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Installing the Contivity 1740

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EN 55 022 statement

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Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

Achtung: Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

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Cet appareil numérique (Contivity 1740) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

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Preface

The Contivity* 1740 is part of the Nortel Networks* Contivity Secure IP Services Gateway product family. The Contivity Secure IP Services Gateways support secure, reliable IP VPNs in a single, integrated hardware device. Throughout this guide, the Contivity 1740 is also referred to as *the gateway.*

This guide provides instructions for installing the Contivity 1740 for the first time and for replacing any field replaceable unit (FRU). This guide also provides some initial configuration information and includes technical specifications for the Contivity 1740.

For complete information about configuring and monitoring the Contivity 1740, see the documentation on the software CD. (For information about Contivity documentation, see "Related publications" on page 17.)

Before you begin

This guide is intended for qualified service personnel who are installing the Contivity 1740 for the first time or who need to install or replace any of the following field replaceable units (FRUs):

- LAN, WAN, and serial option cards
- Hardware encryption accelerator card
- Dual inline memory modules (DIMMs)

Before you install the Contivity 1740, make sure that all network wiring has been installed on the premises using standard cable system practices.

Text conventions

This guide uses the following text conventions:

`bold Courier text`	Indicates command names and options and text that you need to enter. Example: Use the **`show health`** command. Example: Enter **`terminal paging`** {**`off`** **`|`** **`on`**}.
italic text	Indicates new terms and book titles.
`plain Courier text`	Indicates system output, for example, prompts and system messages. Example: `File not found.`
separator (>)	Shows menu paths. Example: Choose Status > Health Check.

Acronyms

This guide uses the following acronyms:

ADSL	asymmetric digital subscriber line
AIS	alarm indication signal
CSU	channel service unit
DIMM	dual inline memory module
DSU	digital service unit
DTE	data terminal equipment
HSSI	High Speed Serial Interface
IP	Internet Protocol
IPsec	IP Security
LAN	local area network
LED	light emitting diode
LOS	loss of signal

OOF	out of frame
PCI	peripheral component interconnect
PDN	public data network
URL	uniform resource locator
VPN	virtual private network
WAN	wide area network

Related publications

For complete information about configuring, monitoring, and managing the Contivity 1740, refer to the following publications (included on the software CD):

- Release notes provide the latest information, including brief descriptions of the new features, problems fixed in this release, and known problems and workarounds.
- *Configuring Basic Features for the Contivity Secure IP Services Gateway* introduces the product and provides information about initial setup and configuration.
- *Configuring Authentication and Certificates for the Contivity Secure IP Services Gateway* provides instructions for configuring authentication services and digital certificates.
- *Configuring Firewalls, Filters, NAT, and QoS for the Contivity Secure IP Services Gateway* provides instructions for configuring the Contivity Stateful Firewall, NAT, and Contivity interface and tunnel filters.
- *Configuring Advanced Features for the Contivity Secure IP Services Gateway* provides instructions for configuring the tunneling protocols IPsec, L2TP, PPTP, and L2F, as well as instructions for configuring physical interfaces, PPP, frame relay, PPPoE, and advanced WAN settings.
- *Configuring Routing for the Contivity Secure IP Services Gateway* provides instructions for configuring RIP, OSPF, and VRRP, as well as instructions for configuring ECMP, routing policy services, and client address redistribution CAR).

- *Managing and Troubleshooting the Contivity Secure IP Services Gateway* provides information about system administrator tasks such as backup and recovery, file management, and upgrading software, and instructions for monitoring gateway status and performance. Also, provides troubleshooting information and interoperability considerations.
- *Reference for the Contivity Secure IP Services Gateway Command Line Interface* provides syntax, descriptions, and examples for the commands that you can use from the command line interface.

You can print selected technical manuals and release notes free, directly from the Internet. Go to the www.nortelnetworks.com/documentation URL. Find the product for which you need documentation. Then locate the specific category and model or version for your hardware or software product. Use Adobe* Acrobat Reader* to open the manuals and release notes, search for the sections you need, and print them on most standard printers. Go to Adobe Systems at the www.adobe.com URL to download a free copy of the Adobe Acrobat Reader.

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If you purchased a Nortel Networks service program, contact Nortel Networks Technical Support. To obtain contact information online, go to the www.nortelnetworks.com/cgi-bin/comments/comments.cgi URL, then click on Technical Support.

From the Technical Support page, you can open a Customer Service Request online or find the telephone number for the nearest Technical Solutions Center. If you are not connected to the Internet, you can call 1-800-4NORTEL (1-800-466-7835) to learn the telephone number for the nearest Technical Solutions Center.

An Express Routing Code (ERC) is available for many Nortel Networks products and services. When you use an ERC, your call is routed to a technical support person who specializes in supporting that product or service. To locate an ERC for your product or service, go to the http://www.nortelnetworks.com/help/contact/erc/index.html URL.

Chapter 1
Installing the Contivity 1740 chassis

This chapter describes how to install the Contivity 1740 chassis.

Note: Before you install the chassis, make sure that all network wiring has been installed on the premises using standard cable system practices.

This chapter contains the following topics:

Description of the Contivity 1740

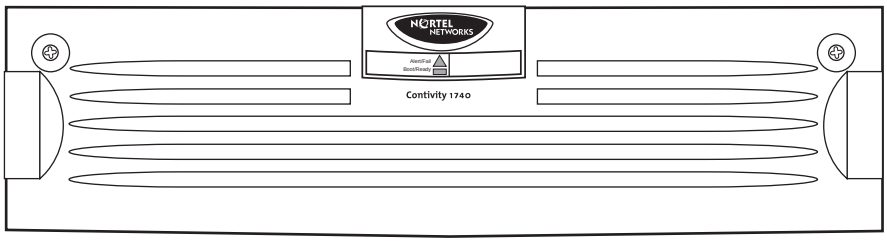
The Contivity 1740 enables scalable, secure, and robust IP VPNs across the public data network (PDN). The Contivity 1740 provides routing, firewall, bandwidth management, encryption, authentication, and data integrity services to ensure secure tunneling across IP networks and the Internet.

The Contivity 1740 is available in two models:

- Contivity 1740 with five tunnels
- Contivity 1740 with 500 tunnels (this model includes one 10/100 Ethernet* interface card installed in PCI slot 4)

Figure 1 shows the front view of the Contivity 1740.

Figure 1 Front view of the Contivity 1740



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The Contivity 1740 chassis provides the following:

- One 10/100 Ethernet LAN port on the base system
- One serial port for out-of-band management of the Contivity 1740
- Four expansion PCI slots that can contain interface cards and one hardware encryption accelerator card
- One 10/100 Ethernet interface card installed in PCI slot 4 (500-tunnel model)
- 128 MB memory upgradable to 256 MB total

Preparing to install the Contivity 1740

Before you begin the installation, verify that:

- Your shipment is complete and undamaged.
- You have the cables, tools, and other equipment that you need.
- Your installation site meets the physical, electrical, and environmental requirements.

The sections that follow provide information to help you prepare for installation.

Shipment contents

In addition to the gateway and this guide, the shipping container for the Contivity 1740 contains a number of hardware accessories and other items (Table 1).

Note: Unless you specifically ordered a power cable, no power cable is shipped with the Contivity 1740.

Table 1 Items shipped with the Contivity 1740

Quantity	Item	Purpose
1	Rack mount shelf	Supports the chassis in the equipment rack
4	10-32 panhead screws	Secure the rack-mount shelf and the chassis to the equipment rack
4	10-32 panhead cage nuts	Used if the equipment rack does not have threaded rail holes
4	Rubber feet	Used to install the chassis on a surface
1	Antistatic wrist strap	Directs the discharge of static electricity from your body to the chassis to prevent damage to sensitive electronic components
1	Molded serial cable DB9/DB25-to-DB9/DB25	Connects the Contivity 1740 to a PC or to a local terminal
1	*Installing the Contivity 1740* (this book)	Provides instructions for installing the chassis and hardware options
1	Recovery diskette	Used to restore the software image and file system
1	Contivity software kit	Contains Contivity Secure IP Services Gateway software and documentation on CD
1	Contivity client kit	Contains Contivity VPN Client software and documentation on CD
1	Sheet of labels	Used to note IP address (apply to front bezel)

Inspect all items for shipping damage. If you detect any damage, do not install the Contivity 1740. Call the Nortel Networks Technical Solutions Center in your area (see “How to get help” on page 18).

Additional equipment

You may need items that are not included in the Contivity 1740 shipping container. Before you begin the installation, make sure that you have all the cables, tools, and other equipment that you need.

Cables

You will need cables that are not included in the Contivity 1740 shipping container. For information about which cables are shipped and which ones you can order, see "Connecting communications cables" on page 30. If you do not have the proper cables, contact your network administrator.

Hardware for mounting the chassis in an equipment rack

To install the Contivity 1740 in an equipment rack, you need a Phillips screwdriver and an equipment rack that meets the following specifications:

- Heavy-duty steel construction
- Width of 19 in. (48.26 cm) and depth of 24 in. (60.96 cm)
- Electronic Industries Association (EIA) standard hole-spacing

If the rack does not have threaded rail holes, you must use the cage nuts shipped with the Contivity 1740.

Site requirements

The installation site must provide sufficient free space around the Contivity 1740 to ensure proper ventilation and access for servicing. For information about the physical, electrical, and environmental requirements for the Contivity 1740, see Appendix A, "Technical specifications," on page 69.

Installing the chassis

To install the Contivity 1740, do one of the following:

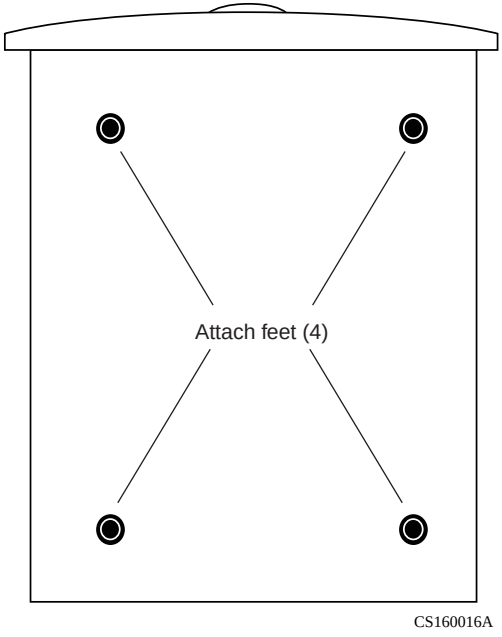
- Position the chassis on a flat, sturdy, horizontal surface.
- Mount the chassis in a standard equipment rack (see “Installing the chassis in an equipment rack” on page 24).

Installing the chassis on a flat surface

If you decide to place the Contivity 1740 on a flat surface, make sure that the surface is large enough for the gateway and sturdy enough to support the combined weight of the Contivity 1740 and the cables that you attach to it.

The Contivity 1740 accessory kit includes four rubber feet that can be attached to the bottom of the gateway. Figure 2 shows the placement of these rubber feet.

Figure 2 Placement of rubber feet on the bottom of the chassis



Installing the chassis in an equipment rack

To mount the Contivity 1740 in an equipment rack, you need the following equipment:

- Standard 19-inch equipment rack
- 4 screws (supplied with the chassis)
- 4 cage nuts (supplied with the chassis) if the rack does not have threaded rail holes
- #2 Phillips screwdriver

Rack-mount recommendations

When you mount the chassis in the rack, observe the following standard recommendations:

- The maximum recommended ambient temperature is 40°C (104°F). Make sure that the internal temperature of the rack does not exceed 40°C (104°F).
- Do not block the power supply vents or otherwise restrict air flow when installing the chassis in a rack.
- Stabilize your rack so that it does not tip over under the weight of the gateway and other devices.
- Make sure that the electrical branch circuits can handle the Contivity 1740 and other units in the rack before you install and turn on the gateway.
- Maintain a reliable earth-ground path in the rack system. The gateway is intended to connect to an earth ground.

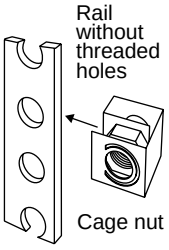
Attaching the shelf in the equipment rack

The Contivity 1740 ships with a rack-mount shelf to support the chassis in the equipment rack.

To attach the shelf to the inside of the equipment rack:

1 If the holes in the rack's vertical supports are not threaded, attach a cage nut in four locations at the front of the rack (Figure 3).

