



NetVanta 1000 Series and NetVanta 1000R Series Hardware Installation Guide

1200500E1	NetVanta 1224
1200504E1	NetVanta 1224ST
1200510L1	NetVanta 1224STR (AC)
1200520E1	NetVanta 1224R
1200530L1	NetVanta 1224R PoE
1200560E2	NetVanta 1524ST
1200570L1	NetVanta 1224STR PoE
1200580L1	NetVanta 1224 PoE
1200584L1	NetVanta 1224ST PoE
1200590L1	NetVanta 1224STR (DC)
1700515E2	NetVanta 1335
1700515E12	NetVanta 1335 WiFi
1700525E2	NetVanta 1335 PoE
1700525E12	NetVanta 1335 WiFi PoE
4200368L1	Enhanced Feature Pack (Hardware and Software) for IPSec VPN Upgrade for NetVanta 1224STR (AC/DC), 1224R, 1224R PoE, and 1224STR PoE
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	NetVanta Serial Network Interface Module
1200936E1	NetVanta SHDSL Network Interface Module, Annex A
1200937E1	NetVanta SHDSL Network Interface Module, Annex B
1202869E1	NetVanta ADSL Network Interface Module, Annex A
1202889E1	NetVanta ADSL Network Interface Module, Annex B
1700801G1	NetVanta 3G CDMA Network Interface Module (NetVanta 1335 only)
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
1200480E1	1000BaseSX Multi-Mode SFP Module
1200481E1	1000BaseLX Single-Mode SFP Module
1200816E1, 817E1, 818E1, 819E1	CompactFlash®, 128, 256, 512, and 1024 MB, respectively (NetVanta 1335 only)

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Conventions



NOTE

Notes provide additional useful information.



CAUTION

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.

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 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.



*Additional safety guidelines, such as Waste Electrical and Electronic Equipment (WEEE) are given in the **NetVanta Safety and Regulatory Information** document on the AOS Documentation CD.*

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 Federal Communications Commission (FCC) rules and requirements adopted by America's Carriers Telecommunications Association (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 affect 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	6.0N	04DU9-BN	RJ-48C
1202863L1		1.544 Mbps - SF and B8ZS		04DU9-DN	
1200872L1	US: HDCDENAN1200872L1	1.544 Mbps - ESF 1.544 Mbps - ESF and B8ZS		04DU9-1KN 04DU9-1SN	
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	US: HDCDL01A1200869L1	ADSL Modem	0.1A	Metallic	RJ-11C

8. The ringer equivalence number (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

NetVanta Module P/N and Name	NetVanta 1224STR (AC) / 1224R	NetVanta 1224STR (DC)	NetVanta 1335
1200861L1 56K/64K NIM	FCC Part 15 Class A EN 55022 Class A	N/A	FCC Part 15 Class A EN 55022 Class 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	N/A
1202862L1 T1/FT1 NIM 1202863L1 T1/FT1 + DSX-1 NIM 1200872L1 Dual T1 NIM	FCC Part 15 Class A EN 55022 Class A	N/A	FCC Part 15 Class A EN 55022 Class A
1200868E1/L1 E1/FE1 NIM 1200878E1/L1 E1/FE1 + G.703 Drop NIM	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3
1200866E1 Serial NIM	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3
1200936E1 SHDSL NIM, Annex A 1200937E1 SHDSL NIM, Annex B	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3
1202869E1 ADSL NIM, Annex A 1202889E1 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	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3
1700801G1 3G CDMA NIM	N/A	N/A	FCC Part 15 Class A
1200864L1 Analog Modem DIM 1200865L1 ISDN BRI DIM 1200875L1 ISDN S/T DIM	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3
1202368L1 VPN Accelerator Card (included in P/N 4200368L1)	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3	N/A	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3

Wireless Radio Channel Ranges

The following table lists by country the channels support by the ADTRAN WiFi products (NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE only).

Country	802.11a (5 GHz) Wireless Radios Channels	802.11bg (2.4 GHz) Wireless Radios Channels
Asia	149, 153, 157, 161	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Australia	36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Canada	36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Denmark	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Europe	34, 38, 42, 46	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Finland	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
France	34, 38, 42, 46	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Germany	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Ireland	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Italy	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Japan	34, 38, 42, 46	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Mexico	36, 40, 44, 48, 149, 153, 157, 161, 165	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Netherlands	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
New Zealand	36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Norway	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Puerto Rico	36, 40, 44, 48, 149, 153, 157, 161, 165	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
South America	802.11a not supported	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Spain	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Sweden	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Switzerland	34, 38, 42, 46	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
United Kingdom	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
United States	36, 40, 44, 48, 149, 153, 157, 161, 165	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

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 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.

Service and Warranty

For information on the service and warranty of ADTRAN products, visit the ADTRAN website at <http://www.adtran.com/support>.

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1. INTRODUCTION

The NetVanta 1000 Series includes the NetVanta 1224, NetVanta 1224 PoE, NetVanta 1224ST, NetVanta 1224ST PoE, NetVanta 1335, NetVanta 1335 PoE, NetVanta 1335 WiFi, NetVanta 1335 WiFi PoE, and the NetVanta 1524ST. The NetVanta 1000R Series includes the NetVanta 1224R, NetVanta 1224R PoE, NetVanta 1224STR (AC), NetVanta 1224STR (DC), and NetVanta 1224STR PoE.

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.

Power over Ethernet

The NetVanta 1000 and 1000R Series power over Ethernet (PoE) devices provide the same basic functionality as the NetVanta 1000 Series products. PoE provides the ability to detect attached powered devices (PDs), and deliver 48 VDC to the PD via existing CAT 5 cabling. The PoE devices are fully compliant with the IEEE 802.3af PoE standard. By default, the PoE switches discover and provide power to IEEE-compliant PDs.

Wireless Access

The NetVanta 1335 Wireless Fidelity (WiFi) Series provides a single access point for connection with IEEE 802.11a/b/g wireless networks. A dual radio design with two dual-band external antennas is used to support concurrent 802.11a and 802.11b/g connections.

SFP Module Slots

The NetVanta 1224ST, NetVanta 1224STR PoE, NetVanta 1335, and NetVanta 1335 PoE support two small form-factor pluggable (SFP) slots; the NetVanta 1224STR, NetVanta 1335 WiFi, and NetVanta 1335 WiFi PoE have one; and the NetVanta 1524ST has four. All accept a number of industry standard SFP modules. The SFP modules provide Gigabit Ethernet fiber connectivity 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):

- 1200480E1 1000BaseSX Multi-Mode SFP Module
- 1200481E1 1000BaseLX Single-Mode SFP Module



In this document, the term NetVanta means all NetVanta 1000 and NetVanta 1000R Series products. 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 also applies to the PoE and WiFi versions of that device.

2. PHYSICAL DESCRIPTIONS

NetVanta 1224

The NetVanta 1224 is a managed switch housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. The front panel contains 24 10/100BaseT Ethernet interfaces (RJ-45). The NetVanta 1224 PoE version provides the ability to detect attached PDs, and deliver 48 VDC to the PDs via existing CAT 5 cabling.

This section includes a list of features, a list of shipping contents, and a description of the unit's front and rear panel designs. For additional information, refer to the following sections:

- *Product Specifications* on page 34
- *Mounting Options* on page 54
- *Supplying Power to the Unit* on page 56

For information on switch configuration for a specific application, refer to the quick configuration documents provided on the *AOS Documentation* CD shipped with your base unit. For details on the command line interface (CLI), refer to the *AOS Command Reference Guide* (also included on your CD).

NetVanta 1224 Shipping Contents

Each NetVanta 1224 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 the *Repair and Replacement* section of the *Support* page on the ADTRAN website at <http://www.adtran.com/support>).

Domestic shipments of the NetVanta 1224 include the following items:

- NetVanta 1224 base unit
- *AOS Documentation* CD
- A detachable power cable with a grounded, three-prong plug
- *Quick Start Guide*
- Warranty card

International shipments of the NetVanta 1224 include the following items:

- NetVanta 1224 base unit
- *AOS Documentation* CD
- All necessary power cords
- *Quick Start Guide*
- Warranty card

NetVanta 1224 Front Panel Design

The NetVanta 1224 and NetVanta 1224 PoE front panels are shown below. *Table 1* on page 33 describes all of the LEDs, and *Appendix A* on page 67 shows the connector pinouts.

NetVanta 1224 Front Panel Features

10/100BaseT Ethernet Interfaces

The NetVanta 1224s contain 24 10/100BaseT Ethernet interfaces (RJ-45). These interfaces are consecutively numbered 1 through 24, from left to right, with the numbers screened directly above each port. Status LEDs for each of these interfaces are located directly over these numbers.

The NetVanta 1224 PoE also has green and red PoE status LEDs located in the upper left and upper right corners (respectively) of each Ethernet connector.

Status LED

The **STAT** LED, which indicates the unit's status, is located to the lower left of RJ-45 port 1.

