run the fallback.bin if the main.bin does not successfully load; in this case, power cycle the unit.

Normal operation When the DW6000 is powered on and transmitting or receiving data:

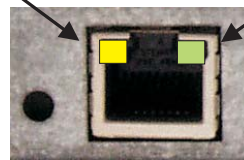
- The LAN LED is on. The LED blinks off momentarily when frames are transmitted or received.
- The Transmit LED is on. The LED blinks off momentarily when frames are transmitted.
- The Receive LED is on. The LED blinks on momentarily when frames are received.
- The System LED is on.
- The Power LED is on.

Ethernet port LED operation The DW6000 Ethernet LAN link has two indicators on the rear of the unit on the top of the LAN port. The green indicator shows link status. The yellow indicator shows traffic speed. Figure 17 illustrates the Ethernet link LEDs.

Traffic speed indicator LED (yellow)

On = 100BaseT

Off = 10BaseT



Link traffic indicator LED (green)

Flashing green = valid link

Off = no valid link

Figure 10: Ethernet port LED operation

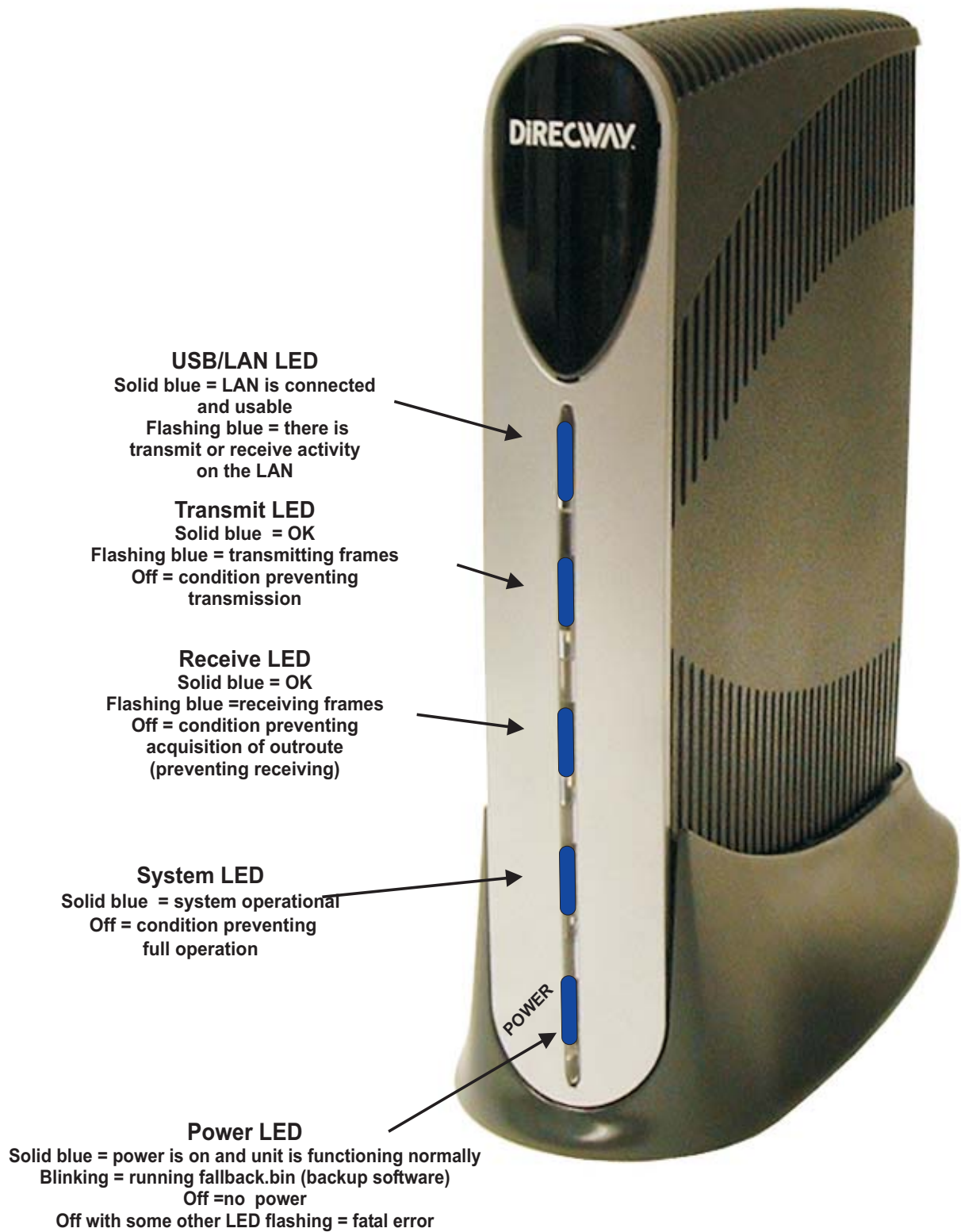


Figure 11: DW6000 LEDs operation

To activate the e-mail accounts provided in your service agreement, go to myDIRECWAY.com. If you purchased your DIRECWAY System through one of our Value Added Resellers (VARs), please contact your service provider to establish your e-mail accounts.

Configuring DIRECWAY e-mail

These instructions describe how to configure Outlook Express, Microsoft Outlook 2000 and 2002, Eudora, and Netscape for DIRECWAY e-mail accounts.

Note: If you are unsure about the type or address of your mail server(s), please check with your ISP.

Outlook Express

1. Go to *Start*→*Programs*→*Microsoft Outlook Express*. If this is the first time opening Outlook Express, and the **Internet Connection Wizard** has started, skip to Step 3.
2. Select *Tools*→*Accounts*. The *Internet Account* window appears. See Figure 12.
3. Select **Add** and select **Mail**. The Internet Connection Wizard appears. See Figure 13.

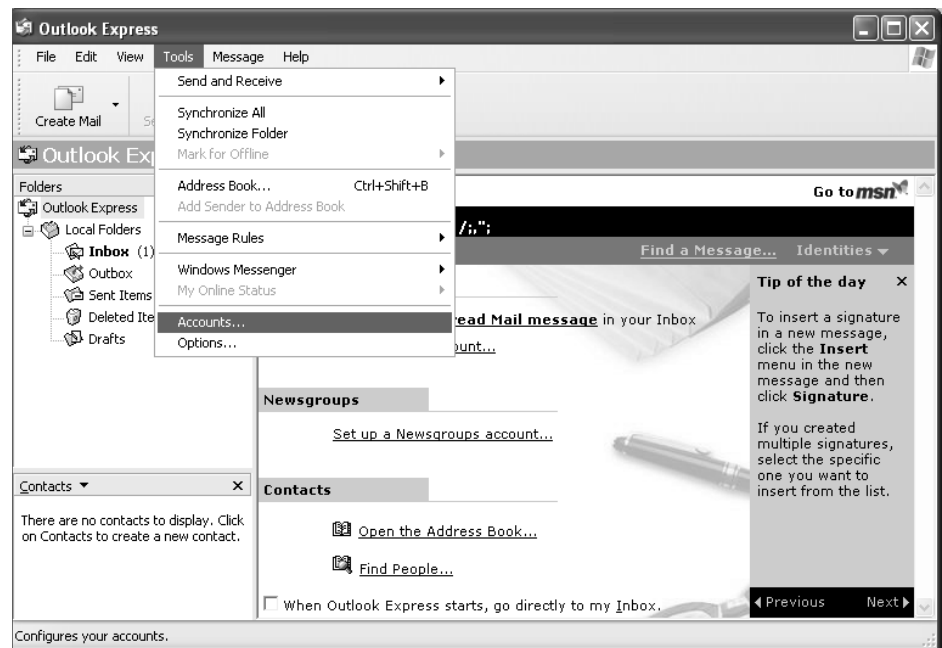


Figure 12: Internet Account



Figure 13: Internet Connection Wizard

4. Enter your full name in Display Name and select **Next**. The E-Mail Internet Address window appears. See Figure 14.
5. Enter your full e-mail address in E-mail address (for example, username@direcway.com) and select Next. An E-mail Server Names window appears. See Figure 15.
6. Verify that POP3 is incoming mail server type.
7. Enter the address of your incoming mail server in the Incoming mail server field.
 - If your e-mail account is with DIRECWAY, enter **pop3.direcway.com**.
 - If your e-mail is through some other service, check with your e-mail provider for the type or address of your mail server.



Figure 14: Internet E-mail Address



Figure 15: E-mail Server Names

8. Enter the address of your outgoing mail server in the Outgoing mail server field.
 - If your e-mail account is with DIRECWAY, enter **smtp.direcway.com**.
 - If your e-mail is through some other service, check with your e-mail provider for the type or address of your mail server.
9. Select **Next**. The Internet Mail Logon window appears. See Figure 16.
10. Enter the name used to log into the mail server in the Account Name field.

Note: This is almost always the first part of your e-mail address. (i.e, Jsmith, not Jsmith@xyz.com).
11. Enter the password associated with the account name in the Password field.
12. Select **Next**
13. Select **Finish**.
14. Select **Close** to close the Internet Account Window, if it is open.



Figure 16: Internet Mail Logon

Microsoft Outlook 2000

1. Go to *Start→Programs→Microsoft Outlook*.
 2. Select on **Tools** from the Outlook Express program menu and select *Accounts*. The Internet Account menu appears.
 3. Select Add and select Mail. The Internet Connection Wizard appears.
- Note:** Use the Internet Connection Wizard to set up your e-mail account.
4. Enter your full name under Display Name.
 5. Select **Next**. A window appears.
 6. Enter your full e-mail address.
 7. Select **Next**.
 8. Enter the address of your incoming mail server.
 - If your e-mail account is with DIRECWAY, enter **pop3.direcway.com**.
 - If your e-mail is through some other service, check with your e-mail provider for the type or address of your mail server. For the incoming mail server, enter the URL of your incoming mail server.
 9. Enter the address of your outgoing mail server.
 - If your e-mail account is with DIRECWAY, enter **smtp.direcway.com**.
 - If your e-mail is through some other service, check with your e-mail provider for the type or address of your mail server.
 10. Select **Next**.
 11. For the account name, enter the name used to log into the mail server.
- Note:** NOTE: This is usually the first part of your e-mail address.
12. For the password, enter your selected password to log into the mail server.
 13. Place a check in the **Remember Password** box to expedite login.
- Note:** By placing a check in Remember Password box, anyone with access to the PC can read and modify your e-mail.
14. Select **Next**.
 15. Select **Finish** to save settings.
 16. Select **Close**.

Microsoft Outlook 2002

1. Go to *Start→Programs→Microsoft Outlook 2002*.
 2. Select **Tools** from the Outlook Express program menu and select *E-Mail Accounts*. The **E-Mail Account Wizard** appears.
 3. Under E-Mail, select the bullet to Add a new e-mail account.
 4. Select **Next**. The Server Type menu appears.
 5. Select the bullet to use a POP3 mail server.
- Note:** NOTE: DIRECWAY uses a POP3 mail server.
6. The Internet E-Mail Settings (POP3) menu will appear. Enter the following information:
 - a. User Information
 - Your Name: Enter your full name.
 - E-Mail Address: Enter your full e-mail address.
 - b. Server Information:
 - For the incoming mail server, enter the URL of your incoming mail server. If your e-mail account is through DIRECWAY, enter **POP3.direcway.com**. If you are using some other service, check with your e-mail provider for the URL of your POP3 e-mail server.
 - For the outgoing mail server, enter the URL of your outgoing mail server. If your e-mail account is through DIRECWAY, enter

SMTP.direcway.com. If you are using some other service, check with your e-mail provider for the URL of your SMTP e-mail server.

c. Login Information

- User Name: mail server login name.
- Password: password for user name login.

Note: Place a check in Remember Password box to expedite login.

Note: By placing a check in Remember Password box, you enable anyone with access to the PC can read and modify your e-mail.

7. Select **Next**.

8. Select **Finish** to save settings.

Eudora

1. Select **Tools** from the Eudora menu.
2. Select *Options*.
3. Select Getting Started Category.
4. In Real Name, enter your full name (as it will appear on outgoing e-mail).
5. In Return address, enter your full e-mail address.
6. In Mail Server (Incoming), enter the URL of your incoming mail server.
 - If your e-mail account is through DIRECWAY, enter **pop3.direcway.com** for your incoming mail server.
 - If you are using some other service, contact your e-mail service provider for the URL of your POP3 e-mail server.
7. In Login Name, enter the name used to log into the mail server.

