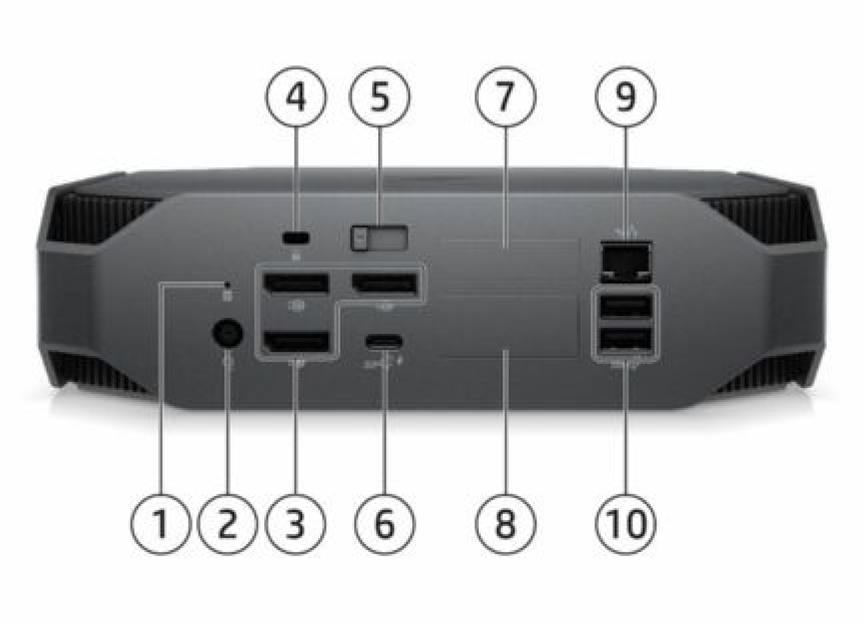
HP Z2 Mini G5 Workstation

Front-Side View

1. Power button
2. 2 Type-A SuperSpeed USB 10Gbps signaling rate port (1 supports charging)
3. 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (charging supported)
4. Universal audio jack



Rear View

1. HDD Activity LED
2. Power connector
3. 2 DisplayPort™ 1.4[3]
   1 DisplayPort™ (optional)[1,3]
4. Standard cable lock slot
5. Cover release latch
8. Flex IO modules, choice of:
   VGA, HDMI 2.0b, DisplayPort™ 1.4[3], Dual Type-A SuperSpeed USB 5Gbps signaling rate port, serial port, 2nd 1GbE LAN, Type-C® SuperSpeed USB 10Gbps signaling rate port (Alt Mode), Thunderbolt™ 3, 2.5GbE LAN[2]
9. RJ-45
10. 2 Type-A SuperSpeed USB 10Gbps signaling rate port

Overview

6. 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (charging supported) (optional)[2]
7. Flex IO modules, choice of:
   Dual Type-A SuperSpeed USB 5Gbps signaling rate port, serial port[2]

[1] Available only when a discrete graphic card is installed.
[2] Available on selected configurations only.
[3] All DisplayPort™ support DP1.4/HBR2 when video output is via Intel Graphics.

Form Factor	Mini

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 separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 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

NOTE: Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support polic
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

[2] For detailed Linux® OS/hardware support information, see: http://www.hp.com/support/linux_hardware_matrix
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[2]	Featuring Intel® vPro™ Technology[3]	16GB Intel® Optane™ memory	TDP (W)
Intel® Core™ i9-10900K Processor[5]	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[4]	10	2.8	20	2933	Y	N/A	5.1	N/A	Y	65
Intel® Core™ i7-10700K Processor[5]	8	3.8	16	2933	Y	Intel® UHD Graphics 630	5.1	Y	Y	125

Overview

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[5]	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	N/A	Y	65
Intel® Core™ i5-10400F Processor[4]	6	2.9	12	2666	Y	N/A	4.3	N/A	Y	65
Intel® Core™ i3-10320 processor[4]	4	3.8	8	2666	Y	Intel® UHD Graphics 630	4.6	N/A	Y	65
Intel® Core™ i3-10300 processor[4]	4	3.7	8	2666	Y	Intel® UHD Graphics 630	4.4	N/A	Y	65
Intel® Core™ i3-10100 processor	4	3.60	6	2666	Y	Intel® UHD Graphics 630	4.3	N/A	Y	65
Intel® Xeon® W-1290P processor[5]	10	3.7	20	2933	Y	Intel® UHD Graphics P630	5.2	Y	Y	125
Intel® Xeon® W-1290 processor[4]	10	3.2	20	2933	Y	Intel® UHD Graphics P630	5.1	Y	Y	80
Intel® Xeon® W-1270P processor[4,5]	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[5]	6	4.1	12	2666	Y	Intel® UHD Graphics P630	4.8	Y	Y	125
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 necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware a software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

[2] The specifications shown in the Intel® Turbo Boost Technology column represent the maximum turbo frequency with one core active. Turbo 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/turboboost for more information.

[3] For full Intel® vPro™ functionality, Windows, a vPro™ supported processor, vPro™ enabled Q370 chipset or higher and vPro™ enable WLAN card are required. Some functionality, such as Intel Active management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Intel vPro™ technology is depen on 3rd party software providers. Compatibility of this generation of Intel vPro™ technology-based hardware with future "virtual applia is yet to be determined.