Figure 3 Attaching the cage nuts to the rack



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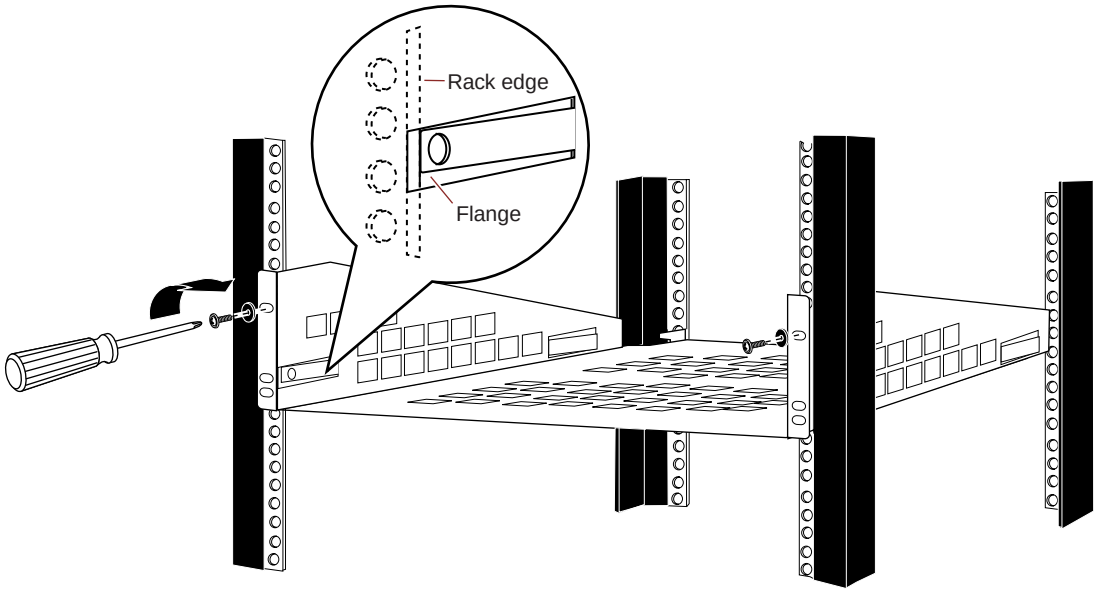
2 Position the rack-mount shelf inside the rack as shown in Figure 4.

3 Align the holes in the shelf with holes in the front of the rack.

Figure 4 Installing the shelf in the equipment rack



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4 Make sure that the support flange snaps into place (Figure 4).

5 Insert one of the supplied panhead screws through the top hole on each side of the shelf into the hole in the rack and tighten the screws (Figure 4).

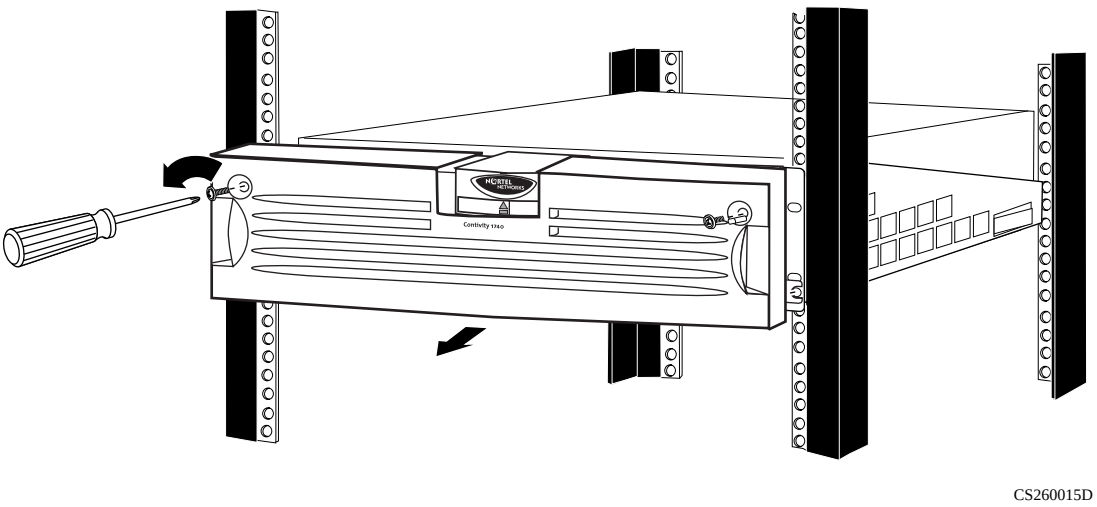
Mounting the chassis in the equipment rack

Nortel Networks recommends that two people install the chassis in the rack.

To install the Contivity 1740 in the equipment rack:

1. Set the Contivity 1740 on the rack-mount shelf.
2. Remove the front bezel from the Contivity 1740 (Figure 5).
   a. Using the Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise.

Figure 5 Removing the front bezel



   b. Grip the two handles and firmly pull the bezel toward you to unsnap it from the chassis.

Caution: Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

The first few times that you remove the front bezel, it may be somewhat difficult to remove because the ball studs and socket clips are new.

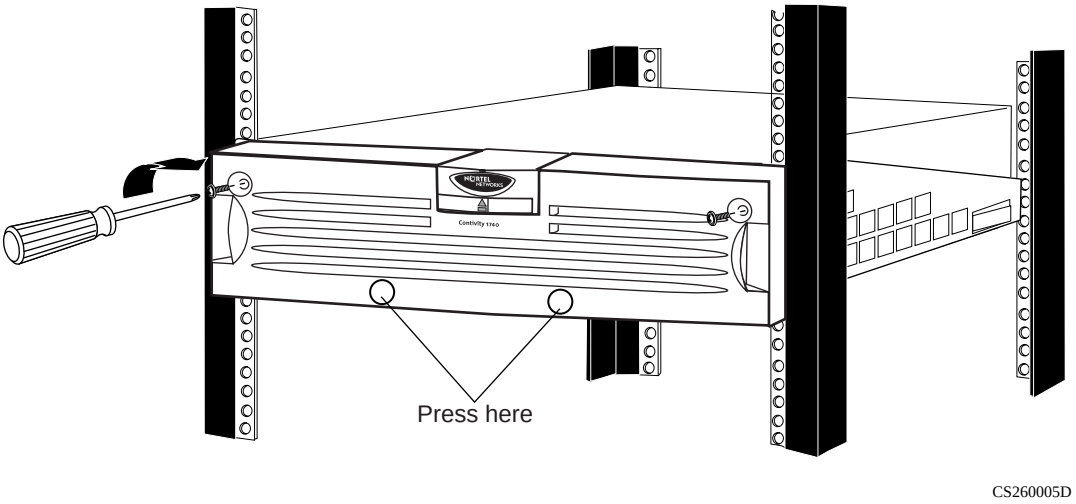
3 Insert one of the supplied panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws (see Figure 4 on page 25).

4 Replace the front bezel (Figure 6).

a Hold the two handles on the bezel and push it onto the chassis.

b Using the Phillips screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Figure 6 Replacing the front bezel



Chapter 2
Cabling the gateway and turning the power on

This chapter provides information about how to connect communications cables and the power cord to the Contivity 1740.

Caution: Connect the cables to the built-in Ethernet port and to the interfaces on the option cards installed in the Contivity 1740 before you plug the power cord into the outlet.

This chapter contains the following topics:

Caution: Cabling for all WAN, LAN, and serial connections is not to be routed outside the building environment.

Connecting communications cables

Gather the cables that you will attach to the Contivity 1740.

Table 2 lists the system ports and the ports provided on the optional interface cards that you can install in the Contivity 1740. The table also indicates whether you can obtain cables for the ports from Nortel Networks.

Table 2 Interfaces and cables for the Contivity 1740

	Cable available from Nortel Networks		
Interface	**Included**	**Ordered separately**	**Contact supplier**
10/100 Ethernet system port			X
Serial port	X		
10/100BASE Ethernet			X
1000BASE-T Ethernet (copper)			X
1000BASE-SX Ethernet (fiber)		X[1]	
ADSL WAN	X		
ISDN BRI			X
T1/E1 CSU/DSU WAN			X
Quad T1/E1 CSU/DSU WAN			X
Single V.35/X.21 WAN		X[2]	
Dual V.35 WAN	X		
V.90 modem	X		
HSSI WAN	X		

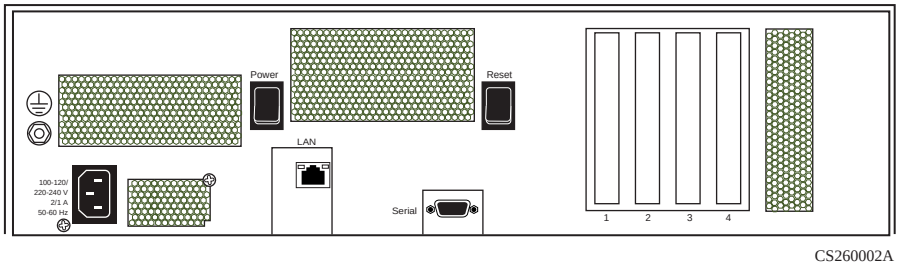
1 Order either the LC-to-LC cable or the LC-to-SC cable.

2 Order either the V.35 cable or the X.21 cable.

For information about the connectors and cable pinouts, see Appendix A, “Technical specifications,” on page 69.

Figure 7 shows the back of the Contivity 1740. All interface cables and the power cord attach to the rear of the gateway.

Figure 7 Rear view of the Contivity 1740



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Connect the interface cables to the Contivity 1740 in this order:

1. Connect the 10/100BASE RJ-45 cable to the built-in 10/100BASE Ethernet LAN port on the gateway (see Figure 7 on page 31).
2. If you plan to connect a terminal or PC to the gateway, connect the serial cable shipped with the Contivity 1740 to the serial port (see Figure 7 on page 31).
3. Connect all other cables to the ports on the installed interface cards.

   If you ordered optional interface cards, connect the cables for these interfaces to the ports.

Connecting the power cord

You must order the power cord for the Contivity 1740 separately.

Warning: Do not modify or use the AC power cord if it is not the exact type that is required for your power outlet.

The power cord must meet the requirements described in Table 3.

Table 3 Power cord requirements

Requirement	Description
Current rating	The power cord must be rated for the available AC voltage and must have a current rating that is at least 125 percent of the gateway's current rating (2 A @ 100 VAC or 1A @ 220 VAC).
Certification	The power cord must have certification marks from an acceptable regional agency.
Cord length and flexibility	The power cord must be less than 4.5 meters (14.7 feet) long. It must be a flexible HAR (harmonized) cord or VDE-certified cordage to comply with the gateway's safety certifications.
Power supply connector	The connector that you plug into the AC receptacle on the gateway must be an IEC 320, Sheet C13 female.
Wall outlet connector	The power cord must terminate in a male plug with appropriate grounding.

To connect the power cord and turn on the system power:

1. Connect the power cord to the AC receptacle on the back of the gateway (see Figure 7 on page 31).
2. Connect the power cord to the power outlet.

Caution: You should protect the Contivity 1740 by plugging it into a surge suppressor.

3. Press and release the power switch on the rear of the Contivity 1740 (see Figure 7 on page 31) and wait for the gateway to boot.

See the next section, "Verifying a successful installation."

Verifying a successful installation

After you connect the gateway to the power source and turn it on, you can verify a successful installation by checking the LEDs on the front panel (Figure 8).

The following sequence of LEDs should occur:

1. The power LED (the Nortel Networks logo) lights blue.
2. As the gateway boots, the Boot/Ready LED lights yellow.
3. When the boot process completes successfully, the Boot/Ready LED lights green, indicating that the gateway is operational.
4. The Alert/Fail LED lights yellow because the gateway is not configured.

   For a newly installed Contivity 1740, a yellow Alert/Fail LED does not indicate an alarm condition. After you configure the management IP address on the gateway, the Alert/Fail LED turns off. (See Chapter 3, “Configuring the management IP interface,” on page 43.)

If the LEDs on the front panel light in this sequence, your installation is successful. If the LEDs do not light in this sequence, check that the bezel is on the gateway and that the power cord is properly attached to the power supply (see “Connecting the power cord” on page 32).

If the Contivity 1740 still does not boot, contact your local Nortel Networks Technical Solutions Center (see “How to get help” on page 18).

Understanding the LEDs

This section describes the LEDs on the front panel of the Contivity 1740 and on the interface cards that have LEDs. You can confirm that the LAN and WAN interfaces are cabled properly by examining the LEDs.

