

### 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.**

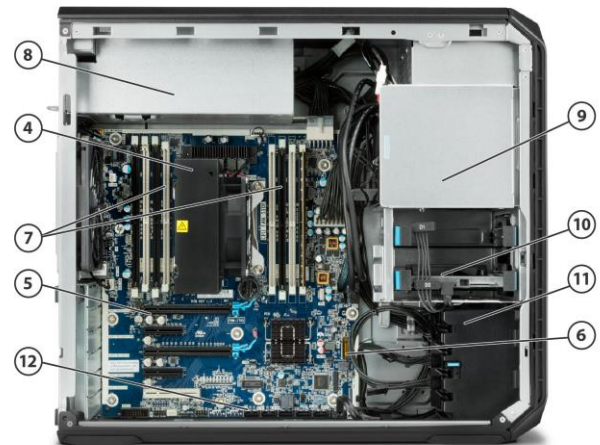
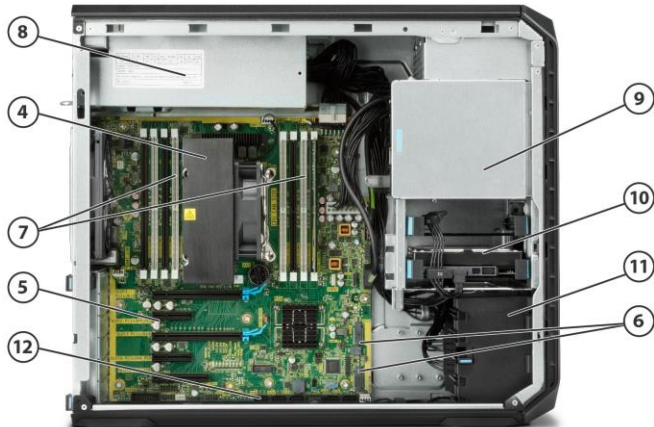
### HP Z4 G4 Workstation



#### 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 audio, 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



### Internal view

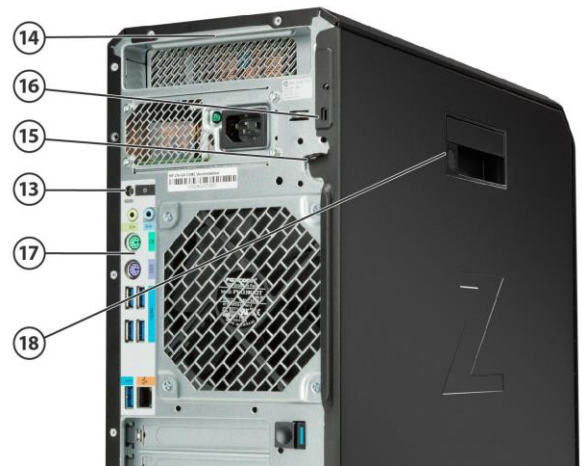
#### Intel® Xeon® W Processors

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
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® 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/Core i7 9800X: 2 PCIe G3 x16, 2 PCIe G3 x4, 1 PCIe G3 x8  
Other Core i7-X configs: 1 PCIe 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

### Overview



### Rear view

#### Intel® Xeon® W Processors

- 13. Rear I/O (top to bottom):
  - Audio in/out,
  - Keyboard/Mouse PS/2
  - USB: 6 USB 3.1 G1 Type-A
  - 2x 1GbE ports

#### Intel® Core™ X-series Processors

- Rear power button
- Rear handle
- Padlock loop
- Kensington lock slot
- 17. Rear I/O (top to bottom):
  - Audio in/out,
  - Keyboard/Mouse PS/2
  - USB: 5 USB 3.1 G1 Type-A
  - 1x 1GbE port

- 18. Side panel barrel keylock (optional)

### Supported Components

## Overview

### Form Factor Operating Systems

#### Minitower

#### 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:

- 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 High End
- 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 Linux® OS/hardware support information, see: [http://www.hp.com/support/linux\\_hardware\\_matrix](http://www.hp.com/support/linux_hardware_matrix)

\* Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

**Note:** In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows® 7 operating system on products configured with Intel® and AMD 7th Generation and forward processors or provide any Windows® 8 or Windows® 7 drivers on <http://www.support.hp.com>

### Supported Components

#### 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) <sup>1</sup>	Intel® Turbo Boost Max Technology 3.0 (GHz) <sup>2</sup>	TDP (W)
<b>Intel® Xeon® W Processors</b>											
Intel® Xeon® W-2295 processor	18	3.0	24.75	2933	YES	512GB	YES	YES	3.8, 4.6	4.8	168
Intel® Xeon® W-2275 processor	14	3.3	19.25	2933	YES	512GB	YES	YES	4.1, 4.6	4.8	165
Intel® Xeon® W-2265 processor	12	3.5	19.25	2933	YES	512GB	YES	YES	4.3, 4.6	4.8	165
Intel® Xeon® W-2255 processor	10	3.7	19.25	2933	YES	512GB	YES	YES	4.3, 4.5	4.7	165
Intel® Xeon® W-2245 processor	8	3.9	16.5	2933	YES	512GB	YES	YES	4.5, 4.5	4.7	155
Intel® Xeon® W-2235 processor	6	3.8	8.25	2933	YES	512GB	YES	YES	4.3, 4.6	N/A	130
Intel® Xeon® W-2225 processor	4	4.1	8.25	2933	YES	512GB	YES	YES	4.5, 4.6	N/A	105
Intel® Xeon® W-2223 processor	4	3.6	8.25	2666	YES	512GB	YES	YES	3.7, 3.9	N/A	120
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
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
<b>Intel® Core™ X-Series Processors</b>											
Intel® Core™ i9-10980XE Extreme Edition processor	18	3.0	24.75	2933	NO	256GB	YES	NO	3.8, 4.6	4.8	165
Intel® Core™ i9-10940X X-series processor	14	3.3	19.25	2933	NO	256GB	YES	NO	4.1, 4.6	4.8	165
Intel® Core™ i9-10920X X-series processor	12	3.5	19.25	2933	NO	256GB	YES	NO	4.3, 4.6	4.8	165
Intel® Core™ i9-10900X X-series processor	10	3.7	19.25	2933	NO	256GB	YES	NO	4.3, 4.5	4.7	165

**Processor Supports:** **XW:** Configurations with Intel® Xeon® -W Processor Family **CX:** Configurations with Intel® Core™ X-series Processor Family **CX (i7):** Core i7-X series only **CX (i9):** Core i9-X series only



### Supported Components

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) <sup>1</sup>	Name	Cores
Intel® Core™ i9-9980XE processor	18	3.0	24.75	2666	NO	128GB	YES	NO	4.4	4.5	165
Intel® Core™ i9-9920X processor	12	3.5	19.25	2666	NO	128GB	YES	NO	4.4	4.5	165
Intel® Core™ i9-9820X processor	10	3.3	16.5	2666	NO	128GB	YES	NO	4.1	4.2	165
Intel® Core™ i7-9800X processor	8	3.8	16.5	2666	NO	128GB	YES	NO	4.4	4.5	165
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
<p><sup>1</sup>For Intel® Xeon® W processors, the specifications shown in this column represent the following: all core maximum turbo frequency, dual core maximum turbo frequency). For Intel® Core™ processors, the specifications shown in this column refer to dual core maximum turbo frequency.</p> <p><sup>2</sup>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.</p> <p><b>NOTE:</b> Processors that do not have certain turbo functionality are denoted as N/A.</p>											

#### 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:**

PCI Express Gen3 x16 (from CPU)

**Slot 3:**



### Supported Components

Core i9-X and Core i7-9800X configs: PCI Express Gen3 x16 (from CPU)  
 Other 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:**

PCI Express Gen3 x8 (from CPU) with open-ended connector\*

**Slot 5:**

- Core i9-X and Core i7-9800X configs: PCI Express Gen3 x8 (from CPU) with open-ended connector\*
- Other 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

**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.

2 external 5.25" bays

- 3rd and 4th 3.5" HDD each occupy one external bay
- 3rd and 4th 2.5" HDD/SSD occupy a single external bay within a 2:1 carrier

**Front I/O**

- Base: Power button with power/fault LED, 1 Headset audio port, 4 USB 3.1 G1 Type A (1 charging, provides 1.5A at 5V)
- Premium (optional): Power button with power/fault LED, Drive activity LED, 1 Headset audio port, 2 USB 3.1 G1 Type-A (1 charging, provides 1.5A at 5V), 2 USB 3.1 G2 Type-C™ (each provides 3A at 5V)
- 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**

6x USB 3.1 G1 Type-A\*  
 2x 1GbE LAN ports (1x supporting Intel AMT)

