NetVanta 1000 Series and NetVanta 1000R Series Hardware Installation Guide

1200500E1/L1	NetVanta 1224
1200504E1/L1	NetVanta 1224ST
1200510L1	NetVanta 1224STR (AC)
1200520E1/L1	NetVanta 1224R
1200530L1	NetVanta 1224R PWR
1200560E2/L2	NetVanta 1524ST
1200570L1	NetVanta 1224STR PWR
1200580L1	NetVanta 1224 PWR
1200584L1	NetVanta 1224ST PWR
1200590L1	NetVanta 1224STR (DC)
1200861L1	NetVanta 56K/64K Network Interface Module
1200862L2#NEBS	NetVanta T1/FT1 NEBS Network Interface Module
1202862L1	NetVanta T1/FT1 Network Interface Module
1202863L1	NetVanta T1/FT1 + DSX-1 Network Interface Module
1200872L1	NetVanta Dual T1 Network Interface Module
1200868E1/L1	NetVanta E1/FE1 Network Interface Module
1200878E1/L1	NetVanta E1/FE1 + G.703 Drop Network Interface Module
1200866E1/L1	NetVanta Serial Network Interface Module
1200867L1	NetVanta SHDSL Network Interface Module
1200869E1/L1	NetVanta ADSL Network Interface Module, Annex A
1200889E1/L1	NetVanta ADSL Network Interface Module, Annex B
1200864L1	NetVanta Analog Modem Dial Backup Interface Module
1200865L1	NetVanta ISDN BRI Dial Backup Interface Module
1200875L1	NetVanta ISDN S/T Dial Backup Interface Module
1200886L1	NetVanta Serial Dial Backup Interface Module
1200480L1	1000BaseSX Multi-Mode SFP Module
1200481L1	1000BaseLX Single-Mode SFP Module
1202368L1	NetVanta VPN Accelerator Card

61200500L1-34J
July 2006

Trademarks

Any brand names and product names included in this manual are trademarks, registered trademarks, or trade names of their respective holders.

To the Holder of the Manual

The contents of this manual are current as of the date of publication. ADTRAN reserves the right to change the contents without prior notice.

In no event will ADTRAN be liable for any special, incidental, or consequential damages or for commercial losses even if ADTRAN has been advised thereof as a result of issue of this publication.

Software Licensing Agreement

Each ADTRAN product contains a single license for ADTRAN supplied software. Pursuant to the Licensing Agreement, you may: (a) use the software on the purchased ADTRAN device only and (b) keep a copy of the software for backup purposes. This Agreement covers all software installed on the system as well as any software available on the ADTRAN website. In addition, certain ADTRAN systems may contain additional conditions for obtaining software upgrades.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

901 Explorer Boulevard
P.O. Box 140000
Huntsville, AL 35814-4000
Phone: (256) 963-8000

Copyright © 2006 ADTRAN, Inc.
All Rights Reserved.
Printed in U.S.A.

Conventions

Notes provide additional useful information.

Cautions signify information that could prevent service interruption or damage to the equipment.

WARNING

Warnings provide information that could prevent injury or endangerment to human life.

Copyright © 2006 ADTRAN, Inc.

Safety Instructions

When using your telephone equipment, please follow these basic safety precautions to reduce the risk of fire, electrical shock, or personal injury:

1. Do not use this product near water, such as a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
2. Avoid using a telephone (other than a cordless-type) during an electrical storm. There is a remote risk of shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord, power supply, and/or batteries indicated in the manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for special disposal instructions.
5. The socket-outlet shall be installed near the equipment and shall be easily accessible.

This equipment incorporates double pole/neutral fusing. If the neutral fuse opens and the line fuse does not open, voltage could still be present in the unit.

Save These Important Safety Instructions

 Copyright © 2006 ADTRAN, Inc.

FCC-Required Information

FCC regulations require that the following information be provided in this manual:

1. This equipment complies with Part 68 of FCC rules and requirements adopted by ACTA. Each registered interface has a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, provide this information to the telephone company.
2. If this equipment causes harm to the telephone network, the telephone company may temporarily discontinue service. If possible, advance notification is given; otherwise, notification is given as soon as possible. The telephone company will advise the customer of the right to file a complaint with the FCC.
3. The telephone company may make changes in its facilities, equipment, operations, or procedures that could effect the proper operation of this equipment. Advance notification and the opportunity to maintain uninterrupted service are given.
4. If experiencing difficulty with this equipment, please contact ADTRAN for repair and warranty information. The telephone company may require this equipment to be disconnected from the network until the problem is corrected or it is certain the equipment is not malfunctioning.
5. This unit contains no user-serviceable parts.
6. This equipment is designed to connect to the telephone network or premises wiring using an FCC-compatible modular jack, which is compliant with Part 68 and requirements adopted by ACTA.
7. The following information may be required when applying to the local telephone company for leased line facilities:

Part Number	Registration Number	Service Type	REN/SOC	FIC	USOC
1200861L1	US:HDCDENAN1200861L1	56 Kbps Digital Interface 64 Kbps Digital Interface	6.0F	04DU5-56 04DU5-64	RJ-48S
1202862L1	US: HDCDENAN1202863L1	1.544 Mbps - SF 1.544 Mbps - SF and B8ZS 1.544 Mbps - ESF 1.544 Mbps - ESF and B8ZS	6.0N	04DU9-BN 04DU9-DN 04DU9-1KN 04DU9-1SN	RJ-48C
1202863L1					
1200872L1	US: HDCDENAN1200872L1				
1200695L1	US: HDCDENAN1200695L1				
1200864L1	US: HDCMM04A1200864L1	Analog Loop Start	0.4A/9.0Y	02LS2	RJ-11C
1200865L1	US: HDCDENAN1200865L1	Basic Rate ISDN	6.0F	02LS5	RJ-49C
1200869E1/L1	US: HDCDL01A1200869L1	ADSL Modem	0.1A	Metallic	RJ-11C
1200691E1/L1	US: HDCMM01B1200691L1	Analog Loop Start/Ground Start	0.1B	02LS2/02GS2	RJ-11C
1200692E1/L1					

8. The REN is useful in determining the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most areas, the sum of the RENs of all devices should not exceed five. To be certain of the number of devices you may connect to your line as determined by the REN, call your telephone company to determine the maximum REN for your calling area.
9. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.

Copyright © 2006 ADTRAN, Inc.

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio frequencies. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R

NetVanta Module P/N and Name		NetVanta 1224STR (AC) /1224R	NetVanta 1224STR (DC)
1200861L1	56K/64K NIM	FCC Part 15, Class A EN 55022 Class A	N/A
1200862L2#NEBS	T1/FT1 NEBS NIM	N/A	FCC Part 15, Class A, EN 55022 Class A GR-1089-CORE, Sections 2 and 3
1202862L1 1202863L1 1200872L1	T1/FT1 NIM T1/FT1 + DSX-1 NIM Dual T1 NIM	FCC Part 15, Class A EN 55022 Class A	N/A
1200868E1/L1 1200878E1/L1	E1/FE1 NIM E1/FE1 + G.703 Drop	FCC Part 15, Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A
1200866E1/L1	Serial NIM	FCC Part 15, Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A
1200867L1	SHDSL NIM	FCC Part 15, Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A
1200869E1/L1 1200889E1/L1	ADSL NIM, Annex A ADSL NIM, Annex B	FCC Part 15, Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A
1200864L1 1200865L1 1200875L1 1200886L1	Analog Modem DIM ISDN BRI DIM ISDN S/T DIM Serial DIM	FCC Part 15, Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A
1202368L1	VPN Accelerator Card	FCC Part 15, Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A

 Copyright © 2006 ADTRAN, Inc.

Industry Canada Compliance Information

Notice: The Industry Canada label applied to the product (identified by the Industry Canada logo or the "IC:" in front of the certification/registration number) signifies that the Industry Canada technical specifications were met.

Notice: The Ringer Equivalence Number (REN) for this terminal equipment is supplied in the documentation or on the product labeling/markings. The REN assigned to each terminal device indicates the maximum number of terminals that can be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices should not exceed five (5).

Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioelectriques applicables aux appareils numériques de Class A prescrites dans la norme sur le materiel brouilleur: "Appareils Numériques," NMB-003 edictee par le ministre des Communications.

Copyright © 2006 ADTRAN, Inc.

Warranty

ADTRAN will repair and return this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found in the *Support* section of the ADTRAN website at http://www.adtran.com.

Product Registration

Registering your product helps ensure complete customer satisfaction. Please take time to register your products in the *Support* section of the ADTRAN website at http://www.adtran.com

Product Support Information

A return material authorization (RMA) is required prior to returning equipment to ADTRAN. For service, RMA requests, training, or more information, use the contact information shown below.

Repair and Return

If you determine that a repair is needed, please contact our Customer and Product Service (CaPS) department to have an RMA number issued. CaPS should also be contacted to obtain information regarding equipment currently in house or possible fees associated with repair.

CaPS Department (256) 963-8722

Identify the RMA number clearly on the package (below the address), and return to the following address:

ADTRAN Customer and Product Service
901 Explorer Blvd. (East Tower)
Huntsville, Alabama 35806

RMA # _____

Pre-Sale Inquiries and Applications Support

Your reseller should serve as the first point of contact for support. If additional pre-sales support is needed, the ADTRAN Support website provides a variety of support services such as a searchable knowledge base, the latest product documentation, application briefs, case studies, and a link to submit a question to an Applications Engineer. All of this, and more, is available in the *Support* section of the ADTRAN website at http://www.adtran.com.

When needed, further pre-sales assistance is available by calling our Applications Engineering Department.

Applications Engineering (800) 615-1176

 Copyright © 2006 ADTRAN, Inc.

Post-Sale Support

Your reseller should serve as the first point of contact for support. If additional support is needed, the ADTRAN website provides a variety of support services such as a searchable knowledge base, updated firmware releases, latest product documentation, service request ticket generation and trouble-shooting tools. All of this, and more, is available in the *Support* section of the ADTRAN website at http://www.adtran.com.

