

# Protectli Appliance

Protectli Vault FW6E

6 Port 1GbE - Intel<sup>®</sup> i7-8550U

February 4<sup>th</sup>, 2025

# Overview

The Protectli Vault FW6E is the Intel® core® i7-8550U processor variant of the FW6 Series, with support for up to 64GB dual DDR4 RAM and support for both mSATA and 2.5" SSD storage. This Vault is equipped with six 1GB Intel® I211 ethernet ports, programmable for your specific use case. Internally, the FW6 series includes a keyed connector for an optional Wi-Fi card and can support an external LTE modem.

Protectli Vaults utilize Intel components ensuring persistent compatibility with a wide range of operating systems (OS) and applications. The "FW" series Vaults feature 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.

## Technical Specifications

<b>Model</b>	FW6E
<b>Description</b>	6X 1G Network Port Fanless Appliance
<b>Processor</b>	Intel® Core™ i7-8550U (64 Bit, 1.8GHz base, 4GHz Turbo, 8MB Smart Cache)
<b>Processor Cores</b>	4
<b>Processor Threads</b>	8
<b>Intel® AES-NI</b>	Supported
<b>Virtualization</b>	Intel® Vt-x, Vt-d
<b>Network</b>	6x Intel® 1G Ethernet, RJ-45
<b>Video / Graphics</b>	Intel® UHD Graphics 620, 1x HDMI 1.4
<b>Audio</b>	Audio over HDMI (AMI Firmware only)
<b>Memory</b>	2x SO-DIMM DDR4-2400 1.2v, Dual Channel , Max 64GB
<b>Storage</b>	1x mSATA
<b>Optional Storage</b>	1x Internal 2.5" SATA 3.0 SSD
<b>External I/O</b>	6x RJ-45 Ethernet 4x USB 3.2 Gen 1 Type-A ports 1x HDMI 1x RJ-45 COM 2x WiFi/LTE Antenna Mounting Holes 1x 12V DC Power Jack
<b>Internal I/O</b>	1x Mini PCIe for mSATA 1x SATA Header, 1x SATA Power

	1x Half Height mPCIe (PCIe 3.0x1) for WiFi
	1x CMOS Reset (2 pin)
	1x CPU Fan Header (4 pin)
	1x USB 2.0 Header (8 pin)
	1x Front Panel Header (9 pin)
<b>Super I/O Chip</b>	IT8613E
<b>BIOS</b>	AMI® or coreboot
<b>Indicators</b>	1x LED Power Button (Blue), 1x LED Power Indicator (Green), 1x LED Disk Activity Indicator (Red), 1x LED Disk Activity Indicator (Yellow)
<b>Power</b>	Input 12V DC, 1x DC Power Jack
<b>Power Usage</b>	Idle: 20W: Max: 80W
<b>Chassis</b>	Fanless, Aluminum, Black
<b>Chassis Dimensions</b>	7.25 x 5 x 2.5 in, 184 x 127 x 63.5 mm
<b>Mounting Options</b>	Desktop, VESA Bracket, Optional 1RU Rack Mount
<b>Weight</b>	3 lbs, 1.36 Kg
<b>Shipping Weight</b>	5 lbs 2 oz, 2.32 kg
<b>Operating Temperature</b>	+14° - +122° F, -10° - +50° C
<b>Operating Humidity</b>	0 – 95% relative humidity, non-condensing
<b>Approvals</b>	UL (Power Supply), FCC Part 15 Class B, CE, RoHS
<b>Country of Origin</b>	Made in China, Assembled in USA, Canada, or Germany
<b>Optional WiFi</b>	1x Half Height mPCIe 802.11b/g/n (USB) or 802.11ac/a/b/g/n (PCIe)