**Intel® Core™ X- Series Processor Family**

5x USB 3.1 G1 Type-A  
 1x 1GbE LAN ports

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

Optional: 1 serial port (cable up to rear bulkhead), 2 Thunderbolt 3\*\*

\*All rear I/O motherboard USB-A ports are 0.9A at 5V

\*\*HP's add-in Thunderbolt card provides two USB-C ports which provide 3A at 5V each

**Interfaces Supported**

SD card reader (optional)  
 6-channel SATA interface (6 @ 6.0 Gb/s)  
 6 channels are eSATA configurable for use with eSATA CTO/AMO Kit (No hot plug / hot swap supported)  
 Thunderbolt 3 (optional)  
 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  
 SATA RAID 1 Mirrored Array Configuration  
 SATA RAID 5 Striped/Parity Configuration  
 SATA RAID 10 Striped/Mirrored Configuration



### Supported Components

<b>Chassis Dimensions (H x W x D)</b>	H: 15.2" (386mm) W: 6.65" (169mm) D: 17.5" (445mm)
<b>Packaged Dimensions</b>	H: 22.5" (572mm) W: 12.4" (314mm) D: 22.2" (563mm)
<b>Rack Dimensions</b>	4U
<b>Weight</b>	Exact weights depend upon configuration (System weight only). Minimum: 10.2 kg (22.4 lbs.) Standard: 11.3 kg (24.9 lbs.) Maximum: 17.3 kg (38.2 lbs.)
<b>Temperature</b>	Non-operating: -40° to 60° C (-40° to 140° F) Operating: 5° to 35° C (40° to 95° F) Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation Maximum rate of change: 10 °C/hr No direct sustained sunlight
<b>Humidity</b>	Operating: 10% to 85% relative humidity, non-condensing, 35° C maximum wet bulb Non-operating: 10% to 90% relative humidity, non-condensing, 35° C maximum wet bulb
<b>Maximum Altitude (non-pressurized)</b>	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet) Non-operating: 12,192 m (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Temperature for details.
<b>Power Supply</b>	<p><b>Processor Support</b></p> <p><b>XW ENTRY</b> 465 watts wide-ranging, active Power Factor Correction, 90% Efficient, with no 6-pin graphics power cables. The Z4 G4 465W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf</a></p> <p><b>XW MID_RANGE</b> 750 watts wide-ranging, active Power Factor Correction, 90% Efficient, with 2x 6-pin graphics power cables. The Z4 G4 750W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf</a></p> <p><b>HIGH-END</b></p> <p><b>XW, CX (i9)</b> 1000 watts wide-ranging, active Power Factor Correction, 90% Efficient. 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.</p> <p><b>CX (i7)</b> 1000 watts wide-ranging, active Power Factor Correction, 90% Efficient. Includes 2x 6+2-pin graphics power cables.</p> <p>The Z4 G4 1000W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf">https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf</a></p> <p><b>NOTE:</b> 1000 W internal power supply, up to 90% efficiency, active PFC available the first half of 2018</p>



### Supported Components

#### Workstation ISV Certifications

See the latest list of certifications at <http://www8.hp.com/us/en/campaigns/workstations/industries-and-partners.html>

#### Processors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>Intel® Xeon® W-Series CPU</b>				
Intel® Xeon® W-2295 3.0 2933 18C CPU	Y	N		
Intel® Xeon® W-2275 3.3 2933 14C CPU	Y	N		
Intel® Xeon® W-2265 3.5 2933 12C CPU	Y	N		
Intel® Xeon® W-2255 3.7 2933 10C CPU	Y	N		
Intel® Xeon® W-2245 3.9 2933 8C CPU	Y	N		
Intel® Xeon® W-2235 3.8 2933 6C CPU	Y	N		
Intel® Xeon® W-2225 4.1 2933 4C CPU	Y	N		
Intel® Xeon® W-2223 3.6 2933 4C CPU	Y	N		
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		
<b>Intel® Core™ X-Series CPU</b>				
Intel® Core™ i9-10980XE 3.0 2933 18C CPU	Y	N		
Intel® Core™ i9-10940X 3.3 2933 14C CPU	Y	N		
Intel® Core™ i9-10920X 3.5 2933 12C CPU	Y	N		
Intel® Core™ i9-10900X 3.7 2933 10C CPU	Y	N		
Intel® Core™ i9-9980XE 3.0 2666 18C CPU	Y	N		
Intel® Core™ i9-9920X 3.5 2666 12C CPU	Y	N		
Intel® Core™ i9-9820X 3.3 2666 10C CPU	Y	N		
Intel® Core™ i7-9800X 3.8 2666 8C CPU	Y	N		
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



### Supported Components

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\*

##### 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 3.5" CMR HDD	XW, CX	Y	Y	QB576AA	
2TB SATA 7200RPM 3.5" SMR HDD	XW, CX	Y	Y	8VE04AA/AT	
4TB SATA 7200RPM Ent 3.5" HDD	XW, CX	Y	Y	K4T76AA	
6TB SATA 7200RPM Ent 3.3" HDD	XW, CX	Y	Y	3DH90AA	



### Supported Components

**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

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>HP Solid State Drives (SSDs) for Workstations</b>					
HP 256GB SATA SSD	XW, CX	Y	Y	A3D26AA/AT	
HP 512GB SATA SSD	XW, CX	Y	Y	D8F30AA	
HP 1TB SATA SSD	XW, CX	Y	Y	F3C96AA/AT	
HP 2TB SATA SSD	XW, CX	Y	Y	Y6P08AA/AT	
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	

#### PCIe Solid State Drives

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>PCIe SSDs for HP Workstations</b>					
HP Z Turbo Drive 256GB MLC Z4/Z6 G4 SSD Kit	XW, CX	N	N	EOL	
HP Z Turbo Drive 512GB MLC Z4/Z6 G4 SSD Kit	XW, CX	N	N	EOL	
HP Z Turbo Drive 1TB MLC Z4/Z6 G4 SSD Kit	XW, CX	N	N	EOL	
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 2TB TLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	3KP39AA	
HP Z Turbo Drive 256GB Z4/Z6 G4 SED Kit	XW, CX	Y	Y	4YZ41AA	
HP Z Turbo Drive 512GB Z4/Z6 G4 SED Kit	XW, CX	Y	Y	4YZ44AA/AT	
HP Z Turbo Drive 1TB SED TLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	6YT76AA	
HP Z Turbo Drive 1TB SED TLC Z4/Z6 G4 SSD Module	XW, CX	Y	Y	6YT79AA	
HP 256GB M.2 2280 PCIe NVMe TLC SSD Z2/Z4/Z6 Kit	XW, CX	Y	Y	8PE68AA	
HP 512GB M.2 2280 PCIe NVMe TLC SSD Z2/Z4/Z6 Kit	XW, CX	Y	Y	8PE69AA	
HP 1TB M.2 2280 PCIe NVMe TLC SSD Z2/Z4/Z6 Kit	XW, CX	Y	Y	8PE70AA	
HP 256GB M.2 2280 PCIe NVMe TLC SSD Module	XW, CX	N	Y	8PE62AA	
HP 512GB M.2 2280 PCIe NVMe TLC SSD Module	XW, CX	N	Y	8PE63AA	
HP 1TB M.2 2280 PCIe NVMe TLC SSD Module	XW, CX	N	Y	8PE64AA	
<b>HP Z Turbo Drive Quad Pro</b>					
HP Z Turbo Drive Quad Pro 2x256GB TLC PCIe® SSD	XW, CX (i9)	Y	Y	4YZ38AA	1, 3
HP Z Turbo Drive Quad Pro 2x512GB TLC PCIe® SSD	XW, CX (i9)	Y	Y	4YZ39AA/AT	1, 3
HP Z Turbo Drive Quad Pro 2x1TB TLC PCIe® SSD	XW, CX (i9)	Y	Y	4YZ40AA	1, 3

