Overview

**Important Note: Features and Supported Configurations will differ between the Z4 G4 Workstations with Intel® Xeon®W Processors and the Z4 G4 Workstation with Intel® Core™ X Processors. Where different – features are shown side by side. Supported configurations are indicated by the CPU Support references.**

## HP Z4 G4 Workstation


### Front view

1. Front I/O module options
   - Premium (optional): power button, 2 USB 3.1 G1 Type-A, 2 USB 3.1 G2 Type-C™, Headset/Mic, SD Card Reader (optional) (Left-most Type-A port has charging capability)
   - Standard (shown here): power button, 4 USB 3.1 G1 Type-A (left-most Type-A port has charging capability), Headset audio, SD Card Reader (optional)
2. Front handle
3. 2 x 5.25” external drive bays

## Overview

**Intel® Xeon® W Processors**


**Intel® Core™ X-series Processors**


## Internal view

**Intel® Xeon® W Processors**

4. Intel® Xeon® Processors: W-2100 family
5. 2 PCIe G3 x16, 2 PCIe G3 x4, 1 PCIe G3 x8
6. 2 PCIe G3 x4 M.2 for SSDs
7. 8 DIMM slots; DDR4-2666 ECC Registered RAM
8. PSU options:
   - 465W 90% efficient with 0 graphics power adapters
   - 750W 90% efficient with 2 graphics power adapters
   - 1000W 90% efficient with up to 4 graphics power Adapters

**Intel® Core™ X-series Processors**

4. Intel® Core ™ i7-X-series processors
   Intel® Core ™ i9-X Series processors
   Intel® Core ™ i9 Extreme Edition processor
5. Core i9-X configs: 2 PCIe G3 x16, 2 PCIe G3 x4, 1 PCIe G3 x8
   Core i7-X configs: 1 PCI G3 x16, 1 PCIe G3 x16 (x8 electrical), 2 PCIe G3 x4, 1 PCIe G3 x8 (mechanical only)
6. 1 PCIe G3 x4 M.2 for SSDs
7. 8 DIMM slots: DDR4-2666 Non-ECC Unbuffered RAM
8. PSU:
   - 1000W 90% efficient with up to 4 graphics power Adapters

9. 2 x 5.25” external drive bays
10. 2 x 2.5”/3.5” internal drive bays
11. Front card guide and fan (select configurations)
12. 6 x 6Gb/s SATA ports

**Intel® Xeon® W Processors**

**Intel® Core™ X-series Processors**

## Overview



**Rear view**

| | Intel® Xeon® W Processors | Intel® Core™ X-series Processors |
|---|---|---|
| 13. | Rear power button | |
| 14. | Rear handle | |
| 15. | Padlock loop | |
| 16. | Kensington lock slot | |
| 17. | Rear I/O (top to bottom):<br>- Audio in/out,<br>- Keyboard/Mouse PS/2<br>- USB: 6 USB 3.1 G1 Type-A<br>- 2x 1GbE ports | Rear I/O (top to bottom):<br>- Audio in/out,<br>- Keyboard/Mouse PS/2<br>USB: 5 USB 3.1 G1 Type-A<br>- 1x 1GbE port |
| 18. | Side panel barrel keylock (optional) | |

# Overview

**Form Factor**

Minitower

**Operating Systems**

**Intel® Xeon® W Processors**

Preinstalled:

- Windows 10 Pro 64 for Workstations
- HP Linux-ready (minimal OS ready for customer OS installation)
- Red Hat® Enterprise Linux® Desktop Workstation (Paper license with 1 year support; no preinstalled OS)

Supported:

- Windows 7 Professional 64-bit (downgrade media available by request from HP Support)*
- Red Hat® Enterprise Linux® Desktop 7.4
- SUSE Linux® Enterprise Desktop 12 SP3
- Ubuntu 16.04.3 LTS

**Intel® Core™ X-series Processors**

Preinstalled:

- Windows 10 Pro 64 **
- Windows 10 Pro 64 National Academic Plus**
- HP Linux-ready (minimal OS ready for customer OS installation)
- Red Hat® Enterprise Linux® Desktop Workstation (Paper license with 1 year support; no preinstalled OS)

Supported:

- Red Hat® Enterprise Linux® Desktop 7.4
- SUSE Linux® Enterprise Desktop 12 SP3
- Ubuntu 16.04 LTS

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

*Windows 10 is preinstalled. Windows 7 media is available 2nd half 2018 upon request from HP Customer Support. 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. For detailed OS hardware support information for Windows 7 on HP Z4 G4 see http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf.

**For Intel Core i9-X processors Windows 10 Pro 64 / National Academic Plus wont be available until April 30, 2018; Windows 10 Pro 64 Workstation Plus only available from May 1, 2018.

**Available Processors**

| Name | Cores | Clock Speed (GHz) | Cache (MB) | Memory Speed (MT/s) | ECC memory support | Max memory support | Hyper-Threading | Featuring Intel® vPro™ Technology | Intel® Turbo Boost Technology 2.0 (GHz)[1] | Intel® Turbo Boost Max Technology 3.0 (GHz)[2] | TDP (W) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Intel® Xeon® W Processors** | | | | | | | | | | | |
| Intel® Xeon® W-2195 processor | 18 | 2.3 | 24.75 | 2666 | YES | 512GB | YES | YES | 3.2, 4.3 | N/A | 140 |
| Intel® Xeon® W-2175 processor | 14 | 2.5 | 19.25 | 2666 | YES | 512GB | YES | YES | 3.3, 4.3 | N/A | 140 |
| Intel® Xeon® W-2155 processor | 10 | 3.3 | 13.75 | 2666 | YES | 512GB | YES | YES | 4.0, 4.5 | N/A | 140 |
| Intel® Xeon® W-2145 processor | 8 | 3.7 | 11.00 | 2666 | YES | 512GB | YES | YES | 4.3, 4.5 | N/A | 140 |
| Intel® Xeon® W-2135 processor | 6 | 3.7 | 8.25 | 2666 | YES | 512GB | YES | YES | 4.4, 4.5 | N/A | 140 |
| Intel® Xeon® W-2133 processor | 6 | 3.6 | 8.25 | 2666 | YES | 512GB | YES | YES | 3.8, 3.9 | N/A | 140 |
| Intel® Xeon® W-2125 processor | 4 | 4.0 | 8.25 | 2666 | YES | 512GB | YES | YES | 4.4, 4.5 | N/A | 120 |
| Intel® Xeon® W-2123 processor | 4 | 3.6 | 8.25 | 2666 | YES | 512GB | YES | YES | 3.7, 3.9 | N/A | 120 |

## Overview

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Intel® Xeon® W-2104 processor | 4 | 3.2 | 8.25 | 2400 | YES | 512GB | NO | YES | N/A | N/A | 120 |
| Intel® Xeon® W-2102 processor | 4 | 2.9 | 8.25 | 2400 | YES | 512GB | NO | YES | N/A | N/A | 120 |
| **Intel® Core™ X-Series Processors** | | | | | | | | | | | |
| Intel® Core™ i9-7980XE processor | 18 | 2.6 | 24.75 | 2666 | NO | 128GB | YES | NO | 4.2 | 4.4 | 165 |
| Intel® Core™ i9-7960X processor | 16 | 2.8 | 22.0 | 2666 | NO | 128GB | YES | NO | 4.2 | 4.4 | 165 |
| Intel® Core™ i9-7940X processor | 14 | 3.1 | 19.25 | 2666 | NO | 128GB | YES | NO | 4.3 | 4.4 | 165 |
| Intel® Core™ i9-7920X processor | 12 | 2.9 | 16.5 | 2666 | NO | 128GB | YES | NO | 4.3 | 4.4 | 140 |
| Intel® Core™ i9-7900X processor | 10 | 3.3 | 13.75 | 2666 | NO | 128GB | YES | NO | 4.3 | 4.5 | 140 |
| Intel® Core™ i7-7820X processor | 8 | 3.6 | 11.0 | 2666 | NO | 128GB | YES | NO | 4.3 | 4.5 | 140 |
| Intel® Core™ i7-7800X processor | 6 | 3.5 | 8.25 | 2400 | NO | 128GB | YES | NO | 4.0 | N/A | 140 |
| | | | | | | | | | | | |
| | [1]For Intel ® Xeon® W processors, the specifications shown in this column represent the following: all core maximum turbo frequency, single core maximum turbo frequency).<br>For Intel® Core™ processors, the specifications shown in this column refer to single core maximum turbo frequency.<br><br>[2]Intel Turbo Boost Max Technology 3.0 identifies the best performing core(s) on a processor and provides increased performance on those cores by taking advantage of power and thermal headroom. Intel® Turbo Boost Max Technology 3.0 frequency is the clock frequency of the CPU when running in this mode.<br><br>**NOTE:** Processors that do not have certain turbo functionality are denoted as N/A. | | | | | | | | | | |

**Available Processors**

**Disclaimers**

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.

**Color**

Black

**Convertibility**

No

**Expansion Slots (see system board section for more details)**

| Intel® Xeon® W Processors | Intel® Core™ X-series Processors |
|---|---|
| **Slot 0:** Mechanical-only, for use with devices that require only rear bulkhead mounting | |
| **Slot 1:** PCI Express Gen3 x16 (from CPU) | |
| **Slot 2:** PCI Express Gen3 x4 (from PCH) with open-ended connector* | |
| **Slot 3:**<br>PCI Express Gen3 x16 (from CPU) | **Slot 3:**<br>Core i9-X configs: PCI Express Gen3 x16 (from CPU)<br>Core i7-X configs: PCI Express Gen3 x16(mechanical) x8(electrical) (from CPU) |
| **Slot 4:** PCI Express Gen3 x4 (from PCH) with open-ended connector* | |
| **Slot 5:**<br>PCI Express Gen3 x8 (from CPU) with open-ended connector* | **Slot 5:**<br>- Core i9-X configs: PCI Express Gen3 x8 (from CPU) with open-ended connector* |

## Overview

| | |
|---|---|
| | - Core i7-X configs: PCI Express Gen3 x8 (mechanical-only, no data) with open-ended connector* |
| | **M.2 Slot 1:** M.2 PCIe Gen 3 x4 (from CPU) up to 80mm storage devices |
| | **M.2 Slot 2:** M.2 PCIe Gen 3 x4 (from CPU) up to 80mm storage devices<br>**M.2 Slot 2:** No 2nd M.2 connector/slot available |
| | * Open-ended connector allows a greater bandwidth (e.g. x16) card to be installed physically into a lower bandwidth connector/slot. |
| **Expansion Bays (see storage section for more details)** | 2 internal 3.5” bays (with acoustic dampening drive carriers pre-installed). Optional 2.5” adapter available.<br>2 external 5.25" bays<br>• 3rd and 4th 3.5" HDD each occupy one external bay<br>• 3rd and 4th 2.5" HDD/SSD occupy a single external bay within a 2:1 carrier |
| **Front I/O** | • Base: Power button, 1 Headset audio port, 4 USB 3.1 G1 Type A (1 charging)<br>• Premium (optional): Power button with power/fault LED, Drive activity LED, 1 Headset audio port, 2 USB 3.1 G1 Type-A (1 charging), 2 USB 3.1 G2 Type-C™<br>• Optional: SD reader |
| **Internal I/O** | 1 USB 3.1 G1 single-port header, 1 USB 2.0 single-port header and 1 USB 2.0 dual-port header |
| **Rear I/O** | **Intel® Xeon® W Processor Family**<br>6x USB 3.1 G1 Type-A<br>2x 1GbE LAN ports (1x supporting Intel AMT)<br>**Intel® Core™ X- Series Processor Family**<br>5x USB 3.1 G1 Type-A<br>1x 1GbE LAN ports<br>Audio: 1 Line out, 1 Line in (Line in can be retasked as microphone), 1 PS/2 mouse port, 1 PS/2 keyboard port, 1 Rear power button<br>Optional: 1 serial port (cable up to rear bulkhead) |
| **Interfaces Supported** | SD card reader (optional)<br>6-channel SATA interface (6 @ 6.0 Gb/s)<br>6 channels are eSATA configurable for use with eSATA CTO/AMO Kit (No hot plug / hot swap supported)<br>USB 2.0, USB 3.1 G1 (aka USB 3.0), USB 3.1 G2 (optional) |
| **On-board RAID Support** | SATA RAID 0 Striped Array Configuration<br>SATA RAID 1 Mirrored Array Configuration<br>SATA RAID 10 Striped/Mirrored Configuration |
| **Chassis Dimensions (H x W x D)** | H: 15.2" (386mm)<br>W: 6.65" (169mm)<br>D: 17.5" (445mm) |
| **Packaged Dimensions** | H: 22.5" (572mm)<br>W: 12.4" (314mm)<br>D: 22.2" (563mm) |
| **Rack Dimensions** | 4U |
| **Weight** | Exact weights depend upon configuration (System weight only).<br>Minimum: 10.2 kg (22.4 lbs.)<br>Standard: 11.3 kg (24.9 lbs.)<br>Maximum: 17.3 kg (38.2 lbs.) |
| **Temperature** | Non-operating: -40° to 60° C (-40° to 140° F)<br>Operating: 5° to 35° C (40° to 95° F) |

## Overview

| | |
|---|---|
| | 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>Maximum rate of change: 10 °C/hr<br>No direct sustained sunlight |
| **Humidity** | Operating: 10% to 85% relative humidity, non-condensing, 35° C maximum wet bulb<br>Non-operating: 10% to 90% relative humidity, 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** | **Processor Support** |
| | **XW** **ENTRY**<br>465 watts wide-ranging, active Power Factor Correction, 90% Efficient, with no 6-pin graphics power cables.<br>The Z4 G4 465W power supply efficiency report can be found at this link: https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf |
| | **XW** **MID_RANGE**<br>750 watts wide-ranging, active Power Factor Correction, 90% Efficient, with 2x 6-pin graphics power cables.<br>The Z4 G4 750W power supply efficiency report can be found at this link: https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf |
| | **XW, CX (i9) CX (i7)** **HIGH-END**<br>1000 watts wide-ranging, active Power Factor Correction, 90% Efficient.<br>Includes 4x 6+2-pin graphics power cables: also includes a Front Fan and Card Guide kit to enable support for dual high end graphics solutions.<br><br>Includes 2x 6+2-pin graphics power cables.<br><br>The Z4 G4 1000W power supply efficiency report can be found at this link: https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf<br><br>**NOTE:** 1000 W internal power supply, up to 90% efficiency, active PFC available the first half of 2018 |
| **Workstation ISV Certifications** | See the latest list of certifications at http://www8.hp.com/us/en/campaigns/workstations/industries-and-partners.html |

Supported Components

## Processors

| | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|
| **Intel® Xeon® W-2100 Series CPU** | | | | |
| Intel® Xeon® W-2195 2.3 2666 18C CPU | Y | N | | |
| Intel® Xeon® W-2175 2.5 2666 14C CPU | Y | N | | |
| Intel® Xeon® W-2155 3.3 2666 10C CPU | Y | N | | |
| Intel® Xeon® W-2145 3.7 2666 8C CPU | Y | N | | |
| Intel® Xeon® W-2135 3.7 2666 6C CPU | Y | N | | |
| Intel® Xeon® W-2133 3.6 2666 6C CPU | Y | N | | |
| Intel® Xeon® W-2125 4.0 2666 4C CPU | Y | N | | |
| Intel® Xeon® W-2123 3.6 2666 4C CPU | Y | N | | |
| Intel® Xeon® W-2104 3.2 2400 4C CPU | Y | N | | |
| Intel® Xeon® W-2102 2.9 2400 4C CPU | Y | N | | |
| **Intel® Core™ X-Series CPU** | | | | |
| Intel® Core™ i9-7980XE 2.6 2666 18C CPU | Y | N | | |
| Intel® Core™ i9-7960X 2.8 2666 16C CPU | Y | N | | |
| Intel® Core™ i9-7940X 3.1 2666 14C CPU | Y | N | | |
| Intel® Core™ i9-7920X 2.9 2666 12C CPU | Y | N | | |
| Intel® Core™ i9-7900X 3.3 2666 10C CPU | Y | N | | |
| Intel® Core™ i7-7820X 3.6 2666 8C CPU | Y | N | | |
| Intel® Core™ i7-7800X 3.5 2400 6C CPU | Y | N | | |

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.

