



NetVanta 1535P ActivReach Ethernet Switch Hardware Installation Guide

1702595G10/G20	NetVanta 1535P
1702595G12	NetVanta ActivReach Media Converter
1702595G14	Hydra Interconnect Cable
1702595G16	NetVanta ActivReach Ethernet Port Protection Device
1702595F17	NetVanta ActivReach Wall Plate Media Converter
1702595F21	AP Mounting Kit for NetVanta ActivReach Wall Plate Media Converter
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 at <https://supportforums.adtran.com>.

Save These Important Safety Instructions

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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.

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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

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

This hardware installation guide describes the NetVanta 1535P ActivReach Ethernet unit's physical characteristics, lists its features and specifications, introduces basic functionality, and provides installation instructions.

- *Physical Descriptions on page 14*
- *Product Specifications on page 19*
- *Unit Installation on page 21*
- *NetVanta 1131 RPS/EPS on page 33*

For additional information on mounting options, supplying power, using NetVanta ActivReach Media Converters, and installing the NetVanta 1131 RPS/EPS, refer to the following sections:

- *Mounting Options on page 22*
- *Supplying Power to the Unit on page 25*
- *NetVanta ActivReach Media Converters on page 25*
- *Installing the NetVanta 1131 RPS/EPS on page 36*

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*. This and all other related documents are also available online at <https://supportforums.adtran.com>.

2. PHYSICAL DESCRIPTIONS

NetVanta 1535P

The NetVanta 1535P is a Layer 3 Lite managed switch. It runs AOS, is managed through an EIA-232 **CONSOLE** port (DB-9), Telnet session, or GUI, and is RoHS compliant (telecommunications exemption). The NetVanta 1535P is described in the following sections.

The NetVanta 1535P 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. The 24 10/100/1000Base-T Ethernet interfaces support both Ethernet and ADTRAN's ActivReach Ethernet. 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 1535P EIA-232 **CONSOLE** port (DB-9) is located on the front panel.

ActivReach Ethernet

The NetVanta 1535P has 24 10/100/1000Base-T Ethernet ports that support both standard and ADTRAN's ActivReach Ethernet. When used in conjunction with the NetVanta ActivReach Media Converter (P/N 1702595G12), the NetVanta 1535P converts standard Ethernet to ActivReach Ethernet, which supports rates of 10/100 Mbps over 1-, 2-, and 4-pair infrastructure wiring at cable distances beyond 100 meters.

For applications requiring connection into a single RJ-21, a hydra interconnect cable (P/N 1702595G14) can be used. The hydra interconnect cable is suitable for 10 Mbps applications only. See [Table A-4 on page 45](#) for the hydra cable's 50-pin Champ connector pinouts.

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

Redundant Power Supply

The NetVanta 1535P unit provides 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 33](#) for more information.

Extended Power Supply

The NetVanta 1535P unit also provides a connection for an optional EPS on the rear panel. The NetVanta 1131 RPS/EPS (P/N 1700530F1) is sold separately. The EPS output provides backup power for a Power over Ethernet (PoE) switch's internal PoE supply. The units will automatically switch to EPS when needed, providing uninterrupted power to the unit. Refer to [NetVanta 1131 RPS/EPS on page 33](#) for more information.

SFP Module Slots

The NetVanta 1535P unit supports two 1000Base-X and two 1000/2500Base-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 1535P provides the ability to detect attached powered devices (PDs) and deliver power to the PD via existing Ethernet cabling. The NetVanta 1535P is fully compliant with the IEEE 802.3af PoE standard. By default, the PoE switches discover and provide power to IEEE-compliant PDs.

ADTRAN's ActivReach Ethernet supports Power over Ethernet (PoE) over a single pair. When used in conjunction with the NetVanta ActivReach Media Converter (P/N 1702595G12), power can be either terminated at the Media Converter or supplied to a downstream device. When used in conjunction with the NetVanta ActivReach Wall Plate Media Converter (P/N 1702595F17) can be supplied to a downstream device.

NetVanta 1535P Shipping Contents

Each NetVanta 1535P 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 1535P includes the following items:

- NetVanta 1535P 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 1535P includes the following items:

- NetVanta 1535P base unit
- All necessary power cords
- Quick start guide
- Two 19-inch rack mounting brackets with four mounting screws

NetVanta 1535P Front Panel Design

The NetVanta 1535P front panel is shown below. [Table 1 on page 18](#) describes all of the LEDs, and [Appendix A on page 43](#) shows the connector pinouts.

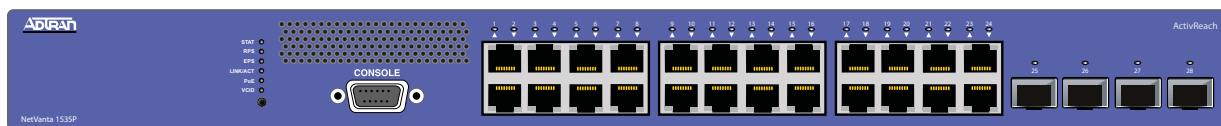


Figure 1. NetVanta 1535P Front Panel Layout

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

The LED mode switch is located on the left side of the unit and is used to toggle Ports **1** through **28** between VCID, 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 43](#) 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 43](#) 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 44](#) for pinouts.