### Supported Components

HP Z Turbo Drive Quad Pro 2x2TB PCIe® SSD	XW, CX (i9)	Y	Y	3KP42AA	
HP Z Turbo Drive Quad Pro 256GB TLC SSD module	XW, CX (i9)	N	Y	4YZ35AA	1, 2, 3
HP Z Turbo Drive Quad Pro 512GB TLC SSD module	XW, CX (i9)	N	Y	4YZ36AA/AT	1, 2, 3
HP Z Turbo Drive Quad Pro 1TB TLC SSD module	XW, CX (i9)	N	Y	4YZ37AA	1, 2, 3
HP Z Turbo Drive Quad Pro 2TB TLC SSD module	XW, CX (i9)	N	Y	3KP43AA	
<b>HP Z Turbo Drive Dual Pro</b>					
HP Z Turbo Drive Dual Pro 256GB TLC SSD		Y	Y	4YF60AA	
HP Z Turbo Drive Dual Pro 512GB TLC SSD		Y	Y	4YF61AA	
HP Z Turbo Drive Dual Pro 1TB TLC SSD		Y	Y	4YF62AA	
HP Z Turbo Drive Dual Pro 2TB TLC SSD		Y	Y	4YF63AA	
HP 256GB M.2 2280 PCIe NVMe TLC SSD Dual Pro Kit	XW, CX	Y	Y	8PE74AA	
HP 512GB M.2 2280 PCIe NVMe TLC SSD Dual Pro Kit	XW, CX	Y	Y	8PE75AA	
HP 1TB M.2 2280 PCIe NVMe TLC SSD Dual Pro Kit	XW, CX	Y	Y	8PE76AA	
<b>Intel® 905p Series SSD (Optane SSD)</b>					
Intel® Optane SSD 905p 280GB AiC**		Y	Y	2SC47AA	
Intel® Optane SSD 905p 480GB AiC**		Y	Y	2SC48AA	
Intel® Optane SSD 905P 380GB M.2 PCIe Dual		Y	Y	6LA63AA	1
Intel® Optane SSD 905P 2x380GB M.2 PCIe Quad		Y	Y	6LA65AA	1
Intel® Optane SSD 905P 380GB M.2 SSD Module		Y	Y	6LA66AA	2, 3

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

**Note 3:** Z Turbo Drive Quad Pro is not supported on Core i7-X configurations

\*\* PCIe card installed in standard PCIe x4 slot

Intel® Virtual RAID on CPU (Intel® VROC) for NVMe	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Intel® VROC NVMe SSD Standard Controller Module		N	Y	3FJ80AA	1,3
Intel® VROC NVMe SSD Premium Controller Module		N	Y	3FJ81AA	2,3

**NOTE 1:** Enables RAID 0, 1 & 10

**NOTE 2:** Enables RAID 0, 1 & 10 plus RAID 5 with write hole closure options.

**NOTE 3:** Xeon processor required

### Hard Drive Controllers

SAS Controller	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
MicroSemi SmartHBA2100-4i4e SAS Controller	XW	Y	Y	1FV90AA	

**NOTE:** Only available on Xeon W configurations

### Supported Components

#### Graphics

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	Supported # of cards
<b>Graphics Cable Adapters</b>						
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			
HP miniDP-to-DP Adapter (4-pack)	XW, CX	Y	N			
HP miniDP-to-DP Adapter (8-pack)	XW, CX	Y	N			
<b>Graphics Card Connectors</b>						
NVIDIA® SLI 2-slot Graphics Connector	XW, CX	Y	Y	2YY84AA		
Quadro® RTX NVLink 2-slot Bridge (RTX 5000)	XW, CX	N	Y	6FY12AA		
Quadro® RTX NVLink High-Bandwidth 2-slot Bridge (RTX 6000 & 8000)	XW, CX	N	Y	6FY11AA		
<b>Entry 3D</b>						
NVIDIA® Quadro® P400 2GB Graphics	XW, CX	Y	Y	1ME43AA	4	2
NVIDIA® Quadro® P620 2GB Graphics	XW, CX	Y	Y	3ME25AA	4	2
<b>Mid-range 3D</b>						
NVIDIA® Quadro® P1000 4GB Graphics	XW, CX	Y	Y	1ME01AA	3, 4	2
NVIDIA® Quadro® P2000 5GB Graphics	XW, CX	Y	Y	1ME41AA	3, 4	2
NVIDIA® Quadro® P2200 5GB Graphics	XW, CX	Y	Y	6YT67AA	3, 4	2
AMD Radeon™ Pro WX 3100 4GB Graphics	XW, CX	Y	Y	2TF08AA	3, 4	2
AMD Radeon™ Pro WX 3200 4GB Graphics	XW, CX	Y	Y	6YT68AA	3, 4	2
AMD Radeon™ Pro WX 4100 4GB Graphics	XW, CX	N	Y	Z0B15AA	3, 4	2
<b>High-End 3D</b>						
NVIDIA® Quadro® P4000 8GB Graphics	XW, CX	Y	Y	1ME40AA	1, 2, 5	2
NVIDIA® Quadro® RTX 4000 8GB Graphics	XW, CX	Y	Y	5JV89AA	1, 2	2
AMD Radeon™ Pro WX 7100 8GB Graphics	XW, CX	Y	Y	Z0B14AA	1, 2	2
<b>Ultra High-End 3D</b>						
NVIDIA® Quadro® GP100 16GB Graphics	XW, CX	Y		1ZE81AA	1, 2, 5	2
NVIDIA® Quadro® GV100 32GB Graphics	XW, CX	Y		3ME26AA	1, 2, 5	2
NVIDIA® Quadro® P5000 16GB Graphics	XW, CX	Y	Y	Z0B13AA	1, 2, 5	2
NVIDIA® Quadro® P6000 24GB Graphics	XW, CX	Y	Y	Z0B12AA	1, 2, 5	2
NVIDIA® Quadro® RTX 5000 16GB Graphics	XW, CX	Y	Y	5JH81AA	1, 2	2
NVIDIA® Quadro® RTX6000 24GB Graphics	XW, CX	Y	Y	5JH80AA	1, 2	2
NVIDIA® Quadro® RTX 8000 48 GB Graphics	XW, CX	Y	Y	6NB51AA	1, 2	2
AMD Radeon™ Pro WX 9100 16GB Graphics	XW, CX	Y		2TF01AA	1, 2	1
NVIDIA® Quadro® Sync II	XW, CX	Y	Y	1WT20AA		

### Supported Components

**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
	HP 8GB (1x8GB) DDR4-2666 ECC Reg RAM	XW	Y	Y	1XD84AA/AT	1
	16GB (1x16GB) DDR4-2666 ECC Reg RAM	XW	Y	Y	1XD85AA/AT	1
	32GB (1x32GB) DDR4-2666 ECC Reg RAM	XW	Y	Y	1XD86AA/AT	1,2
	HP 8GB (1x8GB) DDR4- 2933 ECC Reg RAM	XW	Y	Y	5YZ56AA /AT	1,3
	16GB (1x16GB) DDR4- 2933 ECC Reg RAM	XW	Y	Y	5YZ54AA/AT	1,3
	32GB (1x32GB) DDR4- 2933 ECC Reg RAM	XW	Y	Y	5YZ55AA / AT	1,3
	64GB (1x64GB) DDR4- 2933 ECC Reg RAM	XW	Y	Y	5YZ55AA / AT	1,3,4
	HP 8GB (1x8GB) DDR4-2666 nECC RAM	CX	Y	Y	3PL81AA	1
	HP 16GB (1x16GB) DDR4-2666 nECC RAM	CX	Y	Y	3PL82AA	1
	HP 8GB (1x8GB) DDR4-2933 nECC RAM	CX	Y	Y	7ZZ64AA /AT	1,3
	HP 16GB (1x16GB) DDR4-2933 nECC RAM	CX	Y	Y	7ZZ65AA / AT	1,3
	HP 32GB (1x32GB) DDR4-2933 nECC RAM	CX	Y	Y	7ZZ66AA/AT	1,3,4

**NOTE 1:** ONLY DDR4 DIMMs are supported.

**NOTE 2:** Memory configurations using Xeon processors and 32GB Registered DIMMs require the HP Z4 Memory Cooling Solution, which is available both CTO (1MY90AV) and AMO (8TC68AA).

**NOTE 3:** Intel® Core™ i9-10900X/XE and with Intel® Xeon® W-2200 family processors only support 2933speed memory.

**NOTE 4:**

- 32GB nECC Memory is only available with Intel® Core™ i9-10900X/XE family processors.
- 64GB Registered Memory is only available with Intel® Xeon® W-2200 family processors.

**NOTE:** Factory-configured CTO (xxxxxAV) and aftermarket AMO (xxxxxAA, xxxxxAT) HP memory part numbers designated as "2666" will be transitioned to use "2933 and 3200" speed memory components. This does not affect HP part number availability, nor does it affect system performance or operation. All hardware configurations currently supporting HP memory part numbers designated as "2666" have been tested to work with "2933 and 3200" memory and are fully-supported by HP under standard support terms.