[4] Available in Q4, 2020

[5] Configurable TDP-down 95W

Overview

Convertibility	Z2 Mini G5 can either be placed on a flat surface or mounted behind a display or under a desk. (Mounting sold separately)
Expansion Slots (see system board section for more details)	1 MXM slot (PCIe Gen3 x16) - for discrete graphic card only 2 80mm M.2 Storage slot (PCIe Gen3 x4) 1 30mm M.2 WLAN slot (PCIe Gen3 x1 / Intel CNVI) - for WLAN/BT M.2 modules only **NOTE:** The PCIe Gen 3 x16 slot is meant for HP qualified cards, configured or after market. HP does not provide warranty support for 3rd party cards.
Front I/O	
Side I/O	2 Type-A SuperSpeed USB 10Gbps signaling rate port (upper port supports charging), 1 Type-C® SuperSpeed 10Gbps signaling rate port (charging supported), 1 Universal audio combo
Rear I/O	2 DisplayPort™ 1.4[1], 1 RJ-45 port, 2 Type-A SuperSpeed USB 10Gbps signaling rate port Optional: 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (optional, supports charging), 1 DisplayPort 2 Flex IO modules
On-board RAID Support	NVMe RAID 0 Striped Array NVMe RAID 1 Mirrored Array
Chassis Dimensions (H x W x D)	H: 2.28" [58mm] (Standard desktop orientation) W: 8.5" [216mm] D: 8.5" [216mm]
Packaged Dimensions	H: 11.73" (298mm) W: 6.69" (170mm) D: 19.65" (499mm)
Rack Dimensions	5U
Weight	Exact weights depend upon configuration Minimum: 2.1kg (4.6lbs.) Maximum: 2.42kg (5.3lbs.)
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 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)	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	Choice of: 180W 89% Average Efficiency. 280W 89% Average Efficiency. **NOTES:** Customers placing their system in an enclosure should design their solution to accommodate the siz external power supply for the Z2 Mini G5
Workstation ISV Certifications	See the latest list of certifications at http://www.hp.com/united-states/campaigns/workstations/partnerships.html
Chipset	Intel® W480 chipset
Memory	2 SODIMM slots, supporting up to 64GB ECC/non-ECC, DDR4 2933 MT/s, speed depending on the CPU selectio

[1] All DisplayPort™ support DP1.4/HBR2 when video output is via Intel Graphics. Discrete graphics support DP HBR3.

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		3
Intel® Core™ i9 10900 Processor	Y	N		
Intel® Core™ i9 10900F Processor	Y	N		1
Intel® Core™ i7 10700K Processor	Y	N		3
Intel® Core™ i7 10700 processor	Y	N		
Intel® Core™ i5 10600K processor	Y	N		3
Intel® Core™ i5 10600 processor	Y	N		
Intel® Core™ i5 10500 processor	Y	N		
Intel® Core™ i5 10400 processor	Y	N		
Intel® Core™ i9 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		3
Intel® Xeon® W-1290 processor	Y	N		2
Intel® Xeon® W-1270P processor	Y	N		2,3
Intel® Xeon® W-1270 processor	Y	N		
Intel® Xeon® W-1250P processor	Y	N		3
Intel® Xeon® W-1250 processor	Y	N		

[1] These processors support only non-ECC memory

NOTE 1: No integrated graphics. A discrete graphics card must be purchased at the same time. Available in Q4

NOTE 2: Available in Q4, 2020

NOTE 3: TDP configured down to 95W.

Supported Components

Storage / Hard Drives*	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
SATA Hard Drives				
500GB SATA 7200 rpm 6Gb/s SFF HDD (2.5")	Y	Y	T0K73AA	
1TB SATA 7200 rpm 6Gb/s SFF HDD (2.5")	Y	Y	T0K74AA/AT	
2 TB SATA 5400 rpm SFF HDD (2.5")	Y	N		
500GB SATA 7.2K SED SFF HDD	Y	Y	D8N29AA	
SATA Solid State Drives				
HP 256GB SATA 6Gb/s SSD	Y	Y		
HP 2TB SATA SSD PROMO			Y6P08AT	
PCIe Solid State Drives				
HP ZTurbo 1TB TLC Z2 G5 Mini SSD Kit	Y	Y	141L4AA/AT	
HP ZTurbo 256GB SED Z2 G5 Mini SSD Kit	Y	Y	141L6AA/AT	
HP ZTurbo 256GB TLC Z2 G5 Mini SSD Kit	Y	Y	141L9AA/AT	
HP ZTurbo 2TB TLC Z2 G5 Mini SSD Kit	Y	Y	141M0AA/AT	
HP ZTurbo 2TB TLC Z2 G5 TWR/SFF SSD Kit	Y	Y	141M1AA/AT	
HP ZTurbo 512GB SED Z2 G5 Mini SSD Kit	Y	Y	141M2AA/AT	
HP ZTurbo 512GB SED Z2 G5 TWR/SFF SSD Kit	Y	Y	141M3AA/AT	
HP ZTurbo 512GB TLC Z2 G5 Mini SSD Kit	Y	Y	141M4AA/AT	
HP ZTurbo 512GB TLC Z2 G5 TWR/SFF SSD Kit	Y	Y	141M5AA/AT	

NOTE1: SATA hardware-assisted RAID is not supported on Linux® systems. The Linux® kernel, with built-in sof RAID, provides excellent functionality and performance. It is a good alternative to hardware-assisted RAID. All must be identical in type and capacity. Boot volume/RAID array must be less than 2 TB
NOTE2: 125W CPU SKU is not supported to install the SATA 2.5in HDD or SSD.
NOTE3: 65W CPU and MXM GFX card SKU is not supported to install the SATA 2.5in HDD or SSD.

*For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is l 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Graphics	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Graphics Cable Adapters				
HP DisplayPort To HDMI True 4k Adapter	Y	Y	2JA63AA	
HP DisplayPort To DVI-D Adapter	Y	Y	FH973AA	
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	
Entry 3D				
AMD Radeon^{TM} Pro WX 3200 4GB MXM Graphics	Y	N		
NVIDIA® Quadro® P620 4GB MXM Graphics	Y	N		1
Mid-range 3D				
NVIDIA® Quadro® T1000 4GB MXM Graphics	Y			
NVIDIA® Quadro® T2000 4GB MXM Graphics	Y			
NVIDIA® Quadro® RTX 3000 6GB MXM Graphics	Y	N		2