NetVanta 1535P Rear Panel Design

The NetVanta 1535P rear panel is shown below.



Figure 2. NetVanta 1535P Rear Panel Layout

Rear Panel Interfaces

RPS

The rear panel has a power input for 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.

EPS

The rear panel has a power input for a +54 VDC EPS. The **EPS** LED, located on the front panel of the unit, indicates when the unit is being powered from the EPS.

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 25](#) 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	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	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	Off	Link status/activity is not being displayed.
	Green (solid)	Link status/activity is being displayed.
PoE	Off	PoE status is not being displayed.
	Green (solid)	PoE status is being displayed.
VCID	Off	VCID is not selected.
	Green (solid)	VCID is selected. The port LED that corresponds to the unit's VCID will display green.
Port LED in Link/Activity Mode (1 - 28)	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 LED in PoE Mode (1 - 24 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.



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

3. PRODUCT SPECIFICATIONS

Physical Interface

Ethernet Ports

- 24 standard 10/100/1000Base-T interfaces plus ADTRAN's ActivReach Ethernet capability
- 4 SFP interfaces
- Autorate/duplex/MDI/MDI-X

Console Port

- DB-9, EIA-232

Switching

- Layer 3 Lite switching capability
- Nonblocking
- 8 k medium access control (MAC) addresses

Maximum Forwarding Bandwidth

- 62 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
- EPS and RPS status
- LAN link and activity
- PoE status
- VCID status (future release)

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: 1.7-inch H x 17.2-inch W x 12.5-inch D
- AC input: 110 to 240 VAC, 50/60 Hz, 5.0 A
- RPS input: 12 VDC
- EPS input: 50 VDC

Compliance

- FCC Part 15 Class A
- EN 300 386
- EN 61000-3-2
- EN 61000-3-3
- ICES 003 Class A
- 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:

- [Tools Required on page 22](#)
- [Mounting Options on page 22](#)
- [Supplying Power to the Unit on page 25](#)
- [NetVanta ActivReach Media Converters on page 25](#)
- [Installing a NetVanta ActivReach Media Converter on page 26](#)
- [Installing a NetVanta ActivReach Wall Plate Media Converter on page 29](#)
- [Installing the NetVanta 1131 RPS/EPS on page 36](#)

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](#). This and all other related documents are also available online at <https://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.



- The NetVanta 1535P 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.
- Only remove the RPS or EPS covers when using an optional RPS or EPS as described in [Installing the NetVanta 1131 RPS/EPS on page 36](#).
- The NetVanta 1535P 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 ActivReach Ethernet Port Protection Device (EPPD) (P/N 1700595G16) 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, ADTRAN recommends using the NetVanta PoE Protector/Injector (P/N 1702595F15). Use of a third-party 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



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 1535P 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 1535P

The NetVanta 1535P 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. The following steps guide you in mounting the NetVanta into a rack.




- *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 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 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 25).

Wall Mounting the NetVanta 1535P Units

By following these instructions exactly, the NetVanta 1535P units can be safely mounted on the wall. For instructions on wall mounting the NetVanta 1535P unit, see the table and [Figure 3 on page 24](#).

	<ul style="list-style-type: none"> • <i>To avoid damaging the unit, use only the screws included in the shipment when attaching mounting ears to the chassis.</i> • <i>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.</i> • <i>The socket-outlet must be installed near the equipment and must be easily accessible.</i>
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Instructions for Wall Mounting the NetVanta 1535P ActivReach Switch	
Step	Action
1	Remove the mounting brackets. Rotate them 90 degrees so that the portion of the bracket with the mounting holes is flush with the bottom of the chassis. Reattach the mounting brackets to the chassis (see Figure 3).
2	Decide on a location for the NetVanta. The NetVanta 1535P ActivReach switch is mounted with the front panel facing down as shown in Figure 3 . 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 3).
5	Proceed to the steps given in Supplying Power to the Unit on page 25 .

