NetVanta 1531/1534/1544 Series
Hardware Installation Guide

1700570F1	NetVanta 1531
1700571F1	NetVanta 1531P
1702590G1	NetVanta 1534
1702591G1/G2	NetVanta 1534P
1702544G1	NetVanta 1544
1702545G1/G2	NetVanta 1544P
1700546G1#120	NetVanta 1544F with 120 VAC Power Supply
1700546G1#240	NetVanta 1544F with 240 VAC Power Supply
1200884G1	Wall Mounting Bracket (NetVanta 1531/1534/1544 Series)
1700512F1	Dual Wall Mounting Bracket
1700511F1	Rack Mounting Bracket (NetVanta 1531 Series)
1700508F1	19-inch Dual Mounting Tray
1700530F1	NetVanta 1131 RPS/EPS
1700532F1	NetVanta 1131 RPS Cable
1700533F1	NetVanta 1131 EPS Cable
1700534F1	NetVanta 1131 Dual Mounting Tray

61702590G1-34H
August 2019

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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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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.

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.

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 at https://supportforums.adtran.com.

Save These Important Safety Instructions

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.

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 1531/1534/1544 Series Gigabit Switches include the NetVanta 1531, NetVanta 1531P (Power over Ethernet (PoE)), NetVanta 1534, NetVanta 1534P (PoE), NetVanta 1544, NetVanta 1544P (PoE), and NetVanta 1544F.

> *In this document, the term NetVanta 1531/1534/1544 Series means all of the units collectively. If a statement only applies to one particular switch, the text refers to that switch individually.*

This hardware installation guide lists the NetVanta 1531/1534/1544 Series units' physical characteristics and product specifications, introduces basic functionality, and provides installation instructions.

- *Physical Descriptions on page 10*
- *Product Specifications on page 26*
- *Unit Installation on page 29*
- *NetVanta 1131 RPS/EPS on page 38*

For additional information on mounting options, suppling power, upgrading memory, installing a CompactFlash card, and installing the NetVanta 1131 RPS/EPS refer to the following sections:

- *Mounting Options on page 30*
- *Supplying Power to the Unit on page 37*
- *Installing a CompactFlash Card on page 37*
- *Installing the NetVanta 1131 RPS/EPS on page 41*

For information on switch configuration for 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.

2. PHYSICAL DESCRIPTIONS

NetVanta 1531 Series

The NetVanta 1531 Series is a Layer 3 Lite managed switch. The entire series runs ADTRAN Operating System (AOS), is managed through an EIA-232 **CONSOLE** port (DB-9), Telnet session, or web-based graphical user interface (GUI), and is RoHS compliant (telecommunications exemption). The NetVanta 1531 Series units are described in the following sections.

The NetVanta 1531 Series is housed in a 1U-high, rack-mountable metal enclosure that is half the width of a standard 19-inch rack, allowing two units to be mounted side by side using an optional dual mounting tray. It includes a universal AC power supply and the front panel contains 10 10/100/1000Base-T Ethernet interfaces that are accessed via standard RJ-45 connectors. Two 1000Base-X small form-factor pluggable (SFP) slots (supporting industry standard small SFP modules) are available on the front panel for high-speed uplink via fiber. The NetVanta 1531 EIA-232 **CONSOLE** port (DB-9) is located on the front panel.

SFP Module Slots

The NetVanta 1531 Series units support two 1000Base-X SFP slots on the front panel that accept a number of industry standard SFP modules. The SFP modules provide Gigabit Ethernet fiber connectivity for high-speed uplinks or switch stacking. For a list of supported SFP modules, visit the ADTRAN website at http://www.adtran.com.

Power over Ethernet

The NetVanta 1531P unit provides the same basic functionality as the NetVanta 1531 product. PoE provides the ability to detect attached powered devices (PDs), and deliver 48 VDC to the PD via Ethernet cabling. The NetVanta 1531P is fully compliant with the IEEE 802.3af PoE and IEEE 802.3at PoE+ standards. By default, the PoE switch discovers and provides power to IEEE-compliant PDs. The NetVanta 1531P also supports legacy PDs.

NetVanta 1531 Series Shipping Contents

Each NetVanta 1531 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).

Domestic shipments of the NetVanta 1531 Series includes the following items:

- NetVanta 1531 base unit
- A detachable power cable with a grounded, three-prong plug
- Quick start guide

International shipments of the NetVanta 1531 Series includes the following items:

- NetVanta 1531 base unit
- All necessary power cords
- Quick start guide

NetVanta 1531 Front Panel Design

The NetVanta 1531 front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

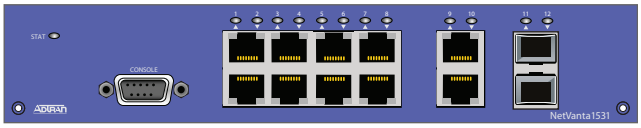

Figure 1. NetVanta 1531 Front Panel Layout

Front Panel Features

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). Refer to *Table A-1 on page 47* for pinouts.

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

10/100/1000Base-T Ethernet Interfaces

The front panel contains 10 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **10** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. Refer to *Table A-2 on page 47* for pinouts.

SFP Slots

The front panel contains two industry standard SFP slots for fiber or copper connectivity. The interfaces numbered **11** and **12** support 1000Base-X SFP modules and their status LEDs are located directly above the interfaces. Refer to *Table A-3 on page 48* for pinouts.

NetVanta 1531 Rear Panel Design

The NetVanta 1531 rear panel is shown below.

Figure 2. NetVanta 1531 Rear Panel Layout

Rear Panel Interface

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.

NetVanta 1531P Front Panel Design

The NetVanta 1531P front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

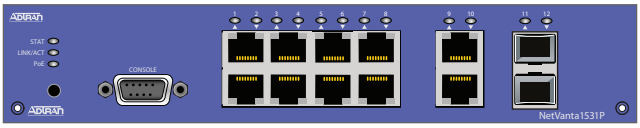

Figure 3. NetVanta 1531P Front Panel Layout

Front Panel Features

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

Link/Activity LED

The **LINK/ACT** LED is located on the left side of the unit and indicates that the port LEDs **1** through **8** are displaying link/activity status.

Power over Ethernet LED

The **PoE** LED is located on the left side of the unit and indicates that the port LEDs **1** through **8** are displaying PoE status.

LED Mode Switch

The LED mode switch is located on the left side of the unit and is used to toggle Ports **1** through **8** between link/activity and PoE display modes.

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). Refer to *Table A-1 on page 47* for pinouts.

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

10/100/1000Base-T Ethernet Interfaces

The front panel contains 10 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **10** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. Refer to *Table A-2 on page 47* for pinouts.

SFP Slots

The front panel contains two industry standard SFP slots for fiber connectivity. The interfaces numbered **11** and **12** support 1000Base-X SFP modules and their status LEDs are located directly above the interfaces. Refer to *Table A-3 on page 48* for pinouts.

NetVanta 1531P Rear Panel Design

The NetVanta 1531P rear panel is shown below.

Figure 4. NetVanta 1531P Rear Panel Layout

Rear Panel Interface

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.

NetVanta 1534 Series

The NetVanta 1534 Series is a Layer 3 Lite managed switch. The entire series runs AOS, is managed through an EIA-232 **CONSOLE** port (DB-9), Telnet session, or GUI, and is RoHS compliant (telecommunications exemption). The NetVanta 1534 Series units are described in the following sections.

The NetVanta 1534 is housed in a 1U-high, rack-mountable metal enclosure that is half the width of a standard 19-inch rack, allowing two units to be mounted side by side using an optional dual mounting tray. It includes a universal AC power supply and the front panel contains 24 10/100/1000Base-T Ethernet interfaces that are accessed via standard RJ-45 connectors. Two 1000Base-X SFP slots and two 2500Base-X slots (all supporting industry standard small SFP modules) are available on the rear panel for high-speed uplink via fiber or copper. The NetVanta 1534 EIA-232 **CONSOLE** port (DB-9) is located on the rear panel.

The NetVanta 1534P is housed in a 1U-high, rack-mountable metal enclosure that can be mounted in a standard 19-inch rack and includes a universal AC power supply. The front panel contains 24 10/100/1000Base-T Ethernet interfaces that are accessed via standard RJ-45 connectors. Two 1000Base-X SFP slots and two 2500Base-X slots (all supporting industry standard SFP modules) are also available on the front panel for high-speed uplink via fiber or copper. The NetVanta 1534P EIA-232 **CONSOLE** port (DB-9) is located on the front panel.