## Monitors / Displays

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| HP Z Display Z22n G2 | XW, CX | | Y | 1JS05AA | |
| HP Z Display Z23n G2 | XW, CX | | Y | 1JS06AA | |
| HP Z Display Z24i G2 | XW, CX | | Y | 1JS08AA | |
| HP Z Display Z24n G2 | XW, CX | | Y | 1JS09AA | |
| HP Z Display Z24nf G2 | XW, CX | | Y | 1JS07AA | |
| HP Z Display Z27n G2 | XW, CX | | Y | 1JS10AA | |
| HP Z Display Z27s (4K display) | XW, CX | | Y | J3G07AA | |

Supported by all operating systems available from HP
Screen size measured diagonally

## Storage / Hard Drives*

## Supported Components

### SAS Hard Drives

| SAS Hard Drives for HP Workstations | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| HP 300GB 15k SAS SFF | XW | Y | Y | L5B74AA | |

**NOTE: Only available on Xeon W configs** SAS controller add-in card required

*For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity may be less. Up to 32GB (for Windows 10) is reserved for system recovery software.

### SATA Hard Drives

| SATA (Serial ATA) Hard Drives for HP Workstations | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| 500GB SATA 7200RPM 6Gb/s 3.5” HDD | XW, CX | Y | Y | LQ036AA | |
| 500GB SATA 7200RPM 6Gb/s OPAL2 SFF 3.5” HDD | XW, CX | Y | Y | D8N29AA | |
| 1TB SATA 7200RPM 3.5” HDD | XW, CX | Y | Y | LQ037AA | |
| 1TB SATA 7200RPM Ent 3.5” HDD | XW, CX | Y | Y | W0R10AA | |
| 2TB SATA 7200RPM HDD | XW, CX | Y | Y | QB576AA | |
| 4TB SATA 7200RPM Ent 3.5” HDD | XW, CX | Y | Y | K4T76AA | |
| 6TB SATA 7200RPM Ent 3.3” HDD | XW, CX | Y | Y | 3DH90AA | |

**NOTES:**

Up to (4) 3.5-inch 7200 rpm SATA drives: 500 GB, 1.0, 2.0, 4.0, 16TB max total

### SATA Solid State Drives

| HP Solid State Drives (SSDs) for Workstations | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| HP 256GB SATA SSD | XW, CX | Y | Y | A3D26AA | |
| HP 512GB SATA SSD | XW, CX | Y | Y | D8F30AA | |
| HP 1TB SATA SSD | XW, CX | Y | Y | F3C96AA | |
| HP 2TB SATA SSD | XW, CX | Y | Y | Y6P08AA | |
| HP 256GB SATA SED OPAL2 SSD | XW, CX | Y | Y | G7U67AA | |
| HP 512GB SATA SED OPAL2 SSD | XW, CX | Y | Y | N8T26AA | |
| HP 240GB SATA Enterprise SSD | XW, CX | Y | Y | T3U07AA | |
| HP 480GB SATA Enterprise SSD | XW, CX | Y | Y | T3U08AA | |

## Supported Components

| PCIe Solid State Drives | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| **PCIe SSDs for HP Workstations** | | | | | |
| HP Z Turbo Drive 256GB MLC Z4/Z6 G4 SSD Kit | XW, CX | Y | Y | 1PD56AA | |
| HP Z Turbo Drive 512GB MLC Z4/Z6 G4 SSD Kit | XW, CX | Y | Y | 1PD57AA/AT | |
| HP Z Turbo Drive 1TB MLC Z4/Z6 G4 SSD Kit | XW, CX | Y | Y | 1PD58AA | |
| HP Z Turbo Drive 256GB TLC Z4/Z6 G4 SSD Kit | XW, CX | Y | Y | 1PD59AA/AT | |
| HP Z Turbo Drive 512GB TLC Z4/Z6 G4 SSD Kit | XW, CX | Y | Y | 1PD60AA | |
| HP Z Turbo Drive 1TB TLC Z4/Z6 G4 SSD Kit | XW, CX | Y | Y | 1PD61AA | |
| HP Z Turbo Drive 256GB Z4/Z6 G4 SED Kit | XW, CX | Y | Y | TBD | |
| HP Z Turbo Drive 512GB Z4/Z6 G4 SED Kit | XW, CX | Y | Y | TBD | |
| **HP Z Turbo Drive Quad Pro** | | | | | |
| HP Z Turbo Drive Quad Pro 2x256GB PCIe® SSD | XW, CX (i9) | Y | Y | N2M98AA | 1, 4 |
| HP Z Turbo Drive Quad Pro 2x512GB PCIe® SSD | XW, CX (i9) | Y | Y | N2M99AA | 1, 4 |
| HP Z Turbo Drive Quad Pro 2x1TB PCIe® SSD | XW, CX (i9) | Y | Y | T9H99AA | 1, 4 |
| HP Z Turbo Drive Quad Pro 256GB SSD module | XW, CX (i9) | N | Y | N2N00AA | 1, 3, 4 |
| HP Z Turbo Drive Quad Pro 512GB SSD module | XW, CX (i9) | N | Y | N2N01AA | 1, 3, 4 |
| HP Z Turbo Drive Quad Pro 1TB SSD module | XW, CX (i9) | N | Y | T9J00AA | 1, 3, 4 |

**Note 1:** All HP Z Turbo Drive Quad Pro modules require the Z4 G4 Fan & Front Card Kit, available as CTO (1MY89AV) and AMO (1XM33AA)

**Note 3:** M.2 SSD module only, designed to be installed into the Z Turbo Drive Quad Pro carrier

**Note 4:** Z Turbo Drive Quad Pro is not supported on Core i7-X configurations

| Hard Drive Controllers | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| **SAS Controller** | | | | | |
| MicroSemi SmartHBA2100-4i4e SAS Controller | XW | Y | Y | 1FV90AA | |
| **NOTE:** Only available on Xeon W configurations | | | | | |

## Graphics

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes | Supported # of cards |
|---|---|---|---|---|---|---|
| **Graphics Cable Adapters** | | | | | | |
| HP DisplayPort to HDMI Adapter | XW, CX | Y | Y | K2K92AA | | |
| HP DisplayPort to Dual Link DVI Adapter | XW, CX | Y | Y | NR078AA | | |
| HP DisplayPort to DVI-D Adapter | XW, CX | Y | Y | FH973AA | | |
| HP DisplayPort to DVI-D Adapter (2-pack) | XW, CX | Y | N | | | |
| HP DisplayPort to DVI-D Adapter (4-pack) | XW, CX | Y | N | | | |
| HP DisplayPort to DVI-D Adapter (6-pack) | XW, CX | Y | N | | | |
| HP miniDP-to-DP Adapter | XW, CX | Y | Y | 2MY05AA | | |
| HP miniDP-to-DP Adapter (2-pack) | XW, CX | Y | N | | | |

## Supported Components

| | | | | | | |
|---|---|---|---|---|---|---|
| HP miniDP-to-DP Adapter (4-pack) | XW, CX | Y | N | | | |
| HP miniDP-to-DP Adapter (8-pack) | XW, CX | Y | N | | | |
| NVIDIA SLI 2-slot Graphics Connector | XW, CX | Y | Y | 2YY84AA | | |
| **Entry 3D** | | | | | | |
| NVIDIA® Quadro® P400 2GB Graphics | XW, CX | Y | Y | 1ME43AA/AT | 4 | 2 |
| NVIDIA® Quadro® P600 1st GFX 2GB Graphics | XW, CX | Y | Y | 1ME42AA/AT | 4 | 2 |
| NVIDIA® Quadro® P620 2GB Graphics | XW, CX | Y | Y | TBD | 4 | 2 |
| AMD FirePro™ W2100 2GB Graphics | XW, CX | Y | Y | J3G91AA/AT | 3 | 2 |
| **Mid-range 3D** | | | | | | |
| NVIDIA® Quadro® P1000 1st GFX 4GB Graphics | XW, CX | Y | Y | 1ME01AA/AT | 3, 4 | 2 |
| NVIDIA® Quadro® P2000 1st GFX 5GB Graphics | XW, CX | Y | Y | 1ME41AA/AT | 3, 4 | 2 |
| AMD Radeon™ Pro WX 3100 4GB Graphics | XW, CX | Y | Y | 2TF08AA | 3, 4 | 2 |
| AMD Radeon™ Pro WX 4100 4GB Graphics | XW, CX | N | Y | Z0B15AA/AT | 3, 4 | 2 |
| **High End 3D** | | | | | | |
| NVIDIA® Quadro® P4000 1st GFX 8GB Graphics | XW, CX | Y | Y | 1ME40AA/AT | 1, 2 | 2 |
| NVIDIA® Quadro® P5000 1st GFX 16GB Graphics | XW, CX | Y | Y | Z0B13AA/AT | 1, 2, 5 | 2 |
| NVIDIA® Quadro® P6000 1st GFX 24GB Graphics | XW, CX | Y | Y | Z0B12AA/AT | 1, 2, 5 | 2 |
| NVIDIA® Quadro® GP100 16GB Graphics | XW, CX | Y | | 1ZE81AA/AT | 1, 2, 5 | 2 |
| NVIDIA® Quadro® GV100 32GB Graphics | XW, CX | Y | | 3ME26AA/AT | 1, 2, 5 | 1 |
| AMD Radeon™ Pro WX 7100 1st GFX 8GB Graphics | XW, CX | Y | Y | Z0B14AA/AT | 1, 2 | 2 |
| AMD Radeon™ Pro WX 9100 16GB Graphics | XW, CX | Y | | 2TF01AA/AT | 1, 2, 5 | 1 |
| NVIDIA® Quadro® Sync II | XW, CX | Y | Y | 1WT20AA | | |

**NOTE 1:** Single graphics configuration requires the HP Z4 G4 Fan and Front Card Guide Kit, which is available both CTO (1MY89AV) and AMO (1XM33AA).
**NOTE 2:** Single graphics configuration requires the 750W chassis or 1000W chassis.
**NOTE 3:** Dual graphics configuration requires the HP Z4 G4 Fan and Front Card Guide Kit, which is available both CTO (1MY89AV) and AMO (1XM33AA).
**NOTE 4:** Dual graphics configuration requires the 750W chassis or 1000W chassis.
**NOTE 5:** Dual graphics configuration requires the 1000W chassis.

| **Memory** | CTO | **Processor Supports** | **Factory Configured** | **Option Kit** | **Option Kit Part Number** | **Support Notes** |
|---|---|---|---|---|---|---|
| | **DDR4-2666 ECC Registered DIMMs** | | | | | |
| | HP 8GB (1x8GB) DDR4-2666 ECC Reg RAM | XW | Y | Y | 1XD84AA/AT | 1 |
| | HP 16GB (2x8GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | HP 24GB (3x8GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | 32GB (4x8GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | 64GB (8x8GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | 16GB (1x16GB) DDR4-2666 ECC Reg RAM | XW | Y | Y | 1XD85AA/AT | 1 |
| | 32GB (2x16GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | 64GB (4x16GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | 128GB (8x16GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1 |
| | 32GB (1x32GB) DDR4-2666 ECC Reg RAM | XW | N | Y | 1XD86AA/AT | 1, 2 |

## Supported Components

| | | | | | |
|---|---|---|---|---|---|
| 64GB (2x32GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1, 2 |
| 128GB (4x32GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1, 2 |
| 256GB (8x32GB) DDR4-2666 ECC Reg RAM | XW | Y | | | 1, 2 |
| HP 8GB (1x8GB) DDR4-2666 nECC RAM | CX | Y | Y | 3PL81AA | 1 |
| HP 16GB (2x8GB) DDR4-2666 nECC RAM | CX | Y | | | 1 |
| HP 32GB (4x8GB) DDR4-2666 nECC RAM | CX | Y | | | 1 |
| HP 64GB (8x8GB) DDR4-2666 nECC RAM | CX | Y | | | 1 |
| HP 16GB (1x16GB) DDR4-2666 nECC RAM | CX | Y | Y | 3PL82AA | 1 |
| HP 32GB (2x16GB) DDR4-2666 nECC RAM | CX | Y | | | 1 |
| HP 64GB (4x16GB) DDR4-2666 nECC RAM | CX | Y | | | 1 |
| HP 128GB (8x16GB) DDR4-2666 nECC RAM | CX | Y | | | 1 |

**NOTES:**
For details on the supported memory configurations on the HP Z4 G4 Workstation, please refer to the System Technical Specifications - System Board section of this document.

Each processor supports up to 4 channels of DDR4 memory. To realize full performance at least 1 DIMM must be inserted into each channel.

The CPUs determine the speed at which the memory is clocked. If an 2400MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2400MT/s, regardless of the specified speed of the memory.

**NOTE 1:** ONLY DDR4 DIMMs are supported.
**NOTE 2** Memory configurations using 32GB DIMMs require the HP Z4 Memory Cooling Solution, which is available both CTO (1MY90AV) and AMO (1XM34AA).

## Multimedia and Audio Devices

Supported Components

## Multimedia and Audio Devices

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| Integrated Realtek HD ALC221 Audio | XW, CX | Y | N | | |

## Optical and Removable Storage

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| **HP SlimTray Optical Drives** | | | | | |
| HP 9.5mm Slim Blu Ray Disc Writer | XW, CX | Y | Y | K3R65AA | 1 |
| HP 9.5mm Slim DVD ROM | XW, CX | Y | Y | K3R63AA | 1 |
| HP 9.5mm Slim DVD Writer* | XW, CX | Y | Y | K3R64AA | 1 |
| **HP SD Card Reader** | | | | | |
| HP SD 4 Card Reader | XW, CX | Y | Y | Y0L99AA | |

**NOTE 1:** Installing an optical drive into Z4 G4 requires a 5.25" external bay adapter (Option Kit Part number NQ099A).

*Actual speeds may vary. No support for DVD-RAM (DVD Writer). 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

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| Intel® i350-T2 PCIe Dual Port Gigabit NIC | XW, CX | Y | Y | V4A91AA | |
| Intel® i350-T4 PCIe 4-Port Gigabit NIC | XW, CX | N | Y | W8X25AA | |
| Intel® Ethernet I210-T1 PCIe x1 Gb NIC | XW, CX | Y | Y | E0X95AA | |
| Aquantia® AQN-108 Single-Port 5GbE NIC | XW, CX | N | Y | 1PM63AA | |
| Intel® X550-T2 10GbE Dual Port NIC | XW, CX | Y | Y | 1QL46AA | |
| Intel® X710-DA2 10GbE SFP+ Dual Port NIC | XW, CX | Y | Y | 1QL47AA | |
| HP 10GbE SFP+ SR Transceiver | XW, CX | Y | Y | C3N53AA | |
| Intel 8265 802.11 a/b/g/n/ac + BT PCIe WLAN | XW, CX | N | Y | 1QL48AA | |

## Racking and Physical Security

Supported Components

## Racking and Physical Security

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| HP Z4/Z6 Side Panel Barrel Keylock | XW, CX | Y | N | | |
| HP Solenoid Lock / Hood Sensor | XW, CX | Y | N | | |
| HP Z4/Z6 Depth Adjustable Fixed Rail Rack Kit | XW, CX | N | Y | 2HW42AA | |
| HP Keyed Cable Lock 10mm | XW, CX | N | Y | T1A62AA | |

## Input Devices

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| HP Wireless Business Slim Keyboard and Mouse | XW, CX | Y | Y | N3R88AA | |
| Business Slim PS/2 Wired Keyboard | XW, CX | Y | Y | N3R86AA | |
| USB Business Slim Wired Keyboard | XW, CX | Y | Y | N3R87AA | |
| USB Premium Wired Keyboard | XW, CX | Y | Y | Z9N40AA | |
| USB Wired SmartCard CCID Keyboard | XW, CX | Y | Y | E6D77AA | |
| 3Dconnexion CADMouse | XW, CX | Y | Y | M5C35AA | |
| HP Optical USB Mouse | XW, CX | Y | Y | QY777AA | |
| HP PS/2 Mouse | XW, CX | Y | Y | QY775AA | |
| HP USB Hardened Mouse | XW, CX | Y | Y | P1N77AA | |

## Other Hardware

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|
| HP ENERGY STAR® Certified Configuration | XW, CX | Y | | | |
| HP Z Premium Front I/O 2xUSB-A 2xUSB-C | XW, CX | Y | Y | 1XM32AA | |
| HP Z4 G4 Memory Cooling Solution | XW, CX | Y | Y | 1XM34AA | Note 1 |
| HP Z4 G4 Fan and Front Card Guide Kit | XW, CX | Y | Y | 1XM33AA | Note 2 |
| HP Internal USB Port Kit | XW, CX | N | Y | EM165AA | Note 3 |
| HP eSATA 2 port PCI Bulkhead Kit | XW, CX | Y | Y | GM110AA | |
| HP Serial Port Adapter | XW, CX | Y | Y | PA716A | |
| HP Workstation Mouse Pad | XW, CX | Y | | | |

**Note 1:** The HP Z4 G4 Memory Cooling Solution is available to add to any configuration for improved system cooling, but is required for memory configurations using 32GB DIMMs.