### Supported Components

Factory Configured System Memory Solutions	Available with Intel Xeon Processor & Registered Memory	Available with Intel Core X Processor & nECC Memory
8GB (1x8GB) DDR4	Yes	Yes
16GB (1x16GB) DDR4	Yes	Yes
16GB (2x8GB) DDR4	Yes	Yes
24GB (3x8GB) DDR4	Yes	Yes
32GB (2x16GB) DDR4	Yes	Yes
32GB (4x8GB) DDR4	Yes	Yes
64GB (2x32GB) DDR4	Yes	Yes (Note 1)
64GB (4x16GB) DDR4	Yes	Yes
64GB (8x8GB) DDR4	Yes	Yes
128GB (2x64GB) DDR4	Yes (Note 2)	No
128GB (4x32GB) DDR4	Yes	Yes (Note 1)
128GB (8x16GB) DDR4	Yes	Yes
192GB (6x32GB) DDR4	Yes	Yes (Note 1)
256GB (4x64GB) DDR4	Yes (Note 2)	No
256GB (8x32GB) DDR4	Yes	Yes (Note 1)
384GB (6x64GB) DDR4	Yes (Note 2)	No
512GB (8x64GB) DDR4	Yes (Note 2)	No

**NOTE 1:** 32GB nECC Memory Configurations are only available with Intel® Core™ i9-10900X/XE family processors.

**NOTE 2:** 64GB Registered Memory Configurations are only available with Intel® Xeon® W-2200 family processors.

### 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
<b>HP SlimTray Optical Drives</b>					
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 HH DVD Writer (16x RW DVD-R)	XW, CX	Y	Y	4AR67AA	
<b>HP SD Card Reader</b>					
HP SD 4 Card Reader	XW, CX	Y	Y	2VK54AA	
<b>NVMe Frame/Carrier</b>					
HP QX310 Removable NVMe Frame/Carrier w/PCIe card	XW, CX	Y	N		
HP QX310 Removable Carrier only	XW, CX	N	Y	8GQ91AA/AT	2

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

**NOTE 2:** Only approved HP Z Turbo storage devices are supported.

\*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	1

### Supported Components

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
Intel® Wi-Fi 6 AX200 & BT PCIe	XW, CX	N	Y	7CE01AA

**Note 1:** Windows 7 is NOT supported

### 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/AT	
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/AT	
HP PS/2 Mouse	XW, CX	Y	Y	QY775AA/AT	
HP USB Hardened Mouse	XW, CX	Y	Y	P1N77AA/AT	

#### 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 Thunderbolt 3 PCIe 2 Port I/O Card	XW, CX	Y	Y	3UU05AA	
HP Z4 G4 Memory Cooling Solution	XW, CX	Y	Y	8TC68AA	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 PCIe 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 Xeon Processors and 32GB Registered 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

### Supported Components

**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
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
Windows 10 Pro 64	CX (i7)	Note 2
Windows 10 Pro High End	CX (i9)	
Windows 7 Professional 64-bit	XW	Note 3
Windows 10 Downgrade to Windows 7*	XW	
HP Linux® Ready	XW, CX	Note 4
Red Hat® Enterprise Linux® (RHEL) Workstation - Paper License (1yr)	XW, CX	Note 5

\*only available in China through June 2019.

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

**NOTE 2:** Only applicable to Core i7 X configurations

**NOTE 3:** Not supported or available for Core X configurations. For detailed Windows 7 OS hardware support information see <http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf>.

**NOTE 4:** includes drivers for 64-bit OS versions of RHEL 6 & 7, SUSE Linux® Enterprise Desktop 11 and Ubuntu 14.04. For detailed Linux® OS/hardware support information, see: [http://www.hp.com/support/linux\\_hardware\\_matrix](http://www.hp.com/support/linux_hardware_matrix)

**NOTE 5:** This second OS must be ordered with the HP Linux® Installer Kit as the first OS.



### System Technical Specifications

#### System Board

**System Board Form Factor**

Main System Board:  
27.7 x 28.0 cm  
10.9 x 11.0 inches  
Single LGA2066 R4

**Processor Socket Chipset**

**Intel® Xeon® W Processor Family**  
Intel® C422 Chipset

**Intel® Core™ X-series Processors**  
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

DDR4, UDIMM, non-ECC

**Memory Modes**

Channel Interleaved

**Memory Speed Supported**

2933MT/s, 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 512GB

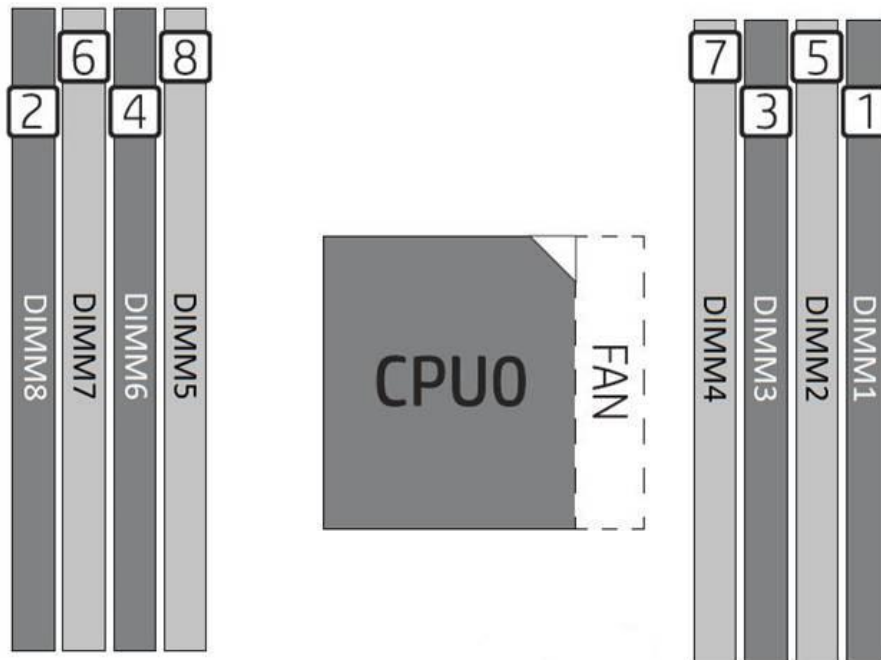
Supports up to 256GB

**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.

### System Technical Specifications

For systems installed with Microsoft Windows 7 (Ultimate, Enterprise or Pro), the maximum accessible system memory is 192GB

#### PCI Express Connectors

#### Intel® Xeon® W Processor Family

#### Intel® Core™ X-series Processors

**Slot 1 (top):** PCI Express Gen3 x16 supplied by CPU.

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

**Slot 3:**

PCI Express Gen3 x16 supplied by CPU

**Slot 3:**

Core i9-X and Core i7-9800X configs: PCI Express Gen3 x16 supplied by CPU

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:**

PCI Express Gen3 x8 supplied by CPU with open-ended connector\*\*

**Slot 5:**

- Core i9-X and Core i7-9800X configs: PCI Express Gen3 x8 supplied by CPU with open-ended connector\*\*
- Other 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:**

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:**

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

<b>SATA</b>	6 SATA @ 6GB/s, supports RAID 0, 1, 5, and 10 Factory integrated Intel® SATA RAID is Microsoft Windows only	
<b>Serial Attached SCSI</b>	<b>Intel® Xeon® W Processor Family</b> Requires Optional PCIe card	<b>Intel® Core™ X-series Processors</b> not supported
<b>Factory Configured RAID</b>	<ul style="list-style-type: none"> <li>• RAID 0 striped array</li> <li>• RAID 1 mirrored array</li> <li>• RAID 10 striped and mirrored array</li> </ul> <p>*HW RAID functionality not supported by Linux®. Use SW RAID functionality provided in the Red Hat® Operating system instead.</p>	

#### Integrated Graphics

No

#### Network Controller

<b>Intel® Xeon® W Processor Family</b> Intel® I219-LM PCIe GbE LAN Intel® I210-AT PCIe GbE LAN Supports the following management functionalities: Intel AMT11.1x, TXT, DASH 1.1, WOL, VLAN, Teaming and PXE 2.1	<b>Intel® Core™ X-series Processors</b> Intel® I219-V PCIe GbE LAN Supports the following management functionalities: WOL and PXE 2.1
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#### External SATA (eSATA)

Supported on all SATA ports configurable with optional eSATA\* cable kit  
\* 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:  
- Standard: 4 USB 3.1 G1 Type A (1 charging)  
- Premium: 2 USB 3.1 G2 Type C™, 2 USB 3.1 G1 Type A (1 charging)

##### Rear

#### Intel® Xeon® W Processor Family

6 USB 3.1 G1 Type A

#### Intel® Core™ X-series Processors

5 USB 3.1 G1 Type-A

##### Internal

1 USB 3.1 G1 single-port header  
1 USB 2.0 single-port header  
1x USB 2.0 dual-port header

### System Technical Specifications

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



### System Technical Specifications

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

<b>Example Z4 G4 Workstation Configuration #1</b>  <b>ENERGY STAR® Certified</b>	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	

<b>Example Z4 G4 Workstation Configuration #2</b>  <b>ENERGY STAR® Certified</b>	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		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled



### System Technical Specifications

(Btu/hr)	Windows Idle (S0)	136.299		135.009		139.741	
	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	

<b>Example Z4 G4 Workstation Configuration #3</b>	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					

<b>Energy Consumption (Watts)</b>		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	

<b>Heat Dissipation (Btu/hr)</b>		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	

