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Installing the Contivity 1010/ 1050/1100

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Preface

The Contivity* 1010, 1050, and 1100 are part of the Nortel Networks* Contivity Secure IP Services Gateway family. Contivity Secure IP Services Gateways support secure, reliable IP VPNs in a single, integrated hardware device. Throughout this guide, the Contivity 1010, 1050, and 1100 are also referred to collectively as *the gateway.*

This guide provides instructions on how to install the Contivity 1010, 1050, and 1100 and how to install and replace option cards in the Contivity 1100. This guide also includes technical specifications.

For complete information about configuring and monitoring the Contivity 1010, 1050, and 1100, see the documentation on the software CD. (For information about Contivity documentation, see "Related publications" on page 13.)

Before you begin

This guide is intended for qualified service personnel who are installing the Contivity 1010, 1050, or 1100 for the first time or who need to install or replace an option card in the Contivity 1100.

Note: Before you install the Contivity 1010, 1050, or 1100, 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/DSU	channel service unit/digital service unit
DIMM	dual inline memory module
DTE	data terminal equipment
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LAN	local area network
LED	light emitting diode
LOS	loss of signal
MAC	media access control
MDI-X	medium dependent interface crossover

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

Related publications

For more information about using the Contivity 1010, 1050, and 1100, refer to the following publications (included on the Contivity 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.
- *Read Me First: Connecting for VPN Access* describes how to set up the Contivity 1010/1050/1100 for basic Internet and VPN access.
- *Configuring Basic Features for the Contivity Secure IP Services Gateway* introduces the product and provides information about initial configuration.
- *Configuring Servers, Authentication, and Certificates for the Contivity Secure IP Services Gateway* provides instructions for configuring authentication servers and services, as well as 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 Tunneling Protocols for the Contivity Secure IP Services Gateway* provides instructions for configuring the tunneling protocols IPsec, L2TP, PPTP, and L2F.
- *Configuring Advanced Features for the Contivity Secure IP Services Gateway* provides instructions for configuring 802.1Q VLANs, circuitless IP, advanced WAN settings, PPP, PPPoE, frame relay, ADSL and ATM, T1/E1 CSU/DSU interfaces, dial services and BIS, DLSw, IPX, and hardware accelerator cards.
- *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.

- *Reference for the Contivity Secure IP Services Gateway Command Line Interface* provides syntax, descriptions, and examples for the commands that you can use to configure, manage, and monitor the gateway.
- *Managing and Troubleshooting the Contivity Secure IP Services Gateway* provides information about backup and recovery, file management, upgrading software, and troubleshooting. This guide also provides instructions for monitoring gateway status and performance.

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.

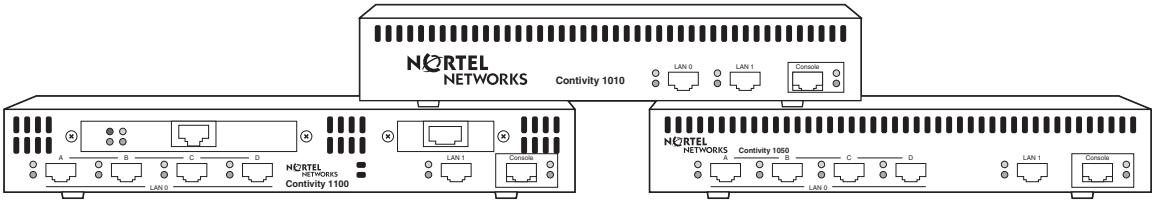
From the Technical Support page, you can open a Customer Service Request online or find the telephone number for the nearest Technical Solutions Center. If you are not connected to the Internet, you can call 1-800-4NORTEL (1-800-466-7835) to learn the telephone number for the nearest Technical Solutions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

The Nortel Networks Contivity 1010/1050/1100 series provides scalable, secure, manageable extranet access for up to five concurrent tunnels across the public data network. These models are based on Intel architecture with a 300 MHz Celeron CPU and 128 MB SDRAM. Instead of a hard drive, this series uses a removable, upgradeable compact flash card. The Contivity 1010, 1050, and 1100 fit on a bookshelf or on a shelf in a rack (Figure 1).

Figure 1 Contivity 1010/1050/1100 series



10674EA

The Contivity 1010/1050/1100 series provides the following network ports:

- The Contivity 1010 has dual 10/100 Ethernet* ports and a serial port.
- The Contivity 1050 has a single Ethernet port and a four-port switch.
- The Contivity 1100 has a single Ethernet port, a four-port switch, and two PCI slots (option cards are purchased separately).
- All models have a serial (console) port.

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

Table 1 lists the hardware accessories and other items shipped with the Contivity 1010, 1050, and 1100.

