Protectli Appliance

Protectli Vault Pro VP2440
Intel® N150 Quad-Core Processor
2x X710-BM2 10GbE SFP+
2x I226-V 2.5GbE Ports

September 21st, 2025

Overview

The Protectli Vault Pro VP2440 is the first 4-Port Vault Pro model featuring SFP+ ports, allowing for the connectivity of 10GbE modules while maintaining a smaller, fanless form factor. The VP2440 is powered by a quad-core Intel® N150 Processor with 32GB onboard eMMC storage and supports up to 64GB of DDR5 SO-DIMM RAM. Keyed M.2 slots are available for PCIe Gen 3x2 NVMe SSD storage, a WiFi card (E key, up to 3052 form factor), and a 5G/LTE module (B Key, 3052 form factor). The VP2440 is equipped with 2 Intel® I226-V RJ-45 Ethernet ports, supporting up to 2.5GbE speeds with full backward compatibility to 1GbE and lower as well as two Intel® X710 BM2 10GbE SFP+ ports, supporting a wide range of SFP+ modules.

Protectli Vaults utilize Intel components to ensure persistent compatibility with a wide range of operating systems (OS) and applications. The VP2440 features a fanless, all-aluminum chassis design, allowing for efficient heat dissipation from the CPU and other components without any moving parts or additional power requirements. Internal heatsinks and thermal pads are supplied to provide optional additional passive cooling for the NVMe, SFP+ Ports, RAM, WiFi, and 4G/5G modem modules.

Technical Specifications

Model	VP2440
Description	2x 10GbE SFP+, 2x 2.5GbE Network Port Appliance
Processor	Intel® N150 Quad Core Processor (6MB Cache, up to 3.6GHz)
Microarchitecture	x86_64-v3
Processor Cores	4
Processor Threads	4
Intel® AES-NI	Supported
Virtualization	Intel® Vt-x, Vt-d
Network	2x Intel® X710-BM2 SFP+, 2x Intel® I226-V 2.5G Ethernet (RJ-45)
Video / Graphics	Intel® HD Graphics GPU, 24 Execution Units, Max Dynamic Frequency 1GHz, HDMI 2.1, DP 1.4
Max Resolution	3840 x 2160 @60hz
Audio	Audio over HDMI, Display Port, and USB-C Display Port
Memory	1x SO-DIMM DDR5-4800, Max 64GB
Onboard Storage	1x M.2 2280 NVMe, 1x 32G eMMC on board
Optional Additional Storage	Not Supported
External I/O	2x 2.5GbE RJ-45 Ethernet ports

	2x 10GbE SFP+ Ports
	4x USB 2.0 Type-A
	1x USB 3.2 Gen 2 Type-C with DisplayPort
	1x USB Type-C COM Port
	1x HDMI 2.1 Port
	1x Display Port 1.4
	1x Nano (4FF) SIM Holder
	8x WiFi/LTE Antenna Mounting Holes
	1x 12V DC Power Jack
Internal I/O	1x M.2 2280 M-Key PCIe 3.0 x2 (NVMe)
	1x M.2 2230/3030/3052 E-Key PCIe 3.0 x1 (WiFi)
	1x M.2 3052 B-Key USB 3.2 Gen 1 (4G/5G Modem)
	1x CPU Fan Header (4 pin) (1.25mm pitch)
	1x JNTP1 Header (NTP/i2c) (4 pin) (1.25mm pitch)
	1x GPIO Header (2x3 pin) (2.54mm pitch)
	1x eSPI Header (2x5 pin, pin 10 clipped) (2.00mm pitch)
	1x RS-232 COM Header (2x5 pin, pin 10 clipped) (2.00mm pitch)
	1x Front Panel Header (2x5 pin, pin 10 clipped) (2.54mm pitch)
	1x CMOS Reset (2 pin)
	1x BIOS Programming Header (Two separate 1x4 pin) (2.00mm pitch)
Super I/O Chip	IT8659E
BIOS	AMI® or coreboot
Indicators	1x LED Power Button (Blue), 1xLED Power Indicator (Green), 1x LED SSD Activity Indicator (Yellow)
Power	Input 12V DC, 1x DC Power Jack
Power Usage	Max 45W
Chassis	Fanless, Aluminum, Gray
Chassis Dimensions	170mm x 152mm x 53mm
Mounting Options	Desktop, VESA Bracket, Optional 1RU Rack Mount
Weight	3lbs, 7.38oz (1.57kg)
Shipping Weight	5lbs, 3.54oz (2.37kg)
Operating Temperature	+14° - +122° F, -10° - +50° C

Operating Humidity	0 – 95% relative humidity, non-condensing
Approvals	UL (Power Supply), FCC Part 15 Class B, CE, RoHS
Country of Origin	Made in China, Assembled in USA, Canada, or Germany
Optional WiFi	1x M.2 2230/3030/3052 E-Key PCIe 3.0 x1 (WiFi)
Optional LTE Cellular	1x M.2 3052 B-Key PCIe 3.0 x1 or USB 3.2 Gen 1 (4G/5G)
Optional TPM	1x Trusted Platform Module, TPM 2.0

Included Accessories and Components

60W (12V @5.0A) Power Supply with threaded barrel connector
Power Cable (US/CA, EU, UK, or AUS/NZ)
USB Type-C (with Type-A adapter) to USB Type-C Serial Console Cable
4x M2 component mounting screws (M2 screw size, 4.75mm length, 1.9mm thread diameter)
8x Thermal Pads for use with attached heatsink†
Quick Start Guide

†More heatsink, thermal pad, and screw details are outlined in the Thermal Pads and Screws Information towards the end of the datasheet.