Redundant Power Supply

All NetVanta 1534 and 1534P units provide a connection for an optional RPS on the rear panel. The NetVanta 1131 RPS/EPS (P/N 1700530F1) is sold separately. When connected, the RPS will provide 120 W of backup power should the internal power supply fail. The units will automatically switch to RPS when needed, providing uninterrupted power to the unit.

Extended Power Supply

The NetVanta 1534P unit also provides a connection for an optional EPS on the rear panel. The NetVanta 1131 RPS/EPS (P/N 1700530F1) is sold separately. When an EPS is connected, the internal and external supplies will use load sharing to provide up to 740 W of power for PoE applications. In the event that the internal power supply fails, the EPS will provide up to 370 W of power for PoE applications. The units will automatically switch to EPS when needed, providing uninterrupted power to the unit.

SFP Module Slots

The NetVanta 1534 Series units support two 1000Base-X and two 1000/2500Base-X SFP slots on either the front or back panel that accept a number of industry standard SFP modules. The SFP modules provide Gigabit Ethernet fiber connectivity for high-speed uplinks or switch stacking. For a list of supported SFP modules, visit the ADTRAN website at http://www.adtran.com.

Power over Ethernet

The NetVanta 1534P unit provides the same basic functionality as the NetVanta 1534 product. PoE provides the ability to detect attached powered devices (PDs), and deliver 48 VDC to the PD via Ethernet cabling. The NetVanta 1534P is fully compliant with the IEEE 802.3af PoE and IEEE 802.3at PoE+ standards. By default, the PoE switch discovers and provides power to IEEE-compliant PDs. The NetVanta 1534P also supports legacy PDs.

NetVanta 1534 Series Shipping Contents

Each NetVanta 1534 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).

Domestic shipments of the NetVanta 1534 Series includes the following items:

- NetVanta 1534 base unit
- A detachable power cable with a grounded, three-prong plug
- Quick start guide
- Two 19-inch rack mounting brackets with four mounting screws

International shipments of the NetVanta 1534 Series includes the following items:

- NetVanta 1534 base unit
- All necessary power cords
- Quick start guide
- Two 19-inch rack mounting brackets with four mounting screws

NetVanta 1534 Front Panel Design

The NetVanta 1534 front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

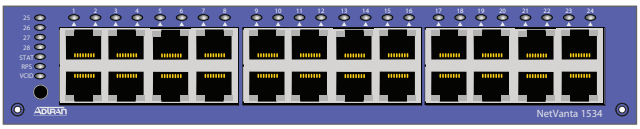

Figure 5. NetVanta 1534 Front Panel Layout

Front Panel Features

Link/Activity LEDs

The link/activity LEDs labeled **1** through **24** are located above the 10/100/1000Base-T Ethernet interfaces and indicates when there is activity on the interface. The link/activity LEDs labeled **25** through **28** indicate when there is activity on the SFP interfaces (located on the rear panel of the unit). When the LED mode switch has been activated, these LEDs will display VCID (future release).

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

Redundant Power Supply LED

The **RPS** LED is located on the left side of the unit and indicates when the unit is receiving power from the RPS.

VCID LED (Future Release)

The **VCID** LED is located on the left side of the unit and indicates that the port LEDs are displaying VCID.

LED Mode Switch (Future Release)

The LED mode switch is located on the left side of the unit and is used to toggle Ports **1** through **28** between link/activity and VCID display modes.

10/100/1000Base-T Ethernet Interfaces

The front panel contains 24 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **24** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. Refer to *Table A-2 on page 47* for pinouts.

NetVanta 1534 Rear Panel Design

The NetVanta 1534 rear panel is shown below.

Figure 6. NetVanta 1534 Rear Panel Layout

Rear Panel Interfaces

SFP Slots

The rear panel contains four industry standard SFP slots for fiber or copper connectivity. The interfaces numbered **25** and **26** support 1000Base-X SFP modules and their status LEDs are located on the front panel of the unit. The interfaces numbered **27** and **28** support both 1000Base-X and 1000/2500Base-X SFP modules and their status LEDs are also located on the front panel of the unit. Refer to *Table A-3 on page 48* for pinouts.

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). Refer to *Table A-1 on page 47* for pinouts.

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

RPS

The rear panel has a power input to a +12 VDC RPS. The **RPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the RPS.

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.

NetVanta 1534P Front Panel Design

The NetVanta 1534P front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

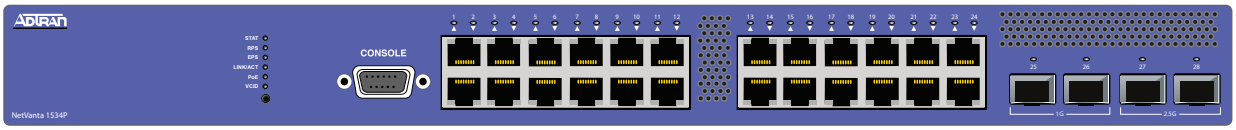

Figure 7. NetVanta 1534P Front Panel Layout

Front Panel Features

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

Redundant Power Supply LED

The **RPS** LED is located on the left side of the unit and indicates when the unit is receiving power from the RPS.

Extended Power Supply LED

The **EPS** LED is located on the left side of the unit and indicates when the unit is receiving power from the EPS.

Link/Activity LED

The **LINK/ACT** LED is located on the left side of the unit and indicates that the port LEDs are displaying link/activity status.

Power over Ethernet LED

The **PoE** LED is located on the left side of the unit and indicates that the port LEDs are displaying PoE status.

VCID LED (Future Release)

The **VCID** LED is located on the left side of the unit and indicates that the port LEDs are displaying VCID.

LED Mode Switch (Future Release)

The LED mode switch is located on the left side of the unit and is used to toggle Ports **1** through **48** between link/activity and VCID display modes.

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). Refer to *Table A-1 on page 47* for pinouts.

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

10/100/1000Base-T Ethernet Interfaces

The front panel contains 24 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **24** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. Refer to *Table A-2 on page 47* for pinouts.

SFP Slots

The front panel contains four industry standard SFP slots for fiber or copper connectivity. These interfaces are numbered **25** through **28** and their status LEDs are located directly above these numbers. Refer to *Table A-3 on page 48* for pinouts.

NetVanta 1534P Rear Panel Design

The NetVanta 1534P rear panel is shown below.

Figure 8. NetVanta 1534P Rear Panel Layout

Rear Panel Interfaces

EPS

The rear panel has a power input to a +50 VDC EPS. The **EPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the EPS.

RPS

The rear panel has a power input to a +12 VDC RPS. The **RPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the RPS.

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.

NetVanta 1544 Series

The NetVanta 1544 Series is a Layer 3 managed switch. The entire series runs AOS, is managed through an EIA-232 **CONSOLE** port (DB-9), Telnet session, or GUI, and is RoHS compliant (telecommunications exemption). The NetVanta 1544 Series units are described in the following sections.

The NetVanta 1544 is housed in a 1U-high, rack-mountable metal enclosure that is half the width of a standard 19-inch rack, allowing two to be mounted side by side using an optional dual mounting tray. The NetVanta 1544 includes a universal AC power supply and the front panels contain 24 10/100/1000Base-T Ethernet interfaces that are accessed via standard RJ-45 connectors. Four industry standard 1000/2500Base-X SFP slots (supporting industry standard SFP modules) are available on the rear panel for high-speed uplink via fiber or copper. The NetVanta 1544 EIA-232 **CONSOLE** port (DB-9) is located on the rear of the unit.

The NetVanta 1544P is housed in a 1U-high, rack-mountable metal enclosure that can be mounted in a standard 19-inch rack. The NetVanta 1544P includes a universal AC power supply and the front panels contain 24 10/100/1000Base-T Ethernet interfaces that are accessed via standard RJ-45 connectors. Four industry standard 1000/2500Base-X SFP slots (supporting industry standard SFP modules) are also available on the front panel for high-speed uplink via fiber or copper. The NetVanta 1544P EIA-232 **CONSOLE** port (DB-9) is located on the front of the unit.

The NetVanta 1544F is housed in a 1U-high, rack-mountable metal enclosure that can be mounted in a standard 19-inch rack and is available with either a 120 VAC or 240 VAC power supply. The front panel contains 24 100/1000Base-X SFP interfaces that are accessed via fiber or copper using industry standard SFP modules. Four industry standard 1000/2500Base-X SFP slots (also supporting industry standard SFP modules) are also available on the front panel for high-speed uplink via fiber or copper. The NetVanta 1544F has expandable memory via CompactFlash. The NetVanta 1544F EIA-232 **CONSOLE** port (DB-9) is located on the front of the unit.

