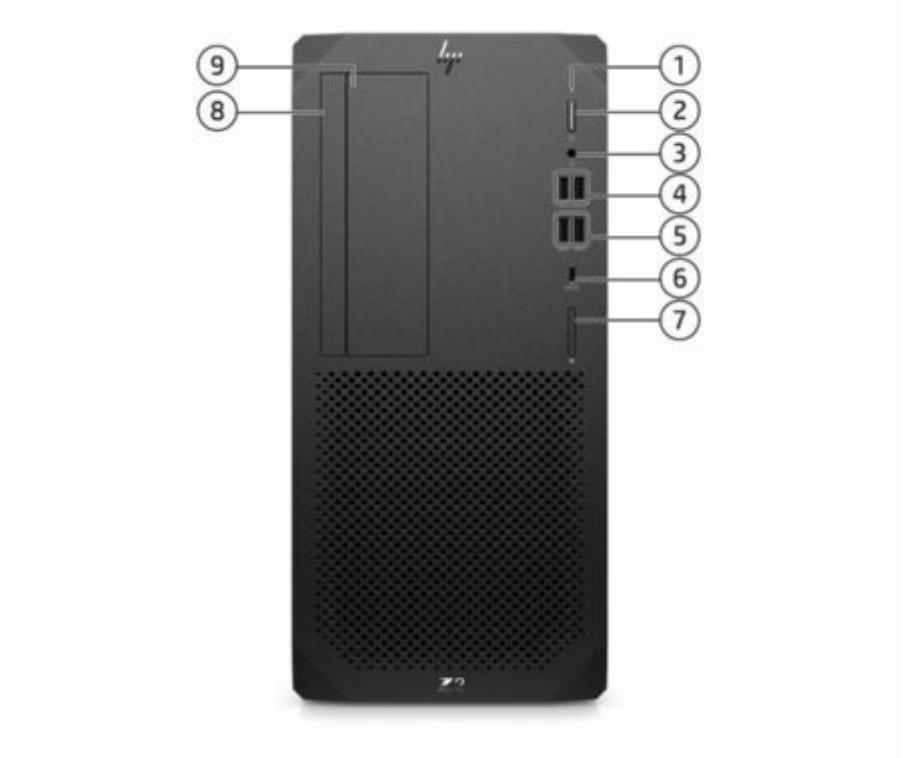
Overview

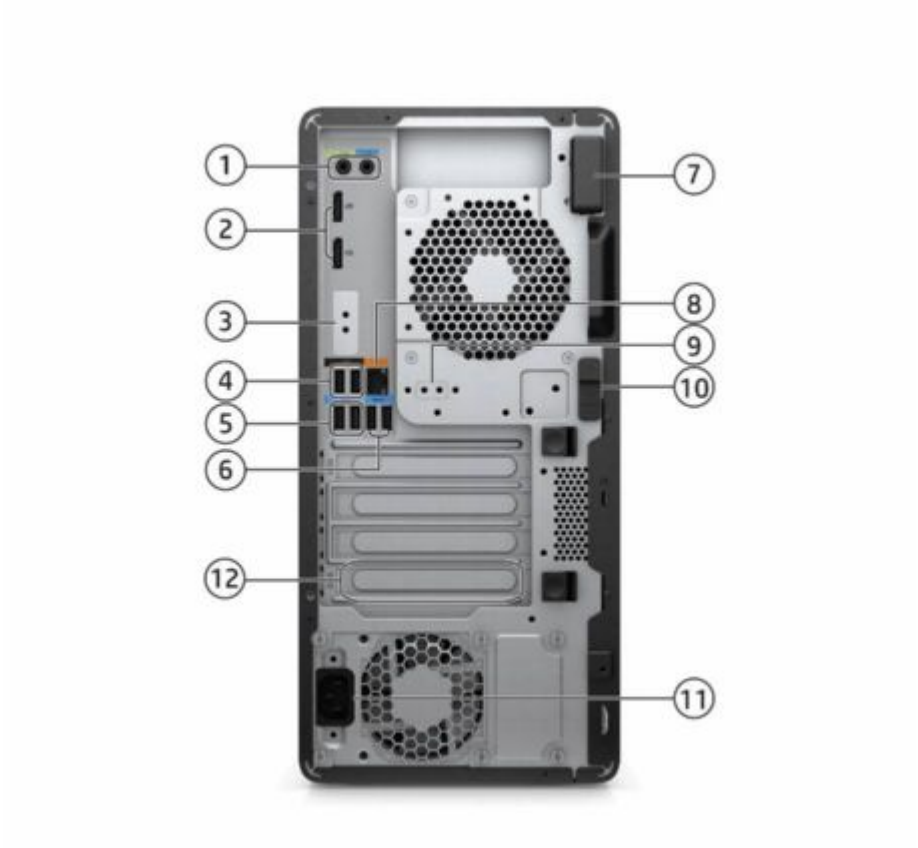
HP Z2 Tower G5 Workstation



front

1. HDD Activity LED
2. Power button
3. Universal audio jack (with CTIA & OMTP headset support)
4. 2 Type-A SuperSpeed USB 5 Gbps signaling rate port (1 charge supports up to 5V/2.1A)
5. 2 Type-A SuperSpeed USB 10Gbps signaling rate port
6. 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (optional, charge supports up to 5V/3A)
7. SD card reader 4.0 (optional)
8. Slim ODD bay
9. External 5.25" bay

Overview



rear

1. 1 Audio Line-in / Audio Line-out
2. 2 DisplayPort™ 1.4*
3. Flex IO modules, choice of:
   VGA, HDMI 2.0b, DisplayPort™ 1.4*, Dual Type-A SuperSpeed USB 5Gbps signaling rate port, 2nd 1GbE LAN, Type-C® SuperSpeed USB 10Gbps signaling rate port (Alt Mode)
4. 2 High-Speed USB 480Mbps signaling rate port
5. 2 Type-A SuperSpeed USB 10Gbps signaling rate port
6. 2 Type-A SuperSpeed USB 5Gbps signaling rate port
7. WLAN antenna (optional)
8. RJ-45
9. 2nd serial port (optional)
10. Hood lock (optional)
11. Power connector
12. Type-C® Thunderbolt™ 3 Dual-port (optional)

Form Factor Tower

Operating Systems

Preinstalled:

- Windows 10 Pro 64[1]
- Windows 10 Pro for Workstations 64[1]
- Windows 10 Home 64[1]
- Linux®-ready[2]

Web-supported only:

- Windows 10 Enterprise 64[1]

Supported Version:

- HP tested Windows 10, version 1809 on this platform. For testing information on newer versions of Windows 10, please see: https://support.hp.com/document/c05195282.

[1] Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or

Overview

separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionalit Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements apply over time for updates. See http://www.windows.com.

NOTE: Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, does not support the Windows® 8 or Windows 7 operating system on products configured with Intel® and AMD 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 H support website. https://support.hp.com/us-en/document/c05195282

All onboard Display support DP1.4/HBR2 when video output is via Intel Graphics.

[2]For detailed OS/hardware support information for Linux, see: http://www.hp.com/support/linux_hardware_ma
NOTE: In accordance with Microsoft's support policy, HP does not support the Windows® 7 operating system on products configured with Intel® 7th Generation and forward processors.

Processors

Name	Cores	Clock Speed (GHz)	Cache (MB)	Memory Speed (MT/s)	Hyper-Threading	Integrated Graphics	Intel® Turbo Boost Technology[3]	Featuring Intel® vPro® Technology[4]	16GB Intel® Optane™ memory[2]	TDP (W)
Intel® Core™ i9-10900K Processor	10	3.7	20	2933	Y	Intel® UHD Graphics 630	5.2	Y	Y	125
Intel® Core™ i9-10900 Processor	10	2.8	20	2933	Y	Intel® UHD Graphics 630	5.1	Y	Y	65
Intel® Core™ i9-10900F Processor	10	2.8	20	2933	Y	N/A	5.1	Y	Y	65
Intel® Core™ i7-10700K Processor	8	3.8	16	2933	Y	Intel® UHD Graphics 630	5.1	Y	Y	125
Intel® Core™ i7-10700 processor	8	2.9	16	2933	Y	Intel® UHD Graphics 630	4.8	Y	Y	65
Intel® Core™ i5-10600K processor	6	4.1	12	2666	Y	Intel® UHD Graphics 630	4.8	Y	Y	125
Intel® Core™ i5-10600 processor	6	3.3	12	2666	Y	Intel® UHD Graphics 630	4.8	Y	Y	65
Intel® Core™ i5-10500 processor	6	3.1	12	2666	Y	Intel® UHD Graphics 630	4.5	Y	Y	65
Intel® Core™ i5-10400 processor	6	2.9	12	2666	Y	Intel® UHD Graphics 630	4.3	Y	Y	65
Intel® Core™ i5-10400F processor6	6	2.9	12	2666	Y	N/A	4.3	Y	Y	65
Intel® Core™ i3-10320 processor6	4	3.8	8	2666	Y	Intel® UHD Graphics 630	4.6	Y	Y	65
Intel® Core™ i3-10300 processor	4	3.7	8	2666	Y	Intel® UHD Graphics 630	4.4	Y	Y	65
Intel® Core™ i3-10100 processor	4	3.60	6	2666	Y	Intel® UHD Graphics 630	4.3	Y	Y	65
Intel® Xeon® W-1290P processor	10	3.7	20	2933	Y	Intel® UHD Graphics P630	5.2	Y	Y	125
Intel® Xeon® W-1290 processor[6]	10	3.2	20	2933	Y	Intel® UHD Graphics P630	5.1	Y	Y	80
Intel® Xeon® W-1270P processor[6]	8	3.8	16	2933	Y	Intel® UHD Graphics P630	5.1	Y	Y	125
Intel® Xeon® W-1270 processor	8	3.4	16	2933	Y	Intel® UHD Graphics P630	5.0	Y	Y	80
Intel® Xeon® W-1250P processor	6	4.1	12	2666	Y	Intel® UHD Graphics P630	4.8	Y	Y	125

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Intel® Xeon® W-1250 processor	6	3.3	12	2666	Y	Intel® UHD Graphics P630	4.7	Y	Y	80

1. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessaril benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware ar software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

2. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system.