Firmware Support Information

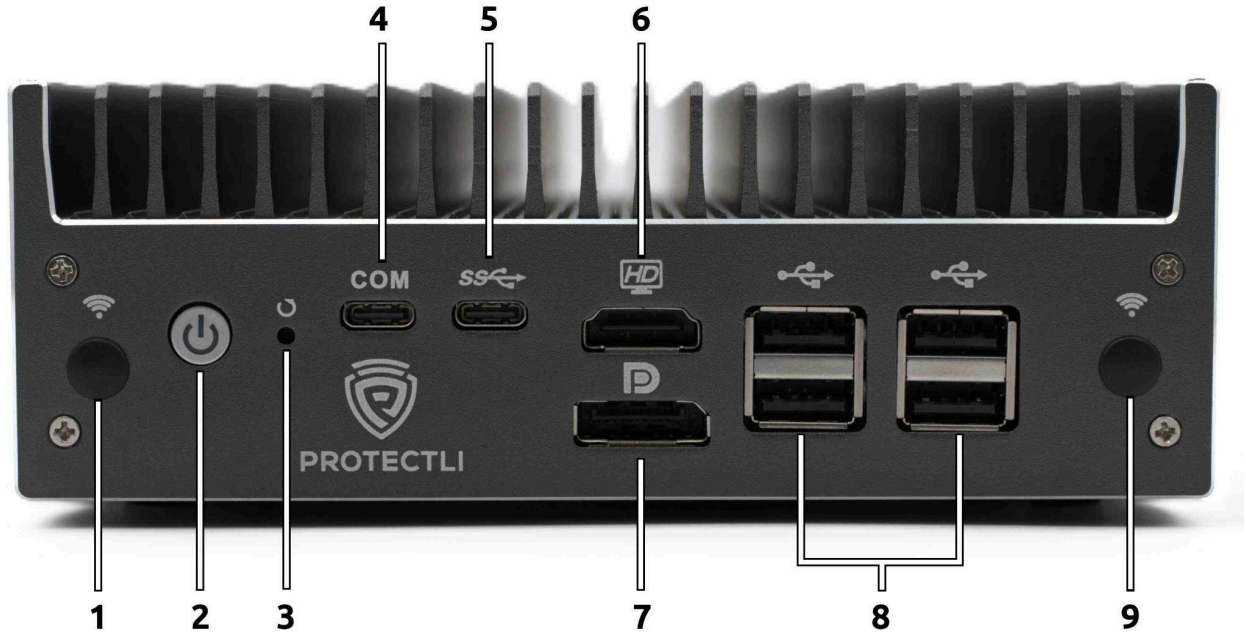
The VP2440 supports American Megatrends, Inc. (AMI) and coreboot firmware. Both firmware options operate exclusively in UEFI mode. They do not support legacy BIOS.

All mentions of the “AMI or coreboot firmware menu” in this document refers to the UEFI setup menu accessed by holding the Delete key at the time of boot. To access the boot options menu, hold the F11 key instead.

Firmware information and downloads for all Protectli Vaults can be found in the Protectli Knowledge Base on our coreboot page and AMI page and are available through our GitHub. We recommend using the Protectli Flashli tool, available through our GitHub, to update Vault firmware.

External Interfaces

Front Panel Configuration



Item #	Object	Label	Description
1,9	Antenna Ports		Two antenna ports for adding radio antennas (WiFi, LTE, etc.). The ports are covered by plugs while not in use.
2	Power Button		Pressing the Power Button will power the unit on and illuminate with a blue LED. *In OSes configured to handle ACPI signals, pressing the power button initiates a shutdown.* *Pressing and holding the Power Button for 5 seconds will force the unit to power off.*
3	Reset Button (Recessed)		A momentary switch exposed via GPIO. This is not an ACPI reset button, but a general purpose button that may be programmed in the guest OS.