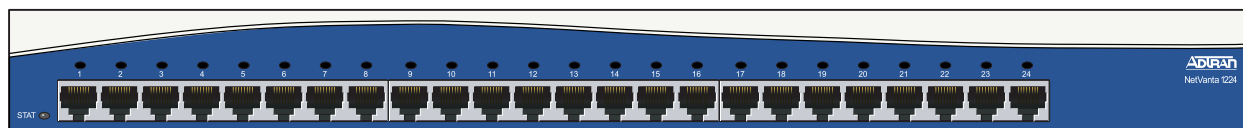


Figure 1. NetVanta 1224 Front Panel Layout

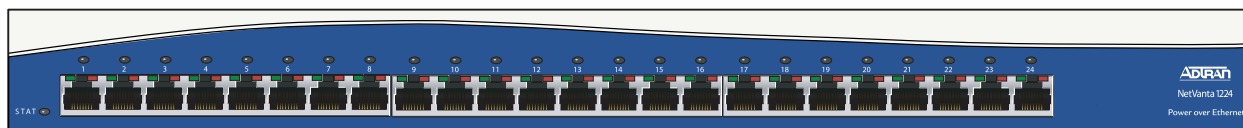


Figure 2. NetVanta 1224 PoE Front Panel Layout

NetVanta 1224 Rear Panel Design

The NetVanta 1224 and NetVanta 1224 PoE rear panel is shown below. Refer to *Appendix A* on page 67 for pinouts.



Figure 3. NetVanta 1224 and NetVanta 1224 PoE Rear Panel Layout

NetVanta 1224 Rear Panel Interfaces

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides for local management and configuration (via a DB-9 female connector).



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

Power Connection

The rear panel has a power input to the AC universal power supply. Please refer to *Supplying Power to the Unit* on page 56 for connection details.

NetVanta 1224ST

The NetVanta 1224ST and NetVanta 1224ST PoE are managed switches housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. The front panel contains 24 10/100BaseT Ethernet interfaces (RJ-45). The NetVanta 1224ST front panel contains two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard SFP slots for fiber connectivity. The NetVanta 1224ST PoE version provides the ability to detect attached PDs, and deliver 48 VDC to the PDs via existing CAT 5 cabling.

This section includes a list of features, a list of shipping contents, and a description of the unit's front and rear panel designs. For additional information, refer to the following sections:

- *Product Specifications* on page 34
- *Mounting Options* on page 54
- *Supplying Power to the Unit* on page 56

For information on switch configuration for a specific application, refer to the quick configuration documents provided on the *AOS Documentation* CD shipped with your base unit. For details on the CLI, refer to the *AOS Command Reference Guide* (also included on your CD).

NetVanta 1224ST Shipping Contents

Each NetVanta 1224ST 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 the *Repair and Replacement* section of the *Support* page on the ADTRAN website at <http://www.adtran.com/support>).

Domestic shipments of the NetVanta 1224ST include the following items:

- NetVanta 1224ST base unit
- *AOS Documentation* CD
- A detachable power cable with a grounded, three-prong plug
- *Quick Start Guide*
- Warranty card

International shipments of the NetVanta 1224ST include the following items:

- NetVanta 1224ST base unit
- *AOS Documentation* CD
- All necessary power cords
- *Quick Start Guide*
- Warranty card

NetVanta 1224ST Front Panel Design

The NetVanta 1224ST and the NetVanta 1224ST PoE front panels are shown below. *Table 1* on page 33 describes all of these LEDs, and *Appendix A* on page 67 shows the connector pinouts.

NetVanta 1224ST Front Panel Features

10/100BaseT Ethernet Interfaces

The NetVanta 1224STs contain 24 10/100BaseT Ethernet interfaces (RJ-45). These interfaces are consecutively numbered 1 through 24, from left to right, with the numbers screened directly above each port. Status LEDs for each of these interfaces are located directly over these numbers.

The NetVanta 1224ST PoE also has green and red PoE status LEDs located in the upper left and upper right corners (respectively) of each Ethernet connector.

Gigabit Ethernet Interfaces/SFP Slots

The NetVanta 1224STs also contain two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard SFP slots for fiber connectivity. (Use either the RJ-45 connectors *or* the SFP slots. The fiber slots have precedence.) 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.

Status LED

The **STAT** LED, which indicates the unit's status, is located to the lower left of RJ-45 port 1.

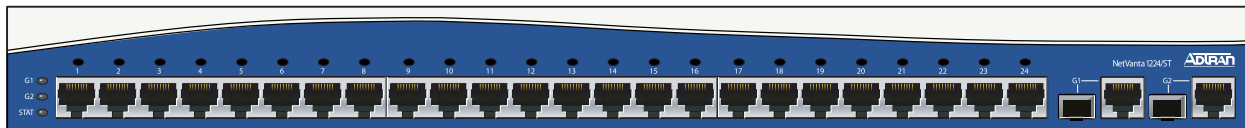


Figure 4. NetVanta 1224ST Front Panel Layout

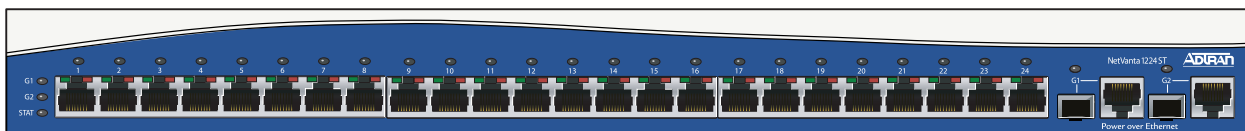


Figure 5. NetVanta 1224ST PoE Front Panel Layout

NetVanta 1224ST Rear Panel Design

The NetVanta 1224ST and NetVanta 1224ST PoE rear panel is shown below. Refer to *Appendix A* on page 67 for pinouts.



Figure 6. NetVanta 1224ST and NetVanta 1224ST PoE Rear Panel Layout

NetVanta 1224ST Rear Panel Interfaces

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides for local management and configuration (via a DB-9 female connector).



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

Power Connection

The rear panel has a power input to the AC universal power supply. Please refer to *Supplying Power to the Unit* on page 56 for connection details.

NetVanta 1224R

The NetVanta 1224R and NetVanta 1224R PoE are managed switches housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. The front panel contains 24 10/100BaseT Ethernet interfaces (RJ-45). The NetVanta 1224R PoE version provides the ability to detect attached PDs, and deliver 48 VDC to the PDs via existing CAT 5 cabling. Both units contain a single network interface module (NIM) slot on the rear panel to support 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 Serial Interface Module
- 1200936E1 SHDSL NIM, Annex A
- 1200937E1 SHDSL NIM, Annex B
- 1202869E1 ADSL NIM, Annex A
- 1202889E1 ADSL NIM, Annex B
- 1200864L1 Analog Modem DIM
- 1200865L1 ISDN BRI DIM
- 1200875L1 ISDN S/T DIM

This section includes a list of features, a list of shipping contents, and a description of the unit's front and rear panel designs. For additional information, refer to the following sections:

- *Product Specifications* on page 34
- *Mounting Options* on page 54
- *Supplying Power to the Unit* on page 56

For information on router configuration for a specific application, refer to the quick configuration documents provided on the *AOS Documentation* CD shipped with your base unit. For details on the CLI, refer to the *AOS Command Reference Guide* (also included on your CD).

NetVanta 1224R Shipping Contents

Each NetVanta 1224R and NetVanta 1224R PoE 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 the *Repair and Replacement* section of the *Support* page on the ADTRAN website at <http://www.adtran.com/support>).

Domestic shipments of the NetVanta 1224R include the following items:

- NetVanta 1224ST base unit
- *AOS Documentation CD*
- A detachable power cable with a grounded, three-prong plug
- *Quick Start Guide*
- Warranty card

International shipments of the NetVanta 1224R include the following items:

- NetVanta 1224ST base unit
- *AOS Documentation CD*
- All necessary power cords
- *Quick Start Guide*
- Warranty card

NetVanta 1224R Front Panel Design

The NetVanta 1224R and the NetVanta 1224R PoE front panels are shown below. *Table 1* on page 33 describes all of these LEDs, and *Appendix A* on page 67 shows the connector pinouts.

NetVanta 1224R Front Panel Features

10/100BaseT Ethernet Interfaces

The NetVanta 1224R and the NetVanta 1224R PoE contain 24 10/100BaseT Ethernet interfaces (RJ-45). These interfaces are consecutively numbered 1 through 24, from left to right, with the numbers screened directly above each port. Status LEDs for each of these interfaces are located directly over these numbers.

The NetVanta 1224R PoE also has green and red PoE status LEDs located in the upper left and upper right corners (respectively) of each of the Ethernet connectors.

Status LEDs

The status LEDs are located to the lower left of RJ-45 port 1. The **WAN** LED reflects the status of an installed NIM. The **DBU** LED reflects the status of an installed dial backup interface module (DIM). The **STAT** LED indicates the unit's status.

