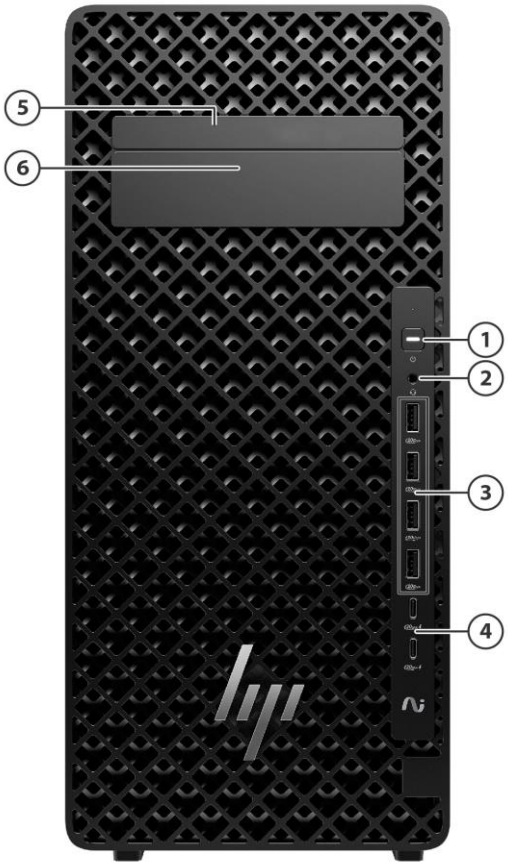
Overview

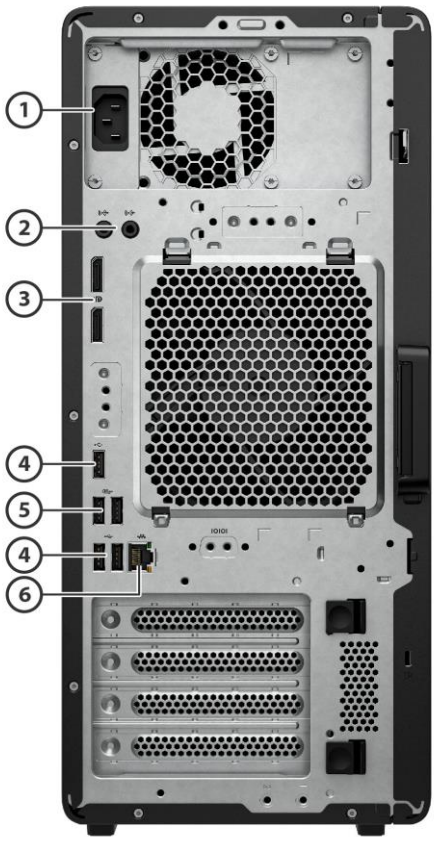
HP Z2 Tower G1i Workstation



front

1. Power button
2. headphone/microphone combo
3. 4 SuperSpeed USB Std-A 10Gbps ports
4. 2 SuperSpeed USB-C® 20Gbps port (charge supports up to 5V/3A)
5. Slim ODD bay (Optional)
6. External 3.5" bay

Overview



rear

1. Power connector
2. 1 Audio Line-in jack
   1 Audio Line-out jack
3. 2 DisplayPort 1.4 ports
4. 3 Hi-Speed USB Std-A 480Mbps ports
5. 2 SuperSpeed USB Std-A 10Gbps ports
6. 1 1Gb LAN

Overview

Operating Systems

Preinstalled:

- Windows 11 Pro 64[1]
- Windows 11 Home 64[1]
- Linux®-ready[4]
- Ubuntu® 24.04 LTS[2,3]

Supported:

- Windows 10
- Red Hat® Enterprise Linux® Workstation 9[4]
- SUSE Linux® Enterprise Desktop 15[4]
- Ubuntu® 24.04 LTS[2,3]

[1] Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 11 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com.
[2] Not all features are available in all editions or versions of Ubuntu®. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply and additional requires may apply over time for updates.
[3] A certified preloaded version of Ubuntu® 24.04 LTS is available from HP for this platform. Not all features are available in all editions or versions of Ubuntu. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply, and additional requirements may apply over time for upgrades.
[4]For detailed OS/hardware support information for Linux, see:
http://www.hp.com/support/linux_hardware_matrix

NOTE: Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows 7 operating system on products configured with Intel® and AMD® 7th generation and forward processors or provide any Windows® 8 or Windows 7 drivers on http://www.support.hp.com. A full list of HP products and the Windows 10 versions tested is available on the HP support website. https://support.hp.com/us-en/document/c05195282

Processors Overview[1,2,3,4,5,6]

Intel® Core™ Ultra 9 Processor 285K with Intel® Graphics (3.2 GHz E-core base frequency, 3.7 GHz P-core base frequency, up to 4.6 GHz E-core Max Turbo frequency, up to 5.5 GHz P-core Max Turbo frequency, 36 MB L3 cache, 8 P-cores and 16 E-cores, 24 threads)
Intel® Core™ Ultra 9 Processor 285 with Intel® Graphics (1.9 GHz E-core base frequency, 2.5 GHz P-core base frequency, up to 4.6 GHz E-core Max Turbo frequency, up to 5.4 GHz P-core Max Turbo frequency, 36 MB L3 cache, 8 P-cores and 16 E-cores, 24 threads)
Intel® Core™ Ultra 7 Processor 265K with Intel® Graphics (3.3 GHz E-core base frequency, 3.9 GHz P-core base frequency, up to 4.6 GHz E-core Max Turbo frequency, up to 5.4 GHz P-core Max Turbo frequency, 30 MB L3 cache, 8 P-cores and 12 E-cores, 20 threads)
Intel® Core™ Ultra 7 Processor 265 with Intel® Graphics (1.8 GHz E-core base frequency, 2.4 GHz P-core base frequency, up to 4.6 GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 30 MB L3 cache, 8 P-cores and 12 E-cores, 20 threads)
Intel® Core™ Ultra 5 Processor 245K with Intel® Graphics (3.6 GHz E-core base frequency, 4.2 GHz P-core base frequency, up to 4.6

Overview

GHz E-core Max Turbo frequency, up to 5.2 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 14 threads)
Intel® Core™ Ultra 5 Processor 245 with Intel® Graphics (3.0 GHz E-core base frequency, 3.5 GHz P-core base frequency, up to 4.5 GHz E-core Max Turbo frequency, up to 5.1 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 14 threads)
Intel® Core™ Ultra 5 Processor 235 with Intel® Graphics (2.9 GHz E-core base frequency, 3.4 GHz P-core base frequency, up to 4.4 GHz E-core Max Turbo frequency, up to 5.0 GHz P-core Max Turbo frequency, 24 MB L3 cache, 6 P-cores and 8 E-cores, 14 threads)
Intel® Core™ Ultra 5 Processor 225 with Intel® Graphics (2.7 GHz E-core base frequency, 3.3 GHz P-core base frequency, up to 4.4 GHz E-core Max Turbo frequency, up to 4.9 GHz P-core Max Turbo frequency, 20 MB L3 cache, 6 P-cores and 4 E-cores, 10 threads)

[1] Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.
[2] Intel Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information.
[3] Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See http://intel.com/vpro
[4] In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on http://www.support.hp.com.
[5] Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
[6]Features and software that require a NPU may require software purchase, subscription or enablement by a software or platform provider, and third party software may have specific configuration or compatibility requirements. Performance varies by use, configuration, and other factors.

Expansion Slots (see system board section for more details)	Slot 1: PCIe Gen5 x16 Slot 2: PCIe Gen4 x1 - with x4 Connector Slot 3: PCIe Gen4 x4 - with x16 Connector Slot 4: PCIe Gen4 x4
Expansion Bays (see storage section for more details)	1 internal 3.5" bays (Include a carrier) 1 external 3.5" bays 1 dedicated 9.5mm slim optical disk drive bay
Front I/O	4 SuperSpeed USB Std-A 10Gbps port; 2 SuperSpeed USB Type-C® 20Gbps port (charge supports up to 5V/3A)
Internal I/O [5]	Serial port
Rear I/O	2 SuperSpeed USB Std-A 10Gbps port; 3 High-speed USB Std-A 480Mbps port

Overview

Optional I/O	Flex IO, choice of: 1 Dual SuperSpeed USB Std-A 5Gbps port, 1 SuperSpeed USB Type-C® 10Gbps port (Alt Mode DisplayPort™1.4 with 15W Output) [1], 1 Dual SuperSpeed USB Type-C® 10Gbps port[1], 1 Thunderbolt™ 4 port (40Gbps)[1], 1 USB-based Serial port, 1 Displayport 2.1 port, 1 HDMI 2.1 port, 1 VGA port, (1) 1GbE NIC, (1) 1Gbps Fiber LC NIC*, (1) 2.5GbE NIC[1], (1) 10GbE NIC*[1], (1) Dual-port 10GbE NIC*, (1) Dual 1GbE NIC, (1) Dual Port 10/25GbE SFP28 * Flex IO2, choice of: 1 Dual SuperSpeed USB Std-A 5Gbps ports, 1 USB-based Serial port, (1) 1Gbps Fiber LC NIC (FLY USB Type) * Modern standby feature was not compatible risk (detail see NETWORKING / COMMUNICATION). [1]Component will be ready in 2025Q3
On-board RAID Support	Factory integrated RAID 0, 1 for NVME drives (RAID 5, 10 Intel support) Factory integrated RAID 0, 1 for SATA data drives
Chassis Dimensions (H x W x D)	H: 15.2" [388mm] W: 6.9" [175mm] D: 16.7" [426mm] (Standard desktop orientation)
Packaged Dimensions	H:11.61” [295 mm] W:23.23” [590 mm] D:19.3” [490 mm] (Standard desktop orientation)
Rack Dimensions	4U, 1 units per slide rail kit(Standard EIA-310-D 19” Rack)
Weight	Exact weights depend upon configuration (System weight only). Starting at 8.6kg (19.02lbs.)s
Temperature	Operating: 5° to 35° C (40° to 95° F) Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation Non-operating: -40° to 60° C (-40° to 140° F) Maximum rate of change: 10°C/hr
Humidity	Operating: 8% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 8% to 90% RH, non-condensing, 35° C maximum wet bulb
Maximum Altitude (non-pressurized)[6]	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet) Non-operating: 12,192 m (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Temperature for details.
Power Supply	1200W wide-ranging, active Power Factor Correction, 92% Efficiency. 700W wide-ranging, active Power Factor Correction, 92% Efficiency. 500W wide-ranging, active Power Factor Correction, 92% Efficiency. **NOTE:** The Power Supply Efficiency Report for the 1200W 92% Efficiency, 700W 92% Efficiency and 500W 92% Efficiency Power Supply may be found at the following links: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2

Overview

Backup Devices	
Chipset	Intel® W880 Chipset
Memory	4 DIMM slots supporting up to 192GB nECC at launch (256 GB later) or up to 128 GB ECC, DDR5 unbuffered DIMM memory. Max memory speed will run at 5600 MT/s based on system configuration. See Supported Components / Memory Section for details.