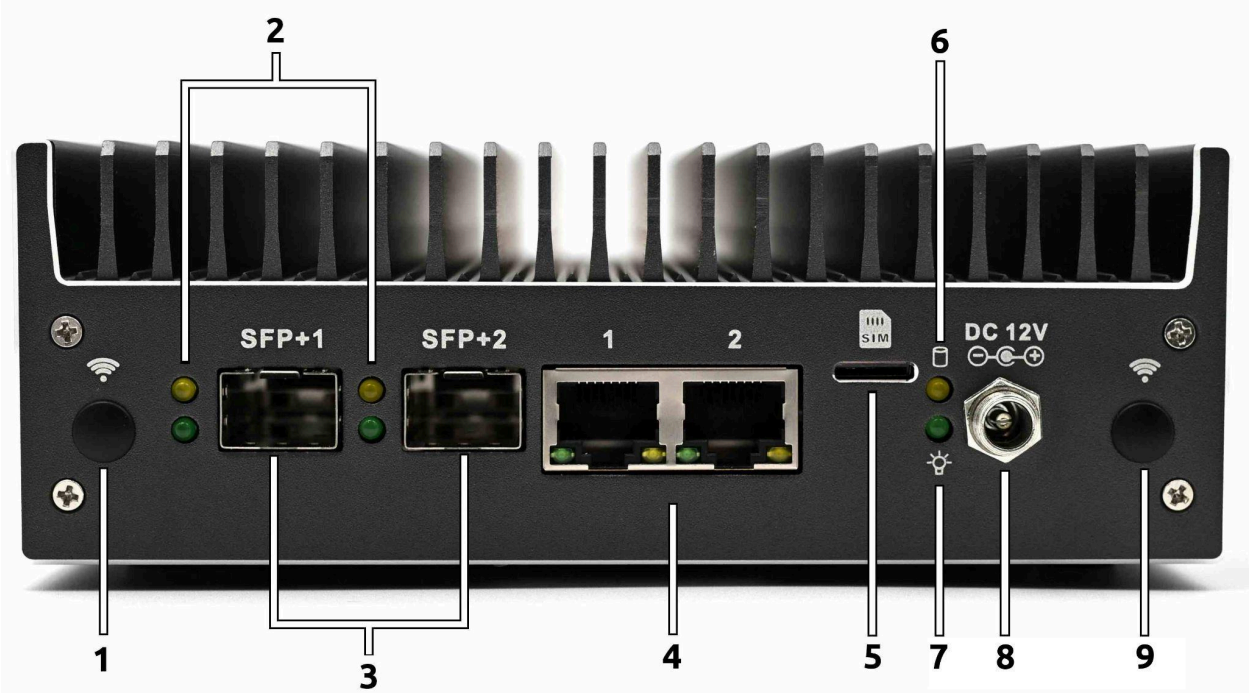
4	USB-C COM Port	**COM**	RS-232 serial communications via USB-C. Default port settings: • 115200 baud • No parity • 8 databits • 1 stopbit This COM port is designated as "COM0" in the AMI Firmware menu. The settings are found at Advanced > Serial Port Console Redirection.
5	USB-C Port	SS	One USB 3.2 Gen 2‡ Type-C connector with Display Port. (Theoretical maximum throughput of 10Gbps [~1.2GBps]) Supports video/audio output when used as Display Port.‡‡
6	HDMI Connector	HD	Video and audio output via HDMI. (HDMI 2.1, max resolution of 3840 x 2160 @60hz)‡‡
7	DisplayPort Connector		Video and audio output via DisplayPort. (Display Port 1.4, max resolution of 3840 x 2160 @60Hz)‡‡
8	Four USB2 Connectors		USB 2.0 Type-A connectors. (Theoretical maximum throughput of 480Mbps [~60MBps])

‡USB-IF naming standard for USB transfer rates: "USB 3.2 Gen 2" is the equivalent and current name for "USB 3.1 Gen 2" offering a theoretical maximum speed of 10 Gigabits (~1.2GB) per second. Older kernels and operating systems may not report the most recent naming convention. For a full linguistic deep dive, please see 3.1 and 3.2 Specification Language Usage Guidelines from USB-IF. https://www.usb.org/sites/default/files/usb_3_2_language_product_and_packaging_guidelines_final.pdf, https://www.usb.org/sites/default/files/usb_3_1_language_product_and_packaging_guidelines_final_0.pdf

‡‡Audio output via HDMI, Display Port, or USB-C Display Port may not work for some operating systems by default. For example: Ubuntu requires the underlying Linux Kernel to be 6.12 or newer. Windows may require you to update all Intel® Chipset drivers, and may require you to update the Intel® Graphics drivers.

Additionally, the maximum display resolution may be locked at 800x600 on some operating systems until the proper driver updates are performed. Again, Ubuntu would require Linux Kernel 6.12 or newer. Windows may require the aforementioned Intel® Chipset drivers & Intel® Graphics drivers.

Rear Panel Configuration



Item #	Object	Label	Description
1, 9	Antenna Ports		Two (2) antenna ports for adding radio antennas (WiFi, LTE, etc.). The ports are covered by plugs while not in use.
2	SFP+ Activity Lights		Top light will illuminate an orange/amber color when connected at 10GbE, LED will be off when at 1GbE. The bottom light illuminates/blinks green when connected.
3	SFP+ Cages	**SFP+1, SFP+2**	Two (2) Intel X710-BM2 1/10GbE SFP+ Cages.
4	Ethernet Ports	**1** , **2**	Two (2) 10/100/1000/2500 Mbps Intel® I226-V ethernet ports. LEDs on the left side of NIC emit solid green when connected at 2500/1000Mbps, and are turned off at 100/10Mbps.
5	SIM Slot	SIM	Nano (4FF) SIM slot for providing a SIM card to an optional internal cellular modem.
6	Data Activity LED		LED emits yellow when data activity is detected over the NVMe interface.

7	Power Indicator LED		This LED will stay solid green when the device is powered on.
8	Power Supply Connector	**DC 12V**	12V DC threaded barrel connector for the 60W external power supply. Positive rail is the tip, negative is sleeve.

Side Panel Features

Item #	Object	Label	Description
1	Antenna Ports		Two (2) antenna ports on the left and right side of the unit (totalling for an additional four). Used for mounting radio antennas (e.g. WiFi, 4G/5G Modem). The ports are covered by plugs while not in use.

