## Overview
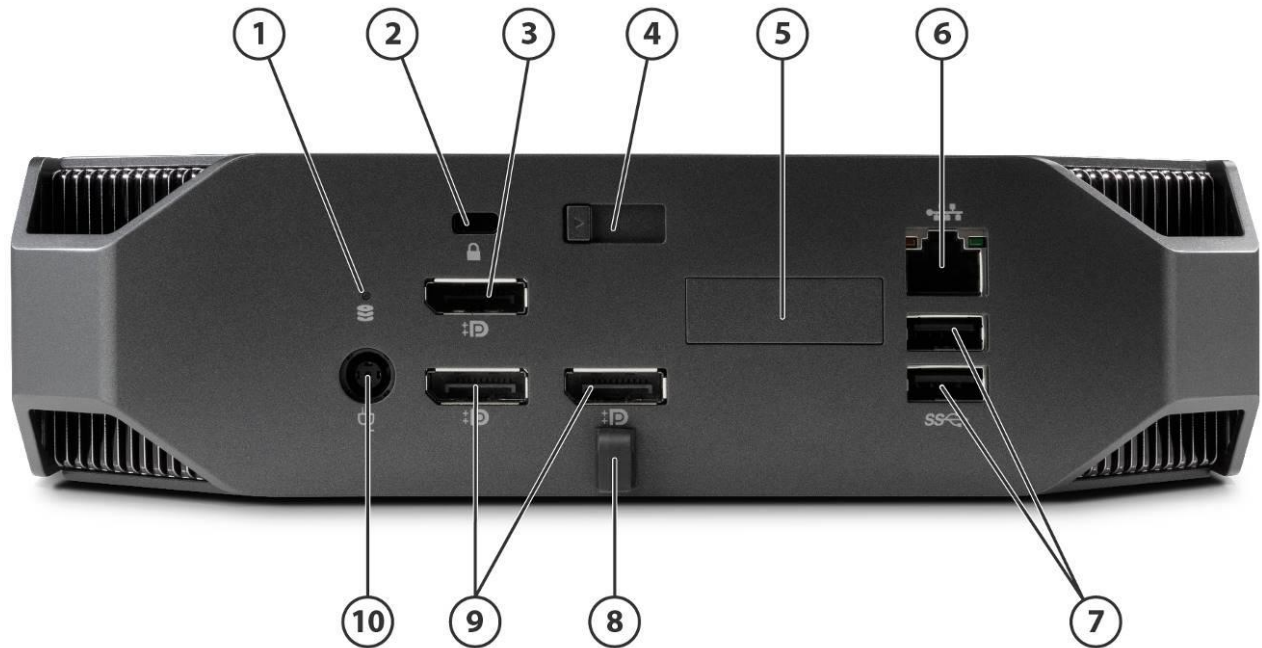
### HP Z2 Mini Workstation

**Front View**

1. Power Button
2. Headset
3. USB 3.0 charging data port
4. USB 3.0 data port
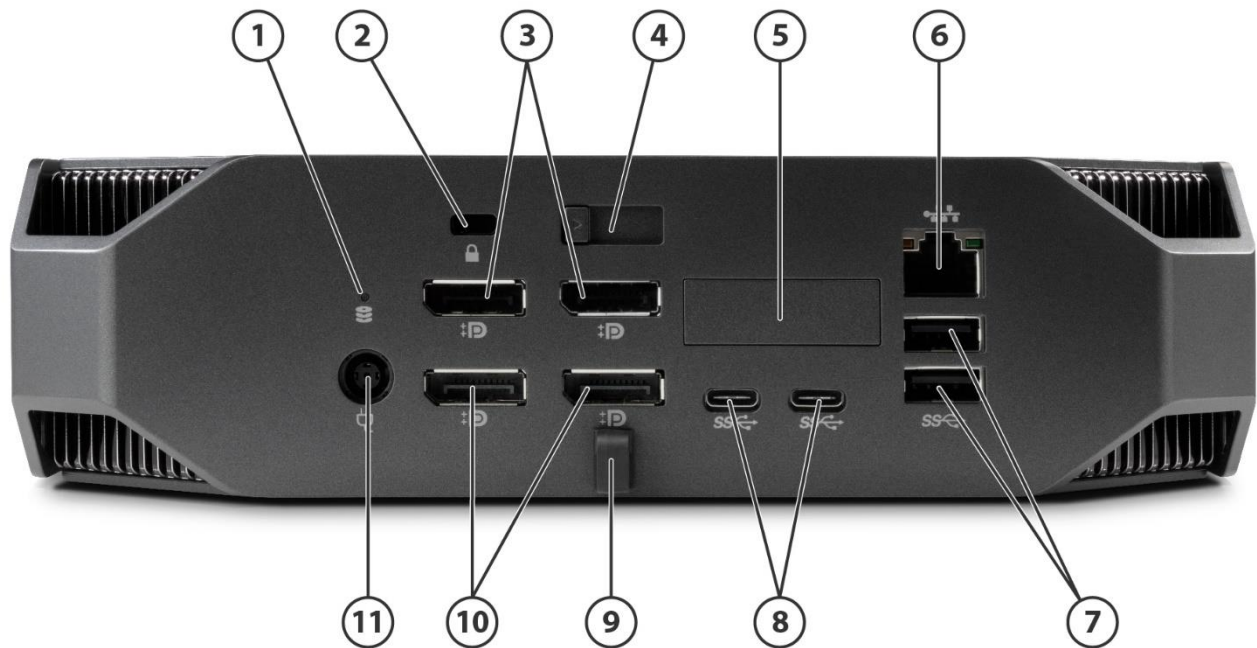
## Overview

**HP Z2 Mini Entry, back view**

1. HDD LED
2. Security slot
3. (1) DisplayPort™
4. Cover latch
5. Serial port (optional)

6. RJ-45 (Ethernet)
7. (2) USB 3.0 ports
8. DC cable clip
9. (2) DisplayPort™
10. DC In

## Overview

**HP Z2 Mini Performance, back view**

1. HDD LED
2. Security slot
3. (2) DisplayPort™
4. Cover latch
5. Serial port (optional)
6. RJ-45 (Ethernet)
7. (2) USB 3.0 ports
8. (2) USB Type C™
9. DC cable clip
10. (2) DisplayPort™
11. DC In
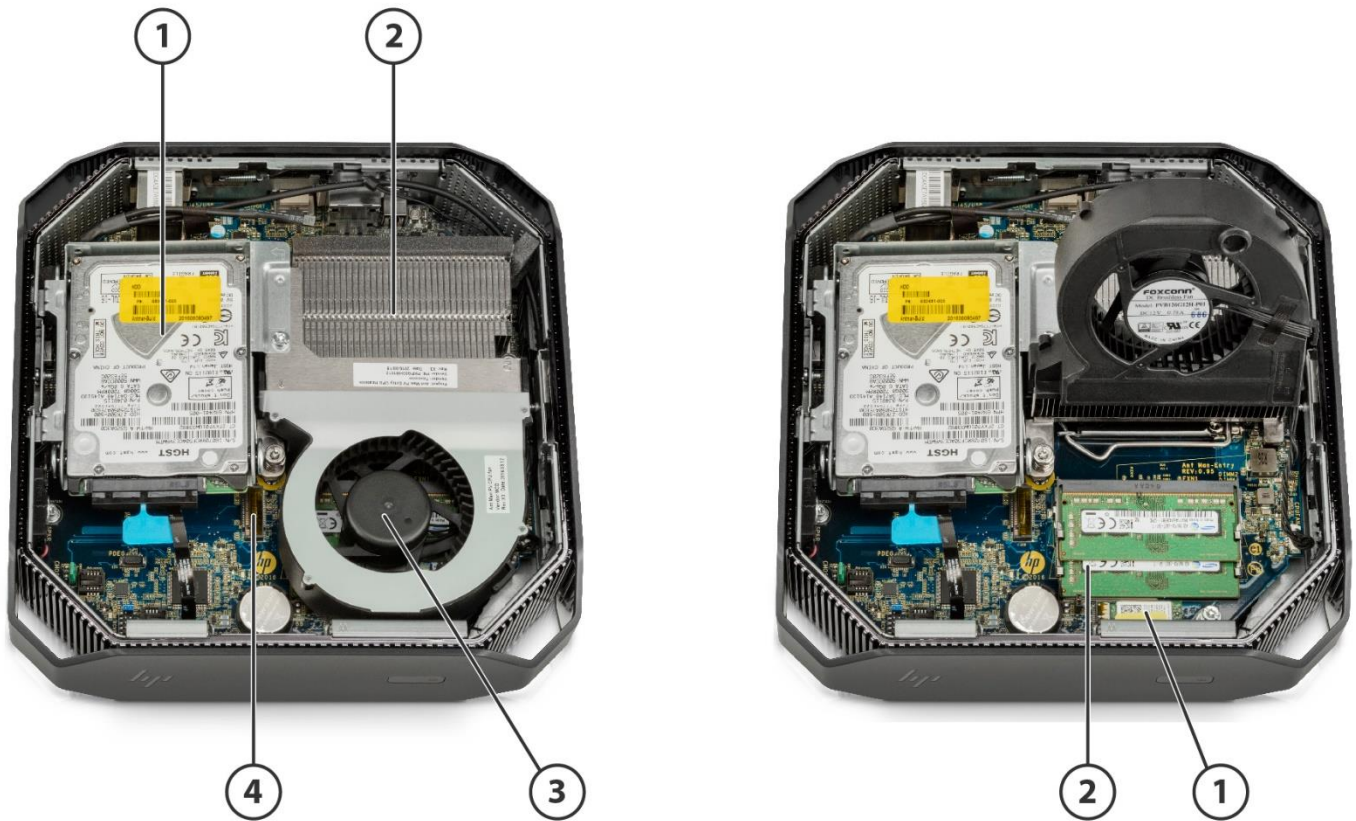
## Overview



