



# **NetVanta 1600 Series Gigabit Ethernet Switch Hardware Installation Guide**

1700568F1	NetVanta 1638
1700569F1	NetVanta 1638P
1700460F1	NetVanta 120 W AC Power Supply
1700462F1	NetVanta 500 W PoE Power Supply
1700470F1	NetVanta Dual Stacking XIM
1700471F1	NetVanta Dual SFP+ XIM
1700473F1	NetVanta Dual SFP XIM
1700530F1	NetVanta 1131 RPS/EPS
1700532F1	NetVanta 1131 RPS Cable
1700533F1	NetVanta 1131 EPS Cable
1700534F1	NetVanta 1131 Dual Mounting Tray

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## Conventions

**NOTE**

*Notes provide additional useful information.*

**CAUTION**

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

**WARNING**

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

## Safety Instructions

When using your telephone equipment, please follow these basic safety precautions to reduce the risk of fire, electrical shock, or personal injury:

1. Do not use this product near water, such as a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
2. Avoid using a telephone (other than a cordless type) during an electrical storm. There is a remote risk of shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord, power supply, and batteries indicated in the manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for special disposal instructions.
5. The socket-outlet shall be installed near the equipment and shall be easily accessible.

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](https://supportforums.adtran.com) available online 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 Federal Communications Commission (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 1638	NetVanta 1638P
1700470F1 Dual Stacking XIM	FCC Part 15 Class A EN 55022 Class A EN 55024	FCC Part 15 Class A EN 55022 Class A EN 55024
1700471F1 Dual SFP+ XIM	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 386 300	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 386 300
1700473F1 Dual SFP XIM	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 386 300	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 386 300
1700460F1 NetVanta 120 W AC Power Supply	FCC Part 15 Class A EN 55022 Class A EN 55024 EN 61000-3-2 EN 61000-3-3 ICES 003 Class A AS/NZS CISPR22 Class A	N/A
1700462F1 NetVanta 500 W PoE Power Supply	N/A	FCC Part 15 Class A ICES 003 Class A

## Canadian Emissions Requirements

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

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

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## **Service and Warranty**

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# 1. INTRODUCTION

The NetVanta 1600 Series Gigabit Switches include the NetVanta 1638 and the NetVanta 1638P (Power over Ethernet (PoE)).



*In this document, the term NetVanta 1600 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 1600 Series units' specifications, describes the physical characteristics of the units, introduces basic functionality, and provides installation instructions.

- *Physical Descriptions on page 14*
- *Product Specifications on page 22*
- *Option Modules on page 25*
- *Unit Installation on page 29*
- *NetVanta 1131 RPS/EPS on page 34*

For additional information on mounting options, powering the unit, installing option modules, and installing the NetVanta 1131 RPS/EPS refer to the following sections:

- *Mounting Options on page 30*
- *Replacing the Power Supply on page 31*
- *Installing XAUI Interface Modules on page 33*
- *Installing the NetVanta 1131 RPS/EPS on page 37*

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

The NetVanta 1600 Series is a 48-port multi-layer Gigabit Ethernet switch. These high-capacity Ethernet switches provides Layer 2 and Layer 3 switching capability. Two dual high-speed option module slots provide optional 10 G interfaces. Applications for the NetVanta 1600 Series include edge switching with high-speed stacking and network aggregation.

The NetVanta 1600 Series units' front panels contain 48 10/100/1000Base-T Ethernet interfaces that are accessed via standard RJ-45 connectors. Also, on the front panel a Type A universal serial bus (USB) host connector is integrated into the 10/100Base-T (RJ-45) management port.

The NetVanta 1600 Series is housed in a 1U-high rack-mountable metal enclosure that includes field replaceable power supplies and fans. The NetVanta 1638 is shipped with the NetVanta 120 W AC power supply (P/N 1700460F1) installed that provides +12 VDC and a redundant power supply (RPS) connector. The NetVanta 1638P is shipped with the NetVanta 500 W PoE power supply (P/N 1700462F1) installed that provides +12 VDC and +50 VDC and both an RPS and an extended power supply (EPS) connector.

NetVanta 1600 Series units run the ADTRAN Operating System (AOS), and are managed through an EIA-232 (DB-9) console port located on the front panel, a 10/100Base-T Ethernet management port, Telnet session, or the Web-based graphical user interface (GUI). The NetVanta 1600 Series is RoHS compliant.