Internal Interfaces and Components

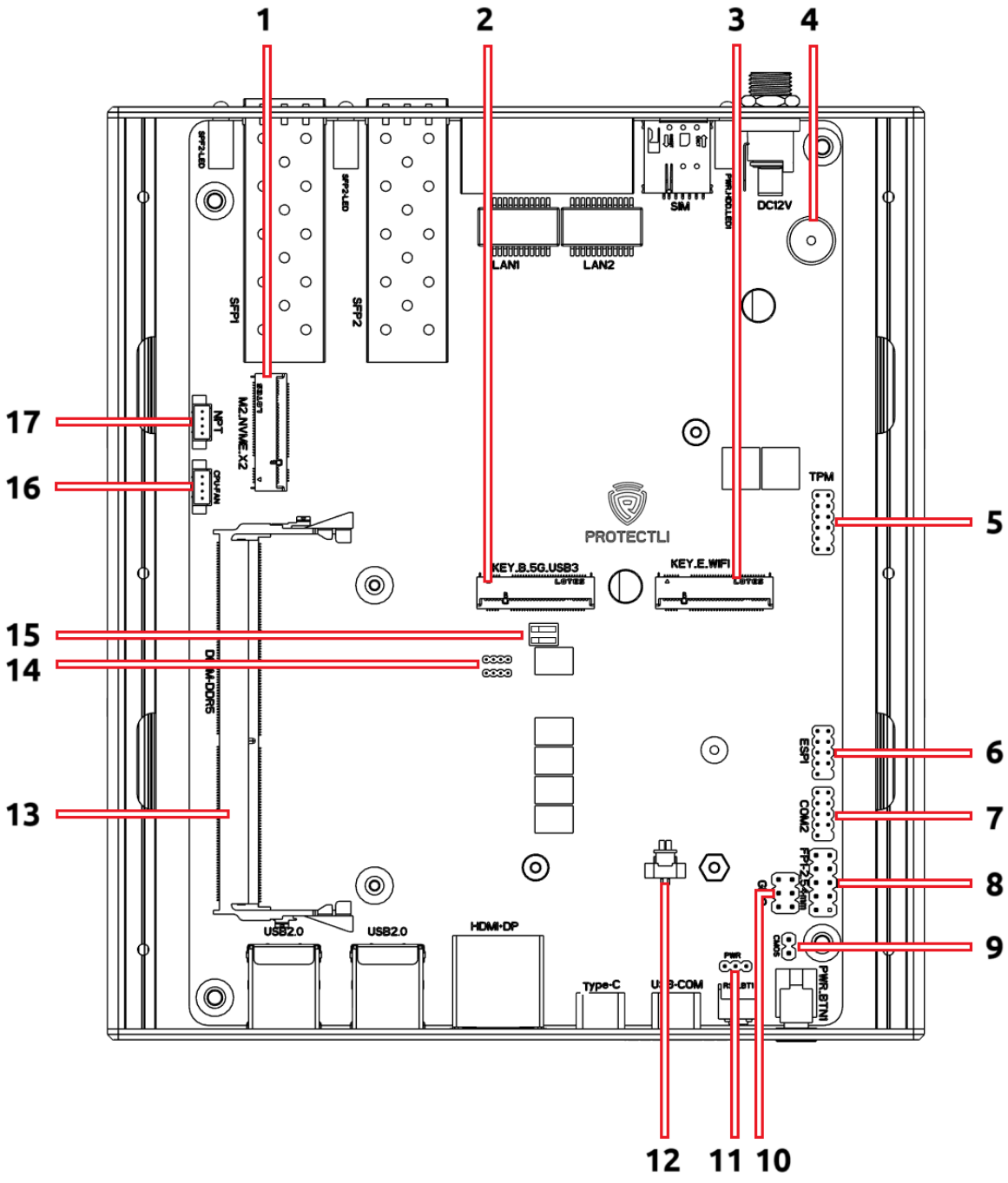


Figure 1. VP2440 motherboard obj file rendering

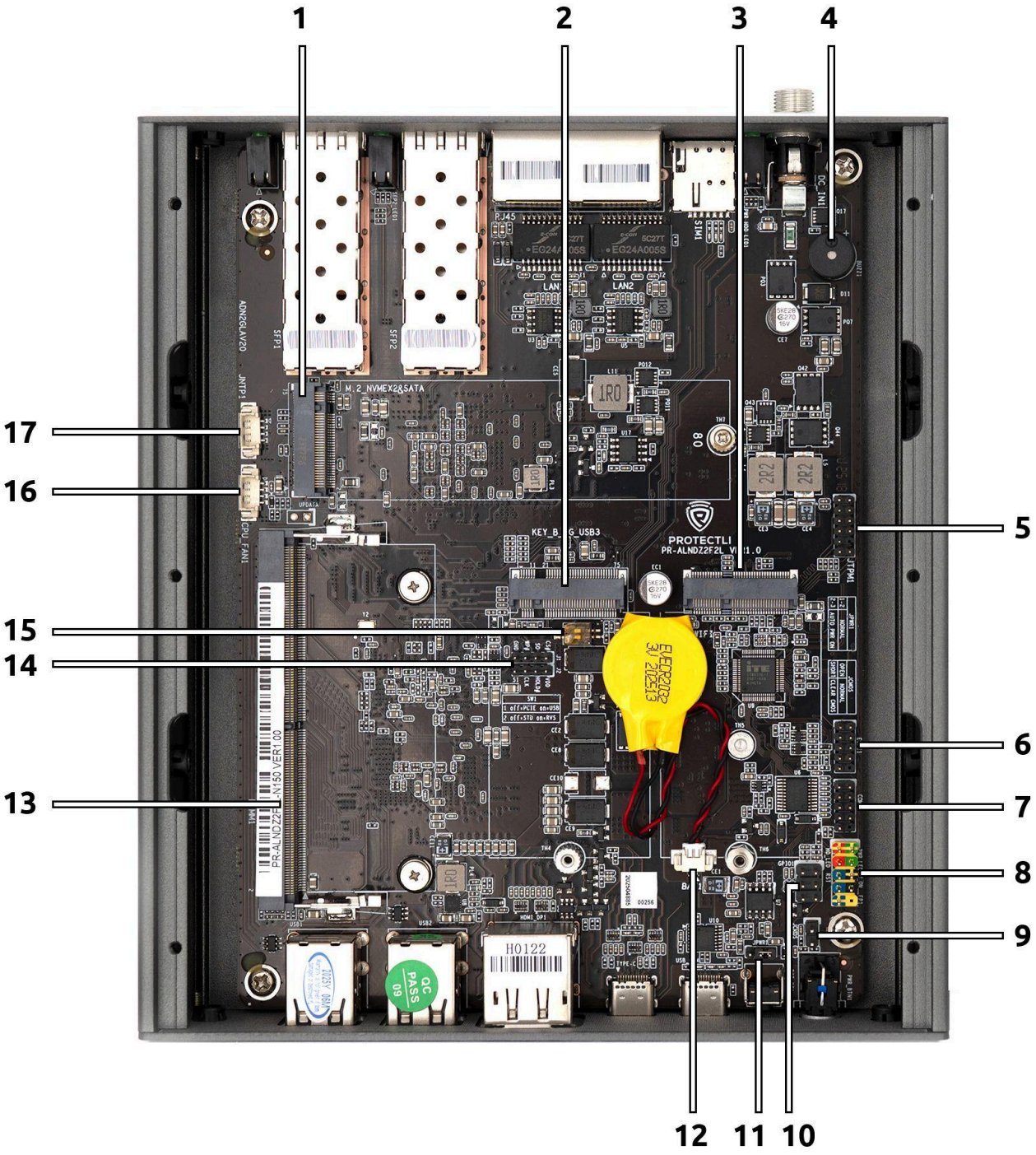


Figure 2. VP2440 actual motherboard image

<table>
<tr><th>Item #</th><th>Object</th><th>Label</th><th>Description</th></tr>
<tr><td>1</td><td>M.2 NVMe SSD Connector</td><td>M2_NVME_X2</td><td>M.2 2280 M-Key connector for a M.2 NVMe SSD that uses PCIe Gen 3.0 x2 protocol. It is designed for an NVMe storage device, but is otherwise a functional two-lane PCIe port.</td></tr>
<tr><td>2</td><td>M.2 4G/5G Modem Connector</td><td>KEY_B_5G</td><td>M.2 3052 B-Key connector that uses USB 3.2 Gen 1 protocol via M.2 3052 B-Key. Certain behaviors can be affected by the SW1 Switch (Item #15) to assist with compatibility with certain modems. Designed for Protectli cellular modems, but is not limited in its capabilities.</td></tr>
<tr><td>3</td><td>M.2 WiFi Card Connector</td><td>KEY_E_WIFI</td><td>Connector uses PCIe 3.0 x1 protocol over an M.2 E-Key socket. Designed for WiFI modules, but is not limited in its capabilities. The standoff mount can be moved to support either a 2230/3030 or 3052 sized M.2 WiFi card.</td></tr>
<tr><td>4</td><td>Buzzer</td><td>BUZZ1</td><td>PC speaker. Produces “beep” sounds that may be utilized by system firmware or certain operating systems.</td></tr>
<tr><td>5</td><td>TPM</td><td>JTPM1</td><td>Trusted Platform Module header for a TPM2.0 hardware device. (2x6, 2.0mm pitch)

<table><tr><td>Pin 1: VDD</td><td>Pin 2: TPM_CS#</td></tr><tr><td>Pin 3: SPI_MISO</td><td>Pin 4: SPI_MOSI</td></tr><tr><td>Pin 5: NC1</td><td>Pin 6: SPI_CLK</td></tr><tr><td>Pin 7: GND</td><td>Pin 8: SPI_REST</td></tr><tr><td>Pin 9: NC2</td><td>X</td></tr><tr><td>Pin 11: NC3</td><td>Pin 12: TPM_PIRQ#</td></tr></table>