**Note 2**: Fan and Front Card Guide required with the following components:
- Specific graphics configurations (see Graphics section above)
- Any HP Z Turbo Quad Pro configuration

**Note 3:** The HP Internal USB Port kit has a single USB 2.0 type A connector.

## Software

| | Processor Supports | Factory Configured | Option Kit | Option Kit Part Number | Support Notes |
|---|---|---|---|---|---|

## Supported Components

| | | | | |
|---|---|---|---|---|
| Sobey Video Editing SW | XW, CX | Y | N | China only |
| SW HP RGS for Z | XW, CX | Y | N | |
| HP Sure Start Gen3 | XW, CX | Y | N | 1 |

**Note 1:** Available on products equipped with Intel® 7th generation processors.

Supported Components

## Operating Systems

| | Processor Supports | Support Notes |
|---|---|---|
| Windows 10 Pro 64 for Workstations | XW | Note 1, 7 |
| Windows 10 Pro 64 | CX | Note 2,7 |
| Win 10 Pro 64 StF MSNA Plus | CX | Note 2 |
| Windows 7 Professional 64-bit | XW | Note 3, 4 |
| HP Linux® Ready | XW, CX | Note 5 |
| Red Hat® Enterprise Linux® (RHEL) Workstation - Paper License (1yr) | XW, CX | Note 6 |

**NOTE 1**: Only applicable to Xeon W configurations

**NOTE 2**: Only applicable to Core X configurations

**NOTE 3:** downgrade media available 2nd half 2018 by request from HP Support. Not supported or available for Core X configurations.

**NOTE 4:** Windows 10 is preinstalled. Windows 7 media is only available for Xeon W configurations, available 2nd half 2018 upon request from HP Customer Support. 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

**NOTE 5:** includes drivers for 64-bit OS versions of RHEL 6 & 7, SUSE Linux® Enterprise Desktop 11 and Ubuntu 14.04.

**NOTE 6**: This second OS must be ordered with the HP Linux® Installer Kit as the first OS.

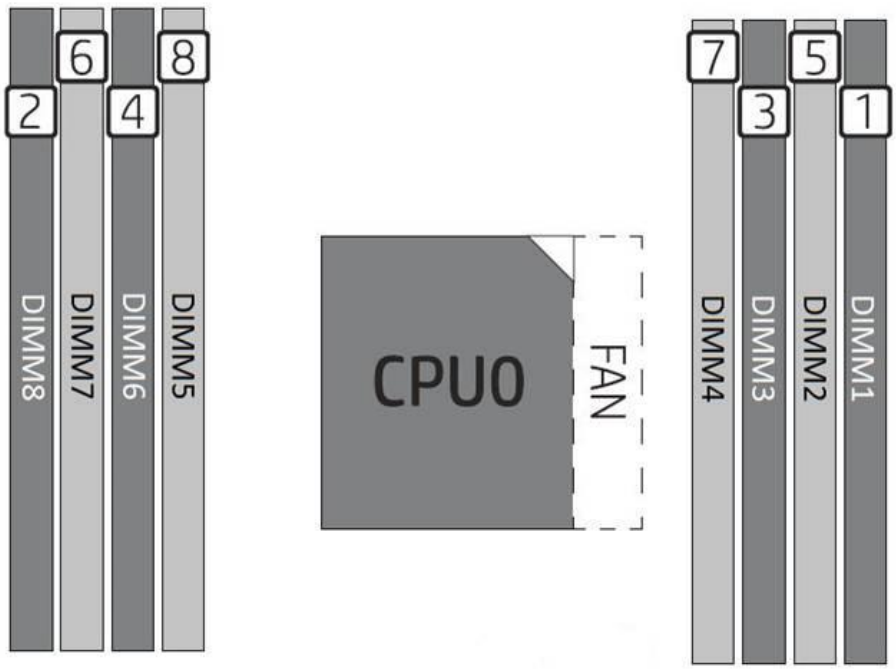
**NOTE 7**: For Intel Core i9-X processors Windows 10 Pro 64 / National Academic Plus wont be available until April 30, 2018; Windows 10 Pro 64 Workstation Plus only available from May 1, 2018.

System Technical Specifications

## System Board

| | | |
|---|---|---|
| **System Board Form Factor** | Main System Board:<br>27.7 x 28.0 cm<br>10.9 x 11.0 inches | |
| **Processor Socket** | Single LGA2066 R4 | |
| **Chipset** | **Intel® Xeon® W Processor Family**<br>Intel® C422 Chipset | **Intel® Core™ X-series Processors**<br>Intel® X299 chipset |
| **Super I/O Controller** | Nuvoton NPCD315HA0DX (SIO-15) | |
| **Memory Expansion Slots** | 8 DDR4 memory slots | |
| **Memory Type Supported** | DDR4, RDIMM (Registered), ECC: 8GB, 16GB and 32GB | DDR4, UDIMM, non-ECC: 8GB and 16GB |
| **Memory Modes** | Channel Interleaved | |
| **Memory Speed Supported** | 2666MT/s, 2400MT/s, and 2133MT/s | |
| **Memory Protection** | ECC available on data, parity on address and command | N/A |
| **Maximum Memory** | Supports up to 256GB | Supports up to 128GB |
| **Memory Configuration (Supported)** | Only Registered DIMMs are supported. | Only non-ECC unbuffered DIMMs are supported |

**Memory Load Order**




| | | |
|---|---|---|
| **Note on Maximum Memory** | Maximum memory capacities assume 64-bit operating systems such as Windows 10 Pro 64-bit, Windows 7 Professional 64-bit. | |
| **PCI Express Connectors** | **Intel® Xeon® W Processor Family** | **Intel® Core™ X-series Processors** |
| | **Slot 1 (top):** PCI Express Gen3 x16 supplied by CPU. | |

System Technical Specifications

**Slot 2 (PCH):** PCI Express Gen3 x4 supplied by PCH with open-ended connector. **

| | |
|---|---|
| **Slot 3:**<br>PCI Express Gen3 x16 supplied by CPU | **Slot 3:**<br>Core i9-X configs: PCI Express Gen3 x16 supplied by CPU<br>Core i7-X configs: PCI Express Gen3 x16 (mechanical)/ x8 (electrical)supplied by CPU |

**Slot 4 (PCH):** PCI Express Gen3 x4 supplied by PCH with open-ended connector**

| | |
|---|---|
| **Slot 5:**<br>PCI Express Gen3 x8 supplied by CPU with open-ended connector** | **Slot 5:**<br>- Core i9-X configs: PCI Express Gen3 x8 supplied by CPU with open-ended connector**<br>- Core i7-X configs: PCI Express Gen3 x8 (mechanical-only, no data) with open-ended connector** |

**NOTE:** Slots 1 through 5 support full-height, full-length cards (with extender)

**M.2 Slot 1:** PCI Express Gen3 x4 supplied by CPU
Socket Type 3, Key M, H4.2, sizes 2260-D5-M, 2280-D5-M, 22110-D5-M

| | |
|---|---|
| **M.2 Slot 2:**<br>PCI Express Gen3 x4 supplied by CPU<br>Socket Type 3, Key M, H4.2, sizes 2260-D5-M, 2280-D5-M, 22110-D5-M | **M.2 Slot 2:**<br>No 2nd M.2 connector/slot available |

** Open-ended connector allows a greater bandwidth (e.g. x16) card to be installed physically into a lower bandwidth connector/slot.

## System Technical Specifications

| | | |
|---|---|---|
| **Supported Drive Interfaces** | | |
| **SATA** | 6 SATA @6Gb/s, supports RAID 0,1, 5, and 10<br>Factory integrated RAID is Microsoft Windows only | |
| **Serial Attached SCSI** | **Intel® Xeon® W Processor Family** | **Intel® Core™ X-series Processors** |
| | Requires Optional PCIe card | not supported |
| **Factory Configured RAID** | • RAID 0 configuration - striped array<br>• RAID 1 configuration - mirrored array<br>• RAID 10 striped and mirrored array<br>*HW RAID functionality not supported by Linux®. Use SW RAID functionality provided in the Red Hat® Operating system instead. | |
| **Integrated Graphics** | No | |
| **Network Controller** | **Intel® Xeon® W Processor Family** | **Intel® Core™ X-series Processors** |
| | Intel® I219-LM PCIe GbE LAN<br>Intel® I210-AT PCIe® GbE LAN<br>Supports the following management functionalities: Intel AMT11.1, TXT, DASH 1.1, WOL, VLAN, Teaming and PXE 2.1 | Intel® I219-V PCIe GbE LAN<br>Supports the following management functionalities: WOL and PXE 2.1 |
| **External SATA (eSATA)** | Supported on all SATA ports configurable with optional eSATA* cable kit<br>* hot plug / hot swap not supported with eSATA | |
| **IDE connector** | No | |
| **Floppy connector** | No | |
| **Serial** | 1 internal header | |
| **2nd Serial** | No | |
| **Parallel** | No | |
| **AUX IN (audio)** | No | |
| **IEEE 1394 Connector(s)** | | |
| **Front** | None | |
| **Rear** | None | |
| **Internal** | None | |
| **USB Connector(s)** | | |
| **Front** | Front USB depends on which FIO module is selected:<br>- Standard: 4 USB 3.1 G1 Type A (1 charging)<br>- Premium: 2 USB 3.1 G2 Type C™, 2 USB 3.1 G1 Type A (1 charging) | |
| **Rear** | **Intel® Xeon® W Processor Family** | **Intel® Core™ X-series Processors** |
| | 6 USB 3.1 G1 Type A | 5 USB 3.1 G1 Type-A |
| **Internal** | 1 USB 3.1 G1 single-port header<br>1 USB 2.0 single-port header<br>1x USB 2.0 dual-port header | |

## System Technical Specifications

| | | | | |
|---|---|---|---|---|
| **HD Integrated Audio** | Realtek ALC221 | | | |
| **Flash ROM** | Yes | | | |
| **CPU Fan Header** | Yes | | | |
| **Rear Chassis Fan Header** | Yes | | | |
| **Front PCI Fan Header** | Yes | | | |
| **Front Control Panel/Speaker Header** | Yes | | | |
| **CMOS Battery Holder - Lithium** | Yes | | | |
| **Integrated Trusted Platform Module** | Trusted Platform Module (TPM) 2.0 (Infineon SLB 9670)<br>Common Criteria EAL4+ Certified<br>Convertible to FIPS 140-2 Certified mode through firmware v7.80<br>TPM Certified products list:<br>https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/ | | | |
| **Power Supply Headers** | Yes | | | |
| **Power Switch, Power LED & Hard Drive LED Header** | Yes | | | |
| **Clear Password Jumper** | Yes | | | |
| **Serial Port** | 1 internal header | | | |
| **Parallel Port** | No | | | |
| **Keyboard/Mouse** | USB or PS/2 | | | |
| **Hood Lock Header** | Yes | | | |
| **Hood Sensor Header** | Yes | | | |
| **Memory Fan** | 1 Memory Fan Header | | | |
| **AUX IN (audio)** | No | | | |
| **Power Supply** | | | | |
| **Power Supply** | 750W 90% Efficient, Custom PSU (Wide-Ranging, Active PFC) | | 465W 90% Efficient, Custom PSU (Wide-Ranging, Active PFC) | |
| **Operating Voltage Range** | 90–269 VAC | | 90–269 VAC | |
| **Rated Voltage Range** | 100-240 VAC | 118 VAC | 100-240 VAC | 118 VAC |
| **Rated Line Frequency** | 50–60 Hz | 400 Hz | 50–60 Hz | 400 Hz |
| **Operating Line Frequency Range** | 47–66 Hz | 393–407 Hz | 47–66 Hz | 393–407 Hz |
| **Rated Input Current** | 100-240V @ 10A | 118V @ 10A | 100-240V @ 6A | 118V @ 6A |
| **Heat Dissipation (Configuration and software dependent)** | Typical = 1850 btu/hr<br>Max = 3084 btu/hr | | Typical = 1147 btu/hr<br>Max = 1912 btu/hr | |
| **Power Supply Fan** | 80x25 mm variable speed | | 80x25 mm variable speed | |
| **ENERGY STAR® Certified (Configuration dependent)** | Yes | | Yes | |
| **80 PLUS® Compliant** | 90% Efficient<br>The Z4 G4 750W power supply efficiency report can be found at this link: https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf | | 90% Efficient<br>The Z4 G4 465W power supply efficiency report can be found at this link: https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf | |
| **Power Supply** | 1000W 90% Efficient, Custom PSU | | | |

## System Technical Specifications

| | | | |
|---|---|---|---|
| | | (Wide-Ranging, Active PFC) | |
| **Operating Voltage Range** | | 90–269 VAC | |
| **Rated Voltage Range** | 100-127 VAC<br>200-240 VAC | | 118 VAC |
| **Rated Line Frequency** | 50–60 Hz | | 400 Hz |
| **Operating Line Frequency Range** | 47–66 Hz | | 393–407 Hz |
| **Rated Input Current** | 12A @100-127 VAC<br>6.3A @ 200-240 VAC | | 12A @ 118VAC |
| **Heat Dissipation (Configuration and software dependent)** | | Typical = 2467 btu/hr<br>Max = 4112 btu/hr | |
| **Power Supply Fan** | | 80x25 mm variable speed | |
| **ENERGY STAR® Certified (Configuration dependent)** | | Yes | |
| **80 PLUS® Compliant** | | 90% Efficient<br>The Z4 G4 1000W power supply efficiency report can be found at this link:<br>https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf | |
| **FEMP Standby Power Compliant @115V <1W in S5 – Power Off)** | Yes | | Yes |
| **EuP Compliant @ 230V (<0.5 W in S5 – Power Off)** | Yes | | Yes |
| **CECP Compliant @ 220V (<4W in S3 – Suspend to RAM)** | Yes; Configuration dependent | | Yes; Configuration dependent |
| **Power Consumption in sleep mode (as defined by ENERGY STAR®) – Suspend to RAM (S3) (Instantly Available PC)** | TBD | | TBD |
| **Built-in Self Test LED** | Yes | | Yes |
| **Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)** | Yes | | Yes |

**NOTE:** 1000 W internal power supply, up to 90% efficiency, active PFC available the first half of 2018

System Technical Specifications

## System Configuration

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Example Z4 G4 Workstation Configuration #1**<br><br>ENERGY STAR® Certified | Processor | 1x Intel Xeon W-2102 4C 2.9GHz | | | | | |
| | Memory | 1x 8GB DDR4-2666 (Registered DIMM) | | | | | |
| | Graphics | 1x NVIDIA Quadro P400 | | | | | |
| | Disks / Optical | 1x 500GB SATA 7200 ; 1x Slim DVD-ROM SATA | | | | | |
| | Power Supply | 465W 90% custom PSU | | | | | |
| | Other | N/A | | | | | |
| **Energy Consumption** | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows Idle (S0) | 42.323 | | 41.338 | | 42.585 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 90.231 | | 92.323 | | 90.786 | |
| | Sleep (S3) | 3.449 | 3.440 | 3.566 | 3.558 | 3.530 | 3.410 |
| | Off (S5) | 1.041 | 1.014 | 1.242 | 1.231 | 1.310 | 1.180 |
| | Zero Power Mode (ErP) | 0.187 | | 0.43 | | 0.174 | |
| | | | | | | | |
| **Heat Dissipation (Btu/hr)** | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows Idle (S0) | 144.406 | | 141.045 | | 145.301 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 307.868 | | 315.006 | | 309.761 | |
| | Sleep (S3) | 11.767 | 11.737 | 12.167 | 12.140 | 12.044 | 11.634 |
| | Off (S5) | 3.551 | 3.459 | 4.237 | 4.200 | 4.469 | 4.026 |
| | Zero Power Mode (ErP) | 0.638 | | 1.467 | | 0.594 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Example Z4 G4 Workstation Configuration #2**<br><br>ENERGY STAR® Certified | Processor | 1x Intel Xeon W-2123 4C 3.6GHz | | | | | |
| | Memory | 2x 8GB DDR4-2666 (Registered DIMM) | | | | | |
| | Graphics | 1x NVIDIA QuadroP1000 | | | | | |
| | Disks / Optical | 1x 500GB SATA 7200 ; 1x Slim DVD-ROM SATA | | | | | |
| | Power Supply | 750W 90% custom PSU | | | | | |
| | Other | N/A | | | | | |
| **Energy Consumption** (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows Idle (S0) | 39.947 | | 39.569 | | 40.956 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 149.543 | | 150.789 | | 147.845 | |
| | Sleep (S3) | 3.615 | 3.566 | 3.801 | 3.798 | 3.634 | 3.621 |
| | Off (S5) | 1.079 | 1.016 | 1.440 | 1.238 | 1.320 | 1.170 |
| | Zero Power Mode (ErP) | 0.204 | | 0.430 | | 0.191 | |
| | | | | | | | |
| **Heat Dissipation** (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows Idle (S0) | 136.299 | | 135.009 | | 139.741 | |