Note: This is almost always the first part of your e-mail address.

8. In SMTP Server (Outgoing), enter the URL of your outgoing e-mail server.
 - If your e-mail account is through DIRECWAY, enter **smtp.direcway.com** for your outgoing mail server.
 - If you are using some other service, contact your e-mail service provider for the URL of your SMTP e-mail server.
9. Select **OK**. Eudora has now been configured.

Netscape

1. Open Netscape Communicator.
2. From the menu bar, select **Edit** and select *Preferences*.
3. In the Category list, select the + symbol to expand Mail & Newsgroups properties.
4. Select Identity under the Mail & Newsgroups category.
5. In the Your Name field, enter your name, as you would like it to appear on outgoing e-mail.
6. In the E-mail address field, enter the registered DIRECWAY e-mail address.
7. The remaining fields in the Identity properties are optional.
8. Select Mail Servers under the Mail & Newsgroups category.
9. For the Outgoing mail server field, if your e-mail account is through DIRECWAY, enter **smtp.direcway.com**. If you are using some other service, contact your e-mail provider for the URL of your SMTP e-mail server.
10. For the Outgoing mail server user name section, enter the user name used to log in to the outgoing mail server.
11. Under the Incoming Mail Servers section, highlight the incoming mail server.

12. Ensure **Never** is selected for **Use Secure Socket Layer (SSL) or TLS for Outgoing message**.
13. Select **Edit** to display the **Mail Server Properties** window. If no server(s) is present, select **Add** to create a mail server.
14. From the **Mail Server Properties** window: In the **Server Name** field, enter the URL of your incoming mail server.
 - If your e-mail account is through **DIRECWAY**, enter **POP3.direcway.com**.
 - If you are using some other service, contact your e-mail provider for the URL of your POP3 e-mail server.
15. Select the drop down menu next to **Server Type** and Select **POP3**.
16. In the **User Name** field, enter the name used to log into the mail server.
17. Select **OK** to close the **Mail Server Properties** window.
18. Select **OK** to close the **Preferences** window.

The DW6000 System Control Center and LEDs provide information about operating status. This chapter provides a troubleshooting guide to typical problems. Remember that the illustrations are examples only.

The System Control Center is described in Chapter 2 – *The DIRECWAY System Control Center*, on page 7. Normal LED operation is described in Chapter 3 – *DW6000 LEDs Operation*, on page 15.

Overview

- If you cannot surf the Internet but can access the Control Center, refer to the troubleshooting procedures in *Cannot surf but can access Control Center* on page 26.
- If you cannot access the Control Center, refer to the troubleshooting procedures in *Cannot access the Control Center* on page 33.
- If you have a device other than a computer connected to the DW6000, refer to the troubleshooting procedures in *Device other than computer connected to DW6000* on page 36.

Cannot surf but can access Control Center

If you cannot surf the Internet but can access the Control Center, follow the troubleshooting procedures below. Remember that any problem may be caused by more than one thing. If you implement a troubleshooting procedure but still cannot surf, proceed to the next step. Also, try the troubleshooting procedures more than once before contacting customer support.

Remember: if you cannot access the Control Center by clicking on the shortcut or typing www.direcwaysupport.com in the URL address or location bar, try typing **http://192.168.0.1** in the bar and pressing Enter.

Check that the unit is commissioned

1. At the Control Center, click on the **System Info** indicator. The System Info screen appears. See Figure 17.
2. In the DW6000 Information box, check the Site ID line.
If the numerical site ID appears, the unit is commissioned. Proceed to the next troubleshooting step.
If **Not Commissioned** appears, the DW6000 is not commissioned. Contact customer support.

The screenshot shows the DirecWay control center interface. At the top, there are four circular indicators: System Status (with a 'Problem' label below it), Reception Info, Transmission Info, and System Info. Below these indicators is a link that says 'What do these controls mean?'. The main content area is titled 'SYSTEM INFO' and includes a 'Print this page. It will be needed if your system fails.' button. Below this, a warning states 'This information is needed when you call Technical Support.' The main data is presented in two columns: 'DW6000 Info' and 'Satellite'.

DW6000 Info		Satellite	
Site ID:	Not_Commissioned	Transmit Path:	Terrestrial
Serial Number:	000000	Outroute:	Primary
Software Creation Date:	Aug 29 2003, 17:14:01	Longitude:	99 West
Software Release Number:	4.2.0.9	Receive Frequency:	1330 MHz
IP Address:	139.85.36.234	Receive Symbol Rate:	22 Msps
Subnet Mask:	255.255.255.0	Receive Polarization:	Horizontal
Software Configuration		Transmit Polarization:	Horizontal
NAT:	Disabled	22kHz Tone:	Off

Figure 17: System Info indicator screen

Check receive signal The DW6000 will not function if satellite signals are not received properly.

1. At the Control Center, click on the **Reception Info** indicator. The Reception Info screen appears. See Figure 18.
2. In the Receive Status row, check the Rx Code.

If the Rx Code is The receiver is operational (RxCode 5) the DW6000 is receiving signals properly. Proceed to the next troubleshooting step.

If any other Rx Code appears, the DW6000 is not receiving signals properly. Click on the Rx Code. Follow the troubleshooting procedure that appears.

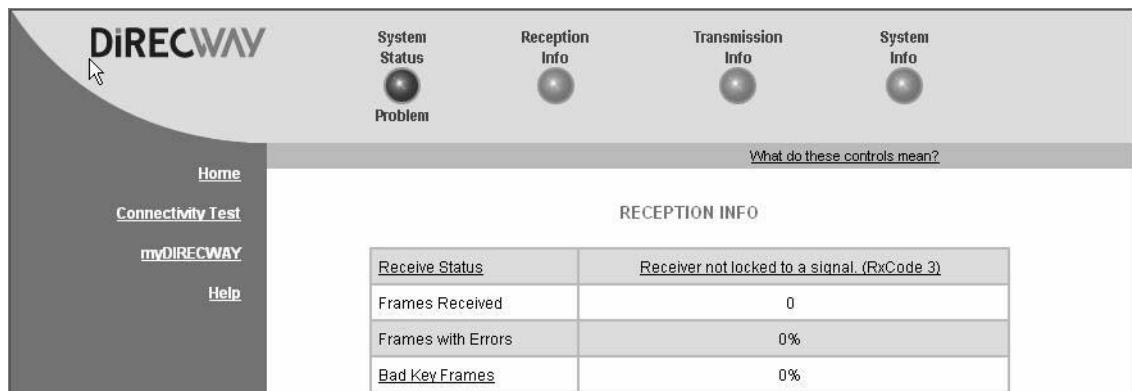


Figure 18: Reception info

Check transmit signal The DW6000 will not function if satellite signals are not transmitted properly.

1. At the Control Center, click on the **Transmission Info** indicator. The Transmission Info screen appears. See Figure 19.
2. In the Transmit Status row, check the Tx Code.

If the Tx Code is Transmitter available for Normal Operation (TxCode 8) the DW6000 is transmitting signals properly. Proceed to the next troubleshooting step.

If any other Tx Code appears, the DW6000 is not transmitting signals properly. Click on the Tx Code. Follow the troubleshooting procedure that appears.

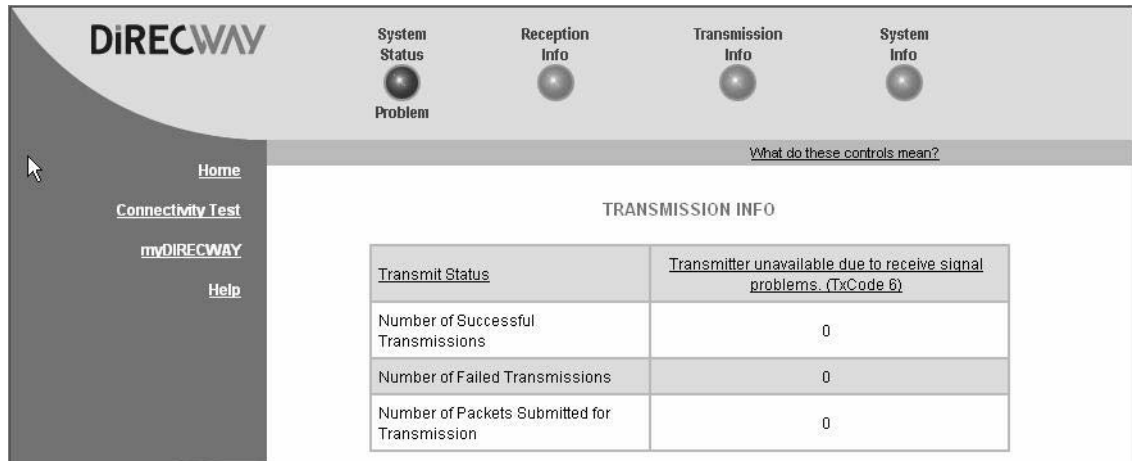


Figure 19: Transmission info

Check that TCP acceleration is operational

TCP Acceleration is a proprietary protocol provided by DIRECWAY. It optimizes performance for TCP/IP-based applications, including faster downloads over satellite.

1. At the Control Center, click on the **System Status** indicator. The System Status screen appears. See Figure 20.
2. Check the message in the TCP Acceleration Status row.
 - If the message says *Enabled*, TCP Acceleration is enabled. Proceed to the next troubleshooting step.
 - If the message says *Disabled*, TCP Acceleration is disabled. Perform the following steps.
 - a. Power cycle the DW6000. Unplug the AC power cord from the power strip or surge protector, wait 10 seconds, and plug it back in. See Figure 24 on page 34. Then check the TCP Acceleration Status again. If it is enabled but you still cannot surf the Internet, proceed to the next troubleshooting step.
 - b. If TCP Acceleration is still disabled after power cycling, wait 30 minutes and then check TCP Acceleration Status again.
 - c. If TCP Acceleration is still disabled after waiting 30 minutes, contact customer support.

DIRECWAY

System Status Reception Info Transmission Info System Info

Problem [What do these controls mean?](#)

[Home](#)
[Connectivity Test](#)
[myDIRECWAY](#)
[Help](#)

SYSTEM STATUS

Signal Strength	5
<i>Note: Signal Strength is not an indicator of browsing speed. Precipitation can affect Signal Strength, but signal strength greater than or equal to 31 is sufficient for browsing.</i>	
Transmit Status	Transmitter unavailable due to receive signal problems. (TxCode 6)
Receive Status	Receiver not locked to a signal. (RxCode 3)
Software Download Status	Waiting for first heartbeat message.
Commission Status	Commissioned [No keys]
TCP Acceleration Status	Disabled

Figure 20: System Status, TCP Acceleration Status

Check Network Operations Center (NOC) connectivity

Use the **Connectivity Test** link to check connectivity to the DIRECWAY Network Operations Center (NOC).

Note: You may want to open a second browser window to be able to access the help page while conducting the Connectivity Test.

1. Click on **Connectivity Test** on the left hand side of the **System Control Center**. A screen with a **Start Test** button appears. See Figure 21.
2. Click **Start Test**. A message will appear, informing you if the test was successful.
3. If the connectivity test succeeds but you still cannot surf the Internet, try *pinging* the Router Address from your computer. *Ping* is a basic Internet program that lets you verify that a particular IP address exists and can accept requests. Ping is used diagnostically to ensure that a host computer you are trying to reach is actually operating. Ping operates by sending a packet to a designated address and waiting for a response. Windows and MacIntosh operating systems both let you use ping.
 - a. At the Control Center, click on the **System Info** indicator. The System Info screen appears.
 - b. From the DW6000 Information box, record the router address.
 - c. In Windows, go to *Start→Run*. The Run box appears.
 - d. Type **command** in the Open field and click **OK**. The *Command* window appears. See Figure 22.
 - e. At the prompt, type **ping** followed by a space and the router address and press **ENTER**. For example, if the router address is 100.100.100.100, type **ping 100.100.100.100** and press **ENTER**. If the ping is successful, the message in Figure 22 appears. If it fails, the message will show the packets were lost; timeout messages will probably also appear. See Figure 23.
 - f. Close the window to end the Command session.