## Included Accessories and Components

90W Power Supply with barrel connector

US/CA Power Cable *(Other regional power cables available)*

RJ45 to DB-9 Console Cable

4x SSD mounting screws

1x SATA power cable

1x SATA data cable

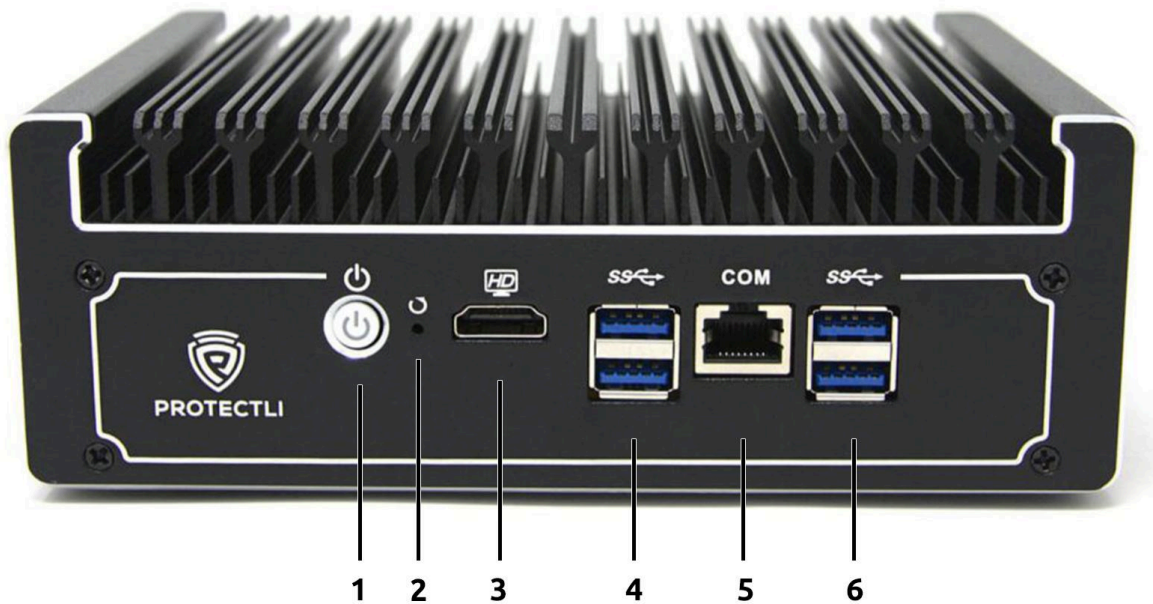
4x Component screws





VESA Bracket mount with hardware

Quick Start Guide

# External Interfaces

## Front Panel Configuration



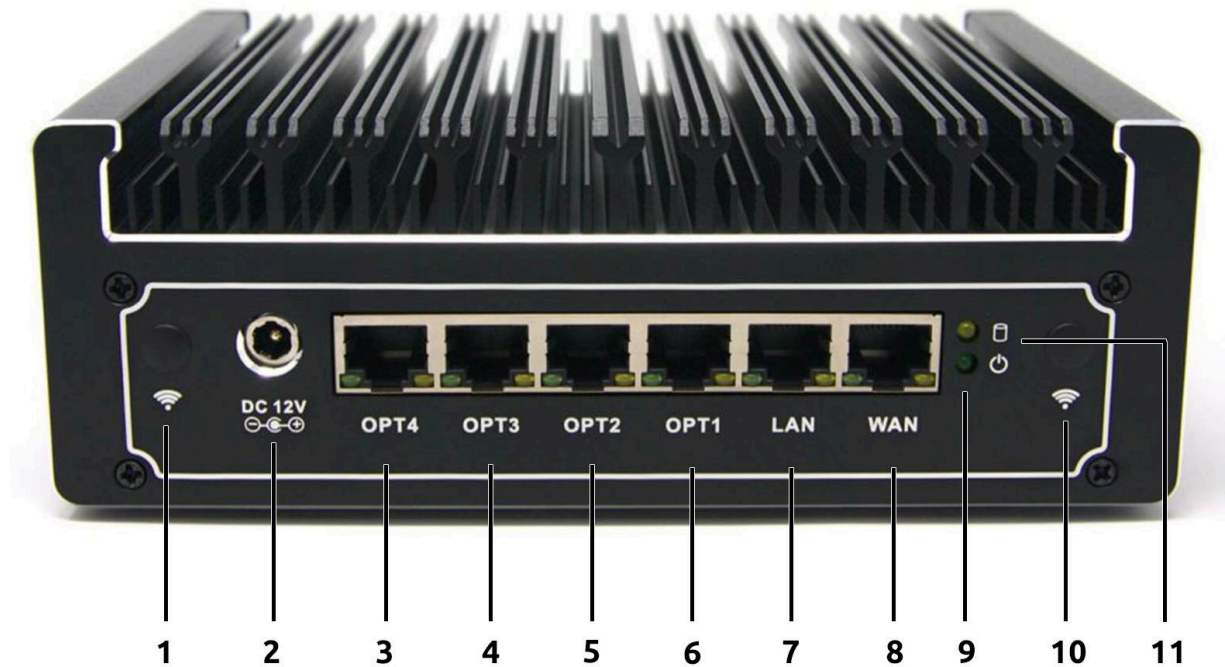
Item #	Object	Label	Description
1	Power Button		Pressing the Power Button will power the unit on and illuminate with a blue LED.  <i>In OSes configured to handle ACPI signals, pressing the power button initiates a shutdown.</i>  <i>Pressing and holding the Power Button for 5 seconds will force the unit to power off.</i>
2	Reset Button (Recessed)		A momentary switch exposed via GPIO. <i>This is not an ACPI reset button, but a general purpose button that may be programmed in the guest OS.</i>
3	HDMI Connector		Video and audio output via HDMI. Audio output will not work when utilizing coreboot firmware.
4,6	USB3 Connectors		USB 3.2 Gen 1+ Type-A connectors. (Theoretical maximum throughput of 5Gbps [~500MBps])