### ActivChassis

ActivChassis is a feature of the NetVanta 1600 Series in which multiple devices, such as Layer 2 or Layer 3 switches, are connected to create a virtual chassis that can be managed as a single virtual switch. The devices are stacked using ActivChassis ports to create a larger logical device comprised of the individual devices. This feature allows multiple devices to share resources and operate as though they are part of a larger chassis-based system, while allowing configuration and control of the logical device from a single member. In ActivChassis, each device adds its set of ports and hardware tables to form a logical device. Refer to the [ActivChassis in AOS](#) configuration guide available on the [ADTRAN Support Forum](#) for more information on configuring the NetVanta 1600 Series for ActivChassis.

### Power over Ethernet

The NetVanta 1638P PoE device provides the same basic functionality as the NetVanta 1638 product. By default, the PoE switch discovers attached powered devices (PDs) and provides 50 VDC to the PD via Ethernet cabling. The NetVanta 1638P is fully compliant with the IEEE 802.3af PoE and IEEE 802.3at PoE+ standards and also supports legacy PDs.

### Redundant Power Supply

All NetVanta 1600 Series 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. Refer to [NetVanta 1131 RPS/EPS on page 34](#) for more information.

### Extended Power Supply

The NetVanta 1638P 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. Refer to [NetVanta 1131 RPS/EPS on page 34](#) for more information.

## NetVanta 1600 Series Shipping Contents

Each NetVanta 1600 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 1638 include the following items:

- NetVanta 1638 base unit
- NetVanta 120 W AC power supply
- A detachable power cable with a grounded, three-prong plug
- Quick start guide
- Two 19-inch rack mounting brackets and eight screws

International shipments of the NetVanta 1638 include the following items:

- NetVanta 1638 base unit
- NetVanta 120 W AC power supply
- All necessary power cords
- Quick start guide
- Two 19-inch rack mounting brackets and eight screws

Domestic shipments of the NetVanta 1638P include the following items:

- NetVanta 1638P base unit
- NetVanta 500 W PoE power supply
- A detachable power cable with a grounded, three-prong plug
- Quick start guide
- Two 19-inch rack mounting brackets and eight screws

International shipments of the NetVanta 1638P include the following items:

- NetVanta 1638P base unit
- NetVanta 500 W PoE power supply
- All necessary power cords
- Quick start guide
- Two 19-inch rack mounting brackets and eight screws

## NetVanta 1638

### Front Panel Design

The NetVanta 1638 front panel is shown below. [Table 1 on page 21](#) describes all of the LEDs, and [Appendix A on page 43](#) shows the connector pinouts.



**Figure 1. NetVanta 1638 Front Panel Layout**

### Front Panel Features

#### Status LED

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

#### Redundant Power Supply LED

The **RPS** LED is located on the upper left side of the unit and indicates RPS status.

#### High-Speed Port LEDs

The high-speed port LEDs labeled **X1/1**, **X1/2**, **X2/1**, and **X2/2** are located on the upper left portion of the unit's front panel and indicate when there is link/activity on the four 10 Gigabit Ethernet interfaces.

#### Port LEDs

The port LEDs labeled **1** through **48** are located above the 10/100/1000Base-T Ethernet interfaces. Using the LED mode switch, these LEDs can display either link/activity or VCID 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 **48** between link/activity and VCID display modes.

#### 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 for the interface.

#### VCID LED

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

#### CONSOLE Interface

The **CONSOLE** interface is an EIA-232 serial port (DCE) that provides local management and configuration (via a DB-9 female connector). See [Table A-1 on page 43](#) for pinouts.



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

### Management Interface

The 10/100Base-T management interface labeled **MGMT** is located above the USB interface. LEDs in the RJ-45 connector provide link and activity indications for the management interface. The management interface provides the following:

- 10Base-T or 100Base-T with a single connector
- Auto MDIX
- Autonegotiation
- Advanced cable diagnostics
- CSMA/CD
- IEEE 802.3 compatibility

### USB Interface

The USB interface labeled **USB** is located below the management interface.

### 10/100/1000Base-T Ethernet Interfaces

The front panel contains 48 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **48** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. See [Table A-2 on page 43](#) for pinouts.

## Rear Panel Design

The NetVanta 1638 rear panel is shown below.



Figure 2. NetVanta 1638 Rear Panel Layout

### Rear Panel Interfaces

#### Option Module Slots

The rear panel contains two high-speed option module slots labeled **X1** and **X2** that accept a variety of high-speed option modules.

#### NetVanta 120 W AC Power Supply

The rear panel houses the field replaceable NetVanta 120 W AC power supply. For information on replacing the power supply, refer [Replacing the Power Supply on page 31](#).

#### RPS

The NetVanta 120 W AC power supply has a power input to a +12 VDC RPS. The **RPS** LED, located on the front panel of the unit, indicates RPS status.

#### Power Connection

The NetVanta 120 W AC power supply has a power input to the AC universal power supply. Refer to [Supplying Power to the Unit on page 31](#) for connection details.

