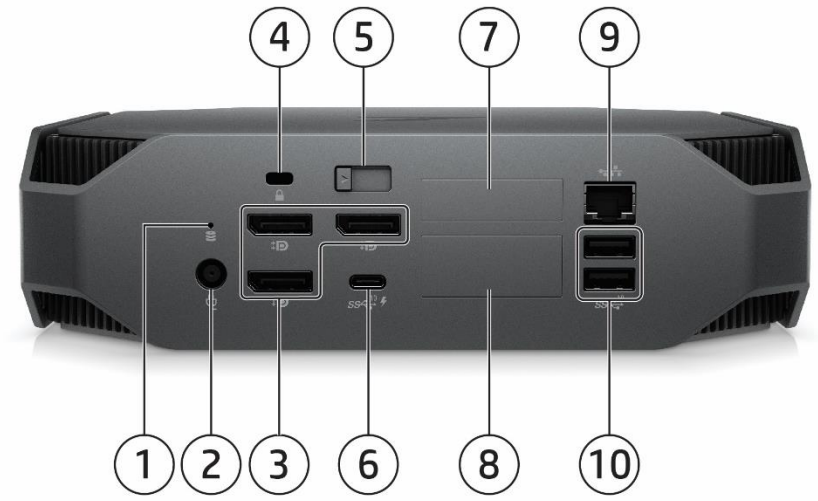
## Overview

### 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

## Overview




**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
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]
8. Flex IO modules, choice of:
   VGA, HDMI 2.0b, DisplayPort™ 1.4[3], Dual Type-A SuperSpeed USB 5Gbps signaling rate 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

[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.

## Overview

**Form Factor** Mini

**Operating Systems** Preinstalled:

- Windows® 10 Pro 64[1]
- Windows® 10 Pro for Workstations 64[1]
- Windows® 10 Home 64[1]
- Ubuntu 20.04 LTS[2]
- Linux®-ready[3]
- Red Hat® Enterprise Linux® Desktop Workstation (Paper license with 1-year support; no preinstalled OS)

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.
- Red Hat® Enterprise Linux® Workstation 8
- SUSE Linux® Enterprise Desktop 15

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

[2] Not all features are available in all editions or versions of Ubuntu. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply, and additional requirements may apply over time for updates.

[3] 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™ i9-10850K Processor | 10 | 3.6 | 20 | 2933 | Y | Intel® UHD Graphics 630 | 5.2 | N/A | Y | 125 |

## Overview

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Intel® Core™ i7-10700K Processor[5] | 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[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 |

## Overview

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

[2]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™ enabled 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 dependent on 3rd party software providers. Compatibility of this generation of Intel vPro™ technology-based hardware with future "virtual appliances" is yet to be determined.

[4]Available in Q4, 2020

[5]Configurable TDP-down 95W

| | |
|---|---|
| **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<br>2 80mm M.2 Storage slot (PCIe Gen3 x4)<br>1 30mm M.2 WLAN slot (PCIe Gen3 x1 / Intel CNVI) – for WLAN/BT M.2 modules only<br><br>**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 USB 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<br><br>Optional: 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (optional, supports charging), 1 DisplayPort™ 1.4[1], 2 Flex IO modules |
| **On-board RAID Support** | NVMe RAID 0 Striped Array<br>NVMe RAID 1 Mirrored Array |
| **Chassis Dimensions (H x W x D)** | H: 2.28" [58mm] (Standard desktop orientation)<br>W: 8.5" [216mm]<br>D: 8.5" [216mm] |
| **Packaged Dimensions** | H: 11.73" (298mm)<br>W: 6.69" (170mm)<br>D: 19.65" (499mm) |
| **Rack Dimensions** | 5U |
| **Weight** | Exact weights depend upon configuration<br>Minimum: 2.1kg (4.6lbs.)<br>Maximum: 2.42kg (5.3lbs.) |

## Overview

| | |
|---|---|
| **Temperature** | Operating: 5° to 35° C (40° to 95° F)<br>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<br>Non-operating: -40° to 60° C (-40° to 140° F)<br>Maximum rate of change: 10°C/hr |
| **Humidity** | Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb<br>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)<br>Operating (with only Solid-State Drives): 5,000 m (16,404 feet)<br>Non-operating: 12,192 m (40,000 feet)<br>Maximum operating temperature is reduced as altitude increases. See Temperature for details. |
| **Power Supply** | Choice of:<br>180W 89% Average Efficiency.<br>280W 89% Average Efficiency.<br>**NOTES:** Customers placing their system in an enclosure should design their solution to accommodate the size of the 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 selection. |
| | [1]All DisplayPort™ support DP1.4/HBR2 when video output is via Intel Graphics. Discrete graphics support DP1.4 / 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™ i9 10850K Processor | Y | N | | |
| | 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, 2020