When needed, further post-sales assistance is available by calling our Technical Support Center. Please have your unit serial number available when you call.

Technical Support	(888) 4ADTRAN
International Technical Support	1-256-963-8716

Installation and Maintenance Support

The ADTRAN Custom Extended Services (ACES) program offers multiple types and levels of installation and maintenance services which allow you to choose the kind of assistance you need. This support is available at:

http://www.adtran.com/aces

For questions, call the ACES Help Desk.

ACES Help Desk	(888) 874-ACES (2237)

Training

The Enterprise Network (EN) Technical Training Department offers training on our most popular products. These courses include overviews on product features and functions while covering applications of ADTRAN's product lines. ADTRAN provides a variety of training options, including customized training and courses taught at our facilities or at your site. For more information about training, please contact your Territory Manager or the Enterprise Training Coordinator.

Training Phone	(800) 615-1176, ext. 7500
Training Fax	(256) 963-6700
Training Email	training@adtran.com

Copyright © 2006 ADTRAN, Inc.

 Copyright © 2006 ADTRAN, Inc.

Table of Contents

 Copyright © 2006 ADTRAN, Inc.

 Copyright © 2006 ADTRAN, Inc.

List of Figures

 Copyright © 2006 ADTRAN, Inc.

 Copyright © 2006 ADTRAN, Inc.

List of Tables

Copyright © 2006 ADTRAN, Inc.

 Copyright © 2006 ADTRAN, Inc.

1. INTRODUCTION

This hardware installation guide lists the NetVanta 1000 and 1000R Series units' specifications, describes the physical characteristics of the units, introduces basic functionality, and provides installation instructions. All NetVanta 1000 and 1000R Series units run the ADTRAN Operating System (AOS) and are managed through an EIA-232 **CONSOLE** port (DB-9) located on the rear panel. Refer to *Reviewing the Rear Panel Design* on page 24 for more information. For more information on switch configuration for a specific application, refer to the documents provided on the *ADTRAN OS System Documentation* CD. For details on the command line interface, refer to the *Command Reference Guide* (also included on the CD).

In this document, the term "NetVanta" means the NetVanta 1224/ NetVanta 1224 PWR, NetVanta 1224ST/NetVanta 1224ST PWR, NetVanta 1224STR (AC and DC)/NetVanta 1224STR PWR, NetVanta 1224R/NetVanta 1224R PWR, and NetVanta 1524ST. If a statement only applies to one particular unit, the text refers to the unit individually. Additionally, unless otherwise specified, descriptions for a NetVanta 1000 or 1000R Series device will also apply to the Power over Ethernet (PWR) version of that device.

NetVanta 1224 and NetVanta 1224ST

The NetVanta 1224 and the NetVanta 1224ST are managed switches housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. Both the NetVanta 1224 and the NetVanta 1224ST front panels contain 24 10/100BaseT Ethernet ports (RJ-45). In addition, the NetVanta 1224ST front panel contains two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard small form-factor pluggable (SFP) slots for connectivity over fiber. (Use either the RJ-45 connectors *or* the SFP slots. The fiber slots have precedence.)

NetVanta 1224STR (AC) and NetVanta 1224R

The NetVanta 1224STR (AC version) and NetVanta 1224R are managed switches containing a multi-service router, housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. The front panels of the NetVanta 1224STR and NetVanta 1224R contain 24 10/100BaseT Ethernet ports. In addition, the NetVanta 1224STR front panel contains one Gigabit Ethernet interface which providing a fixed RJ-45 connector and one standard small form-factor pluggable (SFP) slot for connectivity over fiber. (Use either the RJ-45 connector *or* the SFP slot. The fiber slot has precedence.) Both units contain a single Network Interface Module (NIM) slot on the rear panel that supports the following modules:

- 1200861L1 56K/64K NIM
- 1202862L1 T1/FT1 NIM
- 1202863L1 T1/FT1 + DSX-1 NIM
- 1200872L1 Dual T1 NIM
- 1200868E1/L1 E1/FE1 NIM
- 1200878E1/L1 E1/FE1 + G.703 Drop NIM
- 1200866E1/L1 Serial Interface Module
- 1200867L1 SHDSL NIM
- 1200869E1/L1 ADSL NIM, Annex A
- 1200889E1/L1 ADSL NIM, Annex B

Copyright © 2006 ADTRAN, Inc.

- 1200864L1 Analog Modem DIM
- 1200865L1 ISDN BRI DIM
- 1200875L1 ISDN S/T DIM
- 1200886L1 Serial DIM

NetVanta 1224STR (DC)

The NetVanta 1224STR (DC version) is a managed switch containing a multi-service router, housed in a 1U-high rack-mountable metal enclosure that includes a DC power supply. The front panel of the NetVanta 1224STR DC contains 24 10/100BaseT Ethernet ports, a single Gigabit Ethernet interface, accessed via a fixed RJ-45 connector or an SFP slot for fiber connectivity. In addition, it contains a single NIM slot on the rear panel that supports the following modules:

- 1200861L1 56K/64K NIM
- 1202862L1 T1/FT1 NIM
- 1200862L2#NEBS T1/FT1 NEBS NIM
- 1202863L1 T1/FT1 + DSX-1 NIM
- 1200872L1 Dual T1 NIM
- 1200868E1/L1 E1/FE1 NIM
- 1200878E1/L1 E1/FE1 + G.703 Drop NIM
- 1200866E1/L1 Serial Interface Module
- 1200867L1 SHDSL NIM
- 1200869E1/L1 ADSL NIM, Annex A
- 1200889E1/L1 ADSL NIM, Annex B
- 1200864L1 Analog Modem DIM
- 1200865L1 ISDN BRI DIM
- 1200875L1 ISDN S/T DIM
- 1200886L1 Serial DIM

NetVanta 1524ST

The NetVanta 1524ST is a Layer 2 managed switch housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. The NetVanta 1524ST has twenty-four 10/100/1000BaseT Ethernet ports. The 10/100/1000BaseT ports are accessed via standard RJ-45 connectors, and four of these twenty-four ports can be used in copper or fiber mode. Four industry-standard SFP slots are available for fiber connectivity. The NetVanta 1524ST supports industry-standard SFP modules. The switch is managed through an EIA-232 **CONSOLE** port (DB-9).

Power Over Ethernet

The NetVanta 1000 and 1000R Series Power over Ethernet (PWR) devices provide the same basic functionality as the NetVanta 1000 Series products. Power over Ethernet provides the ability to detect attached powered devices (PD) and deliver 48 VDC to the PD via existing CAT5 cabling. The PWR devices are fully compliant with the IEEE 802.3af power over Ethernet standard. By default, the PWR switches discover and provide power to IEEE-compliant PDs.

 Copyright © 2006 ADTRAN, Inc.

Unpacking and Inspecting the System

Each NetVanta 1000 and 1000R Series unit is shipped in its own cardboard shipping carton. Open each carton carefully and avoid deep penetration into the carton with sharp objects. After unpacking the unit, inspect it for possible shipping damage. If the equipment has been damaged in transit, immediately file a claim with the carrier and contact ADTRAN Customer Service (refer to *Repair and Return* on page 8).

Contents of ADTRAN NetVanta 1000 and NetVanta 1000R Series Shipments

The NetVanta 1000 and 1000R Series units ship with the following items:

- NetVanta 1000 and 1000R Series unit
- A detachable power cable with a grounded, three-prong plug
- *ADTRAN OS System Documentation* CD
- *Quick Start Guide*
- Warranty Card

Copyright © 2006 ADTRAN, Inc.

2. PRODUCT SPECIFICATIONS

	1224	1224ST	1224STR (AC)	1224STR (DC)	1224STR PWR	1224R	1524ST
Physical Interfaces							
10/100BaseT Ethernet ports on the front panel	24	24	24	24	24	24	0
1000BaseT Gigabit Ethernet interfaces on the front panel (SFP slots for connectivity over fiber / RJ-45 connectors for copper connectivity)	0	2	1	1	2	0	24
Integrated DB-9, EIA-232 console port (DCE) on the rear panel	1	1	1	1	1	1	1
Modular network interface on the rear panel	N/A	N/A	1	1	1	1	N/A
Stacking	✔	✔	✔	✔	✔	✔	✔
Spanning Tree Support (802.1D and 802.1w)	✔	✔	✔	✔	✔	✔	✔
Link Aggregation (802.3ad)	✔	✔	✔	✔	✔	✔	✔
VLAN Support (802.1Q), up to 255 active VLANs	✔	✔	✔	✔	✔	✔	✔
Priority QoS (802.1p)	✔	✔	✔	✔	✔	✔	✔
Management							
Console	✔	✔	✔	✔	✔	✔	✔
Telnet CLI	✔	✔	✔	✔	✔	✔	✔
SSH CLI	✔	✔	✔	✔	✔	✔	✔
SNMP V2	✔	✔	✔	✔	✔	✔	✔
Port mirroring	✔	✔	✔	✔	✔	✔	✔
Power							
AC Power: 100 to 250 VAC, 50/60 Hz	✔	✔	✔		✔	✔	✔
DC Power: 24 to 48 VDC				✔			
Mechanical Specifications							
Housing: 1U-high metal enclosure (1.72-inch H x 17.22-inch W x 7.8-inch D) (The 1224STR PWR is 12.8-inches in diameter.)	✔	✔	✔	✔	✔	✔	✔
10/100BaseT Ethernet: 24 ganged RJ-45 jacks	✔	✔	✔	✔	✔	✔	
10/100/1000BaseT Ethernet: SFP slots/standard RJ-45 jacks	0	2	1	1	1	0	24
Console Port: DB-9, female	✔	✔	✔	✔	✔	✔	✔
Environmental Specifications							
AC Input Power: 100 to 250 VAC	✔	✔	✔		✔	✔	✔
DC Input Power: 24 to 48 VDC at 2.5 A				✔			
Storage Temperature: -20°C to 70°C	✔	✔	✔	✔	✔	✔	✔
Operating Temperature: 0°C to 50°C	✔	✔	✔	✔	✔	✔	✔
Relative Humidity: Up to 95 percent, noncondensing	✔	✔	✔	✔	✔	✔	✔

 Copyright © 2006 ADTRAN, Inc.