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

Table 1 Items shipped with the Contivity 1010, 1050, and 1100

Description	Quantity
Contivity 1010/1050/1100	1
Molded serial cable RJ-45 to DB9[1]	1
AC to DC external power supply	1
Contivity CD (contains documentation)	1
Ethernet crossover cable (Contivity 1010 only)	1
Power cord (if ordered separately)	1

1 To connect the gateway to a modem, you can order a null modem adapter.

Inspect all items for shipping damage. If you detect any damage, do not install the Contivity 1010/1050/1100. Call the Nortel Networks Technical Solutions Center in your area (see "How to get help" on page 14).

Internal LAN connections (LAN 0 and LAN 1)

The Contivity 1010, 1050, and 1100 have two internal LANs built in:

- LAN 0 is the **private** LAN and also the LAN to use for Web management.
- LAN 1 defaults to a **public** LAN. The software refers to the LAN 1 port as slot 1, interface 1.

The Contivity 1010 has a single autonegotiating 10/100 Ethernet port on LAN 0. The Contivity 1050 and the Contivity 1100 have an internal four-port autonegotiating 10/100 Ethernet switch for LAN 0.

Note: The LAN 0 statistics for the Contivity 1050 and 1100 provide accurate information for reports and troubleshooting, but the LAN 0 interface always reports a 100 Mb/s full-duplex connection regardless of the actual connection speed. For example, if one of the LAN 0 ports on a Contivity 1050 is connected to a hub, the connection runs at half duplex, but the LAN 0 statistics page reports a full-duplex connection.

Figure 2, Figure 3, and Figure 4 show the front views of the Contivity 1010, Contivity 1050, and the Contivity 1100, respectively. For a description of the LEDs, see "Understanding the LEDs" on page 21.

Figure 2 Contivity 1010 front view

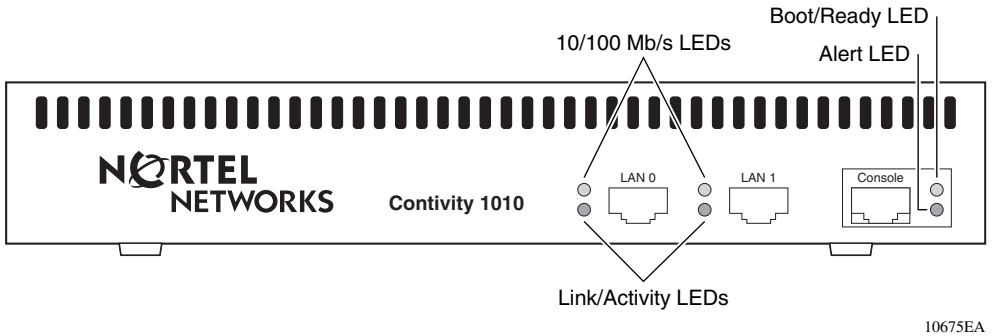


Figure 3 Contivity 1050 front view

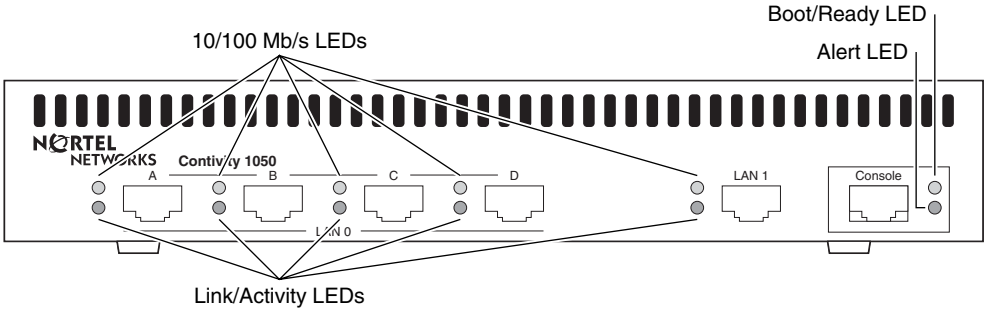
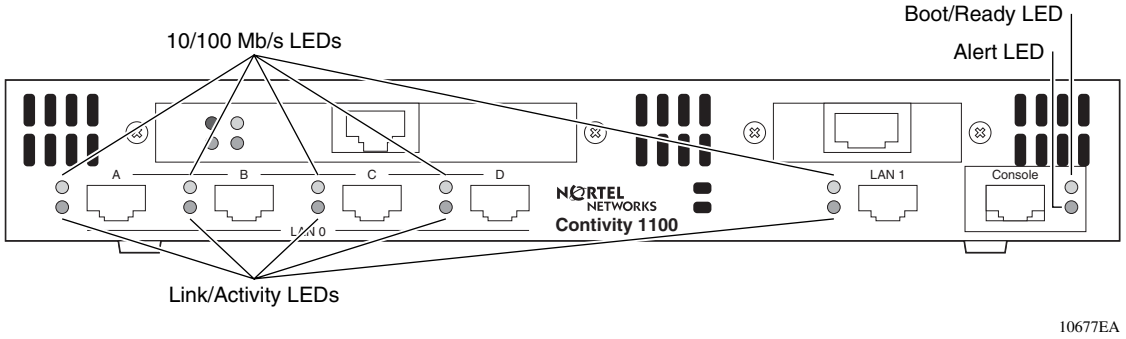