If pinging the Router Address succeeds but you still cannot surf the Internet, skip to the Internet Connectivity test below.

If pinging the Router Address fails, the default gateway address is probably not set correctly in the computer's operating system settings. The default gateway address should be the DW6000 IP address as received during commissioning and displayed in the System Information DW6000 Info box in the IP address line. Fix this in the computer's operating system settings. See Appendix A – *Typical operating system settings*, on page 45. Then repeat the sequence above.

If the tests still fail, power cycle the DW6000 by unplugging the power cord from the power strip or surge protector, waiting 10 seconds, and plugging it back in. If you still can't surf the Internet, call your service provider.

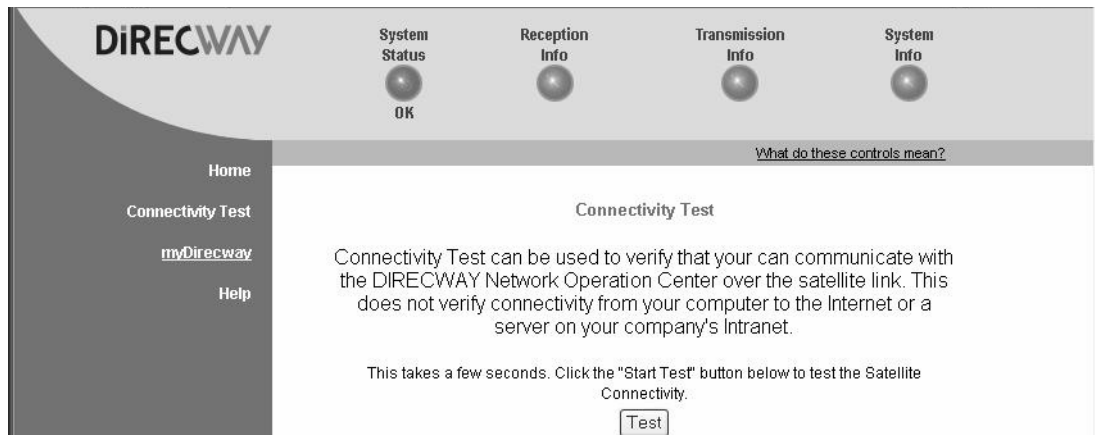


Figure 21: Connectivity Test

```

C:\WINNT\system32\cmd.exe
C:\>
C:\>
C:\>
C:\>ping direcwaysupport.com
Unknown host direcwaysupport.com.

C:\>
C:\>
C:\>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time<10ms TTL=64
Reply from 192.168.0.1: bytes=32 time<10ms TTL=64
Reply from 192.168.0.1: bytes=32 time<10ms TTL=64
Reply from 192.168.0.1: bytes=32 time<10ms TTL=64

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

Figure 22: Successful ping

```

C:\WINNT\system32\cmd.exe
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

Figure 23: Failed ping

Internet Connectivity Sometimes the Internet or Internet site is experiencing problems. Try pinging the DIRECWAY Web server (www.direcway.com) instead of the Web server or site you could not connect to.

Note: The DIRECWAY Internet server may not be accessible or may not respond. In such a case, you should try to ping another Web server.

If pinging the DIRECWAY Web server succeeds, the problem is probably in the particular Web server that you were trying to access. Try accessing it later.

If pinging the DIRECWAY Web server does not succeed, try pinging the DNS server address 198.77.116.8. If you cannot ping that address, contact customer support. If you are a business customer contact your System Administrator.

If you can ping the DNS server address but not surf the Internet, check the DNS Server settings in your operating system TCP/IP settings. In Windows 2000, for example, the menu is accessed using the instructions below. Other Windows systems will have similar windows and menus.

1. Go to *Programs*→*Settings*→*Control Panel*→*Network and Dial-up Connections*.
2. Right-click on the *Local Area Connection* icon and select *Properties*. The *Local Area Connection Properties* window appears.
3. Select TCP/IP from the list of components and click *Properties*. The *Internet Protocol (TCP/IP) Properties* window appears.
4. Click *Advanced*. The *Advanced TCP/IP Settings* window appears.
5. Click *Add* in the *Default Gateways* box. A *TCP/IP Gateway Address* screen appears.
6. Type **198.77.116.8** in the *Gateway* field and click *Add*. The address is added to the *Default Gateways* list.
7. Click *OK* to close all the windows.
8. Now try accessing or pinging the DIRECWAY Internet server or other Web servers again. You should be successful.

If these steps do not work, wait awhile and try them again. There may be a temporary Internet connection outage.

If you still cannot surf the Internet and you are using a firewall, work through the firewall instructions below. Otherwise, please contact your service provider for further assistance.

Check for virus and firewall issues If you have checked gone through all the steps in this section and still cannot surf the Internet, check your computer for viruses. A virus can prevent you from operating normally. If you find a virus, delete or disable it and try surfing again.

If you are using a firewall, check that none of your settings are blocking access to the Internet or the DIRECWAY servers. If you do not know how to do this, disable the firewall. If you can surf after disabling the firewall, you need to learn how to set up the firewall so that it does not block DIRECWAY. Refer to the firewall manufacturer's instructions.

Finally, check and make sure you are using the latest version of your virus and/or firewall program. These are updated frequently. If you are not using the latest version, update and run the programs again.

Cannot access the Control Center

If you cannot access the Control Center, you can still get information from the DW6000 LEDs that can enable you to restore connectivity. Follow the troubleshooting procedures below. Remember that any problem may be caused by more than one thing. If you implement a troubleshooting procedure but still cannot access the Control Center, proceed to the next step. Also, try the troubleshooting procedures more than once before contacting customer support.

Remember to also try to access the Control Center by clicking on the shortcut or typing www.direcwaysupport.com in the URL address or location bar, try typing `http://192.168.0.1` in the bar and pressing Enter.

The DW6000 LEDs

The DW6000 has five LED indicators on the front panel. See Figure 11 on page 17. They are listed below.

Note: Whenever the LEDs do not function properly as described below, check to be sure you have the correct power supply, PN 1031105-0001.

- **LAN** - The LAN indicator shows whether the LAN is connected and usable, and whether there is receive or transmit activity.
- **Transmit** - The Transmit indicator shows whether the DW6000 can transmit or is transmitting, or if some condition is preventing transmission.
- **Receive** - The Receive indicator shows whether the DW6000 has acquired the correct outroute, is receiving, or if some condition is preventing reception.
- **System** - The System indicator shows whether the DW6000 is completely operational or not.
- **Power** - The Power indicator shows if the DW6000 is powered on and operating normally.

Fatal error indication If the Power LED is off and one or more of the other LEDs is flashing, the unit may have to be replaced. If there is not fatal error indication, proceed to the next troubleshooting step.

First try power cycling the DW6000 by disconnecting the power from the power strip or surge protector, waiting 10 seconds, and then plugging it back in. The unit may recover.

Note: If the fatal error indication continues, the unit must be replaced. Please contact customer support.

All LEDs off If all the LEDs are off, check that all the power connections are secure. If they are, unplug the AC power cord from the surge protector or other power source. If the LEDs do not come on, contact customer support.

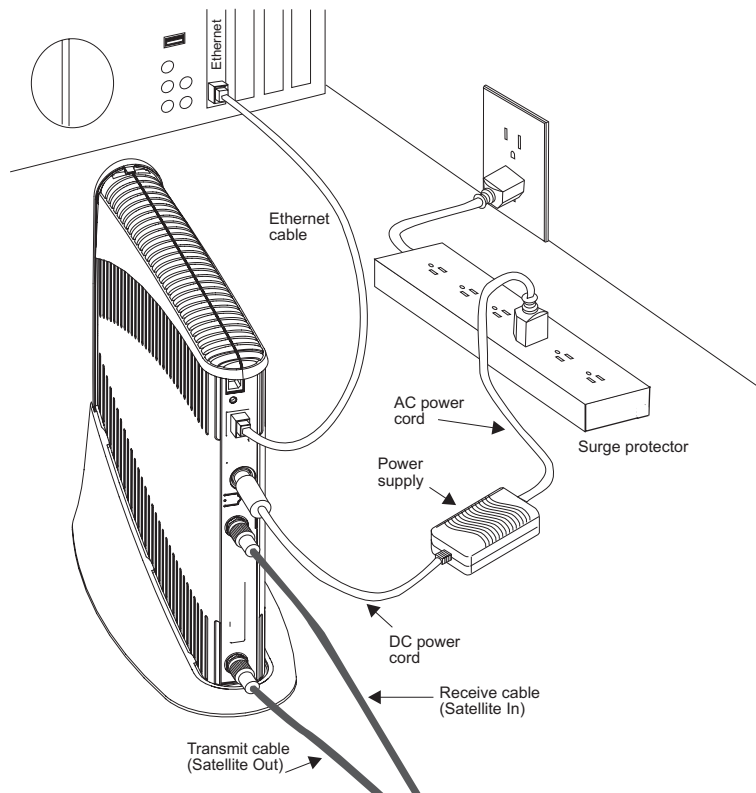


Figure 24: DW6000 power and cable connections

Check the Power LED Check the Power LED. If it is lit, proceed to the next troubleshooting step. If it is not lit, perform the following steps.

1. Power cycle the DW6000 by unplugging the power cord from the power strip or surge protector, waiting 10 seconds, and plugging it back in.
2. If the Power LED is still not lit, check that the AC cord is securely attached to both the power adapter and the DW6000.
3. If the Power LED is still not lit, plug a small appliance, such as a radio, into both the power strip or surge protector and the wall outlet or other power source. If it works, the power sources are functional. Call customer support for assistance.

Check the LAN LED Check the LAN LED. If it is lit, proceed to the next troubleshooting step. If it is not lit, perform the following steps.

1. Check that the Ethernet cable is connected to the DW6000 LAN port and to the computer's Ethernet port.
2. If the LAN LED is still not lit, power cycle the DW6000 by unplugging the power cord from the power strip or surge protector, waiting 10 seconds, and plugging it back in.
3. If the LAN LED is still not lit, 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 will appear 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 not lit after fixing any NIC problems, check the back panel LEDs.
 - a. If the Orange LED is lit and the front panel LAN LED is NOT, please contact Technical Support for further assistance.
 - b. If both the Orange LED and the front panel LAN LED are not lit, check all network equipment that connects the computer with the DW6000, 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 seems alright, power cycle the DW6000 by unplugging the power cord from the power strip or surge protector. If this doesn't solve the issue, refer to the vendor that supplied the network equipment.
 5. If the LAN LED is still not lit, try connecting the DW6000 to another computer. If the Power and LAN LEDs are lit, the problem is with your computer. If they are not lit, contact customer support.

LAN LED is lit If the LAN LED is lit, disconnect the Ethernet cable. The LAN LED will either stay lit or go dark. Follow the appropriate instructions below.

If LAN LED stays lit If the LAN LED stays lit, power cycle both the DW6000 and the computer by unplugging the power cords from the power strip or surge protector, waiting 10 seconds, and plugging them back in. **Do not reconnect the Ethernet cable.**

If the LAN LED is lit after the DW6000 powers back on, call customer support.

If LAN LED goes dark

1. If the LAN LED goes dark, plug the Ethernet cable back into the DW6000 Ethernet port.
2. Check the IP address assigned to the computer.
 - a. In Windows, go to *Start→Run*. The Run box appears.
 - b. Type **command** in the Open field and click **OK**. The *Command* window appears.
 - c. Type **ipconfig** at the prompt and press Enter. Information related to the computer's network configuration appears.
 - d. Check the IP Address. If the IP address is set to "0.0.0.0" or to an address that begins with "169.254", make sure the TCP/IP settings for your NIC are set to "Obtain IP address automatically". For more information, see *Configuring Windows when DHCP is enabled* on page 52.
If the TCP/IP settings are correct, power cycle the computer; this sets the IP address correctly.
If the ipconfig command did not display IP address information, there is probably a problem with the NIC. Refer to the manufacturer's documentation.