3. PHYSICAL DESCRIPTION

Front Panel RJ-45 Ports and LEDs

The NetVanta 1224**,** NetVanta 1224ST, NetVanta 1224STR, NetVanta 1224STR PWR, and NetVanta 1224R front panels contain twenty-four 10/100BaseT Ethernet ports (RJ-45). The NetVanta 1524ST front panel contains twenty-four 10/100/1000BaseT Ethernet ports. These ports are consecutively numbered one through twenty-four, from left to right, with the numbers screened directly above each port. Status LEDs for each of these ports are located directly over these numbers. (See Figures 1 through 8.)

Front Panel Gigabit Ethernet Interfaces and LEDs

In addition to the Ethernet ports, the NetVanta 1224ST and 1224STR PWR front panels contain two Gigabit Ethernet interfaces, and the NetVanta 1224STR contains one Gigabit Ethernet interface. These interfaces are provided as SFP slots and RJ-45 jacks. Use either the SFP slots (refer to *SFP Module Slots* on page 22) or the RJ-45 jacks. These interfaces are labeled **G1** and **G2**, and their status LEDs (also labeled **G1** and **G2**) are located to the left of RJ-45 port 1, above the **STAT** LED on the NetVanta 1224ST and 1224STR. On the NetVanta 1224STR PWR, the **G1** and **G2** status LEDs are located on the right side of the unit above the SFP slots. The NetVanta 1224R PWR, 1224ST PWR, and 1224STR PWR also have red and green Power over Ethernet status LEDs located in the upper right and upper left corners (respectively) of each of the Ethernet and Gigabit Ethernet (where applicable) connectors.

Other Front Panel LEDs

The **STAT** LED, which indicates the unit's status, is located to the lower left of RJ-45 port 1. The NetVanta 1224STR and NetVanta 1224R also contain LEDs labeled **WAN** and **DBU**. The **WAN** LED reflects the status of an installed NIM, and the **DBU** LED reflects the status of an installed DIM. The NetVanta 1524ST has the **STK** LED, which indicates whether the 1524 is a member of a stack. Table 1 on page 23 describes all of these LEDs, and Appendix A shows the pinouts for the connectors.

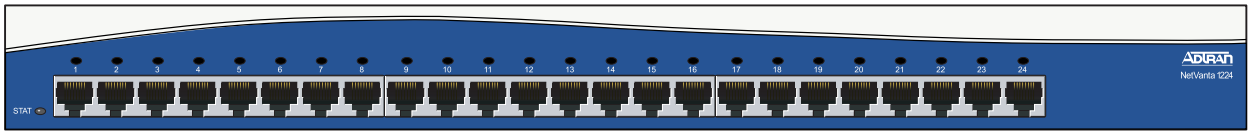

Figure 1. NetVanta 1224 Front Panel Layout

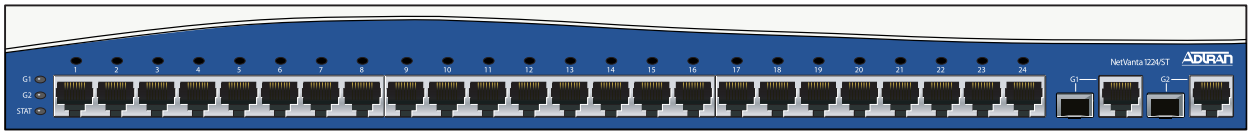

Figure 2. NetVanta 1224ST Front Panel Layout

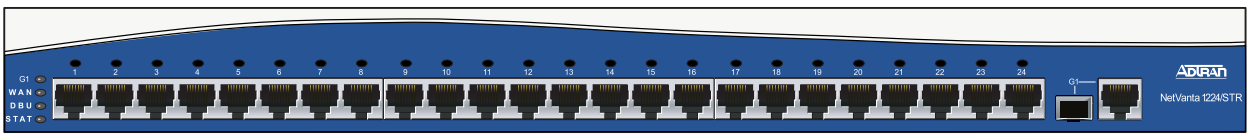

Figure 3. NetVanta 1224STR (AC and DC Versions) Front Panel Layout

 Copyright © 2006 ADTRAN, Inc.

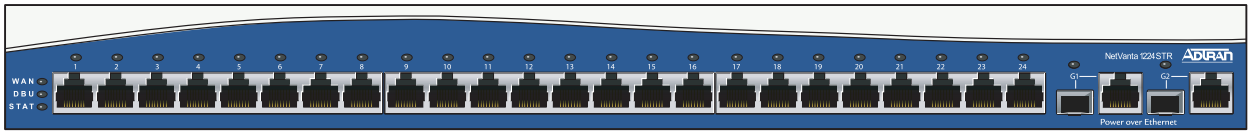

Figure 4. NetVanta 1224STR PWR Front Panel Layout

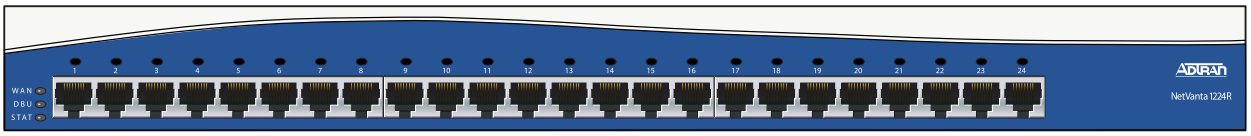

Figure 5. NetVanta 1224R Front Panel Layout

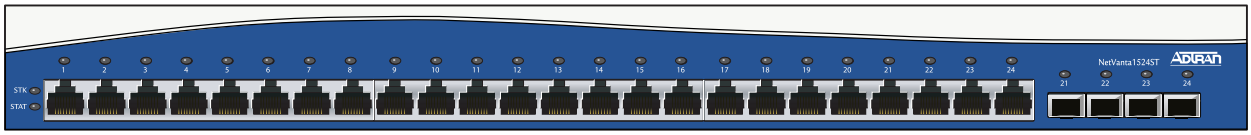

Figure 6. NetVanta 1524ST Front Panel Layout

SFP Module Slots

The NetVanta 1224ST and 1224STR PWR support two SFP slots, the NetVanta 1224STR has one, and the NetVanta 1524ST has four. All accept a number of industry-standard SFP modules. The SFP modules provide Gigabit Ethernet connectivity over fiber for high-speed uplinks or switch stacking. The following modules are available for purchase (both of these modules require fiber optic cable with LC connectors):

- 1200480L1 1000BaseSX Multi-Mode SFP Module
- 1200481L1 1000BaseLX Single-Mode SFP Module

 Copyright © 2006 ADTRAN, Inc.

Table 1. Front Panel LED Descriptions

LED	Color	Indication
STAT	Green (flashing)	On power-up the STAT LED flashes rapidly for five seconds, during which time the user may escape to boot mode from the **CONSOLE** port.
	Green (solid)	Power is on and self-test passed.
	Red (solid)	Power is on, but the self-test failed or the boot code could not be booted.
STK (1524ST only)	Green (solid)	Unit is a member of a stack.
	Off	Unit is not a member of a stack.
Port LEDs (i.e., 1 through 24, G1, G2, etc.)	Off	Port is administratively disabled or does not have a link.
	Green (solid)	Port is enabled and has a link.
	Amber (flashing)	Port has activity (transmit or receive).
DBU (1224R and 1224STR only)	Off	No DIM is installed.
	Green (solid)	DIM is ready. For the ISDN BRI DIM, green solid indicates that the negotiation with the switch is complete.
	Green (flashing)	Unit is in dial backup.
	Red (solid)	Alarm condition is occurring on the DBU interface, or there is a self-test failure.
	Amber (flashing)	Port has activity (transmit or receive).
WAN (1224R and 1224STR only)	Off	No NIM is installed, or interface is administratively down.
	Green (solid)	Link is up and everything is okay.
	Red (solid)	Alarm condition is occurring on the WAN interface, or there is a self-test failure.
	Amber (flashing)	Port has activity (transmit or receive).
Power over Ethernet Status LEDs (PWR units only)	Green (solid)	Power is applied to the interface.
	Red (solid)	Fault is detected on the interface.

Copyright © 2006 ADTRAN, Inc.

Reviewing the Rear Panel Design

Figure 7 shows the NetVanta 1224 and 1224ST rear panel layout. Figure 8 shows the NetVanta 1224STR (AC) and 1224R rear panel layout. Figure 9 shows the rear panel layout of the NetVanta 1224STR (DC). Figure 10 shows the NetVanta 1524ST rear panel. All NetVanta rear panels contain a power connection and a single DB-9 (female) interface (labeled **CONSOLE**) used for connecting to a VT100 terminal or a PC running VT100 terminal emulation software. The NetVanta 1524ST has a rear panel Ethernet port (labeled **ETH 0/0**). The NetVanta 1224STR and NetVanta 1224R contain one modular network interface that accepts a variety of modules (refer to *Option Modules* on page 25). Appendix A shows the pinouts for the connectors.