3. The specifications shown in the Intel® Turbo Boost Technology column represent the maximum turbo frequency with one core active. boost stepping occurs in 100MHz increments. Processors that do not have turbo functionality are denoted as N/A. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turbobo for more information

4. For full Intel® vPro™ functionality, Windows 10 Pro 64 bit, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or WLAN card and TPM 2.0 are required. Some functionality requires additional 3rd party software in order to run. See http://intel.com/vpro

6. Available in Q4, 2020

Color	Black
Convertibility	No
Expansion Slots (see system board section for more details)	Slot 1: PCIe Gen3 x16 Slot 2: PCIe Gen3 x1 - with x4 Connector Slot 3: PCIe Gen3 x1 - with x4 Connector Slot 4: PCIe Gen3 x4 - with x16 Connector
Expansion Bays (see storage section for more details)	2 internal 3.5" bays 1 external 5.25" bay 1 internal 2.5" bay (for SSD only) 1 dedicated 9.5mm slim optical disk drive bay
Front I/O	2 Type-A SuperSpeed USB 5Gbps signaling rate port, 2 Type-A SuperSpeed USB 10Gbps signaling rate port, 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (optional), 1 SD card reader 4.0 (optional), 1 universal aud jack
Internal I/O	1 Hi-Speed USB 480Mbps signaling rate port
Rear I/O	2 DisplayPort™ 1.4, 1 Audio Line in/out, 1 RJ-45, 2 Hi-Speed USB 480Mbps signaling rate port, 2 Type-A SuperSpeed USB 10Gbps signaling rate port, 2 Type-A SuperSpeed USB 5Gbps signaling rate port, 1 serial port (optional), 1 serial and PS/2 combo (optional), 1 Flex I/O port (choice of VGA, HDMI 2.0b, DisplayPort™ 1.4, Type C® SuperSpeed USB 10Gbps signaling rate port (Alt mode), Dual Type-A SuperSpeed USB 5Gbps signaling rate port, 2nd 1GbE LAN), Thunderbolt™ 3 (40Gbs signaling rate port, optional, cabled to PCIe AIC) **NOTE:** All DisplayPort™ support DP1.4/HBR2 when video output is via Intel Graphics.
Interfaces Supported	SD Media Card Reader (optional)
On-board RAID Support	RAID 0 RAID 1
Chassis Dimensions (H x W x D)	H: 14" [356mm] W: 6.7" [169mm] D: 15.2" [385mm]

Overview

Packaged Dimensions	H: 20.39" (518mm) W: 11.61" (295mm) D: 19.29" (490mm)
Rack Dimensions	5U
Weight	Exact weights depend upon configuration (System weight only). Starting at 7kg (15.43lbs.)
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: 10% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 10% 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	700W wide-ranging, active Power Factor Correction, 92% Efficiency. 500W wide-ranging, active Power Factor Correction, 90% Efficiency. 350W wide-ranging, active Power Factor Correction, 92% Efficiency. **NOTE:** The Power Supply Efficiency Report for the 700W 92% Efficiency, 500W 90% Efficiency and 350W 92% Efficiency Power Supply may be found at the following links: 700W PSU: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2 500W PSU: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2 350W PSU: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2
Backup Devices	For a complete listing of compatible DAT tape drives, LTO tape drives and RDX Removable Disk Backup System offerings, please visit http://www.hp.com/go/connect
Chipset	Intel® W480 chipset

Supported Components

Processors	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
10th Generation Intel Core Processors[1]				
Intel Core i9-10900K processor	Y	N		
Intel Core i9-10900 processor	Y	N		
Intel Core i9-10900F processor	Y	N		1
Intel Core i7-10700K processor	Y	N		
Intel Core i7-10700 processor	Y	N		
Intel Core i5-10600K processor	Y	N		
Intel Core i5-10600 processor	Y	N		
Intel Core i5-10500 processor	Y	N		
Intel Core i5-10400 processor	Y	N		
Intel Core i5-10400F processor	Y	N		1
Intel Core i3-10320 processor	Y	N		2
Intel Core i3-10300 processor	Y	N		2
Intel Core i3-10100 processor	Y	N		
Intel Xeon W Processors				
Intel Xeon W-1290P processor	Y	N		
Intel Xeon W-1290 processor	Y	N		2
Intel Xeon W-1270P processor	Y	N		2
Intel Xeon W-1270 processor	Y	N		
Intel Xeon W-1250P processor	Y	N		
Intel Xeon W-1250 processor	Y	N		

[1]These processors support only non-ECC memory
NOTE 1: No iGfx. A discrete graphics card must be purchased at the same time. Avaialble in Q4, 2020
NOTE 2: Available in Q4, 2020

SATA Hard Drives	Factory Configured	Option Kit	Option Kit Part Number
500GB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ036AA
1TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ037AA
2TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y		
1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	W0R10AA
2TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	2Z274AA
4TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	K4T76AA
8TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	2Z273AA
500GB SATA 7.2K SED SFF HDD	Y	Y	D8N29AA

Supported Components

SATA Solid State Drives	HP 256GB SATA 6Gb/s SSD	Y		A3D26AA
	HP 512GB SATA 6Gb/s SSD	Y		D8F30AA
	HP 1TB SATA 6Gb/s SSD	Y		F3C96AA
	HP 2TB SATA 6Gb/s SSD	Y		Y6P08AA/AT
	HP 256GB SATA 6Gb/s SED Opal 2 SSD	Y		G7U67AA
	HP 512GB SATA 6Gb/s SED Opal 2 SSD	Y		N8T26AA
PCIe Solid State Drives	**PCIe SSDs for HP Workstations**			
	HP ZTurbo 1TB TLC Z2 G5 TWR/SFF SSDKit	Y	Y	141L5AA/AT
	HP ZTurbo 256GB SED Z2 G5 TWR/SFF SSDKit	Y	Y	141L8AA/AT
	HP ZTurbo 256GB TLC Z2 G5 TWR/SFF SSDKit	Y	Y	141L7AA/AT
	HP ZTurbo 2TB TLC Z2 G5 TWR/SFF SSDKit	Y	Y	141M1AA/AT
	HP ZTurbo 512GB SED Z2 G5 TWR/SFF SSDKit	Y	Y	141M3AA/AT
	HP ZTurbo 512GB TLC Z2 G5 TWR/SFF SSDKit	Y	Y	141M5AA/AT

NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 3
reserved for system recovery software.

Hard Drive Controllers		**Factory Configured**	**Option Kit**
	Integrated SATA Controller (Z2 G5)		
	Integrated SATA Controller, RAID 0,1 supported: 4x 6 Gb/s ports	Y	
	Factory integrated RAID on motherboard for SATA drives		
	RAID 0 Data Configuration	Y	
	RAID 1 Data Configuration	Y	
	Factory integrated RAID on motherboard for Z Turbo Drive		
	RAID 0 Boot or Data Configuration	Y	
	RAID 1 Boot or Data Configuration	Y	

NOTE: SATA hardware RAID is not supported on Linux® systems. The Linux® kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. All drives must be identical in type and capacity. Boot volume/RAID array must be less than 2 TB
NOTE: Requires identical drives (speeds, capacity, and interface).
NOTE: The HP Z2 Tower G5 Workstation is capable of configuring up to 2 Z Turbo Drives. By default, the Z Turbo Drive configured will be installed in the M.2 storage slot on the system's motherboard.
NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB (for Windows 10) of system disk is reserved for system recovery software.
NOTE: The HP Z2 Tower G5 Workstation is capable of configuring up to 2 Z Turbo Drives. By

Supported Components

Graphics

	Factory Configured	Option Kit	Option Kit Part Number	Supported # of cards
Graphics Cable Adapters				
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 DisplayPort To DVI-D Adapter	Y	Y	FH973AA	
HP DisplayPort To VGA Adapter	Y	Y	AS615AA	
HP DisplayPort To HDMI True 4k Adapter	Y	y	2JA63AA	
HP Single miniDP-to-DP Adapter Cable	Y	Y	2MY05AA	
Entry 3D				
NVIDIA® Quadro® P400 2GB Graphics	Y	Y	1ME43AA/AT[1]	2
NVIDIA® Quadro® P620 2GB Graphics	Y	Y	3ME25AA/AT[1]	2
Mid-range 3D				
AMD Radeon™ Pro WX 3200 4GB Graphics	Y	Y	6YT68AA/AT[1]	2
NVIDIA® Quadro® P1000 4GB Graphics	Y	Y	1ME01AA/AT[1]	2
NVIDIA® Quadro® P2200 5GB Graphics	Y	Y	6YT67AA/AT	1
High End 3D				
NVIDIA® Quadro® RTX 4000 8GB Graphics	Y	Y	5JV89AA/AT	1
AMD Radeon™ Pro W5500 8GB Graphics[2]	Y	Y	9GC16AA/AT	1
AMD Radeon™ Pro W5700 8GB Graphics[2]	Y	Y	9GC15AA/AT	1
Ultra High-End 3D				
NVIDIA® Quadro® RTX 5000 16GB Graphics	Y	Y	5JH81AA/AT	1
NVIDIA® Quadro® RTX 6000 24GB Graphics	Y	Y	5JH80AA/AT	1

[1] Option kits include 2x miniDP-to-DP adapters
[2] Available in Q4, 2020

Memory

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 4GB (1x4GB) DDR4-3200 nECC UDIMM	Y			2, 3
HP 8GB (2x4GB) DDR4-3200 nECC UDIMM	Y			3
HP 8GB (1x8GB) DDR4-3200 nECC UDIMM	Y			2, 3
HP 8GB (1x8GB) DDR4-3200 ECC UDIMM	Y			1, 2, 3, 4
HP 16GB (2x8GB) DDR4-3200 nECC UDIMM	Y			3
HP 16GB (2x8GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4
HP 16GB (1x16GB) DDR4-3200 nECC UDIMM	Y			2, 3
HP 16GB (1x16GB) DDR4-3200 ECC UDIMM	Y			1, 2, 3, 4
HP 24GB (3x8GB) DDR4-3200 nECC UDIMM	Y			3
HP 24GB (3x8GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4
HP 32GB (4x8GB) DDR4-3200 nECC UDIMM	Y			3
HP 32GB (4x8GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4
HP 32GB (2x16GB) DDR4-3200 nECC UDIMM	Y			3
HP 32GB (2x16GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4

Supported Components

HP 32GB (1x32GB) DDR4-3200 nECC UDIMM	Y			2, 3
HP 32GB (1x32GB) DDR4-3200 ECC UDIMM	Y			1, 2, 3, 4
HP 64GB (4x16GB) DDR4-3200 nECC UDIMM	Y			3
HP 64GB (4x16GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4
HP 64GB (2x32GB) DDR4-3200 nECC UDIMM	Y			3
HP 64GB (2x32GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4
HP 128GB (4x32GB) DDR4-3200 nECC UDIMM	Y			3
HP 128GB (4x32GB) DDR4-3200 ECC UDIMM	Y			1, 3, 4

NOTES:

1 Intel® Xeon processors can support either ECC or non-ECC memory; Intel® Core™> only support non-ECC memory.

2 Two channels of DDR4 memory are supported. To realize full performance at least one DIMM must be insert into each channel.