3. If the System Control Center is still not available, try pinging the DW6000 by entering **ping 192.168.0.1** at a DOS command line.
If ping does not work, power cycle the DW6000 by unplugging it from the power strip or surge protector, waiting 10 seconds, and plugging it back in. If you still cannot ping, contact customer support.
If the ping results show `request timed out` power cycle the unit.
If the ping results show `Reply from...`, check the browser settings. Make sure the dial-up connection and proxy server are not configured.
 - a. In Internet Explorer go to *Tools*→*Internet Options*→*Connections*.
 - b. In the Dial-up settings section, make sure Never dial a connection is selected.
 - c. Click on LAN Settings. The LAN Settings window appears.
 - d. Make sure all checkboxes are unchecked.
 - e. Click on OK to close all windows.You should now be able to access the Control Center. If you cannot, contact customer support.

Device other than computer connected to DW6000

If a device other than a computer is connected to the DW6000, the Control Center is probably never accessible. However, you can still use the LED indicators to troubleshoot, as described below.

Problem: Receive LED not on

If the DW6000 is not operating normally and the receive LED is not lit, take the following steps:

- Check all cable connections. See Figure 24. Tighten any that seem loose.
- If the LED still does not come on, power cycle the DW6000 by unplugging the power cord from the wall outlet or surge protector, waiting ten seconds, and plugging it back in.
- If the problem persists, contact customer support.

Note: Often, if the Receive LED is not lit, the other LEDs will not be lit either.

Problem: System LED not lit 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.

- Wait a while. If there is a problem at the NOC, it will soon be corrected and the System LED will come on. You can then resume normal operation.
- If the LED does not come on after you have waited a while, power cycle the DW6000 by unplugging the power cord from the wall outlet or surge protector, waiting ten seconds, and plugging it back in.
- If the problem persists, contact customer support.

Problem: Power LED not on If the Power LED is not lit, take the following steps. Note that if the Power LED is not on, probably no other LEDs will be on or come on.

- Check to make sure the power cable is securely attached. See Figure 24.
- If securing the power cable does not solve the problem, check all cable connections. Tighten any that seem loose.
- If the Power LED still does not come on continuously, power cycle the DW6000 by unplugging the power cord from the wall outlet or surge protector, waiting ten seconds, and plugging it back in.
- If the problem persists, contact customer support.

Problem: Power LED blinking If the Power LED is blinking, take the following steps.

- Check to make sure the power cable is securely attached. See Figure 24.
- If securing the power cable does not solve the problem, check all cable connections. Tighten any that seem loose.
- If the Power LED still does not come on continuously, power cycle the DW6000 by unplugging the power cord from the wall outlet or surge protector, waiting ten seconds, and plugging it back in.
- If the problem persists, contact customer support.

The pedestal base

Follow the instructions below to place the DW6000 in the pedestal base, or remove it from the base.

You do not have to use the pedestal. You can place the DW6000 in a horizontal position if you prefer. If you do this, make sure you never put anything on top of the DW6000. Doing so may damage the unit by interfering with air circulation, which cools the unit.

1. Take the pedestal base in one hand and the DW6000 in the other. Orient them as shown in Figure 25. The Power LED will be at the bottom.
2. The pedestal base has two curved ridges, one on each side of its opening. See Figure 26. The DW6000 has six guides that slide along these ridges. See Figure 27. Locate the ridges and the two guides at the front of the pedestal base.
3. Align the guides with the ridges.
4. Gently slide the guides along the ridges until the DW6000 clicks into place.



Note: If you need to remove the DW6000 from the pedestal base, pull up and back on the clip on the back of the base. See Figure 28. You can then slide the base off the DW6000.



Figure 25: Orienting pedestal base and DW6000

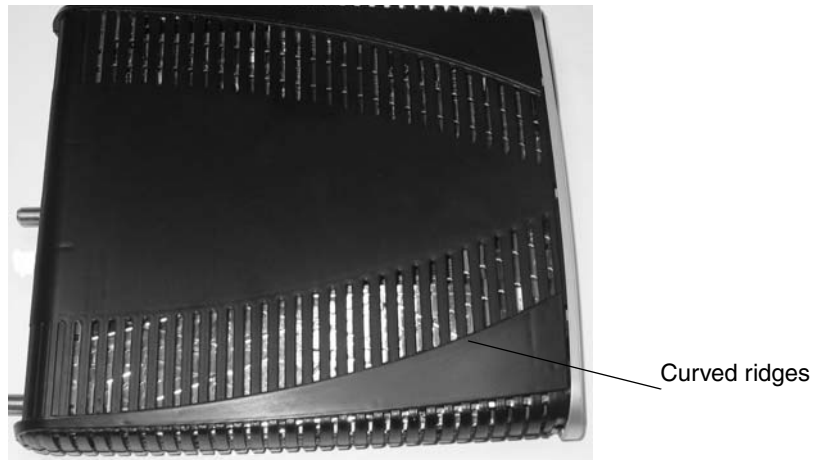


Figure 26: DW6000 guides

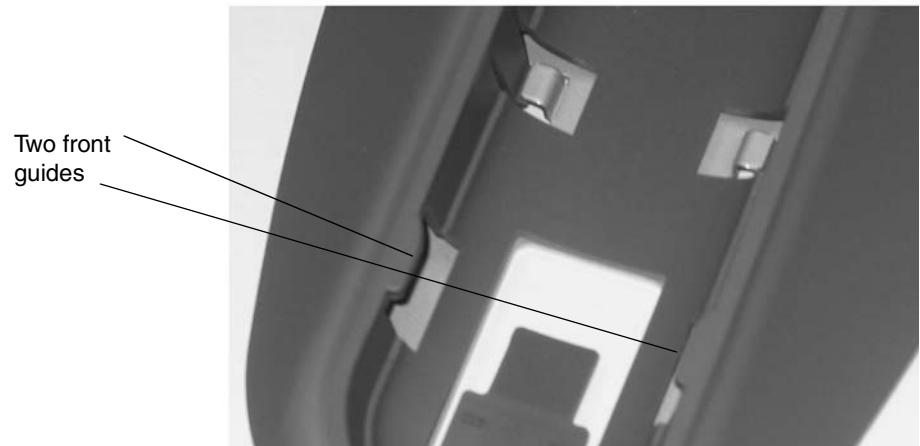


Figure 27: Two front guides

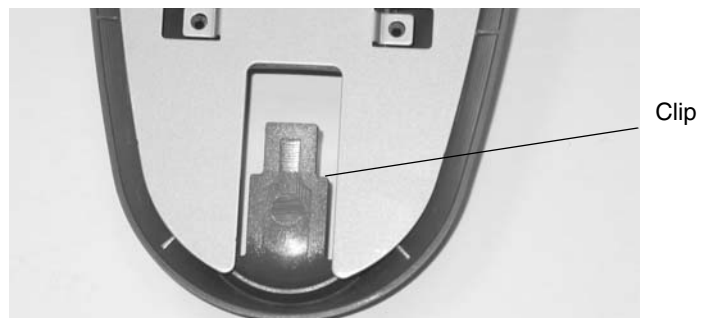


Figure 28: Pedestal base clip

1. What are the causes of interference in the operation of my system?

The DIRECWAY[®] system operates in the Ku band. Other devices transmitting in this band, such as radar detectors, can interfere with the system. Rain or snow can interfere for the signal for brief periods. Also, snow or ice buildup on the antenna may interfere with the signal.

2. What is Automatic Cross Polarization (ACP)?

The ACP feature provides transmit satellite dish pointing information to your installer and automatic satellite dish revalidation. This ensures your satellite dish remains aligned.

Satellite systems with transmit capability — the ability to send data directly to the Internet via the satellite without a telephone connection — need to be checked periodically to be sure that the satellite dish alignment remains correct. Satellite dishes may become misaligned because of structures settling, unauthorized tampering or, more commonly, high winds.

If the satellite dish alignment is not correct, transmissions from your equipment might interfere with other users of the satellite, and your signal might be weak.

The means used in the satellite industry to check transmit satellite dish alignment is **cross polarization co-polarization isolation measurement** or **cross pol** for short. Until recently cross pol measurements could only be made by satellite maintenance personnel.

Your ACP-equipped system can enter a test mode and initiate an automatic cross pol test session between your satellite dish and the Network Operations Center (NOC). The test is performed by firmware in the satellite equipment, not on your PC. Since your PC is not involved, the test cannot compromise the security of your system.

If your equipment fails a periodic test, your service provider will contact you to schedule a service call. Other ACP features such as the Antenna Pointing -

Transmitter screen are utilized by satellite service personnel to increase the accuracy of satellite dish alignment.

3. *What operating systems are compatible with the new DIRECWAY System?*

You can connect your computer to the Internet whether you are running a Windows® or Macintosh® based system.

4. *Is DIRECWAY compatible with my Mac?*

Yes. Please review our Minimum Requirements list above for Macintosh systems.

5. *Why is Mac OS 10.0 not supported?*

Because the Mac OS 10.0 release is not supported by Apple, we do not develop products around non-supported OS systems. We recommend you upgrade your Mac OS to 10.1 or higher, which is supported by DIRECWAY.

9. What if my computer did not come with a Network Interface Card (NIC)? What can I do?

Many computers can be upgraded with a 10/100 Ethernet Network Interface Card (NIC). If you are comfortable with opening your computer and installing hardware, most Ethernet NICs can be self-installed. Check with your computer manufacturer for more information on the right Ethernet NIC for your system. Make sure your NIC is configured for "auto-negotiate".

Also, if you have an available USB port on your computer, you can purchase a USB Ethernet adapter. This may be easier to install than a PCI card in your computer. For a laptop, you can purchase a standard PCMCIA card that provides an Ethernet connection, or you can purchase a USB Ethernet adapter, as well. We recommend that you upgrade your computer to meet all of the requirements listed in *System requirements* on page 1 to get the most out of your Internet experience.

10. Can I use a PCMCIA card adapter for my laptop?

Yes. All you need to connect your computer to the DIRECWAY Modem is either a 10/100 Ethernet Network Interface Card or PCMCIA adapter with an Ethernet connector. The DIRECWAY System includes an Ethernet cable to connect your computer to the DIRECWAY modem.

11. Can I run DIRECWAY on a small network?

Yes, you can connect multiple home computers and laptops to a single DIRECWAY Internet connection at no additional cost. Home networking equipment may be required and is not included with your DIRECWAY System. For network setup, support and configuration, contact your network hardware manufacturer and/or operating system software developer (HUGHES is not responsible for home network configuration or management).

Please understand that all computers on this network will be sharing a single connection. Simultaneous use of high bandwidth applications by multiple users may result in degradation of speed. Actual speeds may vary. Speed and uninterrupted use of service are not guaranteed.

12. How fast is DIRECWAY compared to other high-speed services? Aren't they faster?

Everyone's Internet technology is based on shared bandwidth, so sometimes one option will allow you to do things in less time than others. But because everyone uses shared bandwidth there's truly no definitive answer.

13. What is transmission latency?

Latency refers to the time it takes for signals to travel to and from the satellite. This typically creates a sub-second lag. For this reason, DIRECWAY may not be ideal for playing some "twitch-games" and time sensitive "online" trading.

14. Can I put this system on a boat or in an RV?

No. The DIRECWAY system is for fixed installations only.

DIRECWAY Professional **1. Can I run DIRECWAY Professional on a virtual private network (VPN)?**

Running a VPN client over a satellite network is not an ideal configuration. Although most VPN clients will work, your speeds will be affected significantly. While average download speeds are slightly better than dial-up, they will be reduced from typical DIRECWAY speeds by as much as 50 to 75 percent. Average upload speeds are comparable to dial-up performance. It is recommended that those accessing secure information over a VPN via DIRECWAY Professional do so on a limited basis. To optimize your performance, simply disable your VPN client while surfing the Internet, and enjoy the full speed of DIRECWAY. When you need to access information from your corporate LAN, you can enable your VPN client, keeping in mind that you will see a reduction in throughput. At this time, HUGHES does not endorse or support any VPN products. Customers that run VPN products do so at their own risk and will not receive any support from HUGHES regarding troubleshooting, configuring, optimizing, or maintaining a VPN connection.

2. Why does the service slow down when used in conjunction with a VPN?

Our communication satellite is located over 22,000 miles from Earth. Each data packet must be sent down separately and acknowledged by the remote site. This process takes time. In order to expedite the delivery of data packets to our end-users, HUGHES has developed a patented technology for aggregating those packets and sending all of them down simultaneously. VPNs encrypt each data packet, which prevents our technology from aggregating the data packets and reduces the throughput significantly.

