



NetVanta 1000 Series Switch Hardware Installation Guide

1200500L1	NetVanta 1224
1200504L1	NetVanta 1224ST
1200510L1	NetVanta 1224STR
1200520L1	NetVanta 1224R

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Conventions

**NOTE**

Notes provide additional useful information.

**CAUTION**

Cautions signify information that could prevent service interruption.

WARNING

Warnings provide information that could prevent damage to the equipment or endangerment to human life.

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.



Double pole/neutral fusing.

Save These Important Safety Instructions

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
1200862L1	US: HDCDENAN1200863L1	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
1200863L1					
1202862L1	US: HDCDENAN1202863L1				
1202863L1					
1200872L1	US: HDCDENAN1200872L1				
1200864L1	US: HDCM504A1200864L1	Analog Loop Start	0.4A/9.0F	02LS2	RJ-11C
1200865L1	US: HDCDENAN1200865L1	Basic Rate ISDN	6.0F	021S5	RJ-49C

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.

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/1224R
1200861L1 56K/64K NIM	FCC Part 15, Class A EN55022 Class A
1200862L1 T1/FT1 NIM	FCC Part 15, Class A EN55022 Class A
1202862L1 T1/FT1 NIM, 2nd Gen	FCC Part 15, Class A EN55022 Class A
1200863L1 T1/FT1+DSX-1 NIM	FCC Part 15, Class A EN55022 Class A
1202863L1 T1/FT1+DSX-1 NIM, 2nd Gen	FCC Part 15, Class A EN55022 Class A
1200866L1 Serial NIM	FCC Part 15, Class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3
1200867L1 SHDSL NIM	FCC Part 15, Class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3
1200864L1 Analog Modem DIM	FCC Part 15, Class A EN55022 Class A
1200865L1 ISDN BRI DIM 1200875L1 ISDN S/T DIM	FCC Part 15, Class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3
1200868L1 E1/FE1 NIM	FCC Part 15, Class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3
1200872L1 Dual T1 NIM	FCC Part 15, Class A EN55022 Class A
1200878L1 E1/FE1 w/ G.703 Drop	FCC Part 15, Class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3
1202368L1 VPN Accelerator Card	FCC Part 15, Class A EN55022 Class A EN55024 EN61000-3-2 EN61000-3-3

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 radioélectriques applicables aux appareils numériques de Class A prescrites dans la norme sur le matériel brouilleur: “Appareils Numériques,” NMB-003 édictée par le ministre des Communications.

Affidavits

Affidavit Requirements for Connection to Digital Services

- An affidavit is required to be given to the telephone company whenever digital terminal equipment without encoded analog content and billing protection is used to transmit digital signals containing encoded analog content which are intended for eventual conversion into voiceband analog signals and transmitted on the network.
- The affidavit shall affirm that either no encoded analog content or billing information is being transmitted or that the output of the device meets Part 68 encoded analog content or billing protection specifications.
- End user/customer will be responsible for filing an affidavit with the local exchange carrier when connecting unprotected customer premise equipment (CPE) to 1.544 Mbps or subrate digital services.
- Until such time as subrate digital terminal equipment is registered for voice applications, the affidavit requirement for subrate services is waived.

Affidavit for Connection Of Customer Premises Equipment to 1.544 Mbps And/or Subrate Digital Services

For the work to be performed in the certified territory of _____ (telco name)

State of _____

County of _____

I, _____ (name), _____ (business address),

_____ (telephone number) being duly sworn, state:

I have responsibility for the operation and maintenance of the terminal equipment to be connected to 1.544 Mbps and/or _____ subrate digital services. The terminal equipment to be connected complies with Part 68 of the FCC rules except for the encoded analog content and billing protection specifications. With respect to encoded analog content and billing protection:

- () I attest that all operations associated with the establishment, maintenance, and adjustment of the digital CPE with respect to analog content and encoded billing protection information continuously complies with Part 68 of the FCC Rules and Regulations.
- () The digital CPE does not transmit digital signals containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.
- () The encoded analog content and billing protection is factory set and is not under the control of the customer.

I attest that the operator(s)/maintainer(s) of the digital CPE responsible for the establishment, maintenance, and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully having completed one of the following (check appropriate blocks):

- () A training course provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- () A training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- () An independent training course (e.g., trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signals; or
- () In lieu of the preceding training requirements, the operator(s)/maintainer(s) is (are) under the control of a supervisor trained in accordance with _____ (circle one) above.

I agree to provide _____ (telco's name) with proper documentation to demonstrate compliance with the information as provided in the preceding paragraph, if so requested.

_____ Signature

_____ Title

_____ Date

Transcribed and sworn to before me

This _____ day of _____, _____

Notary Public

My commission expires:

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.

WARNING

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.

Warranty and Customer Service

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 at: <http://support.adtran.com> (Click on *Warranty and Repair Information*, under *Support*.)

Product Registration

Registering your product helps ensure complete customer satisfaction. Please take time to register your products on line at <http://support.adtran.com>. Click on *Service/Support* and then on *Product Registration* under *Support*.