Redundant Power Supply

All NetVanta 1544 and 1544P units provide a connection for an optional RPS on the rear panel. The NetVanta 1131 RPS/EPS (P/N 1700530F1) is sold separately. When connected, the RPS will provide 120 W of backup power should the internal power supply fail. The units will automatically switch to RPS when needed, providing uninterrupted power to the unit.

Extended Power Supply

The NetVanta 1544P unit also provides a connection for an optional EPS on the rear panel. The NetVanta 1131 RPS/EPS (P/N 1700530F1) is sold separately. When an EPS is connected, the internal and external supplies will use load sharing to provide up to 740 W of power for PoE applications. In the event that the internal power supply fails, the EPS will provide up to 370 W of power for PoE applications. The units will automatically switch to EPS when needed, providing uninterrupted power to the unit.

SFP Module Slots

The NetVanta 1544 Series units support four 1000/2500Base-X SFP slots on either the front or back panel that accept a number of industry standard SFP modules. The SFP modules provide Gigabit Ethernet fiber connectivity for high-speed uplinks or switch stacking. As well as the four 1000/2500Base-X SFP slots, the NetVanta 1544F units support 24 100/1000Base-X SFP interfaces that are accessed via fiber or copper using industry standard SFP modules. For a list of supported SFP modules, visit the ADTRAN website at http://www.adtran.com.

Power over Ethernet

The NetVanta 1544P device provides the same basic functionality as the NetVanta 1544 product. PoE provides the ability to detect attached PDs, and deliver 48 VDC to the PD via Ethernet cabling. The NetVanta 1544P is fully compliant with the IEEE 802.3af PoE and IEEE 802.3at PoE+ standards. By default, the PoE switch discovers and provides power to IEEE-compliant PDs. The NetVanta 1544P also supports legacy PDs.

CompactFlash

The NetVanta 1544F's CompactFlash slot, located on the rear panel, allows nonvolatile memory expansion with supported densities ranging from 64 MB to 1 GB.

NetVanta 1544 Series Shipping Contents

Each NetVanta 1544 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).

Domestic shipments of the NetVanta 1544 Series includes the following items:

- NetVanta 1544 base unit
- A detachable power cable with a grounded, three-prong plug
- Quick start guide
- Two 19-inch rack mounting brackets with four mounting screws

International shipments of the NetVanta 1544 Series includes the following items:

- NetVanta 1544 base unit
- All necessary power cords
- Quick start guide
- Two 19-inch rack mounting brackets with four mounting screws

NetVanta 1544 Front Panel Design

The NetVanta 1544 front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

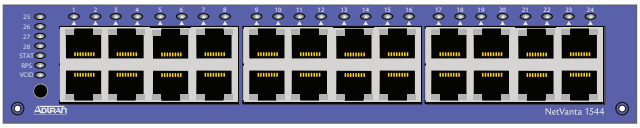

Figure 9. NetVanta 1544 Front Panel Layout

Front Panel Features

Link/Activity LEDs

The link/activity LEDs labeled **1** through **24** are located above the 10/100/1000Base-T Ethernet interfaces and indicates when there is activity on the interface. The link/activity LEDs labeled **25** through **28** indicate when there is activity on the SFP interfaces (located on the rear panel of the unit). When the LED mode switch has been activated, these LEDs will display VCID status (future release).

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

Redundant Power Supply LED

The **RPS** LED is located on the left side of the unit and indicates when the unit is receiving power from the RPS.

VCID LED (Future Release)

The **VCID** LED is located on the left side of the unit and indicates that the port LEDs are displaying VCID.

LED Mode Switch (Future Release)

The LED mode switch is located on the left side of the unit and is used to toggle Ports **1** through **28** between link/activity and VCID display modes.

10/100/1000Base-T Ethernet Interfaces

The front panel contains 24 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **24** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. Refer to *Table A-2 on page 47* for pinouts.

NetVanta 1544 Rear Panel Design

The NetVanta 1544 rear panel is shown below.

Figure 10. NetVanta 1544 Rear Panel Layout

Rear Panel Interfaces

SFP Slots

The rear panel contains four industry standard SFP slots for fiber or copper connectivity. These interfaces are numbered **25** through **28**, support both 1000Base-X and 1000/2500Base-X SFP modules, and their status LEDs are located on the front panel of the unit. Refer to *Table A-3 on page 48* for pinouts.

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). Refer to *Table A-1 on page 47* for pinouts.

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

RPS

The rear panel has a power input to a +12 VDC RPS. The **RPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the RPS.

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.

NetVanta 1544P Front Panel Design

The NetVanta 1544P front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

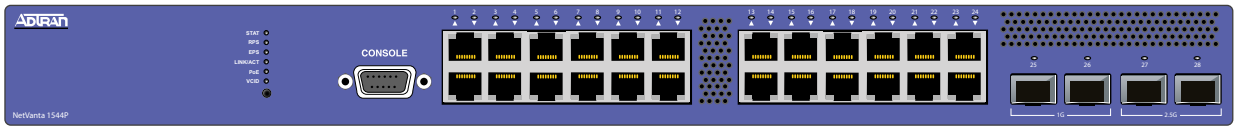

Figure 11. NetVanta 1544P Front Panel Layout

Front Panel Features

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

Redundant Power Supply LED

The **RPS** LED is located on the left side of the unit and indicates when the unit is receiving power from the RPS.

Extended Power Supply LED

The **EPS** LED is located on the left side of the unit and indicates when the unit is receiving power from the EPS.

Link/Activity LEDs

The **LINK/ACT** LED is located on the left side of the unit and indicates that the port LEDs are displaying link/activity status.

Power over Ethernet LED

The **PoE** LED is located on the left side of the unit and indicates that the port LEDs are displaying PoE status.

VCID LED (Future Release)

The **VCID** LED is located on the left side of the unit and indicates that the port LEDs are displaying VCID.

LED Mode Switch

The LED mode switch is located on the left side of the unit and is used to toggle Ports **1** through **48** between link/activity and VCID display modes.

CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). Refer to *Table A-1 on page 47* for pinouts.

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

10/100/1000Base-T Ethernet Interfaces

The front panel contains 24 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **24** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. Refer to *Table A-2 on page 47* for pinouts.

SFP Slots

The front panel contains four industry standard SFP slots for fiber or copper connectivity. These interfaces are numbered **25** through **28** and their status LEDs are located directly above these numbers. Refer to *Table A-3 on page 48* for pinouts.

NetVanta 1544P Rear Panel Design

The NetVanta 1544P rear panel is shown below.

Figure 12. NetVanta 1544P Rear Panel Layout

Rear Panel Interfaces

EPS

The rear panel has a power input to a +50 VDC EPS. The **EPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the EPS.

RPS

The rear panel has a power input to a +12 VDC RPS. The **RPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the RPS.

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.

NetVanta 1544F Front Panel Design

The NetVanta 1544F front panel is shown below. *Table 1 on page 25* describes all of the LEDs, and *Appendix A on page 47* shows the connector pinouts.

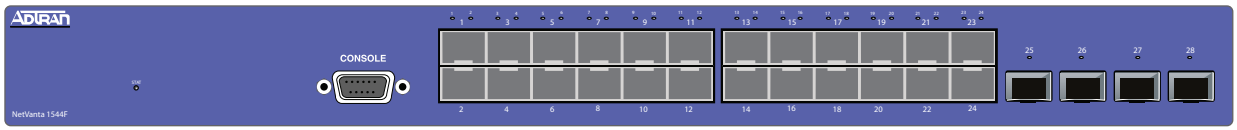

Figure 13. NetVanta 1544F Front Panel Layout

Front Panel Features

Status LED

The **STAT** LED is located on the left side of the unit and indicates the unit's status.

CONSOLE Interface

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

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

100/1000Base-X SFP Interfaces

The NetVanta 1544F front panel contains 24 100/1000Base-X SFP interfaces. These interfaces are arranged in stacked pairs, with the numbers **1** through **24** screened from left to right directly above or below the corresponding port. Status LEDs for each stacked pair of interfaces are located directly over the interfaces.

1000/2500Base-X SFP Slots

The NetVanta 1544F front panel contains four 1000/2500Base-X SFP interfaces. These interfaces are numbered **25** through **28** and their status LEDs are located directly under these numbers.

Rear Panel Design

The NetVanta 1544F rear panel is shown below.