## NetVanta 1638P

### Front Panel Design

The NetVanta 1638P front panel is shown below. [Table 1 on page 21](#) describes all of the LEDs, and [Appendix A on page 43](#) shows the connector pinouts.



**Figure 3. NetVanta 1638P Front Panel Layout**

### Front Panel Features

#### Status LED

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

#### Redundant Power Supply LED

The **RPS** LED is located on the upper left side of the unit and indicates RPS status.

#### Extended Power Supply LED

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

#### High-Speed Port LEDs

The high-speed port LEDs labeled **X1/1**, **X1/2**, **X2/1**, and **X2/2** are located on the upper left portion of the unit's front panel and indicate when there is link/activity on the four 10 Gigabit Ethernet interfaces.

#### Port LEDs

The port LEDs labeled **1** through **48** are located above the 10/100/1000Base-T Ethernet interfaces. Using the LED mode switch, these LEDs can display either link/activity, PoE, or VCID 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 **48** between link/activity, PoE, and VCID display modes.

#### 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 for the interface.

#### VCID LED

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

#### PoE LED

The **PoE** LED is located on the left side of the unit and indicates that the port LEDs are displaying PoE 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). See [Table A-1 on page 43](#) for pinouts.



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

**Management Interface**

The 10/100Base-T management interface labeled **MGMT** is located above the USB interface. LEDs in the RJ-45 connector provide link and activity indications for the management interface. The management interface provides the following:

- 10Base-T or 100Base-T with a single connector
- Auto MDIX
- Autonegotiation
- Advanced cable diagnostics
- CSMA/CD
- IEEE 802.3 compatibility

**USB Interface**

The USB interface labeled **USB** is located below the management interface.

**10/100/1000Base-T Ethernet Interfaces**

The front panel contains 48 10/100/1000Base-T Ethernet interfaces (RJ-45). These interfaces are arranged in stacked pairs, with the numbers **1** through **48** screened from left to right directly above the corresponding ports. Status LEDs for each stacked pair of interfaces are located directly over the interfaces. See [Table A-2 on page 43](#) for pinouts.

**Rear Panel Design**

The NetVanta 1638P rear panel is shown below.



**Figure 4. NetVanta 1638P Rear Panel Layout**

**Rear Panel Interfaces****Option Module Slots**

The rear panel contains two high-speed option module slots labeled **X1** and **X2** that accept a variety of high-speed option modules.

**NetVanta 500 W PoE Power Supply**

The rear panel houses the field replaceable NetVanta 500 W PoE power supply. For information on replacing the power supply, refer to [Replacing the Power Supply on page 31](#).

**RPS**

The NetVanta 500 W PoE power supply has a power input to a +12 VDC RPS. The **RPS** LED, located on the front panel of the unit, indicates RPS status.

**EPS**

The NetVanta 500 W PoE power supply has a power input to a +50 VDC EPS. The **EPS** LED, located on the front panel of the unit, indicates EPS status.

**Power Connection**

The NetVanta 500 W PoE power supply has a power input to the AC universal power supply. Refer to [Supplying Power to the Unit on page 31](#) for connection details.

## LED Descriptions

The following table describes LED activity for the NetVanta 1600 Series.

**Table 1. Front Panel LED Descriptions**

LED	Color	Indication
<b>STAT</b>	Off	Unit is not receiving power.
	Green (flashing)	On power up, the <b>STAT</b> LED flashes rapidly for five seconds, during which time the user may escape to boot mode from the <b>CONSOLE</b> 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.
<b>RPS</b>	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.
<b>EPS</b> (PoE 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.
<b>LINK/ACT</b>	Off	Link status/activity is not being displayed on port LEDs 1 through 48.
	Green (solid)	Link status/activity is being displayed on port LEDs 1 through 48.
<b>PoE</b> (PoE units only)	Off	PoE status is not being displayed on port LEDs 1 through 48.
	Green (solid)	PoE status is being displayed on port LEDs 1 through 48.
<b>VCID</b>	Off	VCID is not selected.
	Green (solid)	VCID is selected. The port LED (1 through 48) that corresponds to the unit's VCID value will display green.
Port LEDs in Link/Activity Mode (1 - 48 and X1/1, X1/2, X2/1, X2/)	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 - 48 PoE units only)	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 only)	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.



For more information on LED behaviors in VCID mode, refer to the [ActivChassis in AOS configuration guide](#) available on the [ADTRAN Support Forum](#).