## System Technical Specifications

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 510.241 | | 514.492 | | 504.447 | |
| | Sleep (S3) | 12.338 | 12.167 | 12.969 | 12.959 | 12.399 | 12.355 |
| | Off (S5) | 3.681 | 3.466 | 4.913 | 4.224 | 4.504 | 3.992 |
| | Zero Power Mode (ErP) | 0.696 | | 1.467 | | 0.651 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Example Z4 G4 Workstation Configuration #3** | Processor | 1x Intel Xeon W-2133 6C 3.6GHz | | | | | |
| | Memory | 4x 8GB DDR4-2666 (Registered DIMM) | | | | | |
| | Graphics | 1x NVIDIA QuadroP2000 | | | | | |
| | Disks/Optical | 2x 1TB SATA7200 ; 1x Slim SuperMulti DVDRW SATA | | | | | |
| | Power Supply | 750W 90% custom PSU | | | | | |
| | Other | N/A | | | | | |
| **Energy Consumption** (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows Idle (S0) | 48.759 | | 46.321 | | 46.578 | |
| | Windows Busy Typ(S0) | TBD | | 199.56 | | 206.055 | |
| | Windows Busy Max (S0) | 209.60 | | 208.66 | | 198.82 | |
| | Sleep (S3) | 4.360 | 4.351 | 4.538 | 4.508 | 4.299 | 4.277 |
| | Off (S5) | 1.039 | 1.017 | 1.42 | 1.219 | 1.015 | 0.997 |
| | Zero Power Mode (ErP) | 0.203 | | 0.399 | | 0.191 | |
| | | | | | | | |
| **Heat Dissipation** (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows Idle (S0) | 166.366 | | 258.047 | | 158.924 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 715.155 | | 711.947 | | 678.373 | |
| | Sleep (S3) | 14.876 | 14.845 | 15.483 | 15.381 | 14.668 | 14.593 |
| | Off (S5) | 3.544 | 3.470 | 4.845 | 4.179 | 3.463 | 3.402 |
| | Zero Power Mode (ErP) | 0.692 | | 1.361 | | 0.651 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Example Z4 G4 Workstation Configuration #4** | Processor | 1x Intel Xeon W-2155 10C 3.3GHz | | | | | |
| | Memory | 8x 32GB DDR4-2666 (Registered DIMM) | | | | | |
| | Graphics | 1x NVIDIA QuadroP6000 | | | | | |
| | Disks / Optical | 4x 2TB SATA 7200 ; 0x ODD | | | | | |
| | Power Supply | 750W 90% custom PSU | | | | | |
| | Other | N/A | | | | | |
| **Energy Consumption** (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows Idle (S0) | 65.959 | | 69.321 | | 68.635 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 463.23 | | 456.95 | | 503.125 | |
| | Sleep (S3) | 6.336 | 6.102 | 6.971 | 6.189 | 6.266 | 6.264 |
| | Off (S5) | 1.047 | 1.036 | 1.254 | 1.222 | 1.014 | 0.995 |

## System Technical Specifications

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|---|---|---|---|---|---|---|---|
| | Zero Power Mode (ErP) | 0.203 | | 0.399 | | 0.191 | |
| | | | | | | | |
| **Heat Dissipation** (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows Idle (S0) | 225.052 | | 236.523 | | 234.183 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 1580.541 | | 1559.113 | | 1716.663 | |
| | Sleep (S3) | 21.618 | 20.821 | 23.785 | 21.117 | 21.379 | 21.372 |
| | Off (S5) | 3.572 | 3.534 | 4.278 | 4.169 | 3.459 | 3.394 |
| | Zero Power Mode (ErP) | 0.692 | | 1.361 | | 0.652 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Example Z4 G4 Workstation Configuration #5** | Processor | 1x Intel Core i7-7800X 3.5GHz 6C | | | | | |
| | Memory | 2x 8GB DDR4-2666 (non-ECC DIMM) | | | | | |
| | Graphics | 1x NVIDIA Quadro P1000 | | | | | |
| | Disks / Optical | 1x 1TB SATA 7200 : 1x Slim DVD-ROM SATA | | | | | |
| | Power Supply | 1000W 90% custom PSU | | | | | |
| | Other | N/A | | | | | |
| **Energy Consumption** (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |
| | Windows Idle (S0) | 46.909 | | 47.175 | | 46.909 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 201.83 | | 199.97 | | 203.41 | |
| | Sleep (S3) | 3.041 | 2.971 | 3.165 | 3.041 | 2.971 | 3.165 |
| | Off (S5) | 0.978 | 0.898 | 1.159 | 0.978 | 0.898 | 1.159 |
| | Zero Power Mode (ErP) | 0.199 | | 0.379 | | 0.187 | |
| | | | | | | | |
| **Heat Dissipation** (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows Idle (S0) | 160.053 | | 160.961 | | 160.053 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 688.644 | | 682.297 | | 694.035 | |
| | Sleep (S3) | 10.376 | 10.137 | 10.799 | 10.376 | 10.137 | 10.799 |
| | Off (S5) | 3.337 | 3.064 | 3.954 | 3.337 | 3.064 | 3.954 |
| | Zero Power Mode (ErP) | 0.678 | | 1.293 | | 0.638 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Example Z4 G4 Workstation Configuration #6** | Processor | 1x Intel Core i7-7920X 2.9GHz 12C | | | | | |
| | Memory | 4x 16GB DDR4-2666 (non-ECC DIMM) | | | | | |
| | Graphics | 1x NVIDIA Quadro P4000 | | | | | |
| | Disks / Optical | 2x 2TB SATA 7200 : 1x Slim DVD-ROM SATA | | | | | |
| | Power Supply | 1000W 90% custom PSU | | | | | |
| | Other | N/A | | | | | |
| **Energy Consumption** (Watts) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled | LAN Enabled | LAN Disabled |

## System Technical Specifications

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|---|---|---|---|---|---|---|---|
| | Windows Idle (S0) | 53.392 | | 51.332 | | 53.367 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 318.58 | | 307.82 | | 319.71 | |
| | Sleep (S3) | 3.558 | 3.486 | 3.694 | 3.558 | 3.486 | 3.694 |
| | Off (S5) | 0.972 | 0.895 | 1.160 | 0.972 | 0.895 | 1.160 |
| | Zero Power Mode (ErP) | 0.201 | | 0.391 | | 0.186 | |
| | | | | | | | |
| **Heat Dissipation** (Btu/hr) | | 115 VAC | | 230 VAC | | 100 VAC | |
| | | LAN Enabled | LAN Disabled | LAN Enabled | LAN Enabled | LAN Disabled | LAN Enabled |
| | Windows Idle (S0) | 182.174 | | 175.144 | | 182.088 | |
| | Windows Busy Typ(S0) | TBD | | TBD | | TBD | |
| | Windows Busy Max (S0) | 1086.994 | | 1050.281 | | 1090.851 | |
| | Sleep (S3) | 12.139 | 11.894 | 12.604 | 12.139 | 11.894 | 12.604 |
| | Off (S5) | 3.316 | 3.054 | 3.957 | 3.316 | 3.054 | 3.957 |
| | Zero Power Mode (ErP) | 0.685 | | 1.334 | | 0.634 | |

**NOTE:** Power consumption measurements do not take advantage of the Intel Turbo Boost Technology. As a result, power consumption measurements may be higher.

## DECLARED NOISE EMISSIONS

| **Declared Noise Emissions** (Entry-level and High-end configurations) | | |
|---|---|---|
| **System Configuration (Entry level)** | **Processor Info** | Intel® Xeon® W-2125 4.0 2666 4C CPU |
| | **Memory Info** | 32GB (4x8GB) DDR4-2666 ECC Reg RAM |
| | **Graphics Info** | 1-NVIDIA® Quadro® P400 2GB |
| | **Disks/Optical** | 1-500GB SATA 7200RPM 3.5" HDD / 1-HP 9.5mm Slim Blu Ray Disc Writer |
| | **Power Supply** | 465 W |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|---|
| | **Idle** | 3.2 | 13 |
| | **Hard drive Operating** (random reads) | 3.4 | 15 |

| **System Configuration (High end)** | **Processor Info** | Intel® Xeon® W-2155 3.3 2666 10C |
|---|---|---|
| | **Memory Info** | 128GB (8x16GB) DDR4-2666 ECC Reg RAM |
| | **Graphics Info** | 1-NVIDIA® Quadro® P6000 24GB |
| | **Disks/Optical** | 2-4TB SATA 7200RPM Ent 3.5" / 1-HP 9.5mm Slim Blu Ray Disc Writer |
| | **Power Supply** | 750 W |

| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
|---|---|---|---|
| | **Idle** | 3.5 | 22 |

System Technical Specifications

| | | | |
|---|---|---|---|
| | **Hard drive Operating** (random reads) | 3.7 | 23 |

| | | |
|---|---|---|
| **System Configuration (Entry Level 2)** | **Processor Info** | Intel® Core i9-7900X 3.3 2666 10C |
| | **Memory Info** | 32GB (4x8GB) DDR4-2666 nECC RAM |
| | **Graphics Info** | 1-NVIDIA® Quadro® P400 2GB |
| | **Disks/Optical** | 1-500GB SATA 7200RPM Ent 3.5" / 1-HP 9.5mm Slim Blu Ray Disc Writer |
| | **Power Supply** | 1000 W |

| | | | |
|---|---|---|---|
| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
| | **Idle** | 3.4 | 16 |
| | **Hard drive Operating** (random reads) | 3.5 | 17 |

| | | |
|---|---|---|
| **System Configuration (High end 2)** | **Processor Info** | Intel®Core i9-7980XE 2.6 2666 18C |
| | **Memory Info** | 128GB (8x16GB) DDR4-2666 nECC RAM |
| | **Graphics Info** | 1-NVIDIA® Quadro® P6000 24GB |
| | **Disks/Optical** | 2-4TB SATA 7200RPM Ent 3.5" / 1-HP 9.5mm Slim Blu Ray Disc Writer |
| | **Power Supply** | 1000 W |

| | | | |
|---|---|---|---|
| **Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296) | | **Sound Power** (LWAd, bels) | **Deskside Sound Pressure** (LpAm, decibels) |
| | **Idle** | 3.5 | 20 |
| | **Hard drive Operating** (random reads) | 3.7 | 21 |

**NOTE:** Higher noise levels may be experienced with non-HP approved graphic card(s). Some consumer graphics cards have side blowing fans that may heat up thermal sensor(s) on the mother board causing fans to ramp.

## ENVIRONMENTAL DATA

| | | |
|---|---|---|
| **Environmental Requirements** | **Temperature** | Non-operating: -40° to 60° C (-40° to 140° F)<br>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>Maximum rate of change: 10 °C/hr<br>No direct sustained sunlight |
| | **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** | 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) |

| | |
|---|---|
| | Maximum operating temperature is reduced as altitude increases. See Temperature for details. |
| **Shock (non-repetitive)** | Operating: ½-sine: 40g, 2-3ms (~62 cm/sec)<br>Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g)<br>Non-operating square: 422 cm/s, 20g |
| **Vibration** | 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 |

## Physical Security and Serviceability

| | |
|---|---|
| **Access Panel** | Tool-less<br>Includes system board and memory information. |
| **Hard Drives** | Tool-less |
| **Expansion Cards** | Tool-less |
| **Processor Socket** | Tool-less |
| **Blue User Touch Points** | Yes, on primary serviceable components. |
| **Color-coordinated Cables and Connectors** | Yes |
| **Memory** | Tool-less |
| **System Board** | Screw-In |
| **Dual Color Power/Failure LED** | Yes |
| **HDD Activity LED** | Yes<br>Note: HDD Activity LED is not dual-color |
| **Configuration Record SW** | Yes |
| **Over-Temp Warning on Screen** | Yes, at POST screen on reboot |
| **Restore CD/DVD Set** | Restores the computer to its original factory shipping image; can be obtained via HP Support. |
| **Dual Function Front Power Switch** | Yes, causes a fail-safe power off when held for 4 seconds |
| **Padlock Support** | Yes (optional): Locks side cover and secures chassis from theft<br>7.0 mm (0.2756 in) diameter padlock loop at rear of system |
| **Cable Lock Support** | Yes, Kensington Cable Lock (optional): Locks side cover and secures chassis from theft<br>3 mm x 7 mm slot at rear of system |
| **Universal Chassis Clamp Lock Support** | Yes (optional): Locks side cover and locks cables to chassis. Secures chassis from theft and allows multiple units to be chained together when used with optional cable<br>Threaded feature at rear of system |
| **Solenoid Lock and Hood Sensor** | Yes (optional)<br>The Solenoid Hood Lock eliminates the need for a physical key by making the chassis lockable through software and a password. You can also lock and unlock the chassis remotely over the network. The Sensor Kit detects when the access panel has been removed |
| **Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control** | Yes, enables or disables serial, USB, audio, and network ports |
| **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 |

## System Technical Specifications

| | |
|---|---|
| **Setup Password** | Yes, prevents an unauthorized person from changing the workstation configuration |
| **3.3V Aux Power LED on System PCA** | Yes |
| **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 |
| **Front Power Button** | Yes, ACPI multi-function |
| **Rear Power Button** | Yes |
| **Front Power LED** | Yes, white (normal), red (fault) |
| **Front Hard Drive Activity LED** | Yes, white |
| **Front ODD Activity LED** | Yes, on device |
| **Internal Speaker** | Yes |
| **System/Emergency ROM Flash Recovery** | Recovers corrupted system BIOS. |
| **Cooling Solutions** | Air cooled forced convection heatsinks |
| **Power Supply Fans** | 80 mm x 80 mm x 25 mm (non-serviceable) |

| | | |
|---|---|---|
| **CPU Heatsink Fan** | **Intel® Xeon® W Processor Family** | **Intel® Core™ X-series Processors** |
| | 92 mm x 92 mm x 25 mm, 5-wire, PWM | Core i7-X configs: 92 mm x 92 mm x 25 mm, 5-wire, PWM<br>Core i9-X 165W CPU configs: 92 mm x 92 mm x 25 mm, 6-wire, PWM (includes 6-to-5pin cable adapter)<br>**NOTE:** Core i9X 140W use the same Heatsink as Core i7X and Xeon |

| | |
|---|---|
| **Chassis Fan** | Front:<br>(Optional) 92 mm x 92mm x 25 mm, 4-wire, PWM<br><br>Rear:<br>120 mm x 120mm x 25 mm, 4-wire, PWM |
| **Memory Heatsink Fan** | Dual 60 mm x 60 mm x 25 mm, 6-wire, PWM, Blindmate (optional based on configuration) |
| **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 ESC then F2 upon the PC reboot, and is available as a download from HP Support. |
| **Access Panel Key Lock** | Yes, side panel barrel keylock (optional from the factory only) |
| **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** | Infineon TPM 2.0 Certified |
| **Integrated Chassis Handles** | Yes, Front handle and dedicated rear recess |
| **Power Supply** | Requires T15 Torx or flat blade screwdriver |
| **PCIe Card Retention** | Yes, rear (all), middle (all), front (full-length cards with extender, using HP Z4 G4 Fan and Front Card Guide Kit) |

## System Technical Specifications

| | |
|---|---|
| **Flash ROM** | Yes |
| **Diagnostic Power Switch LED on board** | Yes |
| **Clear Password Jumper** | Yes |
| **Clear CMOS Button** | Yes |
| **CMOS Battery Holder** | Yes |
| **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. |
| **WMI Support** | WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications. |
| **BIOS Boot Spec 1.01+** | Provides more control over how and from what devices the workstation will boot. |
| **BIOS Power On** | Users can define a specific date and time for the system to power on. |
| **ROM Based Computer Setup Utility (F10)** | Review and customize system configuration settings controlled by the BIOS. |
| **System/Emergency ROM Flash Recovery with Video** | Recovers system BIOS in corrupted Flash ROM. |
| **Replicated Setup** | Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup). |
| **SMBIOS** | System Management BIOS 2.8, 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 5.0 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 with Intel Xeon W Processors. For systems with Intel Core X-Series Processors, Wake on LAN is supported, however to remotely restart or shutdown a system, a remote desktop application must be used to manually Restart or Shutdown. |
| **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** | Allows a new or existing system to boot over the network and download software, including the operating system. |

## System Technical Specifications

| | |
|---|---|
| **2.1) (Remote Boot from Server)** | |
| **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 Specification Support** | |
| **Industry Standard** | Revision Supported by the BIOS |
| **UEFI Specification Revision** | 2.5 |
| **ACPI** | Advanced Configuration and Power Management Interface, Version 5.0 |
| **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 |
| **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 |
| **PMM** | POST Memory Manager Specification, Version 1.01 |
| **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 Platform Module (TPM) 2.0 (Infineon SLB 9670)<br>Common Criteria EAL4+ Certified<br>Convertible to FIPS 140-2 Certified mode through firmware v7.80<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 G1 Specification<br>Universal Serial Bus Revision 3.1 G2 Specification |
| **SMBIOS** | System Management BIOS Reference Specification, Version 2.8 |

System Technical Specifications

External BIOS simulator found at: http://h20464.www2.hp.com/index.html

## 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:

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

The Z4 G4 is registered EPEAT® Gold in the US and Canada. EPEAT® registration varies by country. See http://www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at http://www.hp.com/go/options

**Batteries**

The battery in this product complies with EU Directive 2006/66/EC
Battery mass: 3g
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.