3 Max transfer rates up to 2933 MT/s

AMO

HP 4GB (1x4GB) DDR4-3200 nECC UDIMM	Y	Y	141J1AA/AT	
HP 8GB (1x8GB) DDR4-3200 nECC UDIMM	Y	Y	141J4AA/AT	
HP 8GB (1x8GB) DDR4-3200 ECC UDIMM	Y	Y	141J3AA/AT	1, 4
HP 16GB (1x16GB) DDR4-3200 nECC UDIMM	Y	Y	141H3AA/AT	
HP 16GB (1x16GB) DDR4-3200 ECC UDIMM	Y	Y	141H2AA/AT	1, 4
HP 32GB (1x32GB) DDR4-3200 nECC UDIMM	Y	Y	141H9AA/AT	
HP 32GB (1x32GB) DDR4-3200 ECC UDIMM	Y	Y	141H7AA/AT	1, 4

1 Intel® Xeon® processors can support either ECC or non-
ECC memory; Intel® Core™> processors only support non-ECC memory.
2 Two channels of DDR4 memory are supported. To realize full performance at least one DIMM must be insert into each channel.
3 The CPUs determine the speed at which the memory is clocked. If a 2666 MT/s capable CPU is used in the sy the maximum speed the memory will run at is 2666 MT/s regardless of the specified speed of the memory.
4 ECC or nECC memory availability depends on processor configuration.

Supported Components

Optical and Removable Storage	Factory Configured	Option Kit	Option Kit Part Number
HP 9.5mm Slim DVD Writer	Y	Y	2ZK26AA
HP DX175 Removable HDD Frame/Carrier	Y	Y	1ZX71AA
HP DX175 Removable HDD Spare Carrier	Y	Y	1ZX72AA
HP SD card reader Z2 TWR	Y	Y	141K3AA/AT
HP 9.5mm Slim BDXL Blu-Ray Writer	Y	Y	K3R65AA
HP 9.5mm Slim DVD-ROM Drive	Y	Y	K3R63AA

NOTE: With Blu-ray, certain disc, digital connection, compatibility and/or performance issues may arise, and do no constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray tit to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD-DVD movies cannot be played on this workstation.
NOTE: HD-DVD disks cannot be played on the DVD-ROM Drive. No support for DVD RAM.

Input Devices	Factory Configured	Option Kit	Option Kit Part Number
HP Premium Wireless Keyboard	Y	Y	Z9N41AA/AT
HP USB 320K Keyboard	Y	Y	9SR37AA
HP USB Business Slim Wired SmartCard CCID Keyboard	Y	N	
HP USB Premium Wired Keyboard PROMO	Y	Y	Z9N40AT
HP 320M Wired Mouse	Y	Y	9VA80AA
HP USB Premium Mouse	Y	Y	1JR32AA
HP Wireless Premium Mouse	Y	Y	1JR31AA
3Dconnexion CADMouse	N	Y	M5C35AA
HP Promo PS/2 Mouse	N	Y	QY775AT
HP Wired Desktop 320MK Mouse and Keyboard	N	Y	9SR36AA

Other Hardware	Factory Configured	Option Kit	Option Kit Part Number
HP Thunderbolt 3 PCIe Card Z2 Tower	Y	Y	141M7AA
HP Z2 Internal Serial Port and PS/2 Port	Y	Y	141K9AA/AT
HP Z2 Power Cord Kit	Y	Y	1N1D5AA
HP Z2 2nd serial port adapter	Y	Y	141K8AA/AT
HP Z2 Tower Dust Filter	Y	Y	141L2AA/AT
HP Z2 Tower Dust Filter and bezel	Y	Y	141L3AA/AT
HP 800/600/400 G3 Serial/ PS/2 Adapter	Y	Y	1VD82AA
HP PCIe x1 Parallel Port Card	Y	Y	N1M40AA
HP DP Flex Port 2020	Y	Y	141J7AA/AT
HP 1GbE LAN Flex Port 2020	Y	Y	141J6AA/AT
HP Dual USB-A 3.2 Gen1 Flex 2020	Y	Y	141J8AA/AT
HP Front USB-C 3.2 Gen2 2020 TWR	Y	Y	141K0AA
HP HDMI Flex Port 2020	Y	Y	141K1AA/AT
HP USB-C 3.2 Gen2 Alt Flex Port 2020	Y	Y	141K6AA/AT

Supported Components

HP VGA Flex Port 2020	Y	Y	141K7AA/AT

Networking and Communications	Factory Configured	Option Kit	Option Kit Part Number
Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro® with Intel® AMT 12.0)	Y	N	
Aquantia AQN-108 1-Port 5GbE NIC	Y	Y	1PM63AA
HP 10GbE SFP+ SR Tranceiver	Y	Y	C3N53AA
Intel Ethernet I350-T4 4-Port 1Gb NIC	Y	Y	W8X25AA
Intel X550 10GBASE-T Dual Port NIC	Y	Y	1QL46AA
Intel X710-DA2 10GbE SFP+ DP NIC	Y	Y	1QL47AA
Intel Ethernet I350-T2 2-Port 1Gb NIC	Y	Y	V4A91AA
Intel® AX201 802.11 a/b/g/n/ac/ax WLAN + Bluetooth 5.0 M.2 NIC	Y	N	

NOTE 1: The integrated network connection is required to support Intel® vPro™ Technology.
NOTE 2: If AMT is provisioned, then network teaming with the integrated LAN port is not possible.
NOTE 3: "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required

Racking and Physical Security	Factory Configured	Option Kit	Option Kit Part Number
HP Z2 Mini and Z2/Z4/Z6 TWR Depth Adjustable Fixed Rail Rack Kit	Y	Y	2A8Y5AA

Software	Factory Configured	Option Kit	Support Notes
HP Performance Advisor	Y	N	1
HP PC Hardware Diagnostics UEFI (Windows OS only)	Y	N	2
HP PC Hardware Diagnostics Windows	Y	N	
ZCentral Remote Boost	Y	N	
HP Sure Sense	Y	N	
HP Notifications	Y	N	
HP Desktop Support Utility	Y	N	
HP Documentation	Y	N	
HP Image Assistant	N	N	
HP Support Assistant	N	N	

1. Supports, and preinstalled with Windows 10 only. Also available as a free download from http://www.hp.com/go/performanceadvisor
2.Windows OS only

Supported Components

Operating Systems

Windows 10 Pro 64

Windows 10 Pro 64 Workstation

Windows 10 Home 64

Linux Ready

1. For detailed OS/hardware support information for Linux, see: http://www.hp.com/support/linux_hardware_matrix

HP BIOS

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Z2 G5 Workstation into the enterprise, such as PXE, remote recovery, remote configuration, remote control, and BIOS (F10) Setup support for 14 languages.
- Network firmware updates – Update your BIOS via the cloud or standardize on a BIOS version hosted on an Enterprise network.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- UEFI specification version 2.6
- Absolute Persistence agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Workstation computer in any enterprise environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Workstation computers, including BIOS updates from within Windows (HP Firmware Update and Recovery), HP Client Manager, and fail-safe recovery. In addition, the HP BIOS Configuration Utility enables replication of BIOS settings within Windows while the Replicated Setup feature provides the same capability within BIOS (F10) Setup. The BIOS Configuration Utility is available from the HP support website.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery.

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
-Wake events other than power buttons (such as wake on LAN)
-USB charging ports

HP Sure Start Gen6

- BIOS Integrity checking – Sure Start protection ensures that only trusted BIOS code is executed and not rootkits, viruses and malware. Verification is done upon boot up, shutdown and while the system is on.
- Sure Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability. Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability.
- Protecting beyond BIOS – Integrity checking and repair is extended to other data that should be protected such as network configuration parameters, platform specific information (i.e. system IDs), secure boot credentials, and other code the system needs to boot.
- Audit enabled – System Audit via Sure Start Event Logs capture data such as incident, repair date and time for troubleshooting and investigating

HP Sure Start Gen6 is available on select HP PCs and requires Windows 10.

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

BIOS
HP BIOSphere Gen6[39]
BIOS Update via Network
HP Secure Erase[40]
Absolute Persistence Module[41]
Pre-boot Authentication
HP Wake on WLAN
HP DriveLock & Automatic DriveLock

Software
HP Support Assistant
HP Image Assistant
HP Desktop Support Utility
HP Documentation
HP Notifications
HP PC Hardware Diagnostics UEFI
HP PC Hardware Diagnostics Windows
HP Performance Advisor[24]
ZCentral Remote Boost[28]

Manageability Features
HP Driver Packs[22]
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Manageability Integration Kit Gen4[23]

Supported Components

Client Security Software
HP Client Security Manager Gen6 [25] including:
(including Credential Manager, HP Password Manager[26], HP Spare Key)
HP Sure Run Gen3[35]
HP Power On Authentication
Microsoft Defender[27]

Security Management
HP Sure Click[38]
HP Sure Start Gen6
HP Sure Sense[29]
HP Sure Recover Gen3[36]

[22] HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
[23] HP Manageability Integration Kit can be downloaded from http://www8.hp.com/us/en/ads/clientmanagement/overview.html
[24] HP Performance Advisor Software - HP Performance Advisor is ready and waiting to help you get the most out of your HP Works from day one—and every day after. Learn more or download at: https://www8.hp.com/us/en/workstations/performance-advisor.ht
[25] HP Client Security Manager Gen6 requires Windows and is available on the select HP Elite and Pro PCs.
[26] HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. may need to enable or allow the add-on / extension in the internet browser.
[27] Microsoft Defender Opt in and internet connection required for updates.
[28] HP Z Central Remote Boost Software does not come preinstalled on Z Workstations but can be downloaded and run on all Z deskt laptops without license purchase. With non-Z sender devices, purchase of perpetual individual license or perpetual floating license per simultaneously executing versions and purchase of ZCentral Remote Boost Software Support is required. Zcentral Remote Boost requ Windows, RHEL (7 or 8), UBUNTU 18.04 LTS, or HP ThinPro 7 operating systems. MacOS (10.13 or newer) operating system is only su on the receiver side. Requires network access. The software is available for download at hp.com/ZCentralRemoteBoost.
[29] HP Sure Sense requires Windows 10 Pro or Enterprise. See product specifications for availability.
[35] HP Sure Run is available on HP Workstation products equipped with 8th generation Intel® or AMD® processors.
[36] HP Sure Recover Gen3 is available on select HP PCs and requires an open network connection. You must back up important files, d photos, videos, etc. before using HP Sure Recover to avoid loss of data.
[38] HP Sure Click requires Windows 10 Pro or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.
[39] HP BIOSphere Gen6 Features may vary depending on the platform and configurations.
[40] HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clea sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.
[41] Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Reco Guarantee is a limited warranty. Certain conditions apply. For full details visit:
http://www.absolute.com/company/legal/agreements/computrace-agreement. Data Delete is an optional service provided by Absolu Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

System Board

System Board Form Factor	Customized PCB
Processor Socket	Single LGA-1200
CPU Bus Speed	DMI
Chipset	Intel® PCH W480
Super I/O Controller	Nuvoton SIO18
Memory Expansion Slots	4 DDR4 memory slots
Memory Type Supported	DDR4, UDIMM (Unbuffered), ECC& non-ECC
Memory Modes	Non-Interleaved for single channel. Interleaved when both channels are populated.
Memory Speed Supported	2933MT/s DDR4
Memory Protection	ECC available on data
Maximum Memory	128GB
Memory Configuration (Supported)	4GB, 8GB 16GB and 32GB non-ECC/8GB, 16GB and 32GB ECC unbuffered DIMMs are supported. ECC and non-E memory DIMMs cannot be mixed in the same system

PCI Express Connectors

- 1 PCI Express Gen3 slot x16 mechanical/ x16 electrical (full height, full length)
- 1 PCI Express Gen3 slot x4 mechanical/ x1 electrical (full height, full length, open-ended)
- 1 PCI Express Gen3 slot x4 mechanical/ x1 electrical (full height, full length, open-ended)
- 1 PCI Express Gen3 slot x16 mechanical/ x4 electrical (full height, full length)
- 2 M.2 2280 Storage (PCIe Gen3 x4)
- 1 M.2 2230 WLAN (PCIe Gen3 x1+ Intel CNVi)

In the PCIe Gen3 (x16 electrical/x16 mechanical) slot, it intent to supported HP certified added in card.