When using a physical TPM connected to this header, verify that dTPM is selected as the TPM Selection in the AMI Firmware menu. This is found at Advanced > PTT Configuration > TPM Device Selection.

On coreboot firmware, the physical dTPM will be automatically detected and enabled.</td></tr>
<tr><td>6</td><td>eSPI Header (Enhanced Serial Peripheral Interface)</td><td>ESPI1</td><td>Header used for low-power, high-speed communication between embedded controllers and other system components. Commonly used for BIOS chip flashing. (2x5, pin 10 clipped, 2.00mm pitch)</td></tr>
</table>

<table>
<tr><th>Item #</th><th>Object</th><th>Label</th><th>Description</th></tr>
<tr><td>7</td><td>Serial COM Header</td><td>COM2</td><td>Header used for serial input/output using RS-232 serial communication (~±12V logic levels). (2x5, pin 10 clipped, 2.00mm pitch)

<table>
<tr><td>Pin 1: Data Carrier Detect - Handshaking Signal</td><td>Pin 2: Serial In (RX/Receive Data)</td></tr>
<tr><td>Pin 3: Serial Out (TX/Transmit Data)</td><td>Pin 4: Data Terminal Ready - Control Signal</td></tr>
<tr><td>Pin 5: Ground</td><td>Pin 6: Data Set Ready - Handshaking Signal</td></tr>
<tr><td>Pin 7: Request to Send - Flow Control</td><td>Pin 8: Clear to Send - Flow Control</td></tr>
<tr><td>Pin 9: Ring Indicator</td><td>X</td></tr>
</table>

If utilizing AMI firmware, and you want to use this header strictly for console serial output, make sure that COM1 Console Redirection is Enabled in the AMI firmware menu. This can be found at Advanced > Serial Port Console Redirection. COM0 Console Redirection (the USB-C COM port) may need to be disabled.