NOTE 1: Available in Q4, 2020
NOTE 2: Available in Q1, 2021

Memory		**Factory Configured**	**Option Kit**	**Option Kit Part Number**	**Support Notes**
	HP 4GB (1x4GB) DDR4-3200 nECC SO DIMM	Y			
	HP 8GB (2x4GB) DDR4-3200 nECC SO DIMM	Y			
	HP 8GB (1x8GB) DDR4-3200 nECC SO DIMM	Y			
	HP 8GB (1x8GB) DDR4-3200 ECC SO DIMM	Y			
	HP 16GB (2x8GB) DDR4-3200 nECC SO DIMM	Y			
	HP 16GB (2x8GB) DDR4-3200 ECC SO DIMM	Y			
	HP 16GB (1x16GB) DDR4-3200 nECC SO DIMM	Y			
	HP 16GB (1x16GB) DDR4-3200 ECC SO DIMM	Y			
	HP 32GB (2x16GB) DDR4-3200 nECC SO DIMM	Y			
	HP 32GB (2x16GB) DDR4-3200 ECC SO DIMM	Y			
	HP 32GB (1x32GB) DDR4-3200 nECC SO DIMM	Y			
	HP 32GB (1x32GB) DDR4-3200 ECC SO DIMM	Y			
	HP 64GB (2x32GB) DDR4-3200 nECC SO DIMM	Y			
	HP 64GB (2x32GB) DDR4-3200 ECC SO DIMM	Y			
	AMO				
	HP 4GB (1x4GB) DDR4-3200 nECC SO DIMM	N		141J0AA/AT	
	HP 8GB (1x8GB) DDR4-3200 nECC SO DIMM	N		141J5AA/AT	
	HP 8GB (1x8GB) DDR4-3200 ECC SO DIMM	N		141J2AA/AT	
	HP 16GB (1x16GB) DDR4-3200 nECC SO DIMM	N		141H5AA/AT	
	HP 16GB (1x16GB) DDR4-3200 ECC SO DIMM	N		141H4AA/AT	
	HP 32GB (1x32GB) DDR4-3200 nECC SO DIMM	N		141H8AA/AT	
	HP 32GB (1x32GB) DDR4-3200 ECC SO DIMM	N		141H6AA/AT	

NOTES: The CPUs determine the speed at which the memory is clocked. If a 2666 MHz capable CPU is used in the system, the maximum speed the memory will run at is 2666 MHz regardless of the specified speed of the memo

Intel® Xeon® W processors can support either ECC or non-ECC memory; Intel® Core™ i3/i5/i7 processors only su non-ECC memory.

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

Supported Components

Optical and Removable Storage		Factory Configured	Option Kit	Option Kit Part Number
	HP Slim Tray Optical Drives			
	HP External Ultra-Slim DVD-RW Drive	N	Y	Y3T76AA

Actual speeds may vary. Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses. Double Layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

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	
	Intel Wi-Fi 6 AX201 (2x2) and Bluetooth 5 combo	Y	N	
	HP 1GbE LAN Flex Port 2020	Y	Y	141J6AA/AT
	HP 2.5GbE LAN Flex Port Z2 Mini	Y	Y	169K0AA/AT

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 Keyed Cable Lock 10mm	N	Y	T1A62AA
	Z2 Mini ePSU Sleeve	N	Y	3RW68AA
	HP Z2 Mini Vertical Stand	N	Y	3RW66AA
	HP Z2 Mini VESA Sleeve	N	Y	Y7B61AA
	HP Business PC Security Lock v3 Kit	N	Y	3XJ17AA
	HP Z2 Mini Rack Tray Support Kit	N	Y	1A4W4AA
	HP Z2 Mini and TWR/Z4/Z6 G4 Depth Adjustable Fixed Rail Rack Kit	N	Y	2HW42AA/AT
	Z2 G5 Mini HDD Carrier Cage	Y	Y	1X5Q2AA/AT

Supported Components

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 Wireless Business Slim Keyboard and Mouse	Y	Y	
	HP USB Premium Wired Keyboard	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 CAD Mouse	N	Y	M5C35AA
	HP Wired Desktop 320MK Mouse and Keyboard	N	Y	9SR36AA

Other Hardware		**Factory Configured**	**Option Kit**	**Option Kit Part Number**
	HP Z2 Power Cord Kit	Y	Y	1N1D5AA
	HP DP Flex Port 2020	Y	Y	141J7AA/AT
	HP Dual USB-A 3.2 Gen1 Flex Port 2020	Y	Y	141J8AA/AT
	HP Dual USB-A 3.2 Gen1 Flex Port 2020 Mini	Y	Y	141J9AA/AT
	HP USB-C® 3.2 Gen2 Alt Flex Port 2020	Y	Y	141K6AA/AT
	HP HDMI Flex Port 2020	Y	Y	141K1AA/AT
	HP VGA Flex Port 2020	Y	Y	141K7AA/AT
	HP Mini Serial Upper Flex Port 2020 Mini	Y	Y	141K2AA/AT
	HP Thunderbolt™ 3 Flex Port 2020 Mini	Y	Y	141K4AA/AT

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	

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

Supported Components

Operating Systems

Windows 10 Pro 64

Windows 10 Pro for Workstation 64

Windows 10 Home 64

Linux Ready

NOTE: For detailed QS/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 15 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 2.7
- 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 Start

- 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.

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

BIOS
HP BIOSphere Gen6[10]
BIOS Update via Network
HP Secure Erase[11]
Absolute Persistence Module[12]
Pre-boot Authentication
HP Wake on WLAN
HP DriveLock & Automatic DriveLock

Software
HP Support Assistant[13]
HP Desktop Support Utilities
HP Notifications
HP PC Hardware Diagnostics UEFI
HP PC Hardware Diagnostics Windows
HP Performance Advisor[14]
HP ZCentral Remote Boost[15]
HP Setup Integrated OOBE
HSA Fusion for Commercial
HSA Telemetry for Commercial
Buy Office (sold separately)

Manageability Features
HP Driver Packs (download)[16]
HP System Software Manager (SSM) (download)
HP BIOS Config Utility (BCU) (download)
HP Manageability Integration Kit Gen4 (download)[17]
HP Image Assistant Gen5 (download)
HP Client Catalog (download)
HP Client Management Script Library (download)

Client Security Software
HP Client Security Manager Gen6[18]
HP Security Manager (including Credential Manager, HP Password Manager, HP Spare Key)
HP Sure Run Gen3[22]
HP Power On Authentication
Windows Defender[19]

