NetVanta 7000 Series
Hardware Installation Guide

1700706G1	NetVanta 7060 PoE
1200796E1	NetVanta 7100 PoE
1200690E1	NetVanta Quad FXS Voice Interface Module
1202691G1	NetVanta Quad FXO Voice Interface Module
1202692G1	NetVanta Dual FXS/FXO Voice Interface Module
1200695L1	NetVanta T1/PRI Voice Interface Module
1200696G1	NetVanta E1/PRI Voice Interface Module
1202862L1	NetVanta T1/FT1 Network Interface Module
1200872L1	NetVanta Dual T1 Network Interface Module
1200868E1	NetVanta E1/FE1 Network Interface Module
1200878E1	NetVanta E1/FE1 + G.703 Network Interface Module
1202869E1	NetVanta ADSL Network Interface Module, Annex A
1200852G1	CompactFlash®, 1 GB

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

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

Conventions

Notes provide additional useful information.

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

WARNING

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

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.

If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your qualified service personnel:

1. The power cable, extension cable, or plug is damaged.
2. An object has fallen into the product.
3. The product has been exposed to water.
4. The product has been dropped or damaged.
5. The product does not operate correctly when you follow the operating instructions.

These units contain no user-serviceable parts. They should only be serviced by qualified service personnel.

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 document NetVanta Safety and Regulatory Information available online at http://supportforums.adtran.com.

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
1202862L1	US: HDCDENAN1202862L1	1.544 Mbps - SF 1.544 Mbps - SF and B8ZS 1.544 Mbps - ESF 1.544 Mbps - ESF and B8ZS	N/A/6.0N	04DU9-BN 04DU9-DN 04DU9-1KN 04DU9-1SN	RJ-48C
1202872L1	US: HDCDENAN1200872L1				
1200695L1	US: HDCDENAN1200695L1				
1202869E1	US: HDCDL01A1200869L1	ADSL, ADSL2, ADSL2+	0.1A	Metallic	RJ-11C
1202691G1	US: HDCMM01B1200691L1	Analog Loop Start/Ground Start	0.1B	02LS2/02GS2	RJ-11C
1202692G1	US: HDCMM01B1200691L1				
1200796E1	US: HDCIS01B1200796L1				
1700706G1	US: HDCIS01B1700706G1				

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 7060	NetVanta 7100
1202862L1	T1/FT1 NIM	FCC Part 15 Class A EN 300 386	FCC Part 15 Class A EN 300 386
1202872L1	Dual T1 NIM	FCC Part 15 Class A EN 55022 Class A	FCC Part 15 Class A EN 55022 Class A
1200868E1	E1/FE1 NIM	FCC Part 15 Class A EN 55022 Class A EN 55024	FCC Part 15 Class A EN 55022 Class A EN 55024
1200878E1	E1/FE1 + G.703 NIM	FCC Part 15 Class A EN 55022 Class A EN 55024	FCC Part 15 Class A EN 55022 Class A EN 55024
1202869E1	ADSL NIM, Annex A	FCC Part 15 Class A EN 300 386	FCC Part 15 Class A EN 300 386
1200690E1	Quad FXS VIM	FCC Part 15 Class A EN 300 386	FCC Part 15 Class A EN 300 386
1202691G1	Quad FXO VIM	FCC Part 15 Class A EN 300 386	FCC Part 15 Class A EN 300 386
1202692G1	Dual FXS/FXO VIM	FCC Part 15 Class A EN 300 386	FCC Part 15 Class A EN 300 386
1200695L1	T1/PRI VIM	FCC Part 15 Class A EN 55022 Class A EN 55024	FCC Part 15 Class A EN 55022 Class A EN 55024
1200696G1	E1/PRI VIM	FCC Part 15 Class A EN 300 386	FCC Part 15 Class A EN 300 386

Industry Canada Compliance Information

This product meets the applicable Industry Canada technical specifications.

The Ringer Equivalence Number (REN) is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices not exceed five.

Le présent matériel est conforme aux specifications techniques applicables d'Industrie Canada.

L'indice d'équivalence de la sonnerie (IES) sert à indiquer le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas cinq.

Canadian Emissions Requirements

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

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

Toll Fraud Liability

Be advised that certain security risks are inherent in the use of any telecommunications or networking equipment, including but not limited to, toll fraud, Denial of Service (DoS) attacks, loss or theft of data, and the unauthorized or illegal use of said equipment. ADTRAN OFFERS NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, REGARDING THE PREVENTION, DETECTION, OR DETERRENCE OF TOLL FRAUD, NETWORKING ATTACKS, OR UNAUTHORIZED, ILLEGAL, OR IMPROPER USE OF ADTRAN EQUIPMENT OR SOFTWARE. THEREFORE, ADTRAN IS NOT LIABLE FOR ANY LOSSES OR DAMAGES RESULTING FROM SUCH FRAUD, ATTACK, OR IMPROPER USE, INCLUDING, BUT NOT LIMITED TO, HUMAN AND DATA PRIVACY, INTELLECTUAL PROPERTY, MATERIAL ASSETS, FINANCIAL RESOURCES, LABOR AND LEGAL COSTS. Ultimately, the responsibility for securing your telecommunication and networking equipment rests with you, and you are encouraged to review documentation regarding available security measures, their configuration and implementation, and to test such features as is necessary for your network.