**HP Z2 Mini Entry, Internal View**

1. SATA HDD/SSD (9.5mm 2.5")
2. CPU heatsink
3. CPU blower
4. M.2 80mm (PCIe SSD)

1. M.2 30mm WLAN/BT
2. (2) SODIMM memory slots
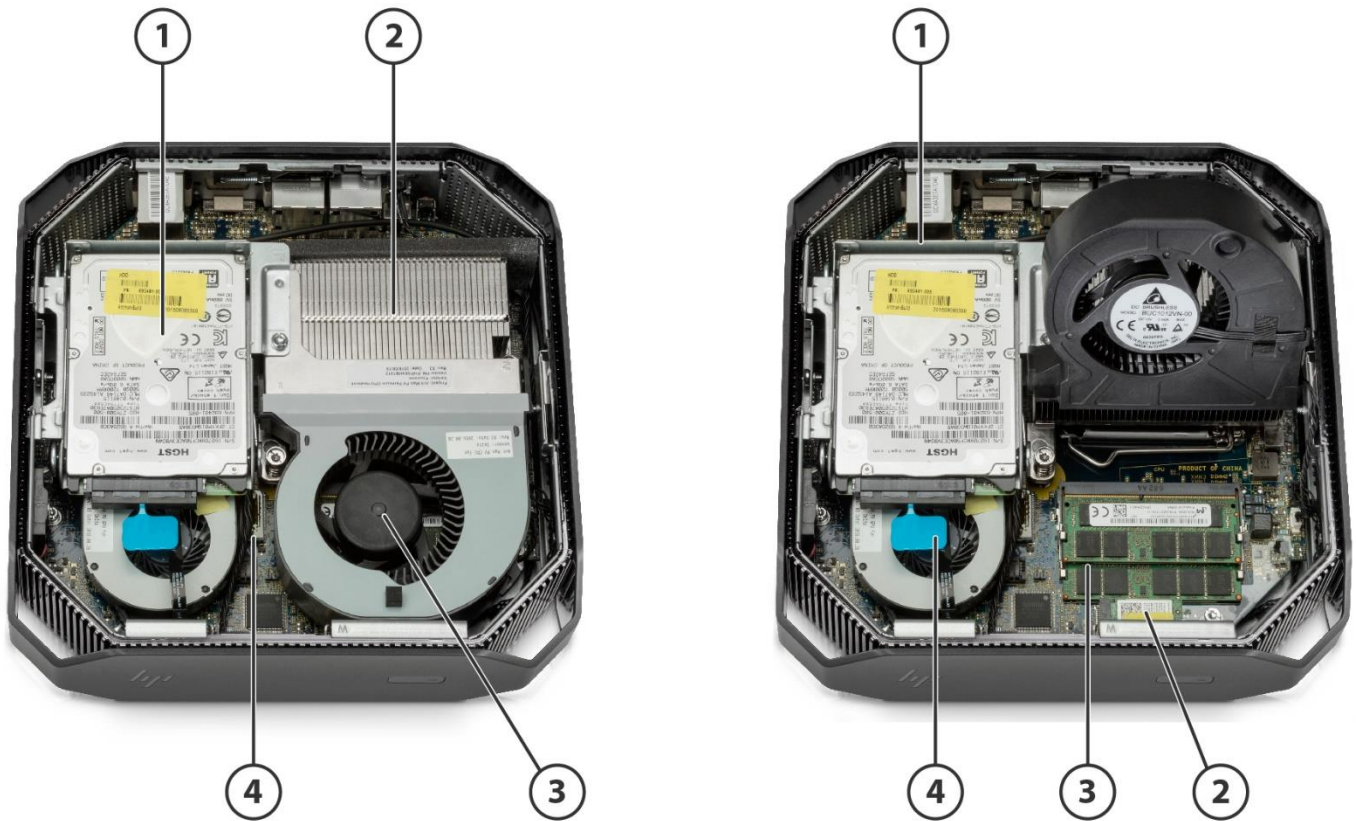
## Overview



**HP Z2 Mini Performance, Internal View**

1. SATA HDD/SSD (9.5mm 2.5")
2. CPU heatsink
3. CPU blower
4. M.2 80mm (PCIe SSD)

1. GPU heatsink (underneath HDD/SSD cage)
2. M.2 30mm WLAN/BT
3. (2) SODIMM memory slots
4. GPU blower

## Overview

| | |
|---|---|
| **Form Factor** | Mini Form Factor |
| **Operating Systems** | Preinstalled: |

Preinstalled:
- Windows 10 Pro 64[1]
- Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro)[2]
- HP Linux® -ready
- Red Hat® Enterprise Linux Workstation (1 year paper license available; Preinstall not available)

Supported:
- Red Hat® Enterprise Linux Desktop 6.7, 7.2
- SUSE Linux® Enterprise Desktop 11 SP4, 12 SP1

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

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

2.  This system is preinstalled with Windows 7 Professional software and also comes with a license and media for Windows 10 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

# QuickSpecs

## Overview

### Processors*

| Name | Cores | Clock Speed (GHz) | Intel® Turbo Boost Technology[1] | Cache (MB) | Memory Speed (MT/s) | Hyper-Threading | Integrated Graphics | Featuring Intel® vPro™ Technology | TDP (W) |
|---|---|---|---|---|---|---|---|---|---|
| **Z2 Mini G3 Performance base unit** | | | | | | | | | |
| Intel® Xeon® processor E3-1245v5 | 4 | 3.5 | 3.9 | 8 | 2133 | Y | Intel HD Graphics P530 | Y | 80W |
| Intel® Xeon® processor E3-1225v5 | 4 | 3.3 | 3.7 | 8 | 2133 | N | Intel® HD Graphics P530 | Y | 80W |
| Intel® Core™ i7-6700 processor | 4 | 3.4 | 4.0 | 8 | 2133 | Y | Intel® HD Graphics 530 | Y | 65W |
| Intel® Core™ i5-6500 processor | 4 | 3.2 | 3.6 | 6 | 2133 | N | Intel® HD Graphics 530 | Y | 65W |
| Intel® Core™ i3-6100 processor | 2 | 3.7 | N/A | 3 | 2133 | N | Intel® HD Graphics 530 | N | 51W |
| **Z2 Mini G3 Entry base unit** | | | | | | | | | |
| Intel® Core™ i7-6700 processor | 4 | 3.4 | 4.0 | 8 | 2133 | Y | Intel® HD Graphics 530 | Y | 65W |
| Intel® Core™ i5-6500 processor | 4 | 3.2 | 3.6 | 6 | 2133 | N | Intel® HD Graphics 530 | Y | 65W |
| Intel® Core™ i3-6100 processor | 2 | 3.7 | N/A | 3 | 2133 | N | Intel® HD Graphics 530 | N | 51W |

[1]The specifications shown in this 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.