Supported Components

Processors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Intel® Core™ Ultra Desktop Processors (series 2)				
Intel® Core™ Ultra 9 285K Processor	Y	N		
Intel® Core™ Ultra 9 285 Processor	Y	N		
Intel® Core™ Ultra 7 265K Processor	Y	N		
Intel® Core™ Ultra 7 265 Processor	Y	N		
Intel® Core™ Ultra 5 245K Processor	Y	N		
Intel® Core™ Ultra 5 245 Processor	Y	N		
Intel® Core™ Ultra 5 235 Processor	Y	N		
Intel® Core™ Ultra 5 225 Processor	Y	N		1

NOTE 1: support only non-ECC memory

SATA Hard Drives

	Factory Configured	Option Kit	Option Kit Part Number
8TB 7200RPM SATA 3.5in Enterprise	Y	Y	2Z273AA
2TB 7200RPM SATA 3.5in Enterprise	Y	Y	2Z274AA
HP 1TB Enterprise SATA 7200 HDD	Y	Y	W0R10AA
4TB 7200 RPM SATA 3.5in Enterprise HDD	Y	Y	K4T76AA
12TB 7200 RPM SATA-6G 3.5in Enterprise HDD	Y	Y	5S461AA

PCIe Solid State Drives

HP Z Turbo Drive 1TB 2280 PCIe-4x4 SED OPAL2 TLC Z2 Kit SSD	Y	Y	223A3AA
HP Z Turbo Drive 2TB 2280 PCIe-4x4 SED OPAL2 TLC Z2 Kit SSD	Y	Y	223A4AA
HP ZTurbo 1TB PCIe-Gen 4x4 TLC Z2 SSDKit	Y	Y	201F5AA
HP ZTurbo 2TB PCIe-Gen 4x4 TLC Z2 SSDKit	Y	Y	201F8AA
HP ZTurbo 512GB PCIe-Gen 4x4 SED Z2 SSDKit	Y	Y	201F9AA
HP ZTurbo 512GB PCIe-Gen 4x4 TLC Z2 SSDKit	Y	Y	201G0AA

Supported Components

Z Turbo 2TB PCIe-4x4 TLC SSD Module	Y	Y	38T75AA
Z Turbo 1TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module	Y	Y	38T76AA
Z Turbo 1TB PCIe-4x4 TLC SSD Module	Y	Y	38T77AA
Z Turbo 2TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module	Y	Y	38T79AA
Z Turbo 512GB PCIe-4x4 TLC SSD Module	Y	Y	38T80AA
Z Turbo 512GB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module	Y	Y	38T81AA
256GB 2280 PCIe-4x4 NVMe Value M.2 Z2 SSD Module	Y	Y	4M9Z1AA
512GB 2280 PCIe-4x4 NVMe Value M.2 Z2 SSD Module	Y	Y	4M9Z2AA
1TB 2280 PCIe-4x4 NVMe Value M.2 Z2 SSD Module	Y	Y	4M9Z3AA
HP CRU Secure High Performance Storage M.2 2TB Storage Module	Y	Y	56Q87AA
HP CRU Secure High Performance Storage M.2 1TB Storage Module	Y	Y	56Q88AA
HP CRU Secure High Performance Storage M.2 512GB Storage Module	Y	Y	56Q89AA
Z Turbo 4TB 2280 PCIe-4x4 TLC M.2 Z2 Kit SSD	Y	Y	5S492AA
Z Turbo 4TB 2280 PCIe-4x4 TLC M.2 SSD Module	Y	Y	5S496AA
Z Turbo 4TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD Module	Y	Y	5S497AA
Z Turbo 4TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 Z2 Kit SSD	Y	Y	5S498AA
Z Turbo 512GB 2280 PCIe-4x4 TLC China SSD Module	Y	Y	906H1AA
Z Turbo 1TB PCIe-4x4 TLC China SSD Module	Y	Y	906H6AA
Z Turbo 2TB PCIe-4x4 TLC China SSD Module	Y	Y	906J0AA
HP Z Turbo 2TB PCIe-4x4 TLC China Z2 Kit SSD	Y	Y	906J1AA
256GB 2280 PCIe-4x4 NVMe Value M.2 China Z2 SSD Module	Y	Y	906J7AA
512GB 2280 PCIe-4x4 NVMe Value M.2 China Z2 SSD Module	Y	Y	906K1AA
1TB 2280 PCIe-4x4 NVMe Value M.2 China Z2 SSD Module	Y	Y	906K2AA
HP Z Turbo 1TB 2280 PCIe-5x4 TLC M.2 Z2 G12 TWR Kit SSD	Y	Y	B11F4AA
HP Z Turbo 1TB 2280 PCIe-5x4 SED OPAL2 TLC M.2 Z2 G12 TWR Kit SSD	Y	Y	B11F5AA
HP Z Turbo 2TB 2280 PCIe-5x4 TLC M.2 Z2 G12 TWR Kit SSD	Y	Y	B11F6AA
HP Z Turbo 2TB 2280 PCIe-5x4 SED OPAL2 TLC M.2 Z2 G12 TWR Kit SSD	Y	Y	B11F7AA

Supported Components

Graphics		Factory Configured	Option Kit	Option Kit Part Number	Supported # of cards	Support Notes
Graphics Cable Adapters	HP DisplayPort To VGA Adapter	Y	Y	AS615AA		
	HP USB-C to DisplayPort Adapter	Y	Y	4SH08AA		
	HP USB-C to HDMI Adapter	Y	Y	4SH07AA		
	HP USB-C to VGA Adapter	Y	Y	4SH06AA		
	HP Single miniDP-to-DP Adapter Cable	Y	Y	2MY05AA		
Entry 3D	NVIDIA RTX A400 4 GB with Mini Bracket 4mDP Graphics	Y	Y	AV8J3AA	TBD	TBD
Mid-range 3D	NVIDIA RTX A1000 8 GB with Mini Bracket 4mDP Graphics	Y	Y	AV8J4AA	TBD	TBD
	NVIDIA RTX 2000 Ada 16 GB 4mDP Graphics	Y	Y	8D6B8AA	TBD	TBD
	NVIDIA RTX PH x2xxx 4DP Graphics	Y	Y	B5CH7AA	TBD	1
High-End 3D	NVIDIA RTX 5880 Ada 48 GB 4DP Graphics	Y	Y	9Z7P5AA	TBD	TBD
	NVIDIA RTX 6000 Ada 48 GB 4DP Graphics	Y	Y	79C23AA	TBD	TBD
	NVIDIA GeForce 32 GB GDDR7 Graphics Special	Y	Y	B88B4AA	TBD	TBD
	NVIDIA RTX 4000 Ada 20 GB 4DP Graphics	Y	Y	8D6B7AA	TBD	TBD
	NVIDIA RTX 4500 Ada 24 GB 4DP Graphics	Y	Y	8D6C1AA	TBD	TBD
	NVIDIA RTX 5000 Ada 32 GB 4DP Graphics	Y	Y	8D6B6AA	TBD	TBD
	NVIDIA RTX PRO 6000 Blackwell Max-Q 300W 96 GB 4DP Graphics	Y	Y	B11E9AA		1
	NVIDIA RTX PRO 6000 Blackwell 96 GB 4DP Graphics	Y	Y	B11F0AA		1
	AMD Radeon Pro W7900 DS 48 GB 3DP+1mDP Graphics	Y	Y	B5CH6AA		
	NVIDIA GeForce RTX 5060 8GB GDDR7 GFX	Y	Y	TBD		

Supported Components

NVIDIA RTX PRO 4000 Blackwell 24 GB 4DP Graphics	Y	Y	B11F3AA	TBD	1

Note 1: Marketing name to be defined.

Memory

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 48GB DDR5 (1x48GB) 5600 UDIMM NECC Memory	Y	Y	8F070AA	
8GB DDR5 (1x8GB) 5600 UDIMM NECC Memory	Y	Y	A9TF0AA	
16GB DDR5 (1x16GB) 5600 UDIMM NECC Memory	Y	Y	A9TF1AA	
16GB DDR5 (1x16GB) 5600 UDIMM ECC Memory	Y	Y	A9TF2AA	1
32GB DDR5 (1x32GB) 5600 UDIMM NECC Memory	Y	Y	A9TF3AA	
32GB DDR5 (1x32GB) 5600 UDIMM ECC Memory	Y	Y	A9TF4AA	1

Note 1: ECC memory is supported

Optical and Removable Storage

	Factory Configured	Option Kit	Option Kit Part Number
HP USB External DVDRW Drive	N	Y	F2B56AA
HP USB External DVDRW Drive	N	Y	Y3T76AA
HP CRU QX328 3.5 in Front Removable Frame/Carrier	Y	Y	4N012AA

Networking and Communications

	Factory Configured	Option Kit	Option Kit Part Number
Z2 G1i Single 1Gbps Fiber NIC USB FLY Adapter	Y	Y	W8X25AA
NVIDIA Mellanox ConnectX-6 DX Dual Port 10/25GbE SFP28 NIC	Y	Y	436M8AA
HP 10GBase-T Flex IO	Y	Y	56Q71AA
Allied Telesis AT-2911T/2-901 Dual Port 1GbE NIC	Y	Y	6E3Y9AA
HP 10GbE SFP+ SR/SW LC Fiber Optic Transceiver	Y	Y	860T8AA
HP Z2 2.5GbE LAN Flex Port1	Y	Y	B96W7AA
Intel Ethernet I350-T4 4-Port 1Gb NIC	N	Y	W8X25AA

Supported Components

HP 1GbE LAN Flex Port 2020	Y	Y	141J6AA
Intel X550 10GBASE-T Dual Port NIC1	Y	Y	1QL46AA
HP 25GbE SFP28 LC Fiber Optic Transceiver	Y	Y	860T9AA
HP Flex 1GbE Fiber LC Single Port	Y	Y	1QL46AA
Intel® Wi-Fi 6E AX211 BT 5.3 wireless card M.2 non-vPro	Y	N	
Intel® Wi-Fi 7 BE200 BT 5.4 wireless card M.2 non-vPro	Y	N	

NOTE: Specific Network on Modern standby feature Support limitation Legacy Card AT-2911T2/901 and INTEL I350-T4 and INTEL X550-T2 and 10GBase-T FLEX IO and NVDIA CX-6 DX Dual 25GbE NIC do not support modern standby. And system equipped with those non modern standby network card, when monitor off and it is not really entered Modern standby state for wake-up function support, another path suggestion is Customer can use Onboard Lan for Wake event instead of legacy function WOL limitation because those commodities might not meet the required compliance standards in system modern standby configuration.

