NetVanta 5305
Hardware Installation Guide

4200990L1	NetVanta 5305 AC System
4200990G1	NetVanta 5305 AC System (RoHS Compliant)
4200990G2	NetVanta 5305 AC System with Enhanced Feature Pack (RoHS Compliant)
4200992L1	NetVanta 5305 AC System with T3 Wide Module
4200995L1	NetVanta 5305 DC System
4200368L3	Enhanced Feature Pack (Hardware and Software) for IPsec VPN Upgrade
1200831G1	NetVanta 5305 System Controller Module (RoHS Compliant)
1200832L1	NetVanta T3 Wide Module
1200934L1	NetVanta HSSI Wide Module
1202843E1	NetVanta Octal T1/E1 Wide Module
1200840G1#120	NetVanta 5305 AC Power Supply, 120 VAC
1200840G1#240	NetVanta 5305 AC Power Supply, 240 VAC
1200841G1	NetVanta 5305 DC Power Supply

61200990L1-34P
July 2014

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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.

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Conventions

Notes provide additional useful information.

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

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

Safety Instructions

When using your communications 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 a 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.

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
1202843E1	US: HDCDENAN202843L1	1.544 Mbps - SF 1.544 Mbps - SF and B8ZS 1.544 Mbps - ESF 1.544 Mbps - ESF and B8ZS	6.0N	04DU9-BN 04DU9-DN 04DU9-1KN 04DU9-1SN	RJ-48C

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 5305
1200831G1	System Controller Module	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3
1202843E1	Octal T1/E1 Wide Module	FCC Part 15 Class A EN 55022 Class A EN 55024
1200832L1	T3 Wide Module	FCC Part 15 Class A EN 55022 Class A EN 55024
1200934L1	HSSI Wide Module	FCC Part 15 Class A EN 55022 Class A EN 55024
1202368E1	VPN Accelerator Card	FCC Part 15 Class A EN 55022 Class A EN 55024

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.

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 5305 is a modular multiservice access router designed for corporate office connectivity over Frame Relay or Point-to-Point Protocol (PPP) networks. The NetVanta 5305 has six modular slots for customizing solutions and runs with the ADTRAN Operating System (AOS).

The NetVanta 5305 family includes the NetVanta 5305 chassis, AC power supply, and system controller. Currently, the NetVanta 5305 family offers an unchannelized T3/FT3 Wide Module for network and data applications, the High Speed Serial Interface (HSSI) Wide Module, the Octal T1/E1 Wide Module, and two integrated auto-sensing 10/100Base-T Ethernet ports for local area network (LAN) connectivity. For virtual private network (VPN) applications using the NetVanta 5305, the enhanced feature pack provides encryption/decryption and security acceleration services. Refer to *Installing the NetVanta VPN Accelerator Card (included in P/N 4200368L3) on page 30* for installation instructions.

Features and Specifications

The NetVanta 5305 has the following features:

- Unchannelized T3 network access via the T3 Wide Module
- Integrated IP router with bridging
- WAN Protocol: Frame Relay, PPP
- Stateful inspection firewall standard
- RIP versions 1 and 2, and OSPF routing protocols
- Two integrated 10/100Base-T Ethernet ports (RJ-48C)
- Optional VPN accelerator card
- Network Address Translation: 1:1, 1:many (NAPT), and reverse NAT
- AOS command line interface (CLI)
- DHCP client, server, and relay support
- Front panel LEDs
- AC, DC, and redundant power supply options
- 3U rack mountable in 19-inch and 23-inch rack
- Six modular slots
- RoHS compliant
- Chassis dimensions: 5.25-inch H x 17-inch W x 11.625-inch D
- AC power information: 85 to 250 VAC 50/60 Hz
- Operating temperature: 0°C to 50°C

This hardware installation guide describes the NetVanta 5305 unit, details basic functionality, gives installation instructions, and lists unit specifications. For more information on a specific application, refer to the configuration guides provided on the ADTRAN Support Community. For details on the command line interface (CLI), refer to the *AOS Command Reference Guide*. All other related documents are also available online at http://supportforums.adtran.com.