Front panel LEDs

The front panel of the Contivity 1740 has a lighted Nortel Networks logo and two LEDs (Figure 8). These LEDs indicate the status of the Contivity 1740.

Figure 8 Front panel LEDs

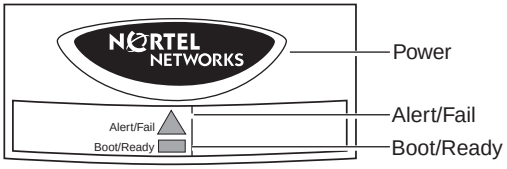


Table 4 describes the LEDs on the Contivity 1740 front panel.

Table 4 Front panel LED indicators

LED	Indicator	Description
Power (Nortel Networks logo)	On	The gateway is receiving AC power.
	Off	The gateway is not receiving AC power.
Alert/Fail	Yellow	A non-fatal alarm condition exists. The yellow alert condition is described in the health check display.
	Red	A serious alarm condition exists that requires attention. A red alert usually indicates a hardware error. The red alert condition is described in the health check display.
Boot/Ready	Yellow	The gateway is booting and is in a non-ready state.
	Green	The boot process has completed successfully and the gateway has reached a state of readiness.

For complete information about the health check, event log, and system log, see *Managing and Troubleshooting the Contivity Secure IP Services Gateway.*

LEDs on the system 10/100BASE Ethernet port

Figure 9 shows the LEDs for the 10/100BASE Ethernet port located on the rear of the Contivity 1740.

Figure 9 LEDs on the system 10/100BASE Ethernet port

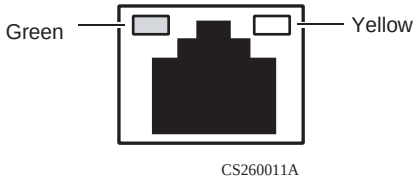


Table 5 describes the LEDs on the system 10/100BASE Ethernet port.

Table 5 LED indicators on the system 10/100BASE Ethernet port

LED	Indicator	Description
Green	On	The LAN port is operating at 100 Mb/s.
	Off	The LAN port is operating at 10 Mb/s.
Yellow	On	The cable connections between the LAN port and the hub are good.
	Off	The cable connections between the LAN port and the hub are faulty.
	Flashing	The LAN port is sending or receiving network data. The frequency of the flashes increases with increased traffic.

10/100BASE Ethernet interface card LEDs

Figure 10 shows the LEDs on the 10/100BASE Ethernet interface card.

Figure 10 LEDs on the 10/100BASE Ethernet interface card

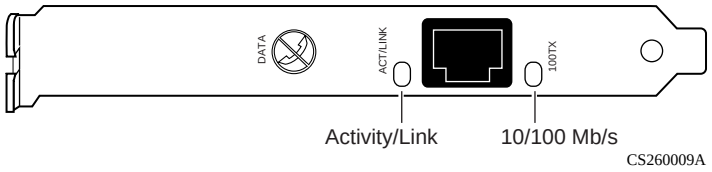


Table 6 describes the LEDs on the 10/100BASE Ethernet interface card.

Table 6 LED indicators on the 10/100BASE Ethernet interface card

LED	Indicator	Description
ACT/LINK	Steady Green or Flashing Green	The card is sending or receiving network data. The frequency of the flashes increases with increased traffic.
	Off	The card is not sending or receiving data.
10/100TX	Green	The port is operating at 100 Mb/s.
	Off	The port is operating at 10 Mb/s.

1000BASE-T Ethernet interface card LEDs

Figure 11 shows the LEDs on the 1000BASE-T Ethernet interface card.

Figure 11 LEDs on the 1000BASE-T Ethernet interface card

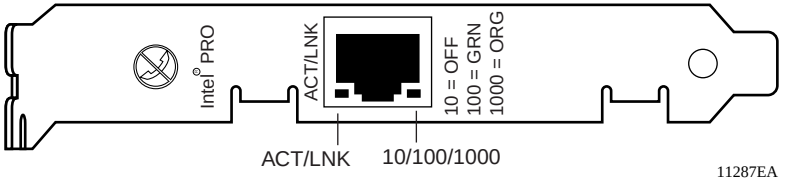


Table 7 describes the LEDs on the 1000BASE-T Ethernet interface card.

Table 7 LED indicators on the 1000BASE-T Ethernet interface card

LED	Indicator	Description
ACT/LNK	Green steady	The port is connected to a valid link partner.
	Green flashing	The LAN port is sending or receiving network data.
	Off	The port is not linked to a valid partner.
10/100/1000	Off	The LAN port is operating at 10 Mb/s.
	Green	The LAN port is operating at 100 Mb/s.
	Orange	The LAN port is operating at 1000 Mb/s.

1000BASE-SX Ethernet interface card LEDs

Figure 12 shows the LEDs on the 1000BASE-SX Ethernet interface card.

Figure 12 LEDs on the 1000BASE-SX Ethernet interface card

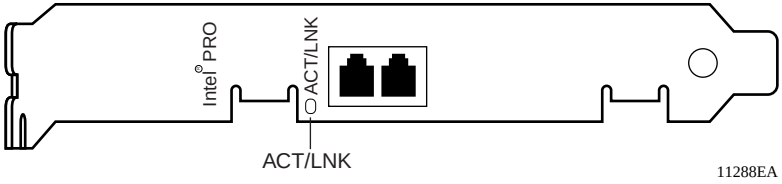


Table 8 describes the LED on the 1000BASE-SX Ethernet interface card.

Table 8 LED indicators on the 1000BASE-SX Ethernet interface card

LED	Indicator	Description
ACT/LNK	Green steady	The port is connected to a valid link partner.
	Green flashing	The LAN port is sending or receiving network data.
	Off	The port is not linked to a valid partner.

ADSL WAN interface card LEDs

Figure 13 shows the LEDs on the ADSL WAN interface card.

Figure 13 LEDs on the ADSL WAN interface card

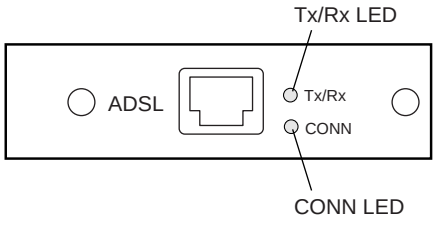


Table 9 describes the LEDs on the ADSL WAN interface card.

Table 9 LED indicators on the ADSL WAN interface card

CONN LED	Tx/Rx LED	Description
Steady green	Steady green	The ADSL interface card is not initialized; the software driver is not installed.
Off	Off	The ADSL interface card is initialized, but has not established a link with the ADSL network.
Flashing green	Off	The ADSL interface card is attempting to establish a link with the ADSL network.
Steady green	Off	The ADSL interface card has established a link with the ADSL network.
Steady green	Flashing green	The ADSL interface card is sending or receiving network data. (The LED may be dim.)

T1/E1 CSU/DSU WAN interface card LEDs

Figure 14 shows the LEDs on the T1/E1 CSU/DSU WAN interface card.

Figure 14 LEDs on the T1/E1 CSU/DSU WAN interface card

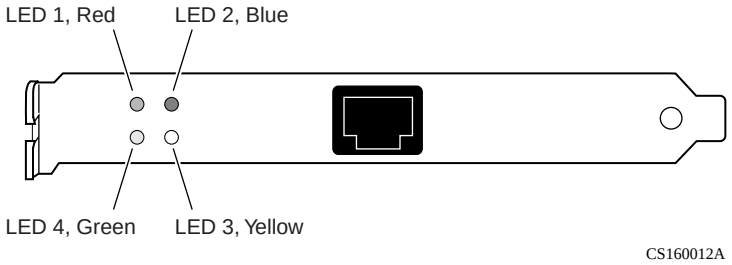


Table 10 describes the LEDs on the T1/E1 CSU/DSU WAN interface card.

Table 10 LED indicators on the T1/E1 CSU/DSU WAN interface card

LED	Indicator	Description
LED 1	Red	Red alarm LED is lit when a loss-of-signal (LOS) or out-of-frame (OOF) condition is detected on the receive signal.
LED 2	Blue	Blue alarm LED is lit when receiving an upstream failure denoted by an alarm indication signal (AIS).
LED 3	Yellow	Yellow alarm LED is lit when the far-end equipment is in the red alarm condition.
LED 4	Green	Normal operation.

Quad T1/E1 CSU/DSU WAN interface card LEDs

Figure 15 shows the LEDs on the quad T1/E1 CSU/DSU WAN interface card.

Figure 15 LEDs on the quad T1/E1 CSU/DSU WAN interface card

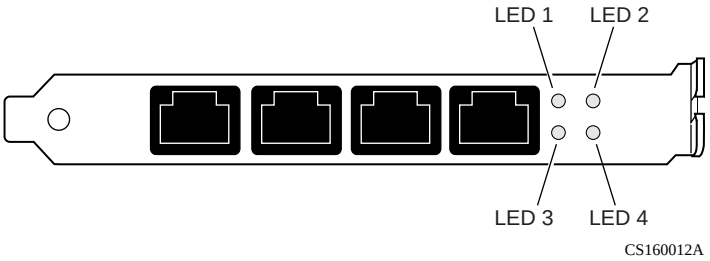


Table 11 describes the LEDs on the quad T1/E1 CSU/DSU WAN interface card.

Table 11 LED indicators on the quad T1/E1 CSU/DSU WAN interface card

LED	Indicator	Description
LED 1	Off	Port 1 is disabled.
	On	Port 1 is enabled and operating normally.
	Flashing	Port 1 is enabled and in an alarm state (red, yellow, or blue).
LED 2	Off	Port 2 is disabled.
	On	Port 2 is enabled and operating normally.
	Flashing	Port 2 is enabled and in an alarm state (red, yellow, or blue).
LED 3	Off	Port 3 is disabled.
	On	Port 3 is enabled and operating normally.
	Flashing	Port 3 is enabled and in an alarm state (red, yellow, or blue).
LED 4	Off	Port 4 is disabled.
	On	Port 4 is enabled and operating normally.
	Flashing	Port 4 is enabled and in an alarm state (red, yellow, or blue).

Single V.35/X.21 WAN interface card LEDs

Figure 16 shows the LEDs on the single V.35/X.21 WAN interface card.

Figure 16 LEDs on the single V.35/X.21 WAN interface card

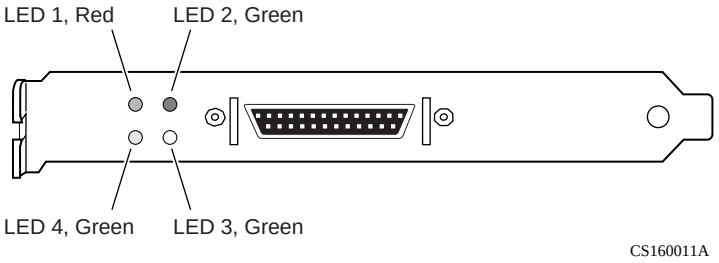


Table 12 describes the LEDs on the single V.35/X.21 WAN interface card.

Table 12 LED indicators on the single V.35/X.21 WAN interface card

LED	Indicator	Description
LED 1	Red	No external transmit clock source is available.
LED 2	Green	The signals CDC and DSR are on between the DSU and the adapter. LED 2 detects receive link status.
LED 3	Green	Power to the adapter is on and the onboard microcode is loaded.
LED 4	Green	Cable is detected.

Chapter 3
Configuring the management IP interface

This chapter describes how to configure a management IP address, subnet mask, and default gateway address on a newly installed Contivity 1740. After you complete the procedures in this chapter, you will be able to configure and manage the Contivity 1740 using a Web browser from a PC.

You can create the management IP interface on the gateway in one of two ways:

- IP address configuration utility (recommended)

  This utility is included on the Contivity software CD. You execute the utility from a PC running on the same subnet as the Contivity 1740.

- Serial interface configuration menu

  If you cannot use the IP address configuration utility, you can use the serial interface configuration menu. You must connect a PC or terminal to the serial port on the Contivity 1740.

This chapter contains the following topics:

Required information

Before you configure the management interface, collect this information:

- IP address for the management interface

  The management IP address must be accessible from one of the private physical interfaces on the Contivity 1740. For example, if you plan to assign IP address 10.2.3.3 with subnet mask 255.255.0.0 to the private physical interface, the management IP address must reside in the 10.2 network.