<b>Example Z4 G4 Workstation Configuration #4</b>	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					

<b>Energy Consumption (Watts)</b>		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		

### System Technical Specifications

	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
	Zero Power Mode (ErP)	0.203		0.399		0.191	
<b>Heat Dissipation</b> (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	

<b>Example Z4 G4 Workstation Configuration #5</b>	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

<b>Energy Consumption</b> (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	

<b>Heat Dissipation</b> (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	

<b>Example Z4 G4 Workstation Configuration #6</b>	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

### System Technical Specifications

	Other	N/A					
<b>Energy Consumption</b> (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	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	
<b>Heat Dissipation</b> (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)

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

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

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

### System Technical Specifications

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

<b>Environmental Requirements</b>	<b>Temperature</b>	Non-operating: -40° to 60° C (-40° to 140° F) Operating: 5° to 35° C (40° to 95° F) Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation Maximum rate of change: 10 °C/hr No direct sustained sunlight
	<b>Humidity</b>	Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb

### System Technical Specifications

	Non-operating: 10% to 90% RH, non-condensing, 35° C maximum wet bulb
<b>Maximum Altitude</b>	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet) Non-operating: 12,192 m (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Temperature for details.
<b>Shock (non-repetitive)</b>	Operating: ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g) Non-operating square: 422 cm/s, 20g
<b>Vibration</b>	Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g <sup>2</sup> /Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g <sup>2</sup> /Hz

### Physical Security and Serviceability

<b>Access Panel</b>	Tool-less Includes system board and memory information.
<b>Hard Drives</b>	Tool-less
<b>Expansion Cards</b>	Tool-less
<b>Processor Socket</b>	Tool-less
<b>Blue User Touch Points</b>	Yes, on primary serviceable components.
<b>Color-coordinated Cables and Connectors</b>	Yes
<b>Memory</b>	Tool-less
<b>System Board</b>	Screw-In
<b>Dual Color Power/Failure LED</b>	Yes
<b>HDD Activity LED</b>	Yes <a href="#">Note: HDD Activity LED is not dual-color</a>
<b>Configuration Record SW</b>	Yes
<b>Over-Temp Warning on Screen</b>	Yes, at POST screen on reboot
<b>Restore CD/DVD Set</b>	Restores the computer to its original factory shipping image; can be obtained via HP Support.
<b>Dual Function Front Power Switch</b>	Yes, causes a fail-safe power off when held for 4 seconds
<b>Padlock Support</b>	Yes (optional): Locks side cover and secures chassis from theft 7.0 mm (0.2756 in) diameter padlock loop at rear of system
<b>Cable Lock Support</b>	Yes, Kensington Cable Lock (optional): Locks side cover and secures chassis from theft 3 mm x 7 mm slot at rear of system
<b>Universal Chassis Clamp Lock Support</b>	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 Threaded feature at rear of system
<b>Solenoid Lock and Hood Sensor</b>	Yes (optional) 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

### System Technical Specifications

<b>Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control</b>	Yes, enables or disables serial, USB, audio, and network ports	
<b>Removable Media Write/Boot Control</b>	Yes, prevents ability to boot from removable media on supported devices (and can disable writes to media)	
<b>Power-On Password Setup Password</b>	Yes, prevents an unauthorized person from booting up the workstation	
<b>3.3V Aux Power LED on System PCA</b>	Yes	
<b>NIC LEDs (integrated) (Green &amp; Amber)</b>	Yes	
<b>CPUs and Heatsinks</b>	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	
<b>Power Supply Diagnostic LED</b>	Yes	
<b>Front Power Button</b>	Yes, ACPI multi-function	
<b>Rear Power Button</b>	Yes	
<b>Front Power LED</b>	Yes, white (normal), red (fault)	
<b>Front Hard Drive Activity LED</b>	Yes, white	
<b>Front ODD Activity LED</b>	Yes, on device	
<b>Internal Speaker</b>	Yes	
<b>System/Emergency ROM Flash Recovery</b>	Recovers corrupted system BIOS.	
<b>Cooling Solutions</b>	Air cooled forced convection heatsinks	
<b>Power Supply Fans</b>	80 mm x 80 mm x 25 mm (non-serviceable)	
<b>CPU Heatsink Fan</b>	<b>Intel® Xeon® W Processor Family</b>	<b>Intel® Core™ X-series Processors</b>
	CPU configs <= 140W: 92 mm x 92 mm x 25 mm, 5-wire, PWM	CPU configs <= 140W: 92 mm x 92 mm x 25 mm, 5-wire, PWM
	CPU configs > 140W: 92 mm x 92 mm x 25 mm, 6-wire, PWM (includes 6-to-5pin cable adapter)	CPU configs > 140W: 92 mm x 92 mm x 25 mm, 6-wire, PWM (includes 6-to-5pin cable adapter)
<b>Chassis Fan</b>	Front: (Optional) 92 mm x 92mm x 25 mm, 4-wire, PWM	
	Rear: 120 mm x 120mm x 25 mm, 4-wire, PWM	
<b>Memory Heatsink Fan</b>	Dual 60 mm x 60 mm x 25 mm, 6-wire, PWM, Blindmate (optional based on configuration)	
<b>HP PC Hardware Diagnostics UEFI</b>	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.	
<b>Access Panel Key Lock</b>	Yes, side panel barrel keylock (optional from the factory only)	
<b>ACPI-Ready Hardware</b>	Advanced Configuration and Power Management Interface (ACPI). <ul style="list-style-type: none"> <li>• Allows the system to wake from a low-power mode.</li> </ul>	



### System Technical Specifications

- 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

<b>Trusted Platform Module Chip</b>	Infineon TPM 2.0 Certified
<b>Integrated Chassis Handles</b>	Yes, Front handle and dedicated rear recess
<b>Power Supply</b>	Requires T15 Torx or flat blade screwdriver
<b>PCIe Card Retention</b>	Yes, rear (all), middle (all), front (full-length cards with extender, using HP Z4 G4 Fan and Front Card Guide Kit)
<b>Flash ROM</b>	Yes
<b>Diagnostic Power Switch LED on board</b>	Yes
<b>Clear Password Jumper</b>	Yes
<b>Clear CMOS Button</b>	Yes
<b>CMOS Battery Holder</b>	Yes
<b>DIMM Connectors</b>	Yes

### BIOS

<b>BIOS 32-bit Services</b>	Standard BIOS 32-bit Service Directory Proposal v0.4
<b>PCI 3.0 Support</b>	Full BIOS support for PCI Express through industry standard interfaces.
<b>ATAPI</b>	ATAPI Removable Media Device BIOS Specification Version 1.0.
<b>BBS</b>	BIOS Boot Specification v1.01.
<b>WMI Support</b>	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.
<b>BIOS Boot Spec 1.01+</b>	Provides more control over how and from what devices the workstation will boot.
<b>BIOS Power On</b>	Users can define a specific date and time for the system to power on.
<b>ROM Based Computer Setup Utility (F10)</b>	Review and customize system configuration settings controlled by the BIOS.
<b>System/Emergency ROM Flash Recovery with Video</b>	Recovers system BIOS in corrupted Flash ROM.
<b>Replicated Setup</b>	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).
<b>SMBIOS</b>	System Management BIOS 2.8, for system management information.
<b>Boot Control</b>	Disables the ability to boot from removable media on supported devices.
<b>Memory Change Alert</b>	Alerts management console if memory is removed or changed.
<b>Thermal Alert</b>	Monitors the temperature state within the chassis. Three modes: <ul style="list-style-type: none"> <li>• NORMAL - normal temperature ranges.</li> <li>• ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown.</li> <li>• SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs.</li> </ul>
<b>Remote ROM Flash</b>	Provides secure, fail-safe ROM image management from a central network console.
<b>ACPI (Advanced Configuration and Power Management Interface)</b>	Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.