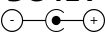

5	Serial Console Port	<b>COM</b>	RS-232 serial communications via RJ-45. Default port settings: <ul style="list-style-type: none"> <li>● 115200 baud</li> <li>● No parity</li> <li>● 8 databits</li> <li>● 1 stopbit</li> </ul>
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†USB-IF naming standard for USB transfer rates: “USB 3.2 Gen 1” is the equivalent and current name for “USB 3.1 Gen 1” offering a theoretical maximum speed of 5 Gigabits (~500Mbps) 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_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](https://www.usb.org/sites/default/files/usb_3_1_language_product_and_packaging_guidelines_final_0.pdf)

## Rear Panel Configuration

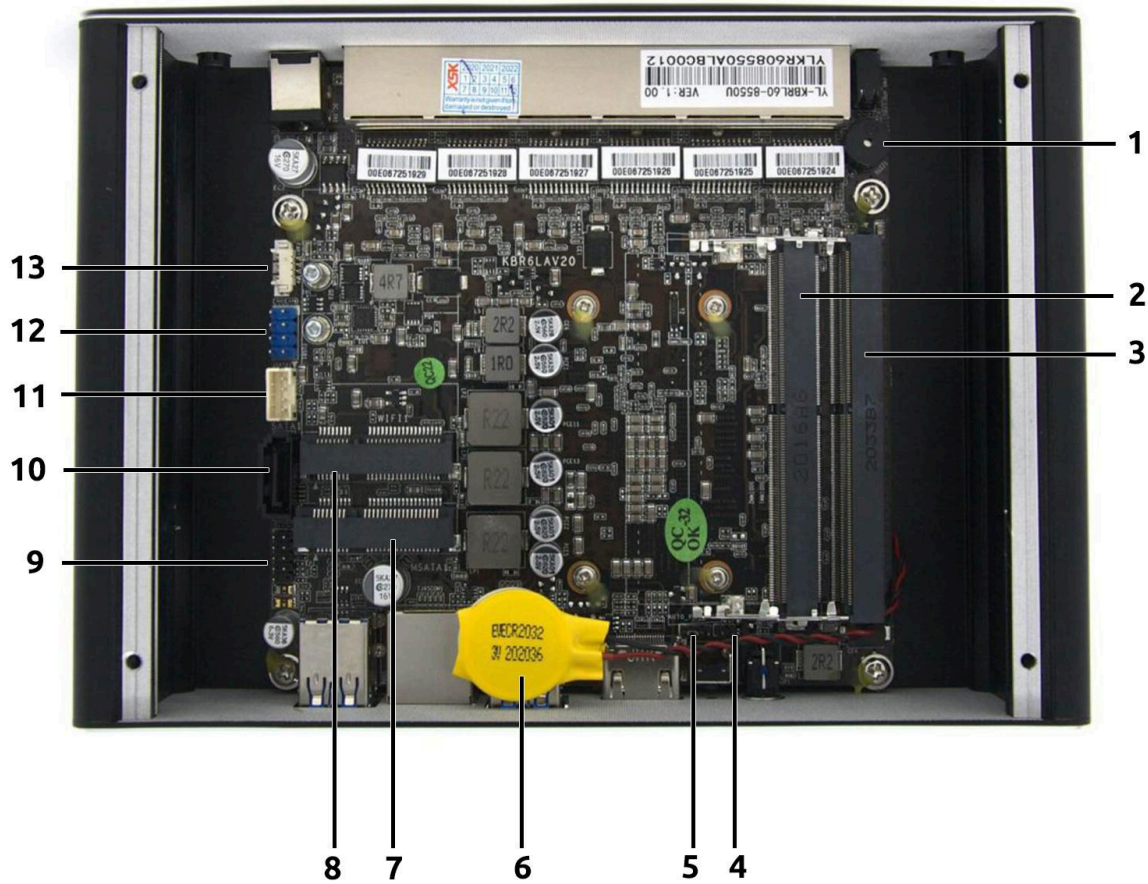


Item #	Object	Label	Description
1	Power Supply Connector	<b>DC 12V</b> 	12V DC barrel connector for the 60W external power supply. Positive rail is the tip, negative is sleeve.
2, 9	Antenna Ports		Two antenna ports for adding radio antennas (WiFi, LTE, etc.). The ports are covered by plugs while not in use.
3	Ethernet Port 6	<b>OPT4</b>	The sixth 10/100/1000 Mbps Intel® i211 ethernet port. This port is labeled “OPT4” for convenience, but is not limited in its capacity. Bottom left LED emits solid Green at 1000/100Mbps, and is turned off at 10Mbps.
4	Ethernet Port 5	<b>OPT3</b>	The fifth 10/100/1000 Mbps Intel® i211 ethernet port. This port is labeled “OPT3” for convenience, but is not limited in its capacity. Bottom left LED emits solid Green at 1000/100Mbps, and is turned off at 10Mbps.