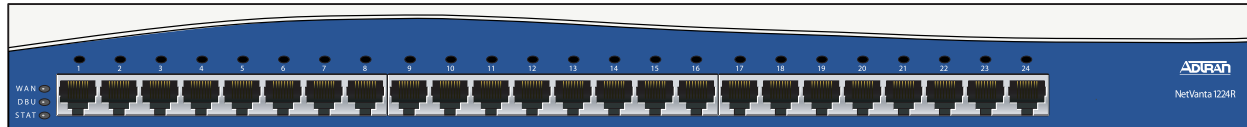


Figure 7. NetVanta 1224R Front Panel Layout

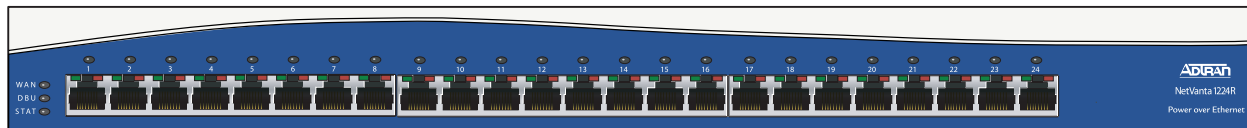


Figure 8. NetVanta 1224R PoE Front Panel Layout

NetVanta 1224R Rear Panel Design

The NetVanta 1224R and NetVanta 1224R PoE rear panel is shown below. Refer to *Appendix A* on page 67 for pinouts.



Figure 9. NetVanta 1224R and NetVanta 1224R PoE Rear Panel Layout

NetVanta 1224R Rear Panel Interfaces

NIM Option Slot

The NIM option slot accepts a variety of NIM option modules (refer to *Option Modules* on page 35).

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides for local management and configuration (via a DB-9 female connector).



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

Power Connection

The rear panel has a power input to the AC universal power supply. Please refer to *Supplying Power to the Unit* on page 56 for connection details.

NetVanta 1224STR

The NetVanta 1224STR (AC and DC versions) and NetVanta 1224STR PoE are managed switches housed in a 1U-high rack-mountable metal enclosure that includes either a universal AC or a DC power supply. The NetVanta 1224STR PoE version provides the ability to detect attached PDs, and deliver 48 VDC to the PDs via existing CAT 5 cabling. Both front panels contain 24 10/100BaseT Ethernet interfaces (RJ-45). The NetVanta 1224STR front panel contains one Gigabit Ethernet interface that provides one fixed RJ-45 connector and one standard SFP slot for fiber connectivity. The NetVanta 1224STR PoE front panel contains two Gigabit Ethernet interfaces and two standard SFP slots. Both units contain a single NIM slot on the rear panel to support the following modules:

- 1200861L1 56K/64K NIM
- 1202862L1 T1/FT1 NIM
- 1200862L2#NEBS T1/FT1 NEBS NIM (NetVanta 1224STR PoE only)
- 1202863L1 T1/FT1 + DSX-1 NIM
- 1200872L1 Dual T1 NIM
- 1200868E1/L1 E1/FE1 NIM
- 1200878E1/L1 E1/FE1 + G.703 Drop NIM
- 1200866E1 Serial Interface Module
- 1200936E1 SHDSL NIM, Annex A
- 1200937E1 SHDSL NIM, Annex B
- 1202869E1 ADSL NIM, Annex A
- 1202889E1 ADSL NIM, Annex B
- 1200864L1 Analog Modem DIM
- 1200865L1 ISDN BRI DIM
- 1200875L1 ISDN S/T DIM

This section includes a list of features, a list of shipping contents, and a description of the unit's front and rear panel designs. For additional information, refer to the following sections:

- *Product Specifications* on page 34
- *Mounting Options* on page 54
- *Supplying Power to the Unit* on page 56

For information on router configuration for a specific application, refer to the quick configuration documents provided on the *AOS Documentation* CD shipped with your base unit. For details on the CLI, refer to the *AOS Command Reference Guide* (also included on your CD).

NetVanta 1224STR Shipping Contents

Each NetVanta 1224STR and NetVanta 1224STR PoE units are shipped in their own cardboard shipping cartons. 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 the *Repair and Replacement* section of the *Support* page on the ADTRAN website at <http://www.adtran.com/support>).

Domestic shipments of the NetVanta 1224STR include the following items:

- NetVanta 1224STR base unit

- *AOS Documentation CD*
- A detachable power cable with a grounded, three-prong plug
- *Quick Start Guide*
- Warranty card

International shipments of the NetVanta 1224STR include the following items:

- NetVanta 1224STR base unit
- *AOS Documentation CD*
- All necessary power cords
- *Quick Start Guide*
- Warranty card

NetVanta 1224STR Front Panel Design

The NetVanta 1224STR and the NetVanta 1224STR PoE front panels are shown below. *Table 1* on page 33 describes all of the LEDs, and *Appendix A* on page 67 shows the connector pinouts.

NetVanta 1224STR Front Panel Features

10/100BaseT Ethernet Interfaces

The NetVanta 1224STRs contain 24 10/100BaseT Ethernet interfaces (RJ-45). These interfaces are consecutively numbered 1 through 24, from left to right, with the numbers screened directly above each port. Status LEDs for each of these interfaces are located directly over these numbers.

The NetVanta 1224STR PoE also has green and red PoE status LEDs located in the upper left and upper right corners (respectively) of each Ethernet connector.

Gigabit Ethernet Interfaces/SFP Slots

The NetVanta 1224STR front panel contains one Gigabit Ethernet interface that provides one fixed RJ-45 connector and one standard SFP slot for fiber connectivity. (Use either the RJ-45 connector *or* the SFP slot. The fiber slot has precedence.) This interface is labeled **G1**, and the status LED is located to the left of RJ-45 port 1, above the **STAT** LED.

The NetVanta 1224STR PoE front panel contains two Gigabit Ethernet interfaces and two standard SFP slots. (Use either the RJ-45 connectors *or* the SFP slots. The fiber slots have precedence.) These interfaces are labeled **G1** and **G2**, and the status LEDs are located above the SFP slots.

Status LEDs

The status LEDs are located to the lower left of RJ-45 port 1. The **WAN** LED reflects the status of an installed NIM. The **DBU** LED reflects the status of an installed DIM. The **STAT** LED indicates the unit's status.

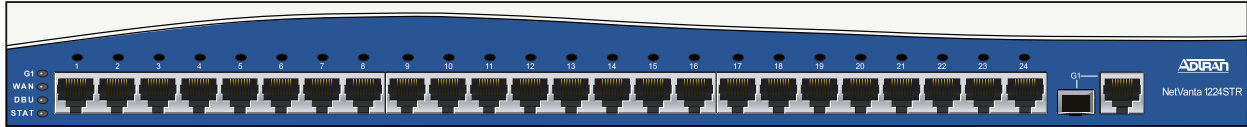


Figure 10. NetVanta 1224STR (AC) Front Panel Layout

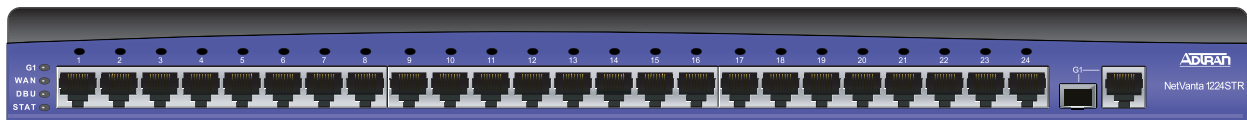


Figure 11. NetVanta 1224STR (DC) Front Panel Layout

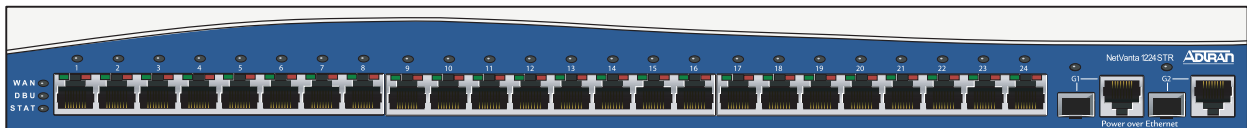


Figure 12. NetVanta 1224STR PoE Front Panel Layout

NetVanta 1224STR Rear Panel Design

The NetVanta 1224STR and NetVanta 1224STR PoE rear panels are shown below. Refer to *Appendix A* on page 67 for pinouts.



Figure 13. NetVanta 1224STR (AC) and NetVanta 1224STR PoE Rear Panel Layout

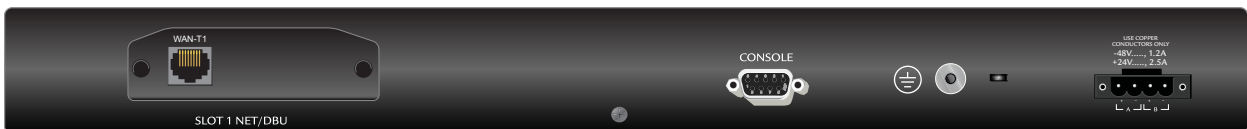


Figure 14. NetVanta 1224STR (DC) Rear Panel Layout

NetVanta 1224STR Rear Panel Interfaces

NIM Option Slot

The NIM option slot accepts a variety of NIM option modules (refer to *Option Modules* on page 35).