**NOTES:**
Integrated Intel® HD graphics P530 is supported on all Intel® Xeon® E3 processors
Intel® Xeon® E3, Intel Core i3 and Intel Pentium processors can support either ECC or non-ECC memory; Intel® Core™ i5/i7 processors only support non-ECC memory.

* 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 is not a measurement of higher performance.

| | |
|---|---|
| **Color** | Space grey with black chrome accents |
| **Convertibility** | The Z2 Mini G3 can either be placed flat on the desktop or mounted behind a display* or under a desk. |
| | **\* Additional HP Hardware is needed for the VESA Mount for the display.** |
| **Expansion Slots** (see system board section for more details) | 1 80mm M.2 slot (PCIe Gen3 x4)<br>1 30mm M.2 slot (PCIe Gen3 x1)*<br><br>* For WLAN/BT M.2 module only |
| **Expansion Bays** (see system board section for more details) | 1 internal 2.5" bay (for For SATA HDDs & SSDs only only) |
| **Front I/O** | Power button |

# QuickSpecs

## Overview

| | |
|---|---|
| **Slide I/O** | 1 USB 3.0 Charging Data Port, 1 USB 3.0 data port, combo headset/microphone port |

**Rear I/O**  **Z2 Mini Entry:** 3 DisplayPort™ (DP 1.2) outputs from Intel® HD graphics, 2 USB 3.0 ports, 1 serial port (optional), RJ-45 (LoM)

**Z2 Mini Performance[1]:** 4 DisplayPort™ (DP 1.2) outputs from NVIDIA® Quadro® M620 graphics, 2 USB 3.0 ports, 2 USB 3.1 G1 Type-C™ ports, 1 serial port (optional),RJ-45 (LoM)

**NOTE 1:** Capable of supporting 6 displays. 6 display solution is achieved using a combination of Intel® HD graphics and NVIDIA Quadro® graphics is ONLY supported on Windows 10.

**Chassis Dimensions (H x W x D)**  Standard desktop orientation: 58 x 216 x216 mm (2.28 x 8.5 x 8.5 in)

**Weight**  Exact weights depend upon configuration;

Minimum Weight: 2.04 kg (4.50 lb)
Typical Weight*: 2.08 kg (4.59 lb)
Maximum Weight: 2.11 kg (4.65 lb)

Max Supported Weight (desktop orientation): 35 kg (77 lb)

* Configured with 1 2.5" hard drive, 1 PCIe SSD, WLAN module, 2 DIMMs and 1 NVIDIA® Quadro® graphics card

**Temperature**  Operating: 40° to 95°F (5° to 35°C)
Non-operating: -40° to 140°F (-40° to 60°C)

**Notes:** Derate the maximum operating temperature by one degree C (1.8 degrees F) for every 305m (1,000 ft) altitude over 1,524m (5,000 ft).

**Humidity**  Operating: 8% to 85%
Non-operating: 8% to 90%

**Maximum Altitude (non-pressurized)**  Operating: 3,000 m (10,000 ft)
Non-operating: 9,100 m (30,000 ft).

**Power Supply**  Z2 Mini G3 Entry:
135W 88% Efficiency  at 115Vac

Z2 Mini G3 Performance:
200W 89% Efficiency  at 230Vac

**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

**Chipset**  Intel® C236 chipset

**Memory**  2 SODIMM slots, supporting up to 32GB ECC/non-ECC, DDR4 2133 MT/s

The CPUs determine the speed at which the memory is clocked. If a 2133 MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2133 MT/s regardless of the specified speed of the memory.
**Note:** Transfer rates up to 2133 MT/s

**Workstation ISV Certifications**  See the latest list of certifications at
http://www.hp.com/united-states/campaigns/workstations/partnerships.html

## Supported Components

| Processors | Factory Configured | Option Kit |
|---|:---:|:---:|
| **Intel® Xeon® processor E3-1200 v5 family** | | |
| Intel® Xeon® E3-1225 v5 3.3 2133 4C CPU[1] | Y | N |
| Intel® Xeon® E3-1245 v5 3.5 2133 4C CPU[1] | Y | N |
| | | |
| **6th generation Intel® Core™ processor family** | | |
| Intel® Core i7-6700 3.4 2133 4C CPU[3] | Y | N |
| Intel® Core i5-6500 3.2 2133 4C CPU[3] | Y | N |
| | | |
| **6th generation Intel® Core™ i3/Pentium processor family** | | |
| Intel® Core™ i3-6100 3.7 2133 2C CPU[2] | Y | N |

**NOTE 1**: Only supported on Z2 Mini Performance Base Unit
**NOTE 2:** These processor support either ECC or non-ECC memory
**NOTE 3:** These processors support only non-ECC memory
**NOTE:** Intel® Integrated Graphics P530 for Xeon® processors supports workstation-specific graphics drivers for improved compatibility and performance on select professional applications, compared to Intel® HD Graphics 530.

| Monitors / Displays | Factory Configured | Option Kit | Option Kit Part Number |
|---|:---:|:---:|:---:|
| HP DreamColor Z24x Professional Display | | | |
| HP DreamColor Z27x Professional Display | | | |
| HP Z22n Narrow Bezel IPS Display | | | |
| HP Z23n Narrow Bezel IPS Display | | | |
| HP Z24n Narrow Bezel IPS Display | | | |
| HP Z24nf Narrow Bezel IPS Display | | | |
| HP Z24nq Narrow Bezel IPS Display | | | |
| HP Z24s IPS UHD 4K Display | | | |
| HP Z25n Narrow Bezel IPS Display | | | |
| HP Z27n Narrow Bezel IPS Display | | | |
| HP Z27n Narrow Bezel IPS Display | | | |
| Supported by all Operating Systems available from HP | | | |

**Notes**

Screen Size Diagonally Measured

| SATA Hard Drives | Factory Configured | Option Kit | Option Kit Part Number |
|---|:---:|:---:|:---:|
| 500GB SATA 7200 rpm 6Gb/s SFF HDD | Y | Y | T0K73AA |
| 1TB SATA 7200 rpm 6Gb/s SFF HDD | Y | Y | T0K74AA |
| **SATA Solid State Drives** HP 256GB SATA 6Gb/s SSD | Y | Y | A3D26AA |

## Supported Components

| PCIe SSDs | PCIe SSDs for HP Workstations | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|---|
| | HP Z Turbo Drive G2 256GB MLC (Z2 Mini) | Y | Y | Y7B58AA |
| | HP Z Turbo Drive G2 256GB TLC (Z2 Mini) | Y | Y | Y7B60AA |
| | HP Z Turbo Drive G2 512GB MLC (Z2 Mini) | Y | Y | Y7B58AA |

\* PCIe card installed in standard PCIe x4 slot
\*\* Installed in native M.2 slot on Z2 Mini motherboard

The HP Z Turbo Drive G2 (NVMe) is not supported with Windows 7 32-bit.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB (for Windows 10) of system disk is reserved for system recovery software.

