Virtual Edge Platform (VEP) 1420 Series

Sourcebook

Abstract

FOR INTERNAL USE ONLY

DELL Technologies

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

Preface

The following rules apply to the information within this sourcebook:

- This **sourcebook** is a Dell-only document for internal use and is not intended for external distribution
- A **platform book** can be shared externally with customers and partners, however, a valid non-disclosure agreement (NDA) is required

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Product description

The Dell Virtual Edge Platform (VEP) 1420 is a next-generation access platform family. The products within the VEP1420 line are built for edge compute, such as uCPE, SD-WAN, and ROBO. The VEP1420 product line consists of the three models that are described in Table 1.

The VEP1420 line is a cost-optimized platform with fewer ports than the VEP14x5 and right-sized performance for smaller to medium sized branch offices. The VEP1420 platform is built for various edge use cases with the primary proof point being an SD-WAN appliance for Versa.

The VEP1420 is built around the Intel Denverton set of processors as defined in the following table:

Table 1. Dell Virtual Edge Platform (VEP) 1420 model descriptions

Model	SKU	CPU	Description	Other
VEP1420N	210-BJJD	4-core	• 8 GB DDR4 • 32G eMMC • 4x10/100/1000 Base-T GE ports • 1x Micro USB Serial Port • TPM • Versa software is installed	• 2xUSB 3.0 • Fanless
VEP1420	210-BJJF	4-core	• 8 GB DDR4 • 32GB eMMC • 1x Micro USB Serial Port • 4x10/100/1000 Base-T GE ports • **Wi-Fi 6** • TPM	• 2xUSB 3.0 • 1 Cooling Fan w/Fanless UI
VEP1420LTE	210-BJJL	4-core	• 8 GB DDR4 • eMMC • 1x Micro USB Serial Port • 4x10/100/1000 Base-T GE ports • **Wi-Fi 6** • **LTE (Dual SIM)** • TPM	• 2xUSB 3.0 • 1 Cooling Fan w/Fanless UI

New technologies

Wireless specifications

The wireless bands that are supported for Wi-Fi are as follows:

Wireless specifications

NOTE: The WiFi specifications apply only to the VEP1420LTE and VEP1420 models. The WiFi specifications do not apply for the VEP1420N model.

The following table provides the wireless technologies that each model supports:

Table 2. Wireless technology support

Wireless technology				
Dell model number	Wi Fi	WWAN: LTE	GNSS	Notes
VEP1420N	No	No	No	NOTE: The VEP1420N does not support any wireless functionality
VEP1420	Yes	No	No	NOTE: The VEP1420 provides two internal WiFi antennas for dual-band WiFi.
VEP1420LTE	Yes	Yes	Yes	NOTE: The VEP1420LTE provides two internal WiFi antennas for dual-band WiFi. NOTE: The VEP1420LTE provides two external antennas for 3G or 4G.

Table 3. Embedded modules that each VEP1420 model supports

Dell model number	WiFi	WWAN and GNSS
VEP1420N	N/A	N/A
VEP1420	Compex WLE3002HX	N/A
VEP1420LTE	Compex WLE3002HX	Sierra Wireless EM7565

Table 4. Wireless technology details

Feature	Overview
4G LTE (Long-Term Evolution)	LTE Category 12: 600 Mbps DL/150Mbps UL)
3G WCDMA (Wideband Code Division Multiple Access)	DC-HSPA+: Cat 24 (42 Mbps DL/5.76Mbps UL) NOTE: US carriers do not provide 3G services any are longer; however, 3G services may exist in other parts of the world.
SIM Card Support	DSSS - Dual SIM, Single Active Supports one active SIM at any time
GNSS (Global Navigation Satellite System)	GPS L1, GLONASS G1, Beidou B1, Galileo E1
WiFi Dual Band	Supports 2.4G & 5G bands 2.4 GHz max data rate: 574 Mbps 5.0 GHz max data rate: 2402 Mbps

	Supports latest 802.11ax and backwards compatibility to all previous standards (802.11 a,b,g,n,ac)
Antennas	Two external WWAN antennas (MAIN + AUX): 4G, 3G and also support GNSS. Two internal embedded antennas with 2x2 MIMO to support dual-band WiFi

NOTE: The VEP1420LTE does not provide a dedicated GPS antenna for the GPS port.

Please see the 1420 Series Warnings and specifications guide for detailed information regarding the following wireless specifications:**

- WWAN 4G LTE specifications
  - LTE bands and frequencies
  - LTE transmit power
  - LTE receiver sensitivity
- WWAN 3G WCDMA specifications
  - 3G WCDMA bands and frequencies
  - 3G WCDMA transmit power
- WWAN antennas
  - WWAN atenna specifications
- WWAN antenna peak gain
- WWAN antenna efficiency
  - LTE TRP based on antenna efficiency
- WWAN antenna guidelines
- WiFi specifications
  - WiFi transmitter
    - Bandwidths across modulations rates
  - Wifi Receiver
  - Wifi data rates
    - Data rates for client devices that support WiFi6
    - Data rates for client devices supporting WiFi5, but not WiFi6
    - Data rates for client devices supporting WiFi5, but not WiFi6 (continued)
    - Data rates for client devices supporting WiFi4, but not WiFi5, or WiFi6
  - WiFi antennas
  - Internal WiFi antenna guidelines
- GNSS specifications
  - GNSS band support
    - GNSS supported bands for the VEP1420LTE
  - GNSS performance specifications
  - GNSS antenna support options
    - Configuration commands for AUX RF port usage for GNSS
  - Configuring the GPS port for usage with an active antenna
    - Configuration commands that enable usage of the GPS RF port for GNSS
  - GNSS antenna specifications of use with GPS port
    - GNSS active antenna specifications
    - Internal components of a GNSS active antenna
  - Validating GNSS performance
    - GNSS verification using AT commands
    - Guidelines to read SNR information
  - Sending AT commands to the embedded module

** Link: https://dl.dell.com/content/manual27646244-dell-technologies-virtual-edge-platform-1420-series-warnings-and-specifications-guide.pdf?language=en-us

GNSS Recommended Antennas for VEP1420LTE

- Either one of these antennas can be ordered directly on Digikey with the part numbers provided

Options	Manufacturer	Manf PartNum	Description	Vendor	Vendor#	Specifications
1*	Taoglas	AA.162.301111	GNSS Active antenna, SMA, 28dB gain, ultra-Low Profile Miniature Magnet	Digikey	931-1238-ND	AA.162.301111 Specification Datasheet | DigiKey
2	Ublox	ANN-MS-0-005-0	RF ANT GPS 1.572GHZ-1.578GHZ, SMA connector, 5m coax	Digikey	672-ANN-MS-0-ND	https://www.u-blox.com/en/product/ann-ms

- * - Recommended due to cost and GNSS coverage with wider bandwidth support
- Support for GNSS and how to test these antennas in DIAG OS can be found in the **Warnings and Spec guide**.

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Product positioning and key marketing messages

The VEP family targets two main use cases:

- Software-defined wide area network (SD-WAN) appliance market
- Universal CPE (uCPE) market

The uCPE market is a superset of the SD-WAN use case that unites multiple software functions onto a single hardware device through virtualization.

The platform targets both service providers (Managed and Telecom) and enterprise markets. Enterprises are considering SD-WAN as a cost- effective alternative and supplement to MPLS only transport. Also, Enterprises see virtualization as a way to combat appliance sprawl, consolidate hardware, simplify, and accelerate application roll-outs. Communication service providers view this as a new revenue opportunity that augments MPLS as a capacity expansion and VPN solution. Managed service providers can now offer network as a service, provide over-the-top network service using SD-WAN, and offer universal CPE as a service.

Service providers see the benefit of being able to offer orchestration and application management services that they were previously unable to offer. This offsets the lost MPLS transport revenues.

Product positioning is similar to that of physical customer premise equipment as it is primarily positioned as a device to provide virtual functions at the service provider edge or access. The value of VEP becomes the universal hardware regardless of software solution, or combination of solutions required at a specific site. The primary goal of introducing this product as an x86 based networking platform is to provide a solution for hosting CPE functions. Finally, this product is positioned for service providers and enterprises of all sizes who want to use NFV and SD-WAN to offer new services.

The key value proposition for the VEP1420 is that it brings an entry-level Dell offering to the CPE market at a competitive price and performance level. Previous generations of Intel processors available at this price point cannot keep up with the demands of SD- WAN and other uCPE applications. The VEP1420 brings the right features, performance, and price to the bulk of the UCPE market.