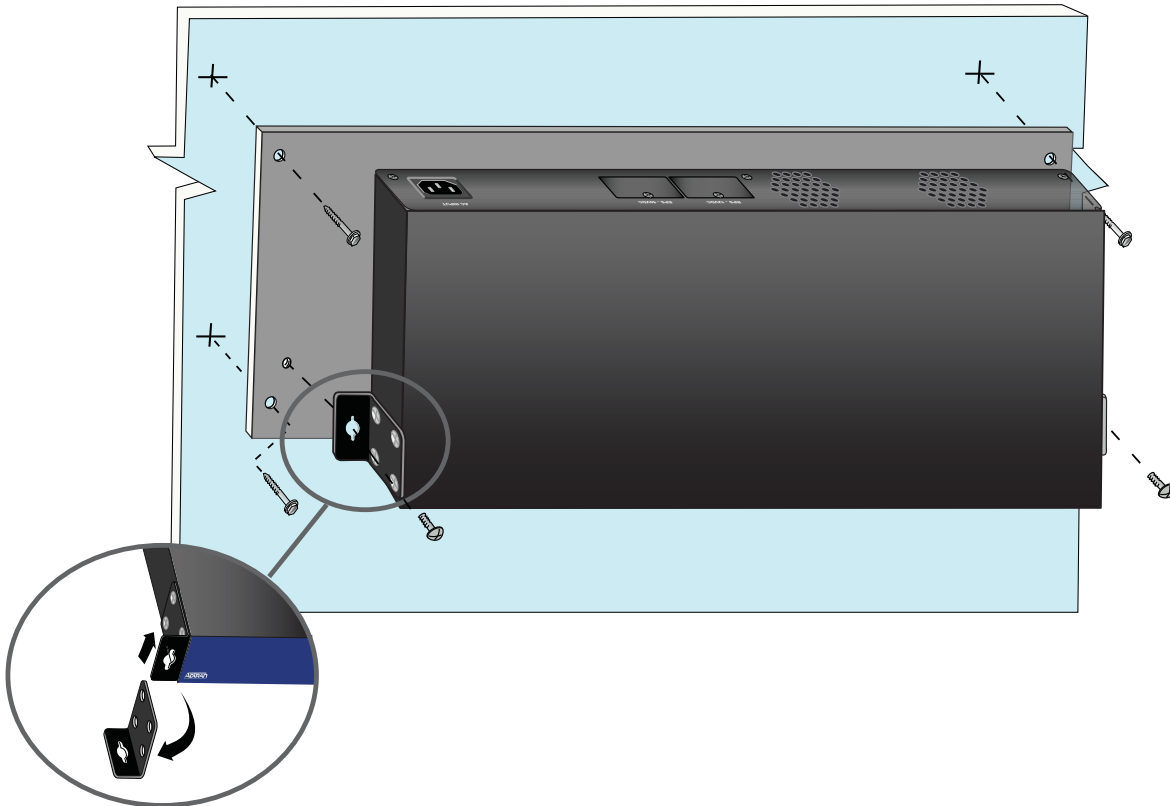


Figure 3. NetVanta 1535P ActivReach Switch Wallmount Installation

Supplying Power to the Unit

The NetVanta 1535P units come equipped with an auto-sensing 100 to 250 VAC, 50/60 Hz 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.

NetVanta ActivReach Media Converters

The NetVanta 1535P has 24 10/100/1000Base-T Ethernet ports that support both standard and ADTRAN's ActivReach Ethernet. The NetVanta 1535P supports standard 2-pair 10/100Base-T over CAT 5 and 4-pair 1000Base-T over CAT 5e. When in standard Ethernet mode, standard Ethernet pinouts apply.

When used in conjunction with the NetVanta ActivReach Media Converter (P/N 1702595G12), the NetVanta 1535P converts standard Ethernet to ActivReach Ethernet, which supports rates of 10/100 Mbps over 1-, 2-, and 4-pair infrastructure wiring. The following diagram illustrates the pin connections for ActivReach applications. The pinouts apply to both the switch port and the ActivReach Media Converter.

When used in conjunction with the NetVanta ActivReach Wall Plate Media Converter (P/N 1702595F17) can be used in the following configurations: 1-pair ActivReach over legacy copper/Cat 3/5/6 cable and 4-pair ActivReach over Cat 3/5/6 cable. There is also an optional voice passthrough configuration that will allow a legacy POTS line to pass through the unit.

For a description of ActivReach pin connections, see the [Figure 4](#). For instructions on installing the Media Converter for each configuration, refer to the [Installing a NetVanta ActivReach Media Converter on page 26](#) and [Installing a NetVanta ActivReach Wall Plate Media Converter on page 29](#).