[1]Component will be ready in June

Input Devices

	Factory Configured	Option Kit	Option Kit Part Number
HP 685 Comfort Dual-Mode Keyboard	N	Y	8T6L9UT
HP 725 Multi-Device Rechargeable Wireless Keyboard	N	Y	9T5B2AA
HP Bus Slim v2 Smart Card USB Keyboard	Y	Y	A71J9AA
HP 125 G2 USB Wired Keyboard	Y	Y	AY2Y7AA
HP 320K G2 USB Wired Keyboard	Y	Y	9SR37UT
HP 685 Comfort Dual-Mode Keyboard and Mouse Combo	N	Y	8T6L7UT
HP 725 Multi-Device Rechargeable Wireless Keyboard and Mouse Combo	Y	Y	9T5B0UT
HP 655 Wireless Keyboard and Mouse Combo G2	N	Y	4R009UT
HP Wired Desktop 320MK Mouse and Keyboard G2	N	Y	9SR36UT
HP Wired 320M Mouse	Y	Y	9VA80AA
HP Creator 935 Black Wireless Mouse	N	Y	1D0K8AA
HP 128 LSR Wired Mouse	Y	Y	265D9AA
HP 125 Wired Mouse	Y	Y	265A9AA/AT/UT

Flex Module (Rear IO)

	Factory Configured	Option Kit	Option Kit Part Number

Supported Components

HP 1GbE LAN Flex Port 2020	TBD	Y	141J6AA
HP Flex 1GbE Fiber LC Single Port	TBD	Y	20J15AA
HP Serial Port v3 Flex IO	TBD	Y	5B895AA
HP 10GBase-T Flex IO	Y	Y	
HP Z2 2.5GbE LAN Flex Port	Y	Y	
Serial Port FLY Flex IO	Y	N	
Dual Type-A 3.2 Gen 1 FLY Flex IO	Y	N	

Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number
HP Parallel PCIe x1 Card	Y	Y	N1M40AA
HP Remote System Controller	Y	Y	7K6D7AA
HP Remote System Controller Main Board Adapter	Y	Y	7K6D8AA
HP Integrated Remote System Controller	Y	Y	7K6D9AA
HP Z2 2nd serial port adapter	Y	Y	141K8AA
HP Z2 TWR G1i HDD Cable Kit	N	Y	B5DU5AA
HP Rack Cable Management Arm	N	Y	35Z34AA
HP Dual TBT5 PCIe x4 Low Profile Card	Y	Y	B15HRAA

Racking and Physical Security

	Factory Configured	Option Kit	Option Kit Part Number
HP Z2 TWR Rail Rack Kit	N	Y	B11FPAA
HP Business PC Security Lock V3 Kit	N	Y	3XJ17AA

Software

	Factory Configured	Option Kit	Support Notes
	Y	N	1
HP PC Hardware Diagnostics UEFI (Windows OS only)	Y	N	2
HP PC Hardware Diagnostics Windows	Y	N	
HP Wolf Security	Y	N	3
HP Notifications	Y	N	
HP Desktop Support Utility	Y	N	
HP Documentation	Y	N	

Supported Components

myHP	Y	N	
Kingsoft WPS Office	Y	N	4
Z by HP Data Science Stack Manager	Y	N	5
HP Image Assistant	N	N	
HP Support Assistant	N	N	1

[1]Supported with Windows only. Also available as a free download from https://www.hp.com/us-en/workstations/performance-advisor.html
[2]Windows OS only
[3]Not available in Russia
[4]Only available in China
[5]Optional software

Operating Systems

Windows 11 Pro 64[1]

Windows 11 Home 64 - HP recommends Windows 11 Pro[1]

Linux®-ready[4]

Ubuntu® 24.04 LTS[2,3]

[1] Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 11 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com.
[2] Not all features are available in all editions or versions of Ubuntu®. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply and additional requires may apply over time for updates.
[3] A certified preloaded version of Ubuntu® 24.04 LTS is available from HP for this platform. Not all features are available in all editions or versions of Ubuntu. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply, and additional requirements may apply over time for upgrades.
[4]For detailed OS/hardware support information for Linux, see:
http://www.hp.com/support/linux_hardware_matrix

HP BIOS

Additional HP BIOS Features: • Power-On password – Helps prevent an unauthorized user from powering on the system.
• Administrator password – Also known as the BIOS Setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS cannot be updated and changes

cannot be made to BIOS settings using BIOS Setup or under the OS.
• S4/S5 Maximum Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 0.5W in S4/S5 (when turned off). When S4/S5 Maximum Power Savings feature is enabled below features are turned off:

-Power to expansion connectors / slots
-Most Wake events other than power buttons and WOL(Wake on LAN supported by embedded Lan controller under S4/S5 Maximum Power Saving Enabled)
-USB charging ports

HP Performance Control Modes
HP Z Desktop Workstations offers Performance Control Modes in the F10 BIOS menu. Z2 G1i offers Quiet Mode, Performance Mode, Rack Mode, and High-Performance Mode. HP recommends using High Performance Mode unless you have concerns about acoustics in an open office environment. Customers can achieve CPU performance gains in multithreaded workloads using High Performance Mode over Performance Mode*. High Performance Mode is configured as default from the factory.

How to Set HP Performance Control Modes in HP F10 BIOS Menu
In the F10 BIOS Menu, the setting titled “Performance Control” is adjustable to High Performance Mode, Performance Mode or Quiet Mode. These modes are choice points for performance and acoustic tradeoffs based on user needs or recommended balanced conditions in performance and noise optimization.

At startup, push the F10 key while system is booting to get to the BIOS Menu.
Go to → Advanced -> System Options ->scroll down and choose “Performance Control”

Set the Performance Mode you desire and then go back to Main->Save Changes and Exit -> Yes
The machine will restart in the mode you’ve chosen.

How to change Performance Modes in HP Performance Advisor software?
Select BIOS Settings -> Advanced -> System Options -> Performance Controls

The machine will restart in the mode you’ve chosen.

For more information on performance control modes, please see the white paper called, HP Performance Control Modes for Z Desktop Workstations.

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

Supported Components

Software

HP Support Assistant [1]
HP Image Assistant
HP Desktop Support Utility
HP Documentation
HP Notifications
HP PC Hardware Diagnostics UEFI
HP PC Hardware Diagnostics Windows
myHP
WSL/Ubuntu Data Science Stack
HP Privacy Settings

Manageability Features

HP Driver Packs[2]
HP UWP Pack
HP System Software Manager (SSM)
HP Manageability Integration Kit [3]
HP Client Catalog (download)
HP Image Assistant (download)
HP Cloud Recovery
HP Client Management Script Library (download)
HP BIOSphere[4]
HP BIOS Configuration Utility (download)

Client Security Software

HP Client Security Suite[5] including: (including Credential Manager, HP Password Manager[6], HP Spare Key)
HP Power On Authentication
Microsoft Defender[7]

Security Management

HP Secure Erase[8]
HP Wolf Pro Security Edition (optional) [9]
HP Wolf Security for Business[10] Includes:
HP Sure Click[11]
HP Sure Sense[12]
HP Sure Run[13]
HP Sure Recover[14]
HP Sure Start[15]
HP Tamper Lock
HP Sure Admin [16]
HP Client Security Manager[17]
Hood Sensor Optional Kit

Supported Components

[1] HP Support Assistant requires Windows and Internet access.

[2]HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.

[3]HP Manageability Integration Kit can be downloaded from http://www8.hp.com/us/en/ads/clientmanagement/overview.html

[4] HP BIOSphere features may vary depending on the platform and configurations.

[5] HP Client Security Manager requires Windows and is available on the select HP PCs.

[6] HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.

[7] Microsoft Defender Opt in and internet connection required for updates.

[8] HP Secure Erase - –or the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 “C“ear” ”anitation method. HP Secure Erase does not support platforms with Intel® Optane.

[9] HP Wolf Pro Security Edition is available preloaded on select SKUs, and, depending on the HP product purchased, includes a license with a term length communicated to you at purchase and in your order confirmation email. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: https://support.hp.com/us-en/document/ish_3875769-3873014-16 as that EULA is modified by the following: 7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition is effective upon 4 months after the date the HP Product was shipped by HP and will continue for the term communicated to you at purchase and in your order confirmation email (“Initial Term”). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support. Notwithstanding the foregoing, the license shall expire no later than one year after the fixed term of the subject license ends.

[10] HP Wolf Security for Business requires Windows 10 or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features

[11] HP Sure Click requires Windows 10 Pro or higher or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

[12] HP Sure Sense requires Windows 11 Pro or Enterprise and supports Microsoft Internet Explorer, Google Chrome™, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.

[13] HP Sure Run is available on select Windows 11 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors

[14] HP Sure Recover is available on select HP PCs and requires Windows 10 and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module

[15] HP Sure Start is available on select HP PCs and workstations. See product specifications for availability.

[16] HP Sure Admin requires Windows 11, HP BIOS, HP Manageability Integration Kit from http://www.hp.com/go/clientmanagement and HP Sure Admin Local Access Authenticator smartphone app from the Android or Apple store.

[17] HP Client Security Manager requires Windows and is available on the select HP PCs.

System Technical Specifications

System Board

System Board Form Factor	421.08mm X 273.80mm X 1.55mm
Processor Socket	Single LGA-1851
CPU Bus Speed	DMI GEN4
Chipset	Intel® W880 Chipset
Super I/O Controller	Nuvoton SIO24
Memory Expansion Slots	4 DDR5 memory slots
Memory Type Supported	DDR5, UDIMM (Unbuffered), ECC& non-ECC
Memory Modes	Non-Interleaved for single channel. Interleaved when both channels are populated.
Memory Speed Supported	5600MT/s DDR5
Memory Protection	ECC available on data
Maximum Memory	256GB
Memory Configuration (Supported)	8GB, 16GB, 32GB, 48G and 64GB non-ECC/16GB, 32GB ECC unbuffered DIMMs are supported. ECC and non-ECC memory DIMMs cannot be mixed on the same system. Two channels of DDR5 memory are supported. To realize full performance at least one DIMM must be inserted into each channel. Single DIMM per channel must be installed into furthest slot from CPU(DIMM 1 or 3).

The system speed will be determined by a number of key factors:

Module Configuration	Description of configuration	Max Memory Speed (Actual Memory speed is dependent on CPU)
Single DIMM per channel	Configurations that contain only one or two DIMM modules with DIMMs only in the black slots	5600MHz
Two single ranked DIMMs in a channel	Configurations with 3 or 4 single ranked DIMMs (8GB and 16GB) installed in a system. Memory speed may also vary depending on vendor module mix.	4800MHz
Two dual ranked DIMMs in a channel	Configurations with 3 or 4 dual ranked DIMMs (32GB, 48GB and 64GB) installed in a system	4400MHz

When more than one memory slot is populated, symmetric configurations are required for 2 DIMMs per channel. Mix of different part numbers or mix of single and dual ranks within a channel is not allowed.