**NOTE 2:** Available in Q4, 2020

**NOTE 3:** TDP configured down to 95W.

| 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 | 4 |
| | 1TB SATA 7200 rpm 6Gb/s SFF HDD (2.5") | Y | Y | T0K74AA/AT | 4 |
| | 2 TB SATA 5400 rpm SFF HDD (2.5") | Y | N | | |
| | 500GB SATA 7.2K SED SFF HDD | Y | Y | D8N29AA | 4 |
| | **SATA Solid State Drives** | | | | |
| | HP 256GB SATA 6Gb/s SSD | Y | Y | A3D26AA/AT | 4 |
| | HP 2TB SATA SSD | | | Y6P08AA/AT | 4 |
| | **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 | |

## Supported Components

| | | | |
|---|---|---|---|
| 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 |
| HP 2TB PCIe NVME TLC M.2 Z2 G5 Mini SSD | Y | Y | 35F75AA |

**NOTE1:** SATA hardware-assisted 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-assisted RAID. All drives 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.
**NOTE4:** Only compatible with 65W CPU

*For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 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™ 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 | | | |

## Supported Components

| | | |
|---|---|---|
| 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 memory.

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

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

| 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 |
| HP Flex 1GbE Fiber LC Single Port | Y | Y | 20J15AA |

**NOTE 1:** The integrated network connection is required to support Intel® vPro™ Technology.

## Supported Components

**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 rack mount bracket Kit | N | Y | 3RW67AA |
| | 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 |

| 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 |
| | 3DConnexion 3 Button Wired CAD Mouse Pro | N | Y | 2H5H5AA |
| | 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 |

## Supported Components

| 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

**Operating Systems**

Windows 10 Pro 64
Windows 10 Pro for Workstation 64
Windows 10 Home 64
Ubuntu 20.04 LTS
Linux-Ready
Red Hat Enterprise Linux(RHEL) Workstation – Paper license (1 yr)

**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.
- Class 3 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

## Supported Components

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**
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 "Clear" 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 activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit: https://www.absolute.com/about/legal/agreements/absolute/
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 Workstation from day one—and every day after. Learn more or download at: https://www8.hp.com/us/en/workstations/performance-advisor.html
15. HP Z Central Remote Boost Software does not come preinstalled on Z Workstations but can be downloaded and run on all Z desktop and 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. RGS requires Windows, RHEL (7 or 8), UBUNTU 18.04 LTS, or HP ThinPro 7 operating systems. MacOS (10.13 or newer) operating system is only supported on the receiver 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.

## Supported Components

22. HP Sure Run Gen3 is available on select Windows 10 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors.
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 on platforms with multiple internal storage drives. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on PC's with Intel Wi-Fi Module.

System Technical Specifications

## 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 memory DIMMs cannot be mixed in the same system | |
| **PCI Express Connectors** | • 1 MXM PCI Express Gen3 slot x1<br>• 2 M.2 Storage (PCIe Gen3 x4)<br>• 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, PXE 2.1 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 to 5V/2.1A); 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (charge supports up to 5V/3A) |
| | **Rear** | 2 Type-A SuperSpeed USB 10Gbps signaling rate port; 1 Type-C® SuperSpeed USB 10Gbps signaling rate port (optional); 1 Type-C® SuperSpeed USB 10Gbps signaling rate 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) | |

## System Technical Specifications

| | |
|---|---|
| **Front Control Panel/Speaker Header** | Yes |
| **CMOS Battery Holder - Lithium** | Yes |
| **Integrated Trusted Platform Module** | Integrated TPM 2.0<br>Convertible to FIPS 140-2 Certified mode through firmware v7.85<br>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)<br>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 Configurations

| | | |
|---|---|---|
| *Z2 Mini G5 Configuration #1* | Processor Info | CPU I Core i5-10400 2.9GHz 6C65W |
| | Memory Info | 8GB (1x 8GB) 2666 MHz DDR4 non-ECC |
| **ENERGY STAR CERTIFIED** | Graphics Info | Intel® UHD Integrated Graphics 630 |
| | Disks/Optical/Floppy | 1x SATA 1TB 7.2k rpm |
| | Power Supply | 180W |

| Energy Consumption | | 115 VAC | 230 VAC | 100 VAC |
|---|---|---|---|---|

## System Technical Specifications

(Watts)

| | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
|---|---|---|---|---|---|---|
| Windows long Idle (S0) | 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 Enabled |
| 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 Disabled |
| 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 Enabled |
| 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 | |