Supported Drive Interfaces	**SATA**	Integrated (4) Serial ATA interfaces (6Gb/s SATA). RAID 0 and 1 supported. Factory integrated RAID for Microsoft Windows only.
	Serial Attached SCSI	None
	Integrated Graphics	Intel® UHD Graphics 630 (on Core i3/i5/i7/i9-10xxx processors); Intel® Integrated Graphics P630 for Xeon 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 4.5 and OpenCL 2.1 on Intel® UHD Graphics P630; 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 4.5 and OpenCL 2.1 on Intel® UHD Graphics P630; 3 DP 1.4 graphics ports integrated in motherboard; Supports up t three simultaneous displays across DisplayPort™/HDMI*/DVI outputs. Max. resolution supported on DP 1.4 ports: 4096x2304 @ 60Hz, 24bpp

System Technical Specifications

	Network Controller	Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 12
	Serial	Yes- requires optional Serial Port Adapter Kit
	2nd Serial	Yes- requires optional Serial Port Adapter Kit
	HD Integrated Audio	Yes
USB Connector(s)	**Front**	2 Type-A SuperSpeed USB 5Gbps signaling rate port (1 charge supports up to 5V/2.1A); 2 Type-A SuperSpeed USB 10Gbps signaling rate port; 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (optional, charge supports up to 5V/3A)
	Rear	2 High-speed USB 480Mbps signaling rate port; 2 Type-A SuperSpeed USB 5Gbps signaling rate port; 2 Type-A SuperSpeed USB 10Gbps signaling rate port; 1 Type-C® SuperSpeed USB 10Gbp signaling rate Alt mode port (optional via Flex)
	Internal	1 High-Speed USB 480Mbps signaling rate port
HD Integrated Audio	Yes	
Flash ROM	Yes	
CPU Fan Header	Yes	
Memory Fan Header	None	
Chassis Fan Header	1 Rear System Chassis Fan Header, 1 Graphic chassis Fan Header.	
Front PCI Fan Header	None	
Front Control Panel/Speaker Header	Yes	
CMOS Battery Holder - Lithium	Yes	
Integrated Trusted Platform Module	Integrated TPM 2.0 Convertible to FIPS 140-2 Certified mode through firmware v7.85 The TPM module disabled where restricted by law, i.e. Russia.	
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	700W EPA92, 500W EPA90 and 350W EPA92	

[1]Maximum memory capacities assume 64-bit operating systems, such as Genuine Windows® 10 Professional 64 bit, Red Hat Linux 64-b bit Windows Operating Systems support up to 4 GB.
[2]M.2 storage supports compatible devices up to 80mm

PCIe Hold-down / Blower Kit Specification

Please refer to section Supported Components - Graphics for supported cards list.

System Technical Specifications

Performance Class	Product Name	Slots space Required	Max Card Count	Number of Cards Require PCIe Hold-down / Blower Kit
High	NVIDIA® Quadro® RTX™ 6000	2	1	1
	NVIDIA® Quadro® RTX™ 5000	2	1	1
	NVIDIA® Quadro® RTX™ 4000	2	1	1
	AMD Radeon™ Pro W5700	2	1	1
Mid-Range	AMD Radeon™ Pro W5500	1	1	1
	NVIDIA® Quadro® P2200	1	2	1
	NVIDIA® Quadro® P1000	1	2	2
	AMD Radeon™ Pro WX 3200	1	2	2
Entry	NVIDIA® Quadro® P620	1	2	2
	NVIDIA® Quadro® P400	1	2	3

NOTE: The PCIe Hold-down / Blower Kit is required for 700W chassis.

System Configurations		
Example Configuration #1	Processor Info	CPU I Core i5-10400 2.9GHz 6C65W
	Memory Info	8GB (1x 8GB) 2666 MHz DDR4 non-ECC
	Graphics Info	Intel® UHD Integrated Graphics 630
	Disks/Optical/Floppy	1x SATA 1TB 7.2k rpm / 1x 9.5mm Slim ODD
	PSU	350W
	Other	

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)	12.3		10.872		11.564	
Windows short Idle (S0)	13.599		12.504		13.423	
Windows Busy Typ (S0)	94.399		92.031		96.542	
Windows Busy Max (S0)	112.35		109.536		114.513	
Sleep (S3)	0.774	0.805	0.766	0.803	0.759	0.808
Off (S5)	0.505	0.504	0.51	0.51	0.512	0.508
Zero Power Mode (EuP)	0.21		0.221		0.276	

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)	41.967		37.095		39.456	
Windows short Idle (S0)	46.399		42.663		45.799	
Windows Busy Typ (S0)	322.089		314.009		329.401	
Windows Busy Max (S0)	383.338		373.736		390.718	
Sleep (S3)	2.64	2.746	2.613	2.739	2.589	2.756
Off (S5)	1.723	1.719	1.74	1.74	1.746	1.733
Zero Power Mode (EuP)	0.716		0.754		0.941	

System Technical Specifications

Example Configuration #2	***Processor Info***	CPU I Core i7-10700 2.9GHz 8C65W
	Memory Info	16GB (2x 8GB) 2666 MHz DDR4 non-ECC
	Graphics Info	P2200 Graphics
	Disks/Optical/Floppy	1x SATA 256GB SSD / 1x 9.5mm Slim ODD
	PSU	500W
	Other	

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)	13.976		13.668		13.856	
	Windows short Idle (S0)	15.331		15.818		15.322	
	Windows Busy Typ (S0)	165.25		147.41		167.52	
	Windows Busy Max (S0)	197.41		183.52		190.23	
	Sleep (S3)	0.843	0.883	0.839	0.871	0.851	0.865
	Off (S5)	0.509	0.506	0.511	0.509	0.512	0.508
	Zero Power Mode (EuP)	0.21		0.222		0.224	

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)	47.686		46.635		47.276	
	Windows short Idle (S0)	52.309		53.971		52.278	
	Windows Busy Typ (S0)	563.883		502.912		571.578	
	Windows Busy Max (S0)	673.562		626.171		649.065	
	Sleep (S3)	2.876	3.012	2.862	2.917	2.903	2.951
	Off (S5)	1.73	1.726	1.743	1.736	1.746	1.733
	Zero Power Mode (EuP)	0.716		0.757		0.764	

Example Configuration #3	***Processor Info***	CPU I Core i9-10900K 3.7GHz 10C125W
	Memory Info	64GB (2x 32GB) 2666 MHz DDR4 ECC
	Graphics Info	RTX2080Ti Graphics
	Disks/Optical/Floppy	1x SATA 512GB SSD
	PSU	700W
	Other	

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)	21.055		20.603		20.826	
	Windows short Idle (S0)	23.714		23.033		23.492	
	Windows Busy Typ (S0)	292.77		284.54		295.32	
	Windows Busy Max (S0)	323.41		310.239		312.456	
	Sleep (S3)	1.36	1.391	1.344	1.371	1.39	1.385
	Off (S5)	0.52	0.511	0.517	0.513	0.519	0.512
	Zero Power Mode (EuP)	0.212		0.223		0.226	

System Technical Specifications

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)	71.839		70.297		71.058	
	Windows short Idle (S0)	80.912		78.588		80.154	
	Windows Busy Typ (S0)	998.931		970.85		1007.631	
	Windows Busy Max (S0)	1103.474		1058.535		1066.099	
	Sleep (S3)	4.64	4.746	4.585	4.677	4.742	4.725
	Off (S5)	1.774	1.743	1.764	1.75	1.77	1.746
	Zero Power Mode (EuP)	0.716		0.76		0.771	

Example Configuration #4	***Processor Info***	CPU Xeon W-1270P 3.8GHz 8C125W
	Memory Info	128GB (4x 32GB) 2666 MHz DDR4 ECC
	Graphics Info	RTX6000 Graphics
	Disks/Optical/Floppy	1x SATA 1TB SSD Z Turbo
	PSU	700W
	Other	

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)	17.623		17.283		17.552	
	Windows short Idle (S0)	19.313		18.848		18.846	
	Windows Busy Typ (S0)	245.58		238.68		248.88	
	Windows Busy Max (S0)	275.45		266.79		272.89	
	Sleep (S3)	0.958	0.869	0.981	0.836	0.965	0.852
	Off (S5)	0.628	0.506	0.623	0.512	0.624	0.509
	Zero Power Mode (EuP)	0.225		0.23		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)	60.129		58.969		70.611	
	Windows short Idle (S0)	65.895		64.309		76.974	
	Windows Busy Typ (S0)	837.918		814.376		987.296	
	Windows Busy Max (S0)	939.835		910.287		1029.821	
	Sleep (S3)	6.762	6.489	6.707	6.213	6.796	6.752
	Off (S5)	2.238	1.729	1.76	1.743	2.125	1.746
	Zero Power Mode (EuP)	0.771		0.794		0.75	

Example Configuration #5	***Processor Info***	CPU Xeon W-1250 3.3GHz 6C80W
	Memory Info	16GB (2x 8GB) 2666 MHz DDR4 ECC
	Graphics Info	RTX5000 Graphics
	Disks/Optical/Floppy	1x SATA 1TB SSD Z Turbo
	PSU	700W
	Other	

System Technical Specifications

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)	17.623		17.283		17.552	
	Windows short Idle (S0)	19.313		18.848		18.846	
	Windows Busy Typ (S0)	245.58		238.68		248.88	
	Windows Busy Max (S0)	275.45		266.79		272.89	
	Sleep (S3)	0.958	0.869	0.981	0.836	0.965	0.852
	Off (S5)	0.628	0.506	0.623	0.512	0.624	0.509
	Zero Power Mode (EuP)	0.225		0.23		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)	60.129		58.969		59.887	
	Windows short Idle (S0)	65.895		64.309		64.302	
	Windows Busy Typ (S0)	837.918		814.376		849.178	
	Windows Busy Max (S0)	939.835		910.287		931.101	
	Sleep (S3)	3.268	2.965	3.347	2.852	3.292	2.907
	Off (S5)	2.258	1.726	2.125	1.749	2.129	1.736
	Zero Power Mode (EuP)	0.767		0.784		0.818	