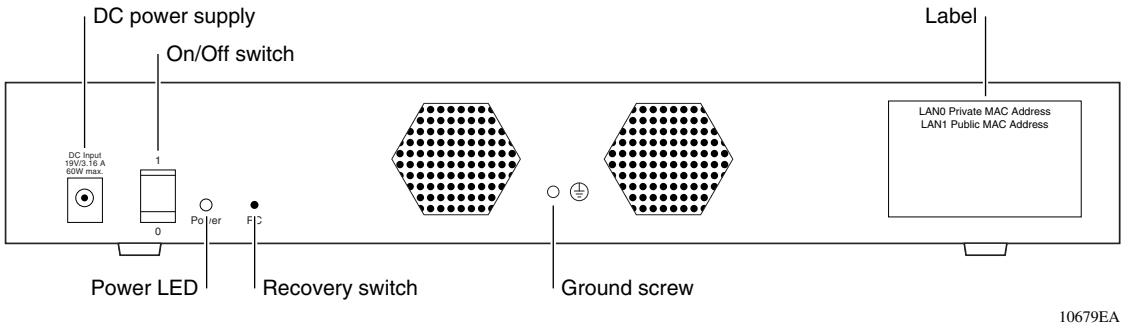
Figure 4 Contivity 1100 front view



Rear view of the gateway

Figure 5 shows the rear view of the Contivity 1010, 1050, and 1100.

Figure 5 Rear view of the Contivity 1010/1050/1100



The components on the rear of the gateway include the following:

- The port labeled “DC Input” is the receptacle for the external power supply that is shipped with the Contivity 1010, 1050, and 1100.
- Mechanical on/off switch.

Note: Nortel Networks recommends that you wait 5 seconds after you turn off the gateway before you turn it on again.

- The Power LED is green when power is supplied to the unit and the internal power converters are not in a protective shutdown state.
- The recessed recovery switch is used to boot the recovery image. To boot the recovery image, press the switch by inserting a paper clip into it during the power-on self-test memory test. For more information about system recovery, see *Managing and Troubleshooting the Contivity Secure IP Services Gateway.*
- The ground screw allows you to ground the chassis (GND).
- The label on the rear panel lists the MAC addresses for LAN 0 and LAN 1.

Connecting the power cord

You must order the power cord for the Contivity 1010/1050/1100 separately. The power cord must meet the requirements described in Table 2.

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

Table 2 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 (1.5 A).
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 power supply must be an IEC 320, Sheet C5 female.
Wall outlet connector	The power cord must terminate in a male plug with appropriate grounding.

Caution: Before you connect the power supply to the gateway, connect the cables to the Ethernet and serial ports. If you have a Contivity 1100, also connect the cables to the ports on any installed option cards.

To connect the power cord and turn on the power:

1. Plug the power cord into the AC receptacle on the external power supply shipped with the Contivity 1010/1050/1100.
2. Plug the power cord into the AC power outlet.

Caution: You should protect the Contivity 1010/1050/1100 by plugging it into a surge suppressor.

3 Plug the external power supply into the port labeled “DC Input” on the back of the gateway (see Figure 5 on page 19).

4 Press the power switch to the “on” position and wait for the gateway to boot.

5 Verify a successful installation by checking the LEDs on the front panel (see “Front panel LEDs” on page 21).

Note: For information about connecting the Contivity 1010/1050/1100 to the network, see the Read Me First, “Connecting for VPN Access.”

Understanding the LEDs

This section describes the LEDs on the front panel of the Contivity 1010/1050/1100 and on the communication cards that you can install in the Contivity 1100.

Front panel LEDs

The front panel of the gateway has two LEDs that indicate the status of the Contivity 1010/1050/1100: the Boot/Ready and the Alert LEDs (Figure 6). The Contivity 1100 also has an audible alarm that corresponds to the Alert LED.

Figure 6 Front panel of the Contivity 1010

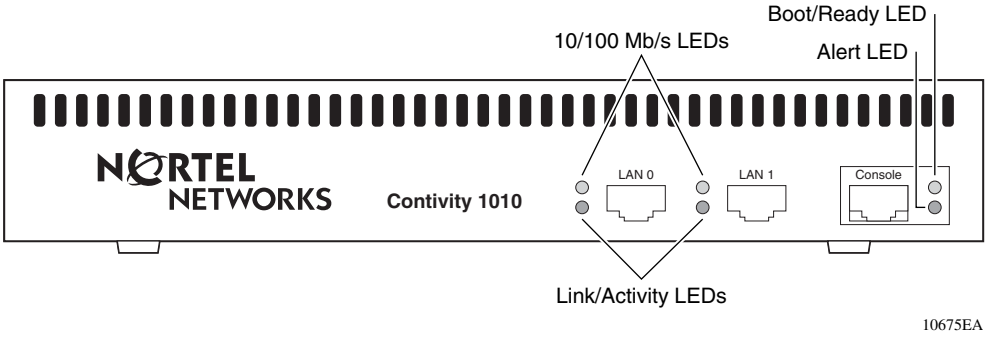


Table 3 describes the LEDs on the Contivity 1010/1050/1100 front panel.