| Graphics | | Factory Configured | Option Kit | Option Kit Part Number | Supported # of cards |
|---|---|---|---|---|---|
| **Integrated Graphics** | **Integrated Intel® HD Graphics (Z2)** | | | | |
| | Intel® HD Graphics P530 | Y | N | | 1 |
| | Intel® HD Graphics 530 | Y | N | | 1 |
| **Graphics DisplayPort™ Cable Adapters** | HP DisplayPort™ To DVI-D Adapter | Y | Y | FH973AA | |
| | HP DisplayPort™ To VGA Adapter | Y | Y | AS615AA | |
| | HP DisplayPort™ to Dual Link DVI Adapter | Y | Y | NR078AA | |
| **Entry 3D** | NVIDIA® Quadro® M620 2GB Graphics[1] | Y | N | | 1 |
| **Notes** | **NOTE 1:** Only offered on Z2 Mini Performance base unit **NOTE:** Intermixing integrated Intel® HD graphics and discrete graphics cards in order to drive more than three displays can be enabled using the Computer (F10) Setup Utility. However, HP recommends using only discrete graphics when four or more displays are required to be supported. 6 display solution is achieved using a combination of Intel® HD graphics and NVIDIA Quadro® graphics is ONLY supported on Windows 10. | | | | |

## Supported Components

| | |
|---|---|
| **Memory** | **DDR4-2400 ECC Unbuffered SODIMMs - CTO** |
| | HP 8GB (1x8GB) DDR4-2400 ECC RAM |
| | HP 16GB (2x8GB) DDR4-2400 ECC RAM |
| | HP 32GB (2x16GB) DDR4-2400 ECC RAM |

**DDR4-2400 non-ECC Unbuffered SODIMMs - CTO**
HP 4GB (1x4GB) DDR4-2400 nECC RAM
HP 8GB (2x4GB) DDR4-2400 nECC RAM
HP 8GB (1x8GB) DDR4-2400 nECC RAM
HP 16GB (2x8GB) DDR4-2400 nECC RAM
HP 32GB (2x16GB) DDR4-2400 nECC RAM

**NOTES:** Intel® Xeon® E3, Intel® Core™ i3 and Intel® Pentium® processors can support either ECC or non-ECC memory; Intel® Core™ 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.

The CPUs determine the speed at which the memory is clocked.  If a 2133 MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2133 MT/s regardless of the specified speed of the memory.

Transfer rates up to 2133 MT/s with Intel Skylake processors.

| AMO | Option Kit Part Number |
|---|---|
| **DDR4-2400 ECC Unbuffered DIMMs - AMO** | |
| HP 8GB (1x8GB) DDR4-2400 ECC RAM | Y7B56AA |
| HP 16GB (1x16GB) DDR4-2400 ECC RAM | Y7B53AA |
| HP 4GB (1x4GB) DDR4-2400 non-ECC RAM | Y7B55AA |
| HP 8GB (1x8GB) DDR4-2400 non-ECC RAM | Y7B57AA |
| HP 16GB (1x16GB) DDR4-2400 non-ECC RAM | Y7B54AA |

**NOTE:** Only unbuffered DDR4 DIMMs are supported.

| Multimedia and Audio Devices | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|
| Integrated Realtek HD ALC221-VB Audio | Y | N | |

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

## Supported Components

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. With Blu-ray, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD-DVD movies cannot be played on this workstation.

| Networking and Communications | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|
| Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel AMT 11.0) | Y | N | |
| Intel® 8265 Wireless LAN (802.11ac) and Bluetooth® 4.2 Module | Y | N | |

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

| Racking and Physical Security | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|
| HP Keyed Cable Lock 10mm | N | Y | T1A62AA |

| Input Devices | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|
| HP USB 1000dpi Laser Mouse | Y | Y | QY778AA |
| HP USB Optical Mouse | Y | Y | QY777AA |
| HP USB CCID SmartCard Keyboard | Y | Y | BV813AA |
| HP USB Business Slim Keyboard | Y | Y | N3R87AA |
| HP Wireless Business Slim Keyboard | Y | Y | QY449AA |

| Other Hardware | Factory Configured | Option Kit | Option Kit Part Number |
|---|---|---|---|
| HP Serial Port Adapter | Y | N | PA716A |
| Z2 Mini Arm/Wall VESA Mount Solution | N | Y | Y7B61AA |
| Z2 Mini Z Display VESA Mount Solution - Current Displays | N | Y | N6N00AA* |
| Z2 Mini Z Display VESA Mount Solution - Legacy Displays | N | Y | E5J35AA** |

\* Current: "n" displays. This mounting kit supports the following displays: Z22n/Z23n/Z24n/Z25n/Z27n.

\*\* Legacy: "I" displays. This mounting kit supports the following displays: Z24i/Z27i/Z30i.

## Supported Components

| Software | | Factory Configured | Option Kit | Support Notes |
|---|---|:---:|:---:|:---:|
| | HP Performance Advisor | Y | N | See Note 1 |
| | HP Remote Graphics Software (RGS) 7.1 | Y | N | |
| | HP PC Hardware Diagnostics UEFI | Y | N | See Note 2 |
| | HP Client Security Software | Y | 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 7 Professional 64(available through downgrade rights from Windows 10 Pro 64)

Red Hat® Enterprise Linux® (RHEL) Workstation - Paper License (1yr)

See http://www.microsoft.com/windows/windows-7/for support details.
See http://www.redhat.com/rhel/desktop/

## System Technical Specifications

## System Board

| | | |
|---|---|---|
| **System Board Form Factor** | Entry: 200mm x 200mm (7.9 x 7.9 inches)<br>Performance: 200mm x 200mm (7.9 x 7.9 inches) | |
| **Processor Socket** | Single LGA 1151 | |
| **CPU Bus Speed** | DMI link between CPU & PCH: Performance comparable to PCIe Gen3 x4 | |
| **Chipset** | Intel® PCH C236 | |
| **Memory Expansion Slots** | 2 SODIMM DDR4 memory slots | |
| **Memory Type Supported** | DDR4, UDIMM (Unbuffered), ECC & non-ECC | |
| **Memory Modes** | Non-Interleaved for single channel. Interleaved when both channels are populated. | |
| **Memory Speed Supported** | 2133MHz DDR4 for Skylake processors; pre-enabled for 2400 MHz DDR4 | |
| **Memory Protection** | ECC available on data<br><br>*Requires ECC DIMMs to be installed, as well as a CPU that supports ECC | |
| **Maximum Memory** | 32GB | |
| **Memory Configuration (Supported)** | 4GB, 8GB and 16GB non-ECC/ 8GB and 16GB ECC unbuffered DIMMs are supported.<br>ECC and non-ECC memory DIMMs cannot be mixed on the same system. | |
| **Notes** | Maximum memory capacities assume 64-bit operating systems, such as Windows® 7 Professional 64-Bit or Red Hat Linux 64-bit. | |
| **Supported Drive Interfaces** | **SATA** | Integrated (1) Serial ATA interfaces (6Gb/s SATA). |
| | **Integrated Graphics** | Intel® HD Graphics 530 (on Core™ i3/i5/i7-6xxx processors);<br>Intel® HD Graphics P530 for Xeon® E3 processors based on Unified Memory Architecture (UMA).<br><br>A region of system memory is reserved and dedicated to the graphics display.<br><br>Support for Microsoft DirectX 12.1, OpenGL 4.4 and OpenCL 2.0 on Intel® HD Graphics P530.<br><br>(3) DP 1.2 graphics ports integrated on motherboard; Supports up to three simultaneous displays across DP outputs.<br>Max. resolution supported: 4096x2160 @60Hz |
| | **Network Controller** | Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 11.0 |
| | **Serial** | 1 rear port (configurable option) |