Third-Party Software

The software included in this product contains copyrighted software that is licensed under the GNU General Public License (GPL). For a list of third-party software and their licenses, go to http://www.adtran.com/software/EULA. You can obtain the complete corresponding source code of such software components from ADTRAN for a period of three years after our last shipment of this product by sending a money order or check for $5 to:

ADTRAN, Inc, P.O. Box 933638, Atlanta, GA 31193-3638
Please write **GPL Source for product NetVanta 7100** in the memo line of your payment.

This offer is valid to anyone in receipt of this information.

Service and Warranty

For information on the service and warranty of ADTRAN products, visit the *Support* section of the ADTRAN website at http://www.adtran.com.

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1. INTRODUCTION

The NetVanta 7000 Series provides an innovative Voice over Internet Protocol (VoIP) communication solution for small- to medium-sized businesses that simplifies the migration to VoIP and resolves complicated network assessments and equipment interoperability issues. The NetVanta 7000 Series includes the NetVanta 7060 and the NetVanta 7100.

This hardware installation guide lists the NetVanta 7000 Series specifications, describes the physical characteristics of the units, introduces basic functionality, and provides installation instructions.

In this document, the term NetVanta 7000 Series means both of the units collectively. If a statement only applies to one particular unit, the text refers to that unit individually.

NetVanta 7060

The NetVanta 7060 is an IP private branch exchange (PBX). It is a cost-effective product built on the ADTRAN Operating System (AOS) platform that is ideal for business locations that already have an IP data network established with routing and virtual private network (VPN) functionality. The NetVanta 7060 comes equipped with 24 Power over Ethernet (PoE) 10/100 Ethernet ports capable of supplying the full 15.4 watts described in the 802.3af specification. The NetVanta 7000 Series front panel contains two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard small form-factor pluggable (SFP) slots for connectivity over fiber. The NetVanta 7060 is a 1U rack-mountable chassis that supplies the user with VoIP capability for up to 100 SIP user registrations. The unit is also equipped with several integrated ports, including analog trunks (FXO), analog stations (FXS), door relays, console, CompactFlash (for voicemail storage), wide area network (WAN) Ethernet port, music on hold (MOH), paging, auto-sensing AC power, as well as two network interface module/voice interface module (NIM/VIM) slots.

NetVanta 7100

The NetVanta 7100 is an integrated IP data networking and telephony solution that combines multiple data and voice functions into a single platform. It is a cost-effective product built on the AOS platform, and includes the AOS built-in IP router, VPN, and firewall features. The NetVanta 7100 comes equipped with 24 PoE 10/100 Ethernet ports capable of supplying the full 15.4 watts described in the 802.3af specification. The NetVanta 7000 Series front panel contains two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard small form-factor pluggable (SFP) slots for connectivity over fiber. The NetVanta 7100 is a 1U rack-mountable chassis that supplies the user with VoIP capability for up to 100 SIP user registrations. The unit is also equipped with several integrated ports, including analog trunks (FXO), analog stations (FXS), door relays, console, CompactFlash (for voicemail storage), WAN Ethernet port, music on hold (MOH), paging, auto-sensing AC power, as well as two network interface module/voice interface module (NIM/VIM) slots.

The NetVanta 7000 Series contains two NIM/VIM slots on the rear panel that support the following modules in data applications:

- 1202862L1 T1/FT1 NIM
- 1200872L1 Dual T1 NIM
- 1200868E1 E1/FE1 NIM
- 1200878E1 E1/FE1 + G.703 NIM
- 1200869E1 ADSL NIM, Annex A

The NetVanta 7000 Series NIM/VIM slots on the rear panel support the following modules in voice applications:

- 1200690E1 Quad FXS VIM
- 1202691G1 Quad FXO VIM
- 1202692G1 Dual FXS/FXO VIM
- 1200695L1 T1/PRI VIM
- 1200696G1 E1/PRI VIM

Power Over Ethernet

The NetVanta 7000 Series PoE interfaces provide the ability to detect attached powered devices (PDs) and deliver 48 VDC to the PD via existing CAT 5 cabling. The PoE interfaces are fully compliant with the IEEE 802.3af PoE standard. By default, the PoE ports automatically discover and provide power to IEEE-compliant PDs.

SFP Module Slots

The NetVanta 7000 Series has two small form-factor pluggable (SFP) slots that accept a number of industry standard SFP modules. The SFP modules provide Gigabit Ethernet fiber connectivity for high-speed uplinks. For a list of supported SFP modules, visit the ADTRAN website at http://www.adtran.com.

Unpacking and Inspecting the System

Each NetVanta 7000 Series unit is shipped in its own cardboard shipping carton. Open each carton carefully, and avoid deep penetration into the carton with sharp objects.

After unpacking the unit, inspect it for possible shipping damage. If the equipment has been damaged in transit, immediately file a claim with the carrier and contact ADTRAN Customer Service (refer to the *Support* page on the ADTRAN website at http://www.adtran.com/support).