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides for local management and configuration (via a DB-9 female connector).



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

Power Connection

The rear panel of the NetVanta 1224STR (AC) and NetVanta 1224STR PoE have a power input for connection to an AC universal power supply. The NetVanta 1224STR (DC) connects to a centralized DC power source via a four-position power connector. Please refer to *Supplying Power to the Unit* on page 56 for connection details.

NetVanta 1335

All NetVanta 1335 Series units are managed switches, plus multiservice routers housed in a 1U-high rack-mountable metal enclosure that includes a universal AC power supply. The NetVanta 1335 PoE and NetVanta 1335 WiFi PoE provide the ability to detect attached PDs, and deliver 48 VDC to the PDs via existing CAT 5 cabling. The NetVanta 1335 WiFi Series units operate as wireless bridges for local area networks (LANs). A dual radio design with two dual-band external antennas is used to support concurrent 802.11a and 802.11b/g connections. The NetVanta 1335 Series front panels contain 24 10/100BaseT Ethernet interfaces and two Gigabit Ethernet interfaces accessed via a fixed RJ-45 connector or SFP slots for fiber connectivity. The NetVanta 1335 WiFi Series front panels contain 24 10/100BaseT Ethernet interfaces and one Gigabit Ethernet interface accessed via a fixed RJ-45 connector or SFP slot. All NetVanta 1335 Series units include IPSec VPN support (without further software upgrades) and expandable memory via CompactFlash and SODIMM slots. NetVanta 1335 Series units also contain one NIM slot on the rear panel to support the following modules in data applications:

- 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 Serial Interface Module
- 1200936E1 SHDSL NIM, Annex A
- 1200937E1 SHDSL NIM, Annex B
- 1202869E1 ADSL NIM, Annex A
- 1202889E1 ADSL NIM, Annex B
- 1700801G1 3G CDMA NIM, 1xRTT, 1xEV-DO Revision 0, 1xEV-DO Revision A
- 1200864L1 Analog Modem DIM
- 1200865L1 ISDN BRI DIM
- 1200875L1 ISDN S/T DIM

This section includes a list of features, a list of shipping contents, and a description of the front and rear panel designs. For additional information, refer to the following sections:

- *Product Specifications* on page 34
- *Mounting Options* on page 54
- *Supplying Power to the Unit* on page 56

For information on router configuration for a specific application, refer to the quick configuration documents provided on the *AOS Documentation* CD shipped with your base unit. For details on the CLI, refer to the *AOS Command Reference Guide* (also included on your CD).

NetVanta 1335 Shipping Contents

Each NetVanta 1335 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 the *Repair and Replacement* section of the *Support* page on the ADTRAN website at <http://www.adtran.com/support>).

Domestic shipments of the NetVanta 1335 include the following items:

- NetVanta 1335 base unit
- *AOS Documentation* CD
- Two dual-band RP-SMA detachable antennas (NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE only)
- A detachable power cable with a grounded, three-prong plug
- *Quick Start Guide*
- Warranty card

International shipments of the NetVanta 1335 include the following items:

- NetVanta 1335 base unit
- *AOS Documentation* CD
- Two dual-band RP-SMA detachable antennas (NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE only)
- All necessary power cords
- *Quick Start Guide*
- Warranty card

NetVanta 1335 Front Panel Design

The NetVanta 1335 Series front panels are shown on page 29. *Table 1* on page 33 describes all of the LEDs, and *Appendix A* on page 67 shows the connector pinouts.

NetVanta 1335 Front Panel Features

10/100BaseT Ethernet Interfaces

The NetVanta 1335 Series units contain 24 10/100BaseT Ethernet interfaces (RJ-45). These interfaces are consecutively numbered 1 through 24, from left to right, with the numbers screened directly above each port. Status LEDs for each of these interfaces are located directly over these numbers.

Gigabit Ethernet Interfaces/SFP Slots

The NetVanta 1335 and NetVanta 1335 PoE contain two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard SFP slots for fiber connectivity. These interfaces are labeled **G1** and **G2**, and the status LEDs are located above the SFP slots. The NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE contain one Gigabit Ethernet interface that provides one fixed RJ-45 connector and one standard SFP slot for fiber connectivity. This interface is labeled **G1**, and the status LED is located above the SFP slot. (Use either the RJ-45 connector *or* the SFP slot. The fiber slot has precedence.)

Status LEDs

The status LEDs are located to the lower left of RJ-45 port 1. The **WLAN** LED (NetVanta 1335 WiFi Series only) reflects the status of the wireless network. The **WAN** LED reflects the status of an installed NIM. The **DBU** LED reflects the status of an installed DIM. The **STAT** LED indicates the unit's status.

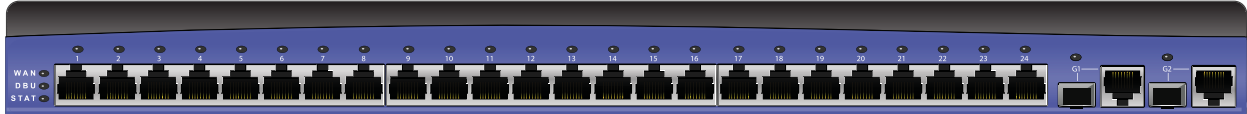


Figure 15. NetVanta 1335 Front Panel Layout

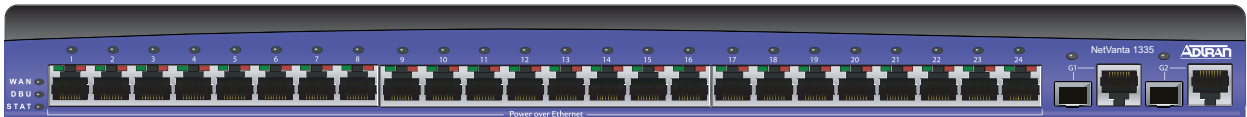


Figure 16. NetVanta 1335 PoE Front Panel Layout



Figure 17. NetVanta 1335 WiFi Front Panel Layout

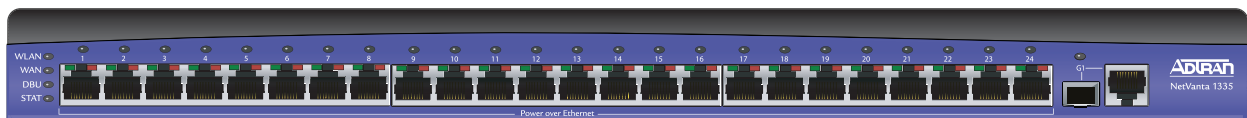


Figure 18. NetVanta 1335 WiFi PoE Front Panel Layout

NetVanta 1335 Rear Panel Design

The NetVanta 1335 Series rear panels are shown below. Refer to *Appendix A* on page 67 for pinouts.

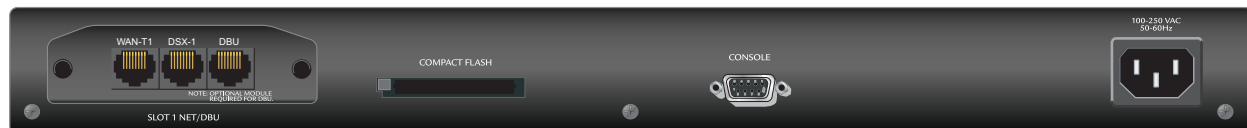


Figure 19. NetVanta 1335 and NetVanta 1335 PoE Rear Panel Layout



Figure 20. NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE Rear Panel Layout

NetVanta 1335 Rear Panel Interfaces

NIM Option Slot

The NIM option slot accepts a variety of NIM option modules (refer to *Option Modules* on page 35).

CompactFlash

The CompactFlash slot supplies nonvolatile configuration and compressed code storage. The NetVanta 1335 supports only ADTRAN-provided CompactFlash (16 MB to 1 GB) (refer to the part number on the front cover of this manual).

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides for local management and configuration (via a DB-9 female connector).



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

Antenna Connectors

The **ANT 1** and **ANT 2** ports (NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE only) support two dual-band antennas for concurrent 802.11a and 802.11b/g connections.

Power Connection

The rear panel has a power input to the AC universal power supply. Please refer to *Supplying Power to the Unit* on page 56 for connection details.

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 front panel contains 24 10/100/1000BaseT Ethernet interfaces that are accessed via standard RJ-45 connectors. Four of these twenty-four interfaces can be used in either copper or fiber mode. Four industry standard SFP slots (supporting industry standard SFP modules) are available for high-speed uplink or stacking requirements. The switch is managed through an EIA-232 **CONSOLE** port (DB-9).

This section includes a list of features, a list of shipping contents, and a description of the unit's front and rear panel designs. For additional information, refer to the following sections:

- *Product Specifications* on page 34
- *Mounting Options* on page 54
- *Supplying Power to the Unit* on page 56

For information on switch configuration for a specific application, refer to the quick configuration documents provided on the *AOS Documentation* CD shipped with your base unit. For details on the CLI, refer to the *AOS Command Reference Guide* (also included on your CD).