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 following contact information:

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 address), and return to the following address:

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

RMA # _____

Pre-Sales 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 web site provides a variety of support services such as a searchable knowledge base, 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 at:

<http://support.adtran.com>

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

Applications Engineering (800) 615-1176

Post-Sale Support

Your reseller should serve as the first point of contact for support. If additional support is needed, the ADTRAN Support web site provides a variety of support services such as a searchable knowledge base, updated firmware releases, latest product documentation, service request ticket generation and troubleshooting tools. All of this, and more, is available at:

<http://support.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

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

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1. INTRODUCTION

This hardware installation guide lists the NetVanta 1000 Series units' specifications, describes the physical characteristics of the units, introduces basic functionality, and provides installation instructions. All NetVanta 1000 Series units run the ADTRAN Operating System (OS) and are managed through an EIA-232 **CONSOLE** port (DB-9) located on the rear panel. See *Console Interface* 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 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, NetVanta1224ST, NetVanta 1224STR, and NetVanta 1224R. If a statement only applies to one particular unit, the text refers to the unit individually.

NetVanta 1224 and NetVanta1224ST

The NetVanta 1224 and the NetVanta1224ST are managed switches housed in a 1U-high metal enclosure that can be rackmounted. The rear panel EIA-232 **CONSOLE** port (DB-9) manages the unit, which includes a universal AC power supply. Both the NetVanta 1224 and the NetVanta1224ST front panels contain twenty-four 10/100BaseT Mbps Ethernet ports (RJ-45). In addition, the NetVanta1224ST front panel contains two Gigabit Ethernet interfaces which 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.)

NetVanta 1224STR and NetVanta 1224R

The NetVanta 1224STR and NetVanta 1224R are managed switches containing a multi-service router, housed in a 1-U high rackmountable metal enclosure that includes a universal AC power supply. The front panels of the NetVanta 1224STR and NetVanta 1224R contain twenty-four 10/100 Mbps Ethernet ports, with the NetVanta 1224STR including a single Gigabit Ethernet interface, accessed via a fixed RJ-45 connector or an SFP (small form-factor pluggable) slot for fiber connectivity. In addition, both units contain a single Network Interface Module (NIM) slot on the rear panel which supports the following modules:

1200861L1	NetVanta 56k/64k Network Interface Module
1200862L1	NetVanta T1/FT1 Network Interface Module
1200863L1	NetVanta T1/FT1+DSX-1 Network Interface Module
1200872L1	NetVanta Dual T1 Network Interface Module
1200864L1	NetVanta V.34 DBU Module
1200865L1	NetVanta ISDN BRI DBU Module
1200866L1	NetVanta Serial Interface Module
1202368L1	NetVanta Encryption Module
1200868L1	E1/FE1 NIM

Unpacking and Inspecting the System

Each NetVanta 1000 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 (see *Warranty and Customer Service* on page 11).

Contents of ADTRAN NetVanta 1000 Series Shipments

The NetVanta 1000 Series ships with the following items:

- NetVanta 1000 Series Unit
- A detachable power cable with a grounded, three-prong plug
- *ADTRAN OS Documentation CD*
- Warranty Card

2. PRODUCT SPECIFICATIONS

	1224	1224ST	1224STR	1224R
Physical Interfaces				
10/100BaseT Ethernet ports on the front panel	24	24	24	24
1000BaseT Gigabit Ethernet interfaces on the front panel (SFP slots for connectivity over fiber / RJ-45 connectors for copper connectivity)	0	2	1	0
Integrated DB-9, EIA-232 console port (DCE) on the rear panel	1	1	1	1
Modular network interface on the rear panel	N/A	N/A	1	1
Front Panel Status LEDs				
Power	✓	✓	✓	✓
LAN: link, activity	✓	✓	✓	✓
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: 100-250 VAC, 50/60 Hz	✓	✓	✓	✓
Power Dissipation: 25 Watts (85 BTUs/hour)	✓	✓	✓	✓
Mechanical Specifications				
Housing: 1-U high metal enclosure (17.22" W x 8" H x 1.72" D)	✓	✓	✓	✓
10/100 BaseT Ethernet: Twenty-four ganged RJ-45 jacks	✓	✓	✓	✓
10/100/1000BaseT Ethernet: SFP slots / standard RJ-45 jacks	0	2	1	0
Console Port: DB-9, female	✓	✓	✓	✓
Environmental Specifications				
AC Input Power: 100–250 VAC, 400 mA	✓	✓	✓	✓
Storage Temperature: -20 °C to 70 °C	✓	✓	✓	✓
Operating Temperature: 0 °C to 50 °C	✓	✓	✓	✓
Humidity: Up to 95% noncondensing	✓	✓	✓	✓

3. PHYSICAL DESCRIPTION

Front Panel RJ-45 Ports and LEDs

The NetVanta front panels contain twenty-four 10/100BaseT Mbps Ethernet ports (RJ-45). 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 4.)

Front Panel Gigabit Ethernet Interfaces and LEDs

In addition to the Ethernet ports, the NetVanta1224ST front panel contains 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 (see *SFP Modules* on page 23) or the RJ-45 jacks. These interfaces are labeled **G1 / G2**, and their status LEDs are located to the left of RJ-45 port 1 (they are labeled as **G1** and **G2**), above the LED labeled **STAT**).

Other Front Panel LEDs

To the lower left of RJ-45 port 1 is an LED labeled **STAT** which indicates the unit's status. The NetVanta 1224STR and NetVanta 1224R also contain LEDs labeled **WAN** and **DBU**. These LEDs indicate the status of the interfaces added by an installed module (WAN-network interface module or DBU-dial backup module). Table 1 on page 23 describes all of these LEDs, and Appendix A shows the pinouts for the connectors.