NOTE *Connection directly to an external modem requires a cross-over cable.*

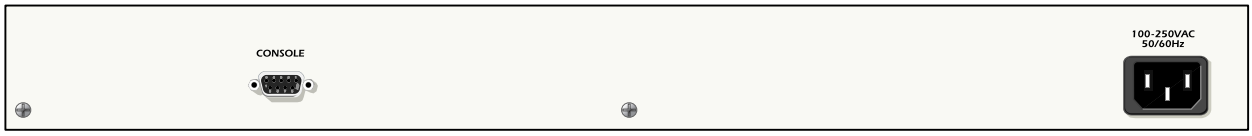

Figure 7. NetVanta 1224 and NetVanta 1224ST Rear Panel Layout

Figure 8. NetVanta 1224STR (AC) and NetVanta 1224R Rear Panel Layout

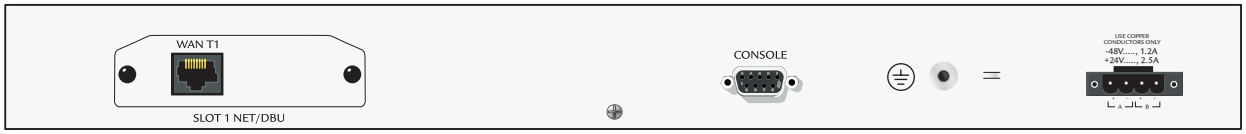

Figure 9. NetVanta 1224STR (DC) Rear Panel Layout

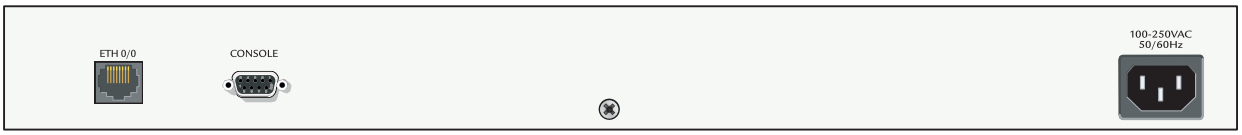

Figure 10. NetVanta 1524ST Rear Panel Layout

 Copyright © 2006 ADTRAN, Inc.

4. OPTION MODULES

The NetVanta 1224STR and NetVanta 1224R support several option modules designed to meet a variety of networking requirements. The option modules include plug-in network and voice interface modules (NIMs/VIMs) and plug-on dial backup interface modules (DIMs).

NIMs/VIMs are cards which plug directly into the option module slot located on the rear of the base unit. These cards provide the following types of interfaces:

- *NetVanta 56K/64K NIM (P/N 1200861L1)* on page 26
- *NetVanta T1/FT1 NIM (P/N 1202862L1)* on page 27
- *NetVanta T1/FT1 NEBS NIM (P/N 1200862L2#NEBS)* on page 28
- *NetVanta T1/FT1 + DSX-1 NIM (P/N 1202863L1)* on page 29
- *NetVanta Dual T1 NIM (P/N 1200872L1)* on page 30
- *NetVanta E1/FE1 NIM (P/N 1200868E1/L1)* on page 31
- *NetVanta E1/FE1 + G.703 Drop NIM (P/N 1200878E1/L1)* on page 32
- *NetVanta Serial NIM (P/N 1200866E1/L1)* on page 33
- *NetVanta SHDSL NIM (P/N 1200867L1)* on page 34
- *NetVanta ADSL NIM, Annex A (P/N 1200869E1/L1)* on page 35
- *NetVanta ADSL NIM, Annex B (P/N 1200889E1/L1)* on page 36

DIMs are plug-*on* cards which plug directly on to the NIM prior to installation into the base unit. A DIM must be plugged on to a NIM/VIM in order for the ports on the NIM/VIM to be active. The NetVanta supports the following DIMs:

- *NetVanta Analog Modem DIM (P/N 1200864L1)* on page 37
- *NetVanta ISDN BRI DIM (P/N 1200865L1)* on page 38
- *NetVanta ISDN S/T DIM (P/N 1200875L1)* on page 39
- *NetVanta Serial DIM (P/N 1200886L1)* on page 40

This section describes each module, providing individual card specifications and features. Refer to *Connector Pin Definitions* on page 51 for pinout information. *Installing Dial Backup and Network Interface Modules* on page 46 provides information on card installation.

 Copyright © 2006 ADTRAN, Inc.

Network Interface Modules

NetVanta 56K/64K NIM (P/N 1200861L1)

The 56K/64K NIM (shown in Figure 11) provides a DDS WAN interface for the NetVanta. This module provides a single 56K or 64K DDS network interface. Refer to Table A-5 on page 53 for the WAN-DDS connector pinouts, and Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

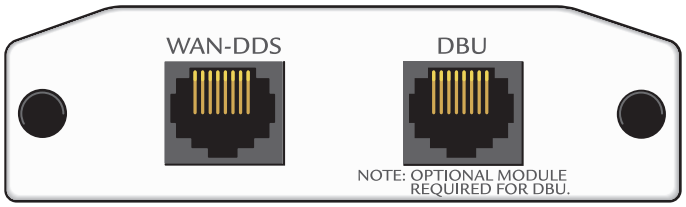

Figure 11. NetVanta 56K/64K NIM

Features and Specifications

Operating Modes
- Dedicated DDS (leased line)

DDS Interface
- Supported Standards: AT&T TR 62310
- 4-wire, full-duplex
- Receiver Sensitivity: -45 dB, all rates
- Data Rates: 56K, 64K, and auto
- Connector: RJ-48S

Clock Source
- Network
- Internal

Diagnostics
- CSU and DSU Loopbacks

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta T1/FT1 NIM (P/N 1202862L1)

The T1/FT1 NIM (shown in Figure 12) provides a T1 WAN interface for the NetVanta. This module provides a full T1 or fractional T1 network interface. Refer to Table A-6 on page 53 for the WAN-T1 connector pinouts and Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

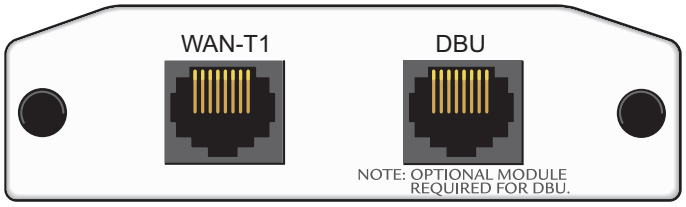

Figure 12. NetVanta T1/FT1 NIM

Features and Specifications

Operating Modes
- Frame Relay, Multilink Frame Relay
- PPP, Multilink PPP
- HDLC

T1/FT1 Interface
- Supported Standards: AT&T TR 62411, AT&T TR 65016, ANSI T1.403, Bellcore TR 194
- Line Rate: 1.544 Mbps ±75 bps
- Line Code: AMI or B8ZS
- Framing: D4 (SF) or ESF
- FT1 Line Rate: DS0 channelized (multiples of 64 kbps)
- Input Signal: 0 to -36 dB (DS1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB (long), 0 to 655 ft (short)
- DS0 Assignment: Programmable
- Connector: RJ-48C

Clock Source
- Network
- Internal

Diagnostics
- Test Pattern Generation and Detection: 511, QRSS, all ones, all zeros
- Network loopbacks (local and remote); responds to both inband and FDL loop codes
- Alarm generation and detection
- Network and user sets of performance data (15 minutes and 24 hours)

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

Copyright © 2006 ADTRAN, Inc.

NetVanta T1/FT1 NEBS NIM (P/N 1200862L2#NEBS)

The T1/FT1 NEBS NIM (see Figure 13) T1 WAN interface for the NetVanta 1224STR DC. The T1 NEBS NIM is NEBS Level 3 compliant, and provides a full T1 or fractional T1 network interface. See Table A-6 on page 53 for the WAN-T1 connector pinouts.

> *Although the T1/FT1 NEBS NIM is compliant with NEBS Level 3, the NetVanta 1224STR DC unit supports only NEBS Level 1.*

Figure 13. NetVanta T1/FT1 NEBS NIM

Features and Specifications

Operating Modes
- Frame Relay, Multilink Frame Relay
- PPP, Multilink PPP
- HDLC

T1/FT1 Interface
- Supported Standards: AT&T TR 62411, AT&T TR 65016, ANSI T1.403, Bellcore TR 194
- Line Rate: 1.544 Mbps ± 75 bps
- Line Code: AMI or B8ZS
- Framing: D4 (SF) or ESF
- FT1 Line Rate: DS0 channelized (multiples of 64 kbps)
- Input Signal: 0 to -36 dB (DS1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB (long), 0 to 655 ft (short)
- DS0 Assignment: Programmable
- Connector: RJ-48C

Clock Source
- Network
- Internal

Diagnostics
- Test Pattern Generation and Detection: QRSS, 511, 2^{15} - 1, 2^{20} - 1, all ones, all zeros
- Network loopbacks (local and remote); responds to inband and FDL loop codes
- Alarm generation and detection
- Network and user sets of performance data (15 minutes and 24 hours)

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- NEBS Level 3
- GR-63-CORE
- GR-1089-CORE
- UL/CUL 60950

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta T1/FT1 + DSX-1 NIM (P/N 1202863L1)

The T1/FT1 + DSX-1 NIM (see Figure 14) provides a T1 WAN interface for the NetVanta, a full or fractional T1 network interface, and a DSX-1 interface. See the pinouts in Table A-6 on page 53 for the WAN-T1 connector, Table A-8 on page 54 for the DSX-1 connector, and Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

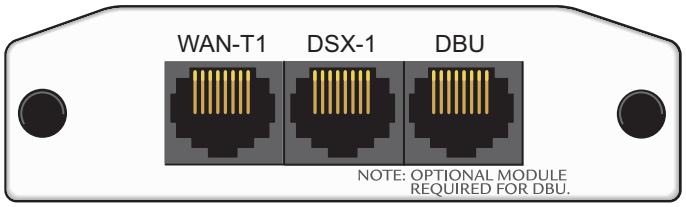

Figure 14. NetVanta T1/FT1 + DSX-1 NIM

Features and Specifications

Operating Modes
- Frame Relay, Multilink Frame Relay
- PPP, Multilink PPP
- HDLC

T1/FT1 Interface
- Supported Standards: AT&T TR 62411, AT&T TR 65016, ANSI T1.403, Bellcore TR 194
- Line Rate: 1.544 Mbps ±75 bps
- Line Code: AMI or B8ZS
- Framing: D4 (SF) or ESF
- FT1 Line Rate: DS0 channelized (multiples of 56/64 kbps)
- Input Signal: 0 to -36 dB (DS1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB (long), 0 to 655 ft (short)
- DS0 Assignment: Programmable
- Connector: RJ-48C

DSX-1 Interface
- Line Interface: DSX-1 per ANSI T1.102
- DSX Receiver Input Range: -10 dBdsx to +6 dBdsx
- Line Rate: 1.544 Mbps
- Capacity: 1 to 24 DS0s
- Line Codes: AMI, B8ZS
- DSX-1 Interface to PBX
- Framing: D4 (SF) or ESF
- Line Length: 0 to 655 feet and -7.5 dB
- Connector: RJ-48C