**IEEE 1394 Connector(s)**

## System Technical Specifications

| | | |
|---|---|---|
| **USB Connector(s)** | **Front** | Side I/O:<br>2 USB 3.0 Type-A |
| | **Rear** | 2 USB 3.0 Type-A<br>2 USB 3.1 G1 Type-C™ (Z2 Mini Performance only) |
| **HD Integrated Audio** | Yes; supports CTIA headset | |
| **Flash ROM** | Yes | |
| **Chassis Fan Header** | Yes<br>Additional CPU/GFX Cooler (Z2 Mini Performance only) | |
| **Front Control Panel/Speaker Header** | Side I/O: Yes | |
| **CMOS Battery Holder - Lithium** | Yes | |
| **Integrated Trusted Platform Module** | Integrated TPM 2.0 | |
| **Power Supply Headers** | Yes, single DC-in jack for external power supplies | |
| **Power Switch, Power LED & Hard Drive LED Header** | 1. The power and failure LED are combined in the front power switch.<br><br>2. The HDD LED & DC-in LED are combined within one port on the Rear I/O. The LED will be lit once the AC power is plugged in. As soon as the system is booted up, the LED will function as a standard HDD activity LED. | |
| **Clear Password Jumper** | Yes | |
| **Keyboard/Mouse** | USB | |
| **Power Supply** | Z2 Mini G3 Entry: 135W, 88% efficiency, wide-ranging, active PFC Power Supply<br><br>Z2 Mini G3 Performance: 200W, 89% efficiency, wide-ranging, active PFC Power Supply<br>The Z2 Mini PSU Efficiency Report can be found at this link: TBD | |
| **Operating Voltage Range** | 115-230 VAC | |
| **Rated Voltage Range** | 100–240 VAC | |
| **Rated Line Frequency** | 50-60 Hz | |
| **Operating Line Frequency Range** | 47–63 Hz | |
| **Rated Input Current** | Z2 Mini G3 Entry: 1.9A @ 90Vac<br>Z2 Mini G3 Performance: 2.9A @ 90Vac | |
| **Heat Dissipation** | Typical: TBD btu/hr (TBD kcal/hr)<br>Maximum: TBD btu/hr (TBD kcal/hr) | |
| **ENERGY STAR® qualified (Config Dependent)** | Yes | |
| **FEMP Standby Power Compliant** | Yes, with Wake-on-LAN disabled: <1W in S5- Power Off | |
| **Surge Tolerant Full Ranging Power Supply** | Yes | |

# QuickSpecs

## System Technical Specifications

**(withstands power surges up to 2000V)**

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### System Configurations

| *Z2 Mini Configuration #1* | Processor Info | 1x Intel® Xeon® E3-1245v5 3.5 8M GT2 4C |
|---|---|---|
| **ENERGY STAR QUALIFIED** | Memory Info | 32GB (2x16GB) DDR4-2400 ECC SO-DIMM |
| | Graphics Info | NVIDIA® Quadro® M620 GPU |
| | Disks/Optical/Floppy | 1x 1TB 7200 RPM SATA HDD / 1x Z Turbo Drive G2 512GB PCIe 1st SSD |
| | Power Supply | 200W EPS |
| | Other | Ethernet Capable |

| | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| **Energy Consumption (Watts)** | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows long Idle (S0) | 23.61 W | | 23.01 W | | 22.95 W | |
| | Windows short Idle (S0) | 25.24 W | | 25.2 W | | 25.56 W | |
| | Windows Busy Typ(S0) | 112.64 W | | 112.76 W | | 113.67 W | |
| | Windows Busy Max (S0) | 157.71 W | | 155.95 W | | 159.22 W | |
| | Sleep (S3) | 2.52 W | 2.47 W | 2.55 W | 2.47 W | 2.51 W | 2.5 W |
| | Off (S5) | 1.27 W | 1.25 W | 1.36 W | 1.24 W | 1.34 W | 1.25 W |
| | Zero Power Mode (ErP) | 0.31 W | | 0.33 W | | 0.31 W | |

| | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| **Heat Dissipation (Btu/hr)** | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows long Idle (S0) | 80.56 btu/hr | | 78.51 btu/hr | | 78.31 btu/hr | |
| | Windows short Idle (S0) | 86.12 btu/hr | | 85.99 btu/hr | | 87.21 btu/hr | |
| | Windows Busy Typ(S0) | 384.34 btu/hr | | 384.75 btu/hr | | 387.86 btu/hr | |
| | Windows Busy Max (S0) | 538.13 btu/hr | | 532.12 btu/hr | | 543.28 btu/hr | |
| | Sleep (S3) | 8.6 btu/hr | 8.43 btu/hr | 8.7 btu/hr | 8.43 btu/hr | 8.56 btu/hr | 8.53 btu/hr |
| | Off (S5) | 4.33 btu/hr | 4.27 btu/hr | 4.64 btu/hr | 4.23 btu/hr | 4.57 btu/hr | 4.27 btu/hr |
| | Zero Power Mode (ErP) | 1.06 btu/hr | | 1.13 btu/hr | | 1.06 btu/hr | |

| *Z2 Mini Configuration #2* | Processor Info | 1x Intel® Xeon® E3-1225v5 3.3 8M GT2 4C |
|---|---|---|
| | Memory Info | HP 8GB (2x4GB) DDR4-2400 ECC SO-DIMM |
| | Graphics Info | NVIDIA® Quadro® M620 GPU |
| | Disks/Optical/Floppy | 1x 1TB 7200 RPM SATA HDD |
| | Power Supply | 200W EPS |
| | Other | Ethernet Capable |

| | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| **Energy Consumption (Watts)** | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows long Idle (S0) | 19.2 W | | 19.85 W | | 19.62 W | |
| | Windows short Idle (S0) | 21.92 W | | 22.18 W | | 21.73 W | |
| | Windows Busy Typ(S0) | 96.02 W | | 94.19 W | | 97.79 W | |
| | Windows Busy Max (S0) | 141.2 W | | 142.16 W | | 140.6 W | |
| | Sleep (S3) | 1.78 W | 1.7 W | 1.83 W | 1.75 W | 1.79 W | 1.71 W |
| | Off (S5) | 1.16 W | 1.14 W | 1.2 W | 1.19 W | 1.16W | 1.14 W |
| | Zero Power Mode (ErP) | 0.31 W | | 0.35 W | | 0.31 W | |

## System Technical Specifications

| 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) | 65.51 btu/hr | | 67.73 btu/hr | | 66.95 btu/hr | |
| | Windows short Idle (S0) | 74.79 btu/hr | | 75.68 btu/hr | | 74.15 btu/hr | |
| | Windows Busy Typ(S0) | 327.63 btu/hr | | 321.39 btu/hr | | 333.67 btu/hr | |
| | Windows Busy Max (S0) | 481.79 btu/hr | | 485.07 btu/hr | | 479.75 btu/hr | |
| | Sleep (S3) | 6.07 btu/hr | 5.8 btu/hr | 6.24 btu/hr | 5.97 btu/hr | 6.11 btu/hr | 5.83 btu/hr |
| | Off (S5) | 3.96 btu/hr | 3.89 btu/hr | 4.1 btu/hr | 4.06 btu/hr | 3.96 btu/hr | 3.89 btu/hr |
| | Zero Power Mode (ErP) | 1.06 btu/hr | | 1.19 btu/hr | | 1.06 btu/hr | |

*Z2 Mini Configuration #3*
**ENERGY STAR QUALIFIED**

| | |
|---|---|
| Processor Info | 1x Intel® Core™ i7-6700 3.4 8M 4C |
| Memory Info | 32GB (2x16GB) DDR4-2400 nECC SO-DIMM |
| Graphics Info | Intel® HD Graphics 530 |
| Disks/Optical/Floppy | 1x 1TB 7200 RPM SATA HDD / 1x Z Turbo Drive G2 512GB PCIe 1st SSD |
| Power Supply | 135W EPS |
| Other | Ethernet Capable |

| Energy Consumption (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|---|
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows long Idle (S0) | 12.98 W | | 13.18 W | | 13.02 W | |
| | Windows short Idle (S0) | 13.52 W | | 13.82 W | | 13.67 W | |
| | Windows Busy Typ(S0) | 96.2 W | | 98.06 W | | 99.7 W | |
| | Windows Busy Max (S0) | 105.74 W | | 105.85 W | | 103.7 W | |
| | Sleep (S3) | 2.29 W | 2.24 W | 2.35 W | 2.34 W | 2.3 W | 2.27 W |
| | Off (S5) | 1.25 W | 1.22 W | 1.37 W | 1.33 W | 1.41 W | 1.37 W |
| | Zero Power Mode (ErP) | 0.27 W | | 0.32 W | | 0.27 W | |

| 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) | 44.29 btu/hr | | 44.97 btu/hr | | 44.43 btu/hr | |
| | Windows short Idle (S0) | 46.13 btu/hr | | 47.16 btu/hr | | 46.64 btu/hr | |
| | Windows Busy Typ(S0) | 328.25 btu/hr | | 334.59 btu/hr | | 340.19 btu/hr | |
| | Windows Busy Max (S0) | 360.8 btu/hr | | 361.18 btu/hr | | 353.84 btu/hr | |
| | Sleep (S3) | 7.81 btu/hr | 7.64 btu/hr | 8.02 btu/hr | 7.98btu/hr | 7.85 btu/hr | 7.75 btu/hr |
| | Off (S5) | 4.27 btu/hr | 4.16 btu/hr | 4.67 btu/hr | 4.54 btu/hr | 4.81 btu/hr | 4.67 btu/hr |
| | Zero Power Mode (ErP) | 0.92 btu/hr | | 1.09 btu/hr | | 0.92 btu/hr | |