Figure 14. NetVanta 1544F Rear Panel Layout

NetVanta 1544F Rear Panel Interfaces

CompactFlash

The CompactFlash slot allows nonvolatile memory expansion with supported densities ranging from 64 MB to 1 GB.

Power Connection

The rear panel has a power input to the AC power supply; either 120 VAC or 240 VAC input depending on application. Please refer to *Supplying Power to the Unit on page 37* for connection details.

LED Descriptions

The following table describes LED activity.

Table 1. Front Panel LED Descriptions

LED	Color	Indication
STAT	Off	Unit is not receiving power.
	Green (flashing)	On power up, the **STAT** LED flashes rapidly for five seconds, during which time the user may escape to boot mode from the **CONSOLE** port.
	Green (solid)	Power is on and self-test passed.
	Red (solid)	Power is on, but the self-test failed or the application code could not be booted.
RPS (1534/1534P/1544/ 1544P units only)	Off	RPS is not connected.
	Green (solid)	RPS is connected and the internal supply is functioning.
	Red (solid)	RPS is connected and the internal supply has failed.
EPS (1534P/1544P units only)	Off	EPS is not connected.
	Green (solid)	EPS is connected and the internal supply is functioning.
	Red (solid)	EPS is connected and the internal supply has failed.
LINK/ACT (PoE units only)	Off	Link status/activity is not being displayed.
	Green (solid)	Link status/activity is being displayed.
PoE (PoE units only)	Off	PoE status is not being displayed.
	Green (solid)	PoE status is being displayed.
VCID (1534/1534P/1544/ 1544P only) (Future Release)	Off	VCID is not selected.
	Green (solid)	VCID is selected. The port LED that corresponds to the unit's VCID will display green.
Port LEDs in Link/Activity Mode (**1** - **12** 1531 Series or **1** - **28** 1534/1544 Series)	Off	The port is not connected.
	Green (solid)	The link is up and the port is enabled.
	Amber (flashing)	There is activity on the port.
Port LEDs in PoE Mode (**1** - **8** 1531P or **1** - **24** 1534P/1544P)	Off	The port is not delivering power.
	Green (solid)	The port is delivering power.
	Red (solid)	The port has detected a PoE fault.
Port LEDs in VCID Mode (**1** - **8** 1534/1544 Series) (Future Release)	Off	ActivChassis is disabled on this device.
	Green (solid)	The device has been admitted to the ActivChassis and the port LED (1 through 8) that corresponds to the unit's assigned VCID value is lit.
	Red (solid)	The device has not been admitted to the ActivChassis and the port LED (1 through 8) that corresponds to the unit's assigned VCID value is lit.

NOTE *Ports **25** through **28** are always in LINK/ACT mode.*

3. PRODUCT SPECIFICATIONS

Physical Interface

Ethernet Ports

- Up to 24 10/100/1000Base-T Ethernet interfaces
- 24 100/1000Base-X SFP interfaces (NetVanta 1544F)
- Up to 4 SFP interfaces
- Autorate/duplex/MDI/MDI-X

Console Port

- DB-9, EIA-232

Switching

- Layer 3 Lite switching capability (NetVanta 1531/1534)
- Layer 3 switching capability (NetVanta 1544)
- Nonblocking
- 8 k (NetVanta 1534) or 16 k (NetVanta 1531/1544) medium access control (MAC) addresses

Maximum Forwarding Bandwidth

- NetVanta 1531: 24 Gbps
- NetVanta 1534: 62 Gbps
- NetVanta 1544: 68 Gbps

Diagnostics

- Port mirroring
- Link Layer Discovery Protocol (LLDP) (802.1ab)
- LLDP-Media Endpoint Discovery (LLDP-MED)
- Ping
- Cable diagnostics

Front Panel Status LEDs

- Power status
- LAN: link, activity

Port Statistics

- Number of TX/RX frames
- Number of collisions
- Number of errors

Spanning Tree Support

- 802.1d spanning tree
- 802.1w rapid spanning tree

Link Aggregation

- 802.3ad link aggregation
- Support for six trunk groups, 8 ports per group

Quality of Service (QoS)

- 802.1p and DiffServ
- Four output queues per egress port
- Weighted round robin (WRR) and strict priority

VLAN Support

- Port-based virtual local area networks (VLANs)
- 802.1Q tagged trunked VLANs
- Support for up to 255 active VLANs

Storm Control

- Broadcast, unicast, and multicast

Administration

- Familiar CLI
- GUI
- n-Command® support
- SNMP v3
- SYSLOG logging
- Email alerts (Simple Mail Transfer Protocol (SMTP))
- Tool command language (Tcl) scripting

Network Access Control

- Port authentication (802.1x)

Wi-Fi Controller

- Controls up to 24 NetVanta wireless access points (WAPs)

Environment

- Operating Temperature: 0°C to 50°C (32°F to 122°F)
- Storage Temperature: -20°C to 70°C (-4°F to 158°F)
- Relative Humidity: Up to 95 percent, noncondensing

Physical

- Chassis: 1U, 19-inch, rack-mountable metal enclosure
- Dimensions NetVanta 1531/1531P/1534/1544: 1.7-inch H x 8.0-inch W x 11.0-inch D
- Dimensions NetVanta 1544F: 1.7-inch H x 17.2-inch W x 9.2-inch D
- Dimensions NetVanta 1534P/1544P: 1.7-inch H x 17.2-inch W x 10.0-inch D
- Internal AC power NetVanta 1534/1544: 100 to 250 VAC, 50/60 Hz, 40 W maximum
- Internal AC power NetVanta 1531/1531P/1534P/1544P: 110 to 240 VAC, 50/60 Hz, 370 W maximum
- Internal AC power NetVanta 1544F: Either 120 or 240 VAC, 50/60 Hz, 40 W maximum
- Redundant power supply (NetVanta 1534/1534P/1544/1544P): 12 VDC
- Extended power supply (NetVanta 1534P/1544P): 50 VDC

Compliance

- FCC Part 15 Class A
- EN 55022 Class A
- EN 55024
- EN 61000-3-2
- EN 61000-3-3
- ICES 003 Class A
- EN 300 386
- AS/NZS CISPR22 Class A
- UL/CUL 60950-1
- EN 60950-1
- IEC 60950-1
- AS/NZS 60950.1
- RoHS compliant (telecommunications exemption)

4. UNIT INSTALLATION

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

For information on switch configuration for 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.

For more information and help installing your NetVanta ActivReach product, go to http://www.adtran.com/activreach-help.

WARNING

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

CAUTION

- *The NetVanta 1531/1534/1544 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.*
- *Do not remove the cover on the RPS or EPS connectors on the rear of the unit. These connectors are reserved for future use.*
- *The NetVanta 1600 Series may be connected to multiple power sources. Disconnect all power sources, including any EPS and RPS connections, prior to servicing the unit.*

WARNING

- *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.*

Tools Required

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

- Ethernet cables
- Phillips-head screwdriver

> NOTE
> *To access the CLI of the NetVanta, you will also need a PC with VT-100 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 on the ADTRAN Support Community.*

Mounting Options

The NetVanta 1531/1534/1544 Series units can 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 1531/1534/1544 Series

The NetVanta 1531/1534/1544 Series are 1U-high, rack-mountable units that can be installed into a 19-inch equipment rack. NetVanta 1531 mounting brackets (P/N 1700511F1) must be purchased separately. NetVanta 1534 and NetVanta 1544 mounting brackets are shipped with the units. The NetVanta 1531 Series, NetVanta 1534, and NetVanta 1544 can be rack mounted with two units side by side using the optional dual mounting tray (P/N 1700508F1).

The following steps guide you in mounting the NetVanta into a rack.

> CAUTION
> - *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).*

Rack Mounting the NetVanta Using the Rack Mounting Brackets	
Step	**Action**
1	Install the rack mounting brackets on the NetVanta. To avoid damaging the unit, use only the screws shipped with the mounting brackets when attaching them to the chassis. (*Figure 15* shows installing the mounting brackets on the NetVanta 1534/1544. The installation of the mounting brackets is similar for the NetVanta 1531/1531P and NetVanta 1534P/1544P.)
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*).

NOTE

The NetVanta 1531/1531P/1534/1544 Series units have a Kensington lock slot that accepts a lock and cable security device (see Figure 15). Consult the manual shipped with your Kensington lock for installation instructions.