5	Ethernet Port 4	<b>OPT2</b>	The fourth 10/100/1000 Mbps Intel® i211 ethernet port. This port is labeled “OPT2” for convenience, but is not limited in its capacity. Bottom left LED emits solid Green

			at 1000/100Mbps, and is turned off at 10Mbps.
6	Ethernet Port 3	<b>OPT1</b>	The third 10/100/1000 Mbps Intel i211® ethernet port. This port is labeled “OPT1” for convenience, but is not limited in its capacity. Bottom left LED emits solid Green at 1000/100Mbps, and is turned off at 10Mbps.
7	Ethernet Port 2	<b>LAN</b>	The second 10/100/1000 Mbps Intel i211® ethernet port. This port is labeled “LAN” for convenience, but is not limited in its capacity. Bottom left LED emits solid Green at 1000/100Mbps, and is turned off at 10Mbps.
8	Ethernet Port 1	<b>WAN</b>	The first 10/100/1000 Mbps Intel i211® ethernet port. This port is labeled “WAN” for convenience, but is not limited in its capacity. Bottom left LED emits solid Green at 1000/100Mbps, and is turned off at 10Mbps.
10	Power Indicator LED		This LED will stay solid green when the device is powered on.
11	HDD Activity LED		This red LED will light up when data activity is detected on either the mSATA or SATA interfaces.

# Internal Interfaces

## Motherboard Layout and Pin Configuration



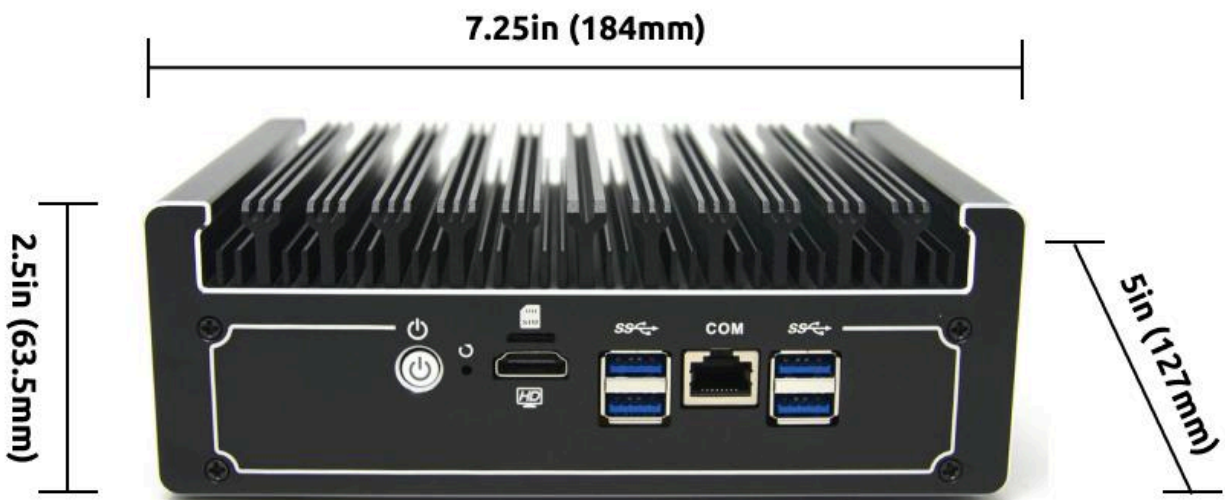
Item #	Object	Label	Description
1	Buzzer	BUZZ1	PC speaker. Produces “beep” sounds that may be utilized by system firmware or certain operating systems.
2	Memory Slot	SODIMM1	DDR4 SODIMM.
3	Memory Slot	SODIMM2	DDR4 SODIMM.
4	NVRAM Reset Jumper	JCMOS	Shorting this jumper while the CMOS battery is connected will reset the BIOS NVRAM.