*Z2 Mini Configuration #4*
**ENERGY STAR QUALIFIED**

| | |
|---|---|
| Processor Info | 1x Intel® Core™ i3-6100 3.7 3M 2C |
| Memory Info | 32GB (2x16GB) DDR4-2400 nECC SO-DIMM |
| Graphics Info | NVIDIA® Quadro® M620 GPU |
| Disks/Optical/Floppy | 1x 1TB 7200 RPM SATA HDD / 1x Z Turbo Drive G2 512GB PCIe 1st SSD |
| Power Supply | 200W EPS |
| Other | Ethernet Capable |

| 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) | 22.92 W | | 22.42 W | | 22.51 W | |
| | Windows short Idle (S0) | 24.42 W | | 23.65 W | | 23.95 W | |
| | Windows Busy Typ(S0) | 79.39 W | | 80.34 W | | 77.93 W | |
| | Windows Busy Max (S0) | 118.18 W | | 118.24 W | | 119.18 W | |

## System Technical Specifications

| | | | | | | |
|---|---|---|---|---|---|---|
| Sleep (S3) | 2.49 W | 2.47 W | 2.48 W | 2.48 W | 2.49 W | 2.45 W |
| Off (S5) | 1.48 W | 1.14 W | 1.3 W | 1.13 W | 1.29 W | 1.26 W |
| Zero Power Mode (ErP) | 0.31 W | | 0.33 W | | 0.31 W | |

**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) | 78.21 btu/hr | | 76.5 btu/hr | | 76.81 btu/hr | |
| Windows short Idle (S0) | 83.32 btu/hr | | 80.7 btu/hr | | 81.72 btu/hr | |
| Windows Busy Typ(S0) | 270.89 btu/hr | | 274.13 btu/hr | | 265.91 btu/hr | |
| Windows Busy Max (S0) | 403.25 btu/hr | | 403.45 btu/hr | | 406.66 btu/hr | |
| Sleep (S3) | 8.5 btu/hr | 8.43 btu/hr | 8.46 btu/hr | 8.46 btu/hr | 8.5 btu/hr | 8.36 btu/hr |
| Off (S5) | 5.05btu/hr | 3.89 btu/hr | 4.44 btu/hr | 3.86 btu/hr | 4.4 btu/hr | 4.3 btu/hr |
| Zero Power Mode (ErP) | 1.06 btu/hr | | 1.13btu/hr | | 1.06 btu/hr | |

*Z2 Mini Configuration #5*

| | |
|---|---|
| Processor Info | 1x Intel® Core™ i3-6100 3.7 3M 2C |
| Memory Info | 4GB (1x4GB) DDR4-2400 nECC SO-DIMM |
| Graphics Info | Intel® HD Graphics 530 |
| Disks/Optical/Floppy | 1x 1TB 7200 RPM SATA HDD |
| Power Supply | 135W EPS |
| Other | Ethernet Capable |

**Energy Consumption (Watts)**

| | 115 VAC | | 230 VAC | | 100 VAC | |
|---|---|---|---|---|---|---|
| | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| Windows long Idle (S0) | 13.26 W | | 10.58 W | | 12.05 W | |
| Windows short Idle (S0) | 14.84 W | | 12.99 W | | 12.39 W | |
| Windows Busy Typ(S0) | 64.06 W | | 65.23 W | | 64.26 W | |
| Windows Busy Max (S0) | 87.97 W | | 92.15 W | | 88.17 W | |
| Sleep (S3) | 1.8 W | 1.67 W | 1.87 W | 1.77 W | 1.78 W | 1.66 W |
| Off (S5) | 1.19 W | 1.18 W | 1.27 W | 1.26 W | 1.17 W | 1.15 W |
| Zero Power Mode (ErP) | 0.31 W | | 0.37W | | 0.31 W | |

**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) | 45.24 btu/hr | | 36.1 btu/hr | | 41.12 btu/hr | |
| Windows short Idle (S0) | 50.64 btu/hr | | 44.32 btu/hr | | 42.28 btu/hr | |
| Windows Busy Typ(S0) | 218.58 btu/hr | | 222.57btu/hr | | 219.26 btu/hr | |
| Windows Busy Max (S0) | 300.17 btu/hr | | 314.43 btu/hr | | 300.85 btu/hr | |
| Sleep (S3) | 6.14 btu/hr | 5.7 btu/hr | 6.38 btu/hr | 6.04 btu/hr | 6.07 btu/hr | 5.66 btu/hr |
| Off (S5) | 4.06 btu/hr | 4.03 btu/hr | 4.33 btu/hr | 4.3 btu/hr | 3.99 btu/hr | 3.92 btu/hr |
| Zero Power Mode (ErP) | 1.06 btu/hr | | 1.26 btu/hr | | 1.06 btu/hr | |

## System Technical Specifications

**Declared Noise Emissions**
(Entry-level and High-end
configurations)

| **System Configuration** **(Entry level)** | **Processor Info** **Memory Info** **Graphics Info** **Disks/Optical** |
|---|---|

| **Environmental Requirements** | **Temperature** | Operating: 40° to 95° F (5° to 35° C)<br>Non-operating: -40° to 140° F (-40° to 60° C) |
|---|---|---|
| | **Humidity** | Operating: 8% to 85% RH, non-condensing<br>Non-operating: 8% to 90% RH, non-condensing |
| | **Maximum Altitude** | Operating: 10,000 feet (3,000 m)<br>Non-operating: 30,000 feet (9,100 m) |
| | **Dynamic** (new) | **Shock**<br>  Operating: ½-sine: 40g, 2-3ms<br>  Non-operating:<br>    ½-sine: 160 cm/s, 2-3ms (~100g)<br>    square: 422 cm/s, 20g<br><br>**Vibration**<br>  Operating random: 0.5g (rms), 5-300 Hz<br>  Non-operating random: 2.0g (rms), 10-500 Hz<br><br>**Notes:** Values represent individual shock events and do not indicate repetitive shock events. Values do not indicate continuous vibration. |
| | **Cooling** | Above 5,000 ft (1524 m) altitude, maximum operating temperature is de-rated by 1.8° F (1° C) per 1,000 ft (305 m) elevation increase |

## System Technical Specifications

## Physical Security and Serviceability

| | |
|---|---|
| **Access Panel** | Tool-less<br>Includes system board and memory information |
| **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. |
| **Processor Socket** | Tool-less, except for the processor heatsink. |
| **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 |
| **Configuration Record SW** | Yes |
| **Over-Temp Warning on Screen** | Yes |
| **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) |
| **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 |
| **Serial, Parallel, 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 G3) |
| **Removable Media Write/Boot Control** | Yes, prevents ability to boot from removable media on supported devices (and can disable writes to media) |
| **Power-On Password** | Yes, prevents an unauthorized person from booting up the workstation |
| **Setup Password** | Yes, prevents an unauthorized person from changing the workstation configuration |