Clock Source
- Network
- Internal
- Through

Diagnostics
- Test Pattern Generation and Detection: 511, QRSS, all ones, all zeros
- Network loopbacks (local and remote); responds to inband and FDL loop codes (T1 interface only)
- Alarm generation and detection
- Network and user sets of performance data (15 minutes and 24 hours)

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta Dual T1 NIM (P/N 1200872L1)

The NetVanta Dual T1 NIM (see Figure 15) provides two WAN T1 interfaces for the NetVanta. Refer to Table A-6 on page 53 for the pinouts. Refer to Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

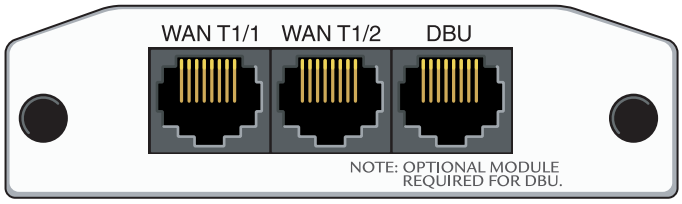

Figure 15. NetVanta Dual T1 NIM

Features and Specifications

Operating Modes
- Frame Relay, Multilink Frame Relay
- PPP, Multilink PPP
- HDLC

T1 Interface
- Supported Standards: AT&T TR 62411, AT&T TR 65016, ANSI T1.403, Bellcore TR 194
- Line Rate: 1.544 Mbps $\pm$75 bps
- Line Code: AMI or B8ZS
- Framing: D4 (SF) or ESF
- FT1 Line Rate: DS0 channelized (multiples of 64 kbps)
- Input Signal: 0 to -36 dB (DS1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB (long), 0 to 655 ft (short)
- DS0 Assignment: Programmable
- Connector: RJ-48C

Clock Source
- Network
- Internal
- Through

Diagnostics
- Test Pattern Generation and Detection: QRSS, 511, 2^{15} - 1, 2^{20} - 1, all ones, all zeros
- Network loopbacks (local and remote); responds to both inband and FDL loop codes
- Alarm generation detection
- Network performance data (15 minutes and 24 hours)

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950

Environmental
- Operating temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta E1/FE1 NIM (P/N 1200868E1/L1)

The NetVanta E1/FE1 module (see Figure 16) provides a WAN-E1 interface for the NetVanta meeting the requirements of ITU-T G.703/G.704. The module provides a single 2.048 Mbps network interface. Refer to Table A-7 on page 53 for the pinouts. Refer to Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

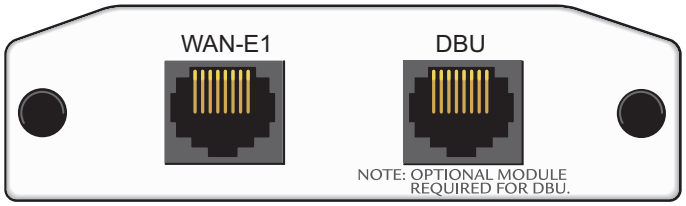

Figure 16. NetVanta E1/FE1 NIM

Features and Specifications

Operating Modes
- Frame Relay, Multilink Frame Relay
- PPP, Multilink PPP
- HDLC

WAN-E1 Interface
- Supported Standards: ITU G.703, ITU-T G.704 (CRC-4), ITU-T G.823, ITU-T G.797
- Line Rate: 2.048 Mbps ±50 PPM
- Line Code: AMI or HDB3
- Framing: FAS with optional CRC-4
- FE1 Line Rate: Channelized timeslot (in multiples of 64 kbps)
- Receiver Sensitivity: -30 dB
- Connector: RJ-48C

Clock Source
- Network
- Internal

Diagnostics
- Test Pattern Generation and Detection: QRSS, 511, all ones, all zeros
- Network loopbacks
- Network performance data (15 minutes and 24 hours)
- Alarm generation and detection

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- AS/ACIF S016
- ETSI TBR 12/TBR 13
- EN 60950
- IEC 60950
- AS/NZS 60950
- RoHS Compliant (Telecommunications exemption)

Environmental
- Operating temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta E1/FE1 + G.703 Drop NIM (P/N 1200878E1/L1)

The NetVanta E1/FE1 + G.703 Drop NIM (see Figure 17) provides a single WAN-E1 interface (2.043 Mbps) with user-selectable TS0 assignment and a G.703 drop port which may be used to drop and insert traffic to an E1 PBX. See Table A-7 on page 53 for the WAN-E1 pinouts. See Table A-9 on page 54 for the G.703 pinouts. See Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

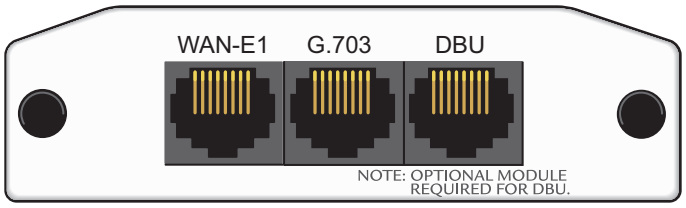

Figure 17. NetVanta E1/FE1 + G.703 Drop NIM

Features and Specifications

Operating Modes
- Frame Relay, Multilink Frame Relay
- PPP, Multilink PPP
- HDLC

WAN-E1 Interface
- Supported Standards: ITU G.703, ITU-T G.704 (CRC-4), ITU-T G.823, ITU-T G.797
- Line Rate: 2.048 Mbps ±50 PPM
- Line Code: AMI or HDB3
- Framing: FAS with optional CRC-4
- FE1 Line Rate: Channelized timeslot (in multiples of 64 kbps)
- Receiver Sensitivity: -30 dB
- Connector: RJ-48C

G.703 Interface
- Receiver Sensitivity: -30 dB
- Line Rate: 2.048 Mbps ±50 PPM
- Line Code: AMI or HDB3
- Framing: FAS with optional CRC-4
- Capacity: 1 to 31 timeslots
- Connector: RJ-48C

Clock Source
- Network
- Internal
- Through

Diagnostics
- Test Pattern Generation and Detection: QRSS, 511, all ones, all zeros
- Network loopbacks
- Network performance data (15 minutes and 24 hours)
- Alarm generation and detection

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- AS/ACIF S016
- ETSI TBR 12/TBR 13
- EN 60950
- IEC 60950
- AS/NZS 60950
- RoHS Compliant (Telecommunications exemption)

Environmental
- Operating temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta Serial NIM (P/N 1200866E1/L1)

The NetVanta Serial NIM (shown in Figure 18) can be configured by the user as a V.35, X.21 (V.11), or EIA 530 interface. This module supports rates up to a maximum of 10 Mbps. An additional V.35 (ADTRAN P/N 1200873L1), X.21 (ADTRAN P/N 1200874L1), or EIA 530 (ADTRAN P/N 1200883L1) cable is required (refer to *Caution*, below). See Table A-12 on page 55 for the serial connector pinouts, and Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

CAUTION

Cable length for the Serial NIM should not exceed 25 feet.

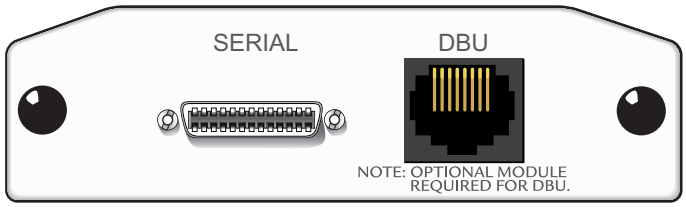

Figure 18. NetVanta Serial NIM

Features and Specifications

Operating Mode
- DTE only

Serial Interface
- Supported Standards: ISO 4903 (X.21), CCITT V.35 Synchronous (V.35), EIA 530 Synchronous
- Provides V.35, X.21 (V.11), or EIA 530 electrical interface
- Connector: 26-pin smart serial (DTE)

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ETSI TBR1
- ETSI TBR2
- EN 60950
- IEC 60950
- UL/CUL 60950
- AS/NZS 60950
- RoHS Compliant (Telecommunications exemption)

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

Copyright © 2006 ADTRAN, Inc.

NetVanta SHDSL NIM (P/N 1200867L1)

The NetVanta SHDSL NIM (shown in Figure 19) provides a WAN SHDSL interface for the NetVanta. See Table A-10 on page 54 for the SHDSL connector pinouts. See Table A-13 on page 56 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

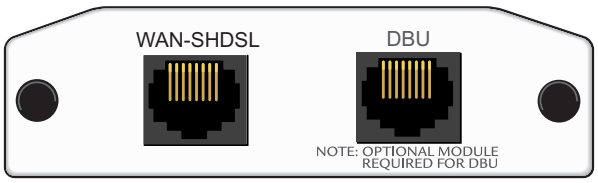

Figure 19. NetVanta SHDSL NIM

Features and Specifications

Operating Mode
- Line termination (CO)
- Network termination (CPE)

SHDSL Interface
- Supported Standards: ITU-T G.991.2 SHDSL
- Line Rate: 200 to 2312 kbps in 64k increments
- Line Code: TC-PAM
- Connector: RJ-45

Clock Source
- CPE Operating Mode: Network
- CO Operating Mode: Internal

Diagnostics
- Test Pattern Generation and Detection: $2^{15} - 1$
- Network loopbacks (local and remote)
- Alarm generation and detection
- Programmable alarm threshold setting for loop attenuation and signal-to-noise ratio

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- AS/ACIF S043
- EN 60950
- AS/NZS 60950

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta ADSL NIM, Annex A (P/N 1200869E1/L1)

The NetVanta ADSL NIM, Annex A (see Figure 20) adds ADSL capability to the NetVanta. The module provides a single ADSL, ADSL2, or ADSL2+ network interface to support rates up to 25 Mbps. See Table A-11 on page 54 for the pinouts. The ADSL NIM supports an optional DIM for dial backup applications. See Table A-13 on page 56 for the DBU connector pinouts.