This chapter explains how to configure Windows and MacIntosh operating system settings so that your computer can communicate with the DW6000.

- If DHCP is not enabled on your DW6000, you have been assigned a static IP address. To check if DHCP is enabled, go to *User Interface*→*System Information*→*Software Configuration*. If DHCP is not enabled on your DW6000, you need to set up an IP address manually on your computer. This is referred to as *static configuration* since the computer's IP address remains the same across restarts.
 - If you are using a Windows system, follow the instructions in *Configuring Windows for a DW6000 with a static IP address* on page 46.
 - If you are using a MacIntosh® system, follow the instructions in *Configuring a MacIntosh for a DW6000 with a static IP address* on page 58.
- If DHCP has been enabled, follow the instructions in the sections listed below.
 - If you are using a Windows system, follow the instructions in *Configuring Windows when DHCP is enabled* on page 52.
 - If you are using a MacIntosh system, follow the instructions in *Configuring a MacIntosh when DHCP is enabled* on page 59.

If you are using the DW6000 with a network, you must have already installed an Ethernet hub or wireless base station, network interface cards (NICs) in the computers that will be on your local area network (LAN), and if necessary connected the computers to the Ethernet hub with Ethernet cable. See Appendix B – on page 61.

Note: Remember you must carry out the relevant instructions for *each* of the computers or other devices on your LAN that you want to have access to the Internet.

Note: Home networking equipment required but not included. For network setup, support and configuration, contact your network hardware manufacturer and/or operating system software developer (HUGHES is not responsible for home network management or troubleshooting). Simultaneous use of high bandwidth applications by multiple users may result in degradation of speed. Actual speeds may vary. Speed and uninterrupted use of service are not guaranteed.

Configuring Windows for a DW6000 with a static IP address

The instructions for configuring a Windows 98SE, ME, 2000, or XP system with a static IP address vary slightly. Find the appropriate instructions for your system and follow them.

As you manually configure the client computers you will enter:

- *IP Address.* You need a valid IP address for each computer. Make sure the address does not conflict with any other computer connected to the DW6000. You can obtain the entire list of available addresses for use with your DW6000 from the Frequently Asked Questions section of the DW6000 System Control Center.
- *Subnet Mask.* This is the subnet mask assigned to your DW6000. It is available on the System Information page of the System Control Center. You would also have written this on the Quick Start Guide during registration.
- *Default Gateway.* This is the IP address of the DW6000 and is also available on the System Information page of the System Control Center. You would have also written this on the Quick Start Guide at the end of registration.

Windows 98SE or ME

1. Select *Start*→*Settings*→*Control Panel*.
2. Select *Network*. The Network configuration dialog box opens to the Configuration tab. See Figure 29.

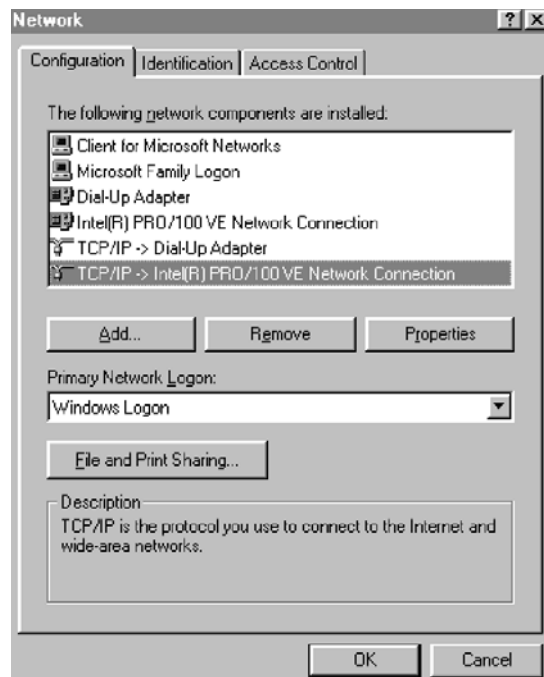


Figure 29: Network dialog with Configuration tab

3. Select the TCP/IP protocol that is bound to the NIC that connects to the DW6000 and select Properties. In Figure 29 it is TCP/IP -> Intel (R) Pro/100VE Network Connection. Your system may display different NIC information. The *TCP/IP Properties* box opens to the *IP Address* tab. See Figure 30.

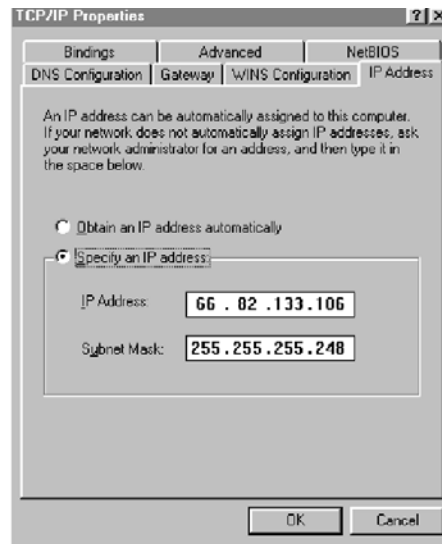


Figure 30: TCP/IP Properties

4. Select **Specify an IP Address**. Enter an appropriate IP address from the range of available IP addresses. See page 46 for more details; do not use the ones in the examples.
5. In the **Subnet Mask** field, enter the appropriate value as explained on page 46.
6. Select the *Gateway* tab. Enter the DW6000 IP Address in the New Gateway field. See Figure 31.
7. Select **Add**.

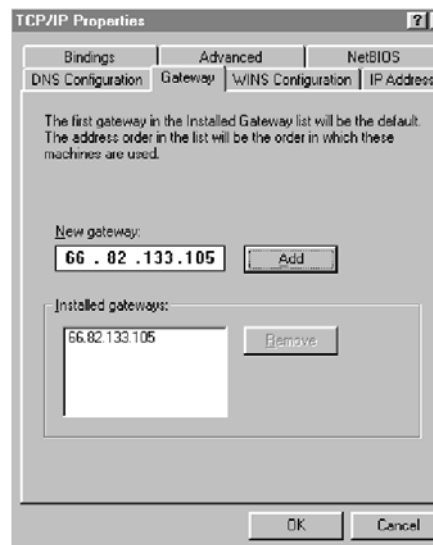


Figure 31: Enter DW6000 IP address

8. Select the DNS Configuration tab, and verify the following settings.
 - a. Make sure Enable DNS is selected.
 - b. The Domain Name should be **direpc.com**.
 - c. Under DNS Server Search Order, you should see 198.77.116.8. If you do not, type it in the box and select **Add**.
9. Select **OK** when finished to close the TCP/IP Properties box.
10. Select **OK** again to close the Network dialog box.
11. Select **Yes** in the window that appears to restart the computer.

Windows 2000

1. Select *Start*→*Settings*→*Control Panel*.
2. Select the Network and Dialup Connections icon. See Figure 32.
3. Right select the Local Area Connection that connects to the DW6000 and select Properties. See Figure 33.

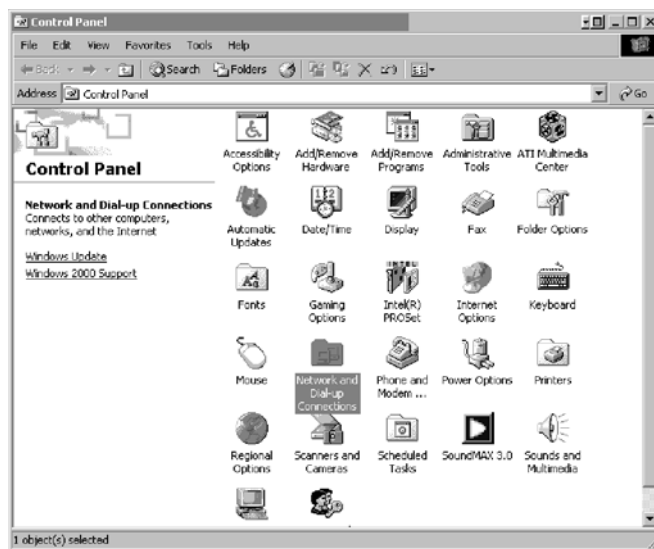


Figure 32: Network and Dialup Connections

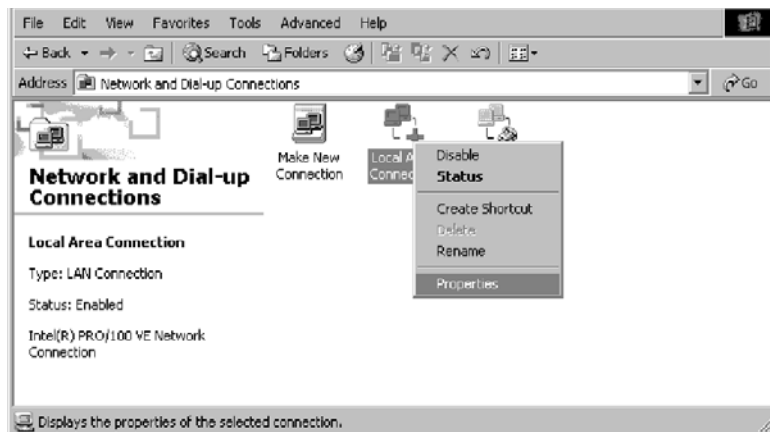


Figure 33: Local Area Connections, right select, Properties

4. Select Internet Protocol (TCP/IP) being careful not to uncheck it and select Properties. See Figure 8.
5. In the General tab, select Use the following IP address. Enter an appropriate IP Address from the range of available IP addresses as explained on page 46.
6. Enter 255.255.255.0 for the subnet mask.
7. Enter the DW6000 IP address as the Default Gateway.
8. Enter 198.77.116.8 for the Preferred DNS server field. See Figure 9.
9. Select OK to save and close Internet Protocol (TCP/IP) Properties.
10. Select close again to save and close Local Area Connection Properties.
11. Reboot the PC, if necessary.

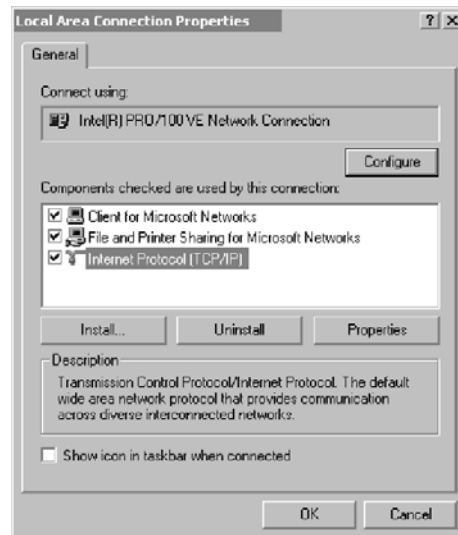


Figure 34: Local Area Connection Properties

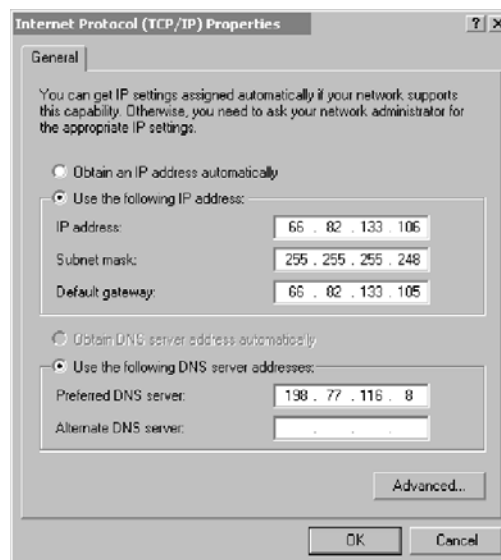


Figure 35: TCP/IP Properties

Windows XP

1. Open the Control Panel by selecting *Start→Control Panel* and double-select the **Network and Dial-up Connections** icon. See Figure 36.

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

2. A list of Network adapters will be displayed. A Local Area Connection must be listed under LAN or High-Speed Internet. If not, the network is not installed correctly.
3. Right-select the Local Area Connection icon that represents the Network adapter that connects the computer to the DW6000 and select Properties. See Figure 37.

Note: If the Local Area Connection icon appears with a red X then check your connections. The red X must not be present in order for you to be successful.