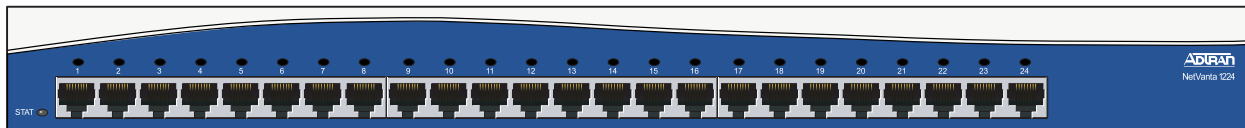


Figure 1. NetVanta 1224 Front Panel Layout

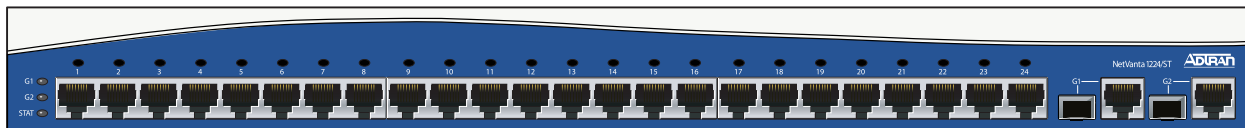


Figure 2. NetVanta1224ST Front Panel Layout

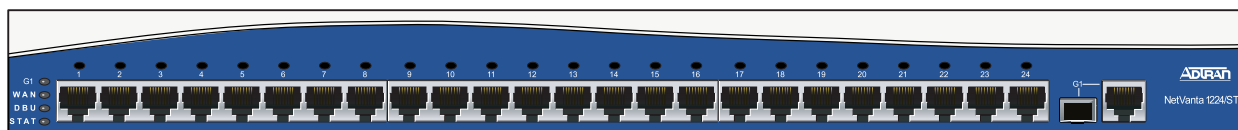


Figure 3. NetVanta 1224STR Front Panel Layout

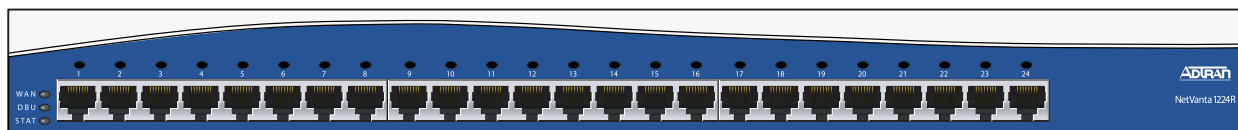


Figure 4. NetVanta 1224R Front Panel Layout

SFP Modules

The NetVanta1224ST contains two SFP slots and the NetVanta 1224STR has one. All accept a number of industry-standard SFP modules. The SFP modules provide Gigabit 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

Table 1. Front Panel LED Descriptions

LED	Color	Indication
STAT	Green (blinking)	On power-up STAT LED blinks rapidly for five seconds, during which time the user may escape to boot mode from the CONSOLE port.
	Green (solid)	The power is on and self-test passed.
	Red (solid)	The power is on, but the self-test failed or the boot code could not be booted.
PORT	Off	The port is administratively disabled or does not have a link.
	Green (solid)	The port is enabled and has a link.
	Amber (blinking)	The port has activity (transmit or receive).
WAN	Off	No NIM is installed or interface is administratively down.
	Green (solid)	The link is up and everything is okay.
	Red (solid)	An alarm condition is occurring on the WAN interface, or there is a self-test failure.
	Yellow (solid)	The unit is in test.

Table 1. Front Panel LED Descriptions (Continued)

LED	Color	Indication
DBU	Off	No DIM is installed.
	Green (solid)	The DIM is ready. For the ISDN BRI DIM, green solid indicates that the negotiation with the switch is complete.
	Green (blinking)	The unit is in dial backup.
	Red (solid)	An alarm condition is occurring on the DBU interface, or there is a self-test failure.
	Yellow (solid)	The unit is in test.

Reviewing the Rear Panel Design

Figures 5 and 6 show the rear panels. All NetVanta rear panels contain a power connection and a single DB-9 (female) interface, labeled **CONSOLE**, for connecting to a VT100 terminal or a PC running VT100 terminal emulation software. In addition, the NetVanta 1224STR and NetVanta 1224R contain a modular network interface that accepts a variety of modules (see *Option Modules* on page 25). Appendix A shows the pinouts for the connectors.

Console Interface

The **CONSOLE** interface is an integrated EIA-232 console port (DCE) which provides local management and configuration (via the DB-9 female connector).

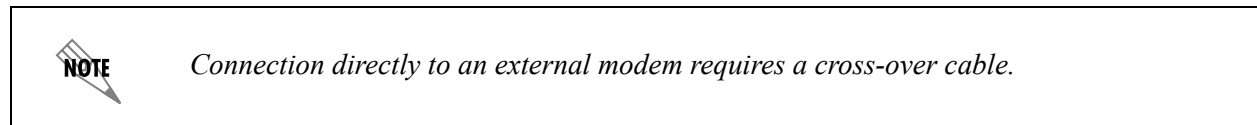


Figure 5. NetVanta 1224 and NetVanta1224ST Rear Panel Layout

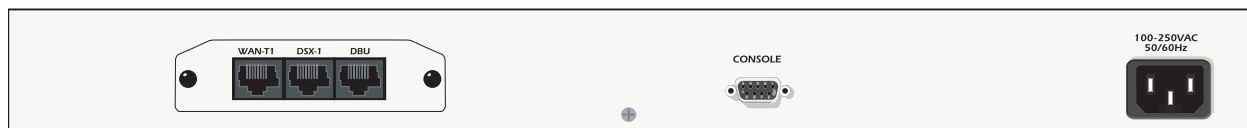


Figure 6. NetVanta 1224STR and NetVanta 1224R Rear Panel Layout

4. OPTION MODULES

The NetVanta 1224STR and NetVanta 1224R offer several option modules designed to meet a variety of networking requirements. The option modules are of two types: plug-in Network Interface Modules (NIMs) and plug-on Dial Backup Interface Modules (DIMs).