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

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**Low Halogen Statement**

This product is low-halogen except for power cords, external cables and peripherals. 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:
Sustainability Report
Eco-label certifications ISO 14001 certificates

**Additional Information**

- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. Product Disassembly Instructions
- Plastic parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

**Packaging**

HP Workstation product packaging meets the HP's General Specification for the Environment

- Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment
- 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 and plastic bags made of low density polyethylene (LDPE). |
| **External** | Outer carton, accessories carton, and insert made of corrugated paper board. |

## Manageability

| | Intel® Xeon® W Processor Family | Intel® Core™ X-series Processors |
|---|---|---|
| **Industry Standard Specifications** | This product meets the following industry standard specifications for manageability functionality:<br>• DASH 1.1 (via Intel® LAN on motherboard) | None apply |
| **Intel Active Management Technology (AMT)** | Intel® Active Management Technology (AMT) 11.10<br><br>An advanced set of remote management features and functionality providing IT administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 11.10 includes the following advanced management functions:<br>• Power Management (on, off, reset, graceful shutdown, sleep and hibernate)<br>  ○ Support in Max Power Savings (Shutdown and Hibernate Modes)<br>• Hardware Inventory (includes BIOS and firmware revisions)<br>• Hardware Alerting<br>• Agent Presence<br>• System Defense Filters<br>• Serial Over LAN (SOL)<br>• USB Redirect (Media Redirection)<br>• ME Wake-on-LAN (WOL), even with Maximum Power Savings Enabled<br>• DASH 1.1 compliance<br>• IPv6 Support<br>• Fast Call for Help - a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection<br>• Remote Scheduled Maintenance - pre-schedule when the system connects to the IT or service provider console for maintenance.<br>• Remote Alerts - automatically alert IT or service provider if issues arise | |

## System Technical Specifications

| | | |
|---|---|---|
| | • Access Monitor - Provides oversight into Intel® AMT actions to support security requirements<br>• PC Alarm Clock<br>• Microsoft NAP Support<br>• Host Base set-up and configuration<br>• Management Engine (ME) firmware roll back<br>• Local Time Sync to UTC<br>• Remote Memory Dump Command – Creates memory dump for debug | |
| **Intel® vPro™ Technology** | The HP Z4 G4 Workstation supports Intel® vPro™ technology when configured as outlined below:<br><br>• Intel® Xeon® processor W-2100 product family featuring Intel® vPro™ Technology<br>• Intel® C422 chipset<br>• Intel® I219LM GbE LAN | Not supported |
| **Remote Manageability Software Solutions** | The HP Z4 G4 Workstation is supported on the following optional remote manageability software consoles:<br><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/easydeploy | • Microsoft System Center Configuration Manager |
| **System Software Manager** | For easydeploy questions or support for SSM, please visit: http://www.hp.com/go/ssm | |
| **Service, Support, and Warranty** | On-site Warranty and Service (Note 1): Three-years, limited warranty and service offering delivers on-site, next business-day (Note 2) service for parts and labor and includes free telephone support (Note 3) 8am - 5pm. Global coverage (Note 2) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering. 24/7 operation will not void the HP warranty.<br><br>**NOTE 1:** Terms and conditions may vary by country. Certain restrictions and exclusions apply.<br>**NOTE 2:** On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.<br>**NOTE 3:** Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24x7 support service may not be available in some countries.<br>HP Care Pack Services extend service contracts beyond the standard warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. Service levels and response times for HP Care Packs may vary depending on your geographic location. | |
| **Product Change Notification** | • Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile.<br>• 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.

## 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 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 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 |
|---|---|---|
| | TBD | Intel® Xeon® W-2125 4.0 2666 4C CPU |
| | TBD | Intel® Xeon® W-2123 3.6 2666 4C CPU |
| | TBD | Intel® Xeon® W-2102 2.9 2400 4C CPU |

| Hard Drives | Product # | Offering |
|---|---|---|
| | LQ037AA | 1TB SATA 7200 RPM |

| Graphics | Product # | Offering |
|---|---|---|
| | 2TF08AA | AMD Radeon™ Pro WX 3100 4GB Graphics |

| Memory | Product # | Offering |
|---|---|---|
| | TBD | TBD |
| | TBD | TBD |
| | TBD | TBD |
| | TBD | TBD |
| | TBD | TBD |
| | TBD | TBD |
| | TBD | TBD |

| Optical and Removable Storage | Product # | Offering |
|---|---|---|
| | TBD | TBD |
| | TBD | TBD |

## Technical Specifications - Processors

**Intel® Xeon® W-2100 Series CPU**

Intel® Xeon® W-2195 2.3 2666 18C CPU
Intel® Xeon® W-2175 2.5 2666 14C CPU
Intel® Xeon® W-2155 3.3 2666 10C CPU
Intel® Xeon® W-2145 3.7 2666 8C CPU
Intel® Xeon® W-2135 3.7 2666 6C CPU
Intel® Xeon® W-2133 3.6 2666 6C CPU
Intel® Xeon® W-2125 4.0 2666 4C CPU
Intel® Xeon® W-2123 3.6 2666 4C CPU
Intel® Xeon® W-2104 3.2 2400 4C CPU
Intel® Xeon® W-2102 2.9 2400 4C CPU

**Intel® Core™ X-Series CPU**

Intel® Core™ i9-7980XE 2.6 2666 18C CPU
Intel® Core™ i9-7960X 2.8 2666 16C CPU
Intel® Core™ i9-7940X 3.1 2666 14C CPU
Intel® Core™ i9-7920X 2.9 2666 12C CPU
Intel® Core™ i9-7900X 3.3 2666 10C CPU
Intel® Core™ i7-7820X 3.6 2666 8C CPU
Intel® Core™ i7-7800X 3.5 2400 6C CPU

Technical Specifications - Hard Drives

## STORAGE/HARD DRIVES

| | | | | |
|---|---|---|---|---|
| **HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations** | **HP 300GB SAS 15K SFF HDD** | **Capacity** | 300GB | |
| | | **Height** | 5.9 in; 15 cm | |
| | | **Width** | **Media Diameter** | 3.5 in; 8.9 cm |
| | | **Interface** | 12Gb/s SAS | |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 1200 MB/s (SAS single port) | |
| | | **Buffer** | 128MB | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Average** | 2.0ms |
| | | **Rotational Speed** | 15K rpm | |
| | | **Operating Temperature** | 41° to 131° F (5° to 55° C) | |

## Technical Specifications - Hard Drives

| | | | | |
|---|---|---|---|---|
| **SATA (Serial ATA) Hard Drives for HP Workstations** | **500GB SATA 7200 rpm 6Gb/s 3.5" HDD** | **Capacity** | 500GB | |
| | | **Height** | 1 in; 2.54 cm | |
| | | **Width** | **Media Diameter** | 3.5 in; 8.9 cm |
| | | | **Physical Size** | 4 in; 10.17 cm |
| | | **Interface** | Serial ATA (6.0Gb/s), NCQ enabled | |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s | |
| | | **Buffer** | 16MB | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 2 ms |
| | | | **Average** | 11 ms |
| | | | **Full Stroke** | 21 ms |
| | | **Rotational Speed** | 7,200 rpm | |
| | | **Logical Blocks** | 976,773,168 | |
| | | **Operating Temperature** | 41° to 131° F (5° to 55° C) | |
| | **1TB SATA 7200 rpm 6Gb/s 3.5" HDD** | **Capacity** | 1TB | |
| | | **Height** | 1 in; 2.54 cm | |
| | | **Width** | **Media Diameter** | 3.5 in; 8.9 cm |
| | | | **Physical Size** | 4 in; 10.17 cm |
| | | **Interface** | Serial ATA (6.0Gb/s), NCQ enabled | |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600 MB/s | |
| | | **Buffer** | 64MB | |
| | | **Cache** | Adaptive | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 2 ms |
| | | | **Average** | 11 ms |
| | | | **Full Stroke** | 21 ms |
| | | **Rotational Speed** | 7,200 rpm | |
| | | **Operating Temperature** | 41° to 131° F (5° to 55° C) | |
| | **2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD** | **Capacity** | 2.0TB | |
| | | **Height** | 1 in; 2.54 cm | |
| | | **Width** | **Media Diameter** | 3.5 in; 8.9 cm |
| | | | **Physical Size** | 4 in; 10.17 cm |
| | | **Interface** | Serial ATA (6.0 Gb/s), NCQ Enabled | |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600 MB/s | |
| | | **Buffer** | 64MB | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 1.0 ms |
| | | | **Average** | 11 ms |
| | | | **Full Stroke** | 18 ms |
| | | **Rotational Speed** | 7,200 rpm | |
| | | **Logical Blocks** | 3,907,029,168 | |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | **Operating Temperature** | 41° to 131° F (5° to 55° C) | |
| **1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)** | **Capacity** | 1TB | |
| | **Protocol** | SATA | |
| | **Form Factor** | 3.5" | |
| | **Controller** | AHCI | |
| | **Reliability** (MTBF) | 2.0M hours | |
| | **Rated Power On Hours** | 8760/yr | |
| | **Annualized Failure Rate** (based on Rated POH) | <0.62% | |
| | **Rated for 24/7/365 operation** | YES | |
| | **Physical Size** (Height) | 1 in; 2.54 cm | |
| | **Physical Size** (Width) | 4 in; 10.17 cm | |
| | **Media Diameter** | 3.5 in; 8.9 cm | |
| | **Interface** | Serial ATA (6Gb/s), NCQ enabled | |
| | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s | |
| | **Buffer** | 128MB | |
| | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.32ms |
| | | **Average** | 7.45ms |
| | | **Full Stroke** | 14.2ms |
| | **Operating Temperature** | 41° to 140° F (5° to 60° C) | |
| | **Performance** | **Sequential Read** | up to 226MB/s |
| | | **Sequential Write** | up to 226MB/s |
| | **Enterprise Class Features** | High Reliability | |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| **4TB SATA 7200 rpm 6Gb/s 3.5" HDD** (Enterprise Class) | **Capacity** | 4TB | |
| | **Height** | 0.275 in; 0.7 cm | |
| | **Width** | **Media Diameter** | 2.5 in; 6.36 cm |
| | | **Physical Size** | 2.75 in; 6.99 cm |
| | **Interface** | Serial ATA (6Gb/s), NCQ enabled | |
| | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s | |
| | Buffer | 128MB | |
| | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.7ms |
| | | **Average** | 8.5ms |
| | | **Full Stroke** | 15.7ms |
| | Rotational Speed | 7,200 rpm | |
| | Operating Temperature | 32° to 140° F (0° to 60° C) | |

| | | | |
|---|---|---|---|
| **500GB SATA 7.2K SED SFF HDD** | **Capacity** | 500GB | |
| | **Height** | 0.275 in; 0.7 cm | |
| | **Width** | **Media Diameter** | 2.5 in; 6.36 cm |
| | | **Physical Size** | 2.75 in; 6.99 cm |
| | **Interface** | Serial ATA (6Gb/s) | |
| | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s | |
| | Buffer | 32MB | |
| | **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 140° F (0° to 60° C) | |

## Technical Specifications - Hard Drives

| | | | | |
|---|---|---|---|---|
| **SATA SSDs for HP Workstations** | **HP 256GB SATA 6Gb/s SSD** | **Capacity** | 256GB | |
| | | **Protocol** | SATA | |
| | | **Form Factor** | 2.5" | |
| | | **Controller** | AHCI | |
| | | **NAND Type** | 3D TLC | |
| | | **Endurance** | 192TBW (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** | 530MB/s (max) |
| | | | **Sequential Write** | 500MB/s (max) |
| | | | **Random Read** | 55K IOPS (max) |
| | | | **Random Write** | 83K IOPS (max) |
| | **HP 256GB SATA 6Gb/s SED Opal 2 SSD** | **Capacity** | 256GB | |
| | | **Protocol** | SATA | |
| | | **Form Factor** | 2.5" | |
| | | **Controller** | AHCI | |
| | | **NAND Type** | 3D TLC | |
| | | **Endurance** | 192TBW (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** | 6Gb/s SATA | |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 550MB/s (Sequential Read) | |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | | **Performance** | **Sequential Read** | 530MB/s |
| | | | **Sequential Write** | 500 MB/s |
| | | | **Random Read** | 55K IOPS |
| | | | **Random Write** | 83K IOPS |
| | | **Self-Encrypting Drive Support** | OPAL 2 | |
| | **HP 512GB SATA 6Gb/s SSD** | **Capacity** | 512GB | |
| | | **Protocol** | SATA | |
| | | **Form Factor** | 2.5" | |
| | | **Controller** | AHCI | |
| | | **NAND Type** | 3D TLC | |
| | | **Endurance** | 388TBW (TB Written) | |
| | | **Reliability** (MTTF) | 1.5M hours | |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | **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 550MB/s (Sequential Read) | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 530 MB/s |
| | | **Sequential Write** | 500 MB/s |
| | | **Random Read** | 95K IOPS |
| | | **Random Write** | 83K IOPS |
| **HP 512GB SATA SED SSD** | **Capacity** | 512GB | |
| | **Protocol** | SATA | |
| | **Form Factor** | 2.5" | |
| | **Controller** | AHCI | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 388TBW (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** | 530 MB/s |
| | | **Sequential Write** | 500 MB/s |
| | | **Random Read** | 95K IOPS |
| | | **Random Write** | 83K IOPS |
| | **Self-Encrypting Drive Support** | OPAL 1 and 2 | |
| **HP 1TB SATA 6Gb/s SSD** | **Capacity** | 1TB | |
| | **Protocol** | SATA | |
| | **Form Factor** | 2.5" | |
| | **Controller** | AHCI | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 400TBW (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 550MB/s (Sequential Read) | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 530 MB/s |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | | **Sequential Write** | 500 MB/s |
| | | **Random Read** | 95K IOPS |
| | | **Random Write** | 83K IOPS |
| **HP 2TB SATA 6Gb/s SSD** | **Capacity** | 2TB | |
| | **Protocol** | SATA | |
| | **Form Factor** | 2.5" | |
| | **Controller** | AHCI | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 400TBW (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 550MB/s (Sequential Read) | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 530 MB/s |
| | | **Sequential Write** | 500 MB/s |
| | | **Random Read** | 95K IOPS |
| | | **Random Write** | 83K IOPS |
| **HP Enterprise Class 240GB SATA SSD** | **Capacity** | 240GB | |
| | **Protocol** | SATA | |
| | **Form Factor** | 2.5" | |
| | **Controller** | AHCI | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 2,200TBW (TB Written) | |
| | **Reliability** (MTTF) | 2.0M hours | |
| | **Physical Size** (Height) | 0.28 in; 0.7 cm | |
| | **Physical Size** (Width) | 2.5 in; 6.36 cm | |
| | **Interface** | 6Gb/s SATA | |
| | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 540 MB/s |
| | | **Sequential Write** | 310 MB/s |
| | | **Random Read** | 93K IOPS |
| | | **Random Write** | 48K IOPS |
| | **Enterprise Class Features** | High Endurance NAND<br>Power Loss Protection<br>End-to-End Data Protection | |
| **HP Enterprise Class 480GB SATA SSD** | **Capacity** | 480GB | |
| | **Protocol** | SATA | |
| | **Form Factor** | 2.5" | |