Table 3 Front panel LED indicators

LED	Indicator	Description
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.
Alert	Yellow (on)	An alarm condition exists. The alarm may indicate a serious condition, such as a hardware defect, or a software attention condition. The alarm condition is described in the health check display.
	Off	No alarm condition exists.

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

Ethernet port LEDs

To confirm that the Ethernet LAN interfaces are cabled properly, examine the port LEDs located on the front of the gateway. (Figure 6 shows the LAN 0 and LAN 1 port LEDs located on the front of the Contivity 1010.)

Table 4 describes the Ethernet port LEDs on the Contivity 1010/1050/1100.

Table 4 Ethernet port LED indicators

LED	Indicator	Description
10/100 Mb/s (Amber)	On	The LAN port is operating at 100 Mb/s.
	Off	The LAN port is operating at 10 Mb/s.
Link/Act (Green)	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 7 shows the LEDs on the 10/100BASE Ethernet interface card.

Figure 7 LEDs on the 10/100BASE Ethernet interface card

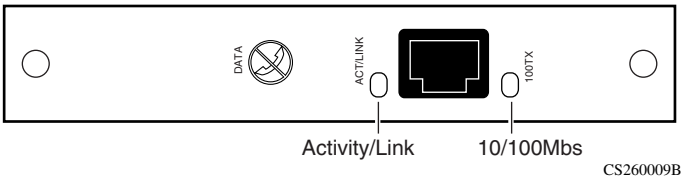


Table 5 describes the LEDs on the 10/100BASE Ethernet interface card.

Table 5 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.

56/64K CSU/DSU WAN interface card LEDs

Figure 8 shows the LEDs on the 56/64K CSU/DSU WAN interface card.

Figure 8 LEDs on the 56/64K CSU/DSU WAN interface card

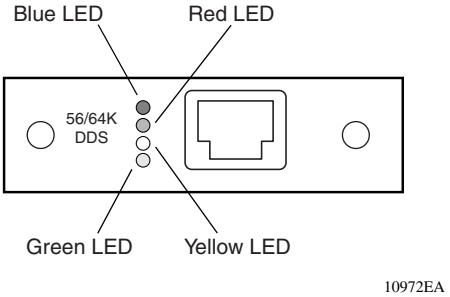


Table 6 describes the LEDs on the 56/64K CSU/DSU WAN interface card.

Table 6 LED indicators on the 56/64K CSU/DSU WAN interface card

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

ADSL WAN interface card LEDs

Figure 9 shows the LEDs on the ADSL WAN interface card.

Figure 9 LEDs on the ADSL WAN interface card

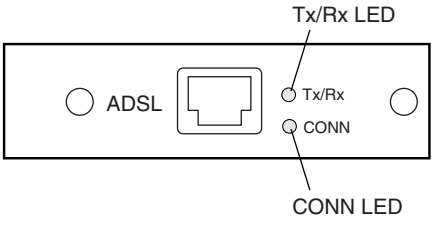


Table 7 describes the LEDs on the ADSL WAN interface card.

Table 7 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 10 shows the LEDs on the T1/E1 CSU/DSU WAN interface card.

Note: The brackets of the full-height and half-height T1/E1 CSU/DSU cards are almost identical. The LEDs on the two cards indicate the same conditions.

Figure 10 LEDs on the T1/E1 CSU/DSU WAN interface card

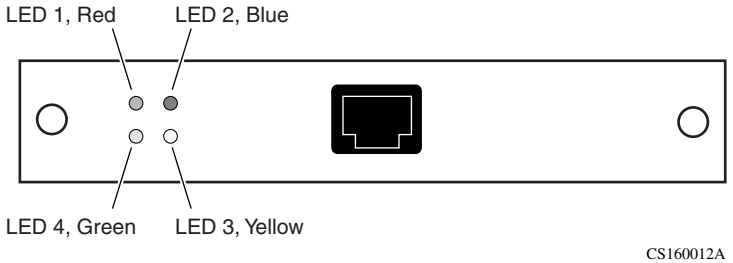


Table 8 describes the LEDs on the T1/E1 CSU/DSU WAN interface card.

Table 8 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.

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

Figure 11 shows the LEDs on the single V.35/X.21 WAN interface card.

Figure 11 LEDs on the single V.35/X.21 WAN interface card

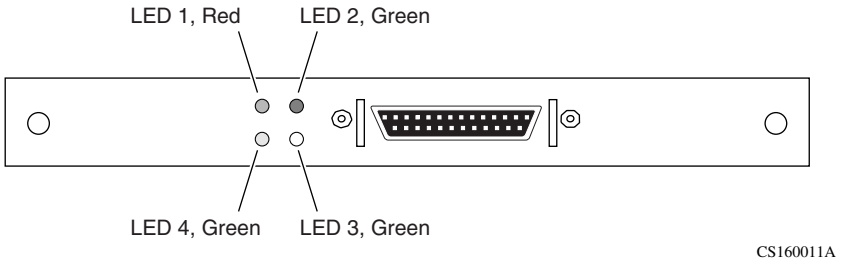


Table 9 describes the LEDs on the single V.35/X.21 WAN interface card.