Contents of ADTRAN NetVanta 7000 Series Shipments

The NetVanta 7000 Series units ship with the following items:

- NetVanta 7000 Series base unit
- A detachable power cable with a grounded, three-prong plug
- Mounting brackets and screws
- Quick start guide

2. PRODUCT FEATURES AND SPECIFICATIONS

The NetVanta 7000 Series has the following features:

IP PBX System Features

- Analog trunks (loop start/ground start; FSK capture of caller ID name/number; two integrated, 10 maximum)
- Analog stations (loop start DTMF; 1500 feet over 26 AWG; two integrated, 10 maximum)
- Auto attendant (multilevel, eight-port)
- Shared line appearance (SLA)
- Shared call appearance (SCA)
- FindMe-FollowMe
- Busy lamp field/direct station select (BLF/DSS)
- System scheduler (seven configurable modes: i.e., night, lunch, weekend)
- Public hold
- Call detail records
- Caller ID name/number override (internal and external)
- Classes of service
- CODEC support includes G.711, G.729, G.722 (wideband)
- Configurable dial plan
- Door relay
- Door phone
- Email notification of voicemail message
- Global call coverage lists
- IP stations (100 maximum; SIP hardphone or softphone)
- Least-cost routing
- Operator groups
- Outgoing number substitution
- PRI or integrated voice/data PRI
- Personal phone manager web page
- Ring groups (ring all, circular hunt group, UCD, executive)
- Call queue
- Paging groups
- Park and paging
- System speed dial
- T1 or integrated voice/data T1
- Trunk groups
- Variable length extension numbers (three-digit, four-digit, and five-digit)
- Voicemail (50 hours, eight ports)
- 30 DSP resources
- 64 ms echo cancellation for VoIP calls

IP Station Features

- Call drop
- Call forward (all, busy, no answer)
- Call forward to outside line (cell phone)
- Call hold
- Caller ID name/number
- Call logs
- Call waiting
- Call park/retrieve
- Handsfree intercom
- Call transfer
- Do not disturb
- Conferencing (3-party)
- Headset jack
- Emergency call override
- Missed call indicator
- Message waiting light
- Music on hold
- Multiple call appearances
- Overhead paging
- Mute
- Redial
- Personal call routing
- Speaker phone
- Volume control

Router Features (NetVanta 7100 only)

- RIP V1, RIP V2, and static routes
- BGP
- PPP, PPPoE, Frame Relay WAN protocols
- DHCP client/server
- Class-based weighted fair queuing, priority queuing, weighted fair queuing
- DiffServ aware/mark
- MLPPP/MLFR

Firewall Features (NetVanta 7100 only)

- Stateful packet inspection
- NAT (1:1), NAPT (many:1)
- Denial of service (DoS) protection
- Access control lists
- SIP aware (B2BUA)

Content Filtering (NetVanta 7100 only)

- Inherent URL filter
- Top website reports
- Integration with Websense®

VPN Features (NetVanta 7100 only)

- Five tunnels
- IPsec
- DES/3DES/AES encryption

Ethernet Switch Features

- 10/100Base-T (24)
- 10/100/1000Base-T (two)
- Two SFP slots
- Autorate
- Auto-duplex
- Auto-MDI/MDI-X
- 802.1d spanning tree
- 802.1p class of service (CoS) aware/mark
- 802.1Q VLANs
- 802.3af Power over Ethernet (15.4 watts for each of the 24 ports)

Management Features

- Command line interface (CLI) - Telnet, SSH, console port
- Web-based graphical user interface (GUI) - HTTP, HTTPS

Environmental

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

Physical

- Chassis: 1U, 19-inch rack-mountable metal enclosure
- Dimensions: 1.7-inch H x 17.2-inch W x 12.8-inch D
- Weight: 11 lb
- AC Input: 100 to 250 VAC, 50/60 Hz

3. PHYSICAL DESCRIPTION

Front Panel RJ-45 Ports and LEDs

The NetVanta 7000 Series front panel is shown below. *Table 1 on page 21* describes all of the LEDs, and *Appendix A: Connector Pin Definitions on page 41* shows the pinouts for the connectors.

NetVanta 7000 Series Front Panel Features

10/100Base-T Ethernet Interfaces

The NetVanta 7000 Series front panel contains 24 10/100Base-T 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 7000 Series 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 7000 Series front panel contains two Gigabit Ethernet interfaces that provide two fixed RJ-45 connectors and two standard small form-factor pluggable (SFP) slots for connectivity over fiber. (Use either the RJ-45 connectors *or* the SFP slots. The fiber slots have precedence.) 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 **SLOT 1** LED reflects the status of a NIM/VIM installed in NIM/VIM option **SLOT 1** (located on the rear panel). The **SLOT 2** LED reflects the status of a NIM/VIM installed in NIM/VIM option **SLOT 2** (located on the rear panel). The **STAT** LED indicates the unit's status.

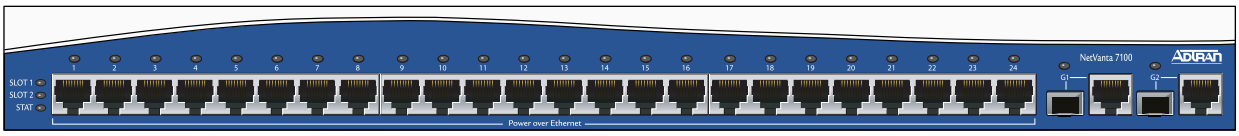

Figure 1. NetVanta 7000 Series Front Panel Layout

Table 1. Front Panel LED Descriptions

LEDs	Color	Indication
STAT	Off	The unit is not receiving power.
	Green (flashing)	On power up STAT LED blinks rapidly for five seconds, during which time the user may escape to boot mode from the console port.
	Green (solid)	The power is on and unit is functioning normally.
	Red (solid)	The power is on and the boot code could not be booted.
SLOT 1/SLOT 2	Off	No NIM/VIM installed or interface is administratively down.
	Green (solid)	The NIM is functioning normally or the VIM is off-hook.
	Green (flashing)	The NIM has activity (transmit or receive) or the VIM is ringing.
	Amber (solid)	The NIM/VIM module is in test.
	Red (solid)	An alarm condition is occurring on the interface.
Port Status (1 through 24, and G1/G2)	Off	Port is administratively disabled or does not have a connection.
	Green (solid)	The link is up and the port is enabled. The port is connected to a host (link is up), and there was activity (transmit or receive) in the past 30 ms interval.
	Amber (flashing)	Port has activity (transmit or receive).
Power over Ethernet (PoE) (RJ-45)	Green (solid)	Power is being applied (48 V) to interface.
	Red (solid)	Fault detected on interface.