- Subnet mask

  The subnet mask specifies which IP addresses are directly reachable on the network and which ones must be routed through a gateway. For example, the IP address 10.2.3.3 with a subnet mask of 255.255.0.0 indicates that all hosts with addresses 10.2.*n*.*n* are directly reachable.

- Default gateway (optional)

  The default gateway routes packets to destinations for which there is no specific route in the routing table. You can configure a default gateway when you assign the management IP address, or you can configure it at a later time.

Note: Write down and save the management IP address. You will need it to configure the Contivity 1740.

Using the IP address configuration utility

To create the initial IP interface on the Contivity Secure IP Services Gateway, Nortel Networks provides the IP address configuration utility on the Contivity server software CD.

System requirements

To run the IP address configuration utility, your PC must meet the following requirements:

- Windows* 95, Windows 98, Windows 2000, or Windows NT*
- Microsoft* TCP/IP protocol stack

- Located on the same subnet as the Contivity 1740 to be configured
- Operational network connection
- CD-ROM drive

To test the TCP/IP stack, send a ping command to any host.

Note: If your environment does not match these requirements, you can use the serial interface to configure the management IP address (see "Using the serial interface" on page 47).

Running the IP address configuration utility

The IP address configuration utility searches for serial numbers of unconfigured gateways and prompts you to enter the management IP address, subnet mask, and default gateway (optional).

The ExtNetIP.exe program on the Contivity software CD starts the IP address configuration utility. You can copy the utility to your hard disk and execute it from there, or you can execute it from the CD drive.

Note: The IP address configuration utility has a Help file called ExtNetIP.hlp that you can display and copy to the hard drive.

To run the IP address configuration utility:

1. Insert the Contivity software CD into the CD-ROM drive.
2. Locate the Tools folder and then locate the ExtNetIP.exe file.

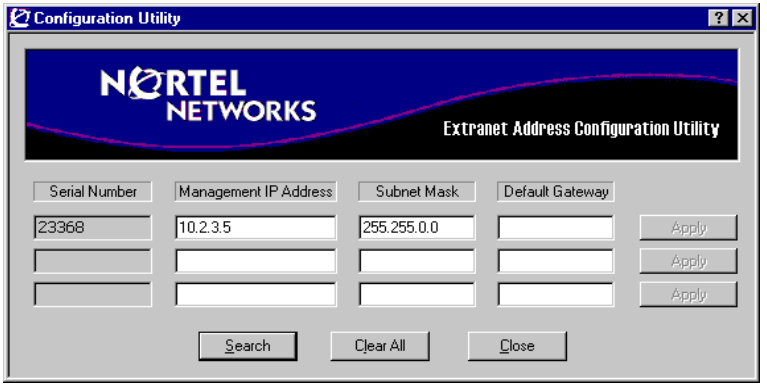
   If you want, copy the file to the hard drive on your system.

3. Double-click on the ExtNetIP.exe icon (Figure 17).

Figure 17 Icon for the IP address configuration utility

When the IP address configuration utility finds an unconfigured gateway, it displays a dialog box where you assign the IP address, subnet mask, and default gateway (Figure 18).

Figure 18 IP address configuration utility dialog box



The utility automatically displays the serial number of the first unconfigured gateway in the dialog box.

4 Assign an appropriate management IP address and subnet mask to the Contivity 1740.

The default gateway address is optional; you can configure it later.

5 Click on Apply to configure the management IP address, subnet mask, and, if specified, the default gateway on the Contivity 1740.

6 Click on Close.

The IP configuration utility dialog box closes.

7 Go to "Testing the configuration" on page 51 to verify that you can access the Contivity 1740 from a Web browser.

For detailed information about configuring and managing the Contivity 1740, refer to the documentation on the Contivity software CD.

Using the serial interface

You can use the serial interface to assign the Contivity 1740 a management IP address and subnet mask so that you can then use a Web browser for management.

Note: Nortel Networks recommends that you use the IP address configuration utility instead of the serial interface to assign the management IP address to the Contivity 1740 (see "Using the IP address configuration utility" on page 44).

To configure the management IP address using the serial interface:

1. Turn on the terminal or PC.

   The terminal or PC should be configured as follows:

   - 9600 baud
   - 8 data bits
   - 1 stop bit
   - No parity
   - No flow control

2. Connect the serial cable (supplied with the Contivity 1740) from the gateway's serial port to a terminal or to the communications port on a PC.

3. On the PC, start HyperTerminal* or another terminal emulation program and press Enter.

   The Welcome screen appears.

```
Welcome to the Contivity Secure IP Services Gateway
Copyright (c) 1999-2004 Nortel Networks, Inc.

Version:              V04_90.155
Creation date:        May 27, 2004, 20:51:06
Date:                 05/27/2004
Unit Serial Number:   317563

Please enter the administrator's user name:
```

4 Enter the default user name and password for the administrator.

The factory default user name is *admin* and the default password is *setup*. The user name and password are case sensitive.

```
Please enter the administrator's user name: admin

Please enter the administrator's password: *****
```

The serial main menu appears.

```
Main Menu: System is currently in NORMAL mode.

1) Interfaces
2) Administrator
3) Default Private Route Menu
4) Default Public Route Menu
5) Create A User Control Tunnel (IPsec) Profile
6) Restricted Management Mode       FALSE
7) Allow HTTP Management            TRUE
8) Firewall Options
9) Shutdown
B) System Boot Options
P) Configure Serial Port
C) Controlled Crash
L) Command Line Interface
R) Reset System to Factory Defaults
E) Exit, Save and Invoke Changes

Please select a menu choice (1 - 9,B,P,C,L,R,E):
```

5 Type **1** and press Enter.

The Interface menu appears.

```
- Interface Menu

0) Slot 0, Port 1, Private LAN
     Interface IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate
```

```
1) Slot 1, Port 1, Public LAN
     IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

R) Return to the Main Menu.

Please select a menu choice:
```

6 Type **0** and press Enter to configure the management IP address.

The default settings appear, followed by the prompt for the management IP address. The old management IP address field is blank on a new gateway.

```
0) Slot 0, Port 1, Private LAN
     Interface IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

   * Type 0.0.0.0 to delete.
   * Just type <CR> to skip.

Old Management IP Address =
New Management IP Address* =
```

7 At the New Management IP Address prompt, type the management IP address and press Enter.

The prompt for the interface IP address appears.

```
Old Interface IP Address =
New Interface IP Address* =
```

8 Enter the IP address for the private LAN or press Enter to skip this prompt.

The subnet mask prompt appears.

```
Old Subnet Mask = 0.0.0.0
New Subnet Mask =
```

9 At the New Subnet Mask prompt, type the subnet mask for the management IP address and press Enter.

The Speed/Duplex prompt appears.

10 Press Enter to leave the speed and duplex settings unchanged.

The Interface menu appears again with the changes you made.

```
- Interface Menu

0) Slot 0, Port 1, Private LAN
     Management IP Address = 47.33.245.66, (Subnet Mask =
     255.255.0.0)
     Interface IP Address = 47.33.245.64
     Subnet Mask = 255.255.0.0
     Speed/Duplex = AutoNegotiate

1) Slot 1, Port 1, Public LAN
     IP Address =
     Subnet Mask = 0.0.0.0
     Speed/Duplex = AutoNegotiate

R) Return to the Main Menu.

Please select a menu choice:
```

11 Type **R** and press Enter to return to the serial main menu.

12 From the serial main menu, type **E** and press Enter to save the new management IP address and mask and to exit the serial menu.

13 Go to the next section, "Testing the configuration," to verify that you can access the Contivity 1740 from a Web browser.

For detailed information about configuring and managing the Contivity 1740, refer to the documentation on the Contivity software CD.

Testing the configuration

After you assign a management IP address to the Contivity 1740, start your Web browser to verify that you can access the gateway from the browser.

To manage the Contivity 1740 using the GUI, your PC must be running one of the following browsers:

- Internet Explorer Version 5.5 or later
- Netscape* Navigator 4.79 or later

To test the management IP address on the Contivity 1740:

1. Open a Web browser.
2. In the URL field, enter **http://** followed by the management IP address that you assigned to the Contivity 1740.

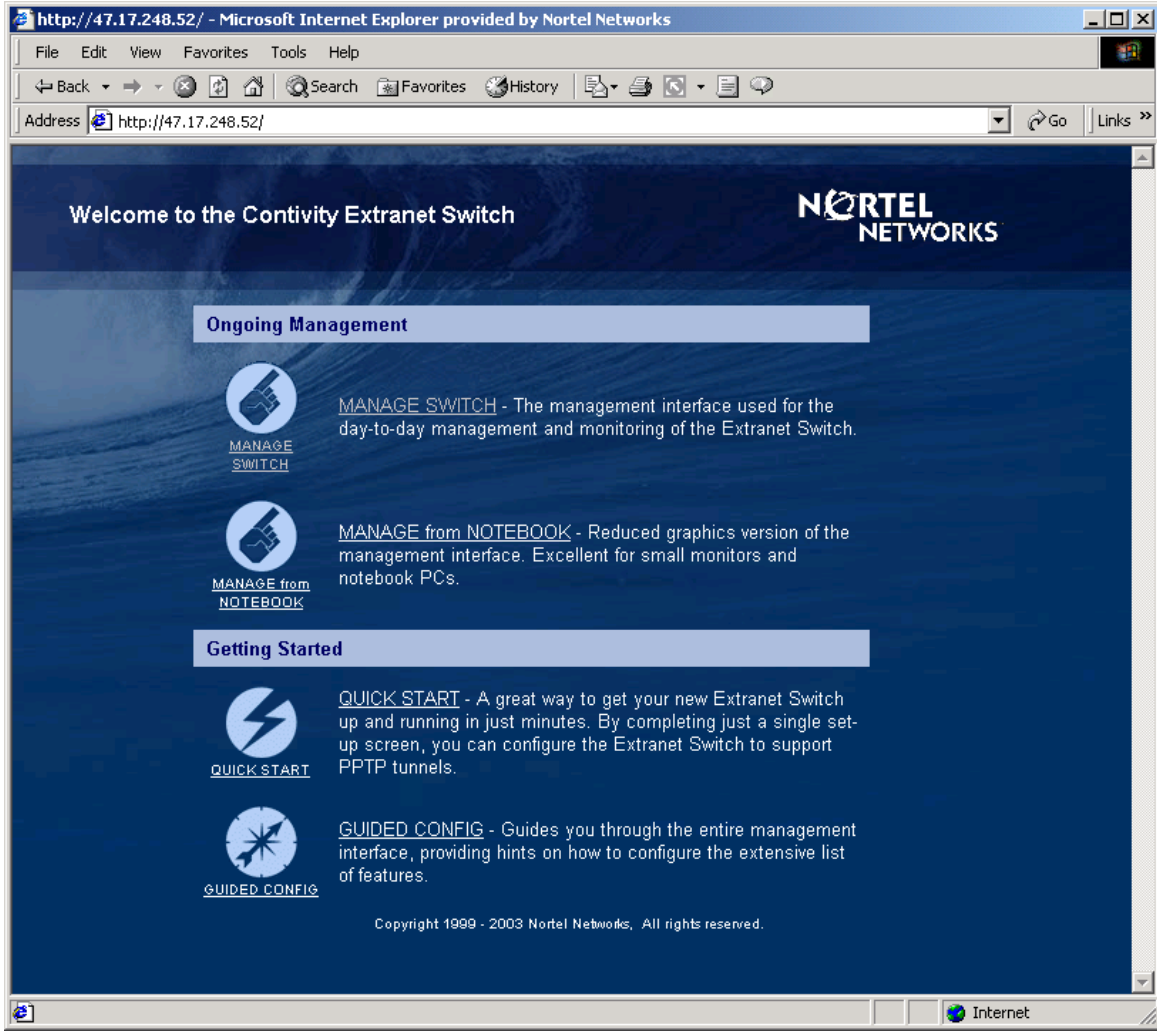
   For example, if the management IP address is 10.2.3.2, enter **http://10.2.3.2**.

   If the Welcome screen (Figure 19) appears, you correctly configured the management IP address for the Contivity 1740.

Note: If the Welcome screen does not appear, see "Troubleshooting" on page 53.

3. Go to *Configuring Basic Features for the Contivity Secure IP Services Gateway* for information about configuring the Contivity 1740.