Table 9 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 2
Installing option cards in the Contivity 1100

The Contivity 1100 has two expansion slots for option cards. This chapter provides instructions on how to install and replace LAN, WAN, and serial option cards in the Contivity 1100.

Table 10 lists the option cards that you can install in the Contivity 1100.

Table 10 Supported option cards for the Contivity 1100

Option card	Maximum number[1]
10/100 Ethernet LAN interface	2
56/64K CSU/DSU WAN interface[2]	2
ADSL WAN interface[3]	2
ISDN BRI S/T or U interface[4]	1
T1/E1 CSU/DSU WAN interface (half-height)	2
T1 CSU/DSU WAN interface (full-height)	1
Single V.35/X.21 WAN interface	1
V.90 modem interface[4]	1

1 When only one card of a type is supported, you must install that card in the larger slot, that is, slot 2.

2 The Contivity 1100 must be running Version 5.0 or later.

3 The Contivity 1100 must be running Version 4.90 or later.

4 The Contivity 1100 must be running Version 4.80 or later.

To install a new LAN, WAN, or serial option card:

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 Turn off the Contivity 1100 power.

The power switch and power outlet are located on the rear of the Contivity 1100.

4 Disconnect the power cord from the power outlet and then disconnect the cord from the Contivity 1100.

Danger: Make sure to turn off the Contivity 1100 and unplug it before you attempt to remove or install an option card.

5 Remove the cables attached to the ports of the Contivity 1100.

6 If there are option cards currently installed, unscrew the 2 screws on each bracket and remove the bracket.

Caution: Unscrew the option card brackets before you remove the cover from the Contivity 1100 or you will damage the option cards.

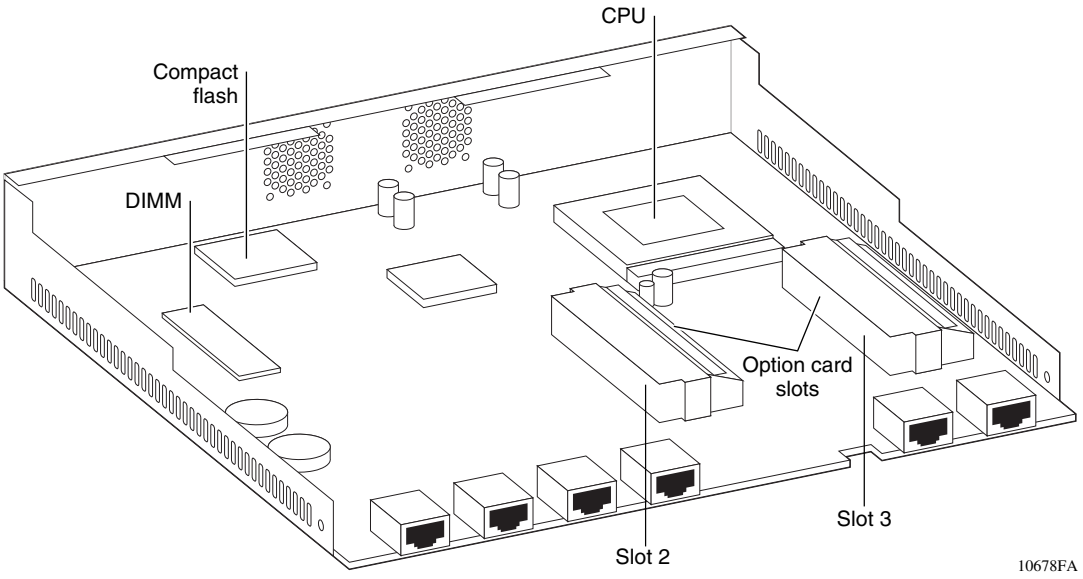
7 Remove the 4 screws located on the sides of the Contivity 1100.

8 Slide the chassis cover away from the base.

The Contivity 1100 system board is now exposed. Figure 12 shows the location of the option card slots on the system board.

9 Locate the slot where you plan to install the new or replacement option card (see Table 10 on page 29).

Figure 12 Contivity 1100 system board



Warning: Beware of danger if the 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.

10 Attach an antistatic wrist strap (not included with the Contivity 1100 shipment).

Caution: Electrostatic discharge can damage Contivity 1100 components.

11 Remove the blank card bracket (or the option card that you are replacing) from the slot.

Caution: If you need to remove an ADSL option card from slot 3 (see Figure 12 on page 31), lift the free end of the card so that the card is at a slight angle, then carefully pull it up and out of the slot so that the card clears the connector of the adjacent slot 2. If you damage components on the underside of the ADSL interface card, the card will not work.