Unpack and Inspect the System

Each NetVanta 5305 unit is shipped in its own cardboard shipping carton. Open the 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 Shipments

NetVanta 5305 AC System

Shipments of the NetVanta 5305 AC include the following items:

- NetVanta 5305 AC
- IEC 3-prong power cord
- 19-inch rackmount kit
- Quick start guide

NetVanta 5305 DC System

Shipments of the NetVanta 5305 DC include the following items:

- NetVanta 5305 DC
- DC Molex connector
- 19-inch rackmount kit
- Quick start guide

NetVanta 5305 T3 Wide Module

Shipments of the T3 Wide Module include the following items:

- T3 Wide Module
- T3 cable
- Quick start guide

NetVanta HSSI Wide Module

Shipments of the HSSI Wide Module include the following items:

- HSSI Wide Module
- Quick start guide

NetVanta Octal T1/E1 Wide Module

- Octal T1/E1 Wide Module
- Quick start guide

Option modules are intended to be serviced by qualified service personnel only.

2. PRODUCT OVERVIEW

Reviewing the Front Panel Design

Figure 1 shows the NetVanta 5305 front panel.

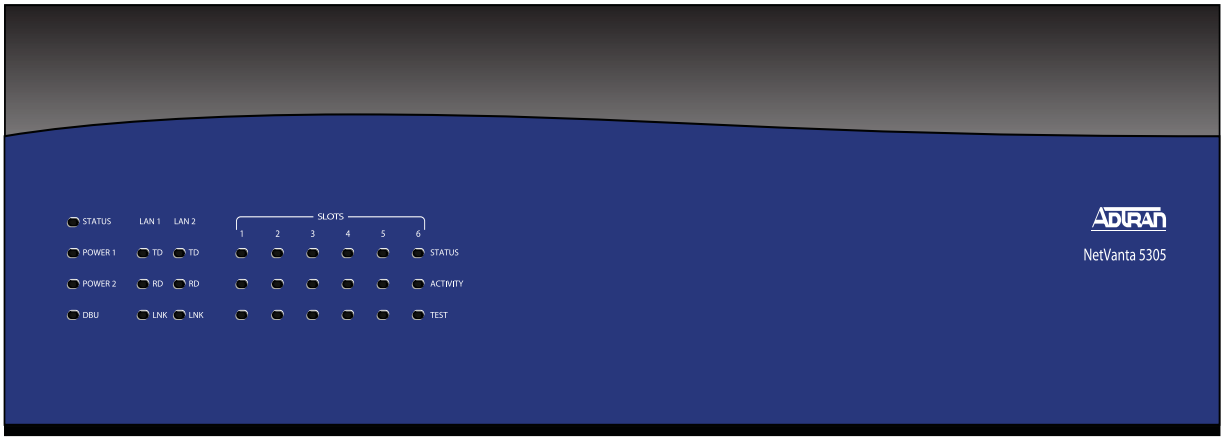

Figure 1. NetVanta 5305 (AC and DC versions) Front Panel Layout

Front Panel LEDs

Table 1 describes the front panel LEDs in order as located on the chassis from left to right.

Table 1. NetVanta 5305 LEDs

LED	Color	Indication
STATUS	Green (flashing)	Unit is powering up.
	Green (solid)	Power is on, self-test passed.
	Red (solid)	Self-test failed or boot code could not be loaded.
POWER 1/POWER 2	Green	Power supply is operational.
	Red	Power supply failed.
	Off	No power supply is present.
DBU	Off	No dial backup modules are installed.
	Green (solid)	Dial backup module is ready for use.
	Green (flashing)	Unit is in dial backup.
	Red (solid)	Dial backup alarm condition exists.
	Yellow (solid)	The unit is in test.
LAN 1/LAN 2 TD/RD	Green (flashing)	Activity on the Ethernet port.
	Off	No activity on the Ethernet port.
LAN 1/LAN 2 LNK	Green (solid)	10Base-T link is up.
	Yellow (solid)	100Base-T link is up.
	Red	Link is down.
	Off	Link is administratively down.
STATUS (Slots 1 through 6)	Off	Slot is empty, or the interface is administratively down.
	Green (solid)	Link is up.
	Red (solid)	Alarm condition is present on the module.
ACTIVITY (Slots 1 through 6)	Green (flashing)	Data is present on the module (i.e., for the T3 module, this indicates TD/RD data).
	Off	No activity on the module.
TEST (Slots 1 through 6)	Off	No test is running.
	Yellow (solid)	Module is in test.