Figure 19 Welcome screen



Troubleshooting

If you cannot connect to the Contivity 1740 using your browser, check the following items:

- Make sure that you entered the correct IP address in the browser window.
- Type a known URL in the browser window to make sure that your network connection is good.
- Check that the management IP address that you configured is on the same subnet as the physical LAN attached to the gateway.
- Make sure that your PC is running a supported browser, either Internet Explorer Version 5.5 or later, or Netscape Navigator* 4.7 or later.
- Check the physical connections on the Contivity 1740, especially the LAN cable and the power cord.

If you still cannot connect to the Contivity 1740 using a browser, connect a terminal or PC to the gateway with the serial cable and check the management IP address listed in the serial menu (see "Using the serial interface" on page 47). Reconfigure the management IP address if necessary.

If you cannot resolve the problem, contact the Nortel Networks Technical Solutions Center closest to you (see "How to get help" on page 18).

Chapter 4
Installing option cards and DIMMs

This chapter provides instructions on how to install and replace the following field replaceable units (FRUs) in the Contivity 1740:

- LAN, WAN, and serial interface cards
- Hardware encryption accelerator card
- Dual inline memory modules (DIMMs)

This chapter contains the following topics:

Shutting down the system to add or replace hardware

To install or replace an option card or a DIMM, you must first shut down the Contivity 1740 and unplug it.

Caution: Shut down the Contivity 1740 as described in this section before you attempt to add or replace an option card or DIMM.

To shut down the Contivity 1740:

1. Use the Web GUI or the command line interface to shut down the gateway.
   - Web GUI: Choose Admin > Shutdown. Select the option to power off the gateway after shutdown.
   - Command line interface: Use the **`reload`** command to shut down the system. For example, enter **`reload power-off disable-logins "Upgrade hardware"`**

     For the complete syntax of the **`reload`** command, see the *Reference for the Contivity Secure IP Services Gateway Command Line Interface*.
2. Wait for the system to shut down.
3. Disconnect the power cord from the power outlet and then disconnect the cord from the Contivity 1740.

   The power receptacle is located on the rear of the Contivity 1740 (see Figure 7 on page 31).

Danger: Make sure to turn off the Contivity 1740 and unplug the power cord before you attempt to remove or install an option card or DIMM.

Removing the front bezel and top cover

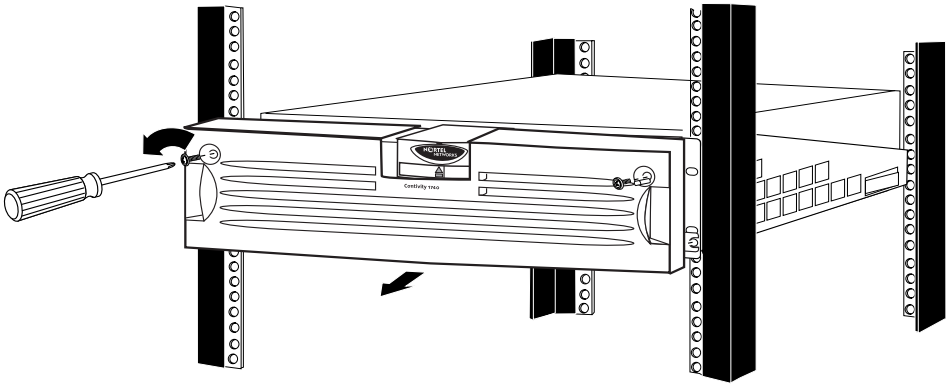
To install option cards or DIMMs, you must remove the front bezel and the top cover from the gateway. To remove the front bezel:

1 Shut down the Contivity 1740 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 56.

Danger: Make sure to turn off the Contivity 1740 and unplug it before you attempt to install an option card or DIMM.

2 Using a Phillips screwdriver, turn each of the 2 screws on the front bezel a quarter turn counterclockwise (Figure 20).

Figure 20 Removing the front bezel



CS260015D

3 Grip the two handles and firmly pull the bezel toward you to unsnap it from the chassis.

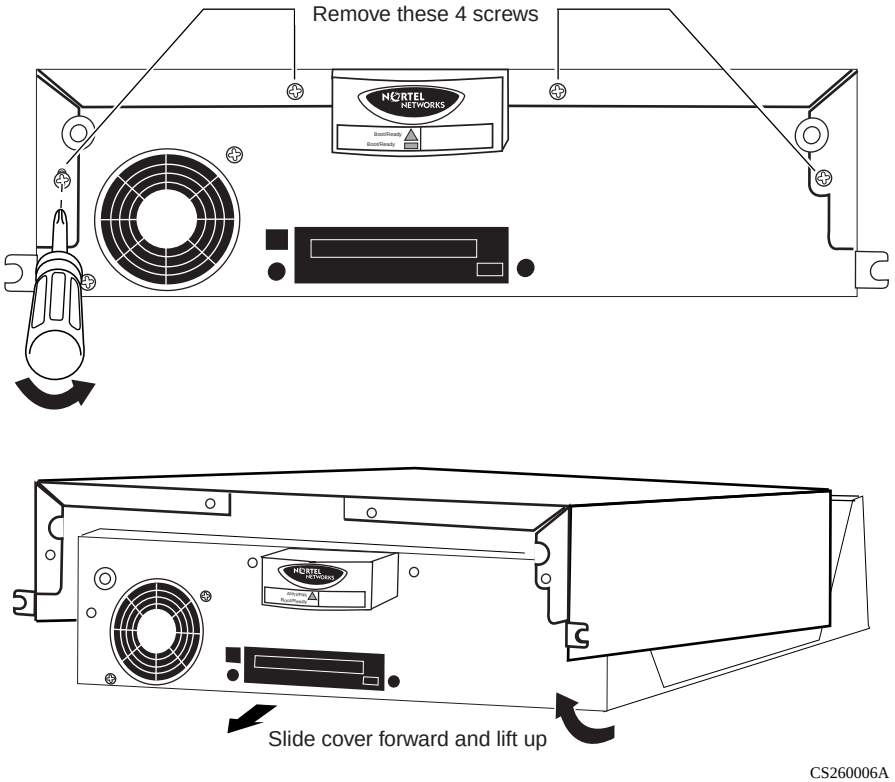
Caution: Do not use the piece with the Nortel Networks logo and the LEDs as a handle.

The first few times that you remove the front bezel, it may be somewhat difficult to remove because the ball studs and socket clips are new.

To remove the top cover:

1. If the Contivity 1740 is installed in an equipment rack, remove it from the rack.
   a. At the front of the chassis, remove the 2 panhead screws that secure the bottom of the chassis to the equipment rack.
   b. Remove the Contivity 1740 from the rack-mount shelf and set it on a sturdy surface.
2. Using a Phillips screwdriver, remove the 4 screws that secure the cover to the chassis (Figure 21).

Figure 21 Removing the top cover

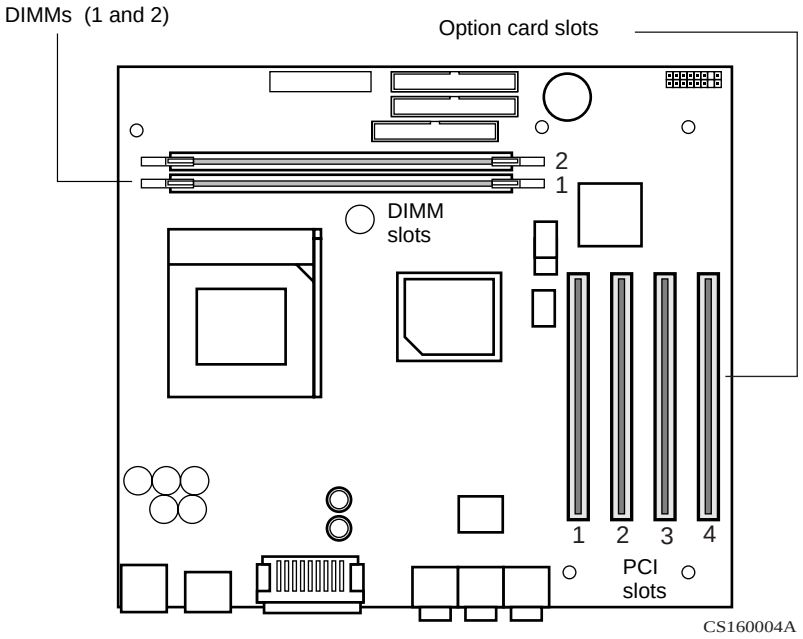


3. Slide the top cover forward approximately 1/4 inch.

4 Lift the lid 2 or 3 inches and pull it off the chassis.

The Contivity 1740 system board is now exposed. Figure 22 shows the location of the option card and DIMM slots on the system board.

Figure 22 Location of option card and DIMM slots on the system board



Warning: Beware of danger if battery is incorrectly replaced. Replace with the *same* or an *equivalent battery* only, as recommended by the manufacturer's instructions.

Danger: In spite of the above warning, which is mandated for regulatory approval, *you should not change the battery.* If you suspect a dead battery, contact Nortel Networks Customer Support.

Attaching the antistatic wrist strap

Nortel Networks ships the Contivity 1740 with an antistatic wrist strap. The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the gateway to avoid damage to sensitive electronic components.

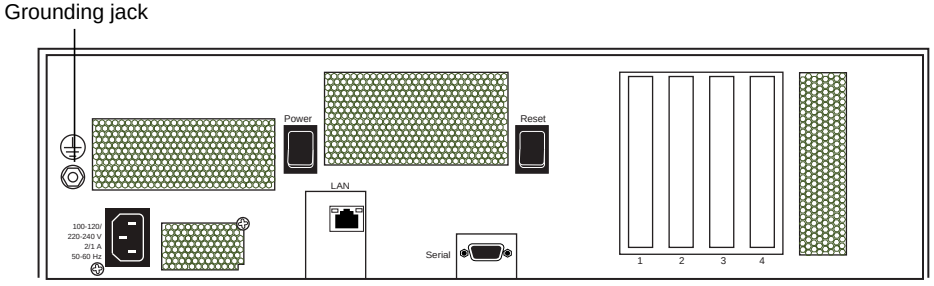
You must wear an antistatic wrist strap on your arm whenever you remove, install, or handle option cards and DIMMs.

Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

To attach the antistatic wrist strap:

1. Locate the antistatic wrist strap and verify that the cable is attached to the wrist strap.
2. Place the strap around your wrist and adjust it to ensure that the metal buckle inside the strap touches your skin.
3. Insert the banana plug into the grounding jack at the rear of the chassis (Figure 23).

Figure 23 Location of the grounding jack for the antistatic wrist strap



Installing and replacing option cards

The Contivity 1740 has four slots for option cards (see Figure 22 on page 59). This section provides instructions on adding new option cards to the Contivity 1740 or, if necessary, replacing an existing card.

Table 13 lists the option cards that you can install in the Contivity 1740.

Table 13 Supported option cards for the Contivity 1740

Option card	Maximum number	Restrictions
Contivity Security Accelerator (CSA)[1]	1	Install one CSA or one Hardware Accelerator card. Do not install either card in slot 4.
Hardware Accelerator	1	
10/100 Ethernet interface	4	
1000BASE-T interface (copper)[1]	2	Install two 1000BASE-T cards, two 1000BASE-SX cards, or one card of each type.
1000BASE-SX interface (fiber)[1]	2	
ADSL WAN interface[1]	4	
ISDN BRI S/T or U interface[2]	4	
T1/E1 CSU/DSU WAN interface	4	
Quad T1/E1 CSU/DSU WAN interface[1]	3	
V.90 modem interface[2]	4	
Single V.35/X.21 WAN interface	4	
Dual V.35 WAN interface[3]	4	
HSSI WAN interface	2	Do not install in slot 4. Install in slot 1 or slot 3 if possible.