NIMs are cards which plug directly into the option module slot (labeled **SLOT x NET/DBU**), 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 1200862L1 and 61202862L1) on page 27*
- *NetVanta T1/FT1+DSX-1 NIM (P/N 1200863L1 and 61202863L1) on page 28*
- *NetVanta Dual T1 NIM (P/N 1200872L1) on page 29*
- *NetVanta Serial NIM (P/N 1200866L1) on page 30*
- *NetVanta E1/FE1 NIM (P/N 1200868L1) on page 31*

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 in order for the **DBU** port on the NIM to be active. The NetVanta supports two DIMs:

- *NetVanta Analog Modem DIM (P/N 1200864L1) on page 32*
- *NetVanta ISDN BRI DIM (P/N 1200865L1) on page 33*

This section describes each module, providing individual card specifications and features. Refer to *Connector Pin Definitions* on page 41 for pinout information. *Installing Dial Backup and Network Interface Modules* on page 38 provides information on card installation.

Network Interface Modules

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

The 56K/64K NIM (shown in Figure 7) provides a WAN interface for the NetVanta. This module provides a single 56K or 64K DDS network interface. Refer to Table A-5 on page 43 for the WAN-DDS connector pinout, and Table A-11 on page 46 for the DBU connector pinout. An optional DIM is required for dial backup applications.

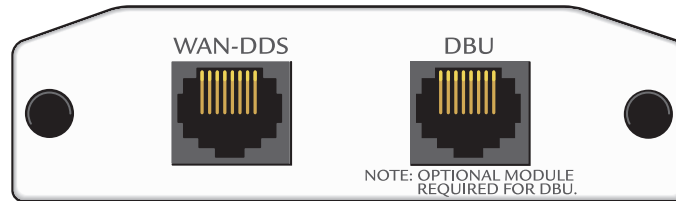


Figure 7. NetVanta 56K/64K NIM

Features and Specifications

Operating Modes

- Dedicated DDS (leased line)

DDS Interface

- RJ-48C
- 4-wire, full duplex
- -45 dB receiver sensitivity all rates
- Data Rates: 56K, 64K, and Auto

Clock Source

- Network
- Internal

Diagnostics

- CSU and DSU Loopbacks

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- Industry Canada CS03
- UL and CUL
- AT&T TR 62310

Environmental

- Operating Temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% non-condensing

Physical

- Dimensions: 4.25" x 2.75"

NetVanta T1/FT1 NIM (P/N 1200862L1 and 61202862L1)

The T1/FT1 NIM (shown in Figure 8) provides a T1 WAN interface for the NetVanta. This provides a full T1 or fractional T1 network interface. Refer to Table A-6 on page 43 for the WAN-T1 connector pinout, and Table A-11 on page 46 for the DBU connector pinout. An optional DIM is required for dial backup applications.

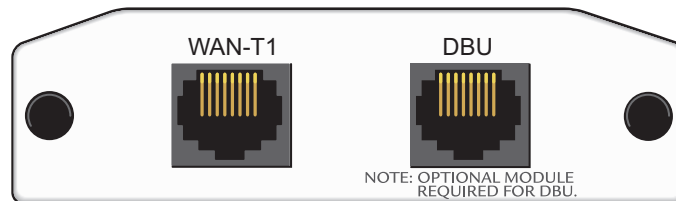


Figure 8. NetVanta T1/FT1 NIM

Features and Specifications

Operating Modes

- T1/FT1 Frame Relay
- T1/FT1 PPP

T1/FT1 Interface

- 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 (DS-1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB
- Connector: RJ-48C
- DS0 Assignment: Programmable

Clock Source

- Network
- Internal

Diagnostics

- Test pattern generation and detection: QRSS and 511
- 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 minute and 24 hour)

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- Industry Canada CS03
- UL and CUL
- T1 Interface: Pub 62411
- ESF Format Interface: TR. 194
- ESF Performance Monitoring: TR. 54016 and T1.403

Environmental

- Operating Temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% noncondensing

Physical

- Dimensions: 4.25" x 2.75"

NetVanta T1/FT1+DSX-1 NIM (P/N 1200863L1 and 61202863L1)

The T1/FT1 + DSX-1 NIM (see Figure 9) 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 43 for the WAN-T1 connector, Table A-8 on page 44 for the DSX-1 connector, and Table A-11 on page 46 for the DBU connector. An optional DIM is required for dial backup applications.