Security Management

Supported Components

HP Sure Click[20]
HP Sure Start Gen6[21]
HP Sure Sense[23]
HP Sure Recover Gen3[24]

10. HP BIOSphere Gen6 features may vary depending on configuration.
11. 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™.
12. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activa the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolut availability outside the U.S. Certain conditions apply. For full details visit: https://www.absolute.com/about/legal/agreements/abso
13. HP Support Assistant requires Windows and internet access
14. 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.htm
15. HP Z Central Remote Boost Software does not come preinstalled on Z Workstations but can be downloaded and run on all Z deskt and laptops without license purchase. With non-Z sender devices, purchase of perpetual individual license or perpetual floating licens simultaneously executing versions and purchase of ZCentral Remote Boost Software Support is required. RGS requires Windows, RH or 8), UBUNTU 18.04 LTS, or HP ThinPro 7 operating systems. MacOS (10.13 or newer) operating system is only supported on the rec side. Requires network access. The software is available for download at hp.com/ZCentralRemoteBoost.
16. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement
17. HP Manageability Integration Kit can be downloaded from http://www8.hp.com/us/en/ads/clientmanagement/overview.html
18. HP Client Security Manager Gen6 requires Windows and is available on select HP Pro and Elite PCs
19. Windows Defender Opt in and internet connection required for updates.
20. HP Sure Click requires Windows 10 Pro or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details
21. HP Sure Start Gen6 is available on select HP PCs.
22. HP Sure Run Gen3 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processor
23. HP Sure Sense requires Windows 10
24. HP Sure Recover Gen3 HP Sure Recover Gen3 is available on select HP PCs and requires an open network connection. Not available platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Re to avoid loss of data. Network based recovery using Wi-Fi is only available on PC's with Intel Wi-Fi Module.

System Board

System Board Form Factor	202.2 x 198.5 mm (7.96 x 7.815 inch)	
Processor Socket	Single LGA-1200	
CPU Bus Speed	DMI	
Chipset	Intel® PCH W480	
Super I/O Controller	Nuvoton SIO18	
Memory Expansion Slots	2 DDR4 memory slots	
Memory Type Supported	DDR4, SODIMM 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	64GB	
Memory Configuration (Supported)	4GB, 8GB 16GB and 32GB non-ECC and 8GB, 16GB and 32GB ECC SO DIMMs are supported. ECC and non-ECC DIMMs cannot be mixed in the same system	
PCI Express Connectors	- 1 MXM PCI Express Gen3 slot x1 - 2 M.2 Storage (PCIe Gen3 x4) - 1 M.2 WLAN (PCIe Gen3 x1+ Intel CNVi)	
Supported Drive Interfaces	**SATA**	Integrated (1) Serial ATA interfaces (6Gb/s SATA).
	Network Controller	Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, and AMT 12
	Serial	1 rear port (requires optional Serial Port Adapter Kit)
	HD Integrated Audio	Yes
USB Connector(s)	**Front**	2 Type-A SuperSpeed USB 10Gbps signaling rate port (1 charge supports up 5V/2.1A); 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (charge sup to 5V/3A)
	Rear	2 Type-A SuperSpeed USB 10Gbps signaling rate port; 1 Type-C® SuperSpee 10Gbps signaling rate port (optional); 1 Type-C® SuperSpeed USB 10Gbps sig Alt mode port (optional via Flex)
	Internal	2 Type-A SuperSpeed USB 5Gbps signaling rate port
HD Integrated Audio	Yes	
Flash ROM	Yes	
CPU Fan Header	Yes	
Memory Fan Header	None	
Chassis Fan Header	None	
Front PCI Fan Header	1 GPU Fan (most)	
Front Control Panel/Speaker Header	Yes	

System Technical Specifications

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	DC Jack for adapter
Power Switch, Power LED & Hard Drive LED Header	Yes
Clear Password Jumper	None
Keyboard/Mouse	USB
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	6A@100-240V
Heat Dissipation	Typical: 444 btu/hr (112 kcal/hr) Maximum: 1484 btu/hr (374 kcal/hr)
ENERGY STAR® certified (Config Dependent)	Yes
CECP Compliant @ 220V	Yes
FEMP Standby Power Compliant	Yes, with Wake-on-LAN disabled: <2W in S5- Power Off
Built-in Self Test (BIST) LED	No
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)	Yes

System Technical Specifications

System Configurations

Z2 Mini G5 Configuration #1 ***ENERGY STAR CERTIFIED***	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					
	Power Supply	180W					
Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disable
	Windows long Idle (S0)	7.38		8.76		7.03	
	Windows short Idle (S0)	10.74		12.02		9.96	
	Windows Busy Typ (S0)	90.37		99.52		88.23	
	Windows Busy Max (S0)	95.11		102.78		93.86	
	Sleep (S3)	0.78	0.45	0.82	0.51	0.73	0.41
	Off (S5)	0.59	0.57	0.61	0.59	0.57	0.56
	Zero Power Mode (ErP)	0.21		0.22		0.2	
Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enable
	Windows long Idle (S0)	25.181		29.889		23.986	
	Windows short Idle (S0)	36.645		41.012		33.984	
	Windows Busy Typ (S0)	308.342		339.562		301.041	
	Windows Busy Max (S0)	324.515		350.685		320.25	
	Sleep (S3)	2.661	1.535	2.798	1.74	2.491	1.399
	Off (S5)	2.013	1.945	2.081	2.013	1.945	1.911
	Zero Power Mode (ErP)	0.717		0.751		0.682	