1 The Contivity 1740 must be running Version 4.90 or later.

2 The Contivity 1740 must be running Version 4.80 or later.

3 This option card is no longer available for purchase.

To install or replace an interface card or a hardware encryption accelerator card:

1. Shut down the Contivity 1740 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 56.

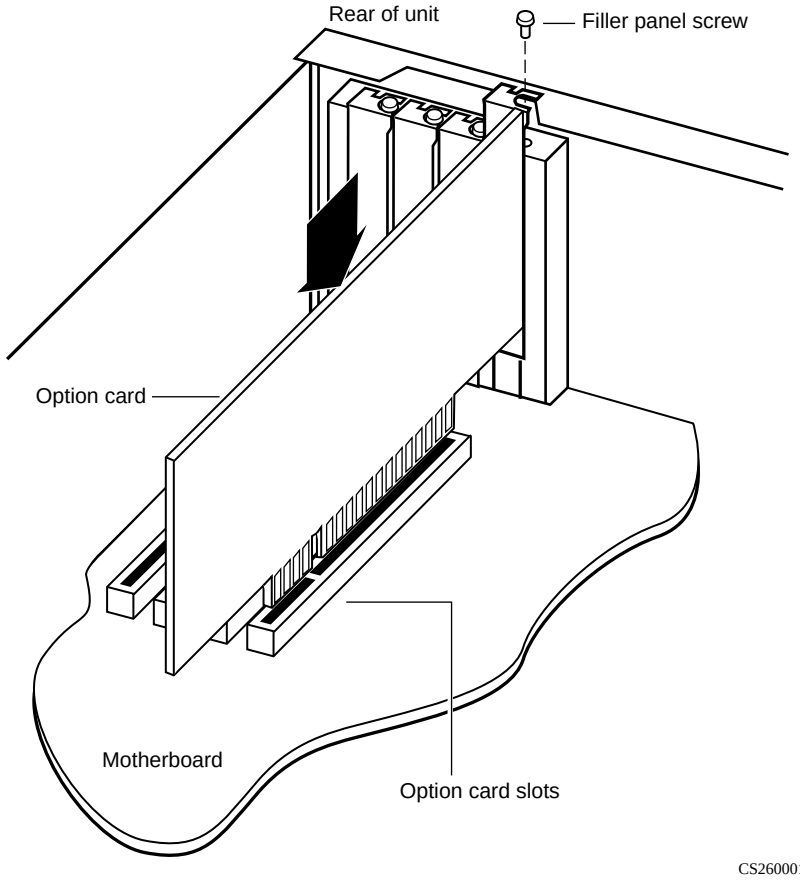
Danger: Turn off the Contivity 1740 and unplug it before you attempt to install an option card.

2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 57).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 57).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1740 (see "Attaching the antistatic wrist strap" on page 60).
5. Locate the slot where you plan to install the new or replacement option card.

Note: Do not try to install an HSSI WAN interface card or a hardware encryption accelerator card in slot 4.

6 Remove the filler panel screw and pull out the filler panel (or the option card that you are replacing) from the slot (Figure 24).

Figure 24 Installing and removing an option card



7 Lower the new option card into the slot and gently press the connector into the slot.

Make sure that the card is seated firmly in the slot. If the card is not seated properly, it will not work.

8 Replace the screw that secures the card to the slot (Figure 24).

9 Replace the top cover on the chassis (see Figure 21 on page 58).

a Hold the cover at an angle and slide it onto the chassis.

b Using a screwdriver, insert and tighten the 4 screws that secure the cover to the chassis.

10 If the Contivity 1740 is installed in an equipment rack, mount it in the rack.

a Set the Contivity 1740 on the rack-mount shelf in the rack.

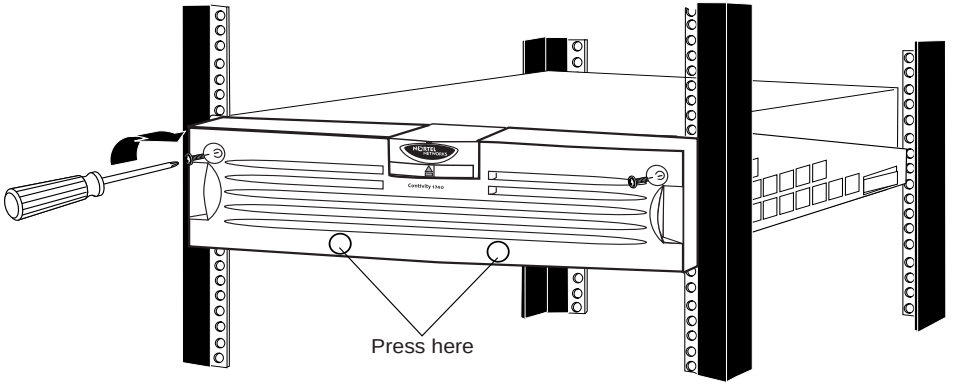
b Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws (see Figure 4 on page 25).

11 Replace the front bezel (Figure 25).

a Hold the bezel by its two handles and push it onto the chassis.

b Using a screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Figure 25 Replacing the front bezel



Installing and replacing DIMMs

The Contivity 1740 has two slots for dual inline memory modules (DIMMs) (see Figure 22 on page 59). Unless you ordered additional memory, the Contivity 1740 is shipped with one 128 MB DIMM installed. You can upgrade memory in the gateway by installing a second 128 MB DIMM.

This section provides instructions on adding a second DIMM to the Contivity 1740 or, if necessary, replacing an existing DIMM.

Caution: Make sure to install the same type of DIMM that is already installed in your gateway. For example, do not install a 256 MB DIMM in the Contivity 1740.

To install or replace a DIMM:

1. Shut down the Contivity 1740 using the Web GUI or the command line interface and then unplug it as described in "Shutting down the system to add or replace hardware" on page 56.

Danger: Turn off the Contivity 1740 and unplug it before you attempt to install a DIMM.

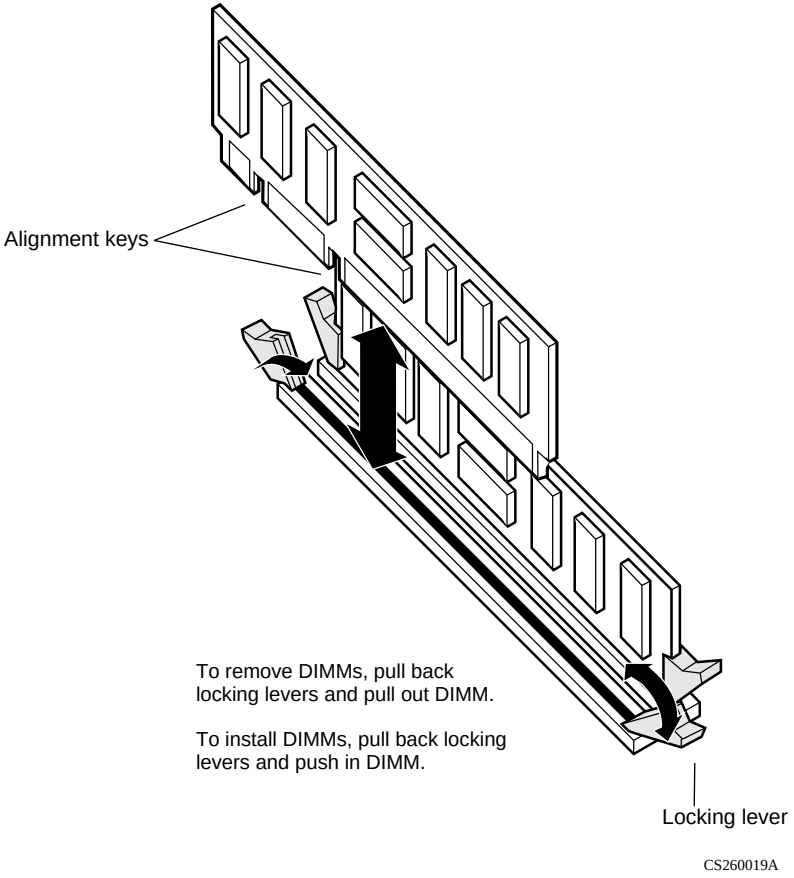
2. Remove the front bezel from the chassis, then remove the chassis from the equipment rack (see "Removing the front bezel and top cover" on page 57).
3. Remove the top cover from the chassis (see "Removing the front bezel and top cover" on page 57).
4. Attach the antistatic wrist strap that was shipped with the Contivity 1740 (see "Attaching the antistatic wrist strap" on page 60).

Caution: Electrostatic discharge can damage Contivity 1740 components.

5. If you are replacing a DIMM, remove the installed DIMM as follows:
   a. Press down the locking lever on either side of the DIMM (Figure 26).
   b. Pull the DIMM up to remove it from the slot.
6. Press down the locking lever on either side of the slot where you plan to install the new DIMM (Figure 26).
7. Place the new or replacement DIMM in the slot (Figure 26).

   Use the alignment keys to properly position the DIMM in the slot.
8. Press the DIMM firmly into the socket.
9. Pull up the locking lever on either side of the DIMM to snap it into position.

Figure 26 Installing and removing a DIMM



10 Replace the top cover on the chassis (see Figure 21 on page 58).

- **a** Hold the cover at an angle and slide it onto the chassis.
- **b** Using a screwdriver, insert and tighten the 4 screws to secure the cover to the chassis.

11 If the Contivity 1740 is installed in an equipment rack, mount it in the rack.

- **a** Set the Contivity 1740 on the rack-mount shelf in the rack.
- **b** Insert one of the panhead screws through the bottom hole on each side of the shelf into the hole in the rack and tighten the screws (see Figure 4 on page 25).

12 Replace the front bezel (see Figure 25 on page 64).

- **a** Hold the bezel by its two handles and push it onto the chassis.
- **b** Using the screwdriver, tighten the 2 screws to secure the bezel to the chassis.

Appendix A
Technical specifications

This appendix provides technical specifications for the Contivity 1740 chassis and its interfaces.

Chassis specifications

Table 14 lists physical, electrical, and environmental specifications for the chassis.

Table 14 Physical, electrical, and environmental specifications

Specification	Description
Physical	
Height	5.25 in. (13.335 cm)
Width	17 in. (43.18 cm)
Depth	21 in. (53.34 cm)
Weight	28 lbs. (12.7 kg)
Electrical	
Voltage	100–120 VAC; 220–240 VAC
Current	2 A @ 100 VAC; 1 A @ 220 VAC
Frequency	50–60 Hz
Environmental	
Operating temperature	32–104°F (0–40°C)
Storage temperature	-40–185°F (-40–85°C)
Operating humidity	10–90% noncondensing
Storage humidity	10–95% noncondensing
Operating altitude	7000 ft (2133.6 m) maximum
Storage altitude	40,000 ft (12,192 m) maximum

System ports

The Contivity 1740 system board provides the following built-in interfaces:

- 10/100BASE Ethernet LAN port
- Serial port

This section provides information about the 10/100BASE Ethernet LAN port and the serial port on the system board.

10/100BASE Ethernet LAN port

The system board provides one 10/100BASE Ethernet LAN interface on the rear of the chassis. This LAN interface, which accommodates an RJ-45 straight-through cable, is generally used for Web management. Depending on whether you will use the interface for 10BASE-T or 100BASE-TX operation, select cables for the interface as follows:

- 100BASE-TX connections require Category 5 twisted-pair wire. The 100BASE-TX specification supports 100 Mb/s transmission over two pairs of Category 5 twisted-pair Ethernet wiring: one pair each for transmit and receive operations.

  The maximum recommended cable segment length is 100 meters between a 100BASE-TX repeater and a workstation (due to signal timing requirements). This wiring scheme complies with the EIA 568 wiring standard.

- 10BASE-T connections can use Category 3, 4 or 5 twisted-pair wiring.

Figure 27 shows the 10/100BASE connector and its pinouts.

Figure 27 10/100BASE Ethernet connector

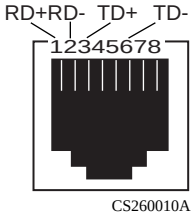


Table 15 provides the 10/100BASE Ethernet port pinouts.

Table 15 10/100BASE Ethernet port pinouts

Pin	Description
1	RD +
2	RD -
3	TD +
6	TD -

Serial port

The system board provides a serial port on the rear of the chassis to enable out-of-band management. Using the serial port, you can assign the management IP address and subnet mask to the newly installed gateway (for more information, see Chapter 3, “Configuring the management IP interface,” on page 43).

The serial cable provided with the Contivity 1740 is a DB9/DB25-to-DB9/DB25 cable. This cable provides a crossover connection (transmit-to-receive and receive-to-transmit). The DB9 connector goes into the gateway and the other DB9 or DB25 connector goes into your workstation.

Table 16 provides the multiple DB9/DB25 serial interface cable pinouts.