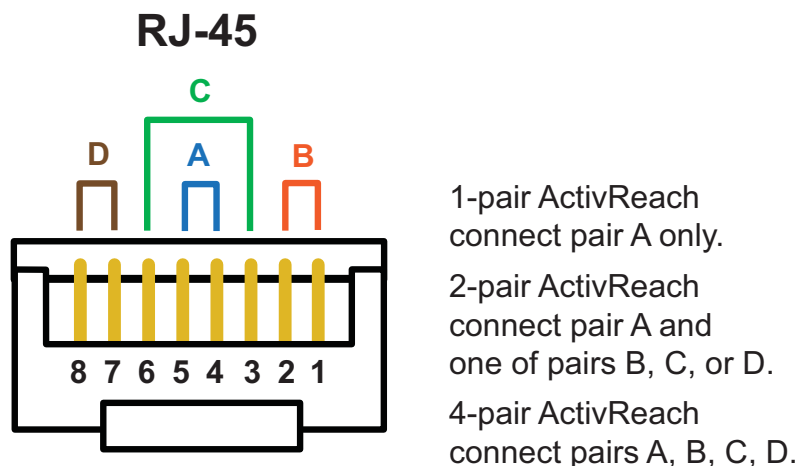


Figure 4. ActivReach RJ-45 Pin Connections



- For 1-pair ActivReach applications, pair A must be connected between the switch and Media Converter. For NetVanta 1535P to NetVanta 1535P ActivReach connections, this requirement does not exist.
- For 2-pair ActivReach applications, pair A must be connected, and either pairs B, C, or D can be used in conjunction with pair A.
- Polarity inversion within a pair does not affect ActivReach performance.

For applications requiring connection into a single RJ-21, a hydra interconnect cable (P/N 1702595G14) can be used. The hydra interconnect cable is suitable for 10 Mbps applications only. See [Table A-4 on page 45](#) for the hydra cable's 50-pin Champ connector pinouts.

Installing a NetVanta ActivReach Media Converter

The NetVanta ActivReach Media Converter is designed to convert ADTRAN's ActivReach Ethernet to standard 10/100Base-T Ethernet over varying cable types and cable distances well beyond the standard Ethernet limitation of 100 meters. It has no input power supply. It draws power from the upstream NetVanta 1535P ActivReach Ethernet Switch. The ActivReach Media Converter has two RJ-45 connectors (labeled **TO NETWORK** and **TO DEVICE**) with built-in LEDs. Refer to [Table 2 on page 28](#) for a description of LED behaviors.

The NetVanta ActivReach Media Converter has two modes. The mode is selected by a sliding switch labeled **PoE** and is dependent on the type of downstream device connected to the converter. With the sliding switch in the **ON** position, the Media Converter provides PoE to the downstream device. With the sliding switch in the **OFF** position, the Media Converter terminates the PoE from the upstream ActivReach Ethernet Switch.

For a description of ActivReach pin connections, see the [Figure 4 on page 25](#). For instructions on installing the Media Converter, refer to [Installing a NetVanta ActivReach Media Converter on page 26](#).



Figure 5. NetVanta ActivReach Media Converter

Features and Specifications

Conversion

- 1-pair, 2-pair, or 4-pair ActivReach Ethernet to standard 10/100Base-T

Compliance

- EN 60950-1
- IEC 60950-1
- AS/NZS 60950.1
- UL/CUL 60950-1
- FCC Part 15 Class B
- EN 300 386
- EN 61000-3-2

- EN 61000-3-3
- ICES 003 Class B
- AS/NZS CISPR22 Class B
- RoHS compliant (telecommunications exemption)

Environmental

- Operating Temperature: 0°C to 40°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical

- Dimensions: 3.50-inch W x 2.00-inch H x 1.12-inch D



The NetVanta ActivReach Media Converter intended for use only with the NetVanta 1535P (P/N 1702595G10) and the NetVanta 1235P (P/N 1700595G10) ActivReach Ethernet Switches.

WARNING

- *The NetVanta ActivReach Media Converter is intended for intrabuilding use only.*
- *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 ActivReach Ethernet Port Protection Device (EPPD) (P/N 1700595G16) 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, ADTRAN recommends using the NetVanta PoE Protector/Injector (P/N 1702595F15). Use of a third-party 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.*



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

Instructions for Installing the ActivReach Media Converter	
Step	Action
1	On the Media Converter, set the sliding switch labeled PoE to ON to provide PoE to the downstream device or OFF to terminate the PoE from the NetVanta 1535P.
2	Ensure that the plugs on each end of the network cables have the two center pins connected. The center pins are used to transmit ActivReach PoE from the NetVanta 1535P to the Media Converter.
3	Insert the network cable into an appropriate connector on the front panel of the NetVanta 1535P switch.
4	Insert the other end of the network cable into the connector on the Media Converter labeled TO NETWORK .
5	Insert an Ethernet cable into the Ethernet connector on the Media Converter labeled TO DEVICE .
6	Insert the other end of the Ethernet cable into the Ethernet port of the downstream device.
7	If the Media Converter is to be wall mounted, install two screw anchors suitable for the type of wall on which you are mounting the unit. The anchors should be horizontally level with each other and spaced 2.5 inches apart on center.
8	Install two #6 PAN-head screws (1-inch or greater in length) into the anchors, leaving approximately 0.25 inch of the screws protruding from the wall.
9	Slide the keyed insets on the bottom of the unit securely onto the screws.