Reviewing the Rear Panel Design

Figure 2 on page 19 shows the NetVanta 5305 AC rear panel layout, and *Figure 3 on page 19* shows the NetVanta 5305 DC rear panel layout. Pinouts for the connectors are given in *Appendix A on page 33*.

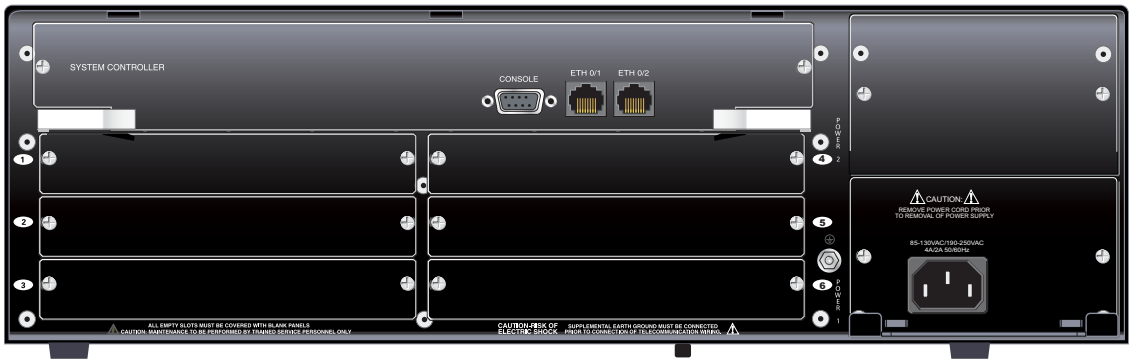

Figure 2. NetVanta 5305 AC Rear Panel Layout

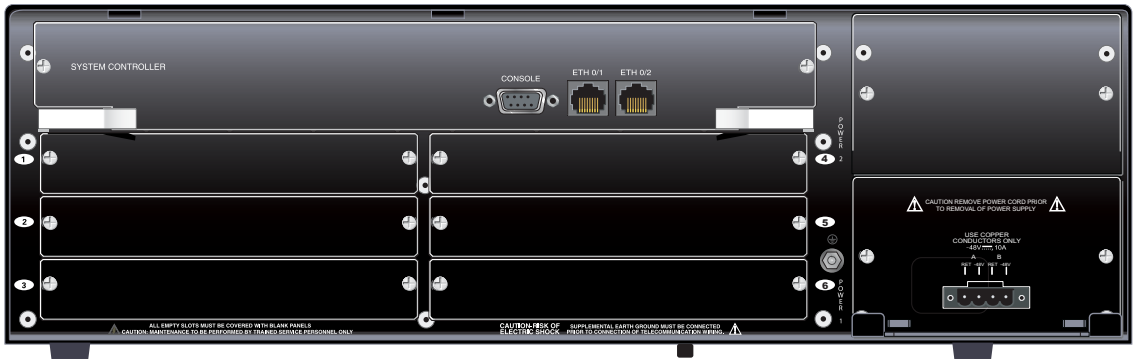

Figure 3. NetVanta 5305 DC Rear Panel Layout

Rear Panel Interfaces

CONSOLE Port

The **CONSOLE** port, a DB-9 interface located on the rear panel, connects to a computer or modem and provides the following functions:

- Accepts electrical EIA-232 input from a PC or modem for controlling the NetVanta 5305.
- Operates at rates ranging from 9.6 kbps to 115.2 kbps.
- Acts an input for either VT100 or PC control.

LAN Interfaces (ETH 0/1, ETH 0/2)

The NetVanta 5305 provides two RJ-48C connectors on the rear panel system controller module for routing data traffic and for local management access. See *Table A-1 on page 33* for the 10/100Base-T Ethernet interface pinouts. The 10/100Base-T Ethernet ports provide the following:

- Auto-sensing
- Primary data port service
- Secondary DMZ port service
- Local management access

3. OPTION MODULES

The NetVanta 5305 family currently offers three option modules to meet networking requirements:

- *NetVanta T3 Wide Module (P/N 1200832L1) on page 22*
- *NetVanta HSSI Wide Module (P/N 1200934L1) on page 23*
- *NetVanta Octal T1/E1 Wide Module (P/N 1202843E1) on page 24*

The following pages describe each module, providing individual card specifications and features. Refer to *Appendix A on page 33* for pinout information. Refer to *Installing Modules on page 28* for more installation instructions.