*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 |

## System Technical Specifications

| | | |
|---|---|---|
| | 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 | |

System Technical Specifications

## Declared Noise Emissions

| | | | |
|---|---|---|---|
| **System Configuration (Entry level)** | **Processor Info** | W-1250P COMET LAKE WS P-1 6c LGA 125W WE1P 6(f)+2 vPro™ QSS / W-1250P COMET LAKE WS Q-0 6c LGA 4.1 GHz 125W QULG vPro™ Supplemental QS | |
| | **Memory Info** | Hynix (TG)<br>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 Cell SS | |
| | **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™ QSK QS / W-1290 COMET LAKE WS Q-0 10c LGA 3.2 GHz 80W QUTJ vPro™ Supplemental QS | |
| | **Memory Info** | Samsung (TH)<br>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)<br>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 Configuration (Mid-level)** | **Processor Info** | I3-10320 COMET LAKE G-0 6c LGA 65W T3 4(f)+2 QS | |
| | **Memory Info** | Micron (TF)<br>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 | |

## System Technical Specifications

| | | | |
|---|---|---|---|
| **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)<br>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)<br>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)<br>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 Cell SS | |
| | **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 | |

| | | |
|---|---|---|
| **Environmental Requirements** | **Temperature** | Operating: 5° to 35° C (40° to 95° F)<br>Non-operating: -40° to 60° C (-40° to 140° F)<br>Maximum rate of change: 10°C/hr |
| | **Humidity** | Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb<br>Non-operating: 10% to 90% RH, non-condensing, 35° C maximum wet bulb |

## System Technical Specifications

| | |
|---|---|
| **Maximum Altitude** | Operating (with Rotational Hard Drives): 3,048 m (10,000 feet)<br>Operating (with only Solid-State Drives): 5,000 m (16,404 feet)<br>Non-operating: 12,192 m (40,000 feet)<br>Maximum operating temperature is reduced as altitude increases. See Cooling for details. |
| **Dynamic** | Shock<br>Operating: ½-sine: 40g, 2-3ms (~62 cm/sec)<br>Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g)<br>square: 422 cm/s, 20g<br><br>Vibration<br>Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g²/Hz<br>Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g²/Hz |
| **Cooling** | Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation, up to 3048 m (10,000 feet) |

## Physical Security and Serviceability

| | |
|---|---|
| **Access Panel** | Tool-less<br>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.<br>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 to prevent theft<br>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 G5) |
| **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. CPU removal is tool-less |

## System Technical Specifications

| | |
|---|---|
| **Power Supply Diagnostic LED** | Yes; this is located on the Rear of the chassis and combined with the HDD LED.<br>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 |
| **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. |

## System Technical Specifications

| | |
|---|---|
| **Replicated Setup** | Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigurationUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup). |
| **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:<br>• NORMAL - normal temperature ranges.<br>• ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown.<br>• 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).<br>Enables an operating system to control system power consumption based on the dynamic workload.<br>Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.<br>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 through an industry standard interface (SMBIOS and WMI) so that management SW applications can use and report this information. |
| **System board revision level** | Allows management SW to read revision level of the system board.<br>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<br>BIOS Enhanced Disk Drive Specification Version 3.0 |

## System Technical Specifications

| | |
|---|---|
| **EHCI** | Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0 |
| **PCI** | PCI Local Bus Specification, Revision 2.3<br>PCI Power Management Specification, Revision 1.1<br>PCI Firmware Specification, Revision 3.0, Draft .7 |
| **PCI Express** | PCI Express Base Specification, Revision 2.0<br>PCI Express Base Specification, Revision 3.0 |
| **SATA** | Serial ATA Specification, Revision 1.0a<br>Serial ATA 3 Gb/s: Serial ATA Specification, Revision 2.5<br>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).<br>Common Criteria EAL4+ certified.<br>FIPS 140-2 Certification<br>TCG TPM Certified products list:<br>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<br>Universal Serial Bus Revision 2.0 Specification<br>Universal Serial Bus Revision 3.1 Specification |
| **SMBIOS** | System Management BIOS Reference Specification, Version 3.2<br>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 be labeled with 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 in your country.
- TCO Certified 8.0