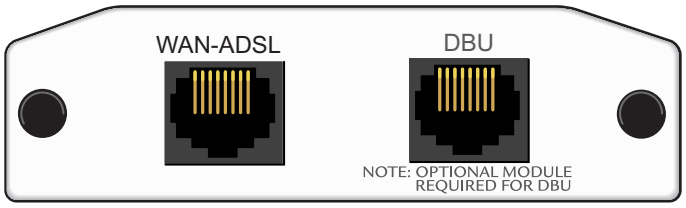

Figure 20. NetVanta ADSL NIM, Annex A

Features and Specifications

ADSL Interface
- ADSL over POTS, Annex A
- Supported Standards:
  - ITU G.992.1 (G.dmt)
  - ITU G.992.2 (G.lite)
  - ITU G.992.3 ADSL2 (G.dmt.bis)
  - ITU G.992.5 ADSL2+
  - ANSI T1.413 Issue 2
  - Reach Extended ADSL (READSL2)
- Connector: RJ-11C (6-pin jack, inner pair)

ATM
- Multiple Protocol over AAL5 (RFC2684)
- PPP over ATM (RFC2364)
- PPP over Ethernet (RFC2516)
- ATM Forum UNI 3.1/4.0 PVC
- ATM Class of Service (UBR)
- ATM F5 OAM
- Up to 16 Virtual Circuits

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6
- ACTA/FCC Part 68
- AS/ACIF S043
- AS/ACIF S002
- IC CS-03
- EN 60950
- IEC 60950
- UL/CUL 60950
- AS/NZS 60950
- RoHS Compliant (Telecommunications exemption)

Environmental
- Operating temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta ADSL NIM, Annex B (P/N 1200889E1/L1)

The NetVanta ADSL NIM, Annex B (see Figure 21) adds ADSL capability to the NetVanta. See Table A-11 on page 54 for the pinouts. The ADSL NIM supports an optional DIM for dial backup applications. See Table A-13 on page 56 for the DBU connector pinouts.

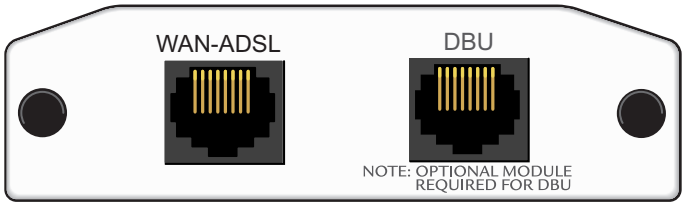

Figure 21. NetVanta ADSL NIM, Annex B

Features and Specifications

ADSL Interface
- ADSL over ISDN, Annex B
- Supported Standards: ITU G.992.1 (G.dmt)
- Connector: RJ-11C (6-pin jack, inner pair)

ATM
- Multiple Protocol over AAL5 (RFC2684)
- PPP over ATM (RFC2364)
- PPP over Ethernet (RFC2516)
- ATM Forum UNI 3.1/4.0 PVC
- ATM Class of Service (UBR)
- ATM F5 OAM
- Up to 16 virtual circuits

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6
- AS/ACIF S043
- EN 60950
- IEC 60950
- AS/NZS 60950
- RoHS Compliant (Telecommunications exemption)

Environmental
- Operating temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.75-inch W x 4.25-inch D

 Copyright © 2006 ADTRAN, Inc.

Dial Backup Interface Modules

NetVanta Analog Modem DIM (P/N 1200864L1)

The Analog Modem DIM provides a modem with data rates up to 33.6 kbps for the NetVanta. This DIM is a plug-on card that connects to the NIM. For installation instructions, refer to *Installing Dial Backup and Network Interface Modules* on page 46.

Features and Specifications

Features
- Supported Standards: ITU V.90
- Async

Compliance
- EMC - see on page 6.
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950

Environmental
- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical
- Dimensions: 2.5-inch W x 3.75-inch D

The Analog Modem DIM can be used in two different modes:
1. Backup interface for a primary connection.
2. CONSOLE port for remote dial-in access.

 Copyright © 2006 ADTRAN, Inc.

NetVanta ISDN BRI DIM (P/N 1200865L1)

The NetVanta ISDN BRI DIM provides dial backup access to the public switched telephone network (PSTN) via Basic Rate ISDN for the NetVanta. This DIM is a plug-on module that connects to the NIM. For installation instructions, refer to *Installing Dial Backup and Network Interface Modules* on page 46.

Features and Specifications

Features

- Clear Channel and bonding mode 1 call protocols
- Network support for 64 kbps (1 B-channel) or 128 kbps (2 B-channels)
- D-channel switch compatibility with AT&T 5ESS, Northern Telecom DMS-100, and National ISDN-1
- V.54 network loopback support

Compliance

- EMC - see on page 6.
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950

Environmental

- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical

- Dimensions: 2.5-inch W x 3.75-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta ISDN S/T DIM (P/N 1200875L1)

The NetVanta ISDN S/T DIM provides dial backup access to the public switched telephone network (PSTN) via Basic Rate ISDN for the NetVanta. This DIM is a plug-on module that connects to the NIM. For installation instructions, see *Installing Dial Backup and Network Interface Modules* on page 46.

Features and Specifications

Features

- Clear channel and bonding mode 1 call protocols
- Network support for 64 kbps (1 B-channel) or 128 kbps (2 B-channels)
- D-channel switch compatibility with AT&T 5ESS, Northern Telecom DMS-100, National ISDN-1, and Euro-ISDN
- V.54 network loopback support

Compliance

- EMC - see on page 6.
- AS/ACIF S031
- ETSI TBR 3
- EN 60950
- IEC 60950
- AS/NZS 60950

Environmental

- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical

- Dimensions: 2.5-inch W x 3.75-inch D

 Copyright © 2006 ADTRAN, Inc.

NetVanta Serial DIM (P/N 1200886L1)

The NetVanta Serial DIM provides NetVanta products with the ability to interface with external devices (e.g., Code Division Multiple Access (CDMA) devices and wireless modems), allowing for dial backup access to the public switched telephone network (PSTN). This DIM is a plug-on module that connects to the NIM. For installation instructions, see *Installing Dial Backup and Network Interface Modules* on page 46.

> *An RJ-45 to DB-9 adapter cable (P/N 1200887L1) is required to connect to the external modem.*

Features and Specifications

Features

- 5-pin RS-232 interface vial host RJ-45 DBU connector
- Modem flow control support via CTS
- Communications with external model via AT commands

Compliance

- EMC - see on page 6.
- IEC 60950
- EN 60950
- UL/CL 60950
- AS/NZS 60950

Environmental

- Operating Temperature: 0°C to 50°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical

- Dimensions: 2.3-inch W x 2.75-inch D

 Copyright © 2006 ADTRAN, Inc.

5. UNIT INSTALLATION

The instructions and guidelines provided in this section cover hardware installation topics such as mounting options, supplying power to the unit, and installing option cards. These instructions are presented as follows:

- *Mounting Options* on page 42
- *Supplying Power to the Unit* on page 44
- *Installing Dial Backup and Network Interface Modules* on page 46
- *Installing the NetVanta VPN Accelerator Card (P/N 1202368L1)* on page 48

For information on configuring a specific application, refer to the quick configuration documents provided on your *ADTRAN OS System Documentation* CD or the *Command Line Reference Guide* (also included on your CD).

WARNING *To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*

CAUTION *Electronic modules can be damaged by static electrical discharge. Before handling modules, put on an antistatic discharge wrist strap to prevent damage to electrical components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

Tools Required

The customer-provided tools required for the hardware installation of the NetVanta are:

- Ethernet cables
- Network cables (module dependent)
- DSX-1 cable (T1/FT1 + DSX-1 module only)
- DBU cable (dial backup functions require an optional DIM)
- Phillips-head screwdriver (rack-mounted applications only)

NOTE *To access the command line interface (CLI) of the NetVanta, you will also need a VT100 terminal or PC with terminal emulation software and a console port cable. Instructions on how to access the CLI are given in the* ***Command Reference Guide*** *(provided on the* ***ADTRAN OS System Documentation*** *CD).*

 Copyright © 2006 ADTRAN, Inc.

Mounting Options

The unit may be installed in rackmount, wallmount, or tabletop configurations. The following sections provide step-by-step instructions for rack mounting and wall mounting.

If you have purchased the VPN Accelerator Card, install it first (refer to Installing the NetVanta VPN Accelerator Card (P/N 1202368L1) on page 48).

Rack Mounting the NetVanta

The NetVanta is a 1U-high, rack-mountable unit which can be installed into a 19-inch equipment rack. The following steps guide you in mounting the NetVanta into a rack.

Instructions for Rack Mounting the NetVanta	
Step	**Action**
1	To allow proper grounding, scrape the paint from the rack around the mounting holes where the NetVanta will be positioned.
2	Position the NetVanta in a stationary equipment rack. This unit occupies 1U of space.
3	Have an assistant hold the unit in position as you install two mounting bolts through the unit's brackets and into the equipment rack using a #2 phillips-head screwdriver.
4	Apply power to the unit (refer to *Supplying Power to the Unit* on page 44).

Be careful not to compromise the stability of the equipment mounting rack when installing this product.

 Copyright © 2006 ADTRAN, Inc.

Wall Mounting the NetVanta

By following these instructions exactly, the NetVanta can be safely mounted to the wall.

Instructions for Wall Mounting the NetVanta	
Step	**Action**
1	Remove the mounting ears. Rotate them 90 degrees so that the portion of the bracket with the mounting holes is flush with the bottom of the chassis. Reattach the mounting ears to the chassis (see Figure 22 on page 44).
2	Decide on a location for the NetVanta. Keep in mind that the unit needs to be mounted at or below eye-level so that the LEDs are viewable.
3	Prepare the mounting surface by attaching a board (typically plywood, 3/ 4-inch to 1-inch thick) to a wall stud. ***Important!*** *Mounting to a stud ensures stability. Using sheetrock anchors may not provide sufficient long-term stability.*
4	Have an assistant hold the unit in position as you install two #6 to #10 (1 1/ 2 inches or greater in length) wood screws through the unit's brackets and into the mounted board (see Figure 22 on page 44).
5	Proceed to the steps given in *Supplying Power to the Unit* on page 44.