### System Technical Specifications

<b>Ownership Tag</b>	Supports ACPI 5.0 for full compatibility with 64-bit operating systems.
<b>Remote Wakeup/Remote Shutdown</b>	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen. 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.
<b>Instantly Available PC (Suspend to RAM - ACPI sleep state S3)</b>	Allows for very low power consumption with quick resume time.
<b>Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)</b>	Allows a new or existing system to boot over the network and download software, including the operating system.
<b>ROM revision levels</b>	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.
<b>System board revision level</b>	Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified.
<b>Start-up Diagnostics (Power-on Self-Test)</b>	Assesses system health at boot time with selectable levels of testing.
<b>Auto Setup when new hardware installed</b>	System automatically detects addition of new hardware.
<b>Keyboard-less Operation</b>	The system can be booted without a keyboard.
<b>Localized ROM Setup</b>	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 14 languages with local keyboard mappings.
<b>Asset Tag</b>	The user or MIS to set a unique tag string in non-volatile memory.
<b>Per-slot Control</b>	Allows I/O slot parameters (option ROM enable/disable, bus latency) to be configured individually.
<b>Adaptive Cooling</b>	Control parameters are set according to detected hardware configuration for optimal acoustics.
<b>Pre-boot Diagnostics</b>	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
<b>Industry Standard Specification Support</b>	
<b>Industry Standard UEFI Specification Revision</b>	Revision Supported by the BIOS 2.5
<b>ACPI</b>	Advanced Configuration and Power Management Interface, Version 5.0
<b>ATA (IDE)</b>	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
<b>CD Boot</b>	"El Torito" Bootable CD-ROM Format Specification Version 1.0
<b>EDD</b>	- Enhanced Disk Drive Specification Version 1.1 - BIOS Enhanced Disk Drive Specification Version 3.0
<b>EHCI</b>	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
<b>PCI</b>	PCI Local Bus Specification, Revision 2.3 PCI Power Management Specification, Revision 1.1 PCI Firmware Specification, Revision 3.0, Draft .7
<b>PCI Express</b>	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0
<b>PMM</b>	POST Memory Manager Specification, Version 1.01
<b>SATA</b>	Serial ATA Specification, Revision 1.0a Serial ATA 3 Gb/s: Serial ATA Specification, Revision 2.5 Serial ATA 6 Gb/s: Serial ATA Specification, Revision 3.0
<b>SPD</b>	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
<b>TPM</b>	Trusted Platform Module (TPM) 2.0 (Infineon SLB 9670)

### System Technical Specifications

<b>UHCI</b>	Common Criteria EAL4+ Certified FIPS 140-2 Certified TCG TPM Certified products list: <a href="http://www.trustedcomputinggroup.org/certification/tpm-certified-products/">http://www.trustedcomputinggroup.org/certification/tpm-certified-products/</a> Universal Host Controller Interface Design Guide, Revision 1.1
<b>USB</b>	Universal Serial Bus Revision 1.1 Specification Universal Serial Bus Revision 2.0 Specification Universal Serial Bus Revision 3.1 G1 Specification Universal Serial Bus Revision 3.1 G2 Specification
<b>SMBIOS</b>	System Management BIOS Reference Specification, Version 2.8  External BIOS simulator found at: <a href="http://h20464.www2.hp.com/index.html">http://h20464.www2.hp.com/index.html</a>

### 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 3<sup>rd</sup> 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

**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.

### System Technical Specifications

#### HP Inc. Corporate Environmental Information Additional Information

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

[Sustainability Report](#)  
[Eco-label certifications ISO 14001 certificates](#)

- 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
- A multi-unit eco packaging option is available to institutional customers that uses less packaging material or has a lower volume footprint than conventional single-unit packaging. Please contact your sales representative for additional details.

#### 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

#### Industry Standard Specifications

##### Intel® Xeon® W Processor Family

This product meets the following industry standard specifications for manageability functionality:

- DASH 1.1 (via Intel® LAN on motherboard)

#### Intel Active Management Technology (AMT)

Intel® Active Management Technology (AMT) 11.1x

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 11.1x includes the following advanced management functions:

- Power Management (on, off, reset, graceful shutdown, sleep and hibernate)
  - Support in Max Power Savings (Shutdown and Hibernate Modes)
- Hardware Inventory (includes BIOS and firmware revisions)
- Hardware Alerting
- Agent Presence
- System Defense Filters
- Serial Over LAN (SOL)

##### Intel® Core™ X-series Processors

None apply

### System Technical Specifications

- USB Redirect (Media Redirection)
- ME Wake-on-LAN (WOL), even with Maximum Power Savings Enabled
- DASH 1.1 compliance
- IPv6 Support
- 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
- Remote Scheduled Maintenance - pre-schedule when the system connects to the IT or service provider console for maintenance.
- Remote Alerts - automatically alert IT or service provider if issues arise
- Access Monitor - Provides oversight into Intel® AMT actions to support security requirements
- PC Alarm Clock
- Microsoft NAP Support
- Host Base set-up and configuration
- Management Engine (ME) firmware roll back
- Local Time Sync to UTC
- 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: Not supported

- Intel® Xeon® processor W-2100 product family featuring Intel® vPro™ Technology
- Intel® C422 chipset
- Intel® I219LM GbE LAN

**Remote Manageability Software Solutions** The HP Z4 G4 Workstation is supported on the following optional remote manageability software consoles: • Microsoft System Center Configuration Manager

- LANDesk Management Suite (HP recommended solution)
- Microsoft System Center Configuration Manager

For questions or support for manageability needs, please visit <http://www.hp.com/go/easydeploy>

**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](#))

### System Technical Specifications

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.

**NOTE 1:** Terms and conditions may vary by country. Certain restrictions and exclusions apply.

**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.

**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.

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.
- 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

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

#### Hard Drives

1TB SATA 7200 RPM

#### Graphics

AMD Radeon™ Pro WX 3100 4GB Graphics  
NVIDIA® Quadro® P400 2GB Graphics  
NVIDIA® Quadro® P1000 4GB Graphics  
NVIDIA® Quadro® P2000 5GB Graphics

### Technical Specifications - Processors

#### Intel® Xeon® W-Series CPU

Intel® Xeon® W-2295 3.0 2933 18C CPU  
Intel® Xeon® W-2275 3.3 2933 14C CPU  
Intel® Xeon® W-2265 3.5 2933 12C CPU  
Intel® Xeon® W-2255 3.7 2933 10C CPU  
Intel® Xeon® W-2245 3.9 2933 8C CPU  
Intel® Xeon® W-2235 3.8 2933 6C CPU  
Intel® Xeon® W-2225 4.1 2933 4C CPU  
Intel® Xeon® W-2223 3.6 2933 4C 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™ i9-10980XE 3.0 2933 18C CPU  
Intel® Core™ i9-10940X 3.3 2933 14C CPU  
Intel® Core™ i9-10920X 3.5 2933 12C CPU  
Intel® Core™ i9-10900X 3.7 2933 10C CPU  
Intel® Core™ i9-9980XE 3.0 2666 18C CPU  
Intel® Core™ i9-9920X 3.5 2666 12C CPU  
Intel® Core™ i9-9820X 3.3 2666 10C CPU  
Intel® Core™ i7-9800X 3.8 2666 8C 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

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

\*Actual performance may vary.

### Technical Specifications - Hard Drives

#### SATA (Serial ATA) Hard Drives for HP Workstations

**500GB SATA 7200 rpm  
6Gb/s 3.5" HDD**

<b>Capacity</b>	500GB
<b>Height</b>	1 in; 2.54 cm
<b>Width</b>	<b>Media Diameter</b> 3.5 in; 8.9 cm
	<b>Physical Size</b> 4 in; 10.17 cm
<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s*
<b>Buffer</b>	16MB
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 2 ms*
	<b>Average</b> 11 ms*
	<b>Full Stroke</b> 21 ms*
<b>Rotational Speed</b>	7,200 rpm
<b>Logical Blocks</b>	976,773,168
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)

\*Actual performance may vary.

**1TB SATA 7200 rpm  
6Gb/s 3.5" HDD**

<b>Capacity</b>	1TB
<b>Height</b>	1 in; 2.54 cm
<b>Width</b>	<b>Media Diameter</b> 3.5 in; 8.9 cm
	<b>Physical Size</b> 4 in; 10.17 cm
<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600 MB/s*
<b>Buffer</b>	64MB
<b>Cache</b>	Adaptive
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 2 ms*
	<b>Average</b> 11 ms*
	<b>Full Stroke</b> 21 ms*
<b>Rotational Speed</b>	7,200 rpm
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)

\*Actual performance may vary.