Dell differs in this market as it is the only global vendor with a trusted brand to adopt and embrace the desegregation of hardware and software that is required by the open computing movement. Traditional vendors such as Cisco and Juniper maintain closed proprietary solutions, while smaller open vendors such as Lanner and Super Micro, do not have the scale or global reach that the Enterprise market demands for service and support.

The Deployment Guides that are available on the sales portal, outline the performance envelope for the VEP1420 line of systems, and the various software applications that the line of systems, supports. The VEP1420 systems are value option systems that provide right-sized computing in a value-optimized package. The VEP1420 systems enable you to deploy SD-WAN and multiple VNFs at a lower cost than other Dell VEP platforms.

Product overview

The Virtual Edge Platform 1420, or VEP1420, is a universal customer premise equipment (uCPE) device. The VEP1420 series securely connects the service edge of small to medium branch locations with cloud or centrally managed data centers, to host virtual network functions.

The VEP1420 series is a single-socket,1RU platform that offers hosted virtualized network functionality, with applicability for the service edge and Enterprise Branch. The VEP1420 series uses the Intel Denverton-L (Atom processor, C3000 family).

The VEP1420 series features:

- Intel processor product family — 4c Intel Denverton-L C3436L
- Onboard 8GB DDR4
- 32GB eMMC
- Four 1GBase-T network ports

Target market segments

Universal customer premise equipment

Universal customer premise equipment, or uCPE, is a software-based solution that runs VNFs, at the customer site. The device is a remotely manageable platform, by the uCPE software that is installed, that enables the deployment, modification, or deletion of multiple applications over a Wide Area Networks (WAN). uCPE devices are still a hardware-based commodity, however, it is typically more powerful since the VNF runs at the customer site. The following figure summarizes the benefits:

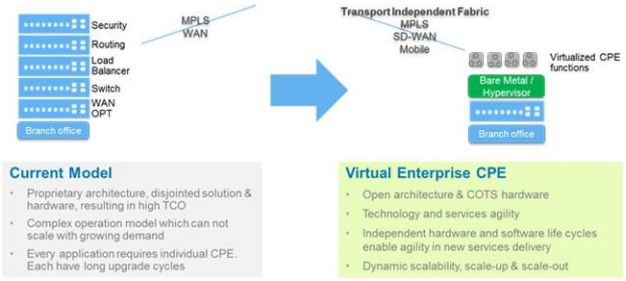


Figure 1. Single VEP1420 system replacing multiple hardware devices

SD-WAN termination point

Multiprotocol Label Switching, or MPLS, is essential to any enterprise IT. MPLS offers services within SLA to internal customers. It offers both a clean pipe and a secure connection between various enterprise edges and the SP core data center. Software-defined wide area network, or SD-WAN, is a less expensive and is cost effective way to provide the same solution to the enterprise. Using variously available less expensive pipes using WAN, enterprise can securely connect with all of the campuses and to the SP data center.

Multiple options are being adopted to deploy the SD-WAN overlay connectivity. The main use cases are summarized in Figures 2–5.

MPLS VPN offload

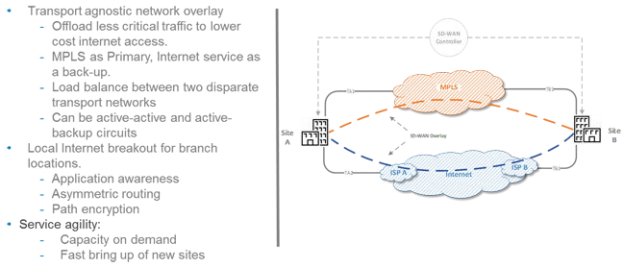


Figure 2. Use case: MPLS VPN offload

Dual Internet WAN

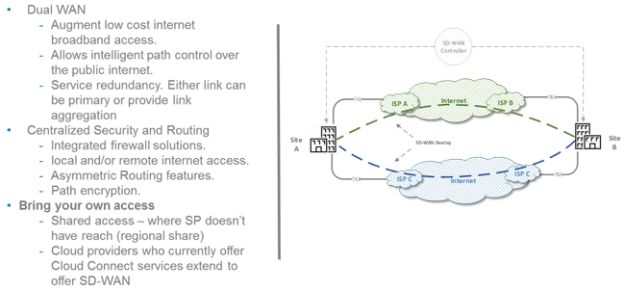


Figure 3. Use case: Dual Internet WAN

LTE tertiary path backup

The following use case describes the LTE tertiary path backup where LTE is RTS+:

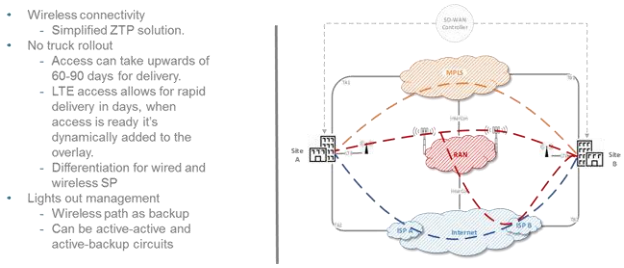


Figure 4. Use case: LTE tertiary path backup

Product specifications

Table 5. Key features

Feature	Overview
Processor	Intel Denverton-L (Atom processor, C3000 family)
CPU SKU	C3436L (4-core)
Chipset	North and south bridge that is built into the CPU/SOC
Memory	8GB DDR4
Out of Band Management	Micro-USB console
Mounting Options	Desktop, wall mount, or rack mount (1.5 RU, dual unit tray
Dimensions	208 mm (8.18 in) x 52 mm (2.04 in) x 200 mm (7.87 in) (W x H x D)
Weight	1.281 kg to 1.431 kg
Power Consumption	1420N 23 W typical, 24 W max 1420 28 W typical, 29 W max 1420LTE 31 W typical, 32 W max
Airflow	The VEP1420 and VEP1420LTE models have one fan inlet at the bottom, with the exhaust ports on the sides and on the back. The VEP1420N is fan-less
Power supply	External AC/DC power adapter, 110-240 V AC, 50-60Hz, 12V DC
TPM 2.0	External AC/DC power adapter, 110-240 V AC, 50-60Hz, 12V DC

Table 5. Key features (continued)

Feature	Overview
Serviceability	No field upgradable components
USB	2x Superspeed USB 3.0 ports on sides of the enclosure
BIOS	AMI BIOS
BMC	No BMC
Hypervisor	Certification available for Versa

Versa performance figures

The following VEP1420 series performance information was published by Versa:

Table 6. Versa performance information

Features	Dell VEP1425	Dell VEP1420N	Dell VEP1420-LTE	VEP1420
Throughput without UTM enabled	800 Mbps	400 Mbps	400 Mbps	400 Mbps
AV + NGFW	200+ Mbps	110 Mbps	110 Mbps	110 Mbps
IPS + NGFW	150+ Mbps	85 Mbps	85 Mbps	85 Mbps
AV + IPS + NGFW	120+ Mbps	60 Mbps	60 Mbps	60 Mbps

Third-party software

The VEP1420 series of systems is validated only with Versa. RFP questions that are related to the software are handled by the software vendor directly. Customers also have the flexibility to install other OS options on their own.

NOTE: For a list of partners that are part of the ecosystem, see the *Virtual Edge Platform, SD-WAN, and uCPE Solutions Architecture Guide* in the Attachment section of this document.

Device management

The VEP1420 model has 32GB of eMMC storage where full diagnostics are stored. Basic diagnostics exist in BIOS, however full diagnostics require a reboot into the diagnostic image that is housed in eMMC storage. For information on booting into the diagnostic image, see uCPE Diagnostics Guide.

The VEP1420 series of systems have a Kensington K-Lock slot that acts as a security anchor point with an appropriate cable.

Table 7. Reset button behavior

Status	Action
The VEP1420 series system is in a powered off state using the Linux power-off or shutdown command	Press the **Reset** button for **1 to 2 seconds** to power on the unit
The VEP1420 series system is in a powered on state	Press the **Reset** button is recorded as an event

Competitive

Key differentiators

- Purpose built for next generation access solution to host virtualized or other access solutions on top
- Globally available short depth single socket server with networking features that are designed for cost leadership and

to provide an open verified ecosystem

Traditional CPE vendors like Cisco and Juniper do not offer a device in this price point. Cisco and Juniper are single vendors that only offer proprietary lock-in solutions. Cisco Meraki offers a product at and below the Dell price point. However, the product is tied to the Meraki service and is closed from the perspective of the customer being able to run applications of their own choosing on the device. Traditional white box vendors such as Silicom, Accton, Advantech, and Lanner, lack brand recognition, quality, service support, and global reach of Dell. Fulfillment, on-site support, 8-hour and 4-hour response times where required, are not offered by these vendors.