12 Install the new option card.

Caution: To prevent stress damage to components on the underside of the ADSL option card when you install that card in slot 3 (see Figure 12 on page 31), hold the card at a slight angle and insert it into the connector so that the card clears the connector of the adjacent slot 2. If you damage components on the underside of the ADSL interface card, the card will not work.

Make sure to press the card all the way into the PCI connector on the motherboard.

13 Carefully slide the chassis cover onto the base and secure it with the 4 screws.

14 Attach the bracket of the new option card to the front panel with 2 screws.

15 Connect the cables to the system ports and to the option card ports.

16 Plug the power cord into the AC power outlet.

17 Plug the external power supply into the port labeled “DC Input” on the back of the Contivity 1100.

18 Press the power switch to the “on” position and wait for the gateway to boot.

Caution: The boot process can take as long as 3 minutes. Do not turn the power off and on again; recycling the power quickly can cause problems. Always wait at least 5 seconds after you turn off the power before you turn it on again.

Appendix A
Technical specifications

This appendix provides technical specifications for the Contivity 1010, 1050, and 1100 chassis and for their interfaces.

Chassis specifications

Table 11 lists the physical specifications for the Contivity 1010, 1050, and 1100 chassis.

Table 11 Physical specifications

Chassis	Height	Width	Depth	Weight
Contivity 1010	1.75 in. (4.44 cm)	8.25 in. (21 cm)	7.5 in. (19 cm)	2.65 lb (1.2 kg)
Contivity 1050	1.75 in. (4.44 cm)	8.25 in. (21 cm)	7.5 in. (19 cm)	2.75 lb (1.25 kg)
Contivity 1100	1.75 in. (4.44 cm)	8.25 in. (21 cm)	10.75 in. (27.3 cm)	3.8 lb (1.7 kg)

Table 12 lists the electrical and environmental specifications for the chassis.

Table 12 Electrical and environmental specifications

Specification	Description
Electrical	
Voltage	100–240 VAC
Current	1.5 A
Frequency	50–60 Hz
Operating environment	
Temperature	32–104°F (0–40°C)
Relative humidity	10–90% noncondensing

System ports

The Contivity 1010/1050/1100 system board provides the following interfaces:

- 10/100BASE Ethernet LAN ports
- Serial port

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

10/100BASE Ethernet LAN ports

The Contivity 1010, 1050, and 1100 have two internal LANs built in:

- LAN 0 is the **private** LAN and also the LAN to use for Web management.
  - — The LAN 0 connector on the front of the Contivity 1010 is an Ethernet MDI configuration and requires a crossover cable (included with your shipment).
  - — The LAN 0 connectors on the front of the Contivity 1050 and 1100 are an Ethernet MDI-X configuration. These ports support the Auto-MDI-X feature, so either straight-through or crossover cables can be used.
- LAN 1 defaults to a **public** LAN. The software refers to the LAN 1 port as slot 1, interface 1.

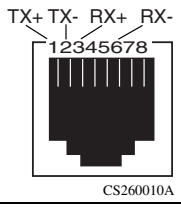
The LAN 1 connector on the front of the Contivity 1010, 1050, and 1100 is an Ethernet MDI configuration and requires an RJ-45 straight-through cable. Depending on whether you will use the interface for 10BASE-T or 100BASE-TX operation, select cables for the interfaces as follows:

- 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.

Table 13 provides the 10/100BASE Ethernet port pinouts for the system ports on the Contivity 1100.

Table 13 10/100BASE Ethernet port pinouts

	Pin	Description
	1	TX +
	2	TX -
	3	RX +
	6	RX -

Serial port

The system board provides a serial port on the front of the Contivity 1010, 1050, and 1100 to enable out-of-band management of the gateway. The serial cable provided with the Contivity 1010, 1050, and 1100 is an RJ-45-to-DB9 cable (Figure 13). The RJ-45 connector goes into the Contivity 1010, 1050, or 1100, and the DB9 connector goes into your workstation.

Caution: Use this cable to connect a PC or modem to the Contivity 1010/1050/1100. Do not use this cable to attach a PC or modem to any other Contivity device.

Figure 13 Serial cable (RJ-45-to-DB9)

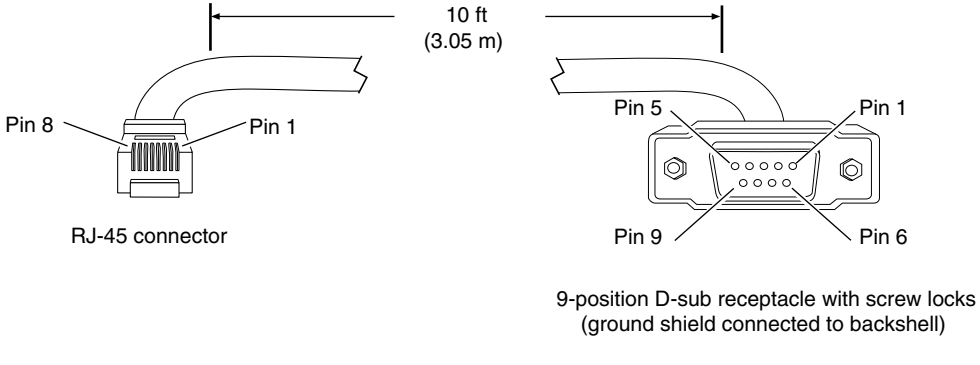


Table 14 provides the RJ-45-to-DB9 serial interface cable pinouts.