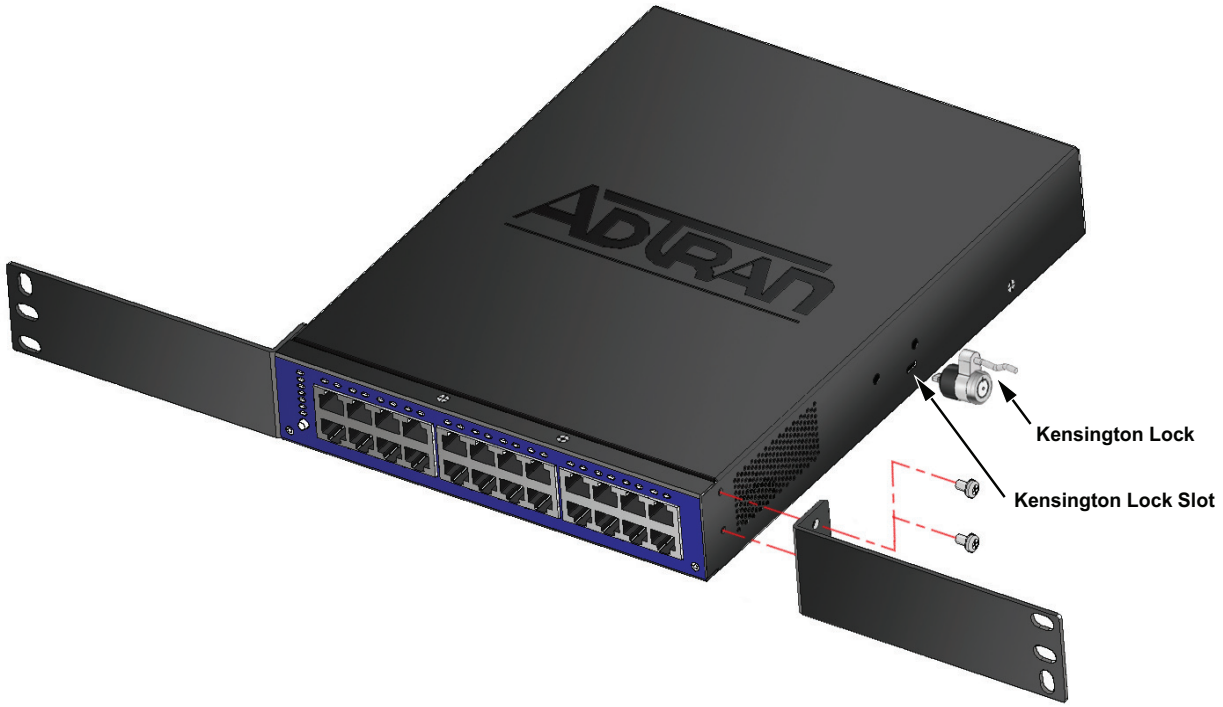

Figure 15. NetVanta Rack Mounting Brackets and Kensington Lock Slot

Rack Mounting the NetVanta 1531/1531P/1534/1544 Using the Dual Mounting Tray	
Step	**Action**
1	Install the mounting tray (P/N 1700508F1) in a stationary 19-inch equipment rack using the screws provided.
2	To allow proper grounding, scrape the paint from the rack around the mounting holes where the tray will be positioned.
3	Position two NetVanta units side by side on the mounting tray lining up the holes in the front of the NetVantas with the holes in the tabs on the front of the tray (see *Figure 16*).
4	Insert the provided screws through the tabs into the NetVanta units securing them with a screwdriver.
5	Apply power to the units (refer to *Supplying Power to the Unit on page 37*).

NOTE

The NetVanta 1531/1531P/1534/1544 Series units have a Kensington lock slot that accepts a lock and cable security device (see Figure 15). Consult the manual shipped with your Kensington lock for installation instructions.

Figure 16. Dual Mounting Tray

Wall Mounting the NetVanta 1531/1531P/1534/1544 Units

By following these instructions exactly, the NetVanta 1531/1534/1544 Series units can be safely mounted on the wall. The brackets for wall mounting a single unit (P/N 1200884G1) are shipped with NetVanta 1534/1544 Series units but must be purchased separately for the NetVanta 1531 Series. The NetVanta 1531/1531P/1534/1544 units can be mounted on the wall in a stacked configuration. The brackets for wall mounting two units (P/N 1700512F1) must be purchased separately. For instructions on wall mounting a single NetVanta 1531/1531P/1534/1534P/1544, refer to the instructions and *Figure 17 on page 34*. For instructions on dual wall mounting the NetVanta 1531/1531P/1534/1534P/1544, refer to the instructions and *Figure 18 on page 35*. For instructions on wall mounting the NetVanta 1534P/1544P/1544F units, refer to the instructions and *Figure 19 on page 36*.

- *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 a Single NetVanta 1531/1531P/1534/1544	
Step	**Action**
1	Attach the mounting brackets (P/N 1200884G1) to the chassis using the provided screws (see *Figure 17*).
2	Decide on a location for the NetVanta. NetVanta 1531/1531P/1534/1544 units are mounted with the front panel facing down, left, or right (see *Figure 17*). Keep in mind that the unit needs to be mounted at or above 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 using #6 to #10 (2.5-inch or greater in length) wood screws. ***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 wood screws (1 inch or greater in length) through the unit's brackets and into the mounted board.
5	Proceed to the steps given in *Supplying Power to the Unit on page 37*.

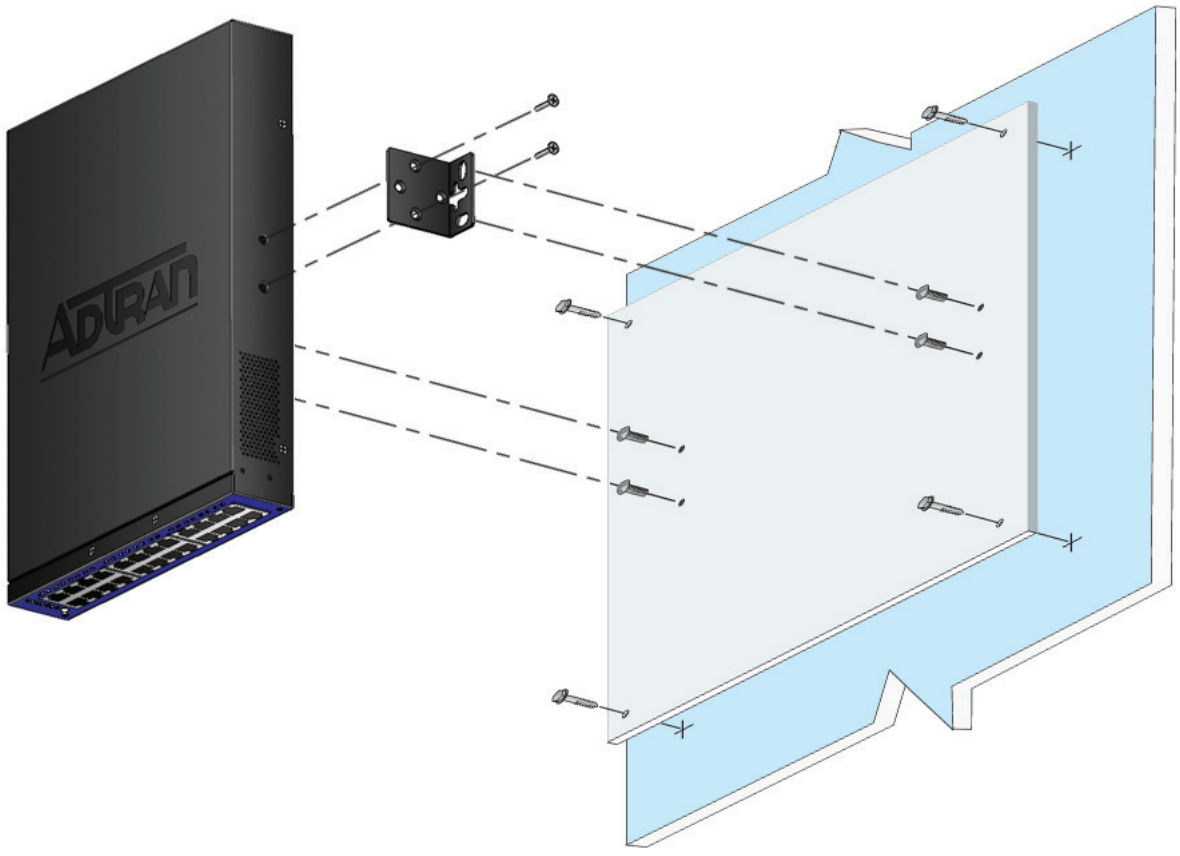

Figure 17. NetVanta 1531/1531P/1534/1544 Wallmount Installation

Instructions for Dual Wall Mounting NetVanta 1531/1531P/1534/1544	
Step	**Action**
1	Attach the mounting brackets (P/N 1700512F1) to the two chassis using the provided screws (see *Figure 18*).
2	Decide on a location for the NetVanta. NetVanta 1531/1531P/1534/1544 units are mounted with the front panel facing down, left, or right (see *Figure 18*). Keep in mind that the unit needs to be mounted at or above eye level so that the LEDs of both units are viewable.
3	Prepare the mounting surface by attaching a board (typically plywood, 3/4-inch to 1-inch thick) to a wall stud using #6 to #10 (2.5-inch or greater in length) wood screws. ***Important!*** *Mounting to a stud ensures stability. Using sheetrock anchors may not provide sufficient long-term stability.*
4	Have an assistant hold the units in position as you install two #6 to #10 wood screws (1 inch or greater in length) through the unit's brackets and into the mounted board.
5	Proceed to the steps given in *Supplying Power to the Unit on page 37*.