NetVanta 5305 System Controller Module (P/N 1200831L1)

The NetVanta 5305 uses a central system controller module to provide configuration for the system using the AOS. The NetVanta 5305 System Controller module (shown in *Figure 4*) provides control interfaces for the NetVanta 5305 system including a **CONSOLE** port (DB-9) and two Ethernet interfaces (RJ-48). See *Table A-2 on page 33* for the **CONSOLE** connector pinouts, and *Table A-1 on page 33* for the Ethernet connector pinouts. A system controller module is required for all NetVanta 5305 systems.

Figure 4. NetVanta 5305 System Controller Module

Features and Specifications

Interfaces

- Console: EIA-232 (DB-9 female) for access to CLI and monitoring
- Ethernet: Two 10/100Base-T interfaces (RJ-48) for connection to the LAN

Compliance

- EMC - see Electromagnetic Compatibility (EMC) Table on page 6.
- UL/CUL 60950
- 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: 11.63-inch W x 8.63-inch D

NetVanta T3 Wide Module (P/N 1200832L1)

The NetVanta T3 Wide Module (shown in *Figure 5*) provides a T3 interface with a dual BNC for the NetVanta 5305. The T3 connection provides a full unchannelized T3 interface that provides a connection to the wide area network (WAN). Up to two T3 Wide Modules may be used simultaneously in the NetVanta 5305 chassis. The T3 Wide Module may be installed in any slot (1 through 6). *Table A-3 on page 34* gives the pinouts for this module.

Figure 5. NetVanta T3 Wide Module

Features and Specifications

Interface

- DS3 electrical (coax) interface
- Line Rate: 44.736 Mbps
- Line Code: Bipolar three zero substitution (B3ZS)
- Framing: M13 or C-bit
- Connector: Dual BNC (1 receive, 1 transmit)

Compliance

- EMC - see Electromagnetic Compatibility (EMC) Table on page 6.
- UL/CUL 60950
- 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: 5.63-inch W x 8.63-inch D

NetVanta HSSI Wide Module (P/N 1200934L1)

The NetVanta HSSI Wide Module (shown in *Figure 6*) provides an HSSI interface for the NetVanta 5305. Up to two HSSI Wide Modules may be used simultaneously in the NetVanta 5305 chassis. The HSSI Wide Module may be installed in any slot (1 through 6). *Table A-4 on page 34* gives the pinouts for this module.

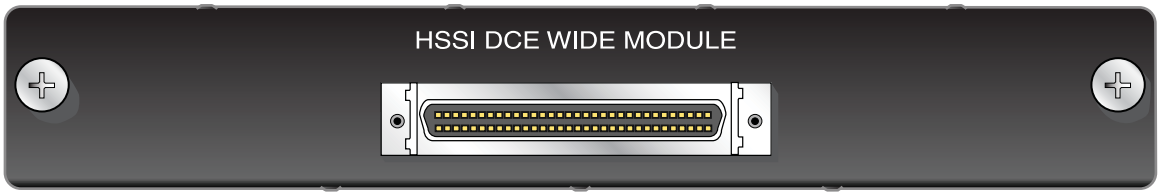

Figure 6. NetVanta HSSI Wide Module

Features and Specifications

Interface

- 50-pin SCSI-II female connector
- Line Rate: 0 to 52 Mbps
- Signal Type: Electrically balanced with non-return-to-zero (NRZ) encoding

Compliance

- EMC - see Electromagnetic Compatibility (EMC) Table on page 6.
- UL/CUL 60950
- 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

- 5.63-inch W x 8.63-inch D

NetVanta Octal T1/E1 Wide Module (P/N 1202843E1)

The NetVanta Octal T1/E1 Wide Module (shown in *Figure 7*) provides eight T1 or E1 interfaces with RJ-48C wire connections. These interfaces can be used independently or as aggregate bandwidth using Multilink Point-to-Point Protocol (MLPPP). Up to six T1/E1 Wide Modules may be used simultaneously in the NetVanta 5305 chassis. The NetVanta Octal T1/E1 Wide Module may be installed in any slot (1 through 6). *Table A-5 on page 35* gives the pinouts for this module.