This puts Dell in a unique position, directly aligned with market demands and direction. The market is demanding open, flexible, and reusable platforms without vendor lock-in at the software layer, the VEP1420 delivers on that. The market also requires Enterprise and carrier class support, service, and logistics, Dell can supply that.

Hardware competitive matrix

Table 8. Hardware competitive matrix

	Dell VEP 1420N	Versa CSG 350	VMware EDGE610	Datacom DM8630	Lanner NCA-1513	Advantech FWA-1012VC
CPU Cores	4	4	2	2	4	2 and 4
Memory	4GB	4GB	4GB	4GB	Up to 32GB	Up to 32GB
Storage	32G eMMC	32G eMMC	16G eMMC	16G eMMC	8G eMMC	64G
USB Serial Port	1xMicro USB	1xMicro USB	1xMicro USB	1x USB 2.0	2x USB 2.0	2x USB 3.0
Management Port(s)	None	Yes	None	Yes	Yes	Yes
Networking Ports	4 x GE (1G)	4 x GE (1G)	6x10/100/1000 BaseT + 2x10G SFP+	6x10/100/1000 BaseT	6x10/100/1000 BaseT	4 x GE (1G)
Integrated WiFi	n/a	Available Slot	Yes	No	No	Available Slot
Integrated LTE	n/a	Available Slot	Yes	No	No	Available Slot
PoE/PoE+	No	Yes	No	No	No	No
Additional USB Ports	1xUSB 3.0	1xUSB 3.0	2xUSB 3.0	1xUSB 3.0	None	None
Cooling Fan(s)	0 (Fanless)	1	0 (Fanless)	1	1	1
TPM (Trusted Platform Module)	Yes	Yes	Yes	Yes	Yes	Optional
Operating System	Versa OS	Versa OS	VMware SD-WAN	-	-	Linux (CentOS, Ubuntu)
Dimension (HxWxD)	52 mm (2.04 in) x 208 mm (8.18 in) x 200 mm (7.87 in)	35 x 150 x 200 mm	52 x 206 x 200mm	43 x 189 x 191mm	44 x 231 x 200m	44 x 250 x 190.4mm

Customer inquiries regarding Dell security

Questions regarding Dell security, such as products, supply chain, and so on, can be referenced at the Dell Security and Trust Center page. If your question is not found on the FAQ, submit a request using the Security Enablement Inquiry tool.

3

System overview

Front and rear view

Front view

Figure 5. Front system view - VEP1420 model

1. Security lock port
2. USB port
3. System status indicator LED

NOTE: The VEP1420 models do not have external antennas. Wi-Fi antennas are housed fully within the chassis.

Rear view

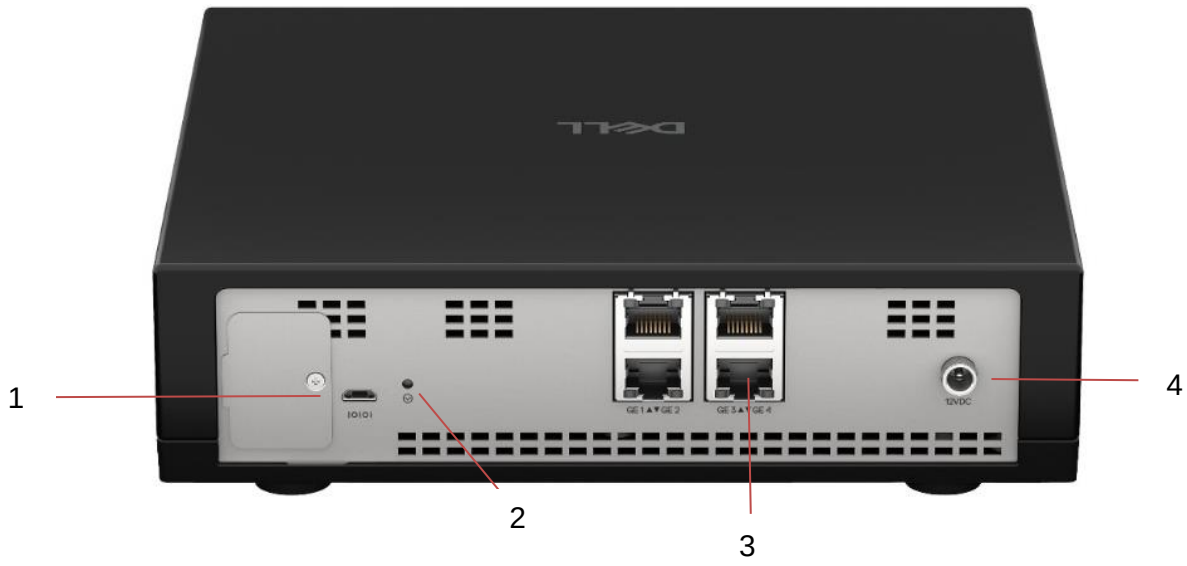


Figure 6. Rear system view - VEP1420 series model

1. Micro USB port
2. Reset button
3. Ethernet ports and LED status lights
4. Power connection port

NOTE: To prevent the VEP1420 series system console port from being accessed in a nonsecure location, the system ships from the factory with a plate covering the micro USB port. To uncover the port, use a #0 (2.5 mm) Phillips head screwdriver to loosen or remove the screw that holds the plate in place.

Left and Right View

Architecture overview

The VEP1420 series of systems consist of an Intel processor complex with these high-level features:

Table 9. Architecture overview

Component	Description
Storage	32GB eMMC
Primary management ports	Out-of-band management using mini-USB 2.0 console port
Memory	8GB DDR4
USB Ports	Two USB type-A receptacle (female) ports supporting a mass storage device (USB flash drive). The port supports USB 3.0 with maximum data rates of 640 Mbps.

Console port	The VEP1420 has a dedicated management console on micro-USB port. Configure USB serial console to 115200 baud, N, 8, 1
Power supply	The power supply connector is on the same side as the I/O. The VEP1420 ships with one external AC/DC power supply
Wi-Fi	Dual-band 2.4G & 5G, WiFi6 802.11ax 2x2 MIMO support,with backwards compatibility for previous WiFi generations 802.11 b/g/n/ac The VEP1420 models do not have external antennas. The two Wi-Fi antennas are housed fully within the chassis.
Mean Time Between Failure (MTBF) **without** external power supply	The following MTBF information does not include the external power supply. ● VEP1420N: 507836 hours@45C ● VEP1420: 750995 hours@45C ● VEP1420LTE: 332638 hours@45C
Mean Time Between Failure (MTBF) **with** external power supply	The following MTBF information does include the external power supply. ● VEP1420N@ 45C 335240 ● VEP1420 @45C 427079 ● VEP1420LTE @45C 248992

NOTE: To download the console port driver, see https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers?tab=downloads