CAUTION

Ensure that the proper mounting orientation is followed for both units being installed in the dual wallmount configuration. Refer to the appropriate hardware installation guide for installation instructions for each unit.

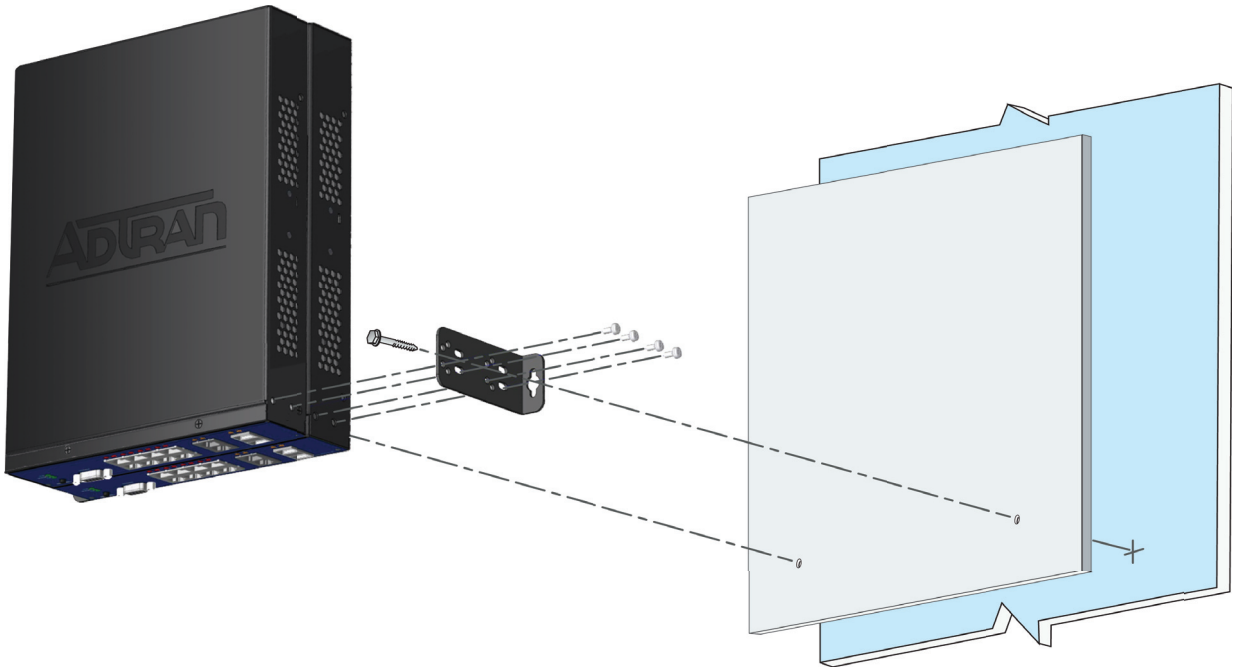

Figure 18. NetVanta 1531/1531P/1534/1544 Dual Wallmount Installation

Instructions for Wall Mounting the NetVanta 1534P/1544P/1544F	
Step	**Action**
1	Using the screws shipped with the bracket, attach the wallmount brackets to the chassis so that the portion of the bracket with the mounting holes is flush with the bottom of the chassis (see *Figure 19*).
2	Decide on a location for the NetVanta. NetVanta 1534P/1544P/1544F units are mounted with the front panel facing left (see *Figure 19*). Keep in mind that the unit needs to be mounted at or above 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 using #6 to #10 (2.5-inch or greater in length) wood screws. ***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 19*).
5	Proceed to the steps given in *Supplying Power to the Unit on page 37*.

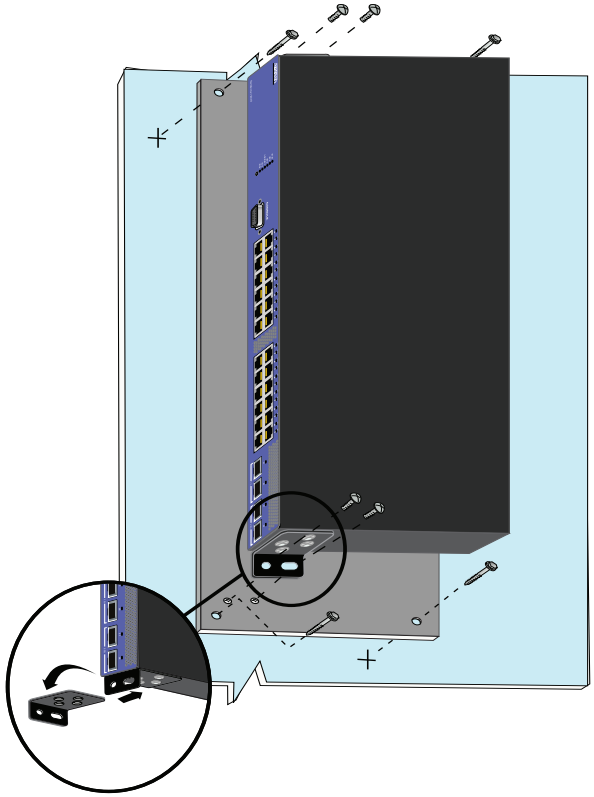

Figure 19. NetVanta 1534P/1544P/1544F Wallmount Installation

Supplying Power to the Unit

The NetVanta 1531 Series, NetVanta 1534 Series, NetVanta 1544, and NetVanta 1544P units come equipped with an auto-sensing 100 to 250 VAC, 50/60 Hz power supply for connecting to a properly grounded power receptacle. The NetVanta 1544F comes equipped with either a 120 VAC or 240 VAC power supply for connecting to a properly grounded power receptacle. All necessary power cords are shipped with the units. To power these units, connect the power cable to an appropriate AC power source.

Installing a CompactFlash Card

The **CompactFlash** slot (NetVanta 1544F only) supports any industry standard 1 GB CompactFlash card. Follow these instructions when installing a card.

> NOTE *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 AOS GUI and CLI.

Figure 20. CompactFlash Card Installation

5. NETVANTA 1131 RPS/EPS

The NetVanta 1131 RPS/EPS has three RPS outputs and one EPS output for use with RPS/EPS equipped NetVanta switches. ***Important:*** *Refer to the NetVanta 1131 product on www.adtran.com for a list of supported switches.* The RPS outputs provide redundant or backup power for a switch's internal power supply. The EPS output provides backup power for a Power over Ethernet (PoE) switch's internal PoE supply, as well as extended or supplemental power to provide full PoE for 48-port switches (up to 740 W of power).

The NetVanta 1131 does not activate RPS power until a failure is detected on the switch for which it is providing redundancy. Once RPS power is being supplied to a switch, if a second switch fails, the power will not transfer to the second switch. In the event that multiple connected switches lose power simultaneously, RPS power will be supplied to the first failed switch detected.

The NetVanta 1131 is housed in a 1U-high, metal enclosure that can be wall mounted, rack mounted singly using the provided rackmount brackets, or rack mounted two side by side using the optional dual mounting tray (P/N 1700534F1).

WARNING *The NetVanta 1131 and the NetVanta switch with which it is associated should be installed in a restricted access location as described in UL 60950-1.*

NetVanta 1131 Series Shipping Contents

Each NetVanta 1131 RPS/EPS 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).