If utilizing coreboot as your firmware, and you want to use this header strictly for console serial output, access the coreboot firmware menu, go to Dasharo System Features > Serial Port Configuration, and make sure COM1 is enabled. You may need to disable COM0 (the USB-C COM port).</td></tr>
</table>

<table>
<tr><th>Item #</th><th>Object</th><th>Label</th><th>Description</th></tr>
<tr><td>8</td><td>Front Panel Header</td><td>FP1</td><td>Internal header for adding external device controls and indicators featured through the front panel, such as power button, reset button, activity LEDs, etc. The pinout chart below has been colored to match the baseboard. (2x5, pin 10 clipped, 2.54mm pitch)

<table>
<tr><td>Pin 1: M.2 SSD_LED+ [+3.3V]</td><td>Pin 2: PWR_LED+ [+3.3V]</td></tr>
<tr><td>Pin 3: M.2 SSD_LED-</td><td>Pin 4: PWR_LED-</td></tr>
<tr><td>Pin 5: Reset_SW +</td><td>Pin 6: Power_SW +</td></tr>
<tr><td>Pin 7: Reset_SW -</td><td>Pin 8: Power_SW -</td></tr>
<tr><td>Pin 9: No connection</td><td>X</td></tr>
</table></td></tr>
<tr><td>9</td><td>NVRAM Reset Jumper</td><td>JCMOS</td><td>Shorting this jumper while the CMOS battery is connected will reset the BIOS NVRAM. This will revert firmware settings to defaults and can assist with certain hardware issues. This will not reset the coreboot admin password if it has been enabled/set.</td></tr>
<tr><td>10</td><td>GPIO Header</td><td>GPIO1</td><td>Header used for GPIO connections. (2x3 pin, 2.54mm pitch)

<table>
<tr><td>Pin 1: +5V</td><td>Pin 2: Ground</td></tr>
<tr><td>Pin 3: GPIO 56</td><td>Pin 4: GPIO 57</td></tr>
<tr><td>Pin 5: GPIO 60</td><td>Pin 6: GPIO 61</td></tr>
</table>
On the AMI firmware menu, navigate to Advanced > IT8659 Super IO Configuration > GPIO Configuration to modify the voltage modes for each GPIO pin. You can select between “Output Low”, “Output High”, and “Input”. Output Low will register at ~0.0014V while Output High will register at ~5.10V.

On coreboot, there are no settings in the firmware menu to manipulate GPIO behavior. The four GPIO pins will register at ~5.10V.</td></tr>
</table>

<table>
<tr><th>Item #</th><th>Object</th><th>Label</th><th>Description</th></tr>
<tr><td>11</td><td>Power Restore Jumper</td><td>JPWR1</td><td>Jumper setting determines system state after power loss. Based on the orientation in the image above, the default location for the jumper is on the right and middle pins and the Vault will automatically attempt to power back on after power loss on both AMI and coreboot.

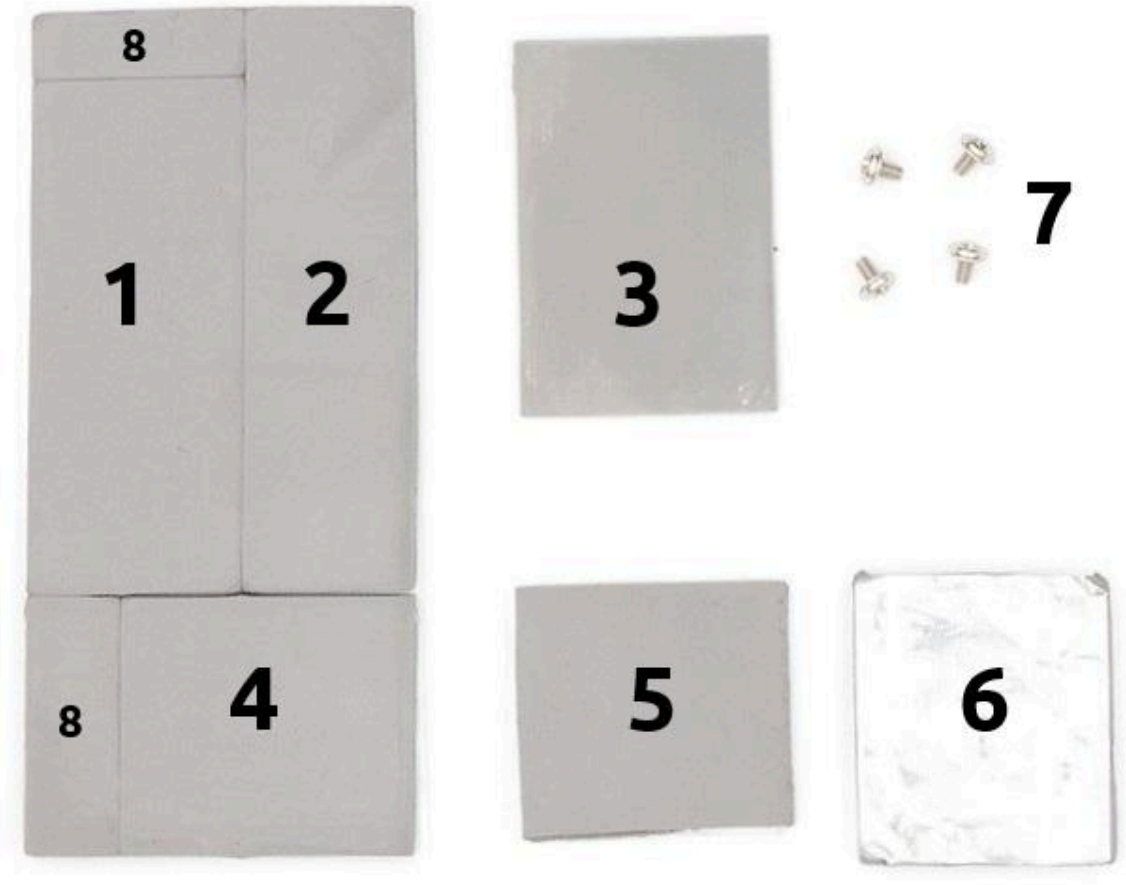
On the AMI firmware menu, you can change the behavior of the system state after power loss by navigating to Advanced > System Power Management. When “Restore On AC Power Loss” is set to “Power On”, the Vault will always attempt to power back on after power loss regardless of the jumper’s position on the JPWR1 header. If set to “Power Off”, the default jumper location will override the firmware, and will still attempt to power back on. If you wish for the Vault to not automatically power back on, you will need to move the jumper to the left and middle pins while “Restore On AC Power Loss” is set to “Power Off”.