Operating Voltage Range	90-269 VAC
Rated Voltage Range	100-240 VAC
Rated Line Frequency	50-60 Hz
Operating Line Frequency Range	47-66 Hz
Rated Input Current	8.2A @ 100-240V (700W PSU) 6A @ 100-240V (500W PSU) 4.2A @ 100-240V (350W PSU)
Heat Dissipation	Typical: 444 btu/hr (112 kcal/hr) Maximum: 1484 btu/hr (374 kcal/hr)
Power Supply Fan	70mm x 70mm x 25mm 4-wire PWM
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) **LED**	Yes
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)	Yes
Hood Lock Header	Yes
ErP Lot 6- Tier 1 Compliance @ 230V (<1W in S4/S5 - Power Off)	Yes
ErP Lot 6- Tier 2 Compliance @ 230V (<0.5W in S4/S5 - Power Off)	Yes

System Technical Specifications

Declared Noise Emissions (Entry-level, Mid-level, and High-end configurations; tested on floor)		
System Configuration (Entry level)	**Processor Info**	I5-10600 COMET LAKE G-0 6c 65W MS2 vPro® QS QTLR
	Memory Info	4*Samsung 32GB 2933 nECC DIMM [1]
	Graphics Info	Intel® UHD
	Disks/Optical/PSU	Samsung PM871b 1TB 6Gb/s SSD / No Optical / Chicony 700W PSU

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.24	13.7
	Hard drive Operating (random reads)	3.44	16.9
	Hard drive Operating (active mode)	3.62	15.7

System Configuration (Entry level)	**Processor Info**	W-1250 COMET LAKE WS G-0 6c LGA 80W WE1 vPro® QS QTMD
	Memory Info	4* Samsung 32GB 2933 nECC DIMM [1]
	Graphics Info	NVIDIA® RTX5000
	Disks/Optical /PSU	2*WD 2TB 7200RPM SATA HSS / No Optical / Lite-on 500W PSU

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.47	18.2
	Hard drive Operating (random reads)	3.75	20.4
	Hard drive Operating (active mode)	3.41	22.2

System Configuration (Entry level)	**Processor Info**	I9-10900 COMET LAKE WS P-1 10c LGA 2.8GHz 65W P2 vPro® QUBN
	Memory Info	4*Samsung 4*Samsung 32GB 2933 nECC DIMM [1]
	Graphics Info	Intel® UHD
	Disks/Optical /PSU	1 TB SATA 6Gb/s SSD / No Optical / Chicony 700W PSU

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.24	13.5
	Hard drive Operating (random reads)	3.39	15.8
	Hard drive Operating (active mode)	3.49	15.9

System Configuration (Mid-level)	**Processor Info**	W-1290 COMET LAKE WS P-1 10c 3.2G LGA 80W WE3 vPro® QSK QS QUBT
	Memory Info	4* Samsung 32GB 2933 nECC DIMM [1]
	Graphics Info	NVIDIA® RTX5000
	Disks/Optical /PSU	2*WD 2TB 7200RPM SATA HSS / No Optical / Lite-on 500W PSU

System Technical Specifications

Declared Noise Emissions (accordance with ISO 7779 and ISO 9296)	n	**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.55	16.9
	Hard drive Operating (random reads)	3.72	19.9
	Hard drive Operating (active mode)	3.43	21.5

System Configuration (High-end)	**Processor Info**	I9-10900K COMET LAKE WS P-1 10c LGA 3.7GHz 125W P2K vPro® QUBQ
	Memory Info	4* Samsung 32GB 2933 nECC DIMM [1]
	Graphics Info	NVIDIA® RTX5000
	Disks/Optical/PSU	2*WD 2TB 7200RPM SATA HSS / No Optical / Lite-on 500W PSU

Declared Noise Emissions (accordance with ISO 7779 and ISO 9296)	n	**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.50	18.3
	Hard drive Operating (random reads)	3.88	20.6
	Hard drive Operating (active mode)	3.88	20.8
	Note 1: Transfer rates up to 2933MT/s.		

Environmental Requirements	**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: 10% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 10% 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 **Temperature** for details.
	Shock (non-repetitive)	Operating ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating ½-sine: 160 cm/s, 2-3 ms (~105 g) Non-operating square: 422 cm/s, 20 g
	Vibration	Operating random: 0.5 g (rms), 5-300 Hz, up to 0.0025 g^2/Hz Non-operating random: 2.0 g (rms), 5-500 Hz, up to 0.0150 g^2/Hz

System Technical Specifications

Physical Security and Serviceability

Access Panel	Tool-less Includes system board and memory information
Optical Drive	Tool-less, except for Screw-In carrier
Hard Drives	Tool-less, except for 2.5" bay
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
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	Yes (optional): Locks side cover and locks cables to chassis. Secures chassis from theft and allows multiple u be chained together when used with optional cable Threaded feature at rear of system
Solenoid Lock and Hood Sensor	Yes (optional) The Solenoid Hood Lock eliminates the need for a physical key by making the chassis lockable through softwa a password. You can also lock and unlock the chassis remotely over the network. The Sensor Kit detects whe access panel has been removed.
Rear Port Control Cover	No
CPUs and Heatsinks	A T-15 Torx or flat blade screwdriver is needed to remove the CPU heatsink before the CPU can be removed. 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 T-15 Torx or flat blade screwdriver
PCI Card Retention	Yes, rear (all), middle (optional), front (full-length cards with extender)

Social and Environmental Responsibility

Eco-Label Certifications & Declarations

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

- ENERGY STAR® (energy-saving features available on select configurations-Windows only)
- US Federal Energy Management Program (FEMP)
- China Energy Conservation Program
- IT ECO declaration

Longevity and Upgrading

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

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD

Spare parts are available throughout the warranty period and or for up to "5"? years after the end of product

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC
Batteries used in the product do not contain:
Mercury greater the1ppm by weight
Cadmium greater than 20ppm by weight

Battery size: CR2032 (coin cell)
Battery type: Lithium

Restricted Material Usage

This product meets the material restrictions specified in HP's General Specification for the Environment.
http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf
HP Inc. is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis.

End-of-Life Management and Recycling

HP Inc. 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/recycle or contact your nearest HP sales office. Products returned will be recycled, recovered or disposed of in a responsible manner. This product is greater than 90% recyclable by weight when properly disposed of at end of life.

HP Inc. Corporate Environmental Information

For more information about HP's commitment to the environment:
Living Progress Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html

Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.

ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

Stable & Consistent Offerings

As part of its commitment to hardware, software, and solution innovation, HP is proud to introduce this breakthrough platform configur stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware software designed and tested to work with all HP Z Workstation platforms through their end of life. These components and their corresponding HP Workstation platform compatibility are outlined in this section. HP Stable & Consistent Offerings are available worldwi all HP Workstation customers—no special programs, no additional cost—no kidding. Simply select your hardware and software compon when you customize your HP Workstation and be assured that you'll be able to buy that same configuration throughout the lifecycle of t product.

Processors	Product #	Offering
		Intel Core i3-10100 3.6 4C 65W processor
		Intel Core i5-10500 3.1 6C 65W processor
		Intel Core i5-10600 3.3 6C 65W processor
		Intel Core i7-10700 2.9 8C 65W processor
		Intel Xeon W-1250 3.3 6C 80W processor
		Intel Xeon W-1250P 4.1 6C 125W processor

Hard Drives	Product #	Offering
		1TB 7200RPM SATA 3.5 HDD

Graphics	Product #	Offering
		AMD Radeon™ Pro WX 3200 4GB

Technical Specifications - Processors

10th Generation Intel Core Processors

Intel® Core™ i9-10900K Processor

Intel® Core™ i9-10900 Processor

Intel® Core™ i9-10900F Processor[1]

Intel® Core™ i7-10700K Processor

Intel® Core™ i7-10700 processor

Intel® Core™ i5-10600K processor

Intel® Core™ i5-10600 processor

Intel® Core™ i5-10500 processor

Intel® Core™ i5-10400 processor

Intel® Core™ i5-10400F Processor[1]

Intel® Core™ i3-10320 processor[1]

Intel® Core™ i3-10300 processor[1]

Intel® Core™ i3-10100 processor

Intel Xeon W Processors

Intel Xeon W-1290P processor

Intel Xeon W-1290 processor[1]

Intel Xeon W-1270P processor[1]

Intel Xeon W-1270 processor

Intel Xeon W-1250P processor

Intel Xeon W-1250 processor

NOTE 1: Available in Q4, 2020

Technical Specifications - Hard Drives

SATA Hard Drives for HP Workstations	**500GB SATA 7200 rpm 6Gb/s 3.5" HDD**	**Capacity**	500GB	
		Protocol	SATA	
		Form Factor	3.5"	
		Controller	AHCI	
		Height	1 in; 2.54 cm	
		Width	**Media Diameter**	3.5 in; 8.9 cm
			Physical Size	4 in; 10.17 cm
		Interface	Serial ATA (6.0Gb/s), NCQ enabled	
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s *	
		Buffer	32MB	
		Seek Time (typical reads, includes controller overhead including settling)	**Single Track**	2 ms *
			Average	11 ms *
			Full Stroke	21 ms *
		Rotational Speed	7,200 rpm	
		Logical Blocks	976,773,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	
		*Actual performance may vary.		
	1TB SATA 7200 rpm 6Gb/s 3.5" HDD	**Capacity**	1TB	
		Protocol	SATA	
		Form Factor	3.5"	
		Controller	AHCI	
		Height	1 in; 2.54 cm	
		Width	**Media Diameter**	3.5 in; 8.9 cm
			Physical Size	4 in; 10.17 cm
		Interface	Serial ATA (6.0Gb/s), NCQ enabled	
		Synchronous Transfer Rate (Maximum)	Up to 600 MB/s *	
		Buffer	64MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms *
			Average	11 ms *
			Full Stroke	21 ms *
		Rotational Speed	7,200 rpm	
		Logical Blocks	1,953,525,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	
		*Actual performance may vary.		