Table 2. NetVanta ActivReach Media Converter LED Descriptions

LED	Color	Indication
PWR	Off	The unit is not receiving power.
	Green (solid)	The unit is receiving power.
LNK	Off	No link is detected.
	Amber (solid)	A link is detected but there is no activity.
	Amber (flashing)	A link is detected and there is activity.
SPD	Off	The unit is communicating at 10 Mbps.
	Green (solid)	The unit is communicating at 100 Mbps.

Installing a NetVanta ActivReach Wall Plate Media Converter

The NetVanta ActivReach Wall Plate Media Converter is designed to be mounted to data junction boxes in a building's existing infrastructure. It converts ADTRAN's ActivReach Ethernet to standard 10/100Base-T over varying cable types and cable distances well beyond the standard Ethernet limitation of 100 meters. The NetVanta ActivReach Wall Plate Media Converter has no input power supply, rather it draws power from the NetVanta 1535P. The optional Access Point (AP) Mounting Kit for NetVanta ActivReach Wall Plate Media Converter (P/N 1702595F21) can be used to easily mount an AP directly to the Media Converter. Refer to the quick start guide that ships with the AP mounting kit for mounting instructions.

The NetVanta ActivReach Wall Plate Media Converter can be used in the following configurations: 1-pair ActivReach over legacy copper/Cat 3/5/6 cable and 4-pair ActivReach over Cat 3/5/6 cable. There is also an optional voice passthrough configuration that will allow a legacy POTS line to pass through the unit.

For a description of ActivReach pin connections, see the [Figure 4 on page 25](#). For instructions on installing the Media Converter for each configuration, refer to [Instructions for Installing the NetVanta ActivReach Wall Plate Media Converter for ActivReach Ethernet on page 31](#) and [Instructions for Installing the NetVanta ActivReach Wall Plate Media Converter for ActivReach Ethernet and Optional Voice Passthrough on page 32](#).

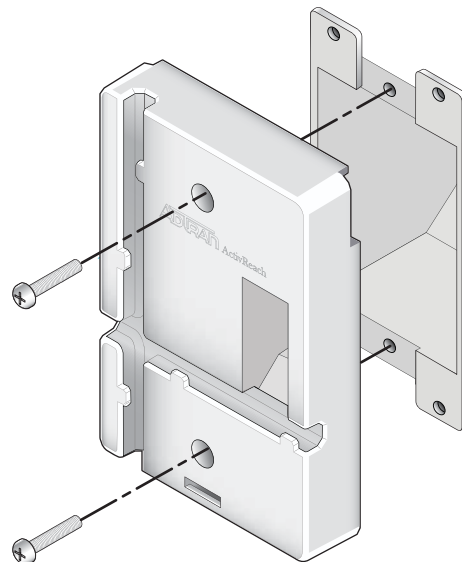


Figure 6. NetVanta ActivReach Wall Plate Media Converter

Conversion

- 1-pair or 4-pair ActivReach Ethernet to standard 10/100Base-T

Compliance

- EN 60950-1
- IEC 60950-1
- AS/NZS 60950.1
- UL/CUL 60950-1
- FCC Part 15 Class B
- EN 300 386
- ICES 003 Class B
- RoHS compliant

Environmental

- Operating Temperature: 0°C to 40°C
- Storage Temperature: -20°C to 70°C
- Relative Humidity: Up to 95 percent, noncondensing

Physical

- Dimensions: 3.50-inch W x 2.00-inch H x 1.12-inch D



- *The NetVanta ActivReach Wall Plate Media Converter has only one mode. It always provides PoE to the downstream device. Caution must be taken when connecting the Wall Plate Media Converter. It should not be used with a downstream device that does not support PoE.*
- *The NetVanta ActivReach Wall Plate Media Converter intended for use only with the NetVanta 1535P (P/N 1702595G10) and the NetVanta 1235P (P/N 1700595G10) ActivReach Ethernet Switches.*

WARNING

- *The NetVanta ActivReach Wall Plate Media Converter is intended for intrabuilding use only.*
- *Ensure that the Wall Plate Media Converter wiring is installed in accordance with all national, state, and local electrical codes.*
- *The Wall Plate Media Converter is intended for use only in low-voltage, communication-level junction boxes only. It must not be used in a junction box containing AC power.*
- *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 ActivReach Ethernet Port Protection Device (EPPD) (P/N 1700595G16) 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 more information and help installing your NetVanta ActivReach product, go to <http://www.adtran.com/activreach-help>.