### 3. PRODUCT SPECIFICATIONS

#### Physical Interface

- 48 10/100/1000Base-T Ethernet interfaces
- 802.3af, 802.3at, and legacy PoE
- 2 high-speed option module slots
- 4 10GbE/HiGig2 stacking ports via dual high-speed option module slots
- DB-9, RS-232 console port
- 10/100Base-T Ethernet management port
- USB port (host mode only)
- Field replaceable power supply and fans
- Supports external redundant power supply

#### Switching

- Layer 2 switching capability
- Layer 3 switching capability
- High-speed stacking
- VCID management
- Nonblocking
- Up to 176 Gbps switching capacity

#### Routing

- Static routes
- RIP
- OSPF
- BGP
- VRRP

#### 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
- VCID
- Redundant power supply
- Extended power supply (NetVanta 1638P only)

**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

**Quality of Service**

- 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
- VLAN assignment via 802.1x

**Storm Control**

- Broadcast, unicast, and multicast

**Administration**

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

**Network Access Control**

- RADIUS
- TACACS+
- Port authentication (802.1x)

**Wi-Fi Controller**

- Wi-Fi access controller for centralized management of NetVanta wireless access points (APs)
- Supports 24 APs

**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 1638): 1.72-inch H x 17.22-inch W x 16.75-inch D
- Dimensions (NetVanta 1638P): 1.72-inch H x 17.22-inch W x 16.75-inch D
- Internal AC power (NetVanta 1638): 110 to 240 VAC, 1.5 A, 50/60 Hz
- Internal AC power (NetVanta 1638P): 110 to 240 VAC, 5.7A, 50/60 Hz
- Redundant power supply: 12 VDC
- Extended power supply (NetVanta 1638P only): 50 VDC

**Compliance**

- NetVanta 1638
  - 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
- NetVanta 1638P
  - 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
  - RoHS compliant

## 4. OPTION MODULES

The NetVanta 1600 Series option module slots support two 10 Gbps uplink or stacking ports. They will support several XAUI-compliant interface modules (XIMs) designed to meet a variety of stacking and networking requirements. XIMs plug directly into the option module slots located on the rear of the base unit. The NetVanta 1600 Series currently supports the following XIM:

- [NetVanta Dual Stacking XIM \(P/N 1700470F1\) on page 26](#)
- [NetVanta Dual SFP+ XIM \(P/N 1700471F1\) on page 27](#)
- [NetVanta Dual SFP XIM \(P/N 1700473F1\) on page 28](#)

This section describes the module, provides shipping contents, specifications, and features. Refer to [Installing XAUI Interface Modules on page 33](#) for information on card installation.

### **XAUI Interface Module Shipping Contents**

#### ***NetVanta Dual Stacking XIM (1700470F1)***

Shipments of the NetVanta Dual Stacking XIM include the following items:

- Dual Stacking XIM
- Quick start guide

#### ***NetVanta Dual SFP+ XIM (1700471F1)***

Shipments of the NetVanta Dual SFP+ XIM include the following items:

- Dual SFP+ XIM
- Quick start guide

#### ***NetVanta Dual SFP XIM (1700473F1)***

Shipments of the NetVanta Dual SFP XIM include the following items:

- Dual SFP XIM
- Quick start guide

## XAUI Interface Modules

### **NetVanta Dual Stacking XIM (P/N 1700470F1)**

The NetVanta Dual Stacking XIM (shown in [Figure 5](#)) provides high-speed connectivity between two ADTRAN 10 Gbps capable devices.



**Figure 5. NetVanta Dual Stacking XIM**

#### **Features and Specifications**

##### **Stacking Interface**

- Data Rate: 10 Gbps, 20 Gbps bidirectional

##### **Compliance**

- *Electromagnetic Compatibility (EMC)*  
Table on page 5.
- EN 60950-1
- IEC 60950-1
- AS/NZS 60950-1
- UL/CUL 60950-1
- RoHS compliant

##### **Environmental**

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

##### **Physical**

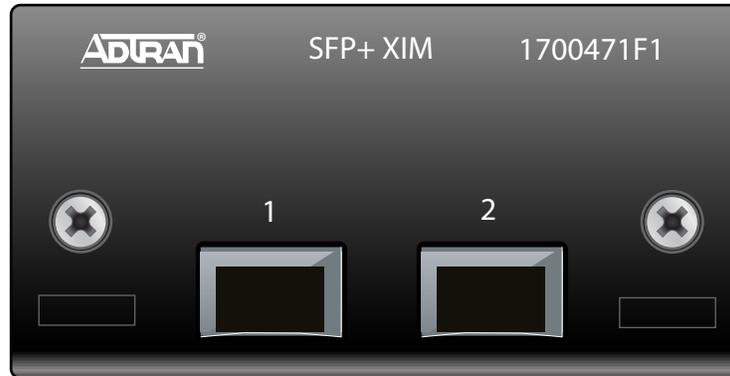
- Dimensions: 3.00-inch W x 1.57-inch H x 8.00-inch D