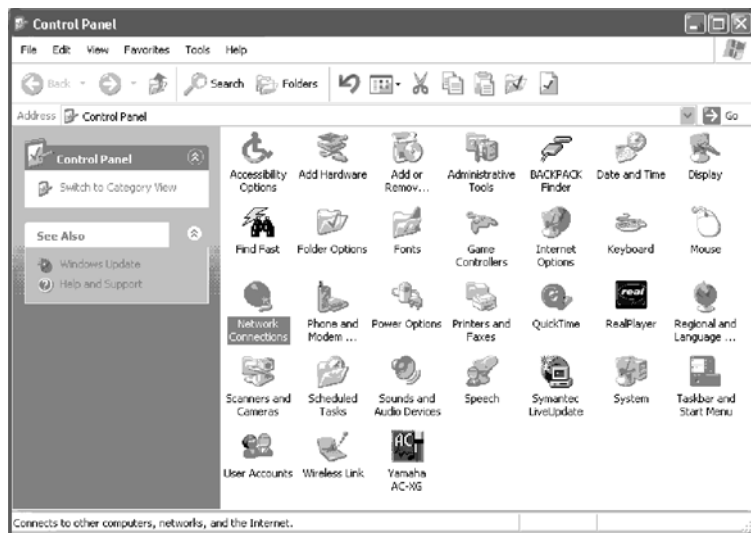


Figure 36: Network and Dialup Connections

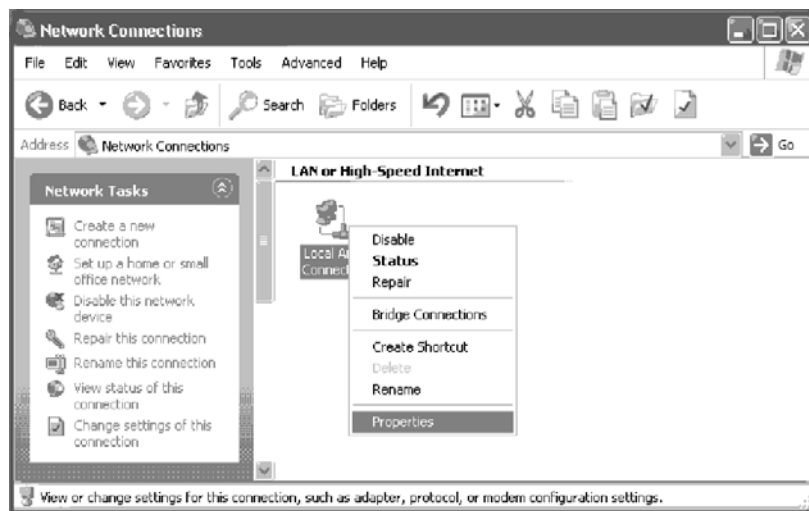


Figure 37: DW6000 Properties

4. Select Internet Protocol (TCP/IP) and select Properties being careful not to uncheck the check box. See Figure 38.
5. In the General tab, select **Use the following IP address**. Enter an appropriate IP address from the range of available IP address and the appropriate Subnet Mask for your network in the fields provided. Enter the IP address of the DW6000 for the Default Gateway. Enter 198.77.116.8 for the Preferred DNS server field. See Figure 39.
6. Select OK to close the open dialog boxes and finish the configuration.
7. Restart the computer even if Windows does not require you to do so. This will ensure that the network settings are automatically reset.

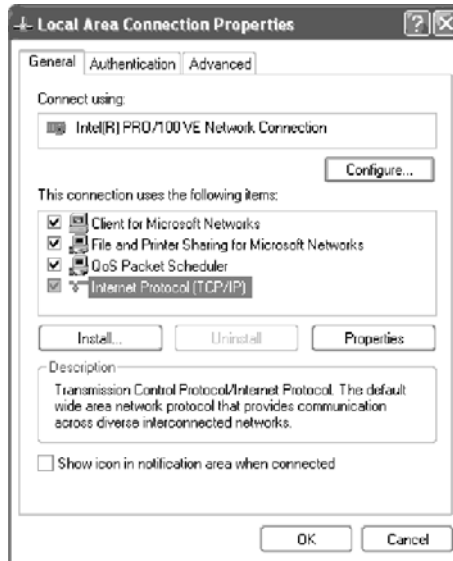


Figure 38: TCP/IP Properties

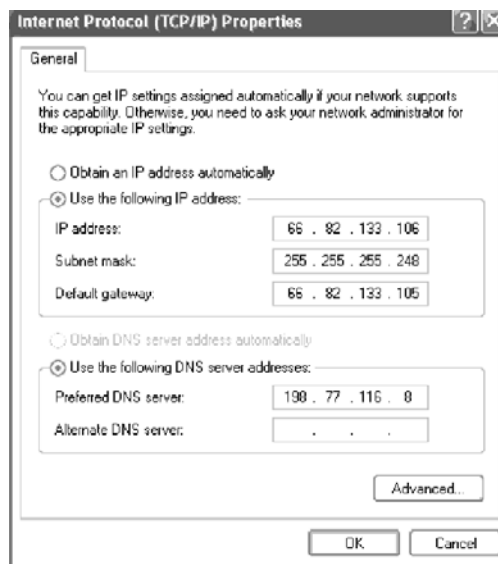


Figure 39:

Configuring Windows when DHCP is enabled

Windows 98SE and ME

1. On the client computer, go to *Start*→*Settings*→*Control Panel* and double-click **Network**. See Figure 40.

Note: On Windows ME computers, choose View All Control Panel Options to see the Network icon.

2. A list of network components will be displayed. See Figure 41.



Figure 40: Control Panel

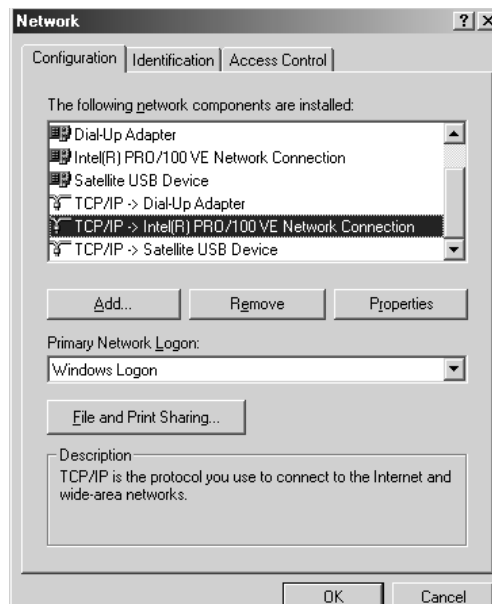


Figure 41: Network window

3. Select the TCP/IP entry associated with Network Interface Card (NIC) and then select Properties. The TCP/IP Properties window appears. See Figure 42.
4. In the IP Address tab, select Obtain an IP address automatically.
5. Select the Gateway tab. Remove any installed gateways by selecting them and selecting **Remove**. See Figure 43.
6. Select the **Disable DNS** radio button on the DNS Configuration tab.
7. Select **OK** to accept the updates for the TCP/IP properties
8. Select **OK** to close the list of network components. Windows may request the installation CD-ROM to complete updating the TCP/IP settings.
9. Restart the computer if it does not do so automatically.

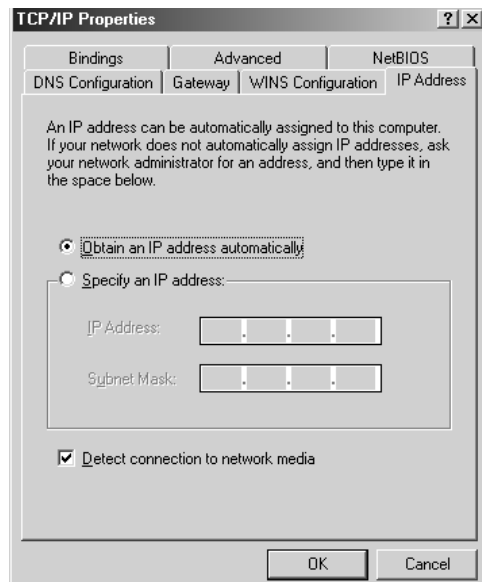


Figure 42: TCP/IP Properties

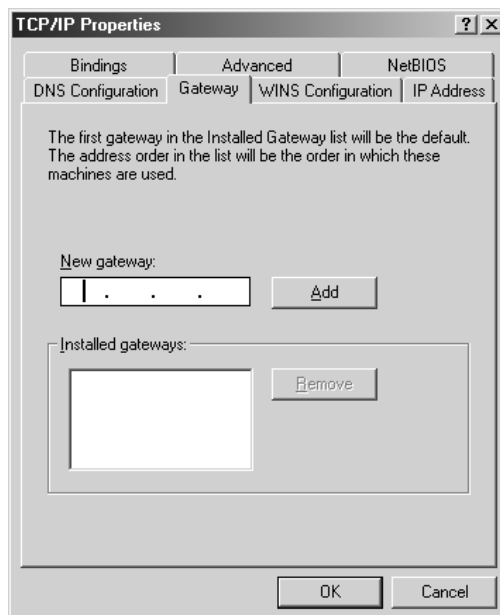


Figure 43: Gateway tab

Windows 2000

1. On the client computer, go to *Start*→*Settings*→*Control Panel* and double-click Network and Dial-up Connections.
2. A list of network adapters appears. See Figure 44. The Local Area Connection adapter must be listed. If it is not, the network is not installed correctly.
3. Right-click the Local Area Connection icon that represents the network adapter that connects the computer to the DW6000 and select Properties. The Local Area Connections Properties window appears. See Figure 45.
4. Ensure that the Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked. If NetBEUI is installed, uninstall it.

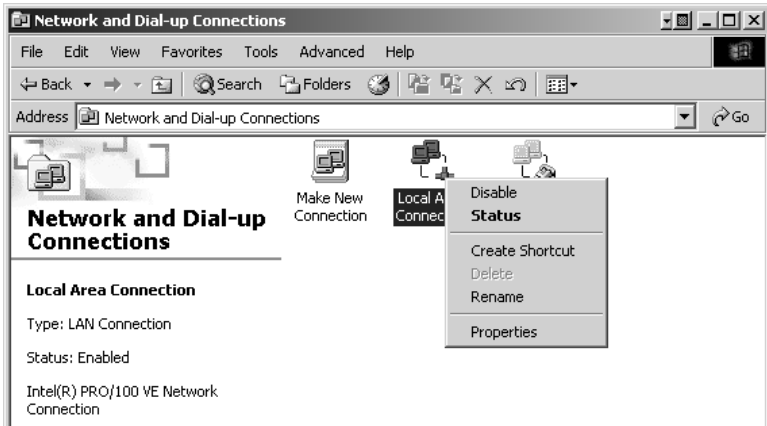


Figure 44: Network and Dial-up Connections

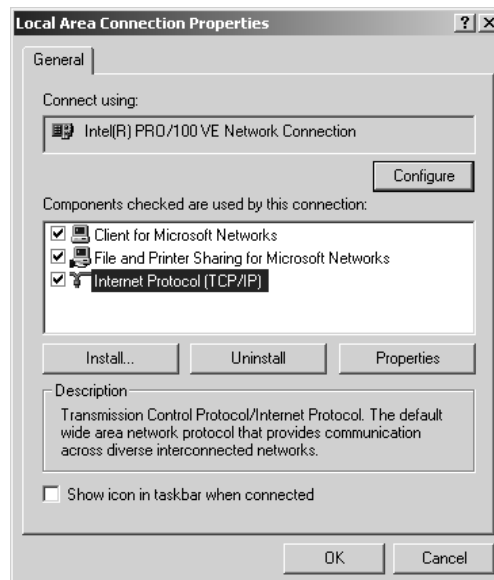


Figure 45: Local Area Connection Properties

5. Select Internet Protocol (TCP/IP). Be careful not to uncheck the checkbox.
6. Select the Properties button. The Internet Protocol Properties window appears. See Figure 46.
7. Ensure that both Obtain an IP Address Automatically and Obtain DNS Server Address Automatically are selected. If not, select them.
8. Select **OK** to close the open dialog boxes and finish the configuration.
9. Restart the computer even if Windows does not require you to do so. This will ensure that the network settings are automatically reset.