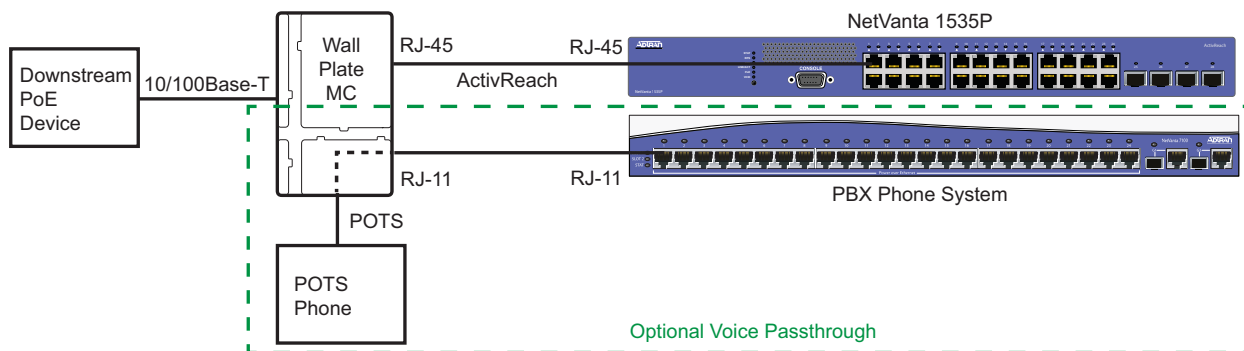


Figure 7. NetVanta ActivReach Wall Plate Media Converter Configuration

Instructions for Installing the NetVanta ActivReach Wall Plate Media Converter for ActivReach Ethernet	
Step	Action
1	Ensure that the NetVanta 1535P lines and any voice/POTS lines are disconnected from the source prior to configuring and installing any jacks inside the junction box.
2	Configure the network cable on both the Media Converter end and the NetVanta 1535P end in accordance with your installation requirements for 1-pair or 4-pair operation as illustrated in Figure 4 on page 25 . Make sure both ends of the network cable are configured in the same manner.
3	Plug the RJ-45 connector of the configured cable into one of the network ports of the NetVanta 1535P.
4	Plug the configured junction box cable into the RJ-45 connector labeled To Network on the back of the Media Converter. After a few minutes, the Media Converter power LED will light.
5	Mount the Media Converter to junction box using the screws provided (see Figure 6 on page 29).
6	Insert a 10/100 Ethernet cable into the RJ-45 connector on the front panel of the Media Converter labeled To Device .
7	Insert the other end of the Ethernet cable into the downstream device.

Instructions for Installing the NetVanta ActivReach Wall Plate Media Converter for ActivReach Ethernet and Optional Voice Passthrough	
Step	Action
1	Ensure that the NetVanta 1535P lines and any voice/POTS lines are disconnected from the source prior to configuring and installing any jacks inside the junction box.
2	Configure the network cable on both the Media Converter end and the NetVanta 1535P end in accordance with your installation requirements 1-pair ActivReach (see Figure 4 on page 25) and optional voice passthrough (see Figure 8 below). Make sure both ends of the network cable are configured in the same manner.
3	Plug the RJ-45 connector of the configured cable into one of the network ports of the NetVanta 1535P.
4	Plug the RJ-11 connector of the configured cable into an RJ-11 connector on the PBX.
5	On the Media Converter end, plug the configured cable's RJ-45 connector into the connector on the Media Converter labeled To Network and the RJ-11 connector in to the connector labeled POTS on the back of the Media Converter. After a few minutes, the Media Converter power LED will light.
6	Mount the Media Converter to junction box using the screws provided (see Figure 6 on page 29).
7	Insert a 10/100 Ethernet cable into the RJ-45 connector on the front panel of the Media Converter labeled To Device .
8	Insert the other end of the Ethernet cable into the downstream device.
9	Insert a phone cable into the RJ-11 connector on the bottom of the Media Converter.
10	Insert the other end of the phone cable into the downstream POTS phone.

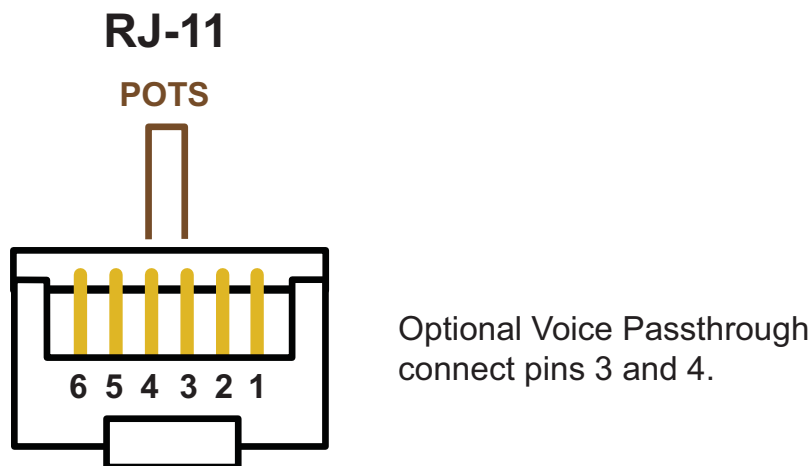


Figure 8. Optional Voice Passthrough RJ-11 Pinouts

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 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
- All necessary power cords
- Quick start guide

NetVanta 1131 Front Panel Design

The NetVanta 1131 front panel is shown below. [Table 3 on page 35](#) describes all of the LED behaviors.