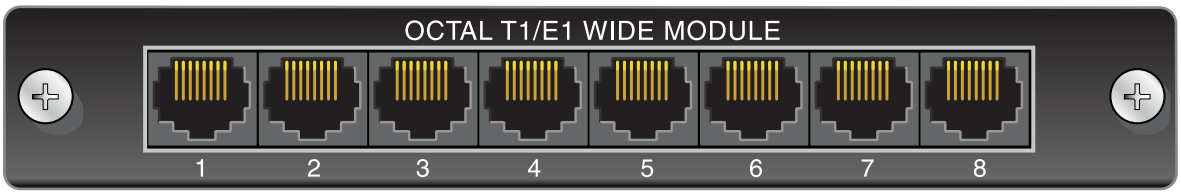

Figure 7. NetVanta Octal T1/E1 Wide Module

Features and Specifications

Operating Modes

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

> *A DIP switch on the circuit board selects either T1 or E1 operation. All eight ports are either T1 or E1. The default is T1. Refer to T1/E1 Mode Switch on page 25 for more information.*

8xT1 Interfaces

- Supported Standards: AT&T TR 62411, AT&T TR 54016, 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); Support for Nx64 on all T1 interfaces
- Line Build Out: 0, -7.5, -15, -22.5 dB (long), 0 to 655 ft (short)
- DS0 Assignment: Programmable

8xE1 Interfaces

- Supported Standards: ITU G.703, ITU-T G.704 (CRC-4), ITU-T G823, ITU-T G.797
- Line Rate: 2.048 Mbps ±50 PPM
- Line Code: AMI or HDB3
- Framing: FAS/NFAS with optional CRC-4
- FE1 Line Rate: Channelized timeslot (in multiples of 64 kbps)
- Input Signal: 0 to -30 dB (DS1) on all E1 interfaces (1 through 8)
- Connector: RJ-48C

NOTE *A different service provider can be used on each interface. Each interface has an independent clock.*

Clock Source

- Network
- Internal

Diagnostics

- Network Loopbacks: Line, payload, remote
- Test Pattern Generation and Detection: QRSS, 2^{15} - 1, 2^{20} - 1, all ones, all zeros

Compliance

- EMC - see Electromagnetic Compatibility (EMC) Table on page 6.
- AS/ACIF S016
- ETSI TBR 12/TBR 13
- ACTA/FCC Part 68
- IC CS-03
- UL/CUL 60950
- 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

- 5.63-inch W x 8.63-inch D

NOTE *No external CSU/DSU is needed with the T1/FT1 interface.*

T1/E1 Mode Switch

The Octal T1/E1 Wide Module is shipped with the T1/E1 mode switch (located on the circuit board) set to T1. If you require E1 functionality, use your thumbnail to slide the E1 mode switch to the **ON** position (as shown in the figure below).

Switch Set to T1 Mode

Switch Set to E1 Mode

4. UNIT INSTALLATION

The instructions and guidelines provided in this section cover hardware installation topics, such as rack mounting 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 5305 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.*

Tools Required

The customer-provided tools required for the hardware installation of the NetVanta 5305 are:

- Ethernet cable
- Phillips-head screwdriver
- AMP P/N 59250 crimping tool or equivalent

NOTE

To access the CLI of the NetVanta, you will also need a PC 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 NetVanta 5305 may be installed in a 19-inch or 23-inch rackmount configuration. The following sections provide step-by-step instructions for rack mounting.

Figure 8. Rack Mounting the NetVanta 5305

Rack Mounting NetVanta 5305

The NetVanta 5305 can be rack mounted in a 19-inch equipment rack using the mounting kit included with the shipment. Rackmount adapter kits (P/N 1200775L1) can be purchased separately for installation in a standard 23-inch rack. Follow these steps to mount the NetVanta 5305 into the equipment rack:

Instructions for Rack Mounting NetVanta 5305	
Step	**Action**
1	Attach the rackmount ears to the NetVanta 5305 chassis.
2	To allow proper grounding, scrape the paint from the rack around the mounting holes where the NetVanta 5305 will be positioned.
3	Position the NetVanta 5305 in a stationary equipment rack.
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	Proceed to the steps given in the *Installing Modules on page 28*.

- *If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient 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).*

Installing Modules

The following table lists the installation steps for inserting modules into the NetVanta 5305 chassis.

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.*

- *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 Modules	
Step	**Action**
1	Remove power from the unit.
2	Remove the cover plate from the appropriate option slot of the rear panel using a Phillips-head screwdriver.
3	Slide the option module into the slot until the module is firmly seated against the chassis.
4	Secure the screws at both edges of the module. Tighten with a screwdriver.
5	Connect the cables to the associated device(s).
6	Complete the installation of remaining modules and unit as specified in the appropriate sections of this hardware installation guide.