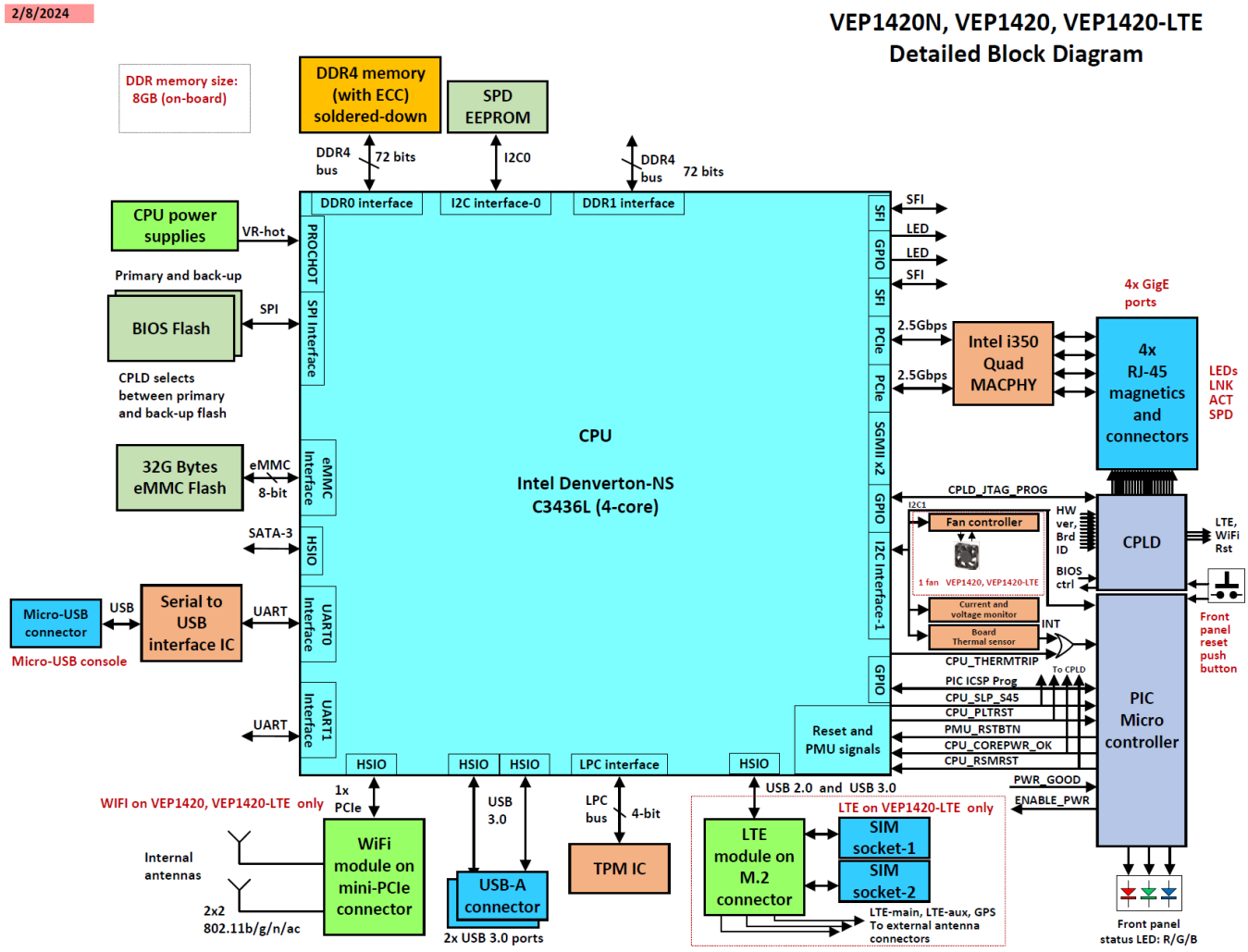
Architectural details

NOTE: The architectural details presented in this section are not to be included within the Partner Book.

Block diagram

NOTE: The block diagram content in this section is not to be included in the Partner Book and may **not** be shared outside of Dell without the approval of the appropriate Product Manager or Executive.

Four of the GigE interfaces are driven by an Intel i350 Ethernet controller.



The ports are enumerated differently for different operating systems as follows:

Table 10. DiagOS port enumeration

DiagOS
Eth0 GE3
Eth1 GE4
Eth2 GE1

Eth3 GE2

Table 11. VOS port enumeration

VOS
vni-0/0.0 ge1
vni-0/1.0 ge2
vni-0/2.1 ge3
eth0 ge4

Chassis mechanical

The following table provides the chassis physical dimensions and characteristics for the VEP1420 series of systems:

Table 12. Mechanical specifications

Dimension		Inches	Centimeters
Product	Width	8.1	20.8
	Depth	7.9	20.0
	Height	2.0	5.2
Height of rack		1.5 RU	1.5 RU
Rack clearance required (Front)		N/A	N/A
Rack clearance required (Rear)		N/A	N/A
Product weight (without PSU) Shipping weight		1.3 kg to 1.4 kg 4.9 kg (10.9 lbs)	
Chassis mounting options		VEP1420 supports desktop placement (rubber feet), wall mount (using brackets), and rack mount using the optional dual-unit tray	

Acoustic noise and vibration report

ISO 7779 A-weighted sound pressure level: 20 dBA at 73.4oF (23oC).

Table 13. Acoustic noise and vibration information

Acoustic noise (db)	
Non-Operational Random Vibration 10~500 HZ(G2/ HZ=0.13-0.0018), 1.88 Grms RHS 15 Minutes for each side Operation Random Vibration 5~350 HZ(G2/ HZ=0.0002-0.0002), 0.26 Grms, RHS 15 Minutes for each side Shock non-op. 2 ms half-Sine Wave 71 g, 1 shock for each side Shock op 2.6 ms half-sine wave 31 g, 4 shock on x, y, z axis Shock non-op 1 ms square wave 32 g 270 in/sec	(See information below this table)

1-fan SKUs (4-core, one 5000 RPM fan)

Fan noise:

- SKUs with 1-fan:
- 100% speed: LwA 57dB
- 25% speed: LwA 36.4 dB

Environment		Levels	Specimen	Comment	Notes
Mechanical Non-Operation	Vibration Random Unpackaged	1.88Grms from 10Hz~500Hz, 6 sides	1 piece	PASS	
	Shock Unpackaged-Square Wave	32g, 270 in/sec 6 sides	1 piece	PASS	
	Shock Unpackaged-Half Sine	The shock table must generate a half sine shock pulse of 71G (at 2ms) ±5%. All 6 sides shall be tested.	1 piece	PASS	
Mechanical Operation	Operational Random Vibration	0.26 Grms Profile **Frequency (Hz)** / **G^2/Hz** 5 / 0.0002 350 / 0.0002 Three of the containers sides will be tested for 30 minutes/side	1 piece	PASS	
	Operational Half-Sine Shock	40G (2.3 ms duration) ±5% All 6 sides No use Rack.	1 piece	PASS	

VEP1420 series rack mount kit

The rack mount kit that is available for the VEP1420 series, allows for two 1420 series of systems to be mounted in one 19-inch rack mount tray. The units sit side by side within the tray. When the tray is populated with 1420 units, two RU should be allocated to each tray mounted in a standard rack.

Table 14. Rack mount kit and Dimensions

Sku	Description	Dell Part Number	DNI Part Number	Dim (L x D x H)	Weight	Carton Dimensions (L x W x H)	Units / carton	Weight
770-BCZE	Rack Mount Kit	V7XX7	VEP1400-BKT1	479.43 x 203.2 x 87.31 mm (18.87 x 8 x 3.43 in)	0.91 kg (2.0 lbs)	600 x 309 x 183 mm	1	2.35 kg (5.18 lbs)

Power supplies

The VEP1420 supports one external AC/DC power supply with secure locking thread.

Table 15. Power specifications

Parameter	Specification
Power input	• AC: 100 VAC–240 VAC, 50/60 Hz Max current draw per system - AC • 100VAC:2.0A • 240 VAC: 1.0A
Power output	• 12 V DC, 5.4A (65 W)
Power consumption	• 1420N 23 W typical, 24 W max • 1420 28 W typical, 29 W max • 1420LTE 31 W typical, 32 W

Table 16. Cooling specifications

Parameter	Specification
Thermal dissipation	See the Power consumption information in the Product specifications section Number
of fixed fans	0 (1420N) or 1 (1420 and 1420LTE)
Minimum CFM	5.6 (one fan)
Maximum CFM	10 (two fans)

NOTE: For thermal considerations, do not stack the VEP1420 platforms on top of each other. Stacking of the platforms impairs cooling and places the external power supply on top of the unit.