PCI Express Connectors	(1) PCI Express Gen5 slot x16 mechanical/ x16 electrical (full height, full length) (1) PCI Express Gen4 slot x4 mechanical/ x1 electrical (full height, full length, open-ended) (1) PCI Express Gen4 slot x16 mechanical/ x4 electrical (full height, full length)

		(1) PCI Express Gen4 slot x4 mechanical/ x4 electrical (full height, full length, open-ended) (1) M.2 2280 Storage (PCIe Gen5 x4) (1) M.2 2280 Storage (PCIe Gen4 x4) (1) M.2 2280 Storage (PCIe Gen4 x4) (1) M.2 2230 WLAN (PCIe Gen4 x1+ Intel CNVi)
Supported Interfaces		
	Integrated RAID	RAID 0, 1 (RAID 5, 10 Intel support)
	Integrated Graphics	Intel® Graphics- (on Core™ Ultra 9 /Core™ Ultra 7/Core™ Ultra 5 processors) Based on Unified Memory Architecture (UMA) - a region of system memory is reserved and dedicated to the graphics display. Support for Microsoft DirectX 12, OpenGL 4.6, OpenCL 3.0 and Vulkan on Intel® Graphics; 2x DP 1.4 graphics ports integrated in motherboard; Supports up to four simultaneous displays with Multiple Stream Transport (MST) across VGA*/DVI*/HDMI* outputs. Max resolution supported on onboard DP 1.4/HBR3 ports: 3840 x2160 (4K) @ 60Hz. Max resolution supported on flexIO DP 2.1/UHBR20 ports: 7680*4320 (8K) @60Hz compressed, 5K120Hz compressed.
	Network Controller	Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 19
	Serial	1 internal header (requires optional Serial Port Adapter Kit)
	2nd Serial	USB-based Serial port option through Flex IO USB-based Serial port option through Flex IO2
	HD Integrated Audio	Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 16
USB Connector(s)	**Front**	4 SuperSpeed USB Std-A 10Gbps port; 2 SuperSpeed USB Type-C® 20Gbps port (charge supports up to 5V/3A)
	Rear	2 SuperSpeed USB Std-A 10Gbps port; 3 High-speed USB Std-A 480Mbps port Flex IO, choice of: 1 Dual SuperSpeed USB Std-A 5Gbps port, 1 SuperSpeed USB Type-C® 10Gbps port (Alt Mode DisplayPort™1.4 with 15W Output) [1], 1 Dual SuperSpeed USB Type-C® 10Gbps port[1], 1 Thunderbolt™ 4 port (40Gbps)[1]

	Flex IO2, choice of: 1 Dual SuperSpeed USB Std-A 5Gbps ports [1]Component will be ready in 2025Q3
HD Integrated Audio	Realtek ALC3205, 2.0W internal mono speaker
Flash ROM	Yes
CPU Fan Header	Yes
Memory Fan Header	None
Chassis Fan Header	1 Rear System Chassis Fan Header, 1 Side chassis Fan Header, 1 Front chassis Fan Header, 2 Bottom chassis Fan Header
Front PCI Fan Header	None
Front Control Panel/Speaker Header	Yes
CMOS Battery Holder - – ithium	Yes
Integrated Trusted Platform Module	Integrated TPM 2.0 Convertible to FIPS 140-2 Certified modeThe TPM module disabled where restricted by law
Power Supply Headers	Yes
Power Switch, Power LED & Hard Drive LED Header	Yes
Clear Password Jumper	None
Keyboard/Mouse	USB or PS/2 (option)
Power Supply	1200W wide-ranging, active Power Factor Correction, 92% Efficiency. 700W wide-ranging, active Power Factor Correction, 92% Efficiency. 500W wide-ranging, active Power Factor Correction, 92% Efficiency. **NOTE:** The Power Supply Efficiency Report for the 1200W 92% Efficiency, 700W 92% Efficiency and 500W 92% Efficiency Power Supply may be found at the following links: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2

System Configurations		
	Processor Info	Intel Core Ultra 5 10C 3.3GHz LGA 65 W

System Technical Specifications

HP Z2 TWR G1i Configuration #1	**Memory Info**	1x 16GB DDR5 ECC
	Graphics Info	1x NVIDIA RTX A400
	Disks/Optical/Floppy	1x 256GB PCIe-4x4 2280 Value M.2 SSD
	PSU	500W
	Other	NA

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	2.3		2.5		2.23	
	Windows short Idle (S0)	13.8		13.91		13.18	
	Windows Busy Typ (S0)	139.2		140.9		138.9	
	Windows Busy Max (S0)	145.5		146.8		144.2	
	Sleep (S3)	2.3	2.3	2.4	2.4	2.3	2.3
	Off (S5)	0.69	0.67	0.69	0.68	0.67	0.67
	Zero Power Mode (EuP)	0.25		0.24		0.25	

Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	7.8476		8.53		7.609	
	Windows short Idle (S0)	47.0856		47.4609		44.9702	
	Windows Busy Typ (S0)	474.9504		480.7508		473.9268	
	Windows Busy Max (S0)	496.446		500.8816		492.0104	
	Sleep (S3)	7.8476	7.8476	8.1888	8.189	7.8476	7.8476
	Off (S5)	2.3202	2.286	2.3543	2.3202	2.286	2.3543
	Zero Power Mode (EuP)	0.853		0.8189		0.853	

HP Z2 TWR G1i Configuration #2	**Processor Info**	Intel Core Ultra 7 20C 2.4GHz LGA 65W
	Memory Info	1x 32GB DDR5 NECC
	Graphics Info	1x NVIDIA RTX A2000
	Disks/Optical/Floppy	1x 1TB 2280 PCIe-4x4 Val M.2 SSD
	PSU	700W
	Other	NA

Energy Consumption		115 VAC	230 VAC	100 VAC

System Technical Specifications

(Watts)		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	2.76		2.69		2.63	
	Windows short Idle (S0)	13.96		14.25		12.85	
	Windows Busy Typ (S0)	196.500		198.600		194.900	
	Windows Busy Max (S0)	208.300		210.600		206.950	
	Sleep (S3)	2.76	2.76	2.69	2.69	2.61	2.61
	Off (S5)	0.68	0.63	0.69	0.62	0.68	0.61
	Zero Power Mode (EuP)	0.26		0.27		0.25	

Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	9.4171		9.1783		8.9736	
	Windows short Idle (S0)	47.6315		48.621		43.8442	
	Windows Busy Typ (S0)	670.458		677.6232		664.9988	
	Windows Busy Max (S0)	710.7196		718.5672		706.1134	
	Sleep (S3)	9.4171	9.4171	9.1783	9.1783	8.9053	8.9053
	Off (S5)	2.3202	2.1496	2.3543	2.1154	2.3202	2.0813
	Zero Power Mode (EuP)	0.8871		0.9212		0.853	

HP Z2 TWR G1i Configuration #3	**Processor Info**	Intel Core Ultra 9K 24C 3.7GHz LGA 125W
	Memory Info	4x 48GB DDR5 NECC
	Graphics Info	1x NVIDIA RTX A6000
	Disks/Optical/Floppy	1x 4TB 2280 PCIe-4x4 OPAL2 M.2 SSD 2x HDD 12TB 7200RPM SATA-6G Ent 3.5in
	PSU	1200W
	Other	NA

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	6.57		6.69		6.35	
	Windows short Idle (S0)	44.53		45.96		42.81	
	Windows Busy Typ (S0)	510.600		517.400		502.980	
	Windows Busy Max (S0)	530.800		538.100		521.300	
	Sleep (S3)	6.57	6.57	6.69	6.69	6.35	6.35

System Technical Specifications

	Off (S5)	0.67	0.63	0.68	0.62	0.65	0.6
	Zero Power Mode (EuP)	0.25		0.25		0.24	

Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	22.4168		22.8263		21.6662	
	Windows short Idle (S0)	151.9364		156.8155		146.0677	
	Windows Busy Typ (S0)	1742.1672		1765.3688		1716.1678	
	Windows Busy Max (S0)	1811.0896		1835.9972		1778.6756	
	Sleep (S3)	22.4168	22.4168	22.8263	22.8263	21.6662	21.6662
	Off (S5)	2.286	2.1496	2.3202	2.1154	2.2178	2.0472
	Zero Power Mode (EuP)	0.853		0.853		0.8189	

NOTE: The Power Supply Efficiency report may be found at the following links:v

https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2

Operating Voltage Range	90-269VAC
Rated Voltage Range	100-240VAC
Rated Line Frequency	50-60 Hz
Frequency Range	47-63Hz
Rated Input Current	14-8A @100-240VAC
Heat Dissipation	Typical: 1765.3688 btu/hr (445.226 kcal/hr) Maximum: 1835.9972 btu/hr (463.0385 kcal/hr)
ENERGY STAR® certified (Config Dependent)	Yes
CECP Compliant @ 220V	YES
FEMP Standby Power Compliant	Yes, with Wake-on-LAN disabled: <1W in S4/S5 - Power Off
Built-in Self Test (BIST)	Yes
LED	
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)	Yes

System Technical Specifications

Hood Lock Header	Yes
ErP Lot 6- Tier 1 Compliance @ 230V (<1W in S5 - –Power Off)	Yes
ErP Lot 6- Tier 2 Compliance @ 230V (<0.5W in S5 - Power Off)	Yes

Declared Noise Emissions (Entry-level, Mid-level, and High-end configurations; tested on floor)

System Configuration (Entry-level)	**Processor Info**	Intel CPU Core U5-225/65W
	Memory Info	Micron 5600 32GB x1
	Graphics Info	NA
	Disks/Optical	PHISON GEN4 M.2 SSD 4TB x1
	Power Supply	700W

Declared Noise Emissions		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.47	15.8
	Hard drive Operating (Drive Random Seek)	NA	NA
	Hard drive Operating (Active mode)	3.6	15.76

System Configuration (Mid-end)	**Processor Info**	Intel Core Ultra 9 285 /65W
	Memory Info	Micron 5600 32GB x4
	Graphics Info	NVIDIA RTX 5000ada
	Disks/Optical	PHISON GEN4 M.2 SSD 4TB x2 PHISON GEN5 M.2 SSD 2TB x1
	Power Supply	700W

Declared Noise Emissions		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.91	22.42
	Hard drive Operating (Drive Random Seek)	NA	NA
	Hard drive Operating	4.07	23.46

System Technical Specifications

	(Active mode)		

System Configuration (High-end)	**Processor Info**	Intel Core Ultra 9 285 /125W
	Memory Info	Micron 5600 32GB x4
	Graphics Info	NVIDIA RTX 5000ada
	Disks/Optical	PHISON GEN4 M.2 SSD 4TB x2 PHISON GEN5 M.2 SSD 2TB x1
	Power Supply	700W

Declared Noise Emissions		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.9	22.02
	Hard drive Operating (Drive Random Seek)	NA	NA
	Hard drive Operating (Active mode)	4.0	22.66

Environmental Requirements	**Temperature**	Operating: 5° to 35° C (40° to 95° F) Non-operating: -40° to 60° C (-40° to 140° F) Maximum rate of change: 10°C/hr
	Humidity	Operating: 8% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 8% to 90% RH, non-condensing, 35° C maximum wet bulb
	Maximum Altitude	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet) Non-operating: 12,192 m (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Cooling for details.
	Dynamic	Shock Operating: ½-sine: 40g, 2ms Non-operating: ½-sine: 165 cm/s, 2-3ms square: 422 cm/s, 30g Vibration Operating random: 0.5g (rms), 5-300 Hz, up to 0.00025g²/Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g²/Hz
	Cooling	Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation,

up to 3048 m (10,000 feet)

Physical Security and Serviceability

Access Panel	Tool-less
Optical Drive	Tool-less
Hard Drives	Internal bay:Tool-less External bay:Acoustic damping screws
Expansion Cards	Tool-less
Processor Socket	Tool-less, except for the processor heatsink
Blue User Touch Points	Yes, on tool-less internal chassis mechanisms
Color-coordinated Cables and Connectors	Yes, PSU connectors are printed with sequence numbers to corresponding board connectors.
Memory	Tool-less
System Board	Screw-In
Padlock Support	Yes (optional): Locks side cover and secures chassis from theft 0.22-in diameter padlock loop at rear of system
Cable Lock Support	Yes, Kensington Cable Lock (optional): Locks side cover and secures chassis from theft 3 mm x 7 mm slot at rear of system
Universal Chassis Clamp Lock Support	No
Solenoid Lock and Hood Sensor	Yes (optional) The Solenoid Hood Lock eliminates the need for a physical key by making the chassis lockable through software and a password. You can also lock and unlock the chassis remotely over the network. The Sensor Kit detects when the access panel has been removed.
CPUs and Heatsinks	A T-15 Torx or flat blade screwdriver is needed to remove the CPU heatsink before the CPU can be removed. CPU removal is tool-less
Internal Speaker	Yes
Power Supply Fans	70mm x 70mm x 25mm 4-wire PWM (non-serviceable)
Access Panel Key Lock	No
Integrated Chassis Handles	Rear Recessed Handle
Power Supply	Requires T15 Torx or flat blade screwdriver
PCI Card Retention	Yes, rear (all), middle (optional), front (full-length cards with extender)
Power-On Password	Yes, prevents an unauthorized person from booting up the workstation

System Technical Specifications

Setup Password Yes, prevents an unauthorized person from changing the workstation configuration

Service, Support, and Warranty

On-site Warranty and Service[1]: One-year (1-1-1), limited warranty and service offering delivers on-site, next business-day[2] service for parts and labor and includes free telephone support[3] 8am - –5pm. Global coverage[2] ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering. 24/7 operation will not void the HP warranty. Storage devices are not covered under warranty for 24/7 operation except for Enterprise class HDDs.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply.
NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.
NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24x7 support service may not be available in some countries. HP Care Pack Services extend service contracts beyond the standard warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. Service levels and response times for HP Care Packs may vary depending on your geographic location.