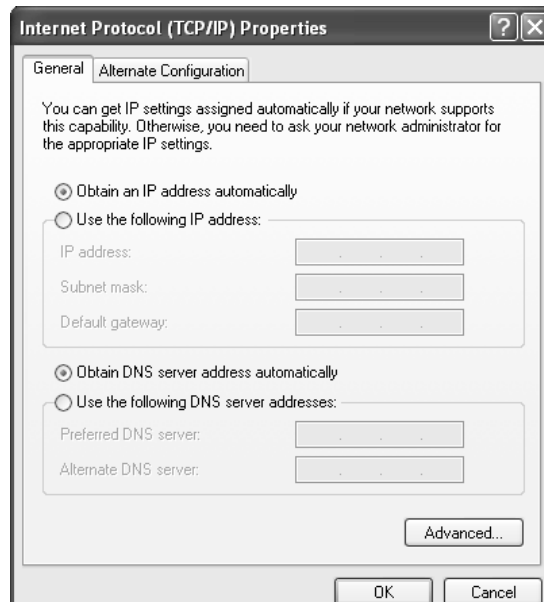


Figure 46: Internet Protocol Properties

Windows XP

1. Go to Start→Settings→Control Panel. Double-click the Network and Dial-up Connections icon.

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

2. A list of network adapters will be displayed. A Local Area Connection must be listed under LAN or High-Speed Internet. If not, the network is not installed correctly. See Figure 47.

3. Right-click the Local Area Connection icon that represents the Network adapter that connects the computer to the Satellite Gateway and select Properties.

Note: If the Local Area Connection icon appears with a red X then check your connections. The red X must not be present in order for you to be successful.

4. Ensure that the Client for Microsoft Networks and Internet Protocol (TCP/IP) are installed and checked. If NetBEUI is installed, uninstall it. See Figure 48.

5. Select Internet Protocol (TCP/IP) and select Properties. See Figure 49.

Note: Be careful not to uncheck the Internet Protocol when you select it

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

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

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

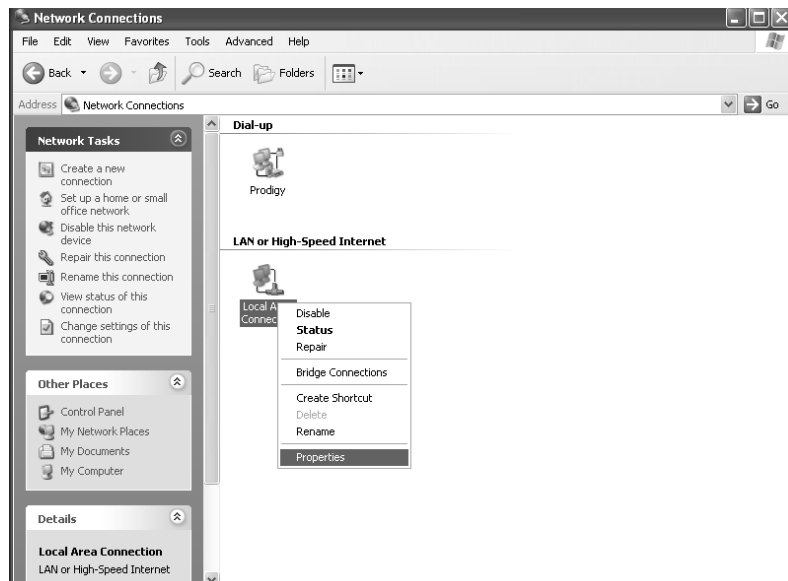


Figure 47: Network Connections

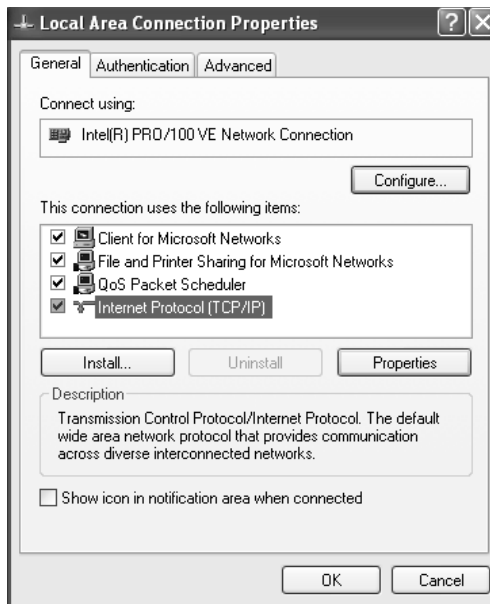


Figure 48: Local Area Connection Properties

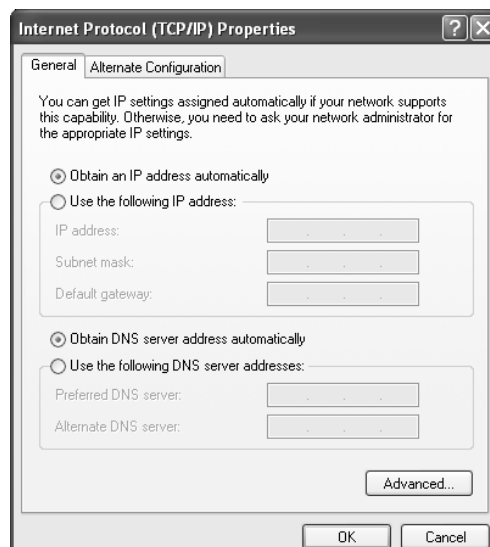


Figure 49: Internet Protocol Properties

Configuring a Macintosh for a DW6000 with a static IP address

Follow the steps below to configure a DW6000 with a static IP address on a Macintosh® system.

1. Select **System Preferences** from the Mac interface. The Systems Preference menu appears.
2. Select the *Network* icon. The Network screen appears. See Figure 51.
3. Select the *Configure* drop-down list. See Figure 52.
4. Select **Manually**.
5. Type the appropriate IP address from the range of available IP addresses in the IP Address field. See page 45 for details. Do not use the numbers in the examples, which are for illustrative purposes only.
6. Select the **Apply Now** button. The Mac is now configured.



Figure 50: Mac Systems Preferences menu

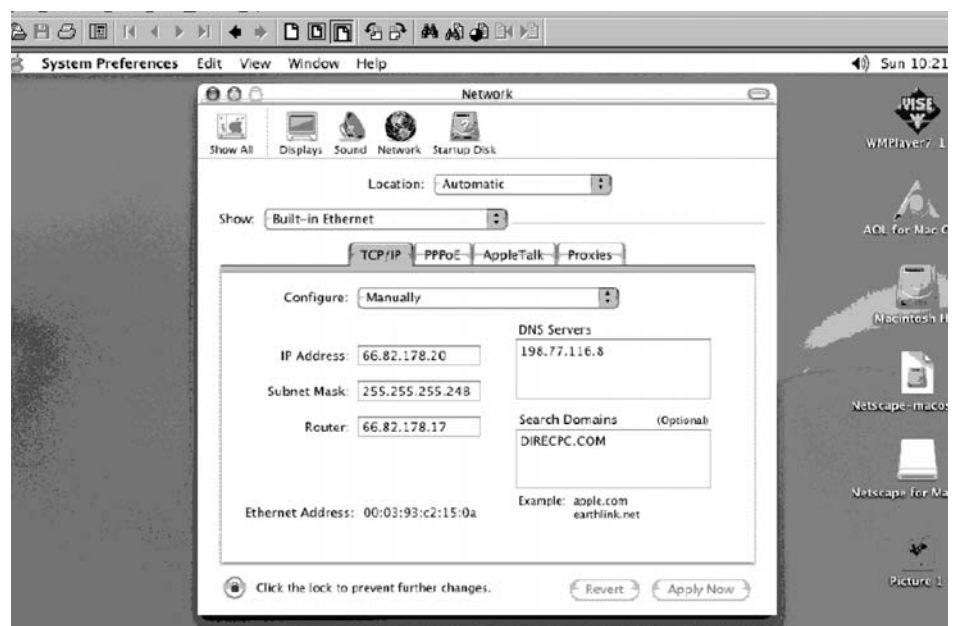


Figure 51: Mac Network screen



Figure 52: Select Manually from the Configure drop-down list

Configuring a Macintosh when DHCP is enabled

Follow the steps below to configure a DW6000 with DHCP enabled on a Macintosh system.

1. Select **System Preferences** from the Mac interface. The Systems Preference menu appears.
2. Select the *Network* icon. The Network screen appears.
3. Select the *Configure* drop-down list. See Figure 55.
4. Select Using DHCP. Notice the IP Address field grays out.
5. Select the **Apply Now** button. The Mac is now configured.

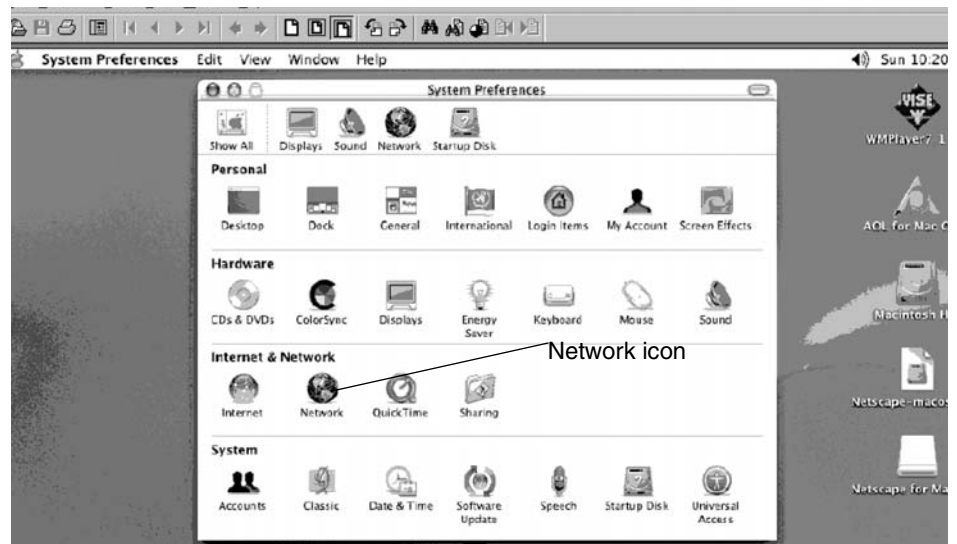


Figure 53: Mac Systems Preferences menu

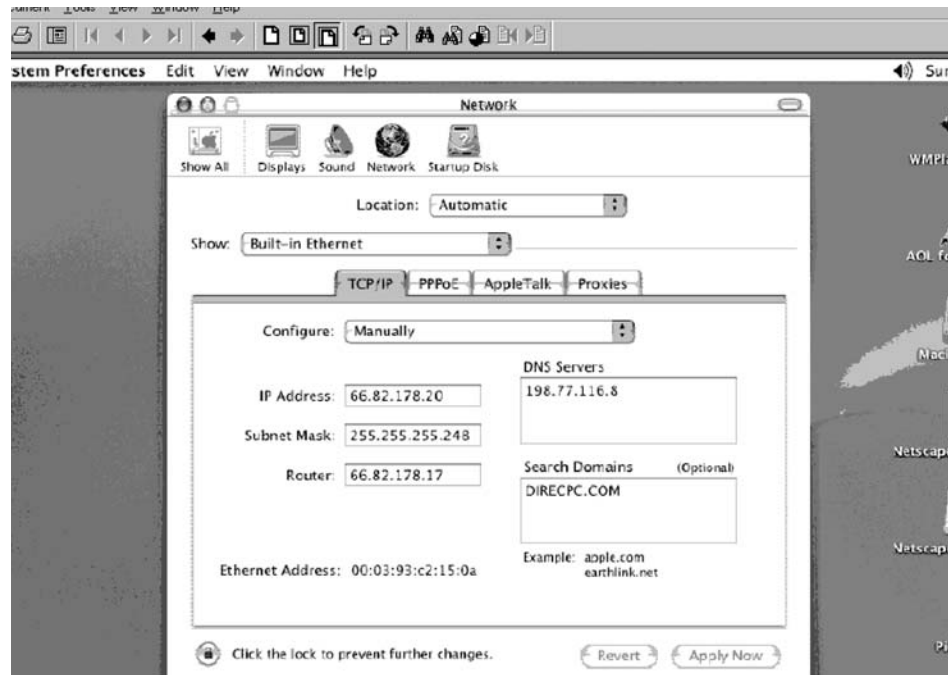


Figure 54: Mac Network screen



Figure 55: Select Manually from the Configure drop-down list

The DW6000, in combination with an antenna, can provide satellite connectivity for multiple computers on a wireless or wired (Ethernet) local area network (LAN). After the DW6000 and network are installed, every computer on the network can surf the Internet via the satellite signal.