##### **Stacking Cables Available from ADTRAN**

- 1700500F1, 0.5 meter
- 1700500F2, 2.0 meter
- 1700500F5, 5.0 meter
- 1700504F2, 2.0 meter Cx4 with jackscrews
- 1700504F5, 5.0 meter Cx4 with jackscrews
- 1700504F12, 2.0 meter Cx4 with latch
- 1700504F15, 5.0 meter Cx4 with latch

**NetVanta Dual SFP+ XIM (P/N 1700471F1)**

The NetVanta Dual SFP+ XIM (shown in [Figure 5](#)) accepts a number of industry standard SFP and SFP+ modules to provide Gigabit Ethernet fiber connectivity for high-speed uplinks or switch stacking.



**Figure 6. NetVanta Dual SFP+ XIM**

**Features and Specifications**

**SFP+ Interface**

- AOS Version: 18.02.02 or later
- Data Rate: 10 Gbps, 20 Gbps bidirectional

**Compliance**

- *Electromagnetic Compatibility (EMC) Table on page 5.*
- EN 60950-1
- IEC 60950-1
- AS/NZS 60950-1
- UL/CUL 60950-1
- RoHS compliant

**Environmental**

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

**Physical**

- Dimensions: 3.00-inch W x 1.57-inch H x 8.00-inch D



*Only approved 'Class 1 Laser Product' SFP and SFP+ modules from ADTRAN's approved vendor list should be installed in this product. ADTRAN cannot certify system integrity with other laser modules. Please refer to the ADTRAN website at [www.adtran.com](http://www.adtran.com) for a list of compatible SFP and SFP+ modules and ADTRAN approved vendors.*

### NetVanta Dual SFP XIM (P/N 1700473F1)

The NetVanta Dual SFP XIM (shown in [Figure 5](#)) accepts a number of industry standard SFP modules to provide Gigabit Ethernet fiber connectivity for high-speed uplinks or switch stacking.



Figure 7. NetVanta Dual SFP XIM

#### Features and Specifications

##### SFP+ Interface

- AOS Version: R10.3.0 or later
- Data Rate: Up to 2.5 Gbps, up to 5 Gbps bidirectional

##### Compliance

- *Electromagnetic Compatibility (EMC) Table on page 5.*
- EN 60950-1
- IEC 60950-1
- AS/NZS 60950-1
- UL/CUL 60950-1
- RoHS compliant

##### Environmental

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

##### Physical

- Dimensions: 3.00-inch W x 1.57-inch H x 8.00-inch D



*Only approved 'Class 1 Laser Product' SFP modules from ADTRAN's approved vendor list should be installed in this product. ADTRAN cannot certify system integrity with other laser modules. Please refer to the ADTRAN website at [www.adtran.com](http://www.adtran.com) for a list of compatible SFP modules and ADTRAN approved vendors.*

## 5. UNIT INSTALLATION

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

- *Mounting Options on page 30*
- *Supplying Power to the Unit on page 31*
- *Replacing the Power Supply on page 31*
- *Installing XAUI Interface Modules on page 33*
- *Installing the NetVanta 1131 RPS/EPS on page 37*

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* (article 2219).

### **WARNING**

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



**CAUTION**

- *The NetVanta 1600 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 unless you plan to install power supplies in those slots.*
- *Always remove all power from the unit, including any optional RPS or EPS sources, prior to servicing the unit.*



**CAUTION**

- *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
- Network cables (module dependent)
- Phillips-head screwdriver (rack-mounted applications only)



*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 1600 Series units can be installed in rackmount or tabletop configurations. The following sections provide step-by-step instructions for rack mounting.

### **Rack Mounting the NetVanta 1600 Series Units**

The NetVanta 1600 Series are 1U-high, rack-mountable units that can be installed into a 19-inch equipment rack with the mounting brackets that are shipped with the units. They can also be mounted in a 23-inch rack with optional brackets 1700509G1.

NetVanta 1600 Series units can be safely mounted in a rack by following these instructions:



- *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	
Step	Action
1	Install the mounting brackets on the NetVanta. To avoid damaging the unit, use only the screws included in the shipment when attaching mounting brackets to the chassis.
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 1 U 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 <a href="#">Supplying Power to the Unit on page 31</a> ).