Certification and Compliance

Environmental Sustainability questions concerning:

- Ecolabels (EPEAT, TCO, etc.)
- ENERGY STAR, California Energy Commission (CEC)
- Compliance with Environmental legislation (EU ErP, China CECP, EU RoHS and other countries)
- Supply Chain Social Environmental Responsibility (SER) (conflict minerals; human rights, etc.)
- Product specific environmental features (material content, packaging content, recycled content, etc.)
- China Energy Label (CEL)

Please contact sustainability@hp.com

For country specific Regulatory Compliance approval documents or Regulatory and Safety questions concerning:

- Declarations of Conformity (for self-service, go to https://www.hp.com/uk-en/certifications/technical/regulations-certificates.html?jumpid=ex_r135_uk/en/any/corp/hpuk-mu_chev/certificates)
- GS Certificates
- Product Safety Certificates (UL, CB, BIS, etc.)
- EMC Certificates, Declarations of Conformity, or Certificates of Conformity (CE, FCC, ICES, etc.)
- CCC Certificates
- Ergonomics
-

Please contact techregshelp@hp.com

System Technical Specifications

BIOS

BIOS 64-bit Services	BIOS supports 64-bit Operating systems.
PCI 3.0 Support	Full BIOS support for PCI Express through industry standard interfaces
ATAPI	ATAPI Removable Media Device BIOS Specification Version 1.0.
WMI Support	WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications.
BIOS Power On	Users can define a specific date and time for the system to power on.
ROM Based Computer Setup Utility (F10)	Review and customize system configuration settings controlled by the BIOS.
System/Emergency ROM Flash Recovery with Video	Recovers system BIOS in corrupted Flash ROM.
Replicated Setup	Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigurationUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
Boot Control	Disables the ability to boot from removable media on supported devices.
Memory Change Alert	Alerts management console if memory is removed or changed.
Thermal Alert	Monitors the temperature state within the chassis. Three modes: • NORMAL – normal temperature ranges. • ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown. • SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console.
ACPI (Advanced Configuration and Power Management Interface)	Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. Supports ACPI 6.0 for full compatibility with 64-bit operating systems.
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen.
Remote Wakeup/Remote Shutdown	System administrators can power on, restart, and power off a client computer from a remote location.
Instantly Available PC (Suspend to RAM - –CPI sleep state Modern standby)	Allows for very low power consumption with quick resume time.

System Technical Specifications

Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system.
ROM revision levels	Reports the system BIOS revision level in Computer Configuration Utility (F10 Setup). Version is available through an industry standard interface (SMBIOS and WMI) so that management SW applications can use and report this information.
System board revision level	Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified.
Start-up Diagnostics (Power-on Self-Test)	Assesses system health at boot time with selectable levels of testing.
Auto Setup when new hardware installed	System automatically detects addition of new hardware.
Keyboard-less Operation	The system can be booted without a keyboard.
Localized ROM Setup	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 15 languages with local keyboard mappings.
Asset Tag	The user or MIS to set a unique tag string in non-volatile memory.
Per-slot Control	Allows I/O slot parameters (option ROM enable/disable, bus latency) to be configured individually
Adaptive Cooling	Control parameters are set according to detected hardware configuration for optimal acoustics.
Pre-boot Diagnostics	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
UEFI Specification Revision	2.9
ACPI	Advanced Configuration and Power Management Interface, Version 6.0
ATA (IDE)	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
CD Boot	“El Torito” Bootable CD-ROM Format Specification Version 1.0
EHCI	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
PCI	PCI Local Bus Specification, Revision 2.3 PCI Power Management Specification, Revision 1.1 PCI Firmware Specification, Revision 3.0
PCI Express	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0 PCI Express Base Specification, Revision 4.0
SATA	Serial ATA Specification, Revision 1.0a Serial ATA 3 Gb/s: Serial ATA Specification, Revision 2.5 Serial ATA 6 Gb/s: Serial ATA Specification, Revision 3.0
SPD	JEDEC JESD300-5

System Technical Specifications

TPM	Trusted Computing Group TPM Specification Version 2.0 (Nuvoton NPCT760HACYX or Infineon SLB9672). Common Criteria EAL4+ certified. FIPS 140-2 Certification TCG TPM Certified products list: http://www.trustedcomputinggroup.org/certification/tpm-certified-products/
UHCI	Universal Host Controller Interface Design Guide, Revision 1.1
USB	Universal Serial Bus Revision 1.1 Specification Universal Serial Bus Revision 2.0 Specification Universal Serial Bus Revision 3.1 Specification Universal Serial Bus Revision 3.2 Specification
SMBIOS	System Management BIOS Reference Specification, Version 3.8 External BIOS simulator found at: http://csrsml.itcs.hp.com/

Social and Environmental Responsibility

Eco-Label Certifications & Declarations

This product is low halogen except for configurations that include HP Z Turbo Quad Pro PCIe TLC SSD, CRU QX 428 & QX448 removable storage frames, ConnectX-6 DX Amphenol 10 & 25 Gb Transceivers, Broadcom 5720-2P NIC Card, power cords, cables, and peripherals. Service parts obtained after purchase may not be Low Halogen.

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- US ENERGY STAR®
- US Federal Energy Management Program (FEMP)
- EPEAT® Gold with Climate+ registered. See www.epeat.net for registration status and tier levels by country
- TCO Certified configurations available
- China Energy Conservation Program (CECP)
- China State Environmental Protection Administration (SEPA)
- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label*

Sustainable Impact Specifications

- Product Carbon Footprint (hp.com)
- System contains 25% ocean-bound plastics in fans
- System contains 60% post-consumer recycled plastics
- System contains 100% recycled rare earth elements in speaker magnet
- System has 100% sustainably sourced packaging
- 10% ITE-derived closed loop plastic

- Bulk packaging available
- System contains 20% post-industrial recycled steel System has 80Plus Platinum rated power supplies
- System has a QR code enabled experience where the user has access to a product portal - complete with product feature highlights, sustainability information, getting started guides, and direct setup and support options.
- New Energy Consumption dashboard available to customers providing timely and accurate carbon usage including recommended actions users can take to decrease carbon footprint.

System Configuration The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.

Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Sort idle)	13.96	14.25	13.89
Normal Operation (Long idle)	2.76	2.69	2.74
Sleep	2.76	2.69	2.74
Off	0.63	0.62	0.64

NOTE:
Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family . HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	47.73	48.72	47.49
Normal Operation (Long idle)	9.44	9.20	9.37
Sleep	9.44	9.20	9.37

Off	2.15	2.12	2.19

*__NOTE:__ Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Longevity and Upgrading

This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the

Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product is 94.8% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	1316 gram
Internal:	PAPER/Molded Pulp	1114 gram
	PLASTIC/Polyethylene low density - –LDPE	58 gram

The plastic packaging material contains at least 30% recycled content.

The corrugated paper packaging materials contains at least 62.5% recycled content.

RoHS Compliance

HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.

We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.

We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.

To obtain a copy of the HP RoHS Compliance Statement, see HP RoHS position statement.

System Technical Specifications

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging Usage

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

System Technical Specifications

End-of-life Management and Recycling

HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

HP, Inc. Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Eco-label certifications
http://www8.hp.com/us/en/hp-information/environment/ecolabels.html
ISO 14001 certificates:
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842
and
http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

footnotes

- Percentage of ocean-bound plastic contained in each component varies by product
- Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.
- External power supplies, WWAN modules, power cords, cables and peripherals excluded.
- 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.
- Fiber cushions made from 100% recycled wood fiber and organic materials.

Manageability

Intel® Active Management Technology (AMT)

Intel® Active Management Technology (AMT) [1]
An advanced set of remote management features and functionality providing IT administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. Intel® AMT includes the following advanced management functions:

- Power Management (on, off, reset, graceful shutdown, sleep and hibernate)
- Hardware Inventory (includes BIOS and firmware revisions)
- Serial Over LAN (SOL)
- USB Redirect (Media Redirection)
- ME Wake-on-LAN (WOL)
- Ipv6 Support
- Host Base set-up and configuration

System Technical Specifications

	• Management Engine (ME) firmware roll back
Intel® vPro® Technology	The HP Z2 G1i Tower Workstation supports Intel® vPro® technology when configured as outlined below: • Intel® Core™ Ultra 200S Series Processors product family featuring Intel® vPro® Technology • Intel® W880 chipset • Intel® I219LM GbE LAN
HP Image Assistant	Visit: http://ftp.hp.com/pub/caps-softpaq/cmit/HPIA.html
System Software Manager	For questions or support for SSM, please visit: http://www.hp.com/go/ssm

[1]Requires activation and a system with a corporate network connection, an Intel® AMT enabled chipset, and network hardware and software. For notebooks, Intel AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating, or powered off. Results dependent upon hardware, setup, and configuration. For more information, visit: https://www.intel.com/content/www/us/en/architecture-and-technology/intel-active-managementtechnology.html

Technical Specifications - Storage Drives

STORAGE

HP Z Turbo Drv PCIE-4X4 512GB TLC PCIe SSD (Z2G1i)	**Capacity**	512GB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	150 TBW
	Reliability	1.5M Hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6400MB/s [1]
	Sequential Write	3400MB/s [1]
	Random Read	600K IOPS [1]
	Random Write	600K IOPS [1]

*Actual performance may vary.

HP Z Turbo Drv PCIE-4X4 1TB TLC PCIe SSD (Z2G1i)	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	300 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6500MB/s [1]
	Sequential Write	5000MB/s [1]
	Random Read	800K IOPS [1]
	Random Write	800K IOPS [1]

*Actual performance may vary.