Supplying Power to the Unit

As shipped, NetVanta 5305 is set to factory default conditions. After installing the chassis and any option modules, the system is ready for power up. To power the system, ensure that the unit is properly connected to an appropriate power source (as outlined in the sections which follow).

NetVanta 5305 (AC)

The AC-powered NetVanta 5305 comes equipped with a detachable 6-foot power cord with a 3-prong plug for connecting to a grounded power receptacle. To power up the unit, ensure that the power cord is securely attached to the unit (located on the rear panel) and connect the cord to the appropriate power supply.

AC Grounding Instructions

The following paragraphs provide grounding instructions for the NetVanta 5305:

- *Power to the NetVanta 5305 AC system must be from a grounded 85 to 250 VAC, 4 A/2 A, 50/60 Hz source.*
- *In addition to the equipment earthing conductor in the power supply cord, a supplementary equipment earthing conductor is to be installed between the system and earth.*
- *The supplemental earthing conductor shall be connected to the equipment using a number 8 ring terminal and should be fastened to the grounding lug provided on the rear panel of the equipment. The ring terminal should be installed using the appropriate crimping tool (AMP P/N 59250 T-EAD Crimping Tool or equivalent).*
- *The supplementary equipment earthing conductor must not be smaller in size than cross-sectional area of not less than 2.5 mm^2, if mechanically protected. The supplementary equipment earthing conductor is to be connected to the product at the terminal provided, and connected to earth in a manner that will retain the earth connection when the power supply cord is unplugged. The connection to earth of the supplementary earthing conductor must be in compliance with the appropriate rules for terminating bonding jumpers in Part K of Article 250 of the National Electrical Code, ANSI/NFPA 70, and Article 10 of Part 1 of the Canadian Electrical Code, Part 1, C22.1. Termination of the supplementary earthing conductor is permitted to be made to building steel, to a metal electrical raceway system, or to any earthed item that is permanently and reliably connected to the electrical service equipment earthed.*
- *Bare, covered, or insulated earthing conductors are acceptable. A covered or insulated conductor must have a continuous outer finish that is either green, or green with one or more yellow stripes.*
- *A readily accessible disconnect device, that is suitably approved and rated, shall be incorporated in the field wiring.*
- *Maximum recommended ambient operating temperature is 50°C.*

Redundant AC Power Supplies (Optional)

A redundant AC power supply can be installed as a backup power supply for the system. Two redundant AC power supplies are available and can be purchased separately: a 120 VAC supply (P/N 1200840G1#120) and a 240 VAC supply (P/N 1200840G1#240).

NetVanta 5305 (DC)

The DC-powered NetVanta 5305 connects to a centralized DC power source via the four-position power connector on the rear of the chassis. The nominal input of the NetVanta 5305 is -48 VDC. Power and ground connections require copper conductors and a ring lug.

- *Power to the NetVanta 5305 DC system must be from a reliably grounded 48 VDC SELV source.*
- *Use only copper conductors (minimum 14 AWG) when making power connections.*
- *The ground wire shall be fitted with a number 8 ring terminal and should be fastened to the grounding lug on the back panel of the unit. The ring terminal shall be installed using AMP P/N 59250 T-EAD crimping tool or equivalent.*
- *Install unit in accordance with the requirements of NEC NFPA 70.*
- *The branch circuit overcurrent protection shall be a fuse or circuit breaker rated minimum 48 VDC, maximum 15 A.*
- *A readily accessible disconnect device, that is suitably approved and rated, shall be incorporated in the field wiring.*
- *Maximum recommended ambient operating temperature is 50°C.*

Instructions for Connecting DC Power Source to the NetVanta 5305	
Step	**Action**
1	With the power disconnected, connect the primary power source to input A of the power connector.
2	Connect a ground wire (minimum 12 AWG) to the grounding point using the screw provided. Connect the other end of the ground wire to a protective earth ground.
3	If using a backup power source, connect it to input B of the power connector.