### Supplying Power to the Unit

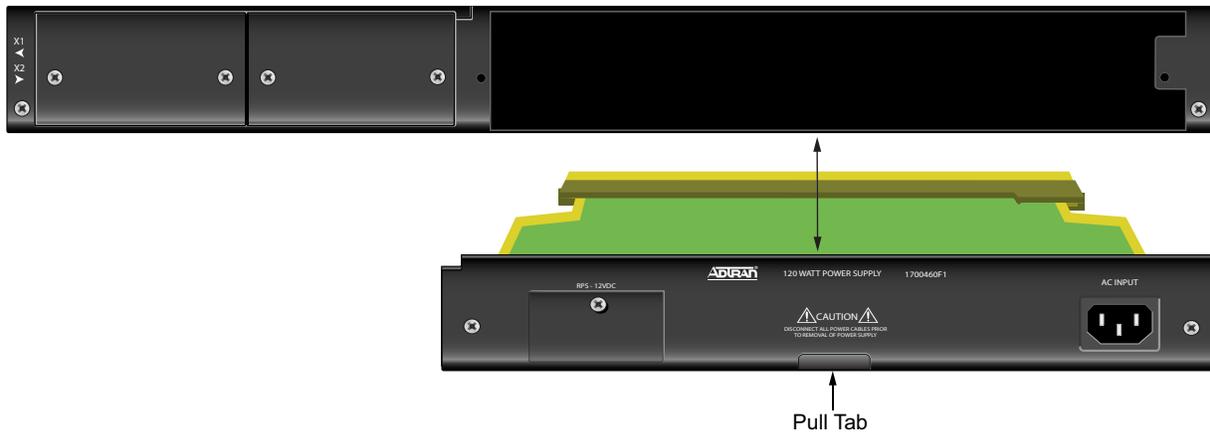
The NetVanta 1638 units come equipped with a field replaceable universal 110 to 240 VAC, 1.5 A, 50/60 Hz power supply (NetVanta 120 W AC Power Supply, P/N 1700460F1). The NetVanta 1638P units come equipped with a field replaceable universal 110 to 240 VAC, 5.7A, 50/60 Hz power supply (NetVanta 500 W PoE Power Supply, P/N 1700462F1). To power these units, connect the supplied power cable to an appropriate properly grounded power receptacle.

### Replacing the Power Supply

The NetVanta 1600 Series power supplies can be safely replaced by following these instructions:

 <p><b>CAUTION</b></p>	<ul style="list-style-type: none"> <li>• <i>The NetVanta 1600 Series power supplies are intended to be installed, maintained, and serviced by qualified service personnel only.</i></li> <li>• <i>The NetVanta 1600 Series power supplies are not interchangeable. The NetVanta 120 W AC Power Supply (P/N 1700460F1) is designed for use only in NetVanta 1638 (P/N 1700568F1) units. The NetVanta 500 W PoE Power Supply (P/N 1700462F1) is designed for use only in NetVanta 1638P (P/N 1700569F1) units.</i></li> <li>• <i>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.</i></li> </ul>
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Instructions for Replacing the Power Supply	
Step	Action
1	Disconnect all power cords from the power supply.
2	Loosen the screws on either side of the power supply using a screwdriver.
3	Remove the power supply from the NetVanta base unit by pulling on the tab that protrudes from the bottom edge of the power supply (see <a href="#">Figure 8</a> ).
4	Being careful to align the new power supply with the card guides, slide it into the slot until it is firmly positioned against the chassis. Do not use excessive force. If you encounter resistance, remove the power supply and try again.
5	Tighten the screws on either side of the power supply with a screwdriver.
6	Reconnect the power cord(s).



**Figure 8. Installing the Power Supply**

### Installing XAUI Interface Modules

XAUI interface modules (XIMs) are installed into the rear panel option module slots. XIMs can be safely installed by following these instructions:

 <p><b>CAUTION</b></p>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>Always remove all power from the unit, including any optional RPS or EPS sources, prior to removing or installing a module.</i></li> <li>• <i>Improper installation may result in damage to the modules.</i></li> </ul>
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Instructions for Installing the XIMs	
Step	Action
1	Remove power from the unit.
2	Remove the cover from the appropriate option slot using a Phillips-head screwdriver.
3	Slide the XIM into the option slot until the module is firmly seated against the chassis (see <a href="#">Figure 9 on page 33</a> ).
4	Secure the screws at both edges of the XIM with a Phillips-head screwdriver.
5	Connect the cables to the associated device(s).
6	Restore power to the unit.



**Figure 9. XIM Installation**

 <p><b>NOTE</b></p>	<p><i>XIMs are hot swappable. However, they will not function until the power is cycled or a manual reload of AOS is performed on the main unit. Refer to the <a href="#">AOS Command Reference Guide</a> (ADTRAN's Support Forum article 2219) at <a href="http://supportforums.adtran.com">http://supportforums.adtran.com</a> for more information on the <b>reload</b> command.</i></p>
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## 6. 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](http://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 36](#) describes all of the LED behaviors.