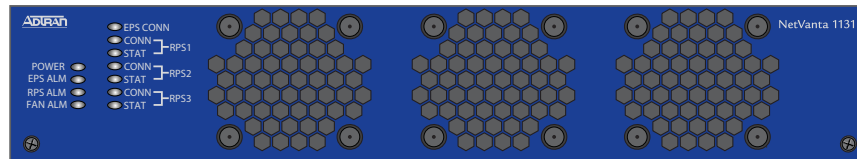


Figure 9. NetVanta 1131 Front Panel Layout

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.

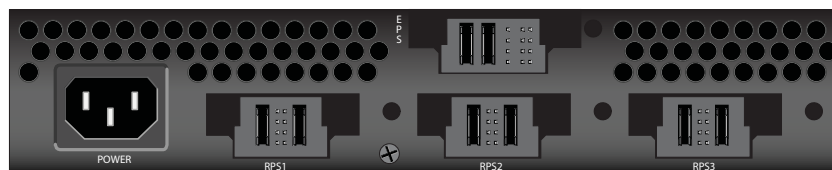


Figure 10. NetVanta 1131 Rear Panel Layout

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 41](#) 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 3. 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 11) 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 40 .

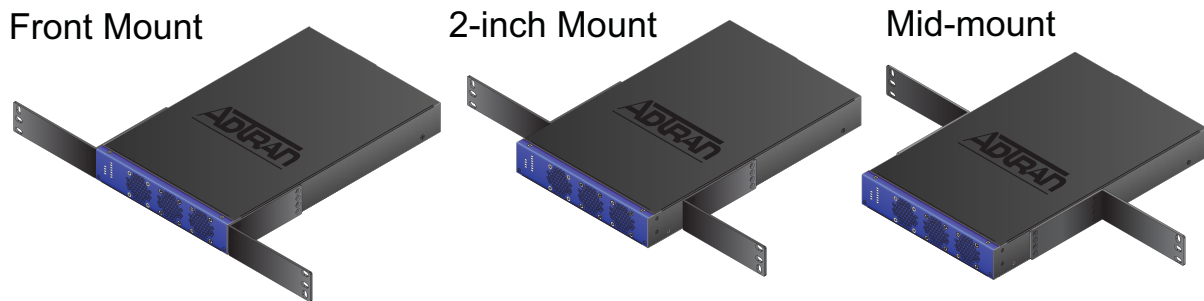


Figure 11. Rack Mounting the NetVanta 1131 Using the Brackets

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 12). 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 40 .

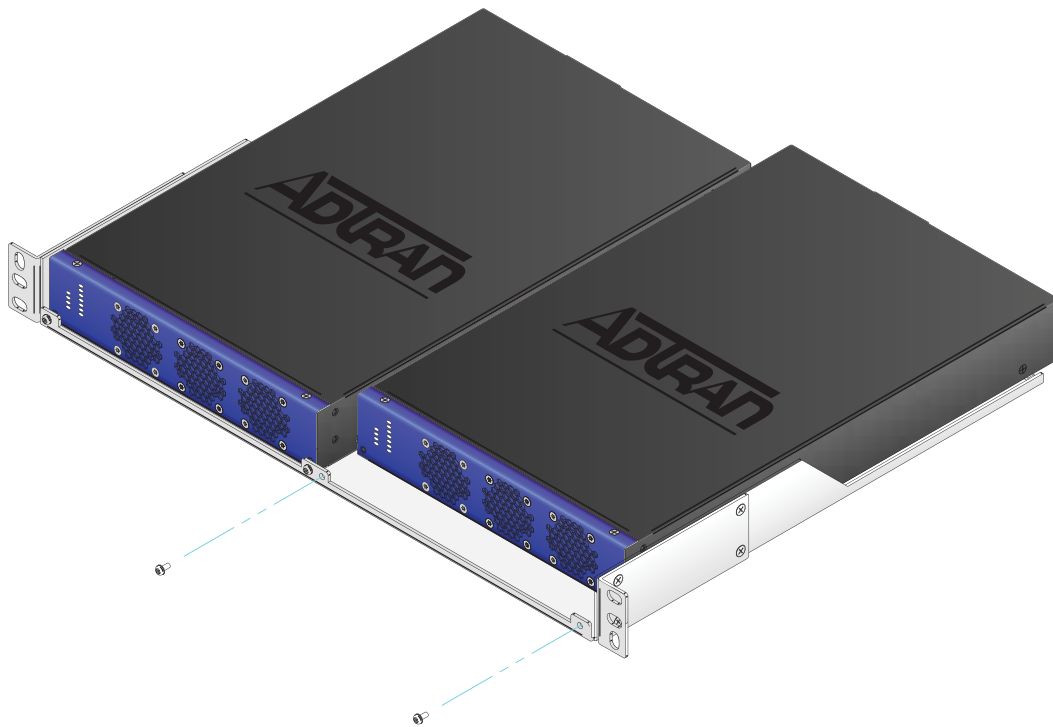


Figure 12. Rack Mounting the NetVanta 1131 Using the Dual Mounting Tray

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 13). 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 13).
5	Proceed to the steps given in Powering the NetVanta 1131 and the NetVanta Switch on page 41 .