Environmental

Table 17. Environmental specifications

Parameter	Specifications
Operating temperature	0°C-40°C (32°F-104°F)
Storage temperature	-40°C to 70°C (-40°F to 158°F)

Operating relative humidity	5% to 85% (RH), noncondensing continuously 5% to 90% (RH), noncondensing Short term (< 1% of operational hour per year)
Storage relative humidity	5% to 90% (RH), noncondensing
Operating altitude	Maximum Operating altitude: 10,000 ft Temperature and performance derating above 950 m (3,117 ft) per Dell Enterprise Reliability Engineering (A09) specification
Storage altitude	10,668 m (35,000 ft)

LED behavior

Status LED behavior

Table 18. Status LED behavior

Class	Behavior
Status LED (Red/Green/Blue)	Depends on partner operating system

Port LED behavior

Table 19. Port LED behavior

Class	Behavior
1000M Base-T LED	Link LED - Green or amber Solid green - Port is linked and running at maximum 1000M speed on Base-T port Solid amber - Port is linked and running at lower 100M or 10M speed on Base-T port
Activity LED	Flashing green indicates port activity Off - no port activity

Chassis physical design

The VEP1420 series supports the following mounting options:

Figure 7. VEP1420 front view

1. System status indicator LED

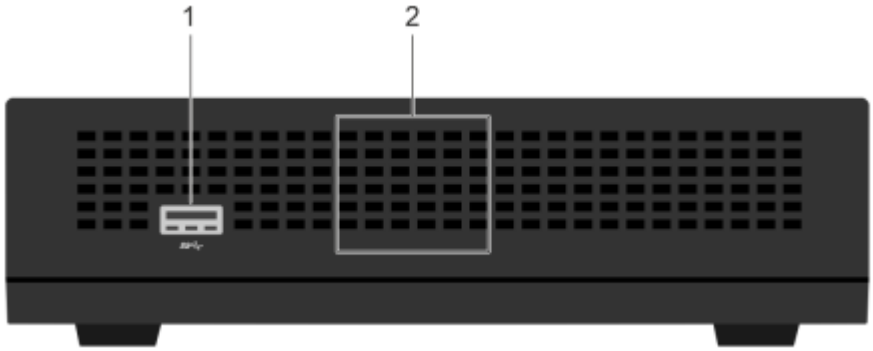


Figure 8. VEP1420 left view

1. USB port.

2. Location of the Internal WiFi antenna (Left).

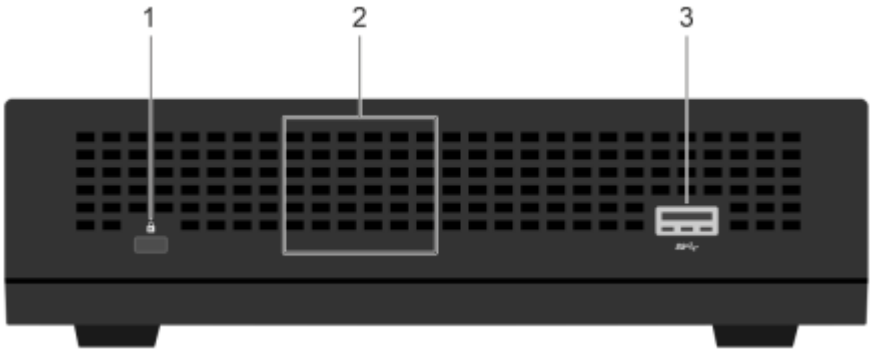


Figure 9. VEP1420 right view

1. Security lock port.

2. Location of the Internal WiFi antenna (Right).

3. USB port NOTE: An additional USB port is on the opposite side of the system.

Table 20. VEP 1420 front view system status indicator LED

Color	Status
Solid Green	• All the functions are normal. The system successfully booted with the operating system
Solid White	• CPU has initiated, and the BIOS is booting.
Solid Red	• System power on has started. • Power fault. When PG_1V24_VCCP is low during the power on sequence. • System booted into BIOS efi shell. • The system is forcing a warm reset. • The system is forcing a cold reset.
LED off	• Thermal fault. The system is in power off mode. • Power shutdown. When RSM_RAILS_GOOD is low during the power on sequence.

- The poweroff command is performed to shut down the system.

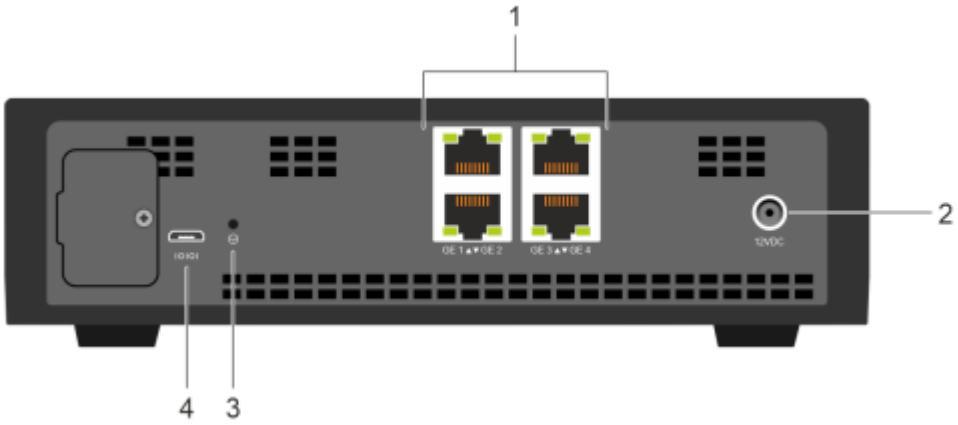


Figure 10. VEP1420N rear view (with port cover)

1. RJ45 ports

2. Power connection port

3. Reset button NOTE: For more information, see Reset button behavior.

4. Micro USB serial console port NOTE: To prevent the VEP1420 system console port from being accessed in a nonsecure location, the system ships from the factory with a plate covering the micro USB port. To uncover the port, use a #0 (2.5 mm) Phillips head screwdriver to loosen or remove the screw that holds the plate in place.

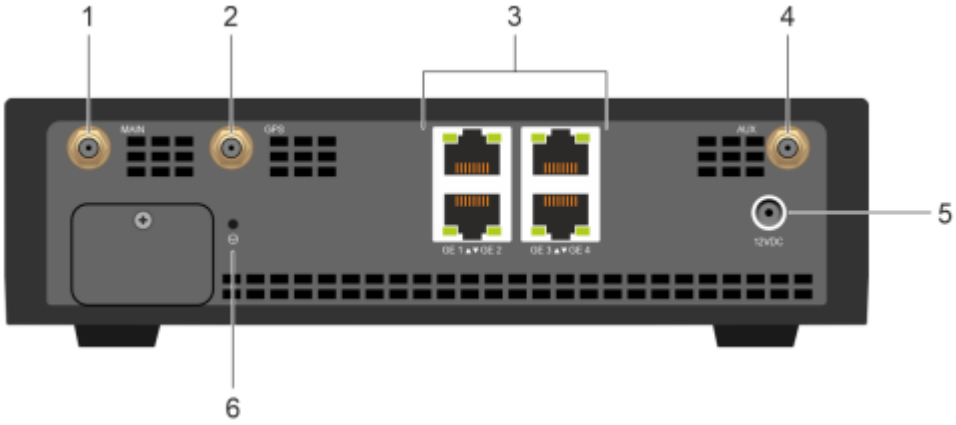


Figure 11. VEP1420-LTE antenna back view (with port cover)

1. SMA jack mount for the main WWAN antenna

2. SMA jack mount for the GPS antenna (optional)

3. RJ 45 ports

4. SMA jack mount for the auxiliary WWAN antenna

5. Power connection port

6. Reset button NOTE: For more information, see Reset button behavior.

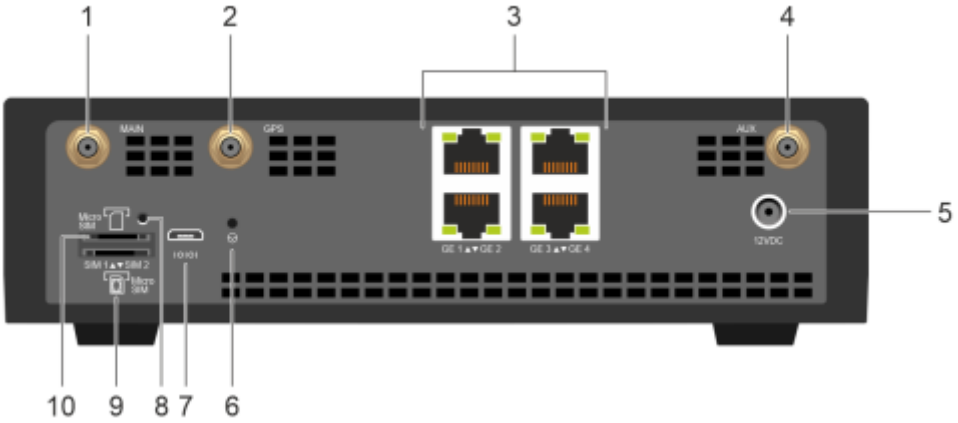


Figure 12. VEP1420-LTE back view (without port cover)