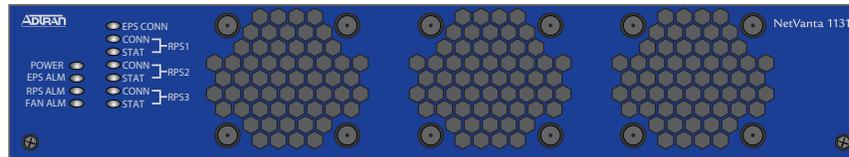


Figure 10. NetVanta 1131 Front Panel Layout

### 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.

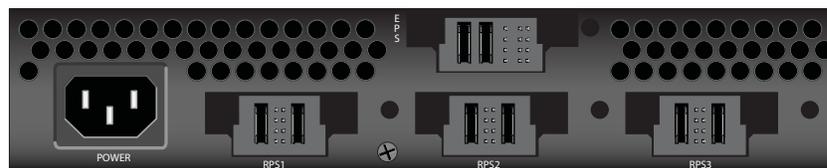


Figure 11. NetVanta 1131 Rear Panel Layout

## 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 42](#) 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
<b>Power</b>	Off	The unit is not receiving power.
	Green (solid)	The unit is receiving power.
<b>RPS ALM</b>	Off	The RPS is functioning properly.
	Red (solid)	The RPS has failed.
<b>EPS ALM</b>	Off	The EPS is functioning properly.
	Red (solid)	The EPS has failed.
<b>FAN ALM</b>	Off	The fans are functioning properly and the system temperature is acceptable.
	Red (solid)	The fans have failed.
<b>RPS CONN (1 - 3)</b>	Off	There is no connection to the switch.
	Green (solid)	There is a valid connection to the switch.
<b>RPS STAT (1 - 3)</b>	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.
<b>EPS CONN</b>	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

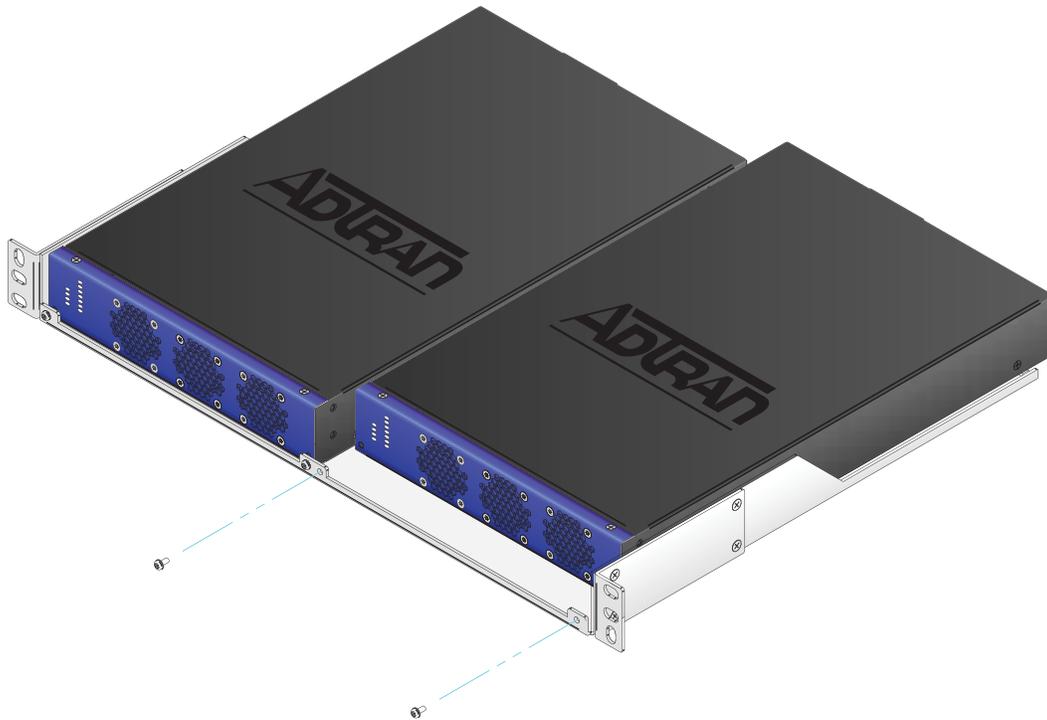
Instructions for Rack Mounting the NetVanta 1131 (Single Mount)	
Step	Action
1	Securely fasten the rackmount brackets to the NetVanta 1131 using the screws provided with the unit. The brackets can be attached in flush mount, 2-inch mount, and mid-mount positions (see <a href="#">Figure 12</a> ) depending on your installation requirements. <b>Important!</b> 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 <a href="#">Connecting the NetVanta 1131 and the NetVanta Switch on page 41</a> .