NetVanta 7000 Series Rear Panel Design

The NetVanta 7000 Series rear panel is shown below. Refer to *Appendix A: Connector Pin Definitions on page 41* for pinouts.

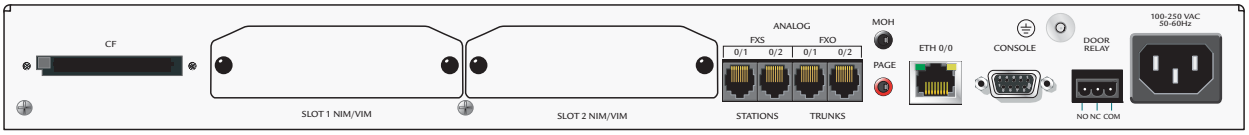

Figure 2. NetVanta 7000 Series Rear Panel

NetVanta 7000 Series Rear Panel Interfaces

CompactFlash

The CompactFlash slot (labeled **CF**) supplies nonvolatile configuration and compressed code storage. The NetVanta 7000 Series supports only ADTRAN-provided 1 GB CompactFlash card.

NIM/VIM Option Slots

The two NIM/VIM option slots (labeled **SLOT 1 NIM/VIM** and **SLOT 2 NIM/VIM**) accept a variety of NIM/VIM option modules (refer to *Option Modules on page 23*).

FXS and FXO Ports

The two FXS interfaces (labeled **FXS STATIONS 0/1** and **0/2**) and two FXO interfaces (labeled **FXO TRUNKS 0/1** and **0/2**) provide FXS and FXO connectivity, respectively.

During power outages, the FXS interfaces are connected directly to the FXO interfaces. This feature is called life line mode, and allows customers to make analog calls even when the power is out.

> CAUTION
>
> *For the NetVanta 7000 Series, devices connected to the FXS (**FXS STATIONS**) ports must be ACTA/FCC Part 68 compliant due to the direct connection to the public switched telephone network (PSTN) in life line mode.*

MOH

The music on hold (**MOH**) port is a 3.5 mm jack for music input to be played when a call is placed on hold. An external music source is required.

Page

The **PAGE** port is a 3.5 mm jack for paging output. Overhead paging equipment is required.

10/100Base-T Ethernet Interface

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

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

Door Relay

The **DOOR RELAY** contacts are connected to a built-in relay that can be activated by using a special prefix (SPRE) code (applications include door locks and other remote control needs).

CONSOLE Interface

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

> NOTE
>
> *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 37* for connection details.

4. OPTION MODULES

The NetVanta 7000 Series supports several option modules designed to meet a variety of networking requirements. The modules include plug-in network and voice interface modules (NIMs/VIMs).

NIMs/VIMs are cards that plug directly into the option module slots (labeled **SLOT 1 NIM/VIM** and **SLOT 2 NIM/VIM**) located on the rear of the base unit. These cards provide the following types of interfaces:

This section describes each module, providing individual card specifications and features. Refer to *Connector Pin Definitions on page 41* for pinout information. *Installing Network Interface and Voice Interface Modules on page 37* provides information on card installation.

Network Interface Modules

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

The NetVanta T1/FT1 NIM (see *Figure 3*) provides a T1 WAN interface for the NetVanta 7000 Series. This module provides a full T1 or fractional T1 network interface. See *Table A-6 on page 43* for the WAN-T1 connector pinouts. Dial backup (DBU) is not supported.

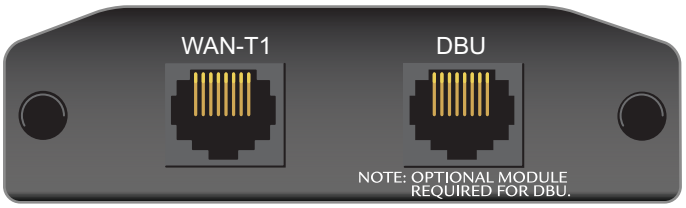

Figure 3. NetVanta T1/FT1 NIM

Features and Specifications

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

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

Clock Source
- Line
- 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 Dual T1 NIM (P/N 1200872L1)

The NetVanta Dual T1 NIM (see *Figure 4*) provides two T1 WAN interfaces for the NetVanta 7000 Series. See *Table A-6 on page 43* for the WAN-T1 pinouts. Dial backup (DBU) is not supported.

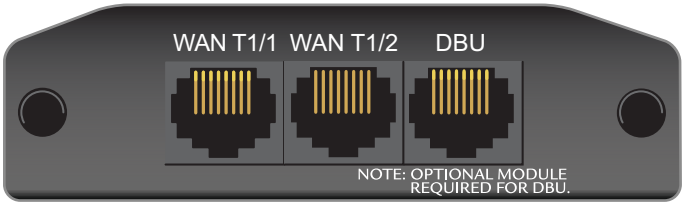

Figure 4. NetVanta Dual T1 NIM

Features and Specifications

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

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

Clock Source
- Line
- Internal
- Through

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

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

NOTE *The NetVanta 7000 Series will support a maximum of three T1 connections. Installing two Dual T1 NIMs is not supported.*

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

The NetVanta E1/FE1 NIM (shown in *Figure 5*) provides an E1 WAN interface for the NetVanta 7000 Series, meeting the requirements of ITU-T G.703/G.704. The module provides a single 2.048 Mbps network interface. See *Table A-6 on page 43* for the pinouts. Dial backup (DBU) is not supported.