1. SMA jack mount for the main WWAN antenna

2. SMA jack mount for the GPS antenna (optional)

3. RJ45 ports

4. SMA jack mount for the auxiliary WWAN antenna

5. Power connection port

6. Reset button NOTE: For more information, see Reset button behavior.

7. Micro USB serial console port

8. Port cover screw hole

9. Micro SIM Slot 2

10. Micro SIM Slot 1

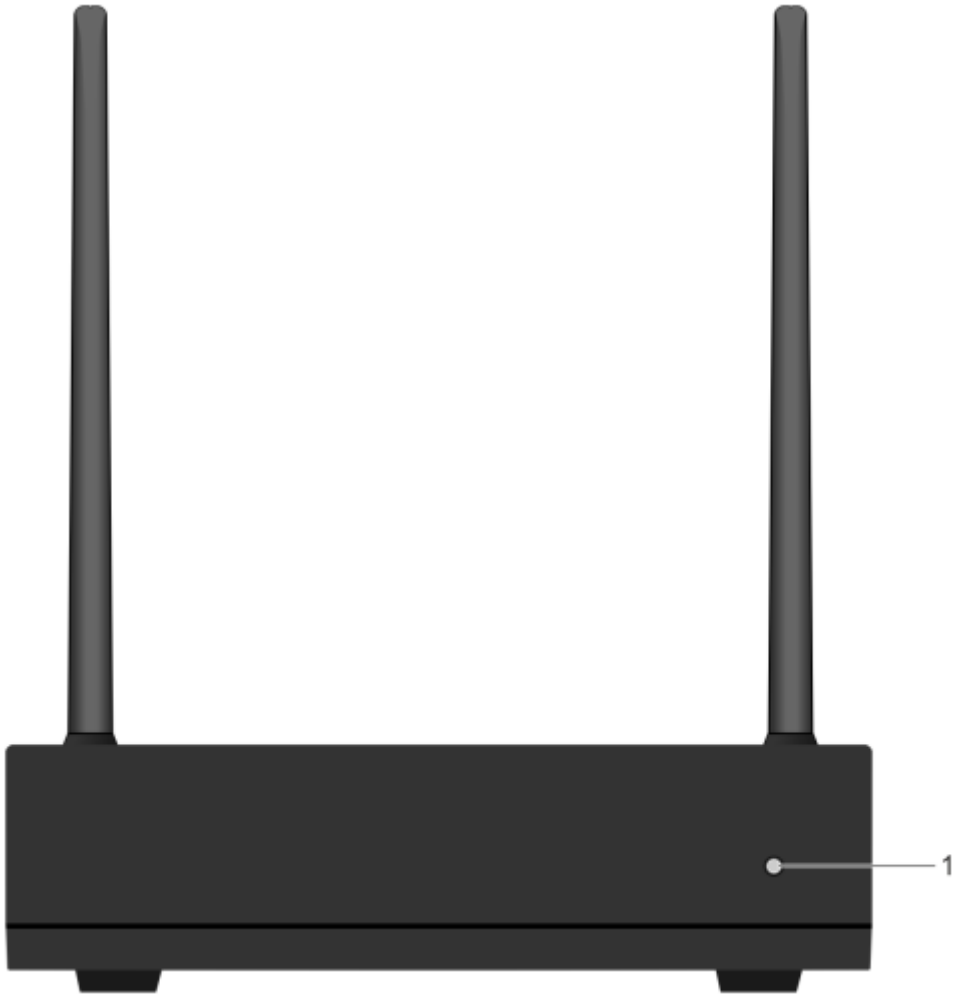


Figure 13. VEP1420-LTE front view with WWAN antennas

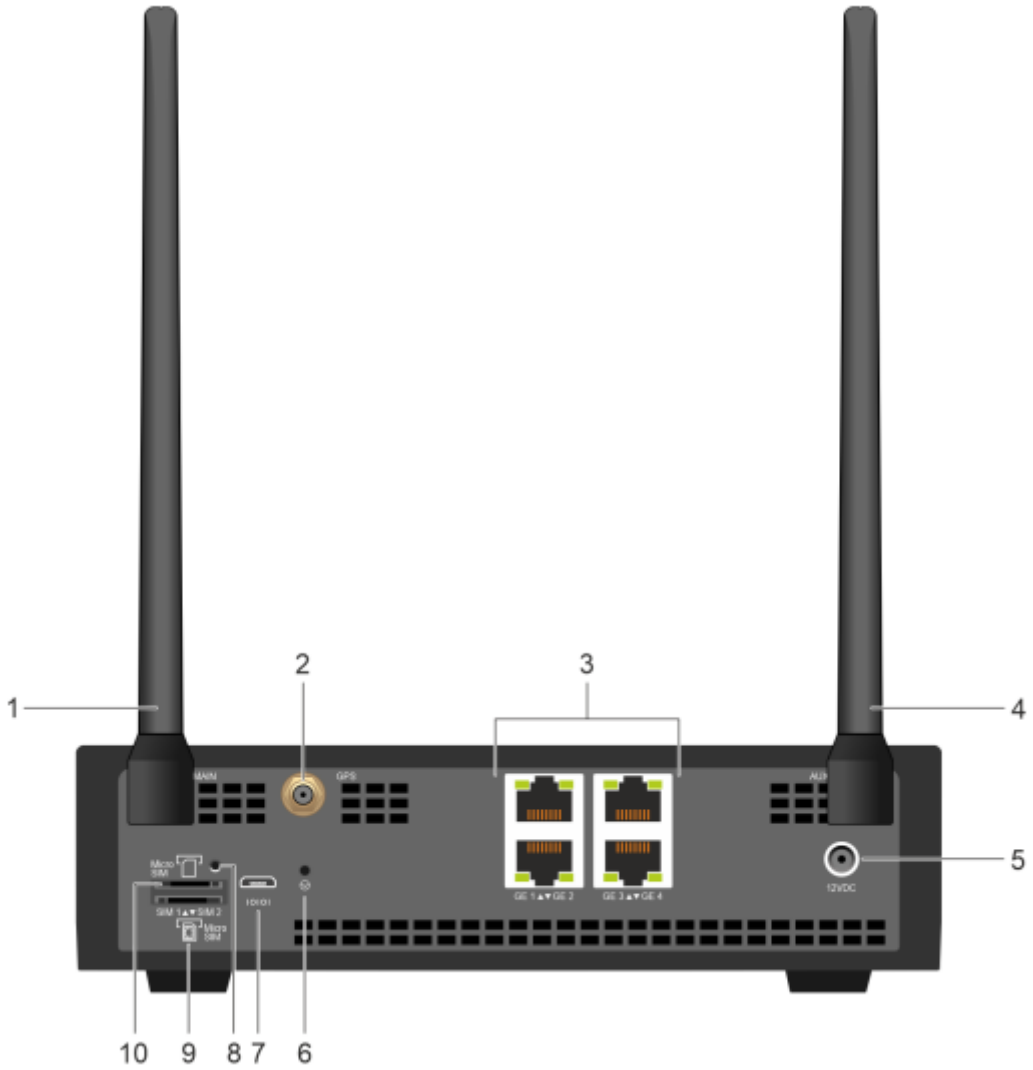


Figure 14. VEP1420-LTE rear view with WWAN antennas

1. Main WWAN antenna

2. SMA jack mount for the GPS antenna (optional)

3. RJ45 ports

4. Auxiliary WWAN antenna

5. Power connection port

6. Reset button NOTE: For more information, see Reset button behavior.

7. Micro USB serial console port

8. Port cover screw hole

9. Micro SIM Slot 2

10. Micro SIM Slot 1

Table 21. Reset button behavior

Action	Behavior
Press the Reset button. When the system is powered off:	• The system powers on

Table 22. Chassis physical design

Parameter	Specification
Height	• 5.2 cm (2.0 in)
Width	• 20.8 cm (8.1 in)
Depth	• 20.0 cm (7.9 in)
Chassis weight with factory-installed components	• VEP1420N: 1.281kg • VEP1420: 1.408kg • VEP1420-LTE: 1.431kg

Table 23. Environmental parameters

Parameter	Specification
Operating temperature	• 0–40°C (32°F–104°F) continuously
Operating humidity	• 5% to 85% (RH), noncondensing continuously • 5% to 90% (RH), noncondensing short-term (< 1% of operational hour per year)
Storage temperature	• –40°-70°C (–40° to 158°F)
Storage humidity	• 5% to 90% (RH), noncondensing
Maximum operational altitude	• 3,048 meters (10,000 ft) with no performance degradation to 950 meters (3117 ft)
Maximum nonoperational altitude	• 10,668 meters (35,000 ft)

Table 24. AC power requirements

Parameter	Specification
Power supply	110–240 VAC 50/60 Hz
Maximum current draw per system - AC	• 110 VAC: 0.6A • 240 VAC: 0.3A
Power consumption	VEP1420N: • Typical - 23 W • Maximum - 24 W VEP1420: • Typical - 28 W • Maximum - 29 W VEP1420-LTE: • Typical - 31 W • Maximum - 32 W

Chassis mounting

The VEP1420 series supports the following mounting options:

- Desktop placement (rubber feet)
- Wall mount placement
- Rack-mounted using the optional rack mount tray

Desktop placement

The VEP1420 series includes four rubber feet that provide secure and stable placement of the unit on a flat surface.