Z2 Mini G5 Configuration #2	Processor Info	CPU I Core i7-10700 2.9GHz 8C65W					
	Memory Info	16GB (2x 8GB) 2666 MHz DDR4 non-ECC					
	Graphics Info	T1000 Graphics					
	Disks/Optical/Floppy	1x SATA 256GB SSD					
	Power Supply	280W					
Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disable
	Windows long Idle (S0)	15.23		15.63		15.01	
	Windows short Idle (S0)	18.35		18.82		17.98	
	Windows Busy Typ (S0)	109.47		109.88		107.36	
	Windows Busy Max (S0)	140.9		142.95		138.56	
	Sleep (S3)	1.13	0.73	1.15	0.78	1.1	0.69
	Off (S5)	0.62	0.61	0.63	0.61	0.61	0.6
	Zero Power Mode (ErP)	0.21		0.23		0.2	
Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enable
	Windows long Idle (S0)	51.965		53.33		51.214	
	Windows short Idle (S0)	62.61		64.214		61.348	
	Windows Busy Typ (S0)	373.512		374.911		366.312	
	Windows Busy Max (S0)	480.751		487.745		472.767	
	Sleep (S3)	3.856	2.491	3.924	2.661	3.753	2.354
	Off (S5)	2.115	2.081	2.15	2.081	2.081	2.047
	Zero Power Mode (ErP)	0.717		0.785		0.682	

System Technical Specifications

Z2 Mini G5 Configuration #3 ***ENERGY STAR CERTIFIED***	Processor Info	CPU I Core i9-10900K 3.7GHz 10C125W					
	Memory Info	64GB (2x 32GB) 2666 MHz DDR4 ECC					
	Graphics Info	T1000 Graphics					
	Disks/Optical/Floppy	1x SATA 512GB SSD					
	Power Supply	280W					
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)	15.31		16.52		15.06	
	Windows short Idle (S0)	18.74		19.04		18.32	
	Windows Busy Typ (S0)	152.66		153.69		150.02	
	Windows Busy Max (S0)	191.14		197.91		189.96	
	Sleep (S3)	1.94	1.5	2.07	1.64	1.91	1.45
	Off (S5)	0.62	0.6	0.63	0.61	0.61	0.6
	Zero Power Mode (ErP)	0.23		0.24		0.22	
Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows long Idle (S0)	52.238		56.366		51.385	
	Windows short Idle (S0)	63.941		64.964		62.508	
	Windows Busy Typ (S0)	520.876		524.39		511.868	
	Windows Busy Max (S0)	652.17		675.269		648.144	
	Sleep (S3)	6.619	5.118	7.063	5.596	6.517	4.947
	Off (S5)	2.115	2.047	2.15	2.081	2.081	2.047
	Zero Power Mode (ErP)	0.785		0.819		0.751	

Z2 Mini G5 Configuration #4 ***ENERGY STAR CERTIFIED***	Processor Info	CPU Xeon W-1250 3.3GHz 6C80W					
	Memory Info	16GB (2x 8GB) 2666 MHz DDR4 ECC					
	Graphics Info	T2000 Graphics					
	Disks/Optical/Floppy	1x SATA 1TB SSD Z Turbo					
	Power Supply	280W					
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)	15.48		15.94		15.25	
	Windows short Idle (S0)	19.47		19.5		19.13	
	Windows Busy Typ (S0)	120.03		123.49		118.69	
	Windows Busy Max (S0)	175.99		176.23		172.33	
	Sleep (S3)	1.21	1.09	1.23	1.11	1.18	1.06
	Off (S5)	0.64	0.63	0.66	0.64	0.6	0.59
	Zero Power Mode (ErP)	0.22		0.24		0.21	
Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows long Idle (S0)	52.818		54.387		52.033	
	Windows short Idle (S0)	66.432		66.534		65.272	
	Windows Busy Typ (S0)	409.542		421.348		404.97	
	Windows Busy Max (S0)	600.478		601.297		587.99	
	Sleep (S3)	4.129	3.719	4.197	3.787	4.026	3.617
	Off (S5)	2.184	2.15	2.252	2.184	2.047	2.013
	Zero Power Mode (ErP)	0.751		0.819		0.717	

Declared Noise Emissions

System Configuration (Entry level)	**Processor Info**	W-1250P COMET LAKE WS P-1 6c LGA 125W WE1P 6(f)+2 vPro^{TM} QSS / W-125 COMET LAKE WS Q-0 6c LGA 4.1 GHz 125W QULG vPro^{TM} Supplemental QS
	Memory Info	Hynix (TG) 8GB 3200 DDR4 SODIMM ECC x2
	Graphics Info	T2000
	Disks/Optical/Floppy	SSD Z Turbo Drive 256GB 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer C
	Power Supply	280W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	TBD	TBD
	Hard drive Operating (random reads)	SSD 512GB M.2 2280 PCIe NVMe Three Layer Cell 3rd	

System Configuration (Mid-level)	**Processor Info**	W-1290 COMET LAKE WS P-1 10c LGA 80W WE3 vPro^{TM} QSK QS / W-1290 CON WS Q-0 10c LGA 3.2 GHz 80W QUTJ vPro^{TM} Supplemental QS
	Memory Info	Samsung (TH) 8GB 3200 DDR4 SODIMM ECC x1
	Graphics Info	T1000
	Disks/Optical/Floppy	NA
	Power Supply	280W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	TBD	TBD
	Hard drive Operating (random reads)	HDD 500GB 7200RPM SATA SFF Self Encrypted Drive OPAL2	

System Configuration (High-end)	**Processor Info**	I5-10400 COMET LAKE G-0 6c LGA 65W MS0 QS
	Memory Info	Hynix (TG) 8GB 3200 DDR4 SODIMM ECC x1
	Graphics Info	Intel UHD Graphics
	Disks/Optical/Floppy	SSD Z Turbo Drive 512GB 2280 Three Layer Cell 2nd
	Power Supply	280W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	TBD	TBD
	Hard drive Operating (random reads)	HDD 1TB 7200RPM 7mm SATA 2.5in	

System Technical Specifications

System Configuration (Mid-level)	**Processor Info**	I3-10320 COMET LAKE G-0 6c LGA 65W T3 4(f)+2 QS
	Memory Info	Micron (TF) 8GB 3200 DDR4 SODIMM ECC x2
	Graphics Info	Intel UHD Graphics
	Disks/Optical/Floppy	SSD Z Turbo Drive 512GB 2280 Three Layer Cell 2nd
	Power Supply	180W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	TBD	TBD
	Hard drive Operating (random reads)	HDD 1TB 7200RPM 7mm SATA 2.5in	