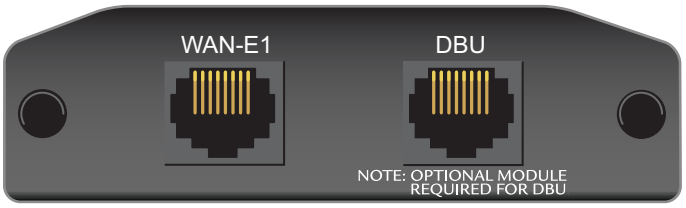

Figure 5. NetVanta E1/FE1 NIM

Features and Specifications

Operating Modes
- Frame Relay, multilink Frame Relay
- PPP, MLPPP
- HDLC

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

Clock Source
- Network
- Internal

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

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table on page 6*.
- AS/ACIF S016
- ETSI TBR 12/TBR 13
- EN 60950
- IEC 60950
- AS/NZS 60950
- RoHS compliant (1200868E1 only) (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 NIM (P/N 1200878E1)

The NetVanta E1/FE1 + G.703 NIM (shown in *Figure 6*) provides a single E1 WAN interface (2.043 Mbps) with user-selectable TS0 assignment and a G.703 drop port that can be used to drop and insert traffic to an E1 PBX. See *Table A-6 on page 43* for the WAN-E1 pinouts. See *Table A-8 on page 43* for the G.703 pinouts. Dial backup (DBU) is not supported.

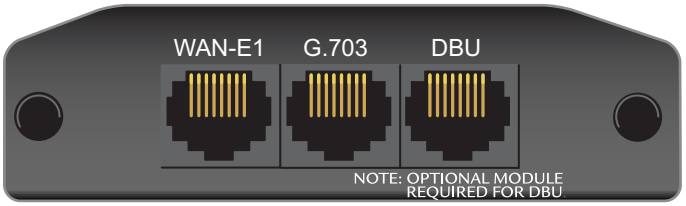

Figure 6. NetVanta E1/FE1 + G.703 NIM

Features and Specifications

Operating Modes
- Frame Relay, multilink Frame Relay
- PPP, MLPPP
- HDLC

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

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

Clock Source
- Network
- Internal
- Through

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

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table on page 6*.
- AS/ACIF S016
- ETSI TBR 12/TBR 13
- EN 60950
- IEC 60950
- AS/NZS 60950
- RoHS compliant (1200878E1 only) (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, Annex A NIM (see *Figure 7*) adds ADSL capability to the NetVanta 7000 Series. The module provides a single ADSL, ADSL2, or ADSL2+ network interface to support rates up to 25 Mbps. See *Table A-9 on page 43* for the pinouts. Dial backup (DBU) is not supported.

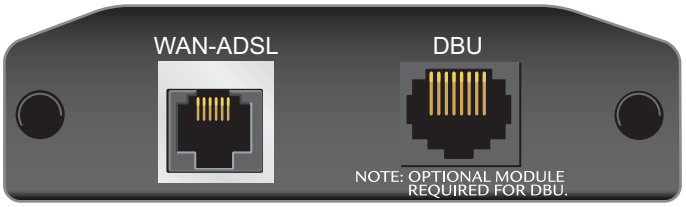

Figure 7. NetVanta ADSL NIM, Annex A

Features and Specifications

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

ATM
- Multiple Protocol over AAL5 (RFC 2684)
- PPP over ATM (RFC 2364)
- PPP over Ethernet (RFC 2516)
- 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

Voice Interface Modules

NetVanta T1/PRI VIM (P/N 1200695G1)

The NetVanta T1/PRI VIM (see *Figure 8*) adds T1 voice capability to the NetVanta 7000 Series. See *Table A-6 on page 43* for the T1 connector pinouts. Dial backup (DBU) is not supported.

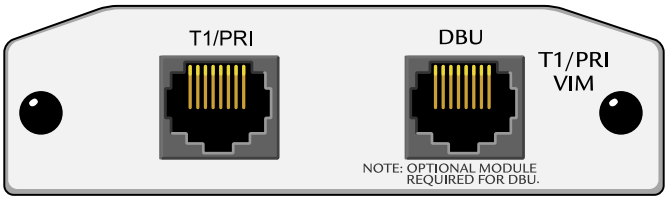

Figure 8. NetVanta T1/PRI VIM

Features and Specifications

Operating Modes
- Primary Rate ISDN (PRI), CAS

T1 Interface
- Supported Standards: AT&T TR 62411, AT&T TR54016, Bellcore TR 194, ANSI T1.403
- Line Rate: 1.544 Mbps ±75 bps
- Line Code: AMI or B8ZS
- Framing: D4 (SF) or ESF
- FT1 Line Rate: DS0 channelized (multiples of 64 kbps)
- Input Signal: 0 to -36 dB (DS1)
- Line Build-Out: 0, -7.5, -15, -22.5 dB (long), 0 to 655 ft (short)
- DS0 Assignment: Programmable
- Connector: RJ-48C

Clock Source
- Line
- Internal
- System

Diagnostics
- Test Pattern Generation and Detection: QRSS, 2^{15} - 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/PRI VIM (P/N 1200696G1)

The NetVanta E1/PRI VIM (see *Figure 9*) adds E1 voice capability to the NetVanta 7000 Series. See *Table A-6 on page 43* for the E1 connector pinouts. Dial backup (DBU) is not supported.