Figure 12. 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 <a href="#">Figure 13</a> ). <b>Important!</b> 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 <a href="#">Connecting the NetVanta 1131 and the NetVanta Switch on page 41</a> .

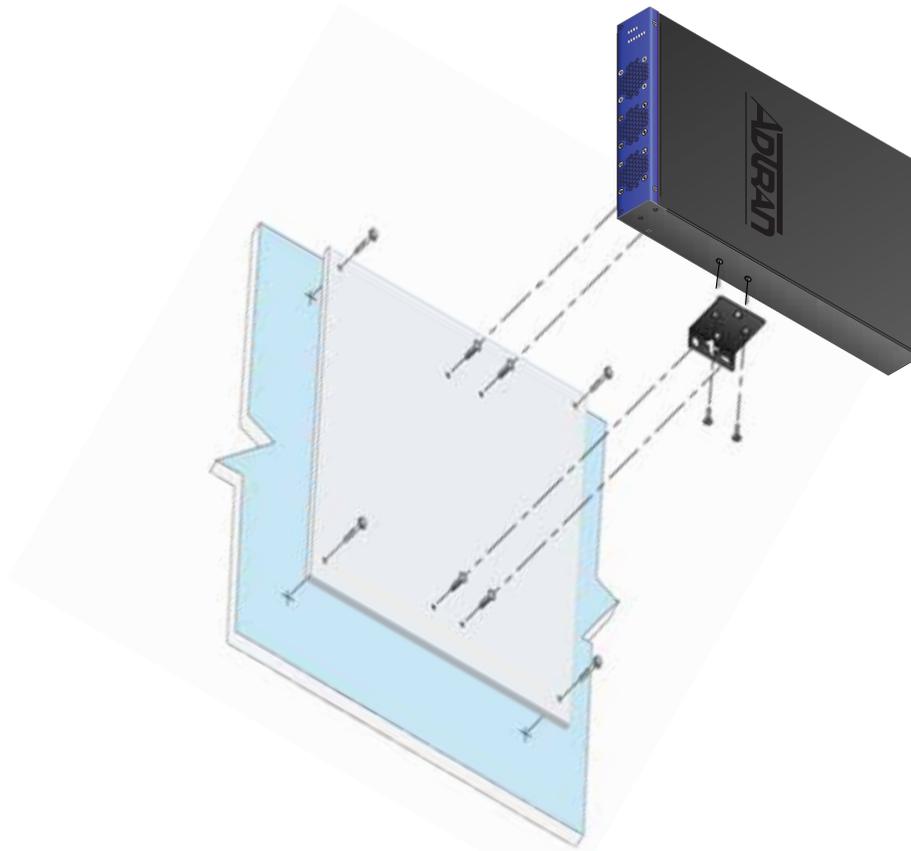


**Figure 13. Rack Mounting the NetVanta 1131 Using the Dual Mounting Tray**

## 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 <a href="#">Figure 14</a> ). 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.  <b>Important!</b> 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 <a href="#">Figure 14</a> ).
5	Proceed to the steps given in <a href="#">Powering the NetVanta 1131 and the NetVanta Switch on page 42</a> .



**Figure 14. 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.  <b>Important!</b> 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 <b>RPS1</b> , <b>RPS2</b> , or <b>RPS3</b> 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.  <b>Important!</b> 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 <b>RPS</b> 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 <b>EPS</b> 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 <a href="#">Powering the NetVanta 1131 and the NetVanta Switch on page 42</a> .

## Powering the NetVanta 1131 and the NetVanta Switch

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

 CAUTION	<ul style="list-style-type: none"> <li>• <i>This unit shall be installed in accordance with Articles 300 and 400 of NEC NFPA 70.</i></li> <li>• <i>Power to the AC system must be from an appropriately rated and grounded source.</i></li> <li>• <i>Maximum recommended ambient operating temperature is 50°C.</i></li> </ul>
--	--

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 130 VAC or 190 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 <b>Power</b> 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 130 VAC or 190 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 online on [ADTRAN's Support Forum](#). For details on the CLI, refer to the [AOS Command Reference Guide](#) (article 2219). All other related documents are also available online on [ADTRAN's Support Forum](#).

## APPENDIX A. CONNECTOR PIN DEFINITIONS

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

### 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 <b>Tied to pin 1</b> (output)
7	—	Unused
8	CTS	Clear to Send <b>Tied to pin 1</b> (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