On the coreboot firmware menu, you can change the power state after power loss by navigating to Dasharo System Features > Power Management Options. You can change the “Power state after power loss” between “Powered Off”, “Powered On", or “state at the moment of failure”. The JPWR1 jumper will take priority, meaning the default jumper location will always attempt to allow the Vault to power back on after power loss.</td></tr>
<tr><td>12</td><td>CMOS Battery Header</td><td>CE1</td><td>3V CR2032 (the battery is underneath the motherboard) connected via 2-pin connector (1.25mm pitch).</td></tr>
<tr><td>13</td><td>Memory Slot</td><td>DIMM1</td><td>DDR5 SODIMM slot, supports up to a single 64GB SODIMM @4800MHz</td></tr>
<tr><td>14</td><td>BIOS Programming Header</td><td>J1, J2</td><td>Two separate headers used for BIOS programming. Based on the orientation in the image above, J1 is the top header and J2 is the bottom. (1x4, 2.00mm pitch each)

J1:
<table>
<tr><td>Pin 1: VDD</td><td>Pin 2: HOLD#</td><td>Pin 3: CLK</td><td>Pin 4: SI</td></tr>
</table>
J2:
<table>
<tr><td>Pin 1: CS#</td><td>Pin 2: SO</td><td>Pin 3: WP#</td><td>Pin 4: GND</td></tr>
</table></td></tr>
</table>

Item #	Object	Label	Description
15	Switch for M.2 Modem Slot Behavior	SW1	There are two switches labeled 1 and 2. The modem slot's (item #2) behavior is affected by these switches. By default, the switches are set to "Off." Protectli modems will work as expected in the default configuration. The switches' behavior is printed on the motherboard: 1 off = PCIE (0V), 1 on = USB (1.8V) [**Switch 1 affects Pin 20 Voltage**] 2 off = Standard (0V), 2 on = Reverse (3.3V) [**Switch 2 affects Pin 22 Voltage**] Some modems use Pins 20 and 22 for adding additional control functions like controlling airplane mode, resetting the modem, or are utilized as voltage sensing pins. Some modems will not work unless proper voltage is applied to specific pins. It is important to reference the documentation of your modem to verify if you need to utilize this switch.
16	CPU Fan Header	CPU_FAN1	Four-pin PicoBlade-compatible header available for an optional PWM fan. Based on the image layout above, pin 1 is on the top. (1x4, 1.25mm pitch) Pin 1: Ground Pin 2: VCC +12V Pin 3: FG (Fan Tachometer / RPM Signal) Pin 4: PWM (Pulse Width Modulation Control)
17	JNTP (NTP/i2c) Header	JNTP1	Four-pin PicoBlade-compatible header used for NTP/i2c, commonly used for GPS capabilities, but offers many other solutions. (1x4, 1.25mm pitch) Pin 1: i2c0_SCL Pin 2: i2c0_SDA Pin 3: +3.3V Pin 4: Ground