Technical Specifications - Hard Drives

2TB SATA 7200 rpm 6Gb/s 3.5" HDD	**Capacity**	2TB	
	Protocol	SATA	
	Form Factor	3.5"	
	Controller	AHCI	
	NAND Type	3D TLC	
	Endurance	400TBW (TB Written)	
	Height	1 in; 2.54 cm	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0 Gb/s), NCQ Enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s *	
	Buffer	64MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms *
		Average	11 ms *
		Full Stroke	21 ms *
	Rotational Speed	7,200 rpm	
	Logical Blocks	3,907,029,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
	*Actual performance may vary.		
1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	1TB	
	Height	1 in; 2.54 cm	
	Protocol	SATA	
	Form Factor	3.5"	
	Controller	AHCI	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0 Gb/s), NCQ Enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s *	
	Buffer	128MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.32ms*
		Average	7.45ms*
		Full Stroke	14.2ms*
	Rotational Speed	7,200 rpm	
	Logical Blocks	3,907,029,168	
	Operating Temperature	41° to 140° F (5° to 60° C)	
	*Actual performance may vary.		

Technical Specifications - Hard Drives

1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	1TB	
	Protocol	SATA	
	Form Factor	3.5"	
	Controller	AHCI	
	Reliability (MTBF)	2.0M hours	
	Rated Power On Hours	8760/yr	
	Annualized Failure Rate (based on Rated POH)	<0.62%	
	Rated for 24/7/365 operation		
	Physical Size (Height)	1 in; 2.54 cm	
	Physical Size (Width)	4 in; 10.17 cm	
	Media Diameter	3.5 in; 8.9 cm	
	Interface	Serial ATA (6Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s*	
	Buffer	128MB	
	Cache	Adaptive	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.32ms*
		Average	7.45ms*
		Full Stroke	14.2ms*
	Rotational Speed	7,200 rpm	
	Operating Temperature	41° to 131° F (5° to 55° C)	
	Performance	**Sequential Read**	up to 226MB/s*
		Sequential Write	up to 226MB/s*
	Enterprise Class Features	High Reliability	
	*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 (MTBF)	2.0M hours	
	Rated Power On Hours	8760/yr	
	Annualized Failure Rate (based on Rated POH)	<0.62%	
	Rated for 24/7/365 Operation		
	Physical Size (Height)	1 in; 2.54 cm	
	Physical Size (Width)	4 in; 10.17 cm	
	Media Diameter	3.5 in; 8.9 cm	
	Interface	Serial ATA (6Gb/s), NCQ enabled	

	Synchronous Transfer Rate (Maximum)	Up to 600MB/s*	
	Buffer	128MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.7ms*
		Average	8.5ms*
		Full Stroke	15.7ms*
	Operating Temperature	41° to 131° F (5° to 55° C)	
	Performance	**Sequential Read**	up to 226MB/s*
		Sequential Write	up to 226MB/s*
	Enterprise Class Features	High Reliability	

*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%	
	Rated for 24/7/365 Operation		
	Physical Size (Height)	1 in; 2.54 cm	
	Physical Size (Width)	4 in; 10.17 cm	
	Media Diameter	3.5 in; 8.9 cm	
	Physical Size	4 in; 10.17 cm	
	Interface	Serial ATA (6Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s*	
	Buffer	256MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.7ms*
		Average	8.5ms*
		Full Stroke	15.7ms*
	Operating Temperature	41° to 131° F (5° to 55° C)	
	Performance	**Sequential Read**	up to 226MB/s*
		Sequential Write	up to 226MB/s*
	Enterprise Class Features	High Reliability	

*Actual performance may vary.

Technical Specifications - Hard Drives

8TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	**Capacity**	500GB	
	Protocol	SATA	
	Form Factor	3.5"	
	Controller	AHCI	
	Reliability	2.0M hours	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s [1]	
	Buffer	256MB	
	Seek Time (typical reads, includes controller overhead including settling)	**Single Track**	0.7ms*
		Average	8.5ms*
		Full Stroke	15.7ms*
	Rotational Speed	7,200 rpm	
	Operating Temperature	32° to 140° F (0° to 60° C)	
	Performance	**Sequential Read**	up to 226MB/s[1]
		Sequential Write	up to 226MB/s[1]
	Enterprise Class Features	High Reliability	
	*Actual performance may vary.		

500GB SATA 7.2K SED 2.5" HDD	**Capacity**	500GB	
	Protocol	SATA	
	Form Factor	2.5"	
	Height	0.275 in; 0.7 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	2.75 in; 6.99 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s*	
	Buffer	64MB	
	Seek Time (typical reads, includes controller overhead including settling)	**Single Track**	1ms*
		Average	4.2ms*
		Full Stroke	25ms (Typical)*
	Rotational Speed	7,200 rpm	
	Operating Temperature	32° to 131° F (0° to 60° C)	
	Self-Encrypting Drive Support	Yes	
	*Actual performance may vary.		

Technical Specifications - Hard Drives

HP 256GB SATA 6Gb/s SSD	**Capacity**	256GB
	Protocol	SATA
	Form Factor	2.5"
	Height	0.28 in; 0.7 cm
	Width	**Physical Size**
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequential Read)*
	Operating Temperature	32° to 158° F (0° to 70° C)
	*Actual performance may vary.	

HP 512GB SATA 6Gb/s SSD	**Capacity**	512GB
	Protocol	SATA
	Form Factor	2.5"
	Height	0.28 in; 0.7 cm
	Width	**Physical Size**
	Interface	6Gb/s SATA
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequential Read)*
	Operating Temperature	32° to 158° F (0° to 70° C)
	*Actual performance may vary.	

HP 1TB SATA 6Gb/s SSD	**Capacity**	1TB
	Protocol	SATA
	Form Factor	2.5"
	Height	0.28 in; 0.7 cm
	Width	**Physical Size**
	Interface	SATA 6Gb/s
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequential Read)*
	Operating Temperature	32° to 158° F (0° to 70° C)
	*Actual performance may vary.	

HP 1TB SATA 6Gb/s SSD	**Capacity**	1TB	
	Height	0.28 in; 0.7 cm	
	Width	**Physical Size**	2.5 in; 6.36 cm
	Interface	6Gb/s SATA	
	Synchronous Transfer Rate (Maximum)	Up to 500MB/s (Sequential Read)*	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	*Actual performance may vary.		

Technical Specifications - Hard Drives

HP 2TB SATA 6Gb/s SSD	**Capacity**	2TB
	Protocol	SATA
	Form Factor	2.5"
	Height	0.28 in; 0.7 cm
	Width	**Physical Size**
	Interface	SATA 6Gb/s
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequential Read)*
	Operating Temperature	32° to 158° F (0° to 70° C)
	*Actual performance may vary.	
HP 256GB SATA 6Gb/s SED Opal 2 SSD	**Capacity**	256GB
	Protocol	SATA
	Form Factor	2.5"
	Height	0.28 in; 0.7 cm
	Width	**Physical Size**
	Interface	SATA 6Gb/s
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequential Read)*
	Operating Temperature	32° to 158° F (0° to 70° C)
	Self-Encrypting Drive Support	OPAL2
	*Actual performance may vary.	
HP 512GB SATA 6Gb/s SED Opal 2 SSD	**Capacity**	512GB
	Protocol	SATA
	Form Factor	2.5"
	Endurance	400TBW (TB Written)
	Reliability	1.5M Hours
	Height	0.28 in; 0.7 cm
	Width	**Physical Size**
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequential Read)*
	Operating Temperature	32° to 158° F (0° to 70° C)
	Self-Encrypting Drive Support	OPAL2
	*Actual performance may vary.	

Technical Specifications - Hard Drives

HP Z Turbo Drv 256GB TLC PCIe SSD (Z2G5)	**Capacity**	256GB	
	Protocol	PCIe	
	Form Factor	M.2 in native Slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	75TBW (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**	2800MB/s*
		Sequential Write	1100MB/s*
		Random Read	250K IOPS*
		Random Write	180K IOPS*

*Actual performance may vary.

HP 256GB SATA 6Gb/s SED Opal 2 SSD	**Capacity**	256GB	
	Protocol	PCIe	
	Form Factor	M.2 in native slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	200TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 electrical x4 physical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3500 MB/s*
		Sequential Write	2200 *
		Random Read	240K IOPS*
		Random Write	480K IOPS*

*Actual performance may vary.

Technical Specifications - Hard Drives

HP Z Turbo Drv 512GB TLC PCIe SSD (Z2G5)	**Capacity**	512GB	
	Protocol	PCIe	
	Form Factor	M.2 in native Slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	150TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	2800MB/s*
		Sequential Write	1600MB/s*
		Random Read	260K IOPS*
		Random Write	260K IOPS*
	*Actual performance may vary.		
HP Z Turbo Drv 1TB TLC PCIe SSD (Z2G5)	**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 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3000MB/s*
		Sequential Write	1700MB/s*
		Random Read	360K IOPS*
		Random Write	330K IOPS*
	*Actual performance may vary.		

Technical Specifications - Hard Drives

HP Z Turbo Drv 2TB TLC PCIe SSD (Z2G5)	**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 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3000MB/s*
		Sequential Write	2100MB/s*
		Random Read	320K IOPS*
		Random Write	265K IOPS*
	*Actual performance may vary.		
HP Z Turbo Drv 256GB TLC PCIe SED OPAL2 (Z2G5)	**Capacity**	256GB	
	Protocol	PCIe	
	Form Factor	M.2 in native Slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	75TBW (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**	2800MB/s*
		Sequential Write	1100MB/s*
		Random Read	250K IOPS*
		Random Write	180K IOPS*
	Self-Encrypting Drive Support	OPAL2	
	*Actual performance may vary.		

Technical Specifications - Hard Drives

HP Z Turbo Drv 512GB TLC PCIe SED OPAL2 (Z2G5)	**Capacity**	512GB	
	Protocol	PCIe	
	Form Factor	M.2 in native Slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	150TBW (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**	2800MB/s*
		Sequential Write	1600MB/s*
		Random Read	260K IOPS*
		Random Write	260K IOPS*
	Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.

HP Z Turbo Drv 1TB TLC PCIe SED OPAL2 (Z2G5)	**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 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3000MB/s*
		Sequential Write	1700MB/s*
		Random Read	360K IOPS*
		Random Write	330K IOPS*
	Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.

Technical Specifications - Hard Drives

HP Z Turbo Drv 2TB TLC PCIe SED OPAL2 (Z2G5)	**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 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3000MB/s*
		Sequential Write	2100MB/s*
		Random Read	320K IOPS*
		Random Write	265K IOPS*
	Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.