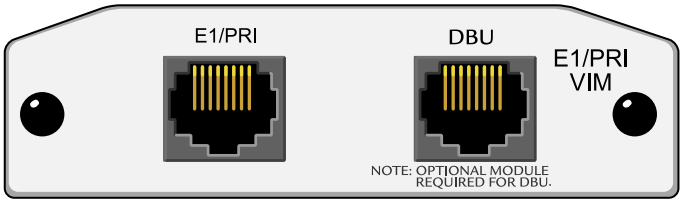

Figure 9. NetVanta E1/PRI VIM

Features and Specifications

Operating Modes
- Primary Rate ISDN (PRI), CAS

E1 Interface
- Supported Standards: ITU-T G.703, ITU-T G.704 (CRC-4), ITU-T G.732, ITU-T G.823
- Line Rate: 2.048 Mbps ±50 bps
- Line Code: AMI or HDB3
- Framing: TS-16, CRC-4, double frame
- FE1 Line Rate: Channelized timeslot (multiples of 64 kbps)
- Receiver Sensitivity: -36 dB
- Connector: RJ-48C

Clock Source
- Line
- Internal
- System

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

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table on page 6*.
- AS/ACIF S016
- ETSI TBR 12/TBR 13
- EN 60950-1
- IEC 60950-1
- AS/NZS 60950-1
- 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 Quad FXS VIM (P/N 1200690E1)

The NetVanta Quad FXS VIM (see *Figure 10*) adds voice capability to the NetVanta 7000 Series. See *Table A-5 on page 42* for the FXS connector pinouts.

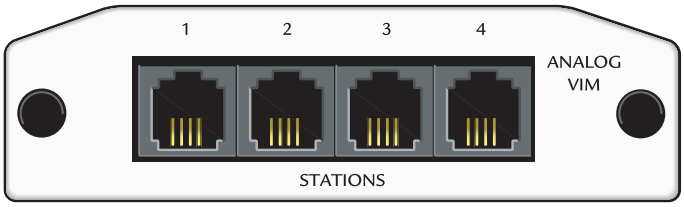

Figure 10. NetVanta Quad FXS VIM

Features and Specifications

Analog Voice Ports
- Loop Start (LS), Ground Start (GS)
- Normal and reverse battery operation

Transmission Level
- FXS Receive Gain: -12 to +6 dB, 0.1 dB steps
- FXS Transmit Gain: -12 to +6 dB, 0.1 dB steps

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table on page 6*.
- UL/CUL 60950
- RoHS compliant (1200690E1 only) (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 Quad FXO VIM (P/N 1202691G1)

The NetVanta Quad FXO VIM (see *Figure 11*) adds voice capability to the NetVanta 7000 Series. See *Table A-5 on page 42* for the FXO connector pinouts.

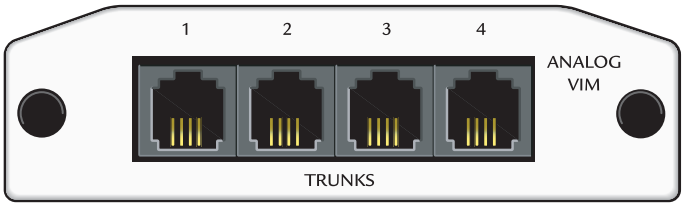

Figure 11. NetVanta Quad FXO VIM

Features and Specifications

Analog Voice Ports
- Loop Start (LS), Ground Start (GS)
- Normal and reverse battery operation

Transmission Level
- FXO Transmit Gain: -6 to +10 dB, 0.1 dB steps
- FXO Receive Gain: -6 to +10 dB, 0.1 dB steps

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table on page 6*.
- ACTA/FCC Part 68
- IC CS-03
- 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 Dual FXS/FXO VIM (P/N 1202692G1)

The NetVanta Dual FXS/FXO VIM (see *Figure 12*) adds voice capability to the NetVanta 7000 Series. See *Table A-5 on page 42* for the FXS/FXO connector pinouts.

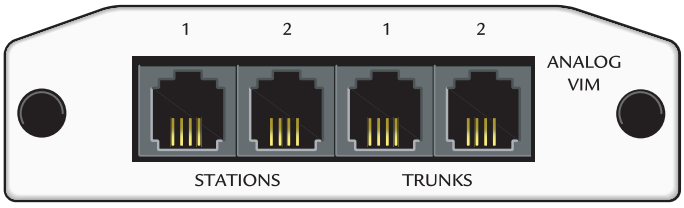

Figure 12. NetVanta Dual FXS/FXO VIM

Features and Specifications

Analog Voice Ports
- Dual FXS and Dual FXO ports
- Loop Start (LS), Ground Start (GS)
- Normal and reverse battery operation

Transmission Level
- FXS Receive Gain: -12 to +6 dB, 0.1 dB steps
- FXS Transmit Gain: -12 to +6 dB, 0.1 dB steps
- FXO Transmit Gain: -6 to +10 dB, 0.1 dB steps
- FXO Receive Gain: -6 to +10 dB, 0.1 dB steps

Compliance
- EMC - see *Electromagnetic Compatibility (EMC) Table on page 6*.
- ACTA/FCC Part 68
- IC CS-03
- 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

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:

For information on configuring a specific application, refer to the configuration guides provided on the ADTRAN's Support Forum or the *AOS Command Reference Guide.*