## Technical Specifications - Hard Drives

| | | | | |
|---|---|---|---|---|
| | | **Controller** | AHCI | |
| | | **NAND Type** | 3D TLC | |
| | | **Endurance** | 4,400TBW (TB Written) | |
| | | **Reliability** (MTTF) | 2.0M hours | |
| | | **Physical Size** (Height) | 0.28 in; 0.7 cm | |
| | | **Physical Size** (Width) | 2.5 in; 6.36 cm | |
| | | **Interface** | 6Gb/s SATA | |
| | | **Synchronous Transfer Rate** (Maximum) | Up to 600MB/s | |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | | **Performance** | **Sequential Read** | 540 MB/s |
| | | | **Sequential Write** | 460 MB/s |
| | | | **Random Read** | 93K IOPS |
| | | | **Random Write** | 74K IOPS |
| | | **Enterprise Class Features** | High Endurance NAND<br>Power Loss Protection<br>End-to-End Data Protection | |
| **PCIe SSDs for HP Workstations** | **HP Z Turbo Drive G2 256GB SSD** | **Capacity** | 256GB | |
| | | **Protocol** | PCIe | |
| | | **Form Factor** | M.2 | |
| | | **Controller** | NVMe | |
| | | **NAND Type** | MLC | |
| | | **Endurance** | 150TB | |
| | | **Reliability** (MTBF) | 1.5M hours | |
| | | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | | **Performance** | **Sequential Read** | 2800 MB/s |
| | | | **Sequential Write** | 1100 MB/s |
| | | | **Random Read** | 250K IOPS |
| | | | **Random Write** | 180K IOPS |
| | **HP Z Turbo Drive G2 512GB SSD** | **Capacity** | 512GB | |
| | | **Protocol** | PCIe | |
| | | **Form Factor** | M.2 | |
| | | **Controller** | NVMe | |
| | | **NAND Type** | 3D MLC | |
| | | **Endurance** | 300TB | |
| | | **Reliability** (MTBF) | 1.5M hours | |
| | | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | | **Performance** | **Sequential Read** | 2800 MB/s |
| | | | **Sequential Write** | 1600 MB/s |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | | **Random Read** | 260K IOPS |
| | | **Random Write** | 260K IOPS |
| **HP Z Turbo Drive G2 1TB SSD** | **Capacity** | 1TB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | M.2 | |
| | **Controller** | NVMe | |
| | **NAND Type** | 3D MLC | |
| | **Endurance** | 600TB | |
| | **Reliability** (MTTF) | 1.5M hours | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 3000 MB/s |
| | | **Sequential Write** | 1700 MB/s |
| | | **Random Read** | 360K IOPS |
| | | **Random Write** | 330K IOPS |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| **HP Z Turbo Drive Quad Pro 2x256GB PCIe SSD** | **Capacity** | 512GB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | PCIe Card, Full Height PCIe Slot | |
| | **Controller** | NVMe | |
| | **NAND Type** | MLC | |
| | **Endurance** | 150TB | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCIe Gen3 x4 architecture | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 2800 MB/s |
| | | **Sequential Write** | 1100 MB/s |
| | | **Random Read** | 250K IOPS |
| | | **Random Write** | 180K IOPS |
| **HP Z Turbo Drive Quad Pro 2x512GB PCIe SSD** | **Capacity** | 1TB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | PCIe Card, Full Height PCIe Slot | |
| | **Controller** | NVMe | |
| | **NAND Type** | MLC | |
| | **Endurance** | 292TB | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCIe Gen3 x4 architecture | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 2800 MB/s |
| | | **Sequential Write** | 1600 MB/s |
| | | **Random Read** | 250 K IOPS |
| | | **Random Write** | 180K IOPS |
| **HP Z Turbo Drive G2 256GB SED SSD** | **Capacity** | 256GB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | Half-height, half-length | |
| | **Controller** | NVMe | |
| | **NAND Type** | MLC | |
| | **Endurance** | 150TBW (TB Written) | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 2800 MB/s |
| | | **Sequential Write** | 1100 MB/s |
| | | **Random Read** | 250K IOPS |
| | | **Random Write** | 180K IOPS |

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | **Self-Encrypting Drive Support** | OPAL 2 | |
| **HP Z Turbo Drive G2 512GB SED SSD** | **Capacity** | 512GB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | Half-height, half-length | |
| | **Controller** | NVMe | |
| | **NAND Type** | 3D MLC | |
| | **Endurance** | 300TBW (TB Written) | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 2800 MB/s |
| | | **Sequential Write** | 1600 MB/s |
| | | **Random Read** | 260K IOPS |
| | | **Random Write** | 150K IOPS |
| | **Self-Encrypting Drive Support** | OPAL 2 | |
| **HP Z Turbo Drive Quad Pro 2x1TB PCIe SSD** | **Capacity** | 2TB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | PCIe Card, Full Height PCIe Slot | |
| | **Controller** | NVMe | |
| | **NAND Type** | 3D MLC | |
| | **Endurance** | 600TB | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 3000 MB/s |
| | | **Sequential Write** | 1700 MB/s |
| | | **Random Read** | 360K IOPS |
| | | **Random Write** | 330K IOPS |
| **HP Z Turbo Drive G2 256GB TLC SSD** | **Capacity** | 256GB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | M.2 | |
| | **Controller** | NVMe | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 75TBW (TB Written) | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 2800 MB/s |
| | | **Sequential Write** | 320 MB/s (1100 MB/s max/Turbo) |
| | | **Random Read** | 250K IOPS |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Hard Drives

| | | | |
|---|---|---|---|
| | | **Random Write** | 180K IOPS |
| **HP Z Turbo Drive G2 512GB TLC SSD** | **Capacity** | 512GB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | M.2 | |
| | **Controller** | NVMe | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 150TBW (TB Written) | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 2800 MB/s |
| | | **Sequential Write** | 660 MB/s (1600 MB/s max/Turbo) |
| | | **Random Read** | 260K IOPS |
| | | **Random Write** | 260K IOPS |
| **HP Z Turbo Drive G2 1TB TLC SSD** | **Capacity** | 1TB | |
| | **Protocol** | PCIe | |
| | **Form Factor** | M.2 | |
| | **Controller** | NVMe | |
| | **NAND Type** | 3D TLC | |
| | **Endurance** | 300TBW (TB Written) | |
| | **Reliability** (MTBF) | 1.5M hours | |
| | **Interface** | PCI Express 3.0 x4 electrical x4 physical | |
| | **Operating Temperature** | 32° to 158° F (0° to 70° C) | |
| | **Performance** | **Sequential Read** | 3000 MB/s |
| | | **Sequential Write** | 1150 MB/s (1700 MB/s max/Turbo) |
| | | **Random Read** | 360K IOPS |
| | | **Random Write** | 330K IOPS |

## HARD DRIVE CONTROLLERS

| | | | |
|---|---|---|---|
| **MicroSemi 2100-4i4e 8-port SAS 12Gb/s RAID Card** | **PCI Bus** | 8 lanes, PCI Express 3.0 | |
| | **RAID Levels** | Offers Integrated RAID (0, 1, and 10) | |
| | **PCI Data Burst Transfer Rate** | Half Duplex x8, PCIe, 8000 MB/s | |
| | **SAS Bandwidth** | **Half Duplex** | 1200 MB/s per lane |
| | **PCI Card Type** | 3.3V Add-in Card | |
| | **PCI Voltage** | 12 V ± 10% | |
| | **PCI Power** | 9.8W typical, Airflow min 200 LFM | |
| | **Bracket** | Full height and low profile | |
| | **Certification Level** | PCI Express 3.0 compliant | |
| | **SAS Processor** | MicroSemi Series 8 SAS Controller | |
| | **Internal Connectors** | One x4 internal mini-SASHD (SFF-8643) | |
| | **External Connectors** | One x4 external mini-SASHD (SFF-8644) | |
| | **Maximum Number of SCSI Devices** | 256 Non-RAID SAS/SATA devices | |
| | **LED Indicators** | Connector for Drive Activity Light | |

## GRAPHICS

| | | |
|---|---|---|
| **NVIDIA® Quadro® P400 2GB Graphics** | **Form Factor** | Dimensions: 2.713” H x 5.7” L<br>Single Slot, Low Profile<br>Cooling: Active<br>Weight: 129 grams |
| | **Graphics Controller** | NVIDIA® Quadro® P400 Graphics Card<br>GP107-825 GPU<br>256 NVIDIA® CUDA® cores<br>Max Power: 30 Watts |
| | **Bus Type** | PCI Express 3.0 x16 |
| | **Memory** | Size: 2 GB GDDR5, 2000 MHz<br>Memory Interface: 64-bit<br>Memory Bandwidth: 32 GB/s |
| | **Connectors** | 3mDP Outputs |
| | **Maximum Resolution** | DisplayPort™ 1.4:<br>- up to 3x 5120 x 2880 x 24 bpp @ 60Hz<br>- supports Multi-Stream Transport (MST) |
| | **Image Quality Features** | 10-bit internal display processing pipeline<br>10-bit scan-out support |
| | **Display Output** | 3 mDP Connectors |
| | **Shading Architecture** | Full Microsoft DirectX® 12 Shader Model 5.1 |
| | **Supported Graphics APIs** | OpenGL® 4.5<br>DirectX® 12<br>Vulkan™ 1.0<br>API support includes:<br>CUDA C, CUDA C++, DirectCompute, OpenCL™ |
| | **Available Graphics Drivers** | Microsoft Windows 10<br>Microsoft Windows 8.1<br>Microsoft Windows 7<br>Linux®<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 |
| | **Notes** | |
| **NVIDIA® Quadro® P600 1st GFX 2GB Graphics** | **Form Factor** | Dimensions: 2.713” H x 5.7” L<br>Single Slot, Low Profile<br>Cooling: Active<br>Weight: 129 grams |
| | **Graphics Controller** | NVIDIA® Quadro® P600 Graphics Card<br>GP107-850 GPU<br>384 NVIDIA® CUDA® cores<br>Max Power: 40 Watts |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | **Bus Type** | PCI Express 3.0 x16 |
| | **Memory** | Size: 2 GB GDDR5, 2000 MHz<br>Memory Interface: 128-bit<br>Memory Bandwidth: 64 GB/s |
| | **Connectors** | 4mDP Outputs |
| | **Maximum Resolution** | DisplayPort™ 1.4:<br>- up to 4x 5120 x 2880 x 24 bpp @ 60Hz<br>- supports Multi-Stream Transport (MST) |
| | **Image Quality Features** | 10-bit internal display processing pipeline<br>10-bit scan-out support |
| | **Display Output** | 4 mDP Connectors |
| | **Shading Architecture** | Full Microsoft DirectX® 12 Shader Model 5.1 |
| | **Supported Graphics APIs** | OpenGL® 4.5<br>DirectX® 12<br>Vulkan™ 1.0<br>API support includes:<br>CUDA C, CUDA C++, DirectCompute , OpenCL |
| | **Available Graphics Drivers** | Microsoft Windows 10<br>Microsoft Windows 8.1<br>Microsoft Windows 7<br>Linux®<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 |
| | **Notes** | |
| **AMD FirePro™ W2100 2GB Graphics** | **Form Factor** | Low Profile, half length (full-height bracket included) |
| | **Graphics Controller** | AMD FirePro™ W2100 professional graphics based on Oland GPU.<br>GPU: 320 Stream Processors organized into 5 Compute Units<br>GPU Frequency: 630Mhz<br>Power: 26W<br>Cooling: Active |
| | **Bus Type** | PCI Express® x8, Generation 3.0 |
| | **Memory** | 2GB DDR3 memory<br>Memory Bandwidth: up to 28.8 GB/s<br>Memory Width: 128 bit |
| | **Connectors** | 2x Display Port™ 1.2 connectors<br><br>Factory Configured: No video cable adapter included<br>After market option kit: No video cable adapter included<br><br>Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories. |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | **Maximum Resolution** | DisplayPort™ 1.2:<br>- up to 4096x2160 x 24 bpp @ 60Hz<br><br>Dual Link DVI(I) (requires adapter cable):<br>- up to 2560 x 1600 x 32 bpp @ 60Hz<br><br>Single Link-DVI(I)(requires adapter cable):<br>- up to 1920 x 1200 x 32 bpp @ 60Hz<br><br>VGA (requires adapter cable):<br>- up to 1920 x 1200 x 32 bpp @ 60Hz |
| | **Image Quality Features** | Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component.<br>High bandwidth scaler for high quality up and downscaling. |
| | **Display Output** | 2 x DisplayPort™ 1.2a<br>Maximum number of displays: 2 |
| | **Shading Architecture** | Shader Model 5.0 |
| | **Supported Graphics APIs** | OpenCL™ 1.2, DirectX® 11.2/12, OpenGL® 4.4<br><br>OpenGL® 4.4 support with driver release 14.301.xxx<br>OpenCL™ 1.2 conformance expected with drive release 14.301.xxx |
| | **Available Graphics Drivers** | Windows10 (64-bit and 32-bit)<br>Windows 8.1 (64-bit and 32-bit)<br>Windows 7 (64-bit and 32-bit)<br>Linux®<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 |
| | **Notes** | Depending on the card model, native DisplayPort™ connectors and/or certified DisplayPort™ active or passive adapters to convert your monitor's native input to your card's DisplayPort™ or Mini-DisplayPort™ connector(s) may be required. See www.amd.com/FirePro™ for details. |
| **NVIDIA® Quadro® P1000 1st GFX 4GB Graphics** | **Form Factor** | Dimensions:2.713" H x 5.7" L<br>Single Slot, Low Profile<br>Cooling: Active<br>Weight: 129 grams |
| | **Graphics Controller** | NVIDIA® Quadro® P1000 Graphics Card<br>GP107-860 GPU<br>640 NVIDIA® CUDA® cores<br>Max Power: 47 Watts |
| | **Bus Type** | PCI Express 3.0 x16 |
| | **Memory** | Size: 4 GB GDDR5, 2500 MHz |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | | Memory Interface: 128-bit memory interface<br>Memory Bandwidth: 80 GB/s memory bandwidth |
| | **Connectors** | 4mDP Outputs |
| | **Maximum Resolution** | DisplayPort™ 1.4:<br>- up to 4x 5120 x 2880 x 24 bpp @ 60Hz<br>- supports Multi-Stream Transport (MST) |
| | **Image Quality Features** | 10-bit internal display processing pipeline<br>10-bit scan-out support |
| | **Display Output** | 4 mDP Connectors |
| | **Shading Architecture** | Full Microsoft DirectX® 12 Shader Model 5.1 |
| | **Supported Graphics APIs** | OpenGL® 4.5<br>DirectX® 12<br>Vulkan™ 1.0<br>API support includes:<br>CUDA C, CUDA C++, DirectCompute, OpenCL™ |
| | **Available Graphics Drivers** | Microsoft Windows 10<br>Microsoft Windows 8.1<br>Microsoft Windows 7<br>Linux®<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 |
| | **Notes** | |
| **NVIDIA® Quadro® P2000 1st GFX 5GB Graphics** | **Form Factor** | Dimensions: 4.4”Hx7.9”L<br>Single Slot<br>Cooling: Active<br>Weight: 260 grams |
| | **Graphics Controller** | NVIDIA® Quadro® P2000 Graphics Card<br>Power: 75 Watts |
| | **Bus Type** | PCI Express 3.0 x16 |
| | **Memory** | Size: 5GB GDDR5<br>Memory Bandwidth: 140 GB/s<br>Memory Width: 160-bit |
| | **Connectors** | 4x DisplayPort™ 1.4<br><br>Factory Configured Option: No adapter included with card<br>After Market Option: No video cable adapter included<br><br>Additional DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories. |
| | **Maximum Resolution** | DisplayPort™:<br>- up to 5120 x 2880 x 24 bpp @ 60Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) DP 1.3 & 1.4 ready.<br><br>DL-DVI(I) output:<br>- up to 2560 x 1600 x 32 bpp @ 60 Hz |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | | Single Link-DVI(I) output:<br>- up to 1920 x 1200 x 32 bpp @ 60Hz<br><br>HDMI 2.0 (requires DP to HDMI adapter):<br>5120 x 2880 x 24 bpp @ 60Hz |
| | **Image Quality Features** | 12-bit internal display pipeline (hardware support for 12-bit scanout on supported panels, applications and connection)<br><br>Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, NVIDIA® Mosaic and nView. |
| | **Display Output** | Maximum number of displays<br>- 4 direct attached monitors<br><br>Maximum number of monitors across all available NVIDIA® Quadro® P2000 outputs is 4. |
| | **Shading Architecture** | Shader Model 5.1 |
| | **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 software |
| | **Available Graphics Drivers** | Microsoft Windows 10<br>Microsoft Windows 7 Professional 64bit<br>Linux® - Full OpenGL® implementation, complete with NVIDIA® Quadro® 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 |
| | **Notes** | |
| **Radeon™ Pro WX 3100 4GB Graphics** | **Form Factor** | Low-Profile Single Slot (6.6” Length ) |
| | **Graphics Controller** | Polaris12 GL<br>GPU: 512 Stream Processors organized into 8 Compute Units<br>Power: 50 Watts<br>Cooling: Active |
| | **Memory** | 4GB GDDR5 memory<br>Memory Bandwidth: 6 Gbps / 96 GB/s<br>Memory Width: 128 bit |
| | **Connectors** | 2x Mini DisplayPort™ 1.4 plus 1x DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.<br><br>Factory Configured: No adapters included<br>After market option kit: One mDP-to-DP cable adapters included |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | | Additional Mini DisplayPort™-to-DisplayPort™, DisplayPort™-to-VGA or DisplayPort™-to-DVI adapters are available as Factory Configuration or Option Kit accessories. |
| | **Maximum Resolution** | 5K support @ 60Hz<br>• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors<br>3x 4K support @ 60Hz |
| | **Image Quality Features** | Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling |
| | **Display Output** | 3 full physical DP1.3 HBR3 / DP1.4 HDR outputs<br>FreeSync support |
| | **GPU Architecture** | Polaris |
| | **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>(Windows® 7 64-bit available from AMD)<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 |
| | **Notes** | 1. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.<br>2. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.<br>3. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support. |
| **Radeon™ Pro WX 4100 4GB Graphics** | **Form Factor** | Low-Profile Single Slot (6.6” Length) |
| | **Graphics Controller** | Polaris 11 Baffin GL XT<br>GPU: 1024 Stream Processors organized into 16 Compute Units<br>Power: 50 Watts<br>Cooling: Active |
| | **Memory** | 4GB GDDR5 memory<br>Memory Bandwidth: 6 Gbps / 96 GB/s |