NetVanta 1524ST Shipping Contents

Each NetVanta 1524ST 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 the *Repair and Replacement* section of the *Support* page on the ADTRAN website at <http://www.adtran.com/support>).

Domestic shipments of the NetVanta 1524ST include the following items:

- NetVanta 1524ST base unit
- *AOS Documentation CD*
- A detachable power cable with a grounded, three-prong plug
- *Quick Start Guide*
- Warranty card

International shipments of the NetVanta 1524ST include the following items:

- NetVanta 1524ST base unit
- *AOS Documentation CD*
- All necessary power cords
- *Quick Start Guide*
- Warranty card

NetVanta 1524ST Front Panel Design

The NetVanta 1524ST front panel is shown below. *Table 1* on page 33 describes all of the LEDs, and *Appendix A* on page 67 shows the connector pinouts.

NetVanta 1524ST Front Panel Features

10/100/1000BaseT Ethernet Interfaces

The NetVanta 1524ST front panel contains 24 10/100/1000BaseT Ethernet interfaces (RJ-45). These interfaces are consecutively numbered 1 through 24, from left to right, with the numbers screened directly above each port. Status LEDs for each of these interfaces are located directly over these numbers.

SFP Slots

The NetVanta 1524ST front panel contains four standard SFP slots for fiber connectivity. These interfaces are numbered 21 through 24. Status LEDs for each of these slots are located directly over these numbers.

Status LEDs

The status LEDs are located to the lower left of RJ-45 port 1. The **STK** LED indicates whether the unit is a member of a stack. The **STAT** LED indicates the unit's status.

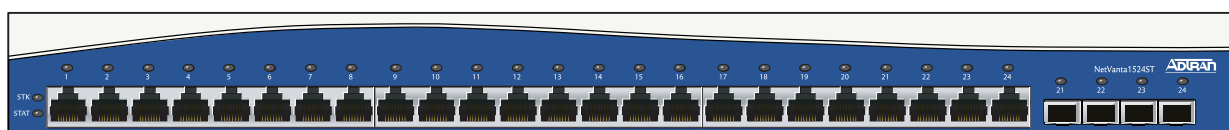


Figure 21. NetVanta 1524ST Front Panel Layout

NetVanta 1524ST Rear Panel Design

The NetVanta 1524ST rear panel is shown below. Refer to *Appendix A* on page 67 for pinouts.



Figure 22. NetVanta 1524ST Rear Panel Layout

NetVanta 1524ST Rear Panel Interfaces

10/100BaseT Ethernet Interface

The Ethernet port (**ETH 0/0**) is an RJ-45 connector. The Ethernet port provides the following:

- 10BaseT or 100BaseT with a single connector
- Auto-negotiation
- CSMA/CD
- IEEE 802.3 compatibility

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides for local management and configuration (via a DB-9 female connector).



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

Power Connection

The rear panel has a power input to the AC universal power supply. Please refer to *Supplying Power to the Unit* on page 56 for connection details.

Table 1. Front Panel LED Descriptions

LED	Color	Indication
STAT	Off	Unit is not receiving power.
	Green (solid)	Power is on and self-test passed.
	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.
	Red (solid)	Power is on, but the self-test failed or the boot code could not be booted.
STK (1524ST only)	Off	Unit is not a member of a stack.
	Green (solid)	Unit is 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 connection.
	Green (solid)	Port is enabled and has a connection.
	Amber (flashing)	Port has activity (transmit or receive).
DBU (1224R, 1224STR, and 1335 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.
	Amber (solid)	Unit is in test.
	Red (solid)	Alarm condition is occurring on the DBU interface, or there is a self-test failure.
WAN (1224R, 1224STR, and 1335 only)	Off	No NIM is installed, or interface is administratively down.
	Green (solid)	NIM is up and everything is operational.
	Green (flashing)	Port has activity (transmit or receive).
	Amber (solid)	Unit is in test.
	Red (solid)	Alarm condition is occurring on the WAN interface, or there is a self-test failure.
Power over Ethernet Status LEDs (PoE units only)	Green (solid)	Power is being applied (48 V) to the interface.
	Red (solid)	Fault is detected on the interface.
WLAN (1335 WiFi and 1335 WiFi PoE)	Off	WLAN is inactive or disabled.
	Green (solid)	WLAN card is enabled and active.
	Amber (flashing)	Activity (transmit or receive) is detected on the WLAN.

3. PRODUCT SPECIFICATIONS

	1224	1224ST	1224STR (AC)	1224STR (DC)	1224STR PoE	1224R	1335, 1335 PoE	1335 WiFi Series	1524ST
Physical Interfaces									
10/100BaseT Ethernet interfaces on the front panel	24	24	24	24	24	24	24	24	0
1000BaseT Gigabit Ethernet interfaces on the front panel (SFP slots for fiber connectivity/RJ-45 connectors for copper connectivity)	0	2	1	1	2	0	2	1	24
Integrated DB-9, EIA-232 console port (DCE) on the rear panel	1	1	1	1	1	1	1	1	1
Modular network interface on the rear panel	N/A	N/A	1	1	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 PoE and 1335 PoE Series are 12.8-inches deep.)	✓	✓	✓	✓	✓	✓	✓	✓	✓
10/100BaseT Ethernet: 24 ganged RJ-45 jacks	✓	✓	✓	✓	✓	✓	✓	✓	
10/100/1000BaseT Ethernet: SFP slots/standard RJ-45 jacks	0	2	1	1	1	0	2	1	24
Console Port: DB-9, female	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dual-band Antenna Connections	0	0	0	0	0	0	0	2	0
CompactFlash							✓	✓	
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	✓	✓	✓	✓	✓	✓	✓	✓	✓

4. OPTION MODULES

The NetVanta 1224STR, 1224R, and 1335 support several option modules designed to meet a variety of networking requirements. The option modules include plug-in NIMs and plug-on DIMs.

NIMs are cards that 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 36
- *NetVanta T1/FT1 NIM (P/N 1202862L1)* on page 37
- *NetVanta T1/FT1 NEBS NIM (P/N 1200862L2#NEBS)* on page 38
- *NetVanta T1/FT1 + DSX-1 NIM (P/N 1202863L1)* on page 39
- *NetVanta Dual T1 NIM (P/N 1200872L1)* on page 40
- *NetVanta E1/FE1 NIM (P/N 1200868E1/L1)* on page 41
- *NetVanta E1/FE1 + G.703 Drop NIM (P/N 1200878E1/L1)* on page 42
- *NetVanta Serial NIM (P/N 1200866E1)* on page 43
- *NetVanta SHDSL NIM, Annex A (P/N 1200936E1)* on page 44
- *NetVanta SHDSL NIM, Annex B (P/N 1200937E1)* on page 45
- *NetVanta ADSL NIM, Annex A (P/N 1202869E1)* on page 46
- *NetVanta ADSL NIM, Annex B (P/N 1202889E1)* on page 47
- *NetVanta 3G CDMA NIM (P/N 1700801G1)* on page 48

DIMs are plug-on cards that 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 interfaces on the NIM to be active. The NetVanta supports the following DIMs:

- *NetVanta Analog Modem DIM (P/N 1200864L1)* on page 50
- *NetVanta ISDN BRI DIM (P/N 1200865L1)* on page 51
- *NetVanta ISDN S/T DIM (P/N 1200875L1)* on page 52

This section describes each module, providing individual card specifications and features. Refer to *Connector Pin Definitions* on page 67 for pinout information. *Installing Dial Backup and Network Interface Modules* on page 57 provides information on card installation.

Network Interface Modules

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

The 56K/64K NIM (shown in Figure 23) provides a DDS WAN interface for the NetVanta. This module provides a single 56K or 64K DDS network interface. See *Table A-5* on page 69 for the WAN-DDS connector pinouts, and page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.