Table 14 RJ-45-to-DB9 cable pinouts

RJ-45 termination		DB9 termination	
Signal	**Pin # to Pin #**		**Signal**
Clear to Send	1	8	Clear to Send
Data Set Ready	2	6	Data Set Ready
Receive Data	3	3	Send Data
Data Carrier Detect	4	1	Data Carrier Detect
Send Data	5	2	Receive Data
Signal Ground	6	5	Signal Ground
Data Terminal Ready	7	4	Data Terminal Ready
Request to Send	8	7	Request to Send

External modem adapter

If you need to connect a Contivity 1010, 1050, or 1100 to a modem, you can order a null modem adapter from Nortel Networks. This adapter allows you to connect the Contivity 1010/1050/1100 console cable (shipped with the gateway) to an RS-232-C modem port.

Caution: Use only the serial cable shipped with the Contivity 1010, 1050, or 1100 and this modem adapter to connect a modem to the Contivity 1010, 1050, or 1100. Other cables and adapters may not provide adequate shielding for EMI regulatory compliance.

To ensure correct dial-in and dial-out operation, configure the modem with the settings “verbal result codes” and “display result codes.” For more information, see the modem documentation.

The cable adapter has a DB9 connector that connects to the serial cable and a DB-25 connector that connects to the modem (Figure 14).

Figure 14 Serial cable adapter for connection to modem (DB9-to-DB25)

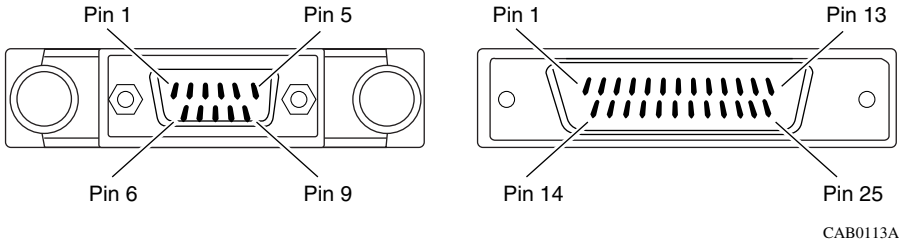


Table 15 provides the null modem adapter cable pinouts.

Table 15 Null modem adapter cable pinouts

DB9 termination		**DB25 termination**	
Signal	**Pin # to Pin #**		**Signal**
Receive Data	2	2	Send Data
Send Data	3	3	Receive Data
Data Terminal Ready	4	6	Data Set Ready
Signal Ground	5	7	Signal Ground
Data Set Ready	6	20	Data Terminal Ready
Request to Send	7	5	Clear to Send
Clear to Send	8	4	Request to Send

Hardware option cards

The Contivity 1100 has two expansion slots that support a combination of the following network interface cards:

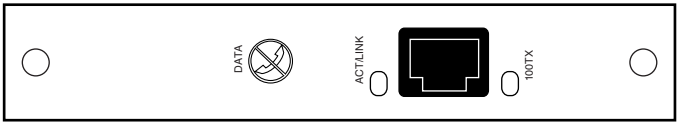
- 10/100BASE Ethernet
- 56/64K CSU/DSU WAN
- ADSL WAN
- ISDN BRI
- T1/E1 CSU/DSU WAN (half-height card)
- T1 CSU/DSU WAN (full-height card)
- V.90 modem
- Single V.35/X.21 WAN

This section provides information about the connectors and cable pinouts for each supported interface card. For instructions on installing an option card, see Chapter 2, “Installing option cards in the Contivity 1100,” on page 29.

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 15 shows the 10/100BASE Ethernet interface card.

Figure 15 10/100BASE Ethernet interface card



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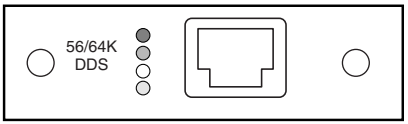
For information about the cables that you can connect to this interface and the cable pinouts, see “10/100BASE Ethernet LAN ports” on page 34.

56/64K CSU/DSU WAN interface card

The 56/64K CSU/DSU WAN interface card has a single RJ-48 connector that provides the signals needed to interface to network equipment. Figure 16 shows the 56/64K CSU/DSU WAN interface card.

Figure 16 56/64K CSU/DSU WAN interface card



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The connector on the 56/64K 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 an interface cable with the 56/64K CSU/DSU 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 1 and 2) and the receive signal (pins 7 and 8) are carried on a twisted pair inside the patch cord. The use of factory-made patch cords is strongly recommended.