## Technical Specifications - Graphics

| | |
|---|---|
| | Memory Width: 128 bit |
| **Connectors** | 4x Mini DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.<br><br>Factory Configured: Four mDP-to-DP cable adapters included<br>After market option kit: Four mDP-to-DP cable adapters included<br><br>Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories. |
| **Maximum Resolution** | 5K support @ 60Hz<br>• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors<br>4x 4K support @ 60Hz |
| **Image Quality Features** | Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling |
| **Display Output** | 4 full physical DP1.3 HBR3 / DP1.4 HDR outputs<br>FreeSync support |
| **GPU Architecture** | GCN 4th Generation |
| **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>Windows® 7 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 |
| **Notes** | 4. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.<br>5. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.<br>6. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windows mode content requires operating system support. |
| **Form Factor** | Dimensions: 4.4”H x 9.5”L |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Graphics

| | | |
|---|---|---|
| **NVIDIA® Quadro® P4000 1st GFX 8GB Graphics** | | Single-slot, full-height<br>Weight: 475 grams (without extender) |
| | **Graphics Controller** | NVIDIA® Quadro® P4000 Graphics Card<br>GPU: GP104 with 1792 CUDA cores<br>Power: 120 Watts |
| | **Bus Type** | PCI Express 3.0 x16 |
| | **Memory** | Size: 8GB GDDR5<br>Memory Bandwidth: 243 GB/s<br>Memory Width: 256-bit |
| | **Connectors** | 4 x DisplayPort 1.4<br>3-pin mini-DIN connector via optional bracket<br>1 x 6-pin auxiliary power connector<br>4-pin header for stereo signal<br>SYNC connector for Quadro® Sync II<br>2 x SLI connectors<br><br>Factory Configured Option: No video cable adapter included<br>After Market Option: No video cable adapter included<br><br>Additional DisplayPort-to-VGA, DisplayPort-to-HDMI, or DisplayPort-to-DVI adapters are available as accessories |
| | **Maximum Resolution** | Dual-link internal TMDS (DVI 1.0):<br>- up to 2560 x 1600 x 32 bpp @ 60 Hz<br><br>Single-link internal TMDS (DVI 1.0):<br>- up to 1920 x 1200 x 32 bpp @ 60 Hz<br><br>HDMI™ 2.0b (requires DP to HDMI adapter):<br>- up to 5120 x 2880 x 24 bpp @ 60Hz<br><br>DisplayPort:<br>- up to 4096 x 2160 x 30 bpp @ 60Hz<br>- up to 2560 x 1600 x 30 bpp @ 120 Hz<br>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)<br><br>Using two DP outputs, the P4000 can drive one dual DP input display with 5120 x 2880 x 30 bpp @ 60Hz resolution. |
| | **Image Quality Features** | Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.<br>HDCP 2.2 support over DisplayPort, DVI, and HDMI connectors<br>NVIDIA 3D Vision™ and other 3D stereo technologies<br>NVIDIA Mosaic and nView |
| | **Display Output** | Maximum number of displays<br>- 4 direct attached monitors<br><br>Maximum number of monitors across all available Quadro P4000 outputs is 4. |
| | **Shading Architecture** | Shader Model 5.1 |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | **Supported Graphics APIs** | OpenGL 4.5<br>DirectX 12<br>Vulcan 1.0<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 |
| | **Notes** | 1. Quadro P4000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.<br>2. Quadro P4000 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately. |
| **NVIDIA® Quadro® P5000 1st GFX 16GB Graphics** | **Form Factor** | Full-Height Dual Slot (4.4” Height x 10.5” Length)<br>Weight: 815 grams / 1.80 lbs |
| | **Graphics Controller** | NVIDIA® Quadro® P5000 graphics<br>GPU: 2560 NVIDIA® CUDA® Parallel Processing Cores<br>Power: 180 Watts<br>Cooling: Active |
| | **Memory** | 16GB GDDR5X memory<br>Memory Bandwidth: Up to 288 GB/s<br>Memory Width: 256 bit<br>ECC Memory (disabled by default) |
| | **Connectors** | DP (x4) with HDR support<br>DL-DVI(D)<br>3-pin mini-DIN connector<br>SLI connector<br>NVIDIA® Quadro® Sync connector (compatible with NVIDIA® Quadro® II Sync)<br>One 8-pin auxiliary power connector<br><br>Factory configured option: No video cable adapter included with card.<br>After market option Kit: No video cable adaptor included with card.<br><br>DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories. |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | **Maximum Resolution** | 5K support @ 60Hz<br>1x single-cable 5K monitor, or 2x dual-cable 5K monitors |
| | **Image Quality Features** | Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.<br>HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors<br>NVIDIA® 3D Vision™ and other 3D stereo technologies<br>NVIDIA Mosaic and nView Desktop Management |
| | **Display Outputs**[1] | 4x DP1.4 HDR outputs (up to 3840x2160 UHD @ 120Hz refresh, or up to 8K at 30Hz)<br>1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz and 1920x1200 @ 120 Hz) |
| | **GPU Architecture** | NVIDIA Pascal™ |
| | **Supported Graphics APIs** | DirectX®12 , OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0<br>Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran |
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Windows® 7 64-bit<br>Linux® 64-bit<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 |
| | **Notes** | 1- Supports up to a total of 4 displays |
| **NVIDIA® Quadro® P6000 1st GFX 24GB Graphics** | **Form Factor** | Full-Height Dual Slot (4.4” Height x 10.5” Length)<br>Weight: 967 grams / 2.14 lbs |
| | **Graphics Controller** | NVIDIA® Quadro® P6000 graphics<br>GPU: 3840 NVIDIA® CUDA® Parallel Processing Cores<br>Power: 250 Watts<br>Cooling: Active |
| | **Memory** | 24GB GDDR5X memory<br>Memory Bandwidth: Up to 432 GB/s<br>Memory Width: 384 bit<br>ECC Memory (disabled by default) |

## Technical Specifications - Graphics

| | |
|---|---|
| **Connectors** | DP (x4) with HDR support<br>DL-DVI(I)<br>3-pin mini-DIN connector<br>SLI connector<br>Quadro Sync connector (compatible with Quadro II Sync)<br>One 8-pin auxiliary power connector<br><br>Factory configured option: No video cable adapter included with card.<br>After market option Kit: No video cable adaptor included with card.<br><br>DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories. |
| **Maximum Resolution** | 5K support @ 60Hz<br>1x single-cable 5K monitor, or 2x dual-cable 5K monitors |
| **Image Quality Features** | Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.<br>HDCP 2.2 support over DisplayPort, DVI, and HDMI connectors<br>NVIDIA 3D Vision™ and other 3D stereo technologies<br>NVIDIA Mosaic and nView |
| **Display Outputs[1]** | 4x DP1.4 HDR outputs (up to 3840x2160 UHD @ 120Hz refresh, or up to 8K at 30Hz)<br>1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz and 1920x1200 @ 120 Hz) |
| **GPU Architecture** | NVIDIA Pascal™ |
| **Supported Graphics APIs** | DirectX®12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0<br>Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran |
| **Available Graphics Drivers** | Windows® 10 64-bit<br>Windows® 7 64-bit<br>Linux® 64-bit<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 |
| **Notes** | 1- Supports up to a total of 4 displays |

| | | |
|---|---|---|
| **NVIDIA® Quadro® GP100 16GB Graphics** | **Form Factor** | Dual Slot (4.4” Height x 10.5” Length)<br>Weight: 989 grams +72 grams extender |

## Technical Specifications - Graphics

| | |
|---|---|
| **Graphics Controller** | NVIDIA® QUADRO® GP100<br>GPU: 3584 NVIDIA CUDA® Parallel Processing Cores<br>Power: 235 Watts<br>Cooling: Active |
| **Memory** | 16GB HBM2<br>Memory Bandwidth: Up to 717 GB/s<br>Memory Width: 4096-bit<br>ECC Memory (disabled by default) |
| **Connectors** | DP (x4) with HDR support<br>DL-DVI(D)<br>3-pin mini-DIN connector via optional bracket<br>4-pin header for stereo signal<br>Quadro Sync connector (compatible with Quadro II Sync)<br>One 8-pin auxiliary power connector<br>(2x) NVLink connectors<br><br>Factory configured option: 8-pin power adapter included with card.<br>After market option Kit: 8-pin power adapter included with card.<br><br>DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories. |
| **Maximum Resolution** | 5K support @ 60Hz<br>1x single-cable 5K monitor, or 2x dual-cable 5K monitors |
| **Image Quality Features** | HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode)<br>HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors<br>NVIDIA 3D Vision™ technology<br>NVIDIA Mosaic and nView Desktop Management |
| **Display Outputs** | 4x DP1.4 MST & HDR2 outputs (up to 5120 x 2880 @ 60Hz)<br>1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz)<br>1x Single-link DVI-D output (up to 1920 x 1200 @ 60 Hz)<br>HDMI™ 2.0b (up to 5120 x 2880 @ 60Hz)*<br><br>*requires DP to HDMI adapter |
| **GPU Architecture** | NVIDIA Pascal™ |
| **Supported Graphics APIs** | DirectX®12 , OpenGL® 4.5, Vulkan™ 1.0 |

Technical Specifications - Graphics

| | | |
|---|---|---|
| | | Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran |
| | **Available Graphics Drivers** | Windows® 10<br>Windows® 7 Professional 64-bit<br>Linux®<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<br><br>Factory Configured (Z840 Workstations): No adapters included<br>Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included<br>After market option kit: No adapters included |

| | | |
|---|---|---|
| **NVIDIA® Quadro® GV100 32GB Graphics** | **Form Factor** | Dual Slot (4.4” Height x 10.5” Length)<br>Weight: 980 grams + 72 gram extender |
| | **Graphics Controller** | NVIDIA® QUADRO® GV100<br>GPU: 5120 NVIDIA® CUDA® Parallel Processing Cores<br>Power: 250 Watts<br>Cooling: Active |
| | **Memory** | 32GB HBM2 memory<br>Memory Bandwidth: Up to 870 GB/s<br>Memory Width: 5120-bit<br>ECC Memory (disabled by default) |
| | **Connectors** | DP (x4) with HDR support<br>3-pin mini-DIN connector via optional bracket<br>4-pin header for stereo signal<br>Quadro Sync connector (compatible with Quadro II Sync)<br>One 8-pin auxiliary power connector<br>(2x) NVLink for GV100 connectors (via optional kit)<br><br>After market option Kit: no power adapter included with card.<br><br>DisplayPort™ to VGA, DisplayPort™ to DVI (single-link and dual-link), and DisplayPort™ to HDMI adapters available as accessories. |
| | **Maximum Resolution** | 5K support @ 60Hz<br>1x single-cable 5K monitor, or 2x dual-cable 5K monitors |

## Technical Specifications - Graphics

| | | |
|---|---|---|
| | **Image Quality Features** | HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode)<br>HDCP 2.2 support over DisplayPort™ and HDMI connectors<br>NVIDIA 3D Vision™ technology<br>NVIDIA Mosaic and nView Desktop Management |
| | **Display Outputs** | 4x DP1.4 HDR2 outputs (up to 5120 x 2880 @ 60Hz) |
| | **GPU Architecture** | NVIDIA® Volta™ |
| | **Supported Graphics APIs** | DirectX®12, OpenGL® 4.5<br>Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran |
| | **Available Graphics Drivers** | Windows® 10 64-bit<br>Windows® 8 & 8.1 64-bit<br>Windows® 7 64-bit<br>Linux® 64-bit<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<br><br>Factory Configured (Z4/Z8 G4 Workstation): No adapters included<br>After market option kit: No adapters included |
| **Radeon™ Pro WX 7100 1st GFX 8GB Graphics** | **Form Factor** | Full-Height Single Slot (9.5" Length ) |
| | **Graphics Controller** | Radeon™ Pro WX 7100 graphics<br>GPU: 2304 Stream Processors organized into 36 Compute Units<br>Power: 130 Watts<br>Cooling: Active |
| | **Memory** | 8GB GDDR5 memory<br>Memory Bandwidth: 7 Gbps / 224 GB/s<br>Memory Width: 256 bit |
| | **Connectors** | 4x Display Port 1.4 – HDR ready connectors with HBR3 and MST support.<br><br>Factory Configured: No video cable adapter included<br>After market option kit: No video cable adapter included<br><br>Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories. |
| | **Maximum Resolution** | 5K support @ 60Hz |

- 1x single-cable 5K monitor, or 2x dual-cable 5K monitors

| | |
|---|---|
| **Image Quality Features** | Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling |
| **Display Output** | 4 full physical DP1.3 HBR3 / DP1.4 HDR outputs<br>FreeSync support |
| **GPU Architecture** | GCN 4th Generation |
| **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>Windows® 7 64-bit<br>Linux® 64-bit<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 |

**Notes**

7. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
8. Radeon VR Ready Creator Products are select Radeon Pro and AMD FirePro™ GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.
9. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
10. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

## Technical Specifications - Graphics

| | | |
|---|---|---|
| **Radeon™ Pro WX 9100 16GB Graphics** | **Form Factor** | Dual Slot (4.4" Height x 10.5" Length) |
| | **Graphics Controller** | Radeon™ Pro WX 9100 graphics<br>GPU: 4096 Stream Processors<br>Power: 250 Watts<br>Cooling: Active |
| | **Memory** | 16GB HBM2 memory<br>Memory Bandwidth: Up to 483 GB/s<br>Memory Width: 2048 bit |
| | **Connectors** | 6x Mini DisplayPort 1.4 – HDR ready connectors with HBR3 and MST support.<br><br>Factory Configured: No video cable adapter included<br>After market option kit: No video cable adapter included<br><br>Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories. |
| | **Maximum Resolution** | 8K support @ 60Hz<br>Single monitor, single or dual-cable |
| | **Image Quality Features** | Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component.<br>High bandwidth scaler for high quality up and downscaling |
| | **Display Output** | 6 full physical mDP 1.4 HDR Ready outputs<br>FreeSync support |
| | **GPU Architecture** | Vega™ |
| | **Supported Graphics APIs** | DirectX® 12.1<br>OpenGL® 4.5<br>OpenCL™ 2.0<br>Vulkan™ 1.0 |
| | **Available Graphics Drivers** | Windows 10 64-bit<br>Windows 7 available from AMD<br>Linux® 64-bit<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 |
| | **Notes** | 1. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready |

player. Windowed mode content requires operating system support.