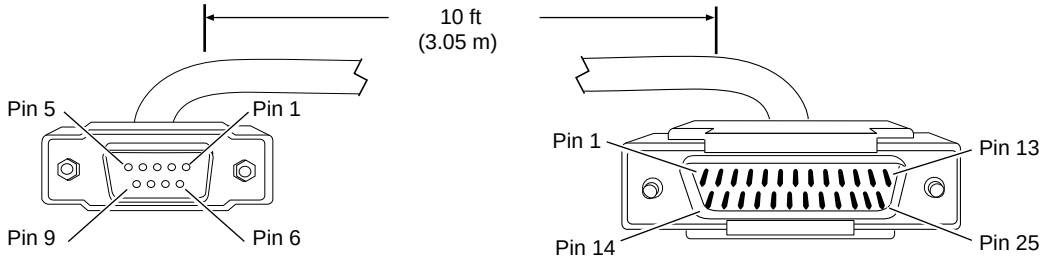
Table 16 Multiple DB9 and DB25 connector pinouts

Serial port DB9 connector		**Serial port DB25 connector**			**Serial port DB25 connector**		**Serial port DB9 connector**	
Pinout	Signal	Pinout	Signal		Pinout	Signal	Pinout	Signal
2	RXD	3	TXD	>	2	RXD	3	TXD
3	TXD	2	RXD	>	3	TXD	2	RXD
4	DTR	20	DSR	>	6	DTR	6	DSR
5	Ground	7	Ground	>	7	Ground	5	Ground
6	DSR	6	DTR	>	20	DSR	4	DTR
7	RTS	4	RTS	>	5	CTS	8	CTS
8	CTS	5	CTS	>	4	RTS	7	RTS

Modem cable specifications

If you need to connect a modem to a Contivity 1740, you must obtain an appropriate modem cable. The modem cable must have a 9-pin D-sub plug that connects to the Contivity 1740 serial port and a 25-pin D-sub plug that connects to the RS-232-C modem port (Figure 28).

Figure 28 Modem cable (9-pin D-sub plug to RS-232-C modem plug)



9-position D-sub receptacle with screw locks (ground shield connected to backshell)

25-position D-sub plug with screw locks (ground shield connected to backshell)

CAB0056A

Table 17 provides the modem cable pinouts.

Table 17 Modem cable pinouts

Nortel Networks termination		**Modem termination**	
Signal	**Pin # to Pin #**		**Signal**
Data Carrier Detect	1	8	Data Carrier Detect
Transmit Data (TXD)	2	2	Transmit Data (TXD)
Receive Data (RXD)	3	3	Receive Data (RXD)
Data Set Ready	4	6	Data Set Ready
Data Terminal Ready	6	20	Data Terminal Ready
Clear to Send	7	5	Clear to Send
Request to Send	8	4	Request to Send

Hardware option cards

The Contivity 1740 provides four PCI slots that support a combination of the following option cards:

- Contivity Security Accelerator and Hardware Accelerator cards (not supported in slot 4)
- 10/100BASE Ethernet interface card
- 1000BASE-T Ethernet interface card
- 1000BASE-SX Ethernet interface card
- ADSL WAN interface card
- ISDN BRI interface card
- T1/E1 CSU/DSU WAN interface card
- Quad T1/E1 CSU/DSU WAN interface card
- Single V.35/X.21 WAN interface card
- Dual V.35 WAN interface card
- HSSI WAN interface card (not supported in slot 4)
- V.90 modem interface card

This section provides information about the option cards, including the connector and the cable pinouts for each supported network interface card.

Contivity Security Accelerator (CSA) and Hardware Accelerator cards

Nortel Networks supports two option cards that perform bulk encryption and compression algorithms for IPsec tunnel traffic:

- Contivity Security Accelerator (CSA) card

  The CSA card uses a single Hifn* 7854 chip for encryption and compression and has 64 MB of onboard RAM. It supports AES-128 cryptography with SHA-1 authentication and triple DES cryptography with either MD5 or SHA-1 authentication.

- Hardware Accelerator card

  The Hardware Accelerator card uses a single Hifn 7811 chip for encryption and compression. It performs triple DES and DES cryptography, LZS* compression, and MD5 or SHA-1 authentication.

The CSA card is the successor to the Hardware Accelerator card. Along with providing support for AES, the CSA card provides increased encryption throughput and improved compression performance.

Note: The CSA card has one green LED; the Hardware Accelerator card has no LEDs.

At startup, whenever an accelerator card is manually enabled, or whenever the accelerator recovers from a failure, the power-on self-test (POST) verifies the integrity of the hardware. This test includes validation of the accelerator's encryption, MAC, and compression algorithms against their software counterparts. In the event POST fails, the accelerator card is set offline.

For more information about the Contivity Security Accelerator card and the Hardware Accelerator card and instructions for configuring these cards, see the guide *Configuring Advanced Features for the Contivity Secure IP Services Gateway.*

10/100BASE Ethernet interface card

The 10/100BASE Ethernet interface card has a single RJ-45 connector that provides the signals needed to interface to 10BASE-T and 100BASE-TX Ethernet equipment. Figure 29 shows the 10/100BASE Ethernet interface card.

Figure 29 10/100BASE Ethernet interface card

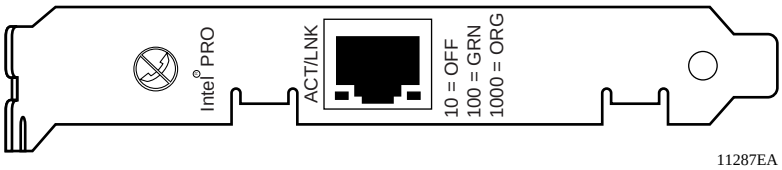
For information about the cables that you can connect to this interface and the cable pinouts, see "10/100BASE Ethernet LAN port" on page 70.

1000BASE-T Ethernet interface card

The 1000BASE-T Ethernet interface card is generally used to connect to Gigabit Ethernet interfaces on other devices in your network, as well as to provide increased throughput. This interface card has a single RJ-45 connector.

Figure 30 shows the 1000BASE-T Ethernet interface card.

Figure 30 1000BASE-T Ethernet interface card

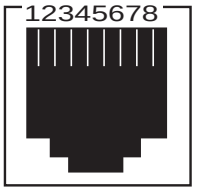


The port on the 1000BASE-T Ethernet interface card accommodates an RJ-45 straight-through cable. Select cables for this port as follows:

- For 1000BASE-T operation, use Category 5 four-pair Ethernet wiring. The cable must comply with the TIA 568 wiring specification. The maximum recommended cable segment length is 100 meters.
- For 100BASE-TX operation, use Category 5 twisted-pair wiring: one pair each for transmit and receive operations. The cable must comply with the EIA 568 wiring specification. The maximum recommended cable segment length is 100 meters.
- For 10BASE-T operation, use Category 3, 4, or 5 twisted-pair wiring.

Table 18 provides the 1000BASE-T Ethernet port pinouts.

Table 18 1000BASE-T Ethernet port pinouts



CS260010A

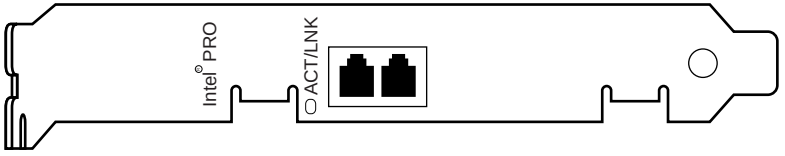
Pin	Description
1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-

1000BASE-SX Ethernet interface card

The 1000BASE-SX Ethernet interface card implements short-wavelength (850 nm) laser transmissions. This interface card is generally used to connect to fiber Gigabit Ethernet interfaces on other devices in your network, as well as to provide increased throughput. The 1000BASE-SX Ethernet interface card has a single type LC fiber connector.

Figure 31 shows the 1000BASE-SX Ethernet interface card.

Figure 31 1000BASE-SX Ethernet interface card



11288EA

The port on the 1000BASE-SX Ethernet interface card accommodates a multimode fiber (MMF) cable that meets MMF standards. Select fiber cable for this interface as follows:

- 50-micron MMF cable: provides a distance range of 500—550 meters (m)
- 62.5-micron MMF cable: provides a distance range of 220—275 m

You can order a 10-foot MMF cable from Nortel Networks:

- Order no. DM0011117 provides an LC-to-LC connector
- Order no. DM0011118 provides an LC-to-SC connector

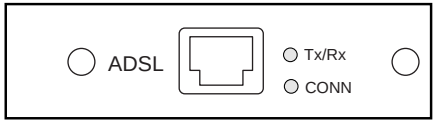
ADSL WAN interface card

The ADSL Annex A and Annex B WAN interface cards have a single RJ-11 connector that provides the signals needed to interface to the digital subscriber line access multiplexer (DSLAM) and to telephone equipment.

Figure 32 shows the ADSL WAN interface card.

Note: The ADSL Annex A and ADSL Annex B cards look identical.

Figure 32 ADSL WAN interface card



10972EA

Included in the accessory box is a 7-foot RJ-11 cable to attach to the DSLAM.

Table 19 provides the ADSL port pinouts.

Table 19 ADSL cable pinouts

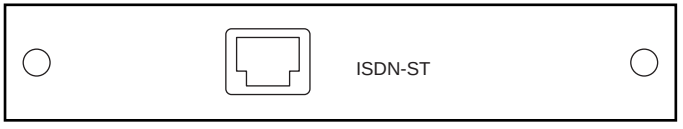
Pin	Function
1	N/C
2	Tip
3	Ring
4	N/C

ISDN BRI interface card

The ISDN BRI S/T and ISDN BRI U interface cards have a single RJ-45 connector that provides the signals needed to interface to ISDN equipment. (To connect the ISDN S/T interface to the ISDN network, you must attach an external NT-1 device to the RJ-45 connector.)

Figure 33 shows the ISDN BRI S/T interface card.

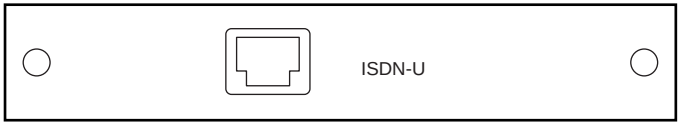
Figure 33 ISDN BRI S/T interface card



10972EA

Figure 34 shows the ISDN BRI U interface card.

Figure 34 ISDN BRI U interface card



10972EB

The connector on the ISDN BRI S/T and ISDN BRI U interface cards accommodates an 8-pin RJ-45 modular patch cord. These cables are commonly sold as Category 5, or Ethernet, cables.

Note: Nortel Networks does not supply a cable with the ISDN BRI interface cards.

Table 20 provides the ISDN BRI S/T cable pinouts.

Table 20 ISDN BRI S/T cable pinouts

Pin	Function
1	N/C
2	N/C
3	Receive +
4	Transmit +
5	Transmit -
6	Receive -
7	N/C
8	N/C

Table 21 provides the ISDN BRI U cable pinouts.

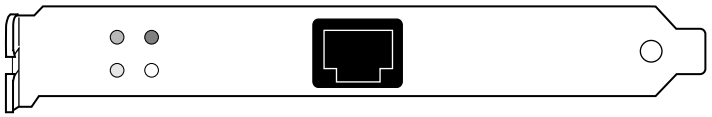
Table 21 ISDN BRI U cable pinouts

Pin	Function
1	N/C
2	N/C
3	N/C
4	U interface network connection (tip)
5	U interface network connection (ring)
6	N/C
7	N/C
8	N/C

T1/E1 CSU/DSU WAN interface card

The T1/E1 CSU/DSU WAN interface card has a single connector that provides the signals needed to interface to T1 or E1 equipment. Figure 35 shows the T1/E1 CSU/DSU WAN interface card.

Figure 35 T1/E1 CSU/DSU WAN interface card



CS160012A

The connector on the T1/E1 CSU/DSU WAN interface accommodates an 8-pin RJ-48 modular patch cord. These cables are commonly sold as Category 5, or Ethernet, cables.

Note: Nortel Networks does not supply the T1/E1 CSU/DSU WAN interface cable with the WAN interface card.

The cable you use should be wired in accordance with EIA-568-A wiring style. This wiring style ensures that the transmit signal (pins 4 and 5) and the receive signal (pins 1 and 2) are carried on a twisted pair inside the patch cord. The use of factory made patch cords is strongly recommended.

You connect the T1/E1 CSU/DSU WAN interface card to the service provider network using a straight-through cable or a crossover cable, depending on how the service provider wired its jack.

- For a straight-through connection, you can use a standard Category 5 (Ethernet) straight-through cable.
- For a crossover connection, you cannot use a standard Category 5 crossover cable. The T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

Table 22 provides the T1/E1 CSU/DSU cable pinouts for a crossover connection.