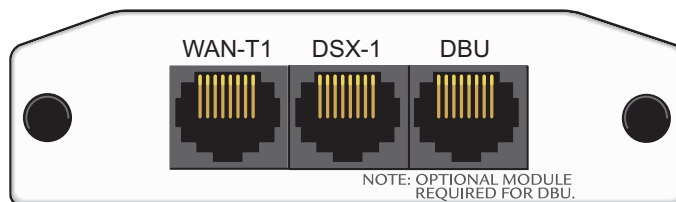


Figure 9. NetVanta T1/FT1+DSX-1 NIM

Features and Specifications

Operating Modes

- T1/FT1 Frame Relay
- T1/FT1 PPP

T1/FT1 Interface

- 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 (DS-1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB
- Connector: RJ-48C
- DS0 Assignment: Programmable

DSX-1 Interface

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

Clock Source

- Network
- Internal
- DSX-1

Diagnostics

- Test pattern generation and detection: QRSS and 511
- Network loopbacks (local and remote); responds to both INBAND and FDL loop codes (T1 interface only)
- Alarm generation and detection
- Network and user sets of performance data (15 minute and 24 hour)

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- Industry Canada CS03
- UL and CUL
- T1 Interface: Pub 62411
- ESF Format Interface: TR. 194
- ESF Performance Monitoring: TR. 54016 and T1.403

Environmental

- Operating Temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% noncondensing

Physical

- Dimensions: 4.25" x 2.75"

NetVanta Dual T1 NIM (P/N 1200872L1)

The NetVanta Dual T1 NIM (see Figure 10) provides two WAN T1 interfaces for the NetVanta. Refer to Table A-6 on page 43 for the pinouts. Refer to Table A-11 on page 46 for the DBU connector pinout. An optional DIM is required for dial backup applications.

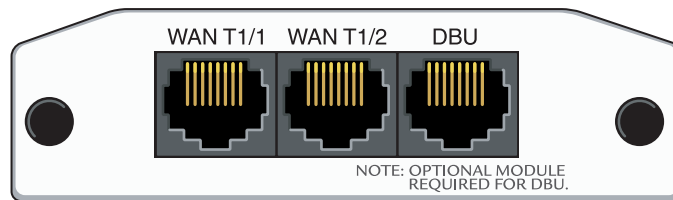


Figure 10. NetVanta Dual T1 NIM

Features and Specifications

Operating Modes

- T1/ FT1

T1 Interface

- 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 (DS-1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB
- Connector: RJ-48C
- DS0 Assignment: Programmable

Clock Source

- Network
- Internal
- Through

Diagnostics

- Test pattern generation and detection: QRSS, 2¹⁵-1, 2²⁰-1, 511
- Network loopbacks (local and remote)
- Responds to both inband and FDL loop codes
- Alarm generation detection
- Network performance data (15 minutes and 24 hours)

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- Industry Canada CS03
- UL and CUL
- T1 Interface: Pub 62411
- ESF Format Interface: TR. 194
- ESF Performance Monitoring: TR. 54016 and T1.403

Environmental

- Operating temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% noncondensing

Physical

- Dimensions: 4.25" x 2.75"

NetVanta Serial NIM (P/N 1200866L1)

The NetVanta Serial NIM (shown in Figure 11) is user-configurable to be either a V.35 or X.21 (V.11) interface. This module supports rates up to a maximum of 10 Mbps. An additional V.35 (ADTRAN P/N 1200873L1) or X.21 (ADTRAN P/N 1200874L1) cable is required (see *Caution*, below). Refer to Table A-10 on page 45 for the **SERIAL** connector pinout, and Table A-11 on page 46 for the DBU connector pinout. An optional DIM is required for dial backup applications.

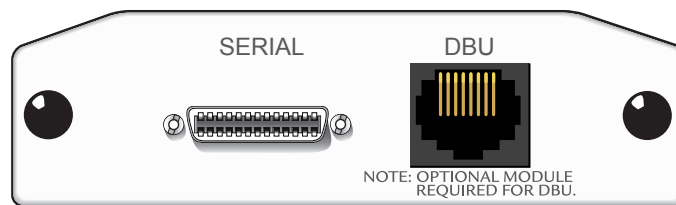
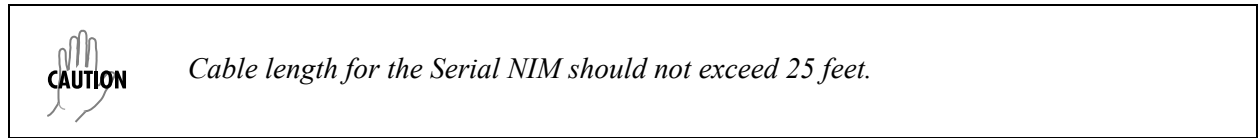


Figure 11. NetVanta Serial NIM

Features and Specifications

Operating Mode

- DTE only

Serial Interface

- Provides V.35 or X.21 (V.11) electrical interface
- CTS, DCD, DSR, TM options are **IGNORE** or **CONNECT**
- DTR, RTS options are **NORMAL** or **FORCED ON**
- 0 to 2.048 Mbps
- 26-pin smart serial (DTE) connector

Clock Source

- Network
- Internal

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- EN60950
- UL and CUL
- ISO 4903 (X.21)
- CCITT V.35 Synchronous (V.35)1

Environmental

- Operating Temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% noncondensing

Physical

- Dimensions: 4.25" x 2.75"

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

The NetVanta E1 module (see Figure 12) 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 43 for the pinouts. Refer to Table A-11 on page 46 for the DBU connector pinout.