Installing the NetVanta VPN Accelerator Card (included in P/N 4200368L3)

The optional NetVanta VPN Accelerator card plugs into a 32-bit PCI slot and is designed to be used in the NetVanta 5305 to provide encryption/decryption and security acceleration services for the host processor. The card is a 1U-high PC card with gold fingers to interface to a 3.3 V keyed PCI connector. It provides the following security services to the host processor: DES, 3DES, AES, SHA-1, MD5, and random number generation. The card is powered from the +3.3 V rail of the PCI Bus, and the power consumption of the card will not exceed 2 watts.

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

CAUTION

The NetVanta VPN Accelerator card is intended to be installed only by qualified service personnel.

Instructions for Installing the VPN Accelerator Card	
Step	**Action**
1	Remove power from the unit.
2	Use a screwdriver to take the screws out of the system controller module. Remove the module.
3	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.
4	Slide the system controller module into the controller slot until the module is firmly positioned against the chassis.
5	Secure the screws at both edges of the module. Tighten with a screwdriver.
6	Restore power to the unit.

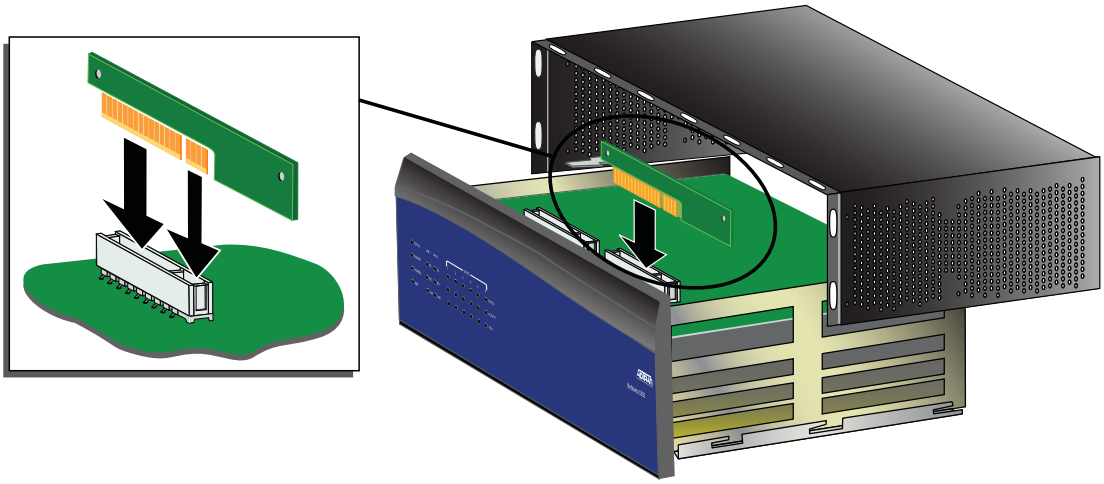

Figure 9. NetVanta VPN Accelerator Card Installation

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. PIN ASSIGNMENTS

The following tables provide the pin assignments for the NetVanta 5305 System controller and option modules.

Controller Module Pinouts

Table A-1. 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-2. CONSOLE Port (DCE) 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 (output)
7	RTS	Request to Send - flow control (input)
8	CTS	Clear to Send (output)
9	RI	Ring Indicate (output)

NOTE

Connection directly to an external modem requires a crossover cable.

Option Module Pinouts

Table A-3. T3 Wide Module/T3 Interface (BNC)

Name	Description
RX IN	Receive data from the network
TX OUT	Transmit data toward the network

Table A-4. HSSI Wide Module Pinouts

PIN# (+ side)	PIN# (- side)	Direction	Description
1	26	—	HSSI SG - Signal Ground
2	27	I	HSSI RT - Receive Timing
3	28	I	HSSI CA - DCE Available
4	29	I	HSSI RD - Receive Data
5	30	I	HSSI LC - Loopback Circuit C
6	31	I	HSSI ST - Send Timing
7	32	—	HSSI SG - Signal Ground
8	33	O	HSSI TA - DTE Available
9	34	O	HSSI TT - Terminal Timing
10	35	O	HSSI LA - Loopback Circuit A
11	36	O	HSSI SD - Send Data
12	37	O	HSSI LB - Loopback Circuit B
13	38	—	HSSI SG - Signal Ground
14-18	—	—	Unused
19	44	—	HSSI SG - Signal Ground
20-23	45	—	Unused
24	49	I	HSSI TM - Test Mode
25	50	—	HSSI SG - Signal Ground

Table A-5. Octal T1/E1 Wide Module Pinouts (for either T1 or E1 Mode)

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