Domestic shipments of the NetVanta 1131 include the following items:

- NetVanta 1131 base unit
- Two 19-inch rack mounting brackets and eight screws
- Two wall mounting brackets and four screws
- A detachable power cable with a grounded, three-prong plug
- Quick start guide

International shipments of the NetVanta 1638 include the following items:

- NetVanta 1131 base unit
- Two 19-inch rack mounting brackets and eight screws
- Two wall mounting brackets and four screws
- All necessary power cords
- Quick start guide

NetVanta 1131 Front Panel Design

The NetVanta 1131 front panel is shown below. *Table 2 on page 40* describes all of the LED behaviors.

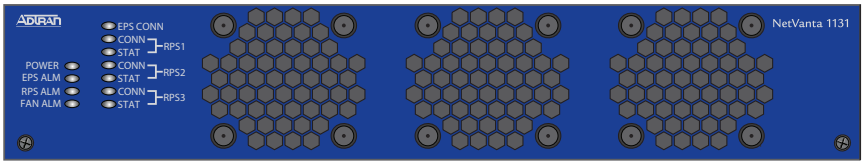

Figure 21. NetVanta 1131 Front Panel Layout

Front Panel Features

Power LED

The **Power** LED is located on the left side of the unit and indicates the unit's power status.

EPS Alarm LED

The **EPS ALM** LED is located on the left side of the unit and indicates whether the EPS is functioning.

RPS Alarm LED

The **RPS ALM** LED is located on the left side of the unit and indicates whether the RPS is functioning.

Fan Alarm LED

The **FAN ALM** LED is located on the left side of the unit and indicates the fan status.

EPS Connection LED

The **EPS CONN** LED is located on the left side of the unit and indicates status of the EPS connection.

RPS Connection LEDs

The **CONN** LEDs for **RPS1**, **RPS2**, and **RPS3** are located on the left side of the unit and indicate status of the RPS connections.

RPS Status LEDs

The **STAT** LEDs for **RPS1**, **RPS2**, and **RPS3** are located on the left side of the unit and indicate status of the RPS connections.

NetVanta 1131 Rear Panel Design

The NetVanta 1131 rear panel is shown below.

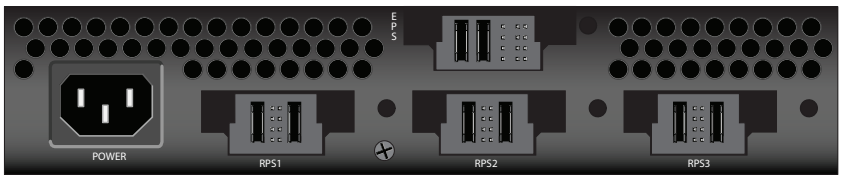

Figure 22. NetVanta 1131 Rear Panel Layout

Rear Panel Interfaces

Power Connection

The NetVanta 1131 has a power input (labeled **POWER**) to the AC universal power supply. Refer to *Powering the NetVanta 1131 and the NetVanta Switch on page 46* for connection details.

Redundant Power Connections

The rear panel contains three RPS receptacles labeled **RPS1, RPS2,** and **RPS3** that can be connected to NetVanta switches using the NetVanta 1131 RPS cable P/N 1700532F1 (purchased separately).

Extended Power Connection

The rear panel contains one EPS receptacle labeled **EPS** that can be connected to NetVanta switches using the NetVanta 1131 EPS cable P/N 1700533F1 (purchased separately).

LED Behaviors

The following table describes LED activity for the NetVanta 1131 RPS/EPS.

Table 2. Front Panel LED Behaviors

LED	Color	Indication
Power	Off	The unit is not receiving power.
	Green (solid)	The unit is receiving power.
RPS ALM	Off	The RPS is functioning properly.
	Red (solid)	The RPS has failed.
EPS ALM	Off	The EPS is functioning properly.
	Red (solid)	The EPS has failed.
FAN ALM	Off	The fans are functioning properly and the system temperature is acceptable.
	Red (solid)	The fans have failed.
RPS CONN (1 - 3)	Off	There is no connection to the switch.
	Green (solid)	There is a valid connection to the switch.
RPS STAT (1 - 3)	Off	Power is not being provided to the associated port.
	Amber (solid)	Power is being provided to the associated port.
	Amber (flashing)	A fault condition exists on the associated port.
EPS CONN	Off	There is no connection to the switch.
	Green (solid)	There is a valid connection to the switch.

Installing the NetVanta 1131 RPS/EPS

The instructions and guidelines provided in the following sections cover hardware installation topics, such as mounting options and supplying power to the NetVanta 1131.

Rack Mounting the NetVanta 1131

The NetVanta 1131 can be installed into a 19-inch equipment rack by following these steps:

- *The NetVanta 1131 is intended to be installed, maintained, and serviced by qualified service personnel only and is for use with NetVanta switches only.*
- *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 specified 50°C ambient temperature.*
- *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).*
- *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. Line and neutral are provided with fuses for overcurrent protection.*

Single Rackmount

Instructions for Rack Mounting the NetVanta 1131 (Single Mount)	
Step	**Action**
1	Securely fasten the rackmount brackets to the NetVanta 1131 using the screws provided with the unit. The brackets can be attached in flush mount, 2-inch mount, and mid-mount positions (see *Figure 23*) depending on your installation requirements. ***Important!*** *To avoid damaging the unit when attaching the mounting brackets, use only the screws supplied with the unit.*
2	To allow proper grounding, scrape the paint from the rack around the mounting holes where the unit will be positioned.
3	Position the unit in a stationary equipment rack either above or below the NetVanta switch.
4	Have an assistant hold the unit in position as you install two appropriate mounting bolts through the unit's brackets and into the equipment rack.
5	Proceed to the steps given in *Connecting the NetVanta 1131 and the NetVanta Switch on page 45*.

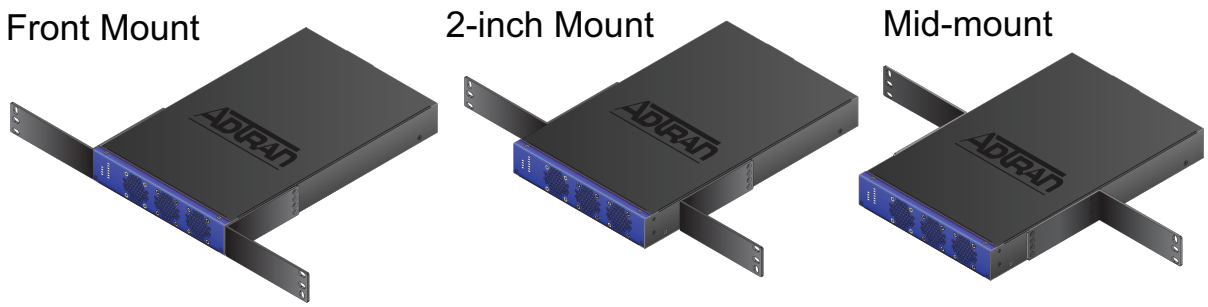

Figure 23. Rack Mounting the NetVanta 1131 Using the Brackets

Dual Rackmount

Instructions for Rack Mounting the NetVanta 1131 (Dual Mount)	
Step	**Action**
1	Install the dual mounting tray (P/N 1700534F1 purchased separately) in a stationary equipment rack using the mounting brackets and four screws provided.
2	To allow proper grounding, scrape the paint from the rack around the mounting holes where the tray will be positioned.
3	Position two NetVanta 1131 units side by side on the dual mounting tray lining up the holes in the front of the units with the holes in the tabs on the front of the tray (see *Figure 24*). ***Important!*** To avoid damaging the unit when attaching it to the dual mounting tray, use only the screws supplied with the tray.
4	Insert the provided screws through the tabs into the units securing them with a screwdriver.
5	Proceed to the steps given in *Connecting the NetVanta 1131 and the NetVanta Switch on page 45*.