To avoid damaging the unit, use only the screws included in the shipment when attaching mounting ears to the chassis.

 Copyright © 2006 ADTRAN, Inc.

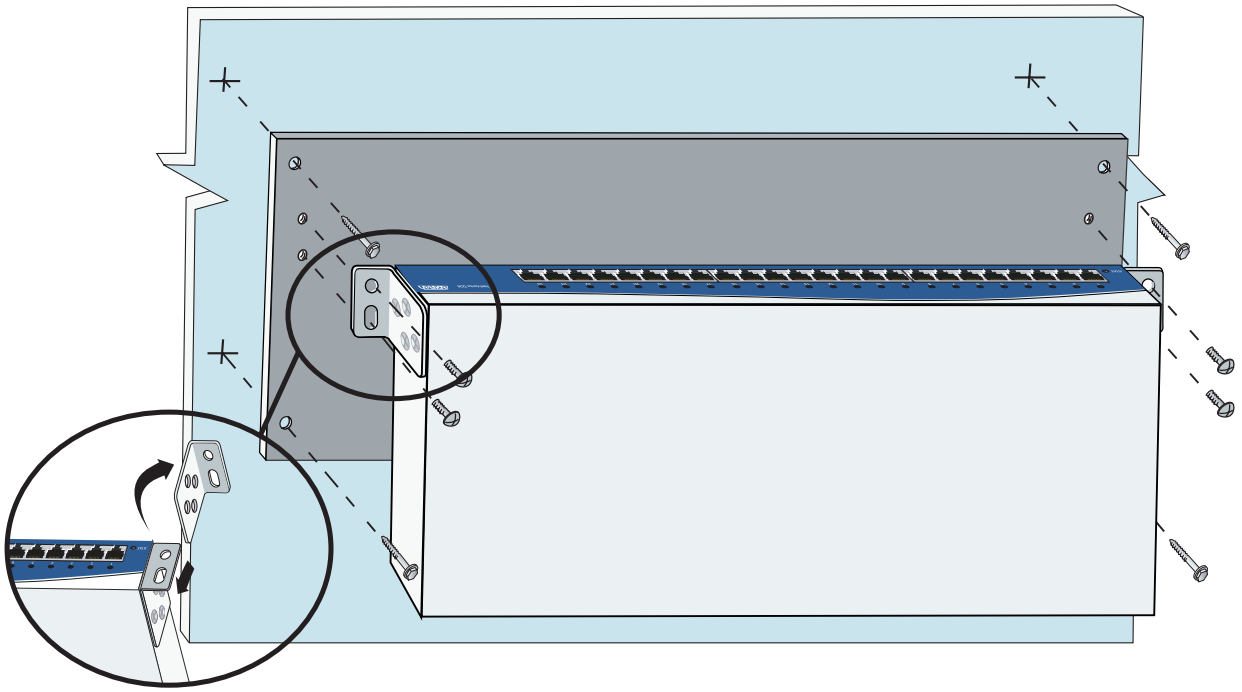

Figure 22. Wallmount Installation

Supplying Power to the Unit

NetVanta 1000 and 1000R Series AC-Powered Units

The AC-powered NetVanta 1000 and 1000R Series units come equipped with an auto-sensing 100 to 250 VAC, 50/60 Hz power supply for connecting to a properly grounded power receptacle. (A detachable power cable with a grounded, three-prong plug comes with the shipment.) To power these units, connect the power cable to an appropriate AC power source.

 Copyright © 2006 ADTRAN, Inc.

NetVanta 1224STR (DC)

The DC-powered NetVanta 1224STR connects to a centralized DC power source via the four-position power connector on the rear of the chassis (see Figure 9 on page 24). Power and ground connections require copper conductors and a ring lug.

Instructions for Connecting DC Power Source to the NetVanta 1224STR	
Step	**Action**
1	With the power disconnected, connect the primary power source to input A of the power connector.
2	Connect a ground wire (fitted with a loop terminal end) to the grounding point using the screw provided. Connect the other end of the ground wire to a protective earth ground. See Figure 23 below.
3	If using a backup power source, connect it to input B of the power connector.

CAUTION

- *Power to the NetVanta 1224STR DC System must be from a reliably grounded 24 or 48 VDC.*
- *Use only copper conductors when making power connections.*
- *Install unit in accordance with the requirements of NEC NFPA 70.*
- *The branch circuit overcurrent protection shall be a fuse or circuit breaker rated minimum 48 VDC, maximum 10 A.*
- *A readily accessible disconnect device, that is suitably approved and rated, shall be incorporated in the field wiring.*
- *Maximum recommended ambient operating temperature is 50°C.*

CAUTION

*The 10/100BaseT and Gigabit-Ethernet interfaces **MUST NOT** be metallically connected to interfaces which connect to the Outside Plant or its wiring. These interfaces are designed for use as intra-building interfaces only. The addition of primary protectors is not sufficient protection in order to connect this interface metallically to OSP wiring.*

CAUTION

*To comply with GR-1089-CORE, Issue 3, this equipment **MUST** only be installed in a DC-C (common) bonding and grounding environment. It may not be utilized in a DC-I (isolated) bonding and grounding environment.*

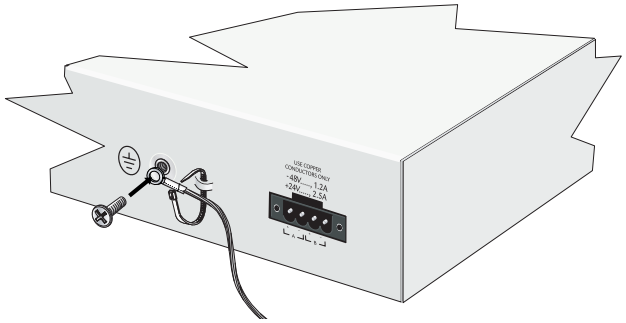

Figure 23. Grounding the NetVanta 1224STR (DC)

Copyright © 2006 ADTRAN, Inc.

Installing Dial Backup and Network Interface Modules

The DIM plugs on to the NIM. The NIM is then installed into the rear panel option module slot. The following tables list the installation steps. Also see Figure 24 on page 46 and Figure 25 on page 47.

WARNING *For NetVanta modules with outside plant connections, ensure that all cables are removed from the module before installing or removing it from the NetVanta chassis.*

CAUTION *Always remove power from the unit prior to removing or installing a module.*

CAUTION *Improper installation may result in damage to the modules.*

Instructions for Installing the DIMs	
Step	**Action**
1	Remove power from the unit.
2	If the NIM is already in the NetVanta chassis, remove all cables, release the pins at both edges of the NIM front panel and slide the module out of the chassis.
3	Carefully align the P1 connector on the NIM with the J1 connector on the DIM. *Using only fingertip pressure* so that neither circuit board bends or flexes, ensure that the connectors are firmly seated. Secure the DIM to the NIM using the screws and standoff posts supplied. See Figure 24.
4	Slide the NIM with the DIM attached into the NetVanta chassis, continuing with the normal NIM installation (refer to *Instructions for Installing the NIMs* on page 47).

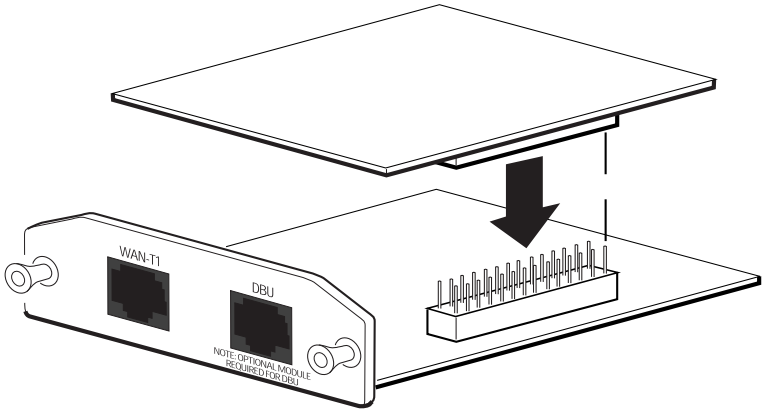

Figure 24. Installing DIMs

 Copyright © 2006 ADTRAN, Inc.

Instructions for Installing the NIMs	
Step	**Action**
1	Remove power from the unit.
2	Slide the option module into the option slot until the module is firmly seated against the chassis.
3	Secure the pins at both edges of the module.
4	Connect the cables to the associated device(s).
5	Restore power to the unit.

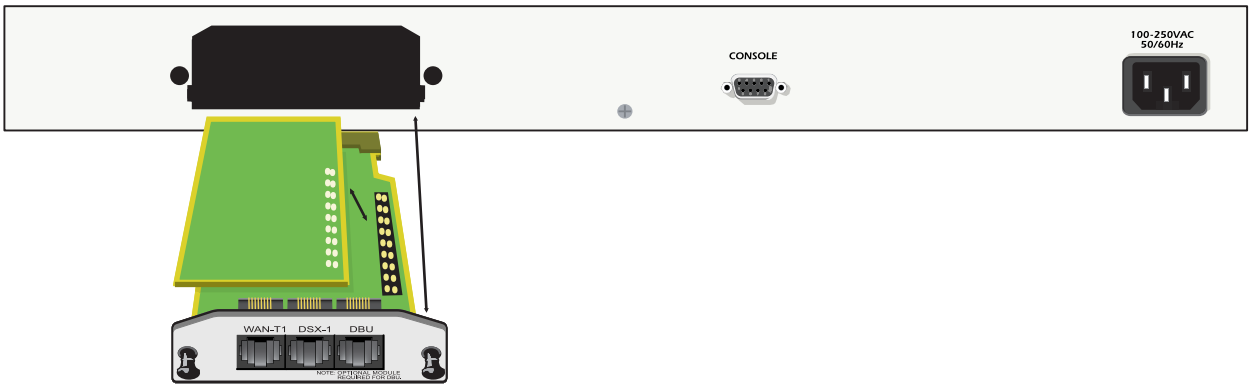

Figure 25. NIM and DIM Installation

Copyright © 2006 ADTRAN, Inc.