HP Z Turbo Drv PCIE-4X4 2TB TLC PCIe SSD (Z2G1i)	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	500 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	

Technical Specifications - Storage Drives

	Sequential Read	6500MB/s [1]
	Sequential Write	5000MB/s [1]
	Random Read	800K IOPS [1]
	Random Write	800K IOPS [1]

*Actual performance may vary.

HP Z Turbo Drv PCIE-4X4 4TB TLC PCIe SSD (Z2G1i)	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	600 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6500MB/s [1]
	Sequential Write	5000MB/s [1]
	Random Read	800K IOPS [1]
	Random Write	800K IOPS [1]

*Actual performance may vary.

HP Z Turbo Drv PCIE-4X4 512GB TLC PCIe SED OPAL2 (Z2G1i)	**Capacity**	512GB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	150 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6400MB/s [1]
	Sequential Write	3400MB/s [1]
	Random Read	600K IOPS [1]
	Random Write	600K IOPS [1]
	Self-Encrypting Drive Support	OPAL2

HP Z Turbo Drv PCIE-4X4 1TB TLC PCIe SED OPAL2 (Z2G1i)	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe

Technical Specifications - Storage Drives

	NAND Type	3D TLC
	Endurance	300 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6500MB/s [1]
	Sequential Write	5000MB/s [1]
	Random Read	800K IOPS [1]
	Random Write	800K IOPS [1]
	Self-Encrypting Drive Support	OPAL2

*Actual performance may vary.

HP Z Turbo Drv PCIE-4X4 2TB TLC PCIe SED OPAL2 (Z2G1i)	**Capacity**	2TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	500 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6500MB/s [1]
	Sequential Write	5000MB/s [1]
	Random Read	800K IOPS [1]
	Random Write	800K IOPS [1]
	Self-Encrypting Drive Support	OPAL2

Actual performance may vary.

HP Z Turbo Drv PCIE-4X4 4TB TLC PCIe SED OPAL2 (Z2G1i)	**Capacity**	4TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	600 TBW
	Reliability	1.5M hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	6500MB/s [1]
	Sequential Write	5000MB/s [1]

Technical Specifications - Storage Drives

	Random Read	800K IOPS [1]
	Random Write	800K IOPS [1]
	Self-Encrypting Drive Support	OPAL2

Actual performance may vary.

256GB 2280 PCIe-4x4 Value M.2 SSD (Z2G1i)	**Capacity**	256GB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	200TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3100MB/s [1]
	Sequential Write	1400MB/s [1]
	Random Read	200K IOPS [1]
	Random Write	400K IOPS [1]

Actual performance may vary.

512GB 2280 PCIe-4x4 Value M.2 SSD (Z2G1i)	**Capacity**	512GB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	300TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 4.0 x4 electrica
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3400MB/s [1]
	Sequential Write	2500MB/s [1]
	Random Read	380K IOPS [1]
	Random Write	430K IOPS [1]

Actual performance may vary.

1TB 2280 PCIe-4x4 Value M.2 SSD (Z2G1i)	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	400TBW (TB Written)

Technical Specifications - Storage Drives

	Reliability	1.5M Hours
	Interface	PCI Express 4.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3400MB/s [1]
	Sequential Write	2500MB/s [1]
	Random Read	500K IOPS [1]
	Random Write	440K IOPS [1]

Actual performance may vary.

HP Z Turbo Drv PCIE-5X4 1TB TLC PCIe SSD	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	300TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 5.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	12000 MB/s*
	Sequential Write	10000 MB/s*
	Random Read	1500K IOPS*
	Random Write	1300K IOPS*

Actual performance may vary.

HP Z Turbo Drv PCIE-5X4 2TB TLC PCIe SSD	**Capacity**	2TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	600TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 5.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	12000 MB/s [1]
	Sequential Write	11000 MB/s [1]
	Random Read	1500K IOPS [1]
	Random Write	1300K IOPS [1]

Actual performance may vary.

HP Z Turbo Drv PCIE-5X4 1TB	**Capacity**	1TB

Technical Specifications - Storage Drives

TLC PCIe SED OPAL2	**Protocol**	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	300TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 5.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	12000 MB/s [1]
	Sequential Write	10000 MB/s [1]
	Random Read	1500K IOPS [1]
	Random Write	1300K IOPS [1]
	Self-Encrypting Drive Support	OPAL2

Actual performance may vary.

HP Z Turbo Drv PCIE-5X4 2TB TLC PCIe SED OPAL2	**Capacity**	2TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	600TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 5.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	12000 MB/s [1]
	Sequential Write	11000 MB/s [1]
	Random Read	1500K IOPS [1]
	Random Write	1300K IOPS [1]

Actual performance may vary.

512GB TLC PCIE Gen3x4 SED FIPS 140-2	**Capacity**	512GB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	320 TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 3.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	up to 3400MB/s [1]

Technical Specifications - Storage Drives

	Sequential Write	up to 2500MB/s [1]
	Random Read	420K IOPS [1]
	Random Write	635K IOPS[1]
	Self-Encrypting Drive Support	OPAL2/FIPS 140-2

Actual performance may vary.

1TB TLC PCIE Gen3x4 SED FIPS 140-2	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	1620 TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 3.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3400MB/s* [1]
	Sequential Write	3000MB/s* [1]
	Random Read	720K IOPS* [1]
	Random Write	690K IOPS* [1]
	Self-Encrypting Drive Support	OPAL2/FIPS 140-2

Actual performance may vary.

2TB TLC PCIE Gen3x4 SED FIPS 140-2	**Capacity**	2TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	3140 TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 3.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3400MB/s [1]
	Sequential Write	3000MB/s [1]
	Random Read	720K IOPS [1]
	Random Write	690K IOPS [1]
	Self-Encrypting Drive Support	OPAL2/FIPS 140-2

Actual performance may vary.

Citadel 512GB TLC PCIE Gen3x4 SED FIPS 140-2	**Capacity**	512GB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard

Technical Specifications - Storage Drives

	Controller	NVMe
	NAND Type	3D TLC
	Endurance	320 TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 3.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	up to 3400MB/s [1]
	Sequential Write	up to 2500MB/s [1]
	Random Read	420K IOPS [1]
	Random Write	635K IOPS[1]
	Self-Encrypting Drive Support	OPAL2/FIPS 140-2

Actual performance may vary.

Citadel 1TB TLC PCIE Gen3x4 SED FIPS 140-2	**Capacity**	1TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	1620 TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 3.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3400MB/s* [1]
	Sequential Write	3000MB/s* [1]
	Random Read	720K IOPS* [1]
	Random Write	690K IOPS* [1]
	Self-Encrypting Drive Support	OPAL2/FIPS 140-2

Actual performance may vary.

Citadel 2TB TLC PCIE Gen3x4 SED FIPS 140-2	**Capacity**	2TB
	Protocol	PCIe
	Form Factor	M.2 in native Slot on motherboard
	Controller	NVMe
	NAND Type	3D TLC
	Endurance	3140 TBW (TB Written)
	Reliability	1.5M Hours
	Interface	PCI Express 3.0 x4 electrical
	Operating Temperature	32° to 158° F (0° to 70° C)
	Performance	
	Sequential Read	3400MB/s [1]
	Sequential Write	3000MB/s [1]

Technical Specifications - Storage Drives

	Random Read	720K IOPS [1]
	Random Write	690K IOPS [1]
	Self-Encrypting Drive Support	OPAL2/FIPS 140-2
1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	1TB
	Protocol	SATA
	Form Factor	3.5"
	Controller	AHCI
	Reliability	2.0M Hours
	Rated Power On Hours	8760/yr
	Annualized Failure Rate (based on Rated POH)	<0.62%
	Width	
	Media Diameter	3.5in; 8.9 cm
	Physical Size	4 in; 10.17cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s [1]
	Buffer	128MB
	Seek Time (typical reads, includes controller overhead, including settling)	
	Single Track	0.32ms [1]
	Average	7.45ms [1]
	Full Stroke	14.2ms [1]
	Rotational Speed	7,200 rpm
	Operating Temperature	41° to 140° F (5° to 60° C)
	Performance	
	Sequential Read	up to 226MB/s[1]
	Sequential Write	up to 226MB/s[1]
	Enterprise Class Features	High Reliability

[1]Actual performance may vary.

2TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	2TB
	Protocol	SATA
	Form Factor	3.5"
	Controller	AHCI
	Reliability	2.0M Hours
	Rated Power On Hours	8760/yr
	Annualized Failure Rate (based	<0.62%

	on Rated POH)	
	Width	
	Media Diameter	3.5in; 8.9 cm
	Physical Size	4 in; 10.17cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s [1]
	Buffer	128MB
	Seek Time (typical reads, includes controller overhead, including settling)	
	Single Track	0.7ms [1]
	Average	8.5ms [1]
	Full Stroke	15.7ms [1]
	Rotational Speed	7,200 rpm
	Operating Temperature	41° to 131° F (5° to 55° C)
	Performance	
	Sequential Read	up to 226MB/s[1]
	Sequential Write	up to 226MB/s[1]
	Enterprise Class Features	High Reliability
	[1]Actual performance may vary.	
4TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	4TB
	Protocol	SATA
	Form Factor	3.5"
	Controller	AHCI
	Reliability	2.0M Hours
	Rated Power On Hours	8760/yr
	Annualized Failure Rate (based on Rated POH)	<0.62%
	Width	
	Media Diameter	3.5in; 8.9 cm
	Physical Size	4 in; 10.17cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s [1]
	Buffer	128MB
	Seek Time (typical reads, includes controller overhead, including settling)	
	Single Track	0.7ms [1]

Technical Specifications - Storage Drives

	Average	8.5ms [1]
	Full Stroke	15.7ms [1]
	Rotational Speed	7,200 rpm
	Operating Temperature	41° to 131° F (5° to 55° C)
	Performance	
	Sequential Read	up to 226MB/s[1]
	Sequential Write	up to 226MB/s[1]
	Enterprise Class Features	High Reliability

[1]Actual performance may vary.

8TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	8TB
	Protocol	SATA
	Form Factor	3.5"
	Controller	AHCI
	Reliability	2.0M Hours
	Rated Power On Hours	8760/yr
	Annualized Failure Rate (based on Rated POH)	<0.62%
	Width	
	Media Diameter	3.5in; 8.9 cm
	Physical Size	4 in; 10.17cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s [1]
	Buffer	128MB
	Seek Time (typical reads, includes controller overhead, including settling)	
	Single Track	0.7ms [1]
	Average	8.5ms [1]
	Full Stroke	15.7ms [1]
	Rotational Speed	7,200 rpm
	Operating Temperature	41° to 131° F (5° to 55° C)
	Performance	
	Sequential Read	up to 226MB/s[1]
	Sequential Write	up to 226MB/s[1]
	Enterprise Class Features	High Reliability

[1]Actual performance may vary.

Technical Specifications - Storage Drives

12TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	12TB
	Protocol	SATA
	Form Factor	3.5"
	Controller	AHCI
	Reliability	2.0M Hours
	Rated Power On Hours	8760/yr
	Annualized Failure Rate (based on Rated POH)	<0.62%
	Width	
	Media Diameter	3.5in; 8.9 cm
	Physical Size	4 in; 10.17cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s [1]
	Buffer	128MB
	Seek Time (typical reads, includes controller overhead, including settling)	
	Single Track	0.7ms [1]
	Average	8.5ms [1]
	Full Stroke	15.7ms [1]
	Rotational Speed	7,200 rpm
	Operating Temperature	41° to 131° F (5° to 55° C)
	Performance	
	Sequential Read	up to 226MB/s[1]
	Sequential Write	up to 226MB/s[1]
	Enterprise Class Features	High Reliability

[1]Actual performance may vary.