Figure 23. 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* 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

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

The T1/FT1 NIM (shown in Figure 24) provides a T1 WAN interface for the NetVanta. This module provides a full T1 or fractional T1 network interface. See *Table A-6* on page 69 for the WAN-T1 connector pinouts, and page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

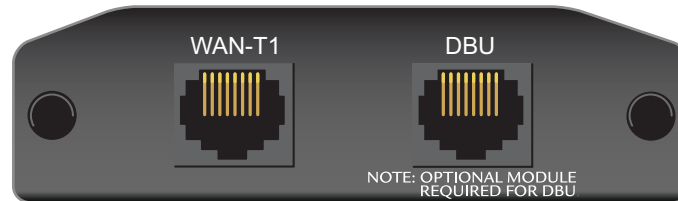


Figure 24. NetVanta T1/FT1 NIM

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 \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

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* 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

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

The T1/FT1 NEBS NIM (see Figure 25) 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 69 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 25. 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 \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

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* 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

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

The T1/FT1 + DSX-1 NIM (see Figure 26) 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 69 for the WAN-T1 connector, *Table A-8* on page 70 for the DSX-1 connector, and page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

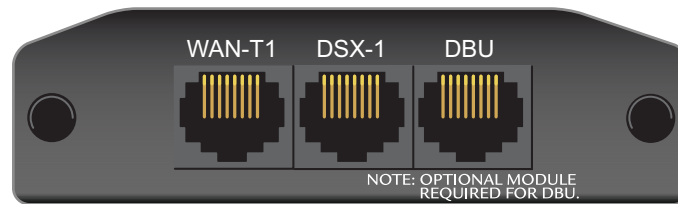


Figure 26. NetVanta T1/FT1 + DSX-1 NIM

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 \pm 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* 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

NetVanta Dual T1 NIM (P/N 1200872L1)

The NetVanta Dual T1 NIM (see Figure 27) provides two T1 WAN interfaces for the NetVanta. See *Table A-6* on page 69 for the pinouts. See page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

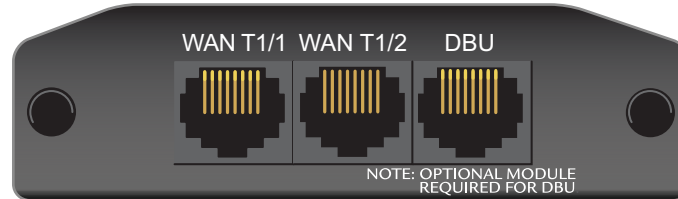


Figure 27. NetVanta Dual T1 NIM

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, 2¹⁵ - 1, 2²⁰ - 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* 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

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

The NetVanta E1/FE1 module (see Figure 28) 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. See *Table A-7* on page 69 for the pinouts. See page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

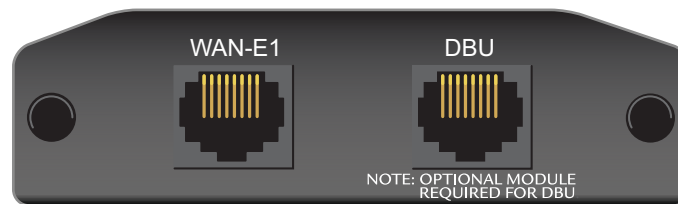


Figure 28. NetVanta E1/FE1 NIM

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 \pm 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* 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

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

The NetVanta E1/FE1 + G.703 Drop NIM (see Figure 29) provides a single WAN-E1 interface (2.043 Mbps) with user-selectable TS0 assignment, and a G.703 drop port that may be used to drop and insert traffic to an E1 PBX. See *Table A-7* on page 69 for the WAN-E1 pinouts. See *Table A-9* on page 70 for the G.703 pinouts. See page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.

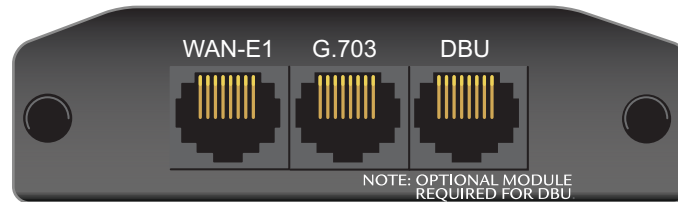


Figure 29. NetVanta E1/FE1 + G.703 Drop NIM

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 \pm 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 \pm 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* 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

NetVanta Serial NIM (P/N 1200866E1)

The NetVanta Serial NIM (shown in Figure 30) 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 71 for the serial connector pinouts, and page 73 for the DBU connector pinouts. An optional DIM is required for dial backup applications.



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

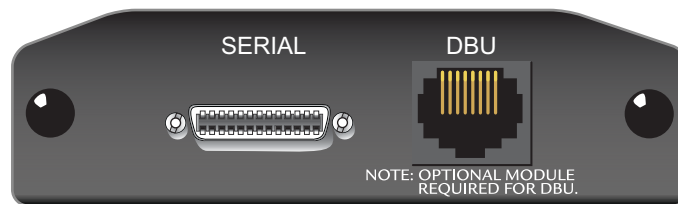


Figure 30. NetVanta Serial NIM

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* 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

NetVanta SHDSL NIM, Annex A (P/N 1200936E1)

The NetVanta SHDSL NIM, Annex A (shown in Figure 31) provides a WAN SHDSL interface for the NetVanta. See *Table A-10* on page 70 for the SHDSL connector pinouts.



Figure 31. NetVanta SHDSL NIM, Annex A
Features and Specifications

Operating Mode

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

SHDSL Interface

- Supported Standards: ITU-T G.991.2 SHDSL, Annex A
M-pair bonding of 2 pairs - ITU.T G.991.2
- Line Rate (2-wire mode): 192 to 2304 kbps in 64k increments
- Line Rate (4-wire mode): 384 to 4608 kbps in 128k increments
- Payload: ATM (AAL5)
- Line Code: TC-PAM
- Connector: RJ-45

Clock Source

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

Diagnostics

- 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* on page 6.
- ACTA/FCC Part 68
- UL/CUL 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

NetVanta SHDSL NIM, Annex B (P/N 1200937E1)

The NetVanta SHDSL NIM, Annex B (shown in Figure 32) provides a WAN SHDSL interface for the NetVanta. See *Table A-10* on page 70 for the SHDSL connector pinouts.

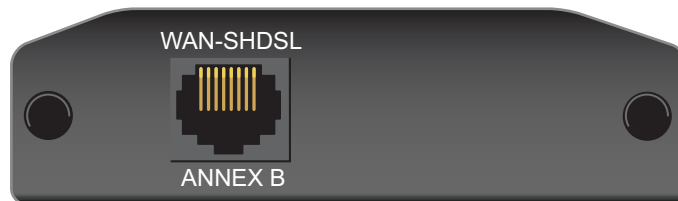


Figure 32. NetVanta SHDSL NIM, Annex B

Features and Specifications

Operating Mode

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

SHDSL Interface

- Supported Standards: ITU-T G.991.2 SHDSL, Annex B
M-pair bonding of 2 pairs - ITU.T G.991.2
- Line Rate (2-wire mode): 192 to 2304 kbps in 64k increments
- Line Rate (4-wire mode): 384 to 4608 kbps in 128k increments
- Payload: ATM (AAL5)
- Line Code: TC-PAM
- Connector: RJ-45

Clock Source

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

Diagnostics

- 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* on page 6.
- AS/ACIF S043
- EN 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

NetVanta ADSL NIM, Annex A (P/N 1202869E1)

The NetVanta ADSL NIM, Annex A (see Figure 33) 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 71 for the pinouts. The ADSL NIM supports an optional DIM for dial backup applications. See page 73 for the DBU connector pinouts.

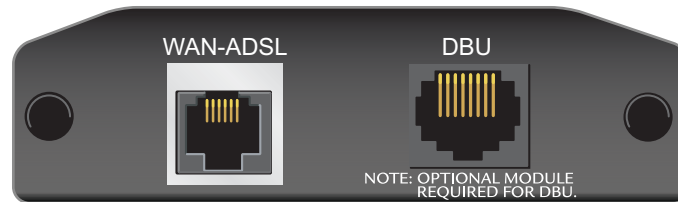


Figure 33. NetVanta ADSL NIM, Annex A

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* 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

NetVanta ADSL NIM, Annex B (P/N 1202889E1)

The NetVanta ADSL NIM, Annex B (see Figure 34) adds ADSL capability to the NetVanta. See *Table A-11* on page 71 for the pinouts. The ADSL NIM supports an optional DIM for dial backup applications. See page 73 for the DBU connector pinouts.

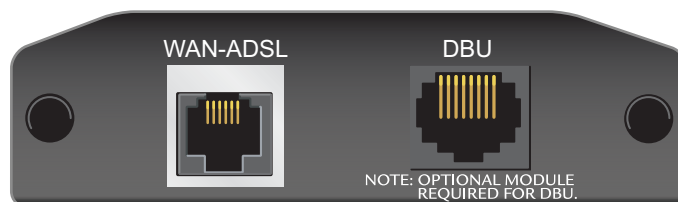


Figure 34. NetVanta ADSL NIM, Annex B

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* 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

NetVanta 3G CDMA NIM (P/N 1700801G1)

The NetVanta 3G CDMA NIM (shown in Figure 35) provides a cellular interface for the NetVanta 1335 and NetVanta 1335 PoE. Refer to *Installing the 3G CDMA NIM Antennas* on page 62 for information about the specifications and installation of the 3G CDMA NIM antennas. For specific connection and configuration instructions, refer to the *3G CDMA NIM Quick Start Guide* or the *3G NIM Configuration Guide* available on the *AOS Documentation CD* shipped with the base unit or on the Web at www.adtran.com.