System Configuration (High-end)	**Processor Info**	I3-10100 COMET LAKE G-0 6c LGA 65W T1 4(f)+2 QS
	Memory Info	Micron (TF) 8GB 3200 DDR4 SODIMM ECC x2
	Graphics Info	Intel UHD Graphics
	Disks/Optical/Floppy	ZTRB HP Z Turbo Drive QX310 256GB SSD
	Power Supply	180W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	TBD	TBD
	Hard drive Operating (random reads)	HDD 1TB 7200RPM 7mm SATA 2.5in	

System Configuration (Mid-level)	**Processor Info**	I9-10900 COMET LAKE P-1 10c LGA 65W P2 vPro™ QS
	Memory Info	Micron (TF) 4GB (1x4GB) 3200 DDR4 SODIMM NECC x2
	Graphics Info	Intel UHD Graphics
	Disks/Optical/Floppy	ZTRB HP Z Turbo Drive QX310 256GB SSD
	Power Supply	180W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	TBD	TBD
	Hard drive Operating (random reads)	ZTRB HP Z Turbo Drive QX310 256GB SSD	

System Configuration (High-end)	**Processor Info**	I5-10500 COMET LAKE G-0 6c LGA 65W MS1 vPro™ QS
	Memory Info	Samsung (TH) 4GB (1x4GB) 3200 DDR4 SODIMM NECC x2
	Graphics Info	Intel UHD Graphics
	Disks/Optical/Floppy	SSD Z Turbo Drive 512GB 2280 PCIe NVMe Self Encrypted OPAL2 Three Layer
	Power Supply	180W

		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)			
	Idle	TBD	TBD
	Hard drive Operating (random reads)	HDD 1TB 7200RPM 7mm SATA 2.5in	

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: 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 Cooling for details.
	Dynamic	Shock Operating: ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g) square: 422 cm/s, 20g Vibration Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g²/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 r 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation, up to 3048 m (1 feet)

Physical Security and Serviceability

Access Panel	Tool-less Has to remove Top panel before Bottom panel be removed.
Optical Drive	No
Hard Drives	HDD cage requires the use of a screwdriver to remove the HDD
Expansion Cards	M.2 module requires a screwdriver to service and replace. An option card requires a screwdriver to service and replace.
Processor Socket	Tool-less, except for the processor heatsink
Blue User Touch Points	Yes, on internal chassis mechanisms
Color-coordinated Cables and Connectors	Yes
Memory	Tool-less
System Board	Screw-In
Dual Color Power and HD LED on Front of Computer	The Power LED is on the front of the system, but the HDD LED is located on the Rear of the system

Restore CD/DVD Set	Consists of an operating system DVD (OSDVD) and a driver DVD (DRDVD). OSDVD restores the original operating system. DRDVD will provide all drivers for the system. The DRDVD may also contain applications that originally shipped with the system for optional installation. Applications can also be obtained from HP.com. OSDVD and DRDVD are orderable with the system and available from HP Support.
Dual Function Front Power Switch	Yes, causes a fail-safe power off when held for 4 seconds (default) or 15 seconds (can be configured by F10 BIOS setup\Advanced\System Options\Power button override)
Padlock Support	No
Cable Lock Support	Yes, Kensington Cable Lock (optional): Locks top cover from being opened and secures chassis to furniture t theft 3 mm x 7 mm slot at rear of system
Universal Chassis Clamp Lock Support	No
Solenoid Lock and Hood Sensor	Only Hood Sensor(optional)
Rear Port Control Cover	No
Serial, USB, Audio, Network, Enable/Disable Port Control	Yes, enables or disables serial, USB, audio, and network ports (parallel port is not supported on the Z2 Mini G
Power-On Password	No
3.3V Aux Power LED on System PCA	No
NIC LEDs (integrated) (Green & Amber)	Yes
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
Power Supply Diagnostic LED	Yes; this is located on the Rear of the chassis and combined with the HDD LED. When the PSU adapter is plugged in, and the unit is powered off, the Power OK LED will glow.
Front Power Button	Yes
Front Power LED	Yes, white (normal), red (fault)
Front Hard Drive Activity LED	HDD LED is located on the Rear of the chassis
Front ODD Activity LED	No
Internal Speaker	Yes
Cooling Solution	Air cooled forced convection
Power Supply Fans	No
Memory Heatsink Fan	No
Access Panel Key Lock	The Kensington lock slot on the chassis serves this purpose
Integrated Chassis Handles	No
Power Supply	No
Flash ROM	Yes
Diagnostic Power Switch LED on board	Yes

System Technical Specifications

Clear CMOS Button	Yes
CMOS Battery Holder	Yes
DIMM Connectors	Yes

BIOS

BIOS 32-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.
BBS	BIOS Boot Specification v1.01.
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 Boot Spec 1.01+	Provides more control over how and from what devices the workstation will boot.
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 utilit can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
SMBIOS	System Management BIOS 3.2, for system management information.
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 affecti 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 - ACPI sleep state S3)	Allows for very low power consumption with quick resume time.
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 thro an industry standard interface (SMBIOS and WMI) so that management SW applications can use and report this information.

System Technical Specifications

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 14 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.
Industry Standard	Revision Supported by the BIOS
UEFI Specification Revision	2.7
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
EDD	Enhanced Disk Drive Specification Version 1.1 BIOS Enhanced Disk Drive Specification Version 3.0
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, Draft .7
PCI Express	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0
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	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
TPM	Trusted Computing Group TPM Specification Version 2.0 (Infineon SLB 9670). 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
SMBIOS	System Management BIOS Reference Specification, Version 3.2 External BIOS simulator found at: http://csrsml.itcs.hp.com/

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 b one or more of these marks: • IT ECO declaration • ~~US ENERGY STAR®~~ • EPEAT® Gold registered in the United States. See http://www.epeat.net for registration status country. • TCO Certified 8.0
System Configuration	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Work is based on a "Typically Configured Workstation"?.