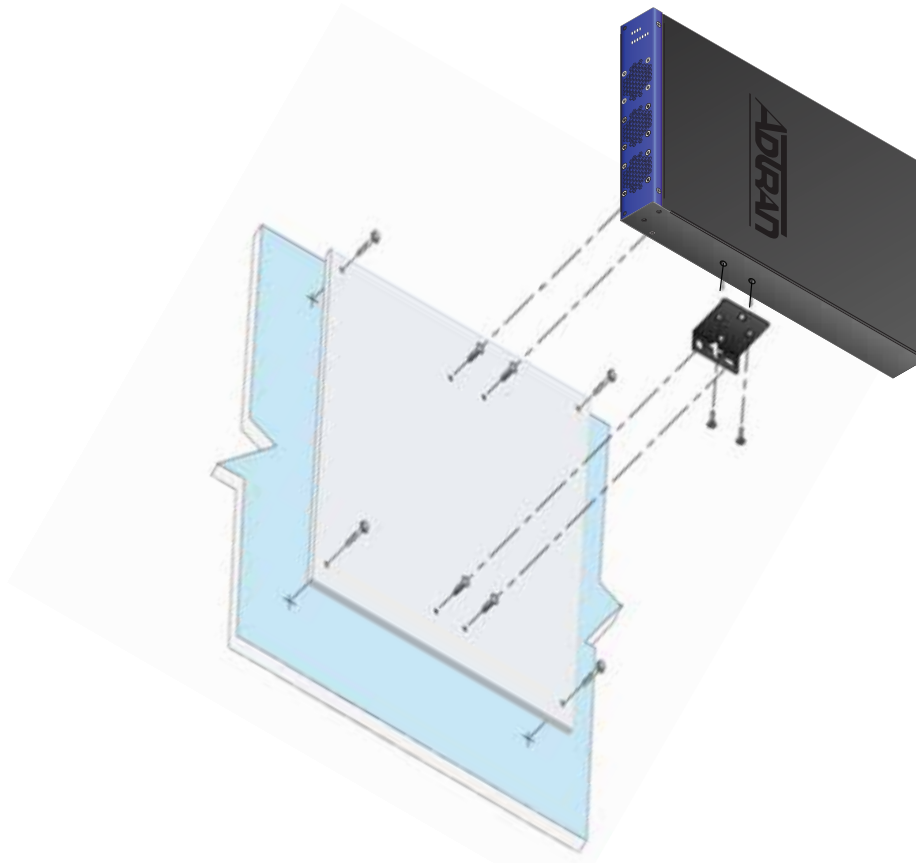


Figure 13. Wall Mounting the NetVanta 1131


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. <i>Important! Do not remove the cover plates from the RPS/EPS receptacles unless you plan to use them.</i>
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. <i>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.</i>
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 41 .

Powering the NetVanta 1131 and the NetVanta Switch

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

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

Table A-4. 50-Pin Champ Connector Pinouts for Hydra Interconnect Cable

Pin	Color		Port	Pin	Color	
1	Blue	/ White	1	26	White	/ Blue
2	Orange	/ White	2	27	White	/ Orange
3	Green	/ White	3	28	White	/ Green
4	Brown	/ White	4	29	White	/ Brown
5	Slate	/ White	5	30	White	/ Slate
6	Blue	/ Red	6	31	Red	/ Blue
7	Orange	/ Red	7	32	Red	/ Orange
8	Green	/ Red	8	33	Red	/ Green
9	Brown	/ Red	9	34	Red	/ Brown
10	Slate	/ Red	10	35	Red	/ Slate
11	Blue	/ Black	11	36	Black	/ Blue
12	Orange	/ Black	12	37	Black	/ Orange
13	Green	/ Black	13	38	Black	/ Green
14	Brown	/ Black	14	39	Black	/ Brown
15	Slate	/ Black	15	40	Black	/ Slate
16	Blue	/ Yellow	16	41	Yellow	/ Blue
17	Orange	/ Yellow	17	42	Yellow	/ Orange
18	Green	/ Yellow	18	43	Yellow	/ Green
19	Brown	/ Yellow	19	44	Yellow	/ Brown
20	Slate	/ Yellow	20	45	Yellow	/ Slate
21	Blue	/ Violet	21	46	Violet	/ Blue
22	Orange	/ Violet	22	47	Violet	/ Orange
23	Green	/ Violet	23	48	Violet	/ Green
24	Brown	/ Violet	24	49	Violet	/ Brown
25	Slate	/ Violet		50	Violet	/ Slate