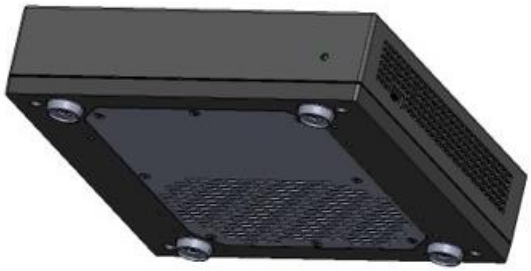


Figure 15. VEP1420 series desktop placement

NOTE: While placing a fan-less unit (VEP1420N) on a flat surface, ensure that you adhere to the following guidelines:

- Ensure that you attach the rubber feet to the base of the unit.
- Ensure that all the venting holes are not blocked by any substance.

Wall mount installation

The VEP1420 series includes the hardware that is required for wall mount installation. Using a torque screwdriver, affix the wall mount brackets to the VEP1420 series using the four M3 screws included.

NOTE: When driving the screws into the bracket and VEP1420 series unit, verify that **5 lb-in** is the achieved torque setting.

NOTE: If mounting the VEP1420 series to the wall using the wall mount bracket provided, removal of the rubber feet from the bottom of the VEP1420 series unit is not necessary.

The VEP1420 series of systems include a wall mount bracket with cross-shaped cutout for the mounting screws. The wall mount bracket includes cross-shaped cutouts for the mounting screws.

Wall mount bracket with cross-shaped cutout for the mounting screws

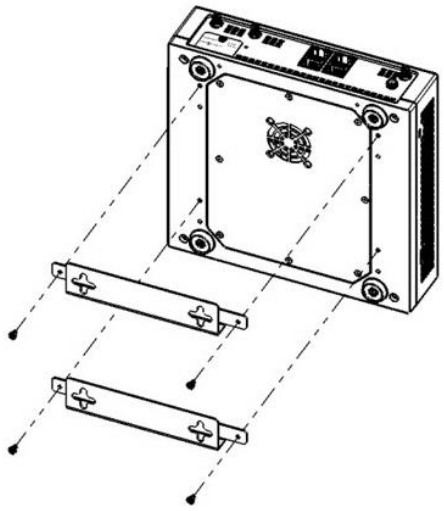


Figure 16. VEP1420 series wall mount installation - cross-shaped cutout

To mount the VEP1420 series unit to the wall using the wall mount bracket provided, you must first anchor the screws into the wall surface. Depending on the type of wall surface, use the M3 screw and anchor to ensure a secure installation. The recommended M3 screw dimensions are as follows:

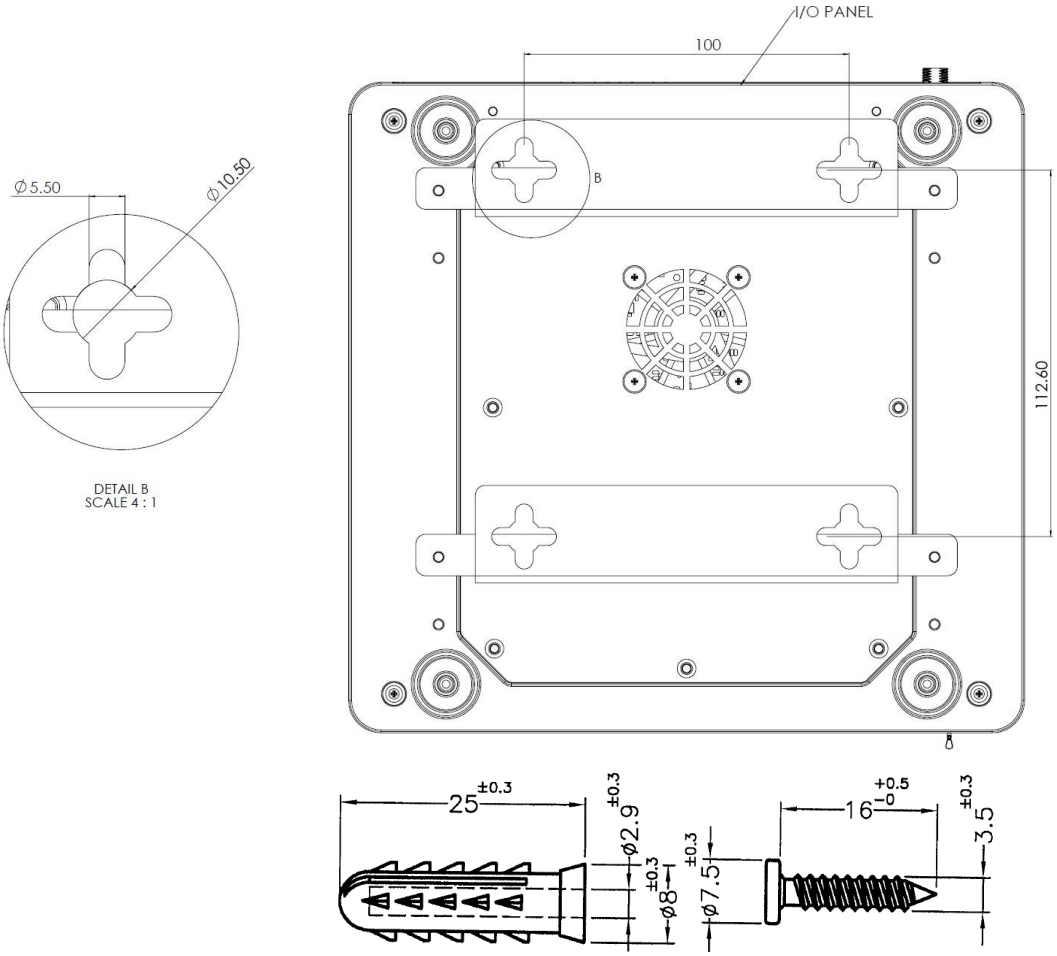


Figure 17. VEP1420 series wall mount, installation anchor, and screw dimensions

NOTE: Before mounting the VEP1420 series to the wall, verify that the wall surface is strong enough to support a firm installation of the unit and can withstand the weight of the unit, power cable, and network cabling.

Using the measurements provided in the following diagram, use the measurement in the red box to mark the distance between the two installation points:

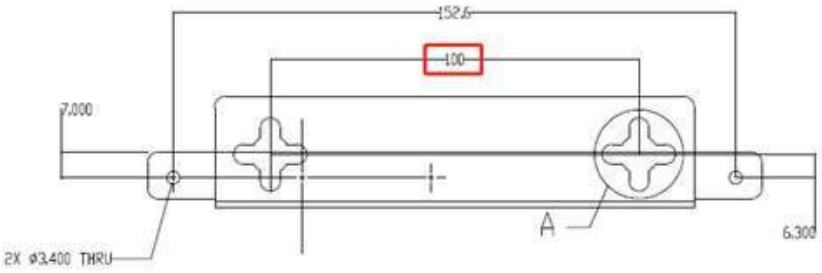


Figure 18. VEP1420 series M3 screw installation points

After the brackets have been attached to the VEP14020 series unit and the screws that are mounted into the wall, place the brackets over the screws and slide the unit to one side to secure the unit in place.