Thermal Pads and Screws Information



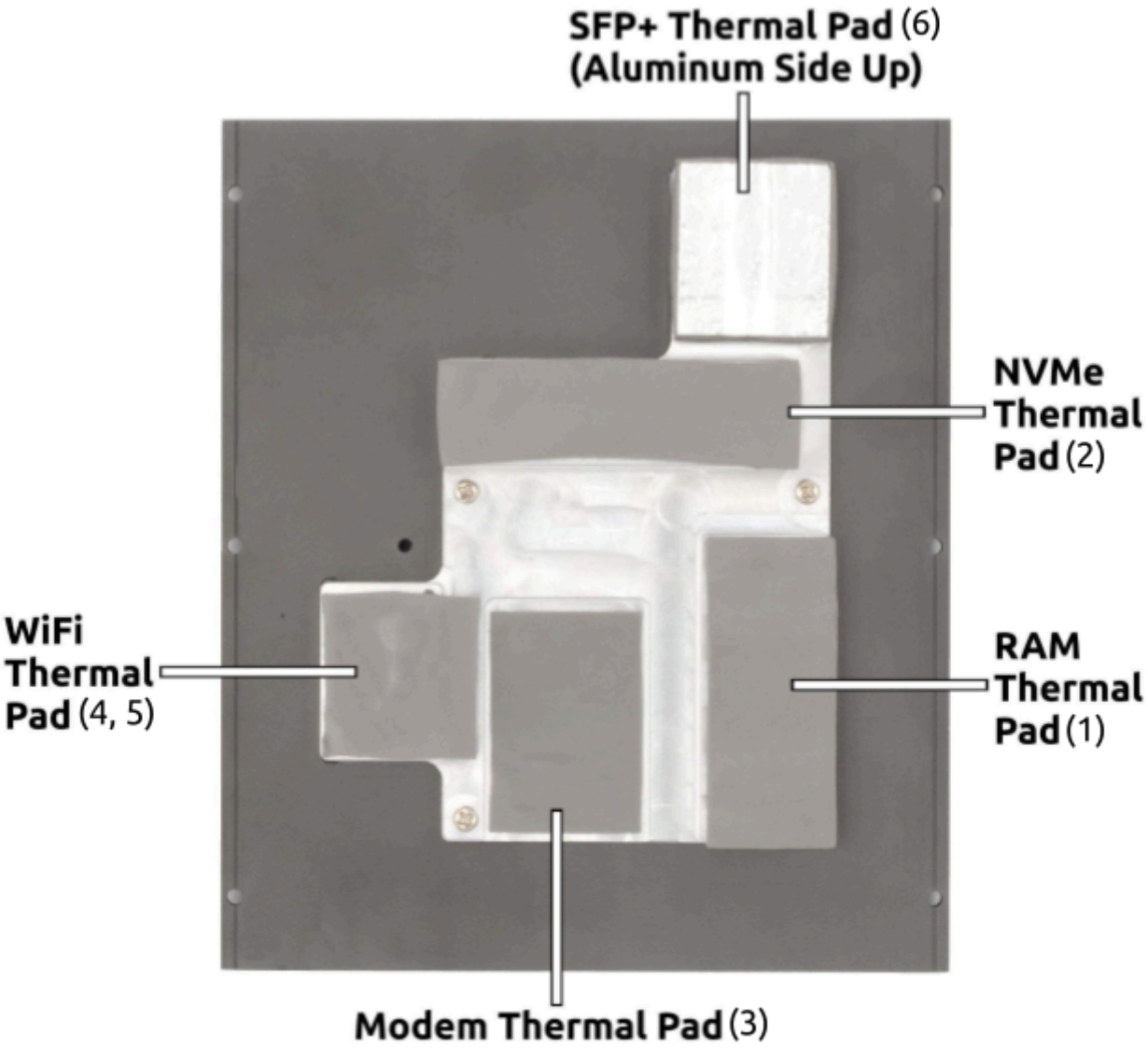
Item #	Object	Description
1	RAM Thermal Pad	Placed between the RAM and the heatsink. Dimensions: 60mm (L) x 25mm (W) x 3mm (H)
2	NVMe Bottom Thermal Pad	Placed between the NVMe and the heatsink. Dimensions: 68mm (L) x 20mm (W) x 3mm (H)
3	4G/5G Modem Thermal Pad	Placed between the 4G/5G Modem and large heatsink. Dimensions: 44mm (L) x 30mm (W) x 1mm (H)

4	WiFi Module Thermal Pad 1	Placed between the WiFi card and large heatsink. Two thermal pad sizes have been supplied to account for different sizes of WiFi cards. Dimensions: 34mm (L) x 30mm (W) x 3mm (H)
5	WiFi Module Thermal Pad 2	Placed between the WiFi card and large heatsink. Two thermal pad sizes have been supplied to account for different sizes of WiFi cards. Dimensions: 32mm (L) x 30mm (W) x 2mm (H)
6	SFP+ Thermal Pad	Placed between the SFP+ cages and the heatsink. Includes an aluminum sheet to prevent thermal compound from entering the SFP+ cages while maintaining effective contact. Dimensions: 34mm (L) x 30mm (W) x 3mm (H)
7	M2 Screws	Used to secure internal computer components (Wifi, LTE, NVMe, etc.) to the standoffs on the motherboard. When a Vault is purchased through protectli.com, these screws are used to install the components selected during checkout. Dimensions: Rounded head, M2 screw size, 4.75mm length, 1.9mm thread diameter.
8	Extra Thermal Pads	Leftover thermal pads. Can be used in miscellaneous spots or to patch up sections of other thermal pads that may have become damaged.

Heatsink and Thermal Pads

The VP2440 heatsink comes mounted to the bottom chassis plate. Customer removal or installation of the heatsink is not required.

The image below shows the heatsink with all thermal pads installed. Reference numbers are defined in the “Thermal Pad and Screws Information” table. The SFP+ thermal pad comes with an aluminum sheet on one side. Do not remove it. The aluminum sheet side of the SFP+ thermal pad must face and make contact with the SFP+ cages to prevent thermal compound from entering the cages.



Dimension View

External chassis dimensions: 170mm (L) x 152mm (W) x 53mm (H)

Document History

2025-10-21

- Clarified behavior of RS-232 Serial Header (Item #7 in Internal Interfaces) to imply that it is not strictly used for console output. This header can be used for general serial output/input. Emphasized what settings to change in the firmware to strictly activate console output.

2025-08-20

- Initial document