System Technical Specifications

Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	22.14 W	25.47 W	24.83 W
Normal Operation (Long idle)	20.37 W	19.53 W	19.39 W
Sleep	2.53 W	1.96 W	2.34 W
Off	0.564 W	0.66 W	0.66 W

NOTE:
Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model fa computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environment Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offe STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC fea 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)	75.72 BTU/hr	87.11 BTU/hr	84.92 BTU/hr
Normal Operation (Long idle)	69.67 BTU/hr	66.79 BTU/hr	66.31 BTU/hr
Sleep	8.65 BTU/hr	6.7 BTU/hr	8 BTU/hr
Off	1.93 BTU/hr	2.26 BTU/hr	2.26 BTU/hr

***NOTE:** Heat dissipation is calculated based on the measured watts, assuming the service level is atta hour.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured - Idle	2.88	15.54
Fixed Disk - Random writes	3.44	23.04

Longevity and Upgrading

"This product can be upgraded, possibly extending its useful life by several years. Upgradeable featu 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

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: Not Applilcable

Battery type: Not Applilcable

Additional Information

- ~~This product~~ is ~~in compliance with the Restrictions~~ of ~~Hazardous Substances (RoH~~ 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; Saf Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the <Gold level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO1146 and ISO1043.
- This product contains 60.0% post-consumer recycled plastic (by wt.)
- This product is 96.6% recycle-able when properly disposed of at end of life.

Packaging Materials	**External:**	PAPER/Corrugated	674 g
		PAPER/Molded Pulp	276 g
	Internal:	PLASTIC/Polyethylene low density - LDPE	19 g

The plastic packaging material contains at least 50% recycled content.

The corrugated paper packaging materials contains at least 70% recycled content.

Material Usage

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

- *Asbestos*
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- 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 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, has been voluntarily removed from mos 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
- 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.

End-of-life Management and Recycling

HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. 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 fo each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the HP web site at: http://www.hp.com/go/recyclers. These instructi may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers 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

Manageability

Remote Manageability Software Solutions	The HP Z2 G5 Workstation is supported on the following remote manageability software consoles: • LANDesk Management Suite (HP recommended solution) • Microsoft System Center Configuration Manager For questions or support for manageability needs, please visit http://www.hp.com/go/clientmanagement
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

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 worldwide to all HP Workstation customers-no special programs, no additional cost, no kic Simply select your hardware and software components when you customize your HP Workstation and be assured that you'll be able to b that same configuration throughout the lifecycle of the 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 9.5mm SATA 2.5 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 2.5" HDD**	**Capacity**	500GB
		Protocol	SATA
		Form Factor	SFF (2.5")
		Controller	AHCI
		Rated for 24/7/365 operation	NO
		Physical Size (Height)	0.28 in; .7 cm
		Physical Size (Width)	2.75 in; 6.99 cm
		Media Diameter	2.5 in; 6.36 cm
		Interface	Serial ATA (6Gb/s), NCQ enabled
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s*
		Operating Temperature	32° to 140° F (5° to 55° C)
		*Actual performance may vary.	
	1TB SATA 7200 rpm 6Gb/s 2.5" HDD	**Capacity**	1TB
		Protocol	SATA
		Form Factor	SFF (2.5")
		Controller	AHCI
		Rated for 24/7/365 operation	NO
		Physical Size (Height)	0.28 in; .7 cm
		Physical Size (Width)	2.75 in; 6.99 cm
		Media Diameter	2.5 in; 6.36 cm
		Interface	Serial ATA (6Gb/s), NCQ enabled
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s*
		*Actual performance may vary.	
	2TB SATA 7200 rpm 6Gb/s 2.5" HDD	**Capacity**	2TB
		Protocol	SATA
		Form Factor	SFF (2.5")
		Controller	AHCI
		Physical Size (Height)	0.28 in; .7 cm
		Physical Size (Width)	2.75 in; 6.99 cm
		Media Diameter	2.5 in; 6.36 cm
		Operating Temperature	32° to 140° F (5° to 55° C)
		*Actual performance may vary.	

Technical Specifications - Hard Drives

500GB SATA 7.2K SED 2.5" HDD

Capacity	500GB	
Protocol	SATA	
Form Factor	2.5"	
Physical Size (Height)	0.275 in; 0.7 cm	
Physical Size (Width)	2.5 in; 6.36 cm	
Media Diameter	2.75 in; 6.99 cm	
Interface	Serial ATA (6Gb/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.

HP 256GB SATA 6Gb/s SSD

Capacity	256GB
Protocol	SATA
Form Factor	2.5"
Physical Size (Height)	0.28 in; 0.7 cm
Physical Size (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.

PCIe SSDs for HP Workstations

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 (MTBF)	1.5M hours
Interface	PCI Express 3.0 x4
Operating Temperature	32° to 158° F (0° to 70° C)

Technical Specifications - Hard Drives

Performance	**Sequential Read**	2800 MB/s*
	Sequential Write	1100MB/s*
	Random Read	250K IOPS*
	Random Write	180K IOPS*

*Actual performance may vary.

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**	2800 MB/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 (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3000 MB/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 (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 electrical	
	Operating Temperature	32° to 158° F (0° to 70° C)	
	Performance	**Sequential Read**	3000 MB/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 (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	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 (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*
	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 (MTBF)	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 (MTBF)	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

AMD Radeon™ Pro WX 3200 4GB Graphics	**Form Factor**	Mobile PCI Express Custom Module
	Power	35W
	Bus Type	PCI Express 3.0 x8
	Memory	4GB GDDR5
	Connectors	3x DisplayPort™ 1.4 - HDR ready connectors with HBR3 and MST support.
	Maximum Resolution	4096x2160 x 24 bpp @ 60Hz
	Supported Graphics APIs	DirectX®12 OpenGL® 4.5 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