**System Configuration**

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

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

| **Heat Dissipation*** | **115VAC, 60Hz** | **230VAC, 50Hz** | **100VAC, 50Hz** |
|---|---|---|---|
| Normal Operation (Short idle) | 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 |

## System Technical Specifications

| | | | |
|---|---|---|---|
| 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 attained for one 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 |

**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 (RoHS) directive - 2011/65/EC.
- • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- • This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- • This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the <Gold> level, see www.epeat.net
- • Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- • This product 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 the HP 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 carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

**Packaging Usage**

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

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

**End-of-life Management and Recycling**

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

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

**HP Inc. Corporate Environmental Information**

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

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

## Manageability

| | |
|---|---|
| **Remote Manageability Software Solutions** | The HP Z2 G5 Workstation is supported on the following remote manageability software consoles:<br>• LANDesk Management Suite (HP recommended solution)<br>• Microsoft System Center Configuration Manager<br><br>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 configuration stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware and 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 kidding. Simply select your hardware and software components when you customize your HP Workstation and be assured that you'll be able to buy 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™ i9-10850K Processor
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. | |
| | **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 |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | **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) | |
| | **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.

| | | | |
|---|---|---|---|
| **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 |

Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | **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. | | |
| **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<br>OpenGL® 4.5<br>OpenCL™ 2.0<br>Vulkan™ 1.0 |
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Linux® 64-bit (selected Enterprise distributions)<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>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<br>OpenGL® 4.5<br>OpenCL™ 2.0<br>Vulkan™ 1.0 |
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Linux® 64-bit (selected Enterprise distributions)<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

| | | |
|---|---|---|
| **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<br>OpenGL® 4.5<br>OpenCL™ 2.0<br>Vulkan™ 1.0 |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Linux® 64-bit (selected Enterprise distributions)<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>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<br>OpenGL® 4.5<br>OpenCL™ 2.0<br>Vulkan™ 1.0 |
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Linux® 64-bit (selected Enterprise distributions)<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

| | | |
|---|---|---|
| **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*<br>*Requires 2 DisplayPorts™ to be plugged into a 5K monitor. |
| | **Supported Graphics APIs** | DirectX®12<br>OpenGL® 4.5<br>OpenCL™ 2.0<br>Vulkan™ 1.0 |
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Linux® 64-bit (selected Enterprise distributions)<br><br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/en/support.html |

## 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<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps |
| | **Management Capabilities** | vPro™, WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, ACPI, Advanced cable diagnostic, loopback modes,<br>AMT 12.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD) |

| | | |
|---|---|---|
| **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 (theoretical 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 access points limited. Wi-Fi 5 (802.11 ax) is backwards compatible with prior 802.11 specs | |

| | | |
|---|---|---|
| **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:<br>OM1 50/125um 500 MHz:km 550m<br>OM2 62.5/125um 200 MHz:km 275m<br>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 |

## Technical Specifications - Networking and Communications

| | |
|---|---|
| **Compliance** | IEE 802.3z Base1000SX<br>802.3x (Ethernet Flow Control)<br>802.1Q (VLANs)<br>802.1P (Quality of Service)<br><br>FCC B (USA)<br>CE (European Union)<br>ICES-003 B (Canada)<br>BSMI (Taiwan)<br>VCCI (Japan)<br>KCC (Korea)<br>CTICK (Australia/New Zealand)<br><br>UL (Safety)<br>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)<br>Cable: 200mm<br>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 fiber board to the motherboard<br>Product Warranty statement and the Installation Guide. |

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 without affecting other elements of the system.
- Intel® Wired for Management support; industry wide initiative to make Intel® architecture based PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network PCs, servers and mobile computers more inherently manageable 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 for 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 key 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 not be initialized
        - 3 red + 3 white  Graphics adaptor could not be found + 3 white  Graphics adaptor could not be found + 3 white  Graphics adaptor could not be found
        - 3 red + 4 white  Power supply failure / not connected + 4 white  Power supply failure / not connected + 4 white  Power 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 support 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  Processor 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 has 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 system 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 invoked 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)

## Technical Specifications – Miscellaneous Features

- 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
- 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 |
| December 18, 2020 | From v2 to v3 | **Changed** | Processors, Other Hardware, HP Bios, Storage / Hard Drives, Networking and Communications, and Input Devices sections |
| February 1, 2021 | From v3 to v4 | **Changed** | Operating Systems, Storage / Hard Drives and NETWORKING AND COMMUNICATIONS sections |
| March 1, 2021 | From v4 to v5 | **Changed** | Social and Environmental Responsibility section |