## System Technical Specifications

| | |
|---|---|
| **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 |
| **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 LED** | Yes, white (normal), red (fault) |
| **Internal Speaker** | Yes, on the side of the chassis |
| **System/Emergency ROM Flash Recovery** | Recovers corrupted system BIOS. |
| **Cooling Solution** | Air cooled forced convection |
| **CPU Heatsink Fan** | Z2 Mini Entry & Performance CPU blower solution: 11.1 mm x 65mm x 82.1mm<br><br>Z2 Mini Performance GPU blower solution: 29mm x 103.6mm x 102.2mm |
| **Chassis Fan** | Z2 Mini G3 Entry: Single system blower<br>Z2 Mini G3 Performance: Dual system blower |
| **Memory Heatsink Fan** | No |
| **HP PC Hardware Diagnostics UEFI** | HP PC Hardware Diagnostics (UEFI) 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. |
| **Access Panel Key Lock** | The Kensington lock slot on the chassis serves this purpose |
| **ACPI-Ready Hardware** | Advanced Configuration and Power Management Interface (ACPI).<br>• Allows the system to wake from a low power mode.<br>• 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 |
| **Trusted Platform Module Chip** | Yes |
| **M.2 Card Retention** | Yes, all M.2 modules are retained by a single screw |
| **Flash ROM** | Yes |
| **Diagnostic Power Switch LED on board** | Yes |
| **Clear Password Jumper** | Yes |
| **Clear CMOS Jumper** | Yes |

## System Technical Specifications

| | |
|---|---|
| **CMOS Battery Holder** | Yes: Z2 Min iG3 Entry<br>Yes: Z2 Mini G3 Performance |
| **DIMM Connectors** | Yes |

## BIOS

| | |
|---|---|
| **BIOS 32-bit Services** | Standard BIOS 32-bit Service Directory Proposal v0.4 |
| **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.<br>Provides more control over how and from what devices the workstation will boot. |
| **WMI Support** | WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications. |
| **BIOS Power On** | Users can define a specific day-of-week 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. Repset.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup). |
| **SMBIOS** | System Management BIOS 2.7.1, 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.<br>Updates can be performed before starting the OS.<br>Updates can be periodically scheduled. |

## System Technical Specifications

| | |
|---|---|
| **ACPI (Advanced Configuration and Power Management Interface)** | Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. Supports ACPI 4.0 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. |
| **ASF 2.0 Compliant** | Yes. |
| **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) so that management SW applications can use and report this information. |
| **System board revision level** | Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified. |
| **Start-up Diagnostics (Power-on Self-Test)** | Assesses system health at boot time with selectable levels of testing. |
| **Auto Setup when new hardware installed** | System automatically detects addition of new hardware. |
| **Keyboard-less Operation** | The system can be booted without a keyboard. |
| **Localized ROM Setup** | Common BIOS image supports System Configuration Utility (F10 Setup) menus in 12 languages with local keyboard mappings. |
| **Asset Tag** | The user or IT administrator to set a unique tag string in non-volatile memory. |
| **Per-slot Control** | Allows I/O slot parameters (option ROM enable/disable) 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. |
| **Digitally and Cryptographically Signed BIOS** | Helps to prevent the installation of unauthorized versions of a BIOS (a rogue BIOS) from a virus, malware, or other code that could lead to compromised system security, data access, physical service, or even system board replacement. |

## System Technical Specifications

| | |
|---|---|
| **Master Boot Record Protection** | A feature in the HP BIOS that prevents changes and/or infections to the Master Boot Record. Useful in protecting from viruses. |
| **Boot Block Emergency Recovery Mode (BIOS Recovery)** | The HP BIOS offers a write-protected boot block ROM that provides recovery from a failed flashing of the computer BIOS. This special recovery mode prevents the system from becoming unusable or "bricked" when a BIOS update is interrupted. |
| **Industry Standard Specification Support** | |
| **Industry Standard** | Revision Supported by the BIOS |
| **UEFI Specification Revision** | UEFI 2.4.0 |
| **ACPI** | Advanced Configuration and Power Management Interface, Version 4.0 |
| **ASF** | Alert Standard Format Specification, Version 2.0 |
| **EDD** | - Enhanced Disk Drive Specification Version 1.1<br>- BIOS Enhanced Disk Drive Specification Version 3.0 |
| **PCI Express** | PCI Express Base Specification, Revision 2.0;<br>PCI Express Base Specification, Revision 3.0. |
| **PMM** | POST Memory Manager Specification, Version 1.01 |
| **SATA** | - Serial ATA Specification, Revision 1.0a<br>- Serial ATA II: Extensions to Serial ATA 1.0, Revision 1.0a<br>- Serial ATA II Cables and Connectors Volume 2 Gold<br>- SATA-IO SATA Revision 3.0 Specification |
| **SPD** | PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B |
| **TPM** | Trusted Computing Group TPM Specification Version 2.0 |
| **USB** | Universal Serial Bus Revision 1.1 Specification<br>Universal Serial Bus Revision 2.0 Specification<br>Universal Serial Bus Revision 3.0 Specification |

## System Technical Specifications

## Social and Environmental Responsibility

| | |
|---|---|
| **Eco-Label Certifications & Declarations** | This product is low halogen except for power cords, cables and peripherals. Service parts obtained after purchase may not be Low Halogen. |

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

**Batteries**

The battery in this product complies with EU Directive 2006/66/EC
Battery size: CR2032 (coin cell)
Battery type: Lithium Metal

The battery in this product does not contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 40ppm by weight

**Restricted Material Usage**

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

**Low Halogen Statement**

This product is low halogen except for power cords, cables and peripherals, as well as the following customer-configurable internal components: Creative Recon3D PCIe Audio Card is not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

**End-of-Life Management and Recycling**

HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. This product is greater than 90% recyclable by weight when properly disposed of at end of life.

**HP Inc. Corporate Environmental Information**

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

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

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

**Additional Information**

- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC.
- Plastic parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product is >90% recycle-able when properly disposed of at end of life
- EPEAT® Gold registered in the U.S. EPEAT registration varies by country. See http://www.epeat.net for registration status by country.

**Packaging**

HP Workstation product packaging meets the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/society/gen_specifications.html

- Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment

## System Technical Specifications

- Does not contain ozone-depleting substances (ODS)
- Does not contain heavy metals (lead, mercury, cadmium or hexavalent chromium) in excess of 100 ppm sum total for all heavy metals listed
- Maximizes the use of post-consumer recycled content materials in packaging materials
- All packaging material is recyclable
- All packaging material is designed for ease of disassembly
- Reduced size and weight of packages to improve transportation fuel efficiency
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards formatting

**Packaging Materials**

**Internal**       Cushions made from fabricated recycled expanded-polyethylene (EPE) or recycled expanded-polypropylene (EPP). May also be made from recycled molded paper-pulp (MPP).

**External**       Carton made from corrugated fiberboard with at least 25% recycled content.

## System Technical Specifications

## Manageability

**Intel® Active Management Technology** (AMT)  The HP Z2 Mini G3 workstation supports Intel® vPro™ technology when purchased with a vPro™ technology capable CPU: Intel® Xeon® processor family or 6th Generation Intel® Core™ i5/i7 processors with Intel® VT-d/VT-x and Intel® TXT technology.

**Remote Manageability Software Solutions**  Visit: http://www.hp.com/go/easydeploy

**System Software Manager**
**Service, Support, and Warranty**  Visit: http://www.hp.com/go/ssm

- Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile.
- PCNs provide advance notification of hardware and software changes to be implemented in the factory providing time to plan for transition.
- Customer Advisories provide concise, effective problem resolution, greatly reducing the need to call technical support.