Technical Specifications - Graphics

Integrated Intel® UHD Graphics (Z2 G5)	**Form Factor**	Integrated in select Intel® Xeon® E, Intel® Core™ i7, and Intel® Core™ i5 processors. Check specific platform specifications for selections.
	Graphics Controller	Intel® UHD Graphics
	Memory	Unified Memory Architecture (UMA) frame buffer. Graphics memory is shared with system memory. Size selectable between 64 MB to 1024 MB via BIOS setting. Default size is 64 MB. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (Intel® DVMT 5.0), to provide an optimal balance between graphics and system memory use.
	Connectors	Check system platform specifications where Intel® UHD Graphics are available.
	Maximum Resolution	Display Port: 4096 x 2160 HDMI: 4096 x 2160 DVI: 1920x1200 VGA: 2048x1536 **NOTE:** For HDMI, DVI and VGA outputs, separate adapters may be required.
	Shading Architecture	Shader Model 6 compiler support
	Supported Graphics APIs	OpenGL 4.54 DirectX 12
	Available Graphics Drivers	Windows 10

NVIDIA® Quadro® P400 2GB Graphics	**Form Factor**	Single Slot, Low Profile (2.713"? H x 5.7"? L)
	Graphics Controller	NVIDIA® Quadro® P400 Graphics Card Max Power: 30 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 2 GB GDDR5
	Maximum Resolution	DisplayPort™ 1.4: - up to 3x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Output	3 mDP (Mini DisplayPort™) 1.4 Connectors
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA, OpenCL 1.x
	Available Graphics Drivers	Microsoft Windows 10 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
	Notes	*P400, P620 and P1000 only have mini-DisplayPort™> (mDP) video ports. **Note 1:** AMO kits for P400, P1000 and Adapters

- Two mDP-to-DP Adapters are included in the P400, P620 and P1000 AMO kits.
- If more mDP-to-DP Adapters are needed, Adapters can be ordered separately:
  - 2MY05AA HP Single miniDP-to-DP Adapter Cable
  - 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

NVIDIA® Quadro® P620 2GB Graphics	**Form Factor**	Single slot, Low Profile (2.713"? H x 5.7"? L)
	Graphics Controller	NVIDIA® Quadro® P620 Max. Power: 40W Cooling Solution: Active fan heatsink
	Bus Type	PCI Express x16
	Memory	Size: 2GB DDR5
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Display Outputs	4 mDP (Mini DisplayPort™) 1.4 Connectors
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA, OpenCL 1.x
	Available Graphics Drivers	Microsoft Windows 10 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or the latest HP qualified drivers are available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
	Notes	*P400, P620 and P1000 only have mini-DisplayPort™ (mDP) video ports. **Note 1:** AMO kits for P400, P620, P1000 and Adapters • Two mDP-to-DP Adapters are included in the P400, P620 and P1000 AMO kits. • If more mDP-to-DP Adapters are needed, Adapters can be ordered separately: - 2MY05AA HP Single miniDP-to-DP Adapter Cable - 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

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Technical Specifications - Graphics

AMD Radeon™ Pro WX 3200 4GB Graphics	**Form Factor**	Low-Profile Single Slot (2.75 "H x 6.6"? L)
	Graphics Controller	Radeon™ Pro WX 3200 Power: 56 Watts Cooling Solution: Active fan heatsink
	Memory	4GB GDDR5 memory
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 4096 x 2160 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Display Outputs	4 mDP (Mini DisplayPort™) 1.4 Connectors
	Supported Graphics APIs	DirectX® 12 OpenGL® 4.6 OpenCL™ 2.0 Vulkan™ 1.0
	Available Graphics Drivers	Windows 10 64-bit (Windows® 7 64-bit available from AMD) 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
	Notes	1. HDR content requires that the system be configured with a fully HD ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content require operating system support. 2. WX 3200 only has mini-DisplayPort™ (mDP) video ports. Two mDP to-DP Adapters are included in the WX 3200 AMO kit. If more mDP-t DP Adapters are needed, Adapters can be ordered separately: • 2MY05AA HP Single miniDP-to-DP Adapter Cable • 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

AMD Radeon™ Pro W5500 8GB Graphics	**Form Factor**	Single slot, full-height, 9.5"? length
	Graphics Controller	Radeon™ Pro W5500 Power: 120 Watts Cooling Solution: Active Fan Heatsink
	Memory	8GB GDDR6
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Outputs	DisplayPort™ 1.4 Connectors FreeSync support
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Supported Graphics APIs	DirectX® 12 (12_1) OpenGL® 4.6 OpenCL™ 2.0 Vulkan™ 1.1
	Available Graphics Drivers	Windows 10 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® Quadro® P1000 4GB Graphics	**Form Factor**	Single Slot, Low Profile, Dimensions:2.713"? H x 5.7"? L Cooling: Active
	Graphics Controller	NVIDIA® Quadro® P1000 47 Watts Cooling Solution: Active Fan Heatsink
	Bus Type	PCI Express 3.0 x16
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Output	4 mDP 1.4 Connectors
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA, OpenCL 1.x
	Available Graphics Drivers	Microsoft Windows 10 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
	Notes	*P400, P620 and P1000 only have mini-DisplayPort™ (mDP) video ports. **Note 1:** AMO kits for P400, P620, P1000 and Adapters • Two mDP-to-DP Adapters are included in the P400, P620 and P1000 AMO kits. • If mDP-to-DP Adapters are needed, Adapters can be ordered separately: - 2KW86A6 - HP (Bulk 4) miniDP-to-DP Adapter Cables - 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

Technical Specifications - Graphics

NVIDIA® Quadro® P2200 5GB Graphics	**Form Factor**	Single Slot, Full Height (4.4"?H x 7.9"?L) Weight: 260 grams
	Graphics Controller	NVIDIA® Quadro® P2200 Power: 75 Watts Cooling Solution: Active Fan Heatsink
	Bus Type	PCI Express 3.0 x16
	Memory	5GB GDDR5X
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Output	4 DisplayPort™ 1.4
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Supported Graphics APIs	OpenGL® 4.5 DirectX® 12 Vulcan 1.0 API support includes: CUDA, OpenCL 1.x
	Available Graphics Drivers	Microsoft Windows 10 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

AMD Radeon™ Pro W5700 8GB Graphics	**Form Factor**	Full-Height Dual Slot (10.5"? Length)
	Graphics Controller	Radeon™ Pro W5700 Power: 210 Watts Cooling Solution: Active Fan Heatsink
	Memory	8GB GDDR6
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Output	4 DisplayPort™ 1.4 Outputs FreeSync support
	Supported Graphics APIs	DirectX® 12 (12_1) OpenGL® 4.6 OpenCL™ 2.0 Vulkan™ 1.0
	Available Graphics Drivers	Windows 10 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® Quadro® RTX 4000 8GB Graphics	**Form Factor**	Full-Height Single Slot (4.4"? Height x 9.5"? Length)
	Graphics Controller	NVIDIA® Quadro® RTX 4000 Power: 160 Watts Cooling Solution: Active Fan Heatsink
	Memory	8GB GDDR6
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Outputs[1]	3x DisplayPort™1.4a and VirtualLink[2]
	Supported Graphics APIs	DirectX®12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0 Additional API support includes: CUDA OpenCL™ 1.x
	Available Graphics Drivers	Windows® 10 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
	Notes	1- Supports up to a total of 4 displays 2- VirtualLink's USB-C™ (data) cannot be disabled at a hardware level

NVIDIA® Quadro® RTX 5000 16GB Graphics	**Form Factor**	Full-Height Dual Slot (4.4"? Height x 10.5"? Length)
	Graphics Controller	NVIDIA® QUADRO® RTX 5000 Power: 265 Watts Cooling Solution: Active Fan Heatsink
	Memory	16GB GDDR6
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Outputs	4x DisplayPort™ 1.4 and VirtualLink[2]
	Supported Graphics APIs	DirectX®12, OpenGL® 4.5 Additional API support includes: CUDA, OpenCL™
	Available Graphics Drivers	Windows® 10 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 Factory Configured: No adapters included After market option kit: No adapters included *VirtualLink's USB-C™ (data) cannot be disabled at a hardware level

Technical Specifications - Graphics

NVIDIA® Quadro® RTX 6000 24GB Graphics	**Form Factor**	Full-Height Dual Slot (4.4"? Height x 10.5"? Length)
	Graphics Controller	NVIDIA® QUADRO® RTX 6000 Power: 295 Watts Cooling Solution: Active Fan Heatsink
	Memory	24GB GDDR6
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Outputs	4x DisplayPort™ 1.4 and VirtualLink[2]
	Supported Graphics APIs	DirectX®12, OpenGL® 4.5, Vulcan 1.0 Additional API support includes: CUDA, OpenCL™ 1.x
	Available Graphics Drivers	Windows® 10 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 Factory Configured: No adapters included After market option kit: No adapters included *VirtualLink's USB-C™ (data) cannot be disabled at a hardware level

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
	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 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat® Enterprise Linux® (RHEL) 6, 7 Desktop/Workstation SUSE Linux® Enterprise Desktop 12	
	Kit Contents	HP SATA DVD Writer drive, installation guide.	
	Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT	

Technical Specifications - Optical and Removable Storage

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	
	Disc Capacity	**DVD-ROM**	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	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 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat® Enterprise Linux® (RHEL) 6, 7 Desktop/Workstation SUSE Linux® Enterprise Desktop 12	
	Kit Contents	9.5mm Slim DVD-ROM Drive, slim SATA data/power cable, installation guide	
	Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT	

HP 9.5mm Slim BDXL Blu-Ray 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	BD-ROM BD-R BD-RE DVD-RAM DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW

Technical Specifications - Optical and Removable Storage

Disc Capacity	**DVD-ROM**	8.5 GB DL or 4.7 GB standard
	Blu-ray	25 GB (single-layer) 50 GB (dual-layer) 100/128 GB (BDXL)
Access Times	**Full Stroke DVD**	< 230 ms (seek)
	Full Stroke CD	< 220 ms (seek)
	Blu-ray	< 230 ms (seek) (Full Stroke Blu-ray)
	Startup Time	(Time to drive ready from tray loading) BD-ROM (SL/DL) 25S / 28S BD-R (SL/DL) 25S / 28S BD-RE (SL/DL) 25S / 28S DVD-ROM (SL/DL) 18S / 18S DVD-R (SL/DL) 25S / 25S DVD-RW 25S DVD+R (SL/DL) 25S / 25S DVD+RW 25S DVD-RAM 45S CD-ROM 15S
Maximum Data Transfer Rates	**CD ROM Read**	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
	DVD ROM Read	DVD-RAM Up to 8X 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
	Blu-ray	BD-ROM Up to 6X BD-ROM DL Up to 6X BD-R Up to 6X BD-R DL Up to 6X BD-R Up to 6X BD-RE SL/DL Up to 6X
Power	**Source**	SATA DC power receptacle
	DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
	DC Current	5 VDC -900 mA typical, 2000mA 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 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat® Enterprise Linux® (RHEL) 6, 7 Desktop/Workstation SUSE Linux® Enterprise Desktop 12	
Kit Contents	9.5mm Slim BDXL Blu-Ray Writer, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	

Technical Specifications - Controller Cards

HP Thunderbolt™ 3 PCIe 3 Dual-port I/O Card	**Data Transfer Rate**	Supports up to 40 Gb/s 40,000 Mb/s)
	Devices Supported	Thunderbolt™ certified devices
	Bus Type	PCIe card, full height PCIe slots
	Ports	One USB 3.1 Type-C® connector (Rear)
	Internal Connectors	One wire-to-board-connector
	System Requirements	Windows 10 RS3 64-bit, Intel® i5 series or higher processor, 4-GB RAM, 20-GB Ha Drive, available PCIe slot.
	Temperature - Operating	50° to 131° F (10° to 55° C)
	Temperature - Storage	-22° to 140° F (-30° to 60° C)
	Relative Humidity - Operating	20% to 80%
	Compliances	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwa BSMI CNS13438, Korea MIC
	Operating Systems Supported	-Windows 10 RS3 64-bit.
	Kit Contents	HP Thunderbolt™ 3 PCIe 3-port I/O Card, full height bulkhead bracket, DisplayPo and GPIO (General-Purpose Input/Output) cable, Installation documentation and warranty card.