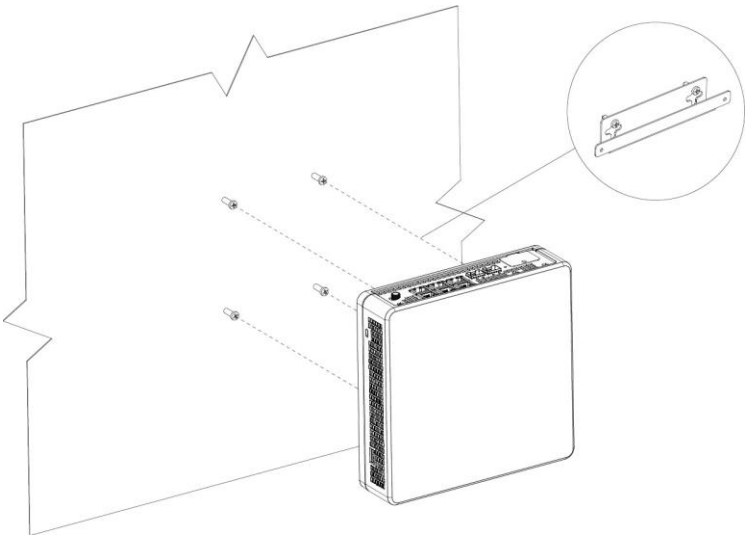


Figure 19. VEP1420 series wall mount bracket installation - cross-shaped cutout

Rack-mounted installation

As an option, the VEP1420 series can be mounted to a dual rack mount tray. Purchased separately, you can install the VEP1420 series to the dual rack mount tray using a torque screwdriver and the eight M3 screws included.

NOTE: When driving the screws into the bracket and VEP1420 series unit, verify that **5 lb-in** is the achieved torque setting.

NOTE: If mounting the VEP1420 series to a dual rack mount tray, removal of the rubber feet from the bottom of the VEP1420 series unit is not necessary.

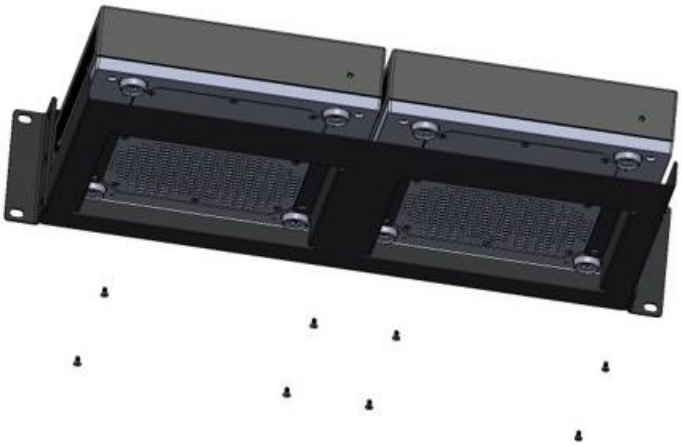


Figure 20. VEP1420 series rack mount installation

Figure 21. VEP1420 series rack installation - front and back view

Regulatory

Compliance

SAFETY

- UL/CSA 62368-1, 3rd Edition
- EN IEC 62368-1:2020 +A11:2020
- EN IEC 62311:2020
- EN 62479:2010
- AS/NZS 62368.1:2022

EMC

- Australia/New Zealand: AS/NZS CISPR 32:2015 AMD 1:2020, Class B
- Canada: CES-003, Issue 7, Class B
- Japan: VCCI, Class B
- USA: FCC CFR 47 Part 15, Subpart B, Class B
- EN 55032:2015 +A11:2020
- EN 55035:2017 +A11:2020
- EN 61000-3-2:2014
- EN 61000-3-3:2013

RoHS

- EN IEC 63000:2018

Class A Immunity

- EN 300 386 EMC for Network Equipment
- EN 55024
- EN 61000 - 3-2: Harmonic Current Emissions
- EN 61000 - 3-3: Voltage Fluctuations and Flicker
- EN 61000-4-2: ESD
- EN 61000-4-3: Radiated Immunity
- EN 61000-4-4: EFT
- EN 61000-4-5: Surge
- EN 61000-4-6: Low Frequency Conducted Immunity

Other

- Safety: IEC62368-1
- AS/NZS 60950
- EN 60950-1 Safety of Information Technology Equipment

- EMC compliance
- ICES-003 (Canada) Class A
- EN55032:2015 (Europe) Class A
- CISPR32 (International) Class A
- AS/NZS CISPR32 (Australia and New Zealand) Class A
- taiwanKN32 (Korea) Class A
- CNS13438 (Taiwan) Class A
- CISPR24
- EN300 386

Reliability

- Enterprise Operational Random Vibration – SV0105
- Enterprise Operational Half-Sine Shock – SV0107
- Enterprise Non-Operational Random Vibration – SV0102
- Enterprise Non-Operational Half-Sine Shock – SV0106
- Enterprise Non-Operational Square Wave Shock – SV0108

Country of origin

Made in Taiwan.

4

Sales information

Products being replaced

Not applicable.

Accessories

The VEP1420 ships with the following accessories:

- AC/DC power supply and AC power cable
- Wall mount hardware
- Micro-USB console cable

The following optional accessories can also be ordered:

- 19-inch Rack-mount dual-unit tray

NOTE: Standard USB LTE dongles can be connected to the VEP1420.

Power supply

The VEP1420 series uses an external power supply, identified in the following table:

Table 25. Power supply SKUs

SKU	Description
492-BCOJ	Dell Networking Power Supply, AC, 65 W, 12V DC (ships with all SKUs)

Services

The following services portfolio is applicable to VEP1420:

Table 26. Services offerings

Category	Description
Warranty	• Base Warranty/Accounting Std - 1 yr NBD
ProSupport	• Basic Support - NBD parts response • ProSupport- NBD or Mission Critical with 2/4/8 hour response options • ProSupport Plus - NBD, or Mission Critical with 2/4/8 hour response options • ProSupport for Flex Data Center/Multi Vendor HW Support • ** Marketing Default 3Yr ProSupport Plus, MC 4hr
Deployment	• Basic deployment under investigation • Custom deployment

Technical support A collaborative support agreement is performed for all software partners. Per the agreement, when a customer calls Dell for support, a hardware validation check is performed. If the validation determines that the issue is software related, a warm transfer to the software vendor is initiated.

Resources

Certification and compliance resources

Table 27. Dell certification and compliance resource information

Category	Behavior
Dell Environmental Data Sheets	https://www.dell.com/learn/us/en/uscorp1/product-info-datasheets-safety-emc-environmental
Dell Regulatory Compliance	https://www.dell.com/learn/us/en/04/regulatory-compliance?c=us&cs=04&l=en&s=bsd

Customer-facing external resources

https://www.dell.com/support

Internal resources

To perform a search of internal resources, see the sales portal and search for the following terms as new content is added regularly:

- VEP1420
- 1420
- VEP
- SD-WAN
- uCPE

Internal training

For information regarding internal training, see http://gstcatalogue.aus.amer.dell.com/Catalog/CourseDetails/?code=ESGB5319.

MTBF disclaimer

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Limitations of reliability prediction models

Reliability prediction models provide MTBF point estimates. Model inputs include base component failure rates, environmental, quality, and stress factors. Base failure rates use failure data from multiple sources, including industry field data, research lab test results, and government labs.

Environmental, quality, and stress factors may differ from field conditions. Predictions assume a constant failure rate which does not account for failures due to early life quality issues or wearout phenomena.

General prediction methodology

Dell uses the default prediction methodology, Telcordia SR332, Reliability Prediction Procedure for Electronic Equipment. Other methods may be used to estimate the reliability of certain products and/or subsystems. System reliability predictions take into account the impact of redundant components.

Component parameters and assumptions

The default methodology for MTBF predictions is Telcordia method 1, case 3. Assumptions include 25oC system inlet air temperature, quality level II components, ground-based, fixed, controlled environment, and 100% duty cycle. Components internal to the system are assumed to be operating at 40oC ambient and 50% electrical stress.

Dell does not provide MTBF data below the system level.

Supplier MTBF data

In developing system MTBF predictions, Dell uses subsystem MTBF data that is provided by suppliers.

Apart from the use of industry standard prediction methodologies, suppliers may derive MTBF data from reliability demonstration testing, life testing, actual field failure rate, or specification/datasheets.

Supplier data is provided as is to Dell, and Dell generally does not verify the accuracy of supplier data.

Subsystem MTBF data release policy

Dell does not release MTBF data below the system level. The reasons for this policy are:

- Dell considers internally designed subsystem MTBF data to be confidential intellectual property.
- Dell obtains supplier subsystem MTBF data under NDA and is prohibited from releasing it.

Supplying MTBF data

MTBF data is provided within Table 9 of this document. More detailed information can be obtained by contacting the MTBF engineering team. The MTBF engineering team maintains a website to assist the sales and marketing teams with MTBF related questions. To access this resource, see http://tnttoolsr.aus.amer.dell.com/mtbf/ to request an account.

NOTE: The MTBF data from the sourcebooks can be shared in an RFP response. The standard Dell disclaimer states that MTBF calculations should accompany any MTBF figures provided.