**2.0TB SATA 7200 rpm  
6Gb/s 3.5" HDD CMR**

<b>Capacity</b>	2.0TB
<b>Height</b>	1 in; 2.54 cm
<b>Width</b>	<b>Media Diameter</b> 3.5 in; 8.9 cm
	<b>Physical Size</b> 4 in; 10.17 cm
<b>Interface</b>	Serial ATA (6.0 Gb/s), NCQ Enabled
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600 MB/s*
<b>Buffer</b>	64MB
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 1.0 ms*
	<b>Average</b> 11 ms*
	<b>Full Stroke</b> 18 ms*

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Hard Drives

	<b>Rotational Speed</b>	7,200 rpm		
	<b>Logical Blocks</b>	3,907,029,168		
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)		
	<i>*Actual performance may vary.</i>			
<b>2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD SMR</b>	<b>Capacity</b>	2.0TB		
	<b>Height</b>	1 in; 2.54 cm		
	<b>Width</b>		<b>Media Diameter</b> 3.5 in; 8.9 cm	
			<b>Physical Size</b> 4 in; 10.17 cm	
	<b>Interface</b>	Serial ATA (6.0 Gb/s), NCQ Enabled		
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600 MB/s*		
	<b>Buffer</b>	64MB		
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.2 ms*	
		<b>Average</b>	12 ms*	
		<b>Full Stroke</b>	21 ms*	
	<b>Rotational Speed</b>	7,200 rpm		
	<b>Logical Blocks</b>	3,907,029,168		
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C)		
	<i>*Actual performance may vary.</i>			
	<b>1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)</b>	<b>Capacity</b>	1TB	
<b>Protocol</b>		SATA		
<b>Form Factor</b>		3.5"		
<b>Controller</b>		AHCI		
<b>Reliability (MTBF)</b>		2.0M hours		
<b>Rated Power On Hours</b>		8760/yr		
<b>Annualized Failure Rate</b> (based on Rated POH)		<0.62%		
<b>Rated for 24/7/365 operation</b>		YES		
<b>Physical Size (Height)</b>		1 in; 2.54 cm		
<b>Physical Size (Width)</b>		4 in; 10.17 cm		
<b>Media Diameter</b>		3.5 in; 8.9 cm		
<b>Interface</b>		Serial ATA (6Gb/s), NCQ enabled		
<b>Synchronous Transfer Rate (Maximum)</b>		Up to 600MB/s*		
<b>Buffer</b>		128MB		
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)		<b>Single Track</b>	0.32ms*	
		<b>Average</b>	7.45ms*	
		<b>Full Stroke</b>	14.2ms*	
<b>Operating Temperature</b>		41° to 140° F (5° to 60° C)		
<b>Performance</b>		<b>Sequential Read</b>	up to 226MB/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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Hard Drives

**Sequential Write**

up to 226MB/s\*

**Enterprise Class Features** High Reliability*\*Actual performance may vary.*

### Technical Specifications - Hard Drives

#### 4TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)

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

\*Actual performance may vary.

#### 500GB SATA 7.2K SED SFF HDD

<b>Capacity</b>	500GB
<b>Height</b>	0.275 in; 0.7 cm
<b>Width</b>	<b>Media Diameter</b> 2.5 in; 6.36 cm
	<b>Physical Size</b> 2.75 in; 6.99 cm
<b>Interface</b>	Serial ATA (6Gb/s)
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s*
Buffer	32MB
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 1ms*
	<b>Average</b> 4.2ms*
	<b>Full Stroke</b> 25ms (typical)*
Rotational Speed	7,200 rpm
Operating Temperature	32° to 140° F (0° to 60° C)

\*Actual performance may vary.

### Technical Specifications - Hard Drives

#### SATA SSDs for HP Workstations

#### HP 256GB SATA 6Gb/s SSD

<b>Capacity</b>	256GB								
<b>Protocol</b>	SATA								
<b>Form Factor</b>	2.5"								
<b>Controller</b>	AHCI								
<b>NAND Type</b>	3D TLC								
<b>Endurance</b>	192TBW (TB Written)								
<b>Reliability (MTTF)</b>	1.5M hours								
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm								
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm								
<b>Interface</b>	SATA 6Gb/s								
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s*								
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)								
<b>Performance</b>	<table> <tr> <td><b>Sequential Read</b></td> <td>530MB/s (max)*</td> </tr> <tr> <td><b>Sequential Write</b></td> <td>500MB/s (max)*</td> </tr> <tr> <td><b>Random Read</b></td> <td>55K IOPS (max)*</td> </tr> <tr> <td><b>Random Write</b></td> <td>83K IOPS (max)*</td> </tr> </table>	<b>Sequential Read</b>	530MB/s (max)*	<b>Sequential Write</b>	500MB/s (max)*	<b>Random Read</b>	55K IOPS (max)*	<b>Random Write</b>	83K IOPS (max)*
<b>Sequential Read</b>	530MB/s (max)*								
<b>Sequential Write</b>	500MB/s (max)*								
<b>Random Read</b>	55K IOPS (max)*								
<b>Random Write</b>	83K IOPS (max)*								

\*Actual performance may vary.

#### HP 256GB SATA 6Gb/s SED Opal 2 SSD

<b>Capacity</b>	256GB								
<b>Protocol</b>	SATA								
<b>Form Factor</b>	2.5"								
<b>Controller</b>	AHCI								
<b>NAND Type</b>	3D TLC								
<b>Endurance</b>	192TBW (TB Written)								
<b>Reliability (MTTF)</b>	1.5M hours								
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm								
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm								
<b>Interface</b>	6Gb/s SATA								
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)*								
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)								
<b>Performance</b>	<table> <tr> <td><b>Sequential Read</b></td> <td>530MB/s*</td> </tr> <tr> <td><b>Sequential Write</b></td> <td>500 MB/s*</td> </tr> <tr> <td><b>Random Read</b></td> <td>55K IOPS*</td> </tr> <tr> <td><b>Random Write</b></td> <td>83K IOPS*</td> </tr> </table>	<b>Sequential Read</b>	530MB/s*	<b>Sequential Write</b>	500 MB/s*	<b>Random Read</b>	55K IOPS*	<b>Random Write</b>	83K IOPS*
<b>Sequential Read</b>	530MB/s*								
<b>Sequential Write</b>	500 MB/s*								
<b>Random Read</b>	55K IOPS*								
<b>Random Write</b>	83K IOPS*								
<b>Self-Encrypting Drive Support</b>	OPAL 2								

\*Actual performance may vary.

#### HP 512GB SATA 6Gb/s SSD

<b>Capacity</b>	512GB
<b>Protocol</b>	SATA
<b>Form Factor</b>	2.5"
<b>Controller</b>	AHCI
<b>NAND Type</b>	3D TLC

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Hard Drives

<b>Endurance</b>	388TBW (TB Written)	
<b>Reliability (MTTF)</b>	1.5M hours	
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm	
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm	
<b>Interface</b>	SATA 6Gb/s	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)*	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	530 MB/s*
	<b>Sequential Write</b>	500 MB/s*
	<b>Random Read</b>	95K IOPS*
	<b>Random Write</b>	83K IOPS*

\*Actual performance may vary.

<b>HP 512GB SATA SED SSD</b>	<b>Capacity</b>	512GB		
	<b>Protocol</b>	SATA		
	<b>Form Factor</b>	2.5"		
	<b>Controller</b>	AHCI		
	<b>NAND Type</b>	3D TLC		
	<b>Endurance</b>	388TBW (TB Written)		
	<b>Reliability (MTTF)</b>	1.5M hours		
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm		
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm		
	<b>Interface</b>	SATA 6Gb/s		
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s*		
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)		
	<b>Performance</b>	<b>Sequential Read</b>	530 MB/s*	
		<b>Sequential Write</b>	500 MB/s*	
<b>Random Read</b>		95K IOPS*		
<b>Random Write</b>		83K IOPS*		
<b>Self-Encrypting Drive Support</b>	OPAL 1 and 2			

\*Actual performance may vary.

<b>HP 1TB SATA 6Gb/s SSD</b>	<b>Capacity</b>	1TB	
	<b>Protocol</b>	SATA	
	<b>Form Factor</b>	2.5"	
	<b>Controller</b>	AHCI	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	400TBW (TB Written)	
	<b>Reliability (MTTF)</b>	1.5M hours	
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm	
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm	
	<b>Interface</b>	SATA 6Gb/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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Hard Drives

<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)*	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	530 MB/s*
	<b>Sequential Write</b>	500 MB/s*
	<b>Random Read</b>	95K IOPS*
	<b>Random Write</b>	83K IOPS*

\*Actual performance may vary.

#### HP 2TB SATA 6Gb/s SSD

<b>Capacity</b>	2TB	
<b>Protocol</b>	SATA	
<b>Form Factor</b>	2.5"	
<b>Controller</b>	AHCI	
<b>NAND Type</b>	3D TLC	
<b>Endurance</b>	400TBW (TB Written)	
<b>Reliability (MTTF)</b>	1.5M hours	
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm	
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm	
<b>Interface</b>	SATA 6Gb/s	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)*	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Sequential Read</b>	530 MB/s*
	<b>Sequential Write</b>	500 MB/s *
	<b>Random Read</b>	95K IOPS*
<b>Random Write</b>	83K IOPS*	

\*Actual performance may vary.