Technical Specifications - Networking and Communications

Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro® with Intel® AMT 12.0)	**Connector**	RJ-45
	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 12.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD)

Intel® X710-DA2 2-Port SFP+ 10GbE NIC	**Connector**	2 SFP+ Ports
	Cabling	Twin Axial Cabling up to 10m
	Controller	Intel® Ethernet Controller X710-AM2
	Network Transfer Rates Supported	10GbE (with supported 10GBASE-SR transceivers)
	Data Path Width	PCIe Gen3x8 (compatible with x4)
	Power Requirement	4.3W (typical) (with supported 10GBASE-SR transceivers)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	2.703 x 6.578 inches
	Operating System Driver Support	Windows 10 64-bit Linux®
	Kit Contents	• Intel® X710-DA2 2-Port SFP+ 10GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature

Technical Specifications - Networking and Communications

HP 10GbE SFP+ SR Transceiver	**Operating Temperature**	32°F to 113°F (0°C to 45°C)
	Operating Humidity	0% to 85%, noncondensing
	Dimensions (HxWxD)	0.47 x 0.54 x 2.19 inches
	Kit Contents	HP 10GbE SFP+ SR Transceiver

Intel® X550-T2 2-Port 10GbE NIC	**Connector**	2 RJ-45
	Cabling	10GbE: Cat6a (or better) up to 100m 5GbE and below: Cat5e (or better) up to 100m
	Controller	Intel® Ethernet Controller X550
	Network Transfer Rates Supported	10GbE, 5GbE, 2.5GbE, 1GbE, 100MbE
	Data Path Width	PCIe Gen3x4
	Power Requirement	11.2W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	5.1 x 2.7 in (without brackets)
	Operating System Driver Support	Windows 10 64-bit Linux®
	Kit Contents	• Intel® X550-T2 2-Port 10GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature

Aquantia® AQN-108 1-Port 5GbE NIC	**Connector**	1 RJ-45
	Cabling	Cat5e (or better) up to 100m
	Controller	Aquantia® AQC108
	Network Transfer Rates Supported	5Gbe, 2.5GbE, 1GbE, 100MbE
	Data Path Width	PCIe Gen3x1
	Power Requirement	3.5W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	3.72 x 3.18 inches (without brackets)
	Operating System Driver Support	Windows 7 64-bit; Windows 10 64-bit; Linux®
	Kit Contents	• Aquantia AQN-108 1-Port 5GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature

Technical Specifications - Networking and Communications

Intel® I350-T2 2-Port 1GbE NIC	**Connector**	2 RJ-45
	Cabling	Cat5e (or better) up to 100m
	Controller	Intel® Ethernet I350 Controller
	Network Transfer Rates Supported	1GbE, 100MbE, 10MbE
	Data Path Width	PCIe Gen2.1x4
	Power Requirement	4.4W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	2.75 x 5.5 inches (without brackets)
	Operating System Driver Support	Windows 7 64-bit; Windows 10 64-bit; Linux®
	Kit Contents	• Intel® I350-T2 2-Port 1GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
Intel® I350-T4 4-Port 1GbE NIC	**Connector**	4 RJ-45
	Cabling	Cat5e (or better) up to 100m
	Controller	Intel® Ethernet I350 Controller
	Network Transfer Rates Supported	1GbE, 100MbE, 10MbE
	Data Path Width	PCIe Gen2.1x4
	Power Requirement	5W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	2.75 x 5.5 inches (without brackets)
	Operating System Driver Support	Windows 7 64-bit; Windows 10 64-bit; Linux®
	Kit Contents	• Intel® I350-T4 4-Port 1GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
Intel® AX201 802.11 a/b/g/n/ac/ax WLAN + Bluetooth 5.0 M.2	**WLAN Standards**	802.11a/b/g/n/ac/ax Wave 6, Dual band 2x2 with up to 2.4Gbps speed (theoretica maximum); Up to 3x faster than 802.11ac and up to 4x capacity in congested environments than 802.11ac
	Antenna	2x2 Dual-Band
	Bluetooth Standards	5
	Operating Temperature	32° to 131° F (0° to 55° C)
	Interface	M.2 CNVio
	Dimensions	M.2 2230
	Kit Contents	Not Available

NOTE: Wireless access point and internet service required and sold separately. Availability of public wireless a points limited. Wi-Fi 5 (802.11 ax) is backwards compatible with prior 802.11 specs.

HP eSATA PCI Cable Kit	**Part Number**	FH966AA
	Features	• 1x eSATA ports • Bring the same ultra-fast SATA performance that you demand from your internal SATA hard drives to an external eSATA hard drive. • Faster transfer rates than existing external storage solutions: USB 2.0 & 1394. • Complete motherboard to eSATA PCI bracket solution. • Robust and user friendly external eSATA connector.

Z2 G5 TWR Bezel w/ Dust Filter option	**Part Number**	4KY89AA
	Overview	Workstations are deployed in a variety of different ways and in different environments, from under a desk to manufacturing floors. HP Workstations designed a dust filter option to further protect the system against the ingress of and other particles over the life of the system. Test have shown a reduction of d ingress of up to 32% for the HP Z2 Tower G5 Workstation platform and is cleanab and serviceable by customers. There is also a BIOS setting that will warn custom when it is time to check and clean their filters.
	Cleaning and servicing the dust filter	After removing the filter from the system bezel (dust filter can be removed with the use of tools from the front bezel), either blow it with and wash with water or a delicate duster (feather duster)to brush off the filter then rinse it with water. 2. Allow the filter half a day to dry at room temperature (25C at 30%-50% humidity 3. Temperature of water can be 0-70C, due to the dust filter meeting the SQTM 70C humidity test. Suggested water temperature for best user experience is 0-50C. 4. Normal tap water (and most other types of water) can be used to rinse the filter. Any type of corrosive liquid is restricted.
	Enabling the Check Filter warning in the BIOS:	1. Customers must enable the BIOS setting once they receive their filter. 2. To enable, do the following once you see the boot screen for your system: F10 > Advanced > Built-In Device Options > Dust Filter 3. Select to enable the Dust Filter replacement reminder, which can be set for 15, 30 60, 90, 120, or 180 days. The Reminder will show during POST after the reminder timer has expired. 4. **NOTE:** customers who anticipate more dust ingress in their environments should the reminder for a shorter window. Customers anticipating longer ingress can se the reminder for a longer window.
	BIOS Warnings	Large enterprise customers deploying multiple systems can centrally enable/con the BIOS warning using the WMI/BCU tool remotely to set the options below: **Dust Filter** • Disable* • Enable **Dust Filter Reminder (Days)** 15, 30, 60*, 90, 120, and 180

Z2 G5 Dust Filter (Filter Only)	**Part Number**	3TQ24AA This is intended to be a replacement filter for the HP Z2 Tower G5 Workstation in event that the original filter would need to be replaced.

HP Z2 Tower G5 Workstation Front Card Guide Kit	**Part Number**	4KY82AA
	Features	This front card guide kit is required to enable added mechanical stability when configuring select graphics cards on the HP Z2 Tower G5 Workstation. The kit enables added mechanical stability when configuring: • 2x AMD W2100 graphics cards • AMD Radeon™ Pro WX 3100 4GB Graphics • AMD Radeon™ Pro WX 3200 4GB Graphics • AMD Radeon™ Pro WX 4100 4GB Graphics • AMD Radeon™ Pro WX 7100 8GB Graphics • 3x NVIDIA® NVS NVS 310 or NVS 315 graphics cards • 2x NVIDIA® NVS 510 graphics cards • 1x NVS 310 plus 1x NVS 510 graphics cards • 1x NVIDIA® Quadro® M4000, M5000 graphics cards • 1x AMD FirePro W7000 graphics card • NVIDIA® Quadro® P1000 4GB Graphics • NVIDIA® Quadro® P2000 5GB Graphics • NVIDIA® Quadro® P2200 5GB Graphics • NVIDIA® Quadro® P4000 8GB Graphics • NVIDIA® Quadro® RTX 4000 8GB Graphics • NVIDIA® Quadro® P5000 16GB Graphics • NVIDIA® Quadro® RTX 5000 16GB Graphics • NVIDIA® Quadro® RTX6000 24GB Graphics **NOTE:** If one of the above graphics cards is configured with the Z2 G5 TWR at time of purchase, the Front Card Guide kit is automatically included. • If one of the above graphics cards is added as an aftermarket option, the Front Card Guide Kit (4KY82AA) is required, as a separate purchase, for installation of the graphics card.

Technical Specifications – Miscellaneous Features

MISCELLANEOUS FEATURES

Management Features

- Advanced Configuration and Power Management Interface (ACPI). Allows the system to wake from a low power mode. Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state with affecting other elements of the system.
- Intel® Wired for Management support; industry wide initiative to make Intel® architecture based PCs, servers and mobile computer more inherently manageable out-of-the-box and over the network
- Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button

Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Power LED will blink red 2 to 5 times, then blink white 2 or more times, then repeat (with beep tones for each blink initially):
    - 2 red + 2 white User must provide file for BIOS recovery (USB storage typically)
    - 2 red + 3 white User must enter a key sequence to proceed with recovery by policy
    - 2 red + 4 white BIOS recovery is in progress
    - 3 red + 2 white Memory could not be initialized
    - 3 red + 3 white Graphics adaptor could not be found
    - 3 red + 4 white Power supply failure / not connected
    - 3 red + 5 white Processor not installed
    - 3 red + 6 white Current processor does not support an enabled feature
    - 4 red + 2 white Processor has exceeded its temperature threshold / system thermal shutdown
    - 4 red + 3 white System internal temperature has exceeded its threshold
    - 5 red + 2 white System controller firmware is not valid
    - 5 red + 3 white System controller detected BIOS is not executing
    - 5 red + 4 white BIOS could not complete initialization / PCA failure
    - 5 red + 5 white System controller rebooted the system after a health or recovery timer triggered
- HP PC Hardware Diagnostics UEFI:
  - This utility enables hardware level testing outside the operating system on many components. The diagnostics can be invok by pressing F2 at POST, and is available as a download from HP Support
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- Clear Password Jumper
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Blue Pull Tabs, and Quick Release Latches for easy Identification

Summary of Changes

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

title