2. Radeon VR Ready Creator Products are select Radeon Pro and AMD FirePro™ GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.
3. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
4. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

| | | |
|---|---|---|
| **NVIDIA® Quadro® Sync II** | **Part number** | 1WT20AA |
| | **Dimensions (HxD)** | 6.0 inches × 4.2 inches |
| | **Devices Supported** | NVIDIA® Quadro® P4000<br>NVIDIA® Quadro® P5000<br>NVIDIA® Quadro® P6000 |
| | **Bus Type** | Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector |
| | **PCI Form Factor** | Full Height, half length, single slot |
| | **Ports** | 2 RJ45 connectors for carrying frame lock signals over CAT5 cables.<br>BNC Connector for external house synchronization. |
| | **Internal Connectors** | 6 NVIDIA SLI® style edge fingers for connection to compatible GPUs<br>• Included with the board are 4 12-Inch Short Sync Cables to connect to GPU's<br>• Included with the board are 2 24-Inch Long Sync Cables to connect to GPU's |
| | **System Requirements** | Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector<br>Must be used with NVIDIA Quadro P4000, P5000 or P6000 graphics cards.<br>Requires Quadro driver version R375 or later. |
| | **Temperature - Operating** | 0° to 55° C |
| | **Temperature - Storage** | -40° to 60° C |
| | **Relative Humidity - Operating** | 10% to 80% |
| | **Power Requirements** | Board power dissipation: <15W |

## Technical Specifications - Graphics

| | |
|---|---|
| **Operating Systems Supported** | Windows 10 64-bit<br>Windows 7 64-bit<br>Linux® 64-bit |
| **Kit Contents** | Contains:<br>• Quadro Sync II Card<br>• 4 x 12-Inch Short Sync Cables<br>• 2 x 24-Inch Long Sync Cables (Two)<br>• Quick Start Guide |

Technical Specifications – Optical and Removable Storage

## OPTICAL AND REMOVABLE STORAGE

| | | | |
|---|---|---|---|
| **HP 9.5mm Slim DVD Writer** | **Description** | 9.5mm height, tray-load | |
| | **Mounting Orientation** | Either horizontal or vertical | |
| | **Interface Type** | SATA/ATAPI | |
| | **Dimensions (WxHxD)** | 128 x 9.5 x 127mm | |
| | **Supported Media Types** | DVD+R<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 |
| | | Full Stroke DVD | < 200 ms (seek) |
| | | Full Stroke CD | < 200 ms (seek) |
| | **Maximum Data Transfer Rates** | CD ROM Read | CD-ROM, CD-R Up to 24X<br>CD-RW Up to 24X |
| | | DVD ROM Read | 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 | SATA DC power receptacle |
| | | DC Power Requirements | 5 VDC ± 5%-100 mV ripple p-p |
| | | DC Current | 5 VDC -< 800 mA typical, <1600 mA maximum |
| | **Operating Environmental (all conditions non-condensing)** | Temperature | 41° to 122° F (5° to 50° C) |
| | | Relative Humidity | 10% to 80% |
| | | Maximum Wet Bulb Temperature | 84° F (29° C) |
| | **Operating Systems Supported** | Windows 10, Windows 7 Professional 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<br>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 SATA DVD Writer drive, installation guide. | |

## Technical Specifications – Optical and Removable Storage

| | | | |
|---|---|---|---|
| **HP 9.5mm Slim DVD-ROM Drive** | **Description** | 9.5mm height, tray-load | |
| | **Mounting Orientation** | Either horizontal or vertical | |
| | **Interface Type** | SATA / ATAPI | |
| | **Dimensions (WxHxD)** | 128 x 9.5 x 127mm | |
| | **Disc Capacity** | DVD-ROM | Single layer: Up to 4.7 GB<br>Double layer: Up to 8.5 GB |
| | **Access Times** | DVD-ROM Single Layer | < 110 ms (typical) |
| | | CD-ROM Mode 1 | < 110 ms (typical) |
| | | Full Stroke DVD | < 230 ms (typical) |
| | | Full Stroke CD | < 220 ms (typical) |
| | **Power** | Source | SATA DC power receptacle |
| | | DC Power Requirements | 5 VDC ± 5%-100 mV ripple p-p |
| | | DC Current | 5 VDC – <800mA typical, < 1600 mA maximum |
| | **Operating Environmental (all conditions non-condensing)** | Temperature | 41° to 122° F (5° to 50° C) |
| | | Relative Humidity | 10% to 80% |
| | | Maximum Wet Bulb Temperature | 84° F (29° C) |
| | **Operating Systems Supported** | Windows 8.1, Windows 8 32-bit and 64-bit, Windows 7 Professional 32-bit and 64-bit,<br>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<br>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** | 9.5mm Slim DVD-ROM Drive, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide | |
| **HP 9.5mm Slim BDXL Blu-Ray Writer** | **Description** | 9.5mm height, tray-load | |
| | **Mounting Orientation** | Either horizontal or vertical | |
| | **Interface Type** | SATA/ATAPI | |
| | **Dimensions (WxHxD)** | 128 x 9.5 x 127mm | |
| | **Supported Media Types** | BD-ROM<br>BD-R<br>BD-RE<br>DVD+R<br>DVD+RW<br>DVD+R DL<br>DVD-R DL<br>DVD-R<br>DVD-RW<br>CD-R | |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications – Optical and Removable Storage

| | | |
|---|---|---|
| | CD-RW | |
| **Disc Capacity** | DVD-ROM | 8.5 GB DL or 4.7 GB standard |
| | Blu-ray | 25 GB (single-layer)<br>50 GB (dual-layer)<br>100/128 GB (BDXL) |
| | Full Stroke DVD | < 230 ms (seek) |
| | Full Stroke CD | < 220 ms (seek) |
| | Blu-ray | < 230 ms (seek) (Full Stroke Blu-ray) |
| | Startup Time | (Time to drive ready from tray loading)<br>BD-ROM (SL/DL) 25S / 28S<br>BD-R (SL/DL) 25S / 28S<br>BD-RE (SL/DL) 25S / 28S<br>DVD-ROM (SL/DL) 18S / 18S<br>DVD-R (SL/DL) 25S / 25S<br>DVD-RW 25S<br>DVD+R (SL/DL) 25S / 25S<br>DVD+RW 25S<br>CD-ROM 15S |
| **Maximum Data Transfer Rates** | CD ROM Read | CD-ROM, CD-R Up to 24X<br>CD-RW Up to 24X |
| | DVD ROM Read | 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 |
| | Blu-ray | BD-ROM Up to 6X<br>BD-ROM DL Up to 6X<br>BD-R Up to 6X<br>BD-R DL Up to 6X<br>BD-R Up to 6X<br>BD-RE SL/DL Up to 6X |
| **Power** | Source | SATA DC power receptacle |
| | DC Power Requirements | 5 VDC ± 5%-100 mV ripple p-p |
| | DC Current | 5 VDC -900 mA typical, 2000mA maximum |
| **Operating Environmental (all conditions non-condensing)** | Temperature | 41° to 122° F (5° to 50° C) |
| | Relative Humidity | 10% to 80% |
| | Maximum Wet Bulb Temperature | 84° F (29° C) |
| **Operating Systems Supported** | Windows 8.1, Windows 8 32-bit and 64-bit, Windows 7 Professional 32-bit and 64-bit,<br>Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. | |

## Technical Specifications – Optical and Removable Storage

| | | |
|---|---|---|
| | | Red Hat® Enterprise Linux® (RHEL) WS4**, 5, 6 Desktop/Workstation<br>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** | 9.5mm Slim BDXL Blu-Ray Writer, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide<br>As Blu-ray is a new format containing new technologies, 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. |
| **HP SD Card Reader** | **Description** | Supports hardware ECC (Error Correction Code) function<br>Supports hardware CRC (Cyclic Redundancy Check) function<br>Supports SD 4-bit parallel transfer mode |
| | **Interface Type** | USB 3.1 G1 High-speed interface |
| | **Dimensions** (WxHxD) | 1.15 x .9 x .15 in (29.00 x 23.6 x 3.15 mm) Fits conveniently in the Front IO Bay |
| | **Supported Media Types** | Secure Digital Card (SD)<br>Secure Digital High Capacity (SDHC)<br>SD Extended Capacity Memory Card (SDXC)<br>SD Ultra High Speed II(SD UHSII)<br><br>These additional media types are supported with a card adapter.<br>Memory Stick Micro (M2)<br>miniSD<br>miniSD High Capacity<br>Micro SD Memory Card (MicroSD)<br>Micro SD High Capacity Memory Card (MicroSDHC)<br><br>Test Parameters/Conditions - Power applied, unit operating on system ±5% |
| | **Operating Systems Supported** | Windows 10<br><br>No driver is required for this device. Native support is provided by the operating system. |
| | **Kit Contents** | SD card reader |
| | **Approvals** | USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0,<br>Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT |
| | **Weight** | 0.35 lbs. (0.16 kg) |

## NETWORKING AND COMMUNICATIONS

| | | |
|---|---|---|
| **Integrated Intel I219 PCIe GbE Controller** | **Connector** | RJ-45 |
| | **Controller** | Intel I219 GbE platform LAN connect networking controller |
| | **Data Rates Supported** | 10/100/1000 Mbps |
| | **Boot ROM Support** | PXE, UEFI |
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = 10Mbps<br>• Amber = 100Mbps<br>• Green = 1000Mbps |
| | **Management Capabilities** | Wake-On-LAN, Intel ® Active Management Technology™ (AMT) 11.<br>**NOTE:** Intel ® AMT™ is not available on Intel Core X configs. |
| **Integrated Intel I210 (not available on Intel Core X configs)** | **Connector** | RJ-45 |
| | **Controller** | Intel® I210 |
| | **Data Rates Supported** | 10/100/1000 Mbps |
| | **Boot ROM Support** | PXE, UEFI |
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = 10Mbps<br>• Amber = 100Mbps<br>• Green = 1000Mbps |
| | **Management Capabilities** | Wake-On-LAN |
| **Intel® I210-T1** | **Networking Interface** | RJ-45 |
| | **System Interface** | PCI Express 2.1 x1 |
| | **Networking Speeds Supported** | 10Mbps, 100Mbps, 1Gbps |
| | **Cabling (up to 100m)** | Cat3 (or higher) for 10Mbps<br>Cat5 (or higher) for 100Mbps<br>Cat5e (or higher) for 1Gbps |
| | **Power Consumption (active-typical)** | 0.81W |
| | **Physical Dimensions** | Length: 6.7cm (2.64 inches)<br>(Bracket) Width: 1.8cm (0.709 inches)<br>Full-height end bracket: 12.07cm (4.755 inches)<br>Low-profile end bracket: 8cm (3.15 inches) |

## Technical Specifications - Networking and Communications

| | | |
|---|---|---|
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = 10Mbps<br>• Green = 100Mbps<br>• Amber = 1Gbps |
| | **Operating Temperature** | 0 °C to 55 °C (32 °F to 131 °F) |
| | **Hardware Certifications** | USA: FCC B,<br>EU: UL CE,<br>Japan: VCCI,<br>Taiwan: BSMI,<br>Australia/New Zealand: CTICK,<br>Korea: KCC,<br>Canada: ICES-003/NMB-003 |
| **Intel® I350-T2** | **Networking Interface** | 2 x RJ-45 |
| | **System Interface** | PCI Express 2.1 x4 |
| | **Networking Speeds Supported** | 10Mbps, 100Mbps, 1Gbps |
| | **Cabling (up to 100m)** | Cat3 (or higher) for 10Mbps<br>Cat5 (or higher) for 100Mbps<br>Cat5e (or higher) for 1Gbps |
| | **Power Consumption (active-typical)** | 4.4W |
| | **Physical Dimensions** | Length: 13.54cm (5.33 inches)<br>Width: 6.89 (2.71 inches)<br>Full-height end bracket: 12.0cm (4.725 inches)<br>Low-profile end bracket: 7.92cm (3.117 inches) |
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = 10Mbps<br>• Green = 100Mbps<br>• Amber = 1Gbps |
| | **Operating Temperature** | 0 °C to 55 °C (32 °F to 131 °F) |
| | **Hardware Certifications** | USA: FCC B,<br>EU: UL CE,<br>Japan: VCCI,<br>Taiwan: BSMI,<br>Australia/New Zealand: CTICK,<br>Korea: KCC,<br>Canada: ICES-003/NMB-003 |
| **Intel® I350-T4** | **Networking Interface** | 4 x RJ-45 |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Networking and Communications

| | | |
|---|---|---|
| | **System Interface** | PCI Express 2.1 x4 |
| | **Networking Speeds Supported** | 10Mbps, 100Mbps, 1Gbps |
| | **Cabling (up to 100m)** | Cat3 (or higher) for 10Mbps<br>Cat5 (or higher) for 100Mbps<br>Cat5e (or higher) for 1Gbps |
| | **Power Consumption (active-typical)** | 5W |
| | **Physical Dimensions** | Length: 13.54cm (5.33 inches)<br>Width: 6.89 (2.71 inches)<br>Full-height end bracket: 12.0cm (4.725 inches)<br>Low-profile end bracket: 7.92cm (3.117 inches) |
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = 10Mbps<br>• Green = 100Mbps<br>• Amber = 1Gbps |
| | **Operating Temperature** | 0 °C to 55 °C (32 °F to 131 °F) |
| | **Hardware Certifications** | USA: FCC B,<br>EU: UL CE,<br>Japan: VCCI,<br>Taiwan: BSMI,<br>Australia/New Zealand: CTICK,<br>Korea: KCC,<br>Canada: ICES-003/NMB-003 |
| **Intel® X550-T2** | **Networking Interface** | 2 x RJ-45 |
| | **System Interface** | PCI Express 3 x4 |
| | **Networking Speeds Supported** | 100Mbps, 1Gbps, 2.5Gbps, 5Gbps, 10Gbps |
| | **Cabling (up to 100m)** | Cat5 (or higher) for 100Mbps<br>Cat5e (or higher) for 1Gbps, 2.5Gbps, or 5Gbps<br>Cat6a (or higher) for 10Gbps |
| | **Power Consumption (active-typical)** | 3.9W at 100Mbps<br>5.5W at 1Gbps<br>11.2W at 10Gbps |
| | **Physical Dimensions** | 5.2 in x 2.7 in (without bracket) |
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = No link<br>• Amber = <10Gbps<br>• Green = 10Gbps |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Networking and Communications

| | | |
|---|---|---|
| | **Operating Temperature** | 0 °C to 55 °C (32 °F to 131 °F) |
| | **Hardware Certifications** | USA: FCC B,<br>EU: UL CE,<br>Japan: VCCI,<br>Taiwan: BSMI,<br>Australia/New Zealand: CTICK,<br>Korea: KCC,<br>Canada: ICES-003/NMB-003 |
| **Intel® X710-DA2 10GBASE-SR Converged Network Adapter** | **Networking Interface** | 2 SFP+ Ports for LC SFP+ Transceivers |
| | **System Interface** | PCI Express 3.0 x8 |
| | **Networking Speeds Supported** | 1Gbps, 10Gbps |
| | **Cabling** | LC fiber optic cabling with LC SFP+ Transceivers |
| | **Power Consumption (active-typical)** | 4.3W |
| | **Physical Dimensions** | 6.578 in x 2.703 in |
| | **Connect Speed LED Indicators** | Link/Activity LED<br>• Off = No link<br>• Blinking = Activity<br>Speed LED<br>• Off = 10Mbps<br>• Green = 100Mbps<br>• Amber = 1Gbps |
| | **Operating Temperature** | 0 °C to 55 °C (32 °F to 131 °F) |
| | **Hardware Certifications** | USA: FCC B,<br>EU: UL CE,<br>Japan: VCCI,<br>Taiwan: BSMI,<br>Australia/New Zealand: CTICK,<br>Korea: KCC,<br>Canada: ICES-003/NMB-003 |
| **10GbE SFP+ SR Transceiver** | **Connector Type** | LC |
| | **Cable Type** | 62.5/125um or 50/125um (core/cladding), graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively. |
| | **Cable Length** | 2-300m |
| | **Wavelength** | 850nm |
| | **Form Factor** | SFP+ |
| | **Physical Dimensions** | 0.47(h) x 0.54(w) x 2.19(d) inches<br>(1.19 x 1.38 x 5.57 cm) |
| | **Operating Temperature** | 0C to 45C (32F to 113F) |
| | **Operating Humidity** | 0% to 85%, noncondensing |

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

## Technical Specifications - Networking and Communications

| | | |
|---|---|---|
| **Intel® 8265 WLAN** | **Networking Speeds** | 802.11ac MU-MIMO (up to 867 Mbps)<br>Bluetooth 4.2 |
| | **IEEE WLAN Standard** | IEEE 802.11a/b/g/n/ac, 802.11d, 802.11e, 802.11h, 802.11i, 802.11w; 802.11r, 802.11k, 802.11v pending |
| | **Bluetooth** | 4.2 |
| | **System Interface** | PCI Express 2.1 x1 |
| | **Antenna** | 2x2 |

Summary of Changes

## SUMMARY OF CHANGES

| Date of change: | Version History: | | Description of change: |
|---|---|---|---|
| November 1, 2017 | From v1 to v2 | Added | HP DisplayPort to HDMI Adapter, NVIDIA SLI 2-slot Graphics Connector and NVIDIA Quadro Sync II to Graphics section |
| | | Changed | Graphics, Storage / Hard Drives and Memory sections, changed Front and internal view info on the Overview section, changed Operating Systems section, changed System Board section, changed System Configuration, DECLARED NOISE EMISSIONS and Physical Security and Serviceability sections |
| November 29, 2017 | From v2 to v3 | Added | Processors, hard drives and graphics to offerings, added Intel Xeon W-2195 to Processors section |
| | | Changed | Wattage links on power supply section updated and Voltage links on efficientcy section updated |
| February 5, 2018 | From v3 to v4 | Added | Features and Supported Configurations for Intel® Core™ X- Series Processor Family |
| | | Changed | Formatting |
| February 27, 2018 | From v4 to v5 | Added | Intel Core i9-X processors footnotes added to processors pre-installed section |
| March 27, 2018 | From v5 to v6 | Added | NVIDIA Quadro GP100 16GB Graphics, NVIDIA Quadro GV100 32GB Graphics and AMD Radeon Pro WX 9100 16GB Graphics as High End 3D in Graphics section |