Technical Specifications - Graphics

AMD Radeon™ Pro W7900 48GB	**Form Factor**	Double slot, full-height, 11" length
	Graphics Controller	Power: 295 Watts Cooling Solution: Active Fan Heatsink
	Bus Type	PCI Express 4.0 x 16
	Memory	48GB GDDR6 Memory Memory Bandwidth: 864 GB/s Memory Width: 384 bit
	Connectors	3x DisplayPort 2.1 1x Enhanced Mini DisplayPort 2.1 Requires 2x 8-pin auxiliary power connectors
	Max simultaneous displays	12288x6912 @ 120Hz
	Available Graphics Drivers	Windows 11 Windows 10 Linux® 64-bit
NVIDIA® RTX™ A400 4GB	**Form Factor**	Half Height Single Slot (2.7" Height x 6.4" Length)
	Graphics Controller	Max Power: 50 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 8
	Memory	4GB GDDR6 Memory Bandwidth: 96 GB/s Memory Width: 64-bit
	Connectors	4x Mini DisplayPort 1.4a
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® RTX™ A1000 8GB	**Form Factor**	Half Height Single Slot (2.7" Height x 6.4" Length)
	Graphics Controller	

Technical Specifications - Graphics

		Max Power: 50 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 8
	Memory	4GB GDDR6 Memory Bandwidth: 96 GB/s Memory Width: 128-bit
	Connectors	4x Mini DisplayPort 1.4a
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® RTX™ 2000 Ada 16GB	**Form Factor**	Half Height Dual Slot (2.7" Height x 6.7" Length)
	Graphics Controller	
		Max Power: 70 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 8
	Memory	16GB GDDR6 Memory Bandwidth: 224 GB/s Memory Width: 128-bit
	Connectors	4x Mini DisplayPort 1.4a
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html

Technical Specifications - Graphics

NVIDIA® RTX™ 4000 Ada 20GB	**Form Factor**	Full-Height Single Slot (4.4” Height x 9.5” Length)
	Graphics Controller	Max Power: 130 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 16
	Memory	20GB GDDR6 Memory Bandwidth: 360 GB/s Memory Width: 256-bit
	Connectors	4x DisplayPort 1.4a
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® RTX™ 4500 Ada 24GB	**Form Factor**	Full-Height Dual Slot (4.4” Height x 10.5” Length)
	Graphics Controller	Max Power: 210 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 16
	Memory	24GB GDDR6 Memory Bandwidth: 432 GB/s Memory Width: 192-bit
	Connectors	4x DisplayPort 1.4a
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site:

		http://welcome.hp.com/country/us/en/support.html
NVIDIA® RTX™ 5000 Ada 32GB	**Form Factor**	Full-Height Dual Slot (4.4” Height x 13.85” Length)
	Graphics Controller	Max Power: 250 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 16
	Memory	32GB GDDR6 with ECC Memory Bandwidth: 576 GB/s Memory Width: 256-bit
	Connectors	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires CEM 5.0 16-pin auxiliary power adapter
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® RTX™ 5880 Ada 48GB	**Form Factor**	Full-Height Dual Slot (4.4” Height x 10.5” Length)
	Graphics Controller	Max Power: 285 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 16
	Memory	48GB GDDR6 with ECC Memory Bandwidth: 960 GB/s Memory Width: 384-bit
	Connectors	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires CEM 5.0 16-pin auxiliary power adapter
	Max simultaneous	4x 4096 x 2160 @ 120 Hz

Technical Specifications - Graphics

	displays	4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® RTX™ 6000 Ada 48GB	**Form Factor**	Full-Height Dual Slot (4.4” Height x 10.5” Length)
	Graphics Controller	Max Power: 300 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 4.0 x 16
	Memory	48GB GDDR6 with ECC Memory Bandwidth: 960 GB/s Memory Width: 384-bit
	Connectors	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires CEM 5.0 16-pin auxiliary power adapter
	Max simultaneous displays	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	Available Graphics Drivers	Windows 10 64-bit Windows 11 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html

Technical Specifications - Optical and Removable Storage

HP 9.5mm Slim DVD Writer	**Description**	9.5mm height, tray-load	
	Mounting Orientation	Either horizontal or vertical	
	Interface Type	SATA/ATAPI	
	Dimensions (WxHxD)	128 x 9.5 x 127mm	
	Supported Media Types	DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
	Disc Capacity	**DVD-ROM**	8.5 GB DL or 4.7 GB standard
	Access Times	**Full Stroke DVD**	< 200 ms (seek)
		Full Stroke CD	< 200 ms (seek)
	Maximum Data Transfer Rates	**CD ROM Read**	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
		DVD ROM Read	DVD+RW Up to 8X DVD-RW Up to 8X DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X DVD-R Up to 8X
	Access Times	**Full Stroke DVD**	< 230 ms (typical)
		Full Stroke CD	< 220 ms (typical)
	Power	**Source**	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC -< 800 mA typical, <1600 mA maximum
	Operating Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 80%
		Maximum Wet Bulb Temperature	84° F (29° C)
	Operating Systems Supported	Windows 10, Windows 11 Linux®	

Technical Specifications - Optical and Removable Storage

Kit Contents	HP SATA DVD Writer drive, installation guide.	
Weight	0.35 lbs. (0.16 kg)	

HP 9.5mm Slim DVD-ROM Drive	**Description**	9.5mm height, tray-load	
	Mounting Orientation	Either horizontal or vertical	
	Interface Type	SATA / ATAPI	
	Dimensions (WxHxD)	128 x 9.5 x 127mm	
	Supported Media Types	DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
	Disc Capacity	**DVD-ROM**	8.5 GB DL or 4.7 GB standard
	Access Times	**DVD-ROM Single Layer**	< 110 ms (typical)
		CD-ROM Mode 1	< 110 ms (typical)
		Full Stroke DVD	< 230 ms (typical)
		Full Stroke CD	< 220 ms (typical)
	Power	**Source**	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC – <800mA typical, < 1600 mA maximum
	Operating Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 80%
		Maximum Wet Bulb Temperature	84° F (29° C)
	Operating Systems Supported	Windows 10, Windows 11 Linux®	
	Kit Contents	HP SATA DVD Writer drive, installation guide.	

Technical Specifications - Networking and Communications

NETWORKING / COMMUNICATION

Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel® AMT 19.0)	**Connector**	RJ-45
	Cabling	Twisted pair up to 100m
	Controller	Intel® I219LM GbE platform LAN connect networking controller
	Memory	3 KB Tx and 3KB Rx FIFO packet buffer memory
	Data Rates Supported	10/100/1000 Mbps
	Compliance	802.1as/1588, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3i, 802.3u, 802.3z
	Bus Architecture	PCI Express and SMBus
	Data Transfer Mode	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)
	Power Requirement	Requires 3.3V (integrated regulators for core Vdc)
	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex; Half-duplex (not supported for the 1000BASE-T transceiver)
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Management Capabilities	vPro, WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, ACPI, Advanced cable diagnostic, loopback modes, AMT 19 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD)
	Notes	onboard LAN support RDP Wake on LAN function, if some networking device does not support Modern standby feature for WOL limitation, suggest using this Function for alternate solution for WOL G3-S5/ S5/S4/MSC wake. **NOTE1:** NDIS driver limitation and Wind11 OS, I219 switch to NDIS Driver and it only support IPV4 wake from MSC, if using IPV6 can't wake up from MSC. **NOTE2:** S4 can't wake up limitation on the NDIS Driver known issue.
HP 1-Port 1GbE Flex IO NIC	**Connector**	RJ-45 (Single Port)
	Cabling	1GbE over Category 5e (or better) up to 100m
	Controller	Realtek 8153 Ethernet Controller
	Data Rates Supported	10/100/1000 Mbps
	Compliance	802.3 (LAN) 802.3u (100BASE-TX) 802.3ab (1000BASE-T) 802.3x (Ethernet Flow Control) 802.1Q (Virtual LAN) 802.1P Layer 2 Priority Encoding 802.3az (Energy Efficient Ethernet)
	Bus Architecture	USB
	Power Requirement	Requires 3.3V (integrated regulators for core Vdc)

Technical Specifications - Networking and Communications

	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex; Half-duplex
	Network Transfer Rate	1000BASE-T Full-Duplex 100BASE-TX Full-Duplex 100BASE-TX Half-Duplex 10BASE-T Full-Duplex 10BASE-T Half-Duplex
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	1.5 in x 1.5 in. x 0.75 in (3.81 cm x 3.81 cm x 1.9 cm)
	Operating System Driver Support	Windows 11 Windows 10 Linux®
HP 2.5GbE LAN Flex Port	**Connector**	RJ-45 (Single Port)
	Cabling	Twisted Pair Cabling, up to 100 meters, 2.5GbE on CAT 5e UTP and up, 2.5Gbe/1GbE/10Mbps on CAT 5 UTP and up
	Controller	I226
	Data Rates Supported	10/100/1000Mbps and 2.5Gbps BASE-T
	Compliance	IEEE: 802.3 (Ethernet Interface for 2500BASE-T, 1000BASE-T, 100BASE-TX, and 10BASE-TE) 802.1AS-Rev 802.1Q (Virtual LAN) 802.1Qav 802.1Qbu 802.1Qbv 1588 802.1AS-REV 802.1p/Q 802.3br 802.3az (Energy Efficient Ethernet) 802.3x (Ethernet Flow Control) 802.3z CB Certification (International Safety) NRTL UL Certification (North America Safety) FCC Class B (USA) CE (European Union) ICES-003 Class B (Canada) BSMI (Taiwan) VCCI (Japan) KCC (Korea) CTICK (Australia/New Zealand) UKCA (UK) UL (Safety) RoHS (Restricted or Hazardous Substances)
	Bus Architecture	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx and low power states)
	Power Requirement	2.5W
	Network Transfer Mode	Full-duplex; Half-duplex
	Network Transfer Rate	2500BASE-T Full-Duplex 1000BASE-T Full-Duplex 100BASE-TX Full-Duplex 100BASE-TX Half-Duplex 10BASE-T Full-Duplex 10BASE-T Half-Duplex
	Operating System Driver Support	Windows 11 Windows 10 Linux®