Installing the NetVanta VPN Accelerator Card (P/N 1202368L1)

The optional VPN Accelerator card plugs into a 32-bit PCI slot and is designed to be used in the NetVanta 1224STR to provide encryption/decryption and security acceleration services. The card provides the following security services to the host processor: DES, triple-DES (3DES), AES, SHA-1, MD5, and random number generation. Performance metrics include 528 Mbps (DES), 176 Mbps (3DES), and 422 Mbps (AES). The power consumption of the card does not exceed 2 watts.

CAUTION

The NetVanta VPN accelerator card is intended to be serviced/installed by qualified service personnel only.

Instructions for Installing the NetVanta VPN Accelerator Card	
Step	**Action**
1	Remove power from the unit.
2	Remove the nine screws and, if necessary, two mounting brackets (see Figure 26).
3	Using a 3/16-inch hex driver, remove the two jack screws located on either side of the DB-9 port.
4	Carefully lift and remove the unit's cover to expose the circuit board.
5	Gently slide the accelerator card into the PC card slot as shown. The card is keyed to fit into the slot only one way. To avoid damaging the card pins, do not use excessive force.
6	Replace the unit cover, screws, and mounting brackets.
7	Restore power to the unit.

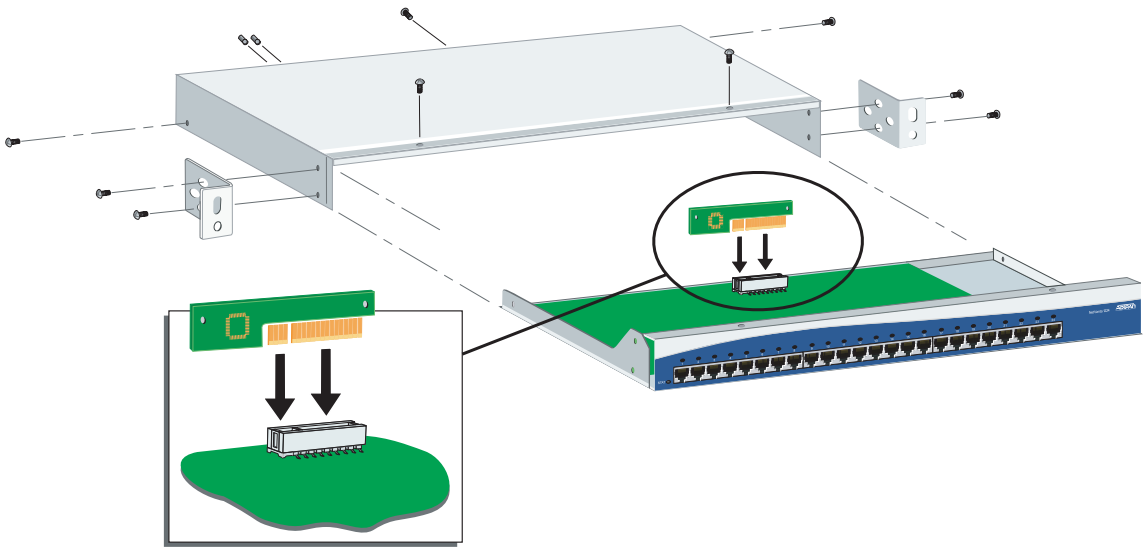

Figure 26. NetVanta VPN Card Installation

Copyright © 2006 ADTRAN, Inc.

Your NetVanta is now ready to be configured and connected to the network. For more information on configuration for a specific application, refer to the quick configuration documents provided on your *ADTRAN OS System Documentation* CD. For details on the command line interface, refer to the *Command Reference Guide* (also included on your CD).

Copyright © 2006 ADTRAN, Inc.

 Copyright © 2006 ADTRAN, Inc.

APPENDIX A. CONNECTOR PIN DEFINITIONS

The following tables provide the pin assignments for the base unit, network interface modules (NIMs), and dial backup interface modules (DIMs).

Base Unit Pinouts

Table A-1. CONSOLE Port Pinouts

Pin	Name	Description
1	DCD	Data Carrier Detect (output)
2	RD	Receive Data (output)
3	TD	Transmit Data (input)
4	DTR	Data Terminal Ready (input)
5	SG	Signal Ground
6	DSR	Data Set Ready **Tied to pin 1** (output)
7	—	Unused
8	CTS	Clear to Send **Tied to pin 1** (output)
9	—	Unused

Table A-2. SFP Slot Pinouts

Pin	Name	Pin	Name
1	RX_LOS	11	RGND
2	RGND	12	RX_DAT-
3	RGND	13	RX_DAT+
4	MOD_DEF(0)	14	RGND
5	MOD_DEF(1)	15	VddR
6	MOD_DEF(2)	16	VddT
7	TX_DISABLE	17	TGND
8	TGND	18	TX_DAT+
9	TGND	19	TX_DAT-
10	TX_FAULT	20	TGND

Copyright © 2006 ADTRAN, Inc.

Table A-3. 10/100BaseT Ethernet Port Pinouts

Pin	Name	Description
1	TX1	Transmit Positive
2	TX2	Transmit Negative
3	RX1	Receive Positive
4, 5	—	Unused
6	RX2	Receive Negative
7, 8	—	Unused

Table A-4. 1000BaseT Gigabit-Ethernet Port Pinouts

Pin	Name	Description
1	TRD0+	Transmit/Receive Positive
2	TRD0-	Transmit/Receive Negative
3	TRD1+	Transmit/Receive Positive
4	TRD2+	Transmit/Receive Positive
5	TRD2-	Transmit/Receive Negative
6	TRD1-	Transmit/Receive Negative
7	TRD3+	Transmit/Receive Positive
8	TRD3-	Transmit/Receive Negative

 Copyright © 2006 ADTRAN, Inc.

Network Interface Module Pinouts

Table A-5. WAN-DDS Connector Pinouts

Pin	Name	Description
1	R1	Transmit data to the network–Ring 1
2	T1	Transmit data to the network–Tip 1
3-6	—	Unused
7	T	Receive data from the network–Tip
8	R	Receive data from the network–Ring

Table A-6. WAN-T1 Connector Pinouts

Pin	Name	Description
1	R1	Receive data from the network–Ring 1
2	T1	Receive data from the network–Tip 1
3	—	Unused
4	R	Transmit data toward the network–Ring
5	T	Transmit data toward the network–Tip
6-8	—	Unused

Table A-7. WAN-E1 Connector Pinouts

Pin	Name	Description
1	R1	Receive data from the network–Ring 1
2	T1	Receive data from the network–Tip 1
3	—	Unused
4	R	Transmit data toward the network–Ring
5	T	Transmit data toward the network–Tip
6-8	—	Unused

Copyright © 2006 ADTRAN, Inc.

Table A-8. DSX-1 Connector Pinouts

Pin	Name	Description
1	R	Transmit data toward the DTE–Ring
2	T	Transmit data toward the DTE–Tip
3	—	Unused
4	R1	Receive data from the DTE–Ring 1
5	T1	Receive data from the DTE–Tip 1
6-8	—	Unused

Table A-9. G.703 Connector Pinouts

Pin	Name	Description
1	R	Transmit data toward the DTE–Ring
2	T	Transmit data toward the DTE–Tip
3	—	Unused
4	R1	Receive data from the DTE–Ring 1
5	T1	Receive data from the DTE–Tip 1
6-8	—	Unused

Table A-10. WAN-SHDSL Connector Pinouts

Pin	Name	Description
1-3	—	Unused
4	T	Transmit data toward the network–Tip
5	R	Transmit data toward the network–Ring
6-8	—	Unused

Table A-11. WAN-ADSL Connector Pinouts

Pin	Name	Description
1, 2	—	Unused
3	R	ADSL Ring
4	T	ADSL Tip
5, 6	—	Unused

 Copyright © 2006 ADTRAN, Inc.

Table A-12. Serial to Cable Connector Pinouts

Serial Pin	V.35 Pin	X.21 Pin	EIA 530 Pin	Name
1	P	2	2	TD_A
2	U	N/A	24	ETC_A
3	Y	N/A	15	TCLK_A
4	V	6	17	RCLK_A
5	R	4	3	RD_A
6	F	N/A	8	DCD_A
7	H	N/A	20	DTR_A
8	C	3	4	RTS_A
9	N/A	10	19	RTS_B (V.11 only)
10	N/A	12	13	CTS_B (V.11 only)
11	D	5	5	CTS_A
12	E	N/A	6	DSR_A
13	K	N/A	25	TM_A
14	S	9	14	TD_B
15	W	N/A	11	ETC_B
16	AA	N/A	12	TCLK_B
17	X	13	9	RCLK_B
18	T	11	16	RD_B
19-26	N/A	N/A	N/A	Unused
26	B	8	7	Ground

Copyright © 2006 ADTRAN, Inc.

Dial Backup Interface Module Pinouts (DBU Connector)

An optional DIM is required for dial backup applications.

Table A-13. Analog Modem and ISDN BRI DBU Connector Pinouts

Pin	Name	Description
1-3	—	Unused
4	R	Network–Ring
5	T	Network–Tip
6-8	—	Unused

Table A-14. ISDN S/T DBU Connector Pinouts

Pin	Name	Description
1, 2	—	Unused
3	R1	Network Receive–Ring 1
4	R	Network Transmit–Ring
5	T	Network Transmit–Tip
6	T1	Network Transmit–Tip 1
7, 8	—	Unused

Table A-15. Serial DBU Connector Pinouts

Pin	Description
1, 2	Unused
3	CTS
4	TXD
5	RXD
6	GND
7	DCD
8	Unused

 Copyright © 2006 ADTRAN, Inc.

Index

 Copyright © 2006 ADTRAN, Inc.

 Copyright © 2006 ADTRAN, Inc.