You connect the 56/64K 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 56/64K CSU/DSU crossover cable and the Ethernet crossover cable are not interchangeable.

Table 16 provides the 56/64K CSU/DSU cable pinouts for a crossover connection.

Table 16 56/64K CSU/DSU cable pinouts for crossover connection

Nortel Networks termination		Remote termination	
Signal	**Pin # to Pin #**		**Signal**
Transmit tip	1	7	Receive tip
Transmit ring	2	8	Receive ring
not used	3	3	not used
not used	4	4	not used
not used	5	5	not used
not used	6	6	not used
Receive tip	7	1	Transmit tip
Receive ring	8	2	Transmit ring

The cable will operate properly if pins 3, 4, 5, and 6 are not connected.

Caution: For crossover connections, do not use Ethernet cable. The link will not be established.

Table 17 provides the 56/64K CSU/DSU cable pinouts for a straight-through connection.

Table 17 56/64K CSU/DSU cable pinouts for straight-through connection

Nortel Networks termination		Remote termination	
Signal	**Pin # to Pin #**		**Signal**
Transmit tip	1	1	Transmit tip
Transmit ring	2	2	Transmit ring
not used	3	3	not used
not used	4	4	not used
not used	5	5	not used
not used	6	6	not used
Receive tip	7	7	Receive tip
Receive ring	8	8	Receive ring

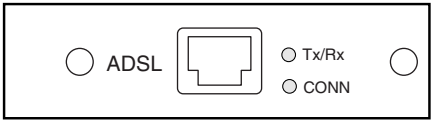
ADSL WAN interface card

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 17 shows the ADSL WAN interface card.

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

Figure 17 ADSL WAN interface card



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

Table 18 provides the ADSL port pinouts.

Table 18 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 BRI S/T interface to the ISDN network, you must attach an external NT-1 device to the RJ-45 connector.)

Figure 18 shows the ISDN BRI S/T interface card.

Figure 18 ISDN BRI S/T interface card

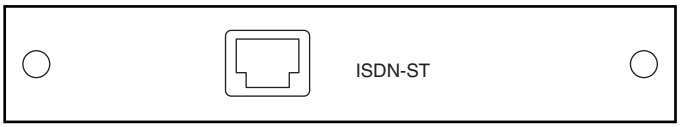
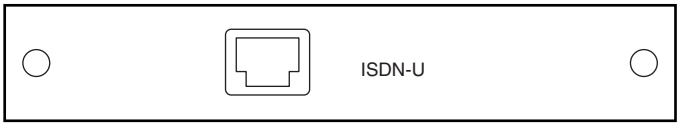


Figure 19 shows the ISDN BRI U interface card.

Figure 19 ISDN BRI U interface card



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 19 provides the ISDN BRI S/T cable pinouts.

Table 19 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 20 provides the ISDN BRI U cable pinouts.

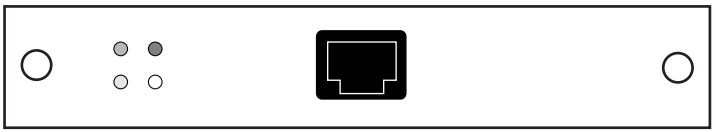
Table 20 ISDN BRI U cable pinouts

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 20 shows the T1/E1 CSU/DSU WAN interface card. This interface card ships as a half-height card and as a full-height card.

Figure 20 T1/E1 CSU/DSU WAN interface card



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Note: The brackets of the half-height and full-height cards are almost identical. For E1 service, you must install the half-height version of the T1/E1 CSU/DSU WAN interface card.

The connector on the 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. Nortel Networks does not supply an interface cable with the the T1/E1 CSU/DSU 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 21 provides the T1/E1 CSU/DSU cable pinouts for a crossover connection.

Table 21 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 22 provides the T1/E1 CSU/DSU cable pinouts for a straight-through connection.

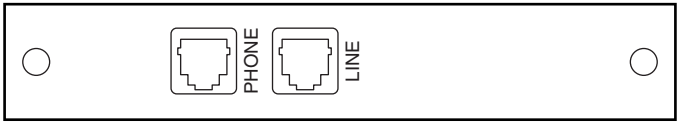
Table 22 T1/E1 CSU/DSU cable pinouts for straight-through connection

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

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 21 shows the V.90 modem interface card.

Figure 21 V.90 modem interface card



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

Table 23 provides the V.90 modem port cable pinouts.

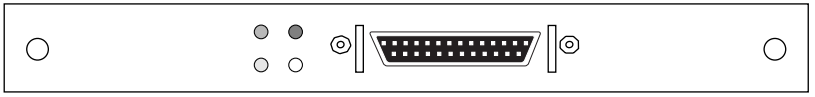
Table 23 V.90 modem cable pinouts

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

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 22 shows the single V.35/X.21 WAN interface card.

Figure 22 Single V.35/X.21 WAN interface card



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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 from Nortel Networks 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 48 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
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	

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
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	

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
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
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.

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