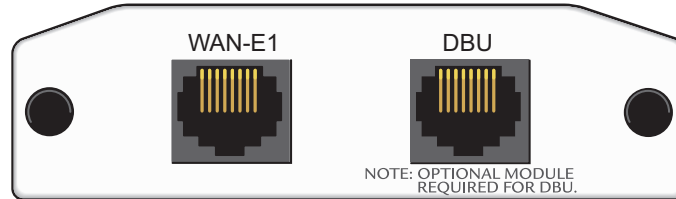


Figure 12. NetVanta E1/FE1 NIM

Features and Specifications

Operating Modes

- E1/FE1

WAN-E1 Interface

- Connector: RJ-48C
- 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)
- Timeslot Assignment: Programmable
- Receiver Sensitivity: -30 dB

Clock Source

- Network
- Internal

Diagnostics

- Network loopbacks
- Network performance data (15-minute and

24-hour)

- Test pattern generation and detection: QRSS, 511
- Alarm generation and detection

Relevant Requirements/Standards

- ACIF S016
- ACA TS001
- ETSI TBR 12 / TBR 13
- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ITU G.703, ITU-T G.704 (CRC-4), ITU-T G.823, ITU-T G.797

Environmental

- Operating temperature: 0 °C to 50 °C

Physical

- Dimensions: 4.25" x 2.75"

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, see *Installing Dial Backup and Network Interface Modules* on page 38.

Features and Specifications

Features

- ITU V.90 compliant
- Async

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- Industry Canada CS03
- UL and CUL

Environmental

- Operating Temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% noncondensing

Physical

- Dimensions: 3.75" x 2.5"

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, see *Installing Dial Backup and Network Interface Modules* on page 38.

Features and Specifications

Features

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

Relevant Requirements/Standards

- EMC - see *Electromagnetic Compatibility (EMC) Table for the NetVanta 1224STR/1224R* on page 6.
- ACTA/FCC Part 68
- Industry Canada CS03
- UL and CUL

Environmental

- Operating Temperature: 0 °C to 50 °C
- Storage Temperature: -40 °C to 85 °C
- Relative Humidity: Up to 95% non-condensing

Physical

- Dimensions: 3.75" x 2.5"

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 35
- *Supplying Power to the Unit* on page 37
- *Installing Dial Backup and Network Interface Modules* on page 38
- *Installing the NetVanta VPN Accelerator Card (1202368L1)* on page 40

For information on configuring a specific application, refer to the quick start documents provided on your *ADTRAN OS 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.



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 (rackmounting applications only)



*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 Documentation CD*).*

Mounting Options




If you have purchased the VPN Accelerator Card, install it first (see [Installing the NetVanta VPN Accelerator Card \(1202368L1\)](#) on page 40).

The unit may be installed in a rackmount, wallmount, or tabletop configuration. The following sections provide step-by-step instructions for rackmounting and wallmounting.

Rack Mounting the NetVanta

The NetVanta is a 1-U 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 takes up 1 U of space.
3	Have someone else 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 (see Supplying Power to the Unit on page 37).



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

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 13 on page 37).
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" to 1" thick) to a wall stud. <i>Important! Mounting to a stud ensures stability. Using sheetrock anchors may not provide sufficient long-term stability.</i>
4	Have someone else hold the unit in position as you install two #6 to #10 (1 1/2" or greater in length) wood screws through the unit's brackets and into the mounted board (see Figure 13 on page 37).
5	Proceed to the steps given in <i>Supplying Power to the Unit</i> on page 37.