WARNING

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

CAUTION

- *The NetVanta 7000 Series is intended to be installed, maintained, and serviced by qualified service personnel only and should be installed in a restricted access location as described in UL/IEC 60950-1.*
- *Ethernet cables are intended for intrabuilding use only. Connecting an ADTRAN unit directly to Ethernet cables that run outside the building in which the unit is housed will void the user's warranty and could create a fire or shock hazard. To connect an ADTRAN unit to Ethernet cables that run outside the building, ADTRAN's Ethernet Port Protection Device (EPPD) (P/N 1700502G1) must be connected between the unit and the outside plant cable. Use of any Ethernet protector other than ADTRAN's for this purpose will void the user's warranty.*
- *PoE cables are intended for intrabuilding use only. Connecting an ADTRAN PoE unit directly to PoE cables that run outside the building in which the unit is housed will void the user's warranty and could create a fire or shock hazard.*
- *For outdoor PoE applications, ensure any PoE injector used is approved and rated for outdoor/exposed wiring applications. Use of a PoE injector that is not rated for outdoor/exposed wiring applications will void the user's warranty and could create a fire or shock hazard.*

CAUTION

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

Tools Required

The customer-provided tools required for the hardware installation of the NetVanta 7000 Series are:

- Ethernet cables
- Network cables (module dependent)
- Phillips-head screwdriver

To access the CLI of the NetVanta, you will also need a system with terminal emulation software and a console port cable. Instructions on how to access the CLI are available in the quick start guide shipped with your unit or online at ADTRAN's Support Forum.

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.

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 7000 Series into a rack.

- *If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than ambient room temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified by the manufacturer.*
- *Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.*
- *Be careful not to compromise the stability of the equipment mounting rack when installing this product.*
- *Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading the circuit might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.*
- *Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).*

Instructions for Rack Mounting the NetVanta	
Step	**Action**
1	Attach the rackmount ears with the screws and brackets supplied in the Rackmount Kit.
2	To allow proper grounding, scrape the paint from the rack around the mounting holes where the NetVanta will be positioned.
3	Position the NetVanta in a stationary equipment rack. This unit occupies 1U of space.
4	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.
5	Apply power to the unit (refer to *Supplying Power to the Unit on page 37*).

Wall Mounting the NetVanta

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

- *To avoid damaging the unit, use only the screws included in the shipment when attaching mounting ears to the chassis.*
- *When wall mounting the NetVanta, care must be taken not to damage the power cord. Do not attach the power cord to the building surface or run it through walls, ceilings, floors, or openings in the building structure.*
- *The socket-outlet must be installed near the equipment and must be easily accessible.*

Instructions for Wall Mounting the NetVanta	
Step	**Action**
1	Remove the mounting ears. Rotate them 90 degrees so that the portion of the bracket with the mounting holes is flush with the bottom of the chassis. Reattach the mounting ears to the chassis (see *Figure 13 on page 37*).
2	Decide on a location for the NetVanta. Keep in mind that the unit needs to be mounted at or below eye level so that the LEDs are viewable.
3	Prepare the mounting surface by attaching a board (typically plywood, 3/4-inch to 1-inch thick) to a wall stud. ***Important!*** *Mounting to a stud ensures stability. Using sheetrock anchors may not provide sufficient long-term stability.*
4	Have an assistant hold the unit in position as you install two #6 to #10 (1-inch or greater in length) wood screws through the unit's brackets and into the mounted board (see *Figure 13 on page 37*).
5	Proceed to the steps given in *Supplying Power to the Unit on page 37*.

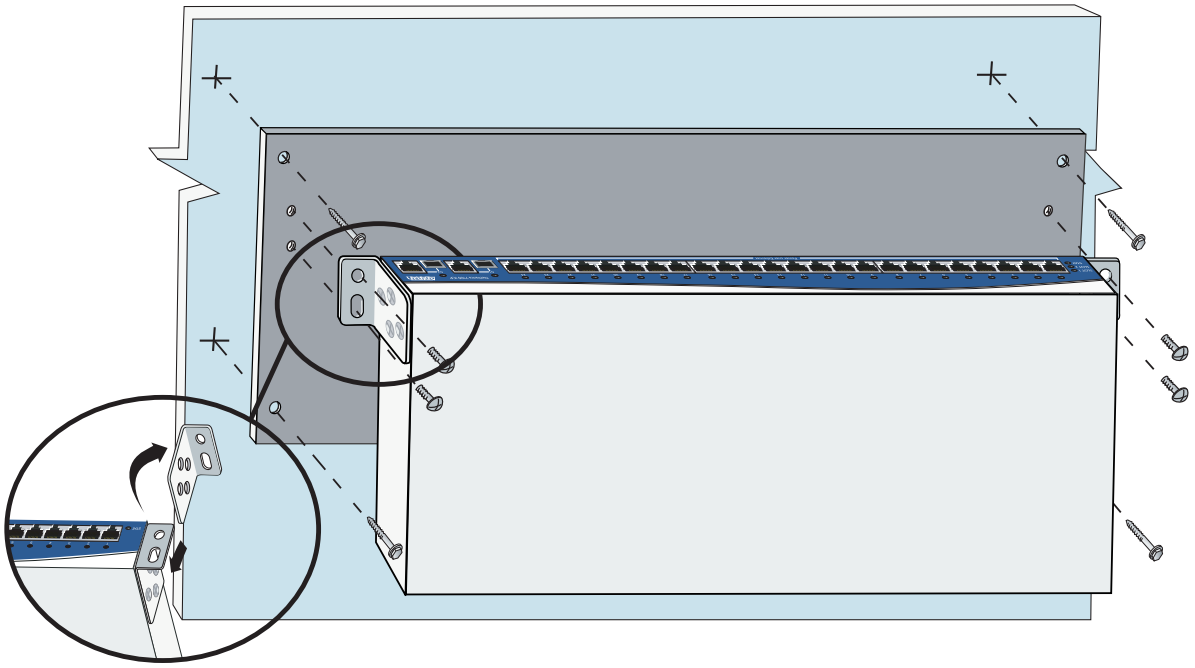

Figure 13. Wallmount Installation

Supplying Power to the Unit

The NetVanta 7000 Series comes 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.