Note: Connect multiple home computers and laptops to a single DIRECWAY Internet connection at no additional cost. Home networking equipment required but not included. For network setup, support and configuration, contact your network hardware manufacturer and/or operating system software developer (HUGHES is not responsible for home network management or troubleshooting). Simultaneous use of high bandwidth applications by multiple users may result in degradation of speed. Actual speeds may vary. Speed and uninterrupted use of service are not guaranteed.

If you connect the DW6000 to a LAN, you must:

- Install and configure an Ethernet hub (or a router if you have a static IP address) or wireless network base station.
- Install and configure a network interface card (NIC) (also called *adapters*) in each computer you want to connect to the network. The NICs must be set to *auto-negotiate*. Refer to the manufacturer's installation instructions.
- If using a wired network, connect the computers to the Ethernet hub with Ethernet cable.

Basic wireless considerations

Wireless networks are easy to install because you don't have to run any cables. Instead, a wireless *base station* is connected to the DW6000 Ethernet port. Wireless NICs are installed in each computer you want on the network. These components are available at most computer supply stores and outlets.

The base station processes the output from the DW6000 and broadcasts it to the computers on the network via radio waves. This is especially an advantage if you use laptops, because the computer can receive the radio waves at any location in the building that the signal can reach, and thus can easily be moved around.

Just remember that wireless signals will not penetrate metal or water. In addition, check that any base station you plan to use broadcasts signals as far as you will need them. Some base stations broadcast signals 200 feet or more in each direction; others broadcast shorter distances.

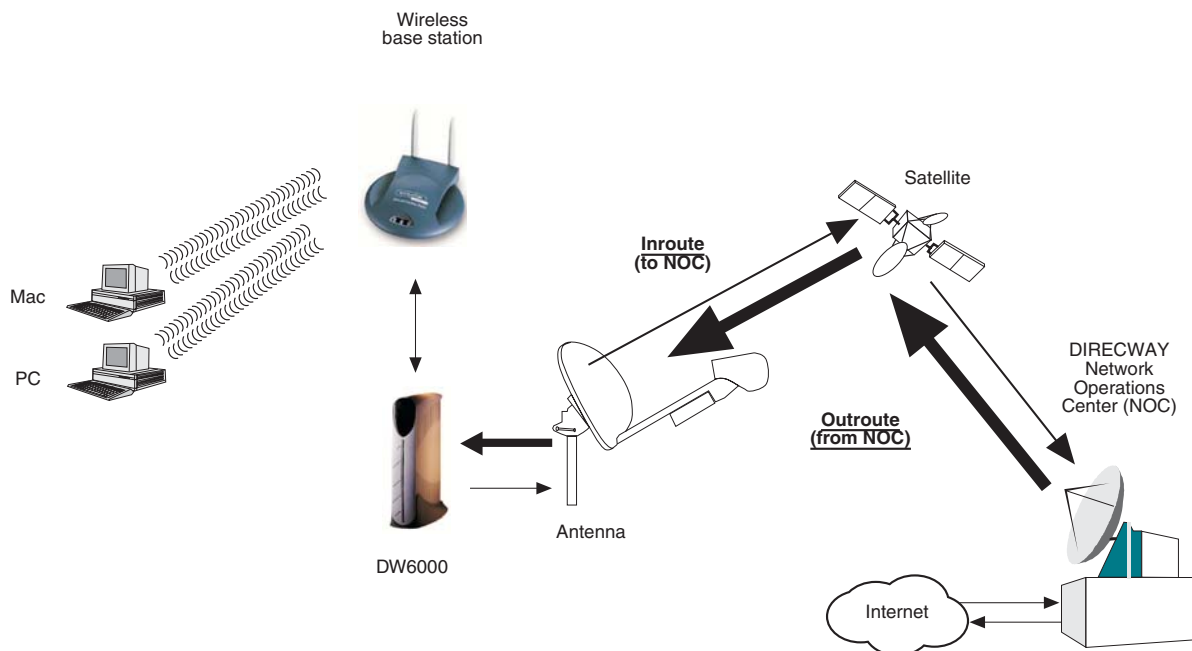


Figure 56: Site with DW6000 and wireless LAN installed

Basic Ethernet considerations

Ethernet hubs, cables, and NICs can be purchased at most computer supply stores or outlets. They are relatively inexpensive and easy to install. The Ethernet interface must support *auto-negotiate*, a feature that enables compatibility and inter-operability among Ethernet devices.

Select an Ethernet hub based on how many computers or other devices you will connect to the network, and how fast you need the data connection to be. (In network terminology, each computer connected to the network is called a *host*.) You may decide that an older 10Mbps Ethernet connection will meet your needs. However, if the users on your network will share large files or play computer games, you may wish to install a 100Mbps Ethernet hub. Some hubs enable the network to use both speeds.

Cat5 (Category 5) Ethernet cable is the minimum recommended and supports Fast Ethernet (100Mbps). If you think that the network or devices on the network may use the recently developed Gigabit Ethernet (1Gbps) in the future, you may want to consider installing Cat5e Ethernet cable now.

When you install the cable, either run it inside your walls or secure it to floor baseboards and doorway frames. Never use staples to secure Ethernet cable. Always leave some slack in the cable in case you have to repair it, which usually involves cutting away a damaged section.

Remember that prepared Ethernet cable--cable that already has RJ-45 jacks installed at the ends--are usually available in lengths of no more than 50 feet. If the cable run will be longer than 50 feet, you can use a kit to install the RG-45 jacks at both ends of the cable. (This is called *terminating* the cable.) The kits are available at some electronic supply or home supply stores. If you do not feel comfortable installing Ethernet cable yourself, contact a professional installer.

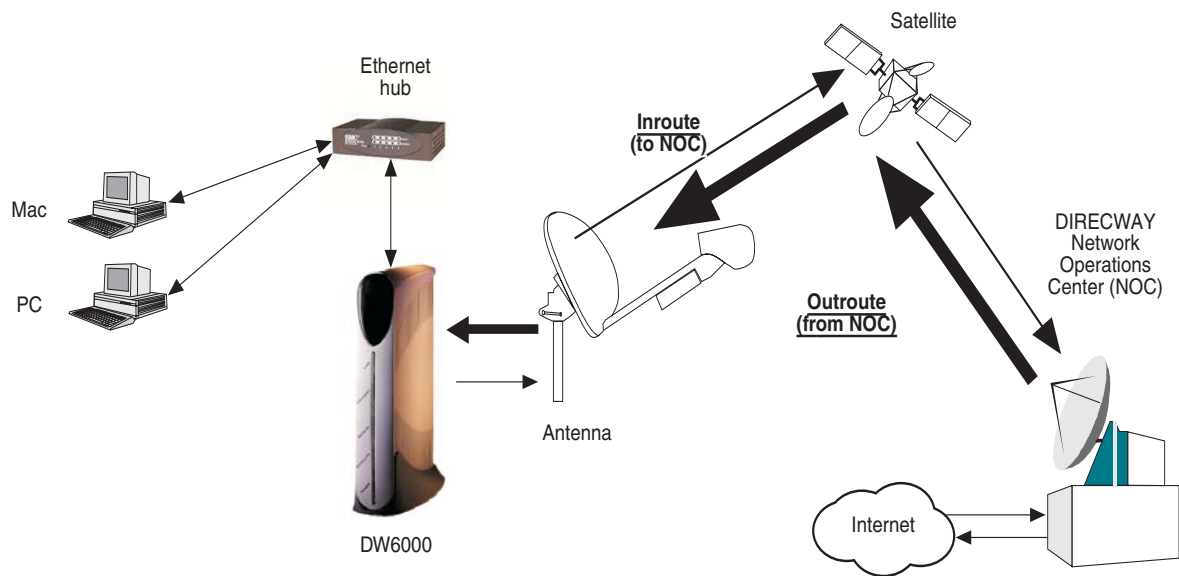


Figure 57: Site with DW6000 and Ethernet LAN installed

B

Base station - a device in a wireless network that processes and routes data from computers, modems (including satellite modems) and other devices on the network.

D

Dotted decimal notation - An IP address consists of 32 bits. Rather than working with 32 bits at a time, it is a common practice to segment the 32 bits of an IP address into four 8-bit fields called octets. Each octet is converted to a decimal number (the Base 10 numbering system) in the range 0-255 and separated by a period (a dot).

Dynamic Host Configuration Protocol (DHCP) - Allows automatic IP address assignment to computers on a network. This simplifies network configuration on your computers. Since your DIRECWAY unit implements DHCP Server functionality, you just need to configure your computers to "Obtain IP Address automatically" (which is the default setting). The computers would get both IP Address and DNS IP Address from your DIRECWAY unit.

E

Ethernet - the technology most commonly used on wired and wireless networks.

Ethernet cable - the cable used in wired networks using Ethernet technology. Category 5 Ethernet cable is recommended for the DW6000.

Ethernet hub - a device in a wired network that processes and routes data from computers, modems (including satellite modems), and other devices on the network.

H

Host - In packet- and message-switching communications networks, the collection of hardware and software that makes use of packet or message switching to support user-to-user, i.e., end-to-end, communications, interprocess communications, and distributed data processing. More simply, a server or computer on a LAN or on the Internet. The computer is reachable via the TCP/IP protocol suite from other computers.

I

Internet protocol (IP) - The method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet. The protocol within TCP/IP that governs the breakup of data messages into packets, routing the packets from sender to destination network and station, and reassembling the packets into the original data messages at the destination.

Internet service provider (ISP) - A business that supplies Internet connectivity services to individuals, businesses, and organizations.

Some ISPs are large national or multinational corporations that offer access in many locations, while others are limited to a single city or region.

IP address - a 32-bit number that identifies each sender or receiver of information that is sent in packets across the Internet. An IP address has two parts: the identifier of a particular network on the Internet and an identifier of the particular device (which can be a server or a workstation) within that network.

On the Internet itself - that is, between the router that move packets from one point to another along the route - only the network part of the address is looked at.

L

Local area network (LAN) - a group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server.

N

Network Address Translation (NAT) - provides IP address translation from the LAN. Two standard types of NAT are Network Address Port Translation (NAPT) and Basic NAT. Another flavor, Simple NAT, is provided by DIRECWAY to facilitate this feature in corporate networks where the LAN addresses are sparsely allocated.

Network interface cards (NIC) - cards used in wired and wireless networks to process signals.

Network Operations Center (NOC) - The heart of the DIRECWAY system. This central office has multiple connections to the Internet backbone. Your requests are received over the satellite, transmitted over the backbones to the Internet sites, and the responses received from the sites are transmitted back to you over the satellite.

Network Address Translation (NAT)- a method of connecting multiple computers to the Internet (or any other IP network) using one IP address.

P

Performance enhancing proxy (PEP) - Also referred to as TCP Acceleration. This is a proprietary protocol provided by DIRECWAY for use over the satellite link to optimize performance for TCP/IP based applications, including faster downloads over satellite.

Post Office Protocol (version 3) (POP3) - A protocol used to retrieve email from your mail server.

Protocol - An agreed upon, standardized format for communicating between computers or devices.

S

Signal quality factor (SQF) - an integer value from 0-99 that indicates the strength of the received satellite signal relative to noise.

Subnet mask - a 32-bit value that is used to distinguish the network ID from the host ID in an arbitrary IP address. Each host on a network requires a subnet mask.

T

TCP/IP internet protocol suite - the basic communication language or protocol of the Internet.

TCP Acceleration - see PEP.

Transmission control protocol (TCP) - a set of rules (protocol) used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet. While IP takes care of handling the actual delivery of the data, TCP takes care of keeping track of the individual units of data (called packets) that a message is divided into for efficient routing through the Internet.

Turbo Page - software that prefetches objects from Web sites you visit to speed up surfing.

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