# QuickSpecs

## 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 |
|---|---|---|
| | X8V05AV | Intel® Xeon® E3- 1225v5 3.3GHz CPU |
| | X8V06AV | Intel® Xeon® E3- 1245v5 3.5GHz CPU |

| Hard Drives | Product # | Offering |
|---|---|---|
| | X8U91AV | HDD 500GB 7200RPM SATA 2.5 |
| | X8U90AV | HDD 1TB 7200RPM SATA 2.5 |

| Memory | Product # | Offering |
|---|---|---|
| | X8V29AV | RAM 8GB (1x8GB) DDR4 2400 ECC Unbuffered |
| | X8V24AV | RAM 16GB (2x8GB) DDR4 2400 ECC Unbuffered |

## Technical Specifications - Processors

**Intel® Xeon® processor E3-1200 v5 family**
Intel® Xeon® E3-1245 v5 3.5 2133 4C CPU
Intel® Xeon® E3-1225 v5 3.3 2133 4C CPU

Intel® Core™ i7-6700 3.4 2133 4C CPU
Intel® Core™ i5-6500 3.2 2133 4C CPU

Intel® Core™ i3-6100 3.7 2133 2C CPU

## Technical Specifications - Hard Drives

| SATA Hard Drives for HP Workstations | 500GB SATA 7200 rpm 6Gb/s 3.5" HDD | | |
|---|---|---|---|
| | | **Capacity** | 500GB |
| | | **Protocol** | SATA |
| | | **Form Factor** | 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 (0° to 60° C) |
| | **1TB SATA 7200 rpm 6Gb/s SFF 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 |
| | | **Operating Temperature** | 32° to 140° F (0° to 60° C) |
| **SATA SSDs for HP Workstations** | **HP 256GB SATA 6Gb/s SSD** | **Capacity** | 256GB |
| | | **Protocol** | SATA |
| | | **Form Factor** | 2.5" |
| | | **Controller** | AHCI |
| | | **NAND Type** | MLC |
| | | **Endurance** | 200TBW (TB Written) |
| | | **Reliability** (MTTF) | 1.5M hours |
| | | **Physical Size** (Height) | 0.28 in; 0.7 cm |
| | | **Physical Size** (Width) | 2.5 in; 6.36 cm |
| | | **Interface** | SATA 6Gb/s |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) |
| | | **Performance** | **Sequential Read** 560MB/s (max) |
| | | | **Sequential Write** 510MB/s (max) |
| | | | **Random Read** 100K IOPS (max) |
| | | | **Random Write** 88K IOPS (max) |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| **Integrated Intel® HD Graphics (Z2)** | **Form Factor** | Integrated in select Intel® Xeon® E3, Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3 processors.<br><br>Check specific platform specifications for selections. |
| | **Graphics Controller** | Intel® HD Graphics |
| | **Memory** | Unified Memory Architecture (UMA) frame buffer.  Graphics memory is shared with system memory. Size selectable between 32 MB to 1024 MB via BIOS setting. Default size is 128 MB. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (Intel® DVMT), to provide an optimal balance between graphics and system memory use. |
| | **Connectors** | Check system platform specifications where Intel® HD Graphics are available. |
| | **Maximum Resolution** | DisplayPort™ 1.2:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>HDMI 2.0 output:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br><br>Dual Link DVI(I) output:<br>- up to 2560 x 1600 x 32 bpp @ 60Hz<br><br>Single Link-DVI(I) output:<br>- up to 1920 x 1200 x 32 bpp @ 60Hz<br><br>VGA output:<br> - 2048 × 1536 × 32 bpp @ 85 Hz<br><br>Note: For HDMI, DVI, and VGA outputs, separate adapters required. |
| | **Shading Architecture** | Shader Model 5.0 |
| | **Supported Graphics APIs** | OpenGL 4.0<br>DirectX 11.1 |
| | **Available Graphics Drivers** | Windows 10<br>Windows 7 |

*Integrated graphics will depend on processor. HD content required to view HD images

## Technical Specifications - Graphics

| **NVIDIA® Quadro® M620 2GB Graphics** | **Maximum Resolution** | DisplayPort 1.2:<br>- up to 4096x2160 x 30 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>HDMI 2.0 output:<br>- up to 4096x2160 x 30 bpp @ 60Hz |
|---|---|---|
| | **Image Quality Features** | Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, 3D DLP, Interleaved, and passive stereo |
| | **Display Output** | Maximum number of displays:<br>- 4 direct attached monitors<br><br>Maximum number of DisplayPort™ displays possible per DisplayPort™ output (Multiple displays daisy-chained from one DisplayPort™ 1.2 port requires DisplayPort™ 1.2 MST capable displays or DP1.3 MST capable hub):<br>- 4 1920x1200 @ 60 Hz<br>- 2 2560x1600 @ 60 Hz<br>- 1 4096x2160 @ 60 Hz<br><br>Maximum number of monitors across all available Quadro M620 outputs is 4. |
| | **Supported Graphics APIs** | OpenGL 4.5<br>DirectX 12<br><br>API support includes:<br>CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran |
| | **Available Graphics Drivers** | Microsoft Windows 10<br>Microsoft Windows 7<br>Linux - Full OpenGL implementation, complete with NVIDIA and ARB extensions<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 - Optical and Removable Storage

| **HP External Ultra-Slim DVD-RW Drive** | **Description** | External 9.5mm high, tray-load | |
|---|---|---|---|
| | **Mounting Orientation** | Either horizontal or vertical | |
| | **Interface Type** | USB 2.0 | |
| | **Dimensions** (WxHxD) | 144 x 14 x 137.5mm | |
| | **Supported Media Types** | DVD-RAM<br>DVD+R<br>DVD+RW<br>DVD+R DL<br>DVD-R DL<br>DVD-R<br>DVD-RW<br>CD-R<br>CD-RW | |
| | **Disc Capacity** | **DVD-ROM** | 8.5 GB DL or 4.7 GB standard |
| | **Access Times** | **Full Stroke DVD** | 160ms (typical for Random Stroke) |
| | | **Full Stroke CD** | 140ms (typical for Random Stroke) |
| | **Maximum Data Transfer Rates** | **CD ROM Read** | CD-ROM, CD-R  Up to 24X<br>CD-RW  Up to 24X |
| | | **DVD ROM Read** | DVD-RAM  Up to 8X<br>DVD+RW  Up to 8X<br>DVD-RW  Up to 8X<br>DVD+R DL  Up to 8X<br>DVD-R DL  Up to 8X<br>DVD-ROM  Up to 8X<br>DVD-ROM DL  Up to 8X<br>DVD+R  Up to 8X<br>DVD-R  Up to 8X |
| | **Power** | **Source** | USB 2.0 DC power |
| | | **DC Power Requirements** | 5 VDC ± 5%-100 mV ripple p-p |
| | | **DC Current** | 5 VDC -< 800 mA typical, <1600 mA maximum |
| | **Operating Environmental** (all conditions non-condensing) | **Temperature** | 41° to 104° F (5° to 40° C) |
| | | **Relative Humidity** | 15% to 80% |
| | | **Maximum Wet Bulb Temperature** | 84° F (29° C) |
| | **Operating Systems Supported** | Windows 10 32-bit and 64-bit, Windows 8 32-bit and 64-bit, Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*.<br>Red Hat Enterprise Linux(RHEL) WS4**, 5, 6 Desktop/Workstation, Removed reference to "Novell" because of acquisition and changed product reference to "SUSE Linux Enterprise Desktop 10 & 11",<br><br>No driver is required for this device. Native support is provided by the operating system. | |
| | **Kit Contents** | HP External Ultra-Slim DVD-RW Drive DVD Writer drive, USB 2.0 type A to mini-B cable.<br>© Copyright 2016 HP Development Company, L.P. | |

## Technical Specifications - Optical and Removable Storage

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## Technical Specifications - Networking and Communications

| Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel® AMT 11.0) | | |
|---|---|---|
| | **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, iSCSI Boot, Muti-port teaming, RSS, ACPI, Advanced cable diagnostic, loopback modes,<br>AMT 11.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD) |

| Intel® 8265 Wireless LAN (802.11ac) and Bluetooth 4.2 Module | | |
|---|---|---|
| | **Connector** | M.2 (Supports 2230 form factor; E Key) Motherboard Interface |
| | **Controller** | Intel® Dual Band Wireless-AC 8260 |
| | **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<br>Bluetooth®: Dual Mode Bluetooth® 2.1, 2.1+EDR, 3.0, 4.0, BLE, and 4.2 |
| | **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 887 Mbps (802.11ac) for WLAN |

## Summary of Changes

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