5	Power Restore Jumper	AUTO_P	Jumper setting determines system state after power loss. Closing the jumper will cause the unit to automatically power on when power is restored after an outage. Jumper is on pins 1 and 2 by default to allow the unit to automatically attempt to power back on after power loss.										
6	CMOS Battery		3V CR2032 connected via 1.25mm pitch 2-pin connector on the opposite side of the motherboard.										
7	mSATA Connector	MSATA1	Connector for an mSATA storage device, such as an SSD.										
8	WiFi Expansion Slot	WIFI1	Connector uses PCIe Gen 3 x1. Designed for Protectli WiFi cards, but is not limited in its capabilities.										
9	Front Panel Header	FP1	Internal header for adding external device controls and indicators featured through the front panel, such as power button, reset button, activity LEDs, etc. (2x5, pin 10 clipped, 2.0mm pitch) <table border="1" data-bbox="721 905 1406 1205"> <tr> <td>Pin 1: +3.3V HDD LED+</td> <td>Pin 2: +5V Power LED</td> </tr> <tr> <td>Pin 3: SATA LED -</td> <td>Pin 4: Ground</td> </tr> <tr> <td>Pin 5: Ground</td> <td>Pin 6: Panel Switch</td> </tr> <tr> <td>Pin 7: Front Panel Reset</td> <td>Pin 8: Ground</td> </tr> <tr> <td>Pin 9: Ground</td> <td>X</td> </tr> </table>	Pin 1: +3.3V HDD LED+	Pin 2: +5V Power LED	Pin 3: SATA LED -	Pin 4: Ground	Pin 5: Ground	Pin 6: Panel Switch	Pin 7: Front Panel Reset	Pin 8: Ground	Pin 9: Ground	X
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Pin 7: Front Panel Reset	Pin 8: Ground												
Pin 9: Ground	X												
10	SATA Data Connector	SATA1	SATA III data connector. Recommended for additional storage, such as a 2.5" SATA SSD. (Standard 7-PIN SATA III Plug)										
11	SATA Power Connector	JSATA1	SATA power connector for additional storage. (1x4, 2.0mm pitch, JST PH style connector)										
12	USB 2.0 Header	FUSB1	Internal header for additional USB 2.0 connections. (2x4, 2.54mm pitch) <table border="1" data-bbox="721 1549 1406 1787"> <tr> <td>Pin 1: +5V</td> <td>Pin 2: +5V</td> </tr> <tr> <td>Pin 3: USB Port 6 Negative Data Line</td> <td>Pin 4: USB Port 5 Negative Data Line</td> </tr> <tr> <td>Pin 5: USB Port 6 Positive Data Line</td> <td>Pin 6: USB Port 5 Positive Data Line</td> </tr> </table>	Pin 1: +5V	Pin 2: +5V	Pin 3: USB Port 6 Negative Data Line	Pin 4: USB Port 5 Negative Data Line	Pin 5: USB Port 6 Positive Data Line	Pin 6: USB Port 5 Positive Data Line				
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			Pin 7: Ground	Pin 8: Ground
13	Fan Header	CPU_FAN1	Four-pin PicoBlade-compatible header for optional PWM CPU fan. (1x4, 1.25mm pitch)	

## Dimension View



# Document History

2025-02-04

- Removed the incorrectly mentioned display port capabilities of USB 3 ports

2025-01-28

- Included Overview and Included Accessories and Components sections
- Changed first page title to accurately reflect the CPU in the unit
- Added note regarding LED behavior for Ethernet Ports based on connection speed
- Changed USB3 Connector speed to USB 3.2 Gen 1 to accurately reflect the hardware
- Removed "LP" from SODIMM slot description
- Added pitch size to CMOS battery connector
- Changed description for WiFi1 slot to remove mention of LTE modems, added PCIe Gen
- Added pitch and pin layout for FP1
- Added connector type for SATA1
- Added pitch and connector type for JSATA1
- Added pitch and pin layout for FUSB1
- Added pitch to CPU\_FAN1

2024-08-01

- Changed "PC Speaker" to "PC speaker"
- Changed "RS232" to "RS-232"
- Updated linked spec sheet with ® and ™ as necessary for Intel and AMI

2024-06-28

- Clarified PCI and USB specifications such as speed, protocol, etc.

2024-05-09

- Clarified LTE and/or WiFi slot naming schemes

2023-03-21

- Initial document.