Technical Specifications - Networking and Communications

HP 10GBase-T Flex IO	**Connector**	RJ-45 (Single Port)
	Cabling	10GbE over Category 6a (or better) up to 100m 5GbE over Category 5e (or better) up to 100m
	Controller	Marvell AQC113C
	Data Rates Supported	10/100/1000 Mbps and 2.5/5/10 Gbps
	Compliance	802.3-2018 Clauses 55 and 126 802.3az (Energy Efficient Ethernet) 1588 v2 (Precision Clock Synchronization) NBASE-T™ Alliance PHY Specification CB Certification (International Safety) NRTL UL Certification (North America Safety) FCC Class B (USA) CE (European Union) ICES-003 Class B (Canada) BSMI (Taiwan) VCCI (Japan) KCC (Korea) CTICK (Australia/New Zealand) UKCA (UK) UL (Safety) RoHS (Restricted or Hazardous Substances)
	Bus Architecture	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx and low power states)
	Power Requirement	6.5W
	Network Transfer Mode	Full-duplex; Half-duplex
	Network Transfer Rate	10G BASE-T 5G BASE-T 2.5G BASE-T 2.5GBASE-T 1000BASE-T 100BASE-TX 10BASE-T Te
	Operating System Driver Support	Windows 11 Windows 10 Linux®
	Notes	**NOTE:1** Modern standby feature was not support & Suggest Customer use Onboard Lan for Wake event instead of FLEX IO MSC Wake The HP 10GBase-T Flex IO NIC can't support MSC (modern standby)/ S4/S5 wake, suggestion customer can use Onboard Lan RDP wake to replace the MSC Wake instead of FLEX IO MSC Wake & Not support. **NOTE:2** Known issue with connection by FLEX IO module of LAN Cable, sometimes will auto resume in S4/S5 risk or User can manually disabled 10GBase-T FLOEX Wake function by changing the driver (Device Manager) this setting for “Wake from power off state” in Advanced.
HP Flex 1GbE Fiber LC Single Port	**Connector**	1 LC Optical Fiber Port (Little Connector)
	Cabling	Optical Multi Mode Fiber OM2 or better
	Controller	AT-29M2/LC-AF-901
	Data Rates Supported	1GbE
	Compliance	IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.1q VLAN Tagging IEEE 802.1AS

Technical Specifications - Networking and Communications

		IEEE 1588 IEEE 802.3az Energy Efficient Ethernet CB Certification (International Safety) NRTL UL Certification (North America Safety) FCC Class B (USA) CE (European Union) ICES-003 Class B (Canada) BSMI (Taiwan) VCCI (Japan) KCC (Korea) CTICK (Australia/New Zealand) UKCA (UK) UL (Safety) RoHS (Restricted or Hazardous Substances)
	Bus Architecture	USB 3.1 interface, USB 2.0 interface,
	Power Requirement	Requires 3.3V (integrated regulators for core Vdc)
	Power Requirement	Up to 3W
	Notes	It's same locate at FLEX IO location and same as HP 2.5GbE LAN Flex Port and HP 10GBase-T Flex IO and HP 1-Port 1GbE Flex IO NIC
Z2 G1i Single 1Gbps Fiber NIC USB FLY YgritteF Adapter	**Connector**	1 LC Optical Fiber Port (Little Connector)
	Cabling	Optical Multi Mode Fiber OM2 or better
	Controller	AT-29M2/LC-AG-901
	Data Rates Supported	1GbE
	Compliance	IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.1q VLAN Tagging IEEE 802.1AS IEEE 1588 IEEE 802.3az Energy Efficient Ethernet CB Certification (International Safety) NRTL UL Certification (North America Safety) FCC Class B (USA) CE (European Union) ICES-003 Class B (Canada) BSMI (Taiwan) VCCI (Japan) KCC (Korea) CTICK (Australia/New Zealand) UKCA (UK) UL (Safety) RoHS (Restricted or Hazardous Substances)
	Bus Architecture	USB 3.1 interface, USB 2.0 interface,
	Power Requirement	Requires 3.3V (integrated regulators for core Vdc)
	Power Requirement	Up to 3W
	Footnotes	Rear IO of Single FLY USB Fiber Adapter, it's not located at FLEX IO location
NVIDIA® Mellanox® ConnectX-6 DX Dual Port 10/25GbE SFP28 NIC	**Connector**	Dual-port SFP28
	Cabling	Transceiver with Multi-Mode Fiber (OM3 or OM4)
	Controller	ConnectX-6 Dx
	Network Transfer Rates Supported	1/10/25 GbE
	Data Path Width	PCIe Gen4x8
	Power Requirement	19.74W Maximum power available through SFP28 port: 2.5W (each port)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	6.22in. x 2.67in (158mm x 68mm)
	Operating System Driver	Windows 11 64-Bit Linux®

Technical Specifications - Networking and Communications

	Kit Contents	•NVIDIA Mellanox ConnectX-6 SFP28 25GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
	Notes	The NVIDIA® Mellanox® ConnectX-6 NIC can't support MSC (modern standby) / S4 / S5 wake, suggestion customer can use Onboard Lan RDP wake to replace the MSC Wake
HP 25GbE SFP28 LC Fiber Optic Transceiver	**Connector**	LC Fiber Optic Connector
	Cabling	Typically, OM4 or higher MMF LC fiber optic cabling, up to 100m on OM4, up to 70m on OM3
	Data Rates Supported	25Gbps
	Compliance	SFF-8472 and 8431, Hot pluggable SFP+ footprint
	Compatibility	Intended for use with NVIDIA Mellanox ConnectX-6 DX Dual Port 10/25GbE NIC
	Wavelength	850nm
	Kit Contents	25GbE SFP28 Transceiver
HP 10GbE SFP+ SR/SW LC Fiber Optic Transceiver	**Connector**	LC Fiber Optic Connector
	Cabling	Typically, OM4 or higher MMF LC fiber optic cabling, up to 300m on MMF
	Data Rates Supported	10Gbps
	Compliance	SFF-8472 and 8431, Hot pluggable SFP+ footprint
	Compatibility	Intended for use with NVIDIA Mellanox ConnectX-6 DX Dual Port 10/25GbE NIC
	Wavelength	850nm
	Kit Contents	10GbE SFP+ Transceiver
Intel® X550-T2 2-Port 10GbE NIC	**Connector**	Dual-port RJ-45
	Cabling	Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps, 2.5Gbps, or 5Gbps Cat6 (or higher) for 10Gbps up to 55m Cat6a (or higher) for 10Gbps up to 100m
	Controller	Intel® Ethernet Controller X550-AT2
	Network Transfer Rates Supported	10GbE, 5GbE, 2.5GbE, 1GbE, 100MbE
	Data Path Width	PCIe Gen3x4
	Power Requirement	3.9W at 100Mbps 5.5W at 1Gbps 11.2W at 10Gbps
	Operating Temperature	32° to 131° F (0° to 55° C)

Technical Specifications - Networking and Communications

	Dimensions (HxW)	167 mm x 69 mm
	Operating System	Windows 11 64-Bit
	Driver	Windows 10 64-bit Linux®
	Management Capabilities	DMI 2.0 Support, Windows Management Instrumentation (WMI) and SNMP, PXE 2.0 through boot ROM, Multi-mode I/O Virtualization, VxLAN, VMDq, VLAN support with VLAN tag insertion
	Kit Contents	• Intel® X550-T2 2-Port 10GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
	Notes	The Intel® X550-T2 NIC can't support MSC (modern standby) / S4 / S5 wake, suggestion customer can use Onboard Lan RDP wake to replace the MSC Wake
Allied Telesis AT2911T/2-901 Dual Port 1GbE NIC	**Connector**	2 x RJ-45 (Dual Port)
	Cabling	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps up to 100m
	Memory	17 Rx and 16 Tx queues
	Network Transfer Rates Supported	10/100/1000 Mbps
	Compliance	IEEE 802.1p (Quality of Service), IEEE 802.1Q (VLANs), IEEE 802.2 (LLC), IEEE 802.3ac (MAC), IEEE 802.3x (Flow control auto-negotiation), IEEE 802.3z (1000 Base-X), IEEE 802.3ad (Link aggregation), IEEE 802.3ab (10/100/1000T) RoHS, UL, FCC/EN55022 Class A, TUV, EN55024, CE, C-TICK, VCCI
	Bus Architecture	PCIe 2x1
	Data Transfer Mode	PCIe-based interface
	Power Requirement	2.4 Watts (typical)
	Management Capabilities	VLAN support, Link aggregation LACP, Link aggregation smart switch, Failover, Smart Load Balancing (SLB), iSCSI boot support, Windows Management Instrumentation (WMI), PXE 2.1, SNMP
	Kit Contents	Allied Telesis AT-2911T/2-901 Dual Port 1GbE NIC with low-profile bracket attached and standard bracket included
	Notes	The AT2911T/2-9 NIC can't support MSC (modern standby) wake, suggestion customer can use Onboard Lan RDP wake to replace the MSC Wake
Intel® I350-T4 4-Port 1GbE NIC	**Connector**	4x RJ-45 (Quad Port)
	Cabling	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps

Technical Specifications - Networking and Communications

		Cat5e (or higher) for 1Gbps up to 100m
	Controller	Intel® I350
	Memory	Jumbo Frames up to 9.5KB, 8 Tx/Rx Queue pairs per port, Main Internal memory is Error Code Correcting
	Network Transfer Rates Supported	10Mbps, 100Mbps, 1Gbps
	Compliance	IEEE 802.3 auto negotiation, 802.3, 802.3u, 802.3ab, 802.3x, 802.3z, IEEE1588 protocol and 802.1AS implementation, 802.3az EEE
	Power Requirement	5W
	Bus Architecture	PCI Express 2.1 x4
	Data Transfer Mode	PCIe-based interface for active state operation
	Network Transfer Mode	multi-speed, full, and half-duplex
	Network Transfer Rate	10BASE-T 100BASE-Tx 1000BASE-T
	Management Capabilities	WOL, PXE 2.1, UEFI, Power Management Protocol Offload (proxying), MAC Power Management, Active State Power Management, VLAN, ACPI
	Kit Contents	Intel® Ethernet I350-T4V2 4-Port 1Gb NIC with full-height bracket installed Low-profile bracket included
	Notes	The I350-T4 NIC can't support MSC (modern standby) /S4 wake, suggestion customer can use Onboard Lan RDP wake to replace the MSC Wake
Intel® Wi-Fi 6E* AX211 802.11ax, BT 5.3, M.2	**WLAN Standards**	IEEE 802.11a, b, d, e, g, h, i, k, n, r, u, v, w, ac, ax; Fine Timing Measurement based on 802.11-2016, 802.11az HW readiness
	Antenna	2x2 Dual-Band
	Bluetooth Standards	5.3
	Operating Temperature	32° to 122° F (0° to 50° C)
	Interface	M.2 CNVio2
	Dimensions	M.2 2230
	Kit Contents	Not Available

Wi-Fi 6E requires a Wi-Fi 6E router, sold separately, to function in the 6GHz band. Availability of public wireless access points is limited. Wi-Fi 6E is backward compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.
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Technical Specifications - Networking and Communications

Intel® Wi-Fi 7 BE200 802.11be, BT 5.4, M.2	**WLAN Standards**	IEEE 802.11a, b, d, e, g, h, i, k, n, r, u, v, w, ac, ax, be; Fine Timing Measurement based on 802.11-2016, 802.11az HW readiness
	Antenna	2x2 Dual-Band
	Bluetooth Standards	5.4
	Operating Temperature	32° to 122° F (0° to 50° C)
	Interface	M.2: PCIe, USB
	Dimensions	M.2 2230
	Kit Contents	Not Available

Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 7 (802.11BE)
functionality requires Windows 11 24H2, select Intel® processor, and a Wi-Fi 7 router, sold separately.
Wi-Fi 7 is backward compatible with prior 802.11 specs. Available in countries where Wi-Fi 7 is supported.

Date of change	Version History		Description of change
	From v1 to v2		