Figure 35. NetVanta 3G CDMA NIM

Features and Specifications

Wireless Technologies

- 1xRTT
- 1xEV-DO Rev 0
- 1xEV-DO Rev A

Frequency Bands

- Band Class 0 (Cellular 800 MHz)
- Band Class 1 (PCS 1.9 GHz)

Compliance

- FCC Part 15, Class A
- FCC Parts 2, 22, 24
- UL/CUL 60950-1
- RSS 102
- RSS 129/133
- RSS 132/133
- IC ES-003

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
- Standard SMA antenna connectors

Table 2. 3G CDMA NIM LED Descriptions

LED Label	LED Color	Indication
WWAN	Off	3G modem is not powered.
	Green (solid)	3G modem is powered, associated, and authenticated, but not transmitting or receiving.
	Green (slow flash)	3G modem is powered and searching, but not associated or authenticated.
	Green (intermittent flash)	3G modem activity proportional to transmitting/receiving speed (3 Hz minimum rate, 20 Hz maximum rate).
RSSI (Received Signal Strength Indication)	Off	No service or no signal detected.
	Red (solid)	Low signal strength.
	Amber (solid)	Medium signal strength.
	Green (solid)	High signal strength.
1xRTT	Off	No 1xRTT service is available.
	Green (solid)	1xRTT service is available.
EVDO	Off	No 1xEV-DO service is available.
	Green (solid)	1xEV-DO service is available.

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 57.

Features and Specifications

Features

- Supported Standards: ITU V.90
- Async

Compliance

- EMC - see *Electromagnetic Compatibility (EMC) Table* 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.*

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 57.

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 *Electromagnetic Compatibility (EMC) Table* 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

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

The NetVanta ISDN S/T DIM provides dial backup access to the 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 57.

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 *Electromagnetic Compatibility (EMC) Table* 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

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 54
- *Supplying Power to the Unit* on page 56
- *Installing Dial Backup and Network Interface Modules* on page 57
- *Installing the NetVanta VPN Accelerator Card (included in P/N 4200368L1)* on page 60

For information on configuring a specific application, refer to the quick configuration documents provided on the *AOS Documentation CD*, or the *AOS Command 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 (rack-mounted applications only)



*To access the 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 **AOS Command Reference Guide** (provided on the **AOS Documentation CD**).*

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 for your NetVanta 1224STR, install it first (refer to **Installing the NetVanta VPN Accelerator Card (included in P/N 4200368L1)** on page 60).*

Rack Mounting the NetVanta

The NetVanta is a 1U-high, rack-mountable unit that 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 <i>Supplying Power to the Unit</i> on page 56).




Be careful not to compromise 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 36).
2	Decide on a location for the NetVanta. All NetVanta 1000 and 1000R Series units are mounted with the front panel facing down (see Figure 36). 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. <i>Important! Mounting to a stud ensures stability. Using sheetrock anchors may not provide sufficient long-term stability.</i>
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 36).
5	Proceed to the steps given in <i>Supplying Power to the Unit</i> on page 56.

 <p>CAUTION</p>	<p><i>To avoid damaging the unit, use only the screws included in the shipment when attaching mounting ears to the chassis.</i></p>
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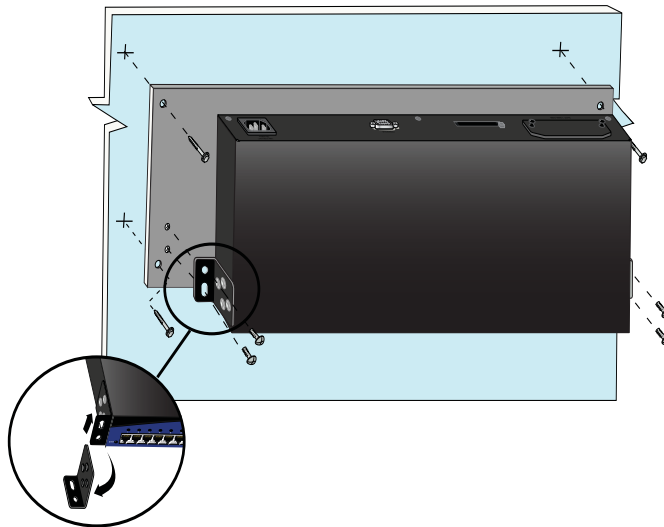


Figure 36. Wallmount Installation

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.

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 37* on page 57). 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 <i>Figure 37</i> on page 57.
3	If using a backup power source, connect it to input B of the power connector.

 <p>CAUTION</p>	<ul style="list-style-type: none"> • <i>Power to the NetVanta 1224STR DC System must be from a reliably grounded 24 or 48 VDC.</i> • <i>Use only copper conductors when making power connections.</i> • <i>Install unit in accordance with the requirements of NEC NFPA 70.</i> • <i>The branch circuit overcurrent protection shall be a fuse or circuit breaker rated minimum 48 VDC, maximum 10 A.</i> • <i>A readily accessible disconnect device, that is suitably approved and rated, shall be incorporated in the field wiring.</i> • <i>Maximum recommended ambient operating temperature is 50°C.</i>
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 <p>CAUTION</p>	<p><i>The 10/100BaseT and Gigabit Ethernet interfaces MUST NOT be metallically connected to interfaces that 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.</i></p>
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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 37. Grounding the NetVanta 1224STR (DC)

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 38 on page 58 and Figure 39 on page 59.

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.



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, 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. <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 38.
4	Slide the NIM with the DIM attached into the NetVanta chassis, continuing with the normal NIM installation (refer to <i>Instructions for Installing the NIMs</i> on page 59).

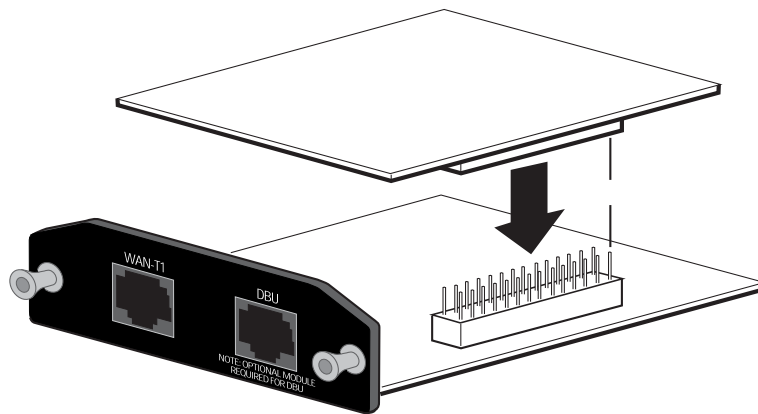


Figure 38. Installing DIMs

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 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.

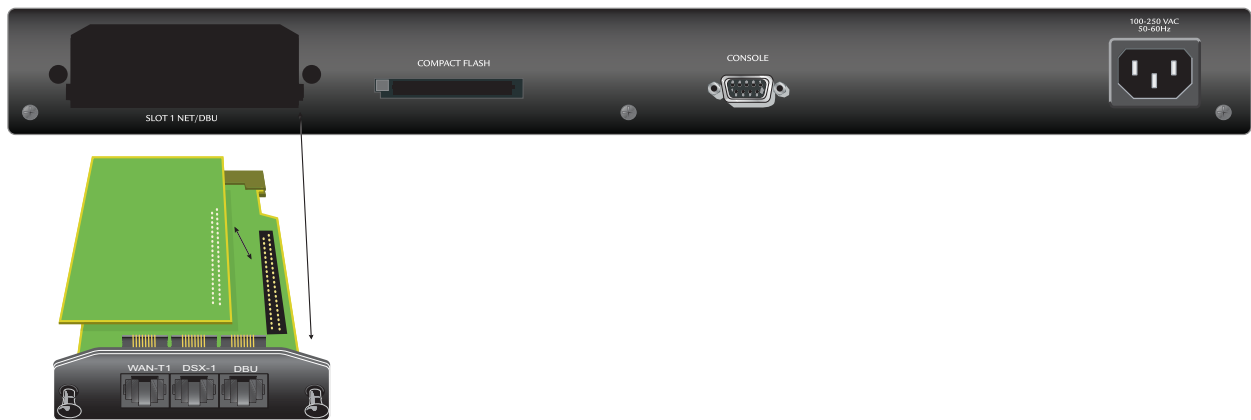


Figure 39. NIM and DIM Installation

Installing the NetVanta VPN Accelerator Card (included in P/N 4200368L1)

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.



The AOS Enhanced Feature Pack software is required to take advantage of the VPN acceleration features of this card.



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 40).
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 PCI 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.