Nvidia® Quadro® P620 4GB Graphics	**Form Factor**	Mobile PCI Express Custom Module
	Power	35W
	Bus Type	PCI Express 3.0 x16
	Memory	4GB GDDR5
	Connectors	3x DisplayPort™ 1.2 - HDR ready connectors with HBR2 and MST support.
	Maximum Resolution	4096x2160 x 24 bpp @ 60Hz
	Supported Graphics APIs	DirectX®12 OpenGL® 4.5 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® T1000 4GB Graphics	**Form Factor**	Mobile PCI Express Custom Module
	Power	50W
	Bus Type	PCI Express 3.0 x16
	Memory	4GB GDDR6
	Connectors	3x DisplayPort™ 1.4 - HDR ready connectors with HBR3 and MST support.
	Maximum Resolution	5120 x 3200 @ 60Hz
	Supported Graphics APIs	DirectX®12 OpenGL® 4.5 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

Nvidia® Quadro® T2000 4GB Graphics	**Form Factor**	Mobile PCI Express Custom Module
	Power	60W
	Bus Type	PCI Express 3.0 x16
	Memory	4GB GDDR6
	Connectors	3x DisplayPort™ 1.4 - HDR ready connectors with HBR3 and MST support.
	Maximum Resolution	5120 x 3200 @ 60Hz
	Supported Graphics APIs	DirectX®12 OpenGL® 4.5 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 3000 6GB Graphics	**Form Factor**	Mobile PCI Express Custom Module
	Power	60W
	Bus Type	PCI Express 3.0 x16
	Memory	6GB GDDR6
	Connectors	3x DisplayPort™ 1.4 - HDR ready connectors with HBR3 and MST support.
	Maximum Resolution	5120 x 3200 @ 60Hz* *Requires 2 DisplayPorts™ to be plugged into a 5K monitor.
	Supported Graphics APIs	DirectX®12 OpenGL® 4.5 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

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® 9560 Wireless LAN (802.11ac) and Bluetooth 5 Module	**Connector**	M.2 (Supports 2230 form factor; E Key) Motherboard Interface
	Controller	Intel® Dual Band Wireless-AC 9560
	Compliance	Wireless LAN: IEEE 802.11abgn, 802.11ac, 802.11d, 802.11e, 802.11i, 802.11h, 802.11w, CCX 4.x/CCX Lite, WMM, WPA, WPA2, APS, WPS 2.0, Protected Management Frames Bluetooth®: Dual Mode Bluetooth® 2.1, 2.1+EDR, 3.0, 4.0, BLE, 4.2, and 5
	Bus Architecture	PCI Express Gen3 x1 and USB 2.0
	Power Requirement	Requires 3.3V; 1.65W TDP
	Management Capabilities	Wake on WLAN (in all sleep states, excluding Max Power Savings mode), WFA Management Frame Protection (802.11w), vPro™/WiAMT Not Currently Supported, F10 BIOS Menu option to disable/enable WLAN and Bluetooth® radios, supports seamless roaming between 802.11 wireless access points
	Throughput	Max PHY throughput 1.73 Gbps (802.11ac) for WLAN

Technical Specifications - Networking and Communications

Allied Telesis 1GbE LC Fiber 2pc Module	**Network Interface(s)**	1 LC Fiber Connection
	System Interface	PCI Express Gen1.1x1 (via WLAN M.2 interface)
	Network Cable	1GbE over Multimode LC Fiber. Distance is dependent upon network cable: OM1 50/125um 500 MHz:km 550m OM2 62.5/125um 200 MHz:km 275m OM2 62.5/125um 160MHz:km 220m
	Data Rates Supported	1 Gbps
	LED Indicators	Link/Activity LED (Green): Off = No Link, Solid = Link, Blinking = Activity
	Controller	Broadcom BCM57762
	Compliance	IEE 802.3z Base1000SX 802.3x (Ethernet Flow Control) 802.1Q (VLANs) 802.1P (Quality of Service) FCC B (USA) CE (European Union) ICES-003 B (Canada) BSMI (Taiwan) VCCI (Japan) KCC (Korea) CTICK (Australia/New Zealand) UL (Safety) RoHS (Restricted or Hazardous Substances)
	Power Requirement	2W (Typical)
	Operating Temperature	32° to 122° F (0° to 50° C)
	Physical Dimensions (LxW)	LC Fiber Board: 37mm x 45mm x 13mm (WxLxH, including connector) Cable: 200mm M.2 Board: 22mm x 30mm x 1.75mm (WxLxH)
	Kit Contents	LC fiber board, M.2 board, connecting cable, and 2 screws for attaching the LC fib board to the motherboard Product Warranty statement and the Installation Guide.

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 PCs, servers and mobile computers more inherently manageabl out-of-the-box and over the network PCs, servers and mobile computers 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 white User must provide file fo BIOS recovery (USB storage typically) + 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 + 3 white User must enter a ke sequence to proceed with recovery by policy + 3 white User must enter a key sequence to proceed with recovery by policy
    - 2 red + 4 white BIOS recovery is in progress + 4 white BIOS recovery is in progress + 4 white BIOS recovery is in progress
    - 3 red + 2 white Memory could not be initialized + 2 white Memory could not be initialized + 2 white Memory could be initialized
    - 3 red + 3 white Graphics adaptor could not be found + 3 white Graphics adaptor could not be found + 3 white Gra adaptor could not be found
    - 3 red + 4 white Power supply failure / not connected + 4 white Power supply failure / not connected + 4 white Po supply failure / not connected
    - 3 red + 5 white Processor not installed + 5 white Processor not installed + 5 white Processor not installed
    - 3 red + 6 white Current processor does not support an enabled feature + 6 white Current processor does not supp an enabled feature + 6 white Current processor does not support an enabled feature
    - 4 red + 2 white Processor has exceeded its temperature threshold / system thermal shutdown + 2 white Processo has exceeded its temperature threshold / system thermal shutdown + 2 white Processor has exceeded its temperature threshold / system thermal shutdown
    - 4 red + 3 white System internal temperature has exceeded its threshold + 3 white System internal temperature ha exceeded its threshold + 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 rebooted the syste after a health or recovery timer triggered 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

Technical Specifications – Miscellaneous Features

- Green Pull Tabs, and Quick Release Latches for easy Identification

Summary of Changes

Date of change:	**Version History:**		**Description of change:**
September 9, 2020	From v1 to v2	**Changed**	Format

title

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