Installing Network Interface and Voice Interface Modules

The NIM/VIM is installed into the rear panel option module slot. The following tables list the installation steps. Also, see *Figure 14 on page 38*.

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

CAUTION	• *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.* • *Always remove power from the unit prior to removing or installing a module.* • *Improper installation could result in damage to the modules.*

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

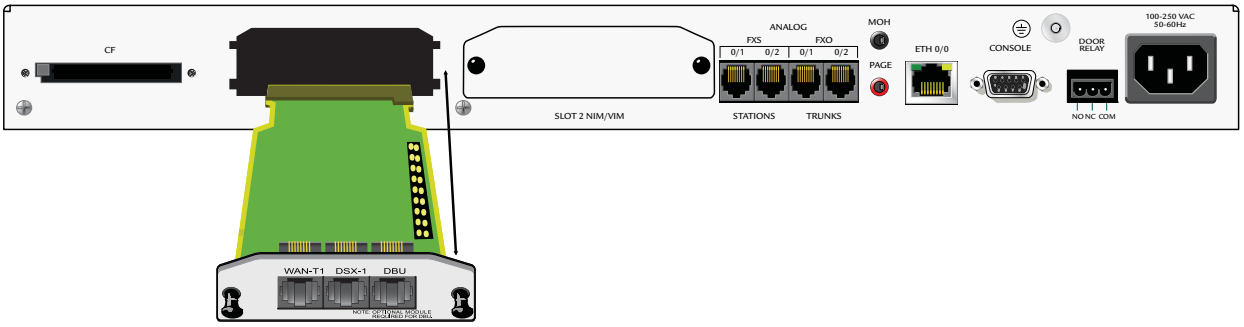

Figure 14. NIM and VIM Installation

CAUTION

All unused NIM/VIM slots on the back panel of the unit must remain covered with the supplied cover plates.

Installing a CompactFlash Card

The CompactFlash (**CF**) slot supports only the ADTRAN-provided 1 GB CompactFlash card. Follow these instructions when installing a card.

> *The CompactFlash card is not hot-swappable. Power must be removed from the unit before the CompactFlash card is inserted or removed.*

Instructions for Installing a CompactFlash Card	
Step	**Action**
1	Remove power from the unit.
2	Remove the two screws and the cover from the **CF** slot on the rear of the unit.
3	Slide the module into the **CF** slot until the card is firmly seated against the chassis.
4	Replace the **CF** slot cover.
5	Restore power to the unit.
6	The CompactFlash options will now be available in the GUI and the AOS CLI.

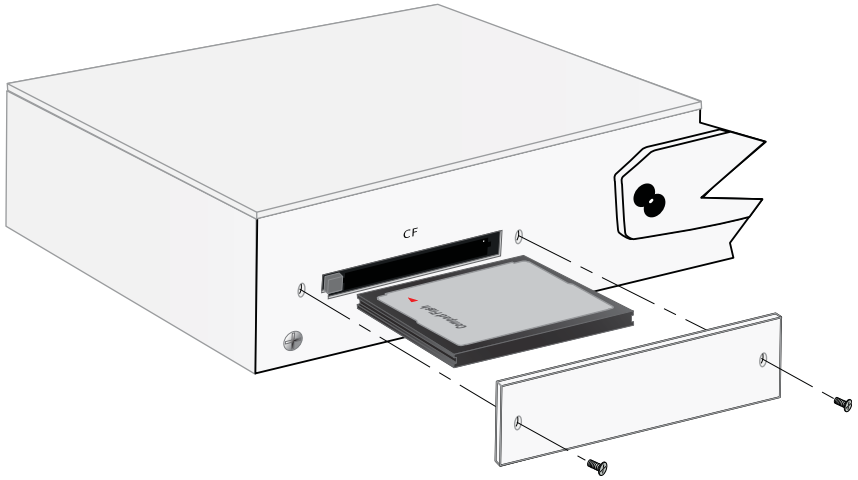

Figure 15. CompactFlash Card Installation

Your NetVanta unit is now ready to be configured and connected to the network. For information on configuration for a specific application, refer to the configuration guides provided online on ADTRAN's Support Forum For details on the CLI, refer to the *AOS Command Reference Guide*. All other related documents are also available online on ADTRAN's Support Forum.

APPENDIX A. CONNECTOR PIN DEFINITIONS

The following tables provide the pin assignments for the base unit, NIMs, and VIMs.

Base Unit Pinouts

Table A-1. CONSOLE Port Pinouts

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

Table A-2. SFP Slot Pinouts

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

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

Table A-5. Analog - Onboard FXS and 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

Network and Voice Interface Module Pinouts

Table A-6. T1/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-7. 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-8. 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-9. ADSL NIM Connector Pinouts

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

Table A-10. 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