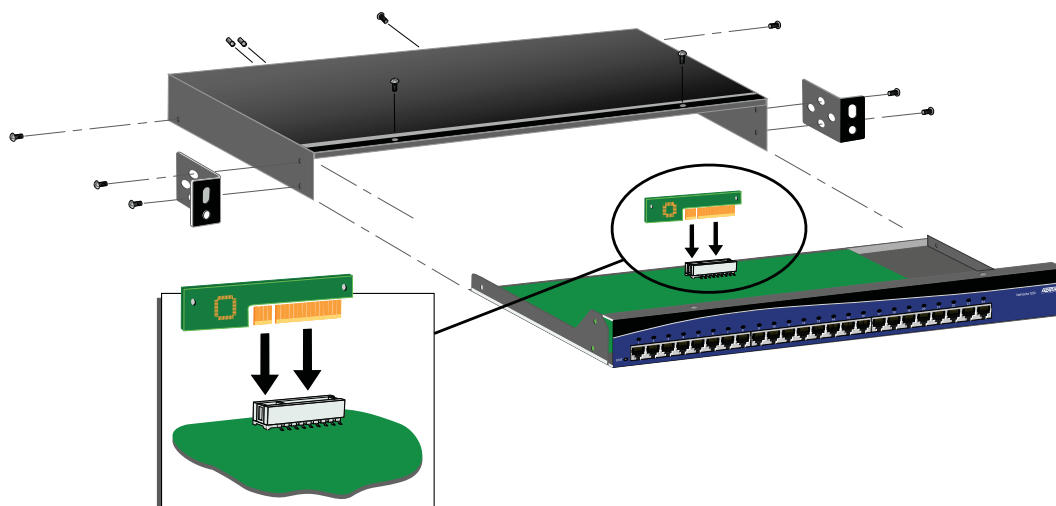


Figure 40. NetVanta VPN Accelerator Card Installation

Installing a CompactFlash Card (NetVanta 1335 Series only)

The **CompactFlash** slot on the NetVanta 1335 Series supports CompactFlash cards (16 MB to 1 GB). ADTRAN supports only ADTRAN-provided CompactFlash (16 MB to 1 GB) (refer to the list of part numbers on the front cover). Follow these instructions when installing a card.



The CompactFlash card is hot-swappable and can be inserted or removed while power is applied to the unit.

Instructions for Installing a CompactFlash Card

Step	Action
1	Slide the module into the CompactFlash slot until the card is firmly seated against the chassis.
2	The CompactFlash options will now be available in the GUI and the AOS CLI.



Figure 41. CompactFlash Card Installation

Installing Wireless Access Antennas (NetVanta 1335 WiFi and NetVanta 1335 WiFi PoE only)

The NetVanta 1335 WiFi Series units are shipped with two dual-band RP-SMA detachable antennas. These must be installed before operating the unit.

Instructions for Installing Antennas	
Step	Action
1	Place either of the two antennas directly onto the antenna port labeled ANT 1 on the rear panel. See Figure 20 on page 29 for port locations.
2	Twist the antenna onto the threads until it is secure.
3	Repeat Step 2 with the second antenna, attaching it to the ANT 2 port.

Installing the 3G CDMA NIM Antennas

The optional 3G CDMA NIM is installed into the rear panel of the base unit following the instructions on page 57. The 3G NIM ships with two detachable dual-band dipole antennas (one primary antenna and one diversity antenna). These must be installed before attempting to connect to a cellular network. Figure 42 shows the antenna connectors on the 3G NIM rear panel.

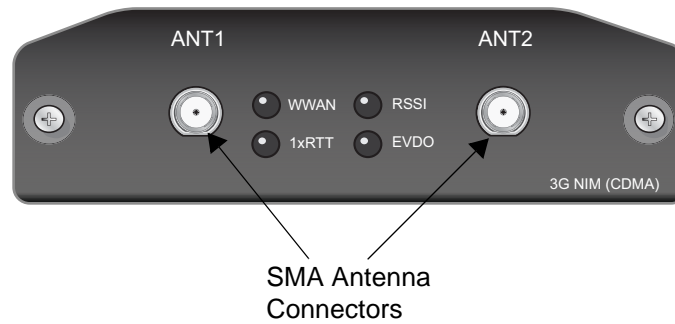


Figure 42. 3G CDMA NIM Rear Panel

Notification for Devices with Detachable Antennas

The 3G CDMA NIM has been designed to operate in the 800/1900 frequency CDMA bands with the dual-band dipole antennas shipped with the card. Antennas that do not match the following antenna specifications are strictly prohibited for use with this device. The required antenna impedance is 50 ohms. Table 3 describes the specifications of the primary antenna (transmit and receive). Table 4 describes the specifications of the diversity antenna (receive only). Table 5 describes the antenna-to-antenna requirements.



To reduce potential radio interference to other users, the antenna type and its gain should be chosen so that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

Table 3. Primary Antenna Specifications

Description	Minimum	Maximum	Unit
Peak Antenna Gain	1.0		dBi
Average Gain	-3.0		dBi
Efficiency	-4.0 (40)		dB (%)
Polarization (Ratio Gv: Gh)	0.0		dB
Input VSWR		2.5:1	
Average Power Handling	2.0		watts

Table 4. Diversity Antenna Specifications

Description	Minimum	Maximum	Unit
Average Gain	-9.0		dBi
Efficiency	-10.0 (10)		dB (%)
Polarization (Ratio Gv: Gh)	0.0		dB
Input VSWR		2.5:1	

Table 5. Antenna-to-Antenna Requirements

Description	Minimum	Maximum	Unit
Isolation		-8.0	dB
Fading Correlation Coefficient		0.5	dB (%)



This device has been designed to operate with the antennas listed below, and having a maximum gain of 2 dB. Antennas not included in this list or having a gain greater than 2 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

*Proper antennas are:
Pulse/Larson Dipole Antenna
Part Number: SPDA24850/1900*

Antenna Extensions

Coaxial cable can be connected to the standard SMA antenna connectors to extend the placement distance of the antennas from the 3G NIM base unit. Using cables introduces signal loss in the antenna system, but can be minimized by minimizing the length of cable used and using low-loss or ultralow-loss antenna cables. Cables that do not match the antenna specifications are strictly prohibited for use with this device.



Using improper cables may hinder the ability of the 3G NIM to communicate with a cellular network. Refer to the documentation accompanying your cables to ensure you have the right cables for this usage and that the cables meet the requirements specified above.

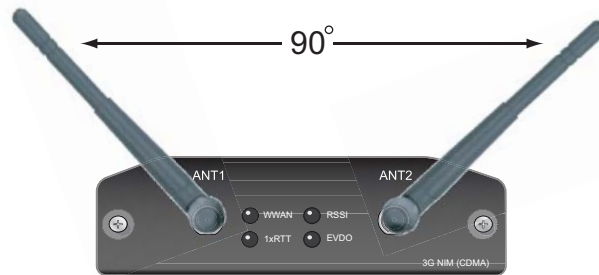
Additional Warnings

The following are guidelines and warnings for wireless access devices.

1. Do not operate RF devices in an environment that may be susceptible to radio interference resulting in danger, specifically:
 - Areas where prohibited by law.
 - Areas where explosive atmospheres may be present.
 - Areas where medical or life support equipment may be present.
 - On an aircraft, either on the ground or airborne.
 - While operating a vehicle.
2. Do not touch or move antennas while the unit is transmitting. Do not hold any unit containing a radio so that the antenna is close to, or touching, exposed parts of the body while the unit is transmitting.
3. The antennas and units are designed to operate in an indoor environment only.
4. Avoid connecting or disconnecting cables during periods of lightning activity.
5. When handling the 3G NIM and antennas, wear grounding straps to avoid ESD damage to the card. Touching the rear panel with your hand or any metal tool can result in a shock.
6. Always disconnect the power to the unit before handling the NIM card, antennas, or cables.

Antenna Installation Instructions

Instructions for Installing the 3G NIM Antennas	
Step	Action
1	Remove power from the base unit.
2	Place either of the two antennas directly onto the antenna port labeled ANT1 on the rear panel.
3	Using the thumb screws only, carefully thread the antenna onto the connector until it is secure.
4	Repeat Step 2 with the second antenna, attaching it to the ANT2 (diversity) port.
5	Once both antennas are secured, the antennas can be flexed at the joint to increase reception.
6	Position antennas in a "V" shape at a 90 degree angle to each other, as shown in Figure 43.

**Figure 43. Proper Antenna Alignment**

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 the *AOS Documentation CD*. For details on the CLI, refer to the *AOS Command Reference Guide* (also included on your CD).

APPENDIX A. CONNECTOR PIN DEFINITIONS

The following tables provide the pin assignments for the base unit, NIMs, and 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	TGND	11	RGND
2	TX FAULT	12	RX-
3	TX DISABLE	13	RX+
4	MOD DEF(2)	14	RGND
5	MOD DEF(1)	15	VccR
6	MOD DEF(0)	16	VccT
7	RATE SELECT	17	TGND
8	LOS	18	TX+
9	RGND	19	TX-
10	RGND	20	TGND

Table A-3. 10/100Base-T 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. 1000Base-T 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

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

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	T2	Loop 2–Tip
2	R2	Loop 2–Ring
3	—	Unused
4	T1	Loop 1–Tip
5	R1	Loop 1–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

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
19-25	N/A	N/A	N/A	Unused
26	B	8	7	Ground

Table A-13. Analog Station (FXS) and Analog Trunk (FXO) Port Pinouts

Pin	Name	Description
1, 2	—	Unused
3	Ring	Ring lead of the 2-wire interface
4	Tip	Tip lead of the 2-wire interface
5, 6	—	Unused

Dial Backup Interface Module Pinouts (DBU Connector)



An optional DIM is required for dial backup applications.

Table A-14. 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-15. 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

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