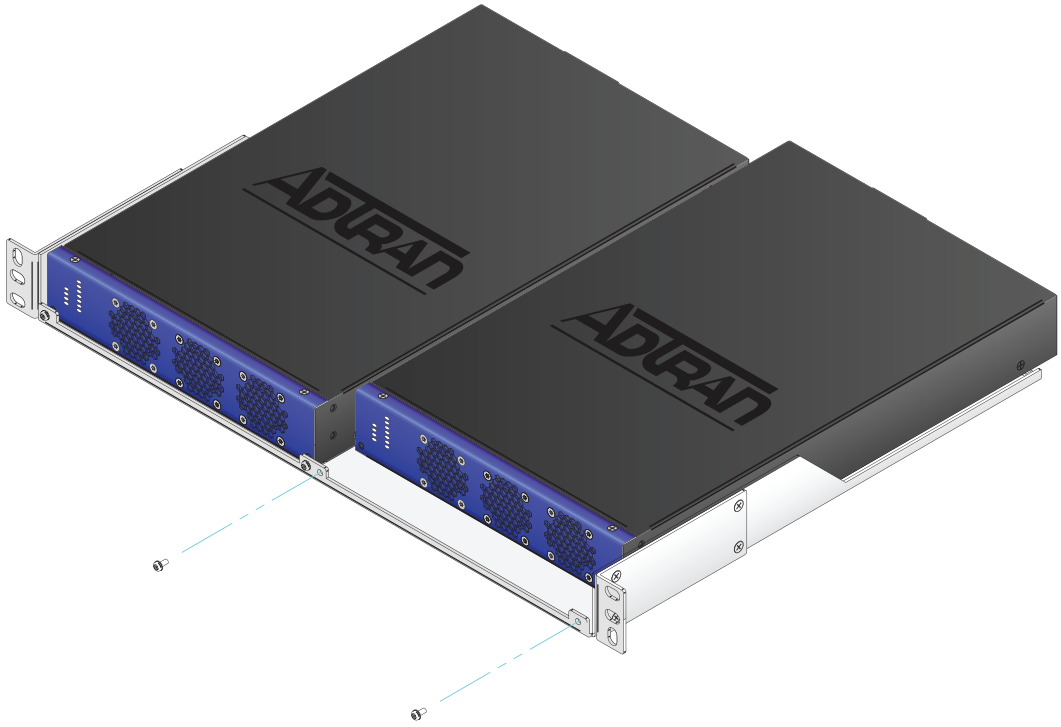

Figure 24. Rack Mounting the NetVanta 1131 Using the Dual Mounting Tray

Wall Mounting the NetVanta 1131

The NetVanta 1131 can be mounted on a wall by following these steps:

Instructions for Wall Mounting the NetVanta 1131	
Step	**Action**
1	Attach the wallmount brackets so that the portion with the mounting holes is flush with the bottom of the chassis.
2	Decide on a location for the unit. NetVanta 1131 units are mounted with the front panel facing left (see *Figure 25*). Keep in mind that the unit needs to be mounted at or above eye-level so that the LEDs are visible.
3	Prepare the mounting surface by attaching a board (typically plywood, 3/4-inch to 1-inch thick) to a wall stud using #6 to #10 (2.5-inch or greater in length) wood screws. ***Important!*** To avoid damaging the unit when attaching the mounting brackets, use only the screws supplied with the unit.
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 25*).
5	Proceed to the steps given in *Powering the NetVanta 1131 and the NetVanta Switch on page 46*.

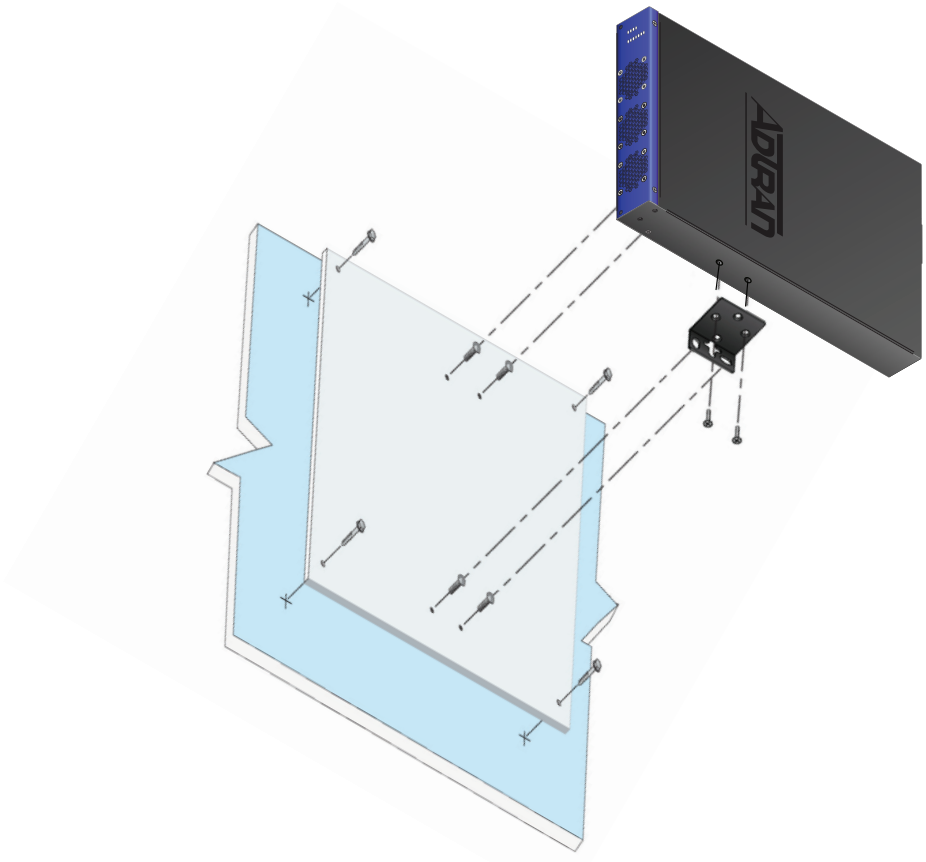

Figure 25. Wall Mounting the NetVanta 1131

Connecting the NetVanta 1131 and the NetVanta Switch

Follow these instructions to connect your NetVanta 1131 RPS/EPS to your NetVanta switch.

Instructions for Connecting the NetVanta 1131 to the NetVanta Switch	
Step	**Action**
1	Ensure that all power sources have been removed from the NetVanta 1131 and the NetVanta switch(es) to be connected.
2	With a Phillips head screwdriver, remove the cover plates from both the NetVanta 1131 RPS/EPS receptacles and the NetVanta switch's RPS/EPS receptacles on the rear panels of the units. ***Important!*** Do not remove the cover plates from the RPS/EPS receptacles unless you plan to use them.
3	Insert one end of the RPS cable (P/N 1700532F1 sold separately) into a receptacle labeled **RPS1**, **RPS2**, or **RPS3** located on the rear panel of the NetVanta 1131. Press the connector until the pins are fully inserted and the base of the connector is flush with the unit. ***Important!*** *Do not use excessive force. If the connector does not insert easily, check to ensure you are inserting the correct connector into the unit.*
4	Insert the connector on the other end of the RPS cable into the receptacle labeled **RPS** located on the rear panel of the NetVanta switch. Press the connector until the pins are fully inserted and the base of the connector is flush with the unit.
5	If you plan to use the NetVanta 1131 as an EPS, repeat Steps 1 through 4 using the EPS cable (P/N 1700533F1 sold separately) and the receptacles labeled **EPS** located on the rear panels of the NetVanta 1131 and the NetVanta switch and an EPS cable.
6	To remove an RPS or EPS cable from the unit, pinch the sides of the connector and pull gently to release it from the receptacle.
7	Proceed to *Powering the NetVanta 1131 and the NetVanta Switch on page 46*.

Powering the NetVanta 1131 and the NetVanta Switch

Follow these instructions to power your NetVanta 1131 RPS/EPS and your NetVanta switch.

- *This unit shall be installed in accordance with Articles 300 and 400 of NEC NFPA 70.*
- *Power to the AC system must be from an appropriately rated and grounded source.*
- *Maximum recommended ambient operating temperature is 50ºC.*

Instructions for Powering the NetVanta 1131 and the NetVanta Switch	
Step	**Action**
1	Plug the female end NetVanta switch's power cord (provided with the unit) into the power receptacle on the rear panel of the unit.
2	Connect the other end (3-prong plug) of the NetVanta switch's power cord to the proper 110 to 240 VAC grounded receptacle.
3	Plug the female end of the NetVanta 1131 unit's power cord (provided with the unit) into the power receptacle labeled **Power** on the rear panel of the unit.
4	Connect the other end (3-prong plug) of the unit's power cord to the proper 110 to 240 VAC grounded receptacle.

Your NetVanta unit is now ready to be configured and connected to the network. For information on switch configuration for 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.

APPENDIX A. CONNECTOR PIN DEFINITIONS

The following tables provide the pin assignments for the base unit.

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. 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-3. SFP Slot Pinouts

Pin	Name	Pin	Name
1	GND	11	GND
2	TX_FAULT	12	RX_DAT-
3	TX_DISABLE	13	RX_DAT+
4	I2C_SDA	14	GND
5	I2C_SCL	15	VddR
6	MOD_DEF(0)	16	VddT
7	RATESEL	17	GND
8	RX_LOS	18	TX_DAT+
9	GND	19	TX_DAT-
10	GND	20	GND