Table 22 T1/E1 CSU/DSU cable pinouts for crossover connection

Standard-wired end 8-pin male	Signal name	Pair number and conductor	Special-wired end 8-pin male
1	RXDA<-TXDA	wht/org pair 2A	5
2	RXDB<-TXDB	orange pair 2B	4
3	not used	wht/grn pair 3A	3
4	TXDB->RXDB	blue pair 1B	2
5	TXDA->RXDA	wht/blu pair 1A	1
6	not used	green pair 3B	6
7	not used	wht/brn pair 4A	7
8	not used	brown pair 4B	8

The cable will operate properly if pins 3, 6, 7, and 8 are not connected.

Caution: For crossover connections, do not use Ethernet cable. The T1/E1 CSU/DSU will not work to specifications. Data may be corrupted.

Table 23 provides the T1/E1 CSU/DSU cable pinouts for a straight-through connection.

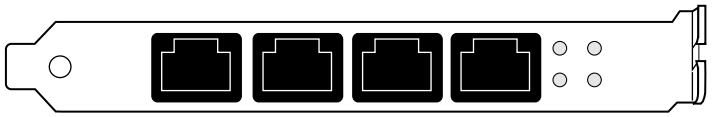
Table 23 T1/E1 CSU/DSU cable pinouts for straight-through connection

Nortel Networks termination		Remote termination	
Signal	**Pin # to Pin #**		**Signal**
Receive A (RXDA)	1	1	Receive A (RXDA)
Receive B (RXDB)	2	2	Receive B (RXDB)
not used	3	3	not used
Transmit B (TXDB)	4	4	Transmit B (TXDB)
Transmit A (TXDA)	5	5	Transmit A (TXDA)
not used	6	6	not used
not used	7	7	not used
not used	8	8	not used

Quad T1/E1 CSU/DSU WAN interface card

The quad T1/E1 CSU/DSU WAN interface card has four connectors that provide the signals needed to interface to T1 or E1 equipment. Figure 36 shows the quad T1/E1 CSU/DSU WAN interface card.

Figure 36 Quad T1/E1 CSU/DSU WAN interface card



CS160012A

Each connector on the quad T1/E1 CSU/DSU WAN interface card accommodates an 8-pin RJ-48 modular patch cord. These cables are commonly sold as Category 5, or Ethernet, cables.

Note: Nortel Networks does not supply cables with the quad T1/E1 CSU/DSU interface card.

The cables you use should be wired in accordance with EIA-568-A wiring style. This wiring style ensures that the transmit signal (pins 4 and 5) and the receive signal (pins 1 and 2) are carried on a twisted pair inside the patch cord. The use of factory-made patch cords is strongly recommended.

You connect the quad T1/E1 CSU/DSU WAN interface card to the service provider network using a straight-through cable or a crossover cable, depending on how the service provider wired its jack.

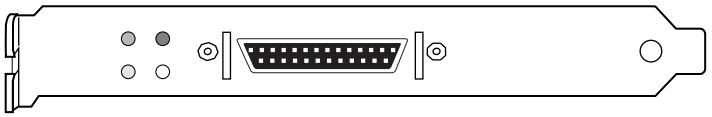
- For a straight-through connection, you can use a standard Category 5 (Ethernet) straight-through cable.
- For a crossover connection, you cannot use a standard Category 5 crossover cable. The T1/E1 CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

For information about the cable pinouts for a crossover connection, see Table 22 on page 81. For information about the cable pinouts for a straight-through connection, see Table 23 on page 81.

Single V.35/X.21 WAN interface card

The single V.35/X.21 WAN interface card has a single DB28S connector that provides the signals needed to interface to V.35 and X.21 equipment. Figure 37 shows the single V.35/X.21 WAN interface card.

Figure 37 Single V.35/X.21 WAN interface card



CS160011A

You need a DSU/CSU (digital service unit/channel service unit) between the WAN connection and the gateway. You can order a V.35 or X.21 cable to attach to the connector. This cable enables the WAN adapter to function as DTE (data terminal equipment).

Table 24 provides the V.35 cable pinouts. Table 25 on page 85 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 24 V.35 cable pinouts

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male	Notes
2	TXDA	pair 1A	P	
14	TXDB	pair 1B	S	
3	RXDA	pair 2A	R	
16	RXDB	pair 2B	T	
15	TXCA	pair 3A	Y	
12	TXCB	pair 3B	AA	
17	RXCA	pair 4A	V	
9	RXCB	pair 4B	X	
24	SCTEA	pair 5A	U	
11	SCTEB	pair 5B	W	
4	RTSA	pair 6A	C	
19	RTSB	pair 6B	no conn	Note 1

Table 24 V.35 cable pinouts (continued)

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male	Notes
5	CTSA	pair 7A	D	
13	CTSB	pair 7B	no conn	Note 1
6	DSRA	pair 8A	E	
22	DSRB	pair 8B	J	
20	DTRA	pair 9A	H	
23	DTRB	pair 9B	no conn	Note 1
8	DCDA	pair 10A	F	
10	DCDB	pair 10B	no conn	Note 1
18	LL	pair 11A	L	
21	RL	pair 11B	N	
25	TM	pair 12A	NN	
26	M0<-SIGNAL GROUND	pair 12B	B	Note 2
27	M1<-SIGNAL GROUND	pair 13A	B	Note 2
28	M2	pair 13B	no conn	Note 1
1	SHIELD	pair 14A	A	Notes 3,4
7	SIGNAL GROUND	pair 14B	B	Notes 2,4

The following notes apply to the single V.35 DTE cable:

1. The term “no conn” means the wire is not connected to a pin in the 34-pin connector.
2. Wires 12B, 13A, and 14B connect to pin B in the 34-pin connector.
3. At each end, the cable shield and connector shell must connect respectively to pin A of the 34-pin connector and pin 1 of the standard 28-pin connector.
4. Do not connect Shield to Signal Ground because these are separate signals.

Table 25 provides the X.21 cable pinouts. (The pair suffix A or B refers to an individual wire within a twisted pair.)

Table 25 X.21 cable pinouts

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Standard-wired end 15-pin male	Notes
2	TXDA	pair 1A	2	
14	TXDB	pair 1B	9	
3	RXDA	pair 2A	4	
16	RXDB	pair 2B	11	
15	TXCA	pair 3A	6	
12	TXCB	pair 3B	13	
17	RXCA	pair 4A	pair 5A	Note 1
9	RXCB	pair 4B	pair 5B	Note 1
24	SCTEA	pair 5A	pair 4A	Note 1
11	SCTEB	pair 5B	pair 4B	Note 1
4	RTSA	pair 6A	3	
19	RTSB	pair 6B	10	
5	CTSA	pair 7A	5	
13	CTSB	pair 7B	12	
6	DSRA	pair 8A	no conn	Note 2
22	DSRB	pair 8B	no conn	Note 2
20	DTRA	pair 9A	no conn	Note 2
23	DTRB	pair 9B	no conn	Note 2
8	DCDA	pair 10A	no conn	Note 2
10	DCDB	pair 10B	no conn	Note 2
18	LL	pair 11A	no conn	Note 2
21	RL	pair 11B	no conn	Note 2
25	TM	pair 12A	no conn	Note 2
26	M0	pair 12B	no conn	Note 2
27	M1	pair 13A	no conn	Note 2
28	M2<-SIGNAL GROUND	pair 13B	8	Note 3

Table 25 X.21 cable pinouts (continued)

Standard-wired end 28-pin male	Signal name	Pair number and conductor	Standard-wired end 15-pin male	Notes
1	SHIELD	pair 14A	1	Note 4,5
7	SIGNAL GROUND	pair 14B	8	Note 3,5

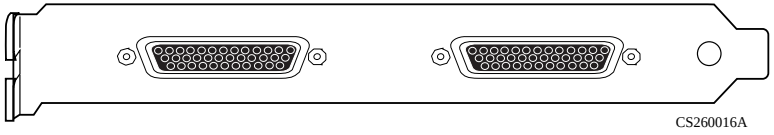
The following notes apply to the single X.21 cable:

1. Wires of pair 4 connect to wires of pair 5, but not to any pins in the DA-15.
2. The term “no conn” means the wire is not connected to a pin in the 15-pin connector.
3. Wires 13B and 14B connect to pin 8 in the 15-pin connector.
4. At each end, the cable shield and connector shell must connect to pin 1 of the connector.
5. Do not interconnect Shield to Signal Ground because these are separate signals.

Dual V.35 WAN interface card

The dual V.35 WAN interface card has two DB26 connectors that provide the signals needed to interface to V.35 equipment. Figure 38 shows the dual V.35 WAN interface card.

Figure 38 Dual V.35 WAN interface card



You need a DSU/CSU (digital service unit/channel service unit) between the WAN connection and the gateway. This section describes the connector and cables used with V.35 WAN synchronous adapters.

If you build your own V.35 DTE cables, observe the following guidelines:

- All connector hoods must be metal.
- Braid must enter and make contact inside the metal connector hood.
- V.35 conn strain relief must be conductive.

Included in the accessory box are two cables to attach to the V.35 connectors. These cables enable the WAN adapter to function as DTE (data terminal equipment). Table 26 provides the DB26-to-V.35 cable pinouts.

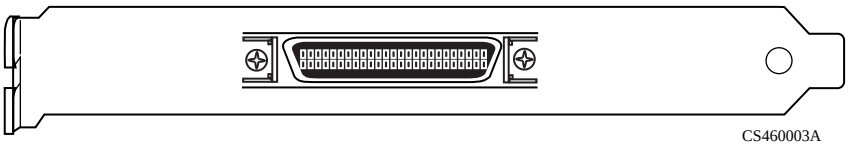
Table 26 DB26-to-V.35 cable pinouts

Standard-wired end 26-pin male	Signal name	Pair number and conductor	Special-wired end 34-pin male
2	TDA	pair 1A	P
14	TDB	pair 1B	S
3	RDA	pair 2A	R
16	RDB	pair 2B	T
24	ETA	pair 3A	U
11	ETB	pair 3B	W
17	RCA	pair 4A	V
9	RCB	pair 4B	X
15	TCA	pair 5A	Y
12	TCB	pair 5B	AA
4	RTS	pair 6A	C
		pair 6B	no conn
5	CTS	pair 7A	D
		pair 7B	no conn
6	DSR	pair 8A	E
		pair 8B	no conn
8	DCD	pair 9A	F
		pair 9B	no conn
20	DTR	pair 10A	H
		pair 10B	no conn
7	SGND	pair 11A	B
		pair 11B	no conn
1	CGND	pair 12A	A
		pair 12B	no conn

HSSI WAN interface card

The HSSI WAN interface card has a 50-pin SCSI II female connector that provides the signals needed to interface to a T3 modem or modem eliminator. Figure 39 shows the HSSI WAN interface card.

Figure 39 HSSI WAN interface card



Included in the accessory box is a cable that maps the T3 signals out to a 50-pin SCSI II male connector.

Table 27 provides the T3 cable pinouts.

Table 27 T3 cable pinouts

50-pin SCSI male	Signal name	50-pin SCSI male
1	GND	1
2	RCB	2
3	CAB	3
4	RDB	4
5	LCB	5
6	STB	6
7	GND	7
8	TAB	8
9	TTB	9
10	LAB	10
11	TDB	11
12	LBB	12
13	GND	13
19	GND	19
24	TESTB	24
25	GND	25

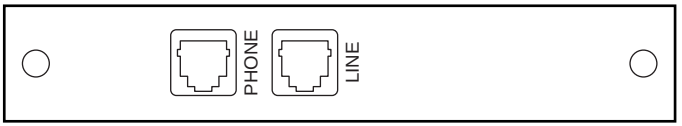
Table 27 T3 cable pinouts (continued)

50-pin SCSI male	Signal name	50-pin SCSI male
26	GND	26
27	RCA	27
28	CAA	28
29	RDA	29
30	LCA	30
31	STA	31
32	GND	32
33	TAA	33
34	TTA	34
35	LAA	35
36	TDA	36
37	LBA	37
38	GND	38
44	GND	44
49	TESTA	49
50	GND	50

V.90 modem interface card

The V.90 modem interface card has two RJ-11 connectors that provide the signals needed to interface to an incoming telephone line and to telephone equipment. Figure 40 shows the V.90 modem interface card.

Figure 40 V.90 modem interface card



Included in the accessory box is a 7-foot RJ-11 cable to attach to a telephone jack.

Table 28 provides the V.90 modem port cable pinouts.

Table 28 V.90 modem cable pinouts

Pin	Function
1	N/C
2	Tip
3	Ring
4	N/C

Index

Numbers

A

B

C

D

E

F

G

H

I

L

M

N

O

P

Q

R

S

T

U

V

W

X