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

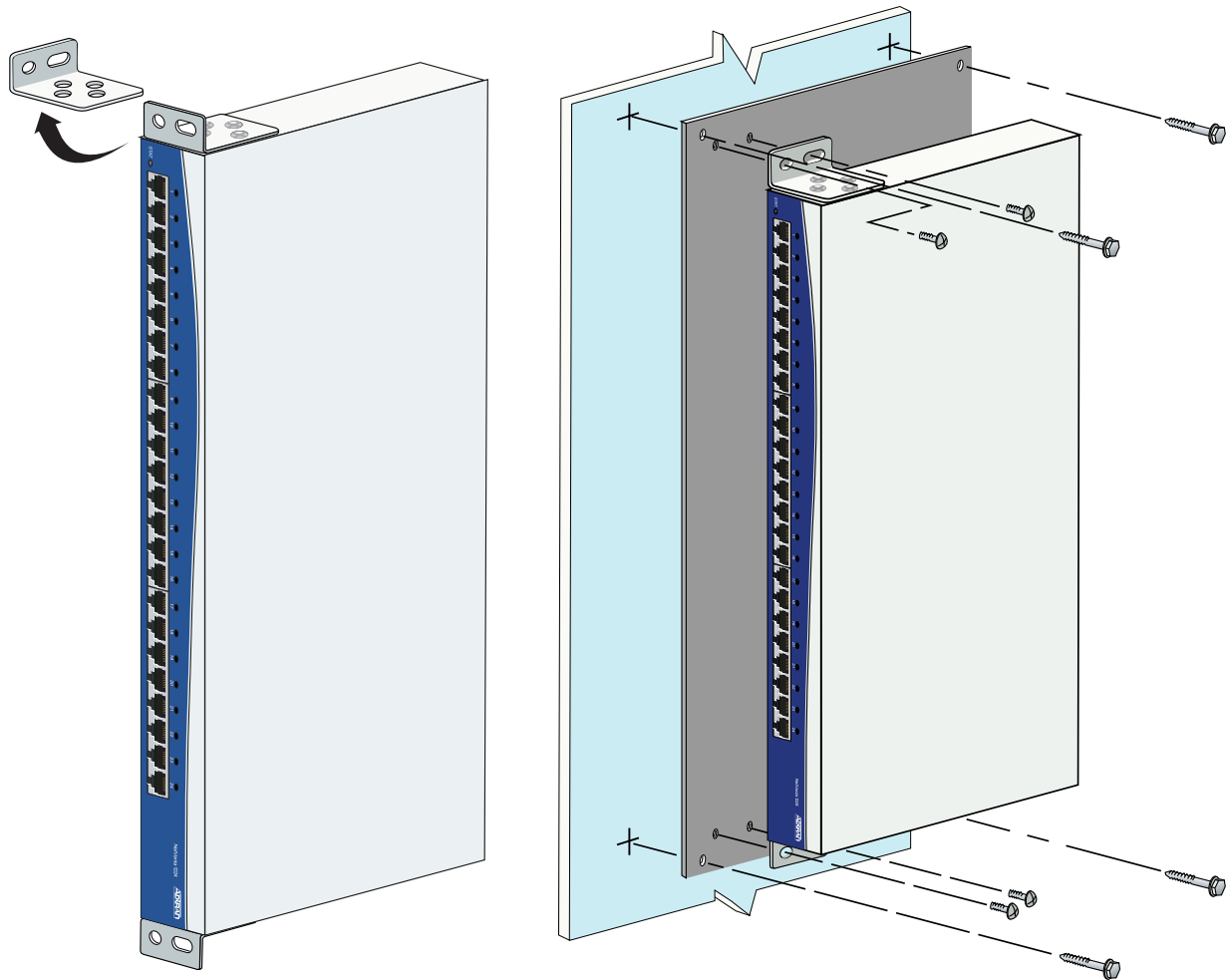


Figure 13. Repositioning the Mounting Bracket for a Wallmount Installation

Supplying Power to the Unit

The NetVanta comes equipped with an auto-sensing 100-250 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-up the unit, connect the power cable to an appropriate power source.

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 15 on page 39.



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



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, release the pins at both edges of the NIM faceplate and slide the module out of the chassis.
3	Carefully align the P1 connector on the NIM with the J1 connector on the DIM. <i>Using only fingertip pressure</i> 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 14.
4	Slide the NIM with the DIM attached into the NetVanta chassis, continuing with the normal NIM installation (see <i>Instructions for Installing the NIMs</i> on page 39).

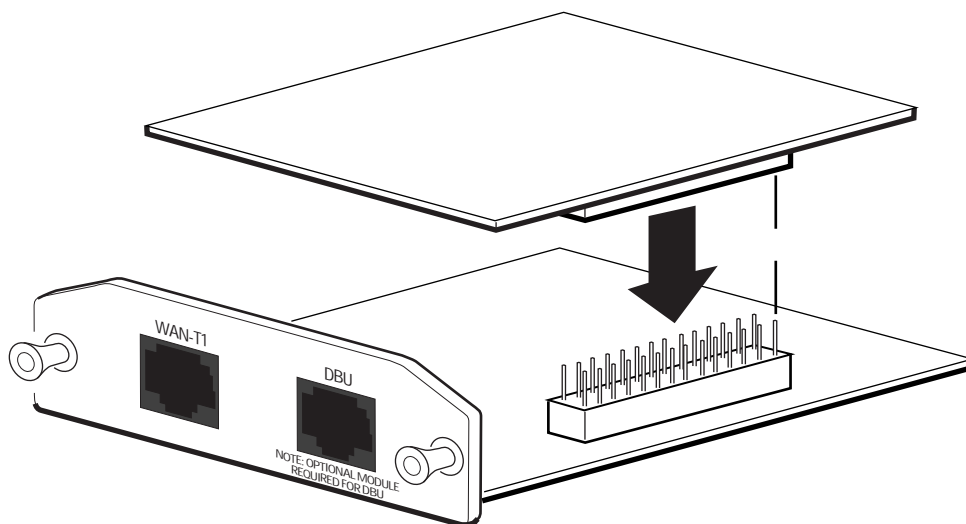


Figure 14. Installing DIMs

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 front of 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.

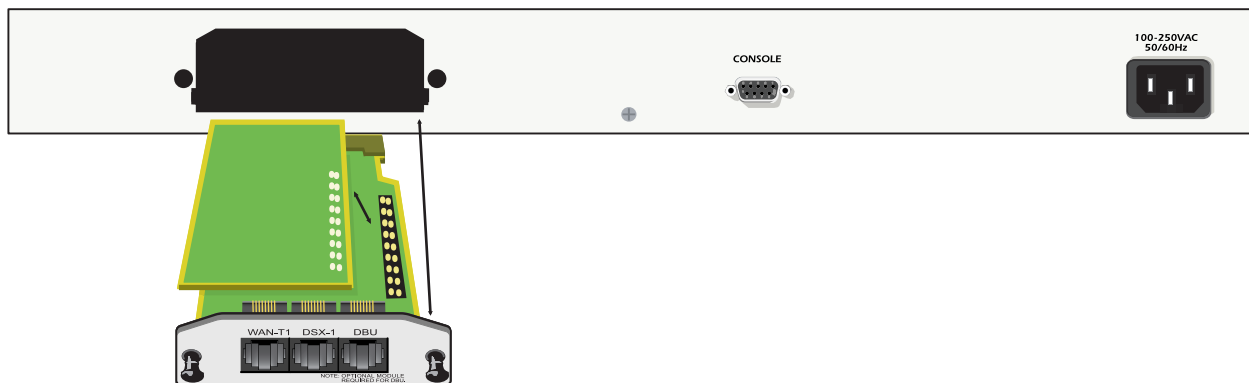


Figure 15. NIM and DIM Installation

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 start documents provided on your *ADTRAN OS Documentation CD*. For details on the command line interface, refer to the *Command Reference Guide* (also included on your CD).

Installing the NetVanta VPN Accelerator Card (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, 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.

Instructions for Installing the VPN Accelerator Card	
Step	Action
1	Remove power from the unit.
2	Remove the nine screws and, if necessary, two mounting brackets (see Figure 16).
3	Using a 3/16" 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.

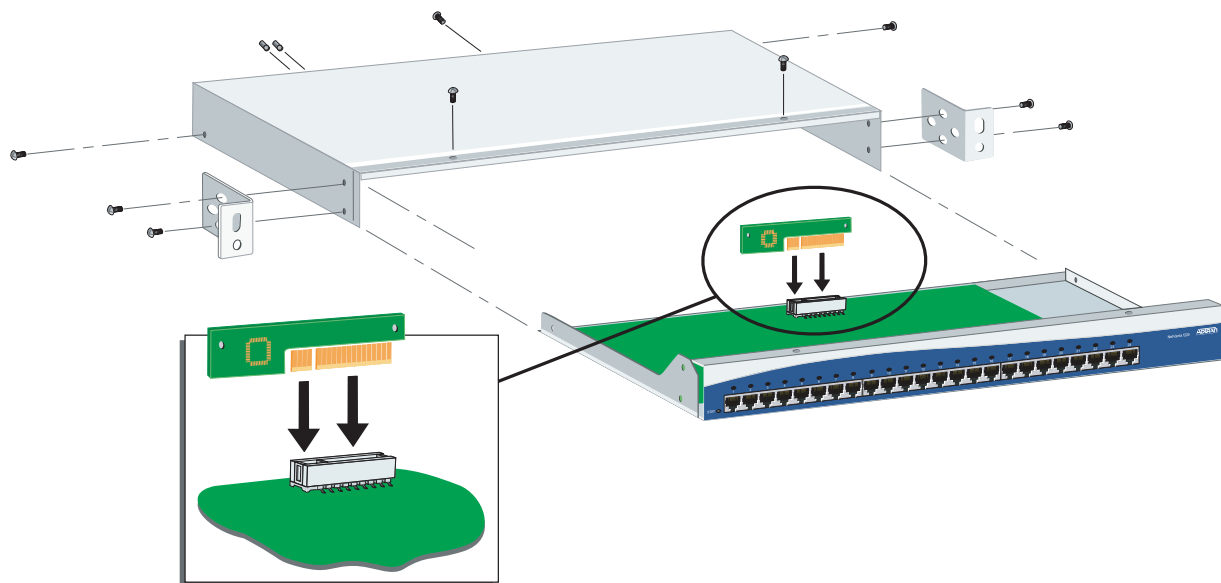


Figure 16. VPN Card Installation

APPENDIX A. CONNECTOR PIN DEFINITIONS

Table A-1. Console Port Interface (DCE)

Pin	Description
1	Carrier Detect (output)
2	Receive Data (output)
3	Transmit Data (input)
4	Data Terminal Ready (input)
5	Signal Ground
6	Data Set Ready (output)
7	Request to Send (input)
8	Clear to Send (output)
9	No Connect

Table A-2. SFP Slots

Pin	Description	Pin	Description
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

Table A-3. 10/100 BaseT Ports

Pin	Description
1	TD+
2	TD-
3	RD+
4	No Connect
5	No Connect
6	RD-
7	No Connect
8	No Connect

Table A-4. 1000 BaseT Ports

Pin	Description
1	TRD0+
2	TRD0-
3	TRD1+
4	TRD2+
5	TRD2-
6	TRD1-
7	TRD3+
8	TRD3-

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
2	T1	Receive data from the network
3	—	Unused
4	R	Transmit data toward the network
5	T	Transmit data toward the network
6-8	—	Unused

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
2	T	Transmit data toward the DTE
3	—	Unused
4	R1	Receive data from the DTE
5	T1	Receive data from the DTE
6-8	—	Unused

Table A-10. Serial NIM Connector Pinouts

Pin	Name	Pin	Name
1	TD_A	14	TD_B
2	ETC_A	15	ETC_B
3	TCLK_A	16	TCLK_B
4	RCLK_A	17	RCLK_B
5	RD_A	18	RD_B
6	DCD_A	19	Unused
7	DTR_A	20	Unused
8	RTS_A	21	Unused
9	RTS_B (V.11 only)	22	Unused
10	CTS_B (V.11 only)	23	Unused
11	CTS_A	24	Unused
12	DSR_A	25	Unused
13	TM_A	26	Ground

Dial Backup Interface Module Connectors

Table A-11. DBU Connector Pinouts

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

Table A-12. E1 DBU Connector Pinouts

Pin	Name	Description
1,2	—	Unused
3	R1	Network–Ring1
4	R	Network–Ring
5	T	Network–Tip
6	T1	Network–Tip1
7,8	—	Unused



NOTE

An optional DIM is required for dial backup applications.

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