#### HP Enterprise Class 240GB SATA SSD

<b>Capacity</b>	240GB	
<b>Protocol</b>	SATA	
<b>Form Factor</b>	2.5"	
<b>Controller</b>	AHCI	
<b>NAND Type</b>	3D TLC	
<b>Endurance</b>	2,200TBW (TB Written)	
<b>Reliability (MTTF)</b>	2.0M hours	
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm	
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm	
<b>Interface</b>	6Gb/s SATA	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s*	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Sequential Read</b>	540 MB/s*
	<b>Sequential Write</b>	310 MB/s*
	<b>Random Read</b>	93K IOPS*
<b>Random Write</b>	48K 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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020





### Technical Specifications - Hard Drives

**Enterprise Class Features** High Endurance NAND  
Power Loss Protection  
End-to-End Data Protection

*\*Actual performance may vary.*

**HP Enterprise Class  
480GB SATA SSD**

**Capacity** 480GB  
**Protocol** SATA  
**Form Factor** 2.5"  
**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  
Power Loss Protection  
End-to-End Data Protection

*\*Actual performance may vary.*

**Value PCIe SSDs for HP  
Workstations**

**HP Z Turbo Drive G2  
256GB M.2 2280 SSD**

**Capacity** 256GB  
**Protocol** PCIe  
**Form Factor** M.2  
**Controller** NVMe  
**NAND Type** 3D TLC  
**Endurance** 200TB  
**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** 3100 MB/s \*  
**Sequential Write** 1400 MB/s \*  
**Random Read** 200K IOPS \*  
**Random Write** 320K IOPS \*

*\*Actual performance may vary.*

**HP 512GB M.2 2280 SSD**

**Capacity** 512GB  
**Protocol** PCIe  
**Form Factor** M.2

**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

<b>Controller</b>	NVMe	
<b>NAND Type</b>	3D MLC	
<b>Endurance</b>	300TB	
<b>Reliability (MTBF)</b>	1.5M hours	
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	3400 MB/s*
	<b>Sequential Write</b>	2500 MB/s*
	<b>Random Read</b>	380K IOPS*
	<b>Random Write</b>	430K IOPS*

\*Actual performance may vary.

#### HP 1TB M.2 2280 SSD

<b>Capacity</b>	1TB	
<b>Protocol</b>	PCIe	
<b>Form Factor</b>	M.2	
<b>Controller</b>	NVMe	
<b>NAND Type</b>	3D TLC	
<b>Endurance</b>	400TB	
<b>Reliability (MTTF)</b>	1.5M hours	
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	3400 MB/s*
	<b>Sequential Write</b>	2500 MB/s*
	<b>Random Read</b>	500K IOPS*
	<b>Random Write</b>	440K IOPS*

\*Actual performance may vary.

### Technical Specifications - Hard Drives

<b>HP Z Turbo Drive Quad Pro 2x256GB PCIe SSD</b>	<b>Capacity</b>	512GB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	PCIe Card, Full Height PCIe Slot	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	200TB	
	<b>Reliability (MTBF)</b>	1.5M hours	
	<b>Interface</b>	PCIe Gen3 x4 architecture	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	3500 MB/s*
		<b>Sequential Write</b>	2200 MB/s*
		<b>Random Read</b>	240K IOPS*
		<b>Random Write</b>	480K IOPS*

\*Actual performance may vary.

<b>HP Z Turbo Drive Quad Pro 2x512GB PCIe SSD</b>	<b>Capacity</b>	1TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	PCIe Card, Full Height PCIe Slot	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	300TB	
	<b>Reliability (MTBF)</b>	1.5M hours	
	<b>Interface</b>	PCIe Gen3 x4 architecture	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	3500 MB/s*
		<b>Sequential Write</b>	2900 MB/s*
		<b>Random Read</b>	460 K IOPS*
		<b>Random Write</b>	500K IOPS*

\*Actual performance may vary.

<b>HP Z Turbo Drive Quad Pro 2x1TB PCIe SSD</b>	<b>Capacity</b>	2TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	PCIe Card, Full Height PCIe Slot	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D MLC	
	<b>Endurance</b>	400TB	
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	3500 MB/s*
		<b>Sequential Write</b>	3000 MB/s*
		<b>Random Read</b>	580K IOPS*
		<b>Random Write</b>	500K IOPS*

\*Actual performance may vary.

**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

#### HP Z Turbo Drive G2 256GB TLC SSD and 256GB SED TLC SSD

<b>Capacity</b>	256GB								
<b>Protocol</b>	PCIe								
<b>Form Factor</b>	M.2								
<b>Controller</b>	NVMe								
<b>NAND Type</b>	3D TLC								
<b>SED Support</b>	Opal 2								
<b>Endurance</b>	200TBW (TB Written)								
<b>Reliability (MTBF)</b>	1.5M hours								
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical								
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)								
<b>Performance</b>	<table> <tr> <td><b>Sequential Read</b></td> <td>3500 MB/s*</td> </tr> <tr> <td><b>Sequential Write</b></td> <td>2200 MB/s*</td> </tr> <tr> <td><b>Random Read</b></td> <td>240K IOPS*</td> </tr> <tr> <td><b>Random Write</b></td> <td>480K IOPS*</td> </tr> </table>	<b>Sequential Read</b>	3500 MB/s*	<b>Sequential Write</b>	2200 MB/s*	<b>Random Read</b>	240K IOPS*	<b>Random Write</b>	480K IOPS*
<b>Sequential Read</b>	3500 MB/s*								
<b>Sequential Write</b>	2200 MB/s*								
<b>Random Read</b>	240K IOPS*								
<b>Random Write</b>	480K IOPS*								

\*Actual performance may vary.

#### HP Z Turbo Drive G2 512GB TLC SSD and 512GB SED TLC SSD

<b>Capacity</b>	512GB								
<b>Protocol</b>	PCIe								
<b>Form Factor</b>	M.2								
<b>Controller</b>	NVMe								
<b>NAND Type</b>	3D TLC								
<b>SED Support</b>	Opal 2								
<b>Endurance</b>	300TBW (TB Written)								
<b>Reliability (MTBF)</b>	1.5M hours								
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical								
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)								
<b>Performance</b>	<table> <tr> <td><b>Sequential Read</b></td> <td>3500 MB/s*</td> </tr> <tr> <td><b>Sequential Write</b></td> <td>2900 MB/s*</td> </tr> <tr> <td><b>Random Read</b></td> <td>460 K IOPS*</td> </tr> <tr> <td><b>Random Write</b></td> <td>500K IOPS*</td> </tr> </table>	<b>Sequential Read</b>	3500 MB/s*	<b>Sequential Write</b>	2900 MB/s*	<b>Random Read</b>	460 K IOPS*	<b>Random Write</b>	500K IOPS*
<b>Sequential Read</b>	3500 MB/s*								
<b>Sequential Write</b>	2900 MB/s*								
<b>Random Read</b>	460 K IOPS*								
<b>Random Write</b>	500K IOPS*								

\*Actual performance may vary.

#### HP Z Turbo Drive G2 1TB TLC SSD and 1TB SED TLC SSD

<b>Capacity</b>	1TB				
<b>Protocol</b>	PCIe				
<b>Form Factor</b>	M.2				
<b>Controller</b>	NVMe				
<b>NAND Type</b>	3D TLC				
<b>SED Support</b>	Opal 2				
<b>Endurance</b>	400TBW (TB Written)				
<b>Reliability (MTBF)</b>	1.5M hours				
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical				
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)				
<b>Performance</b>	<table> <tr> <td><b>Sequential Read</b></td> <td>3500 MB/s*</td> </tr> <tr> <td><b>Sequential Write</b></td> <td>3000 MB/s*</td> </tr> </table>	<b>Sequential Read</b>	3500 MB/s*	<b>Sequential Write</b>	3000 MB/s*
<b>Sequential Read</b>	3500 MB/s*				
<b>Sequential Write</b>	3000 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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Hard Drives

**Random Read** 580K IOPS\*  
**Random Write** 500K IOPS\*

\*Actual performance may vary.

**HP Z Turbo Drive G2  
 2TB TLC SSD and  
 2TB SED TLC SSD**

**Capacity** 2TB  
**Protocol** PCIe  
**Form Factor** M.2  
**Controller** NVMe  
**NAND Type** 3D TLC  
**SED Support** Opal 2  
**Endurance** 500TBW (TB Written)  
**Reliability (MTBF)** 1.5M hours  
**Interface** PCI Express 3.0 x4 electrical x4 physical  
**Operating Temperature** 32° to 158° F (0° to 70° C)  
**Performance**  
**Sequential Read** 3500 MB/s\*  
**Sequential Write** 3000 MB/s\*  
**Random Read** 600K IOPS\*  
**Random Write** 500K IOPS\*

\*Actual performance may vary.

**HP Z Turbo Drive Dual  
 Pro 256GB SSD**

**Capacity** 256GB  
**Protocol** PCIe  
**Form Factor** M.2 in Half-height, half-length card  
**Controller** NVMe  
**NAND Type** 3D TLC  
**Endurance** 200TBW (TB Written)  
**Reliability (MTBF)** 1.5M hours  
**Interface** PCI Express 3.0 x4 electrical x4 physical  
**Operating Temperature** 32° to 158° F (0° to 70° C)  
**Performance**  
**Sequential Read** 3500 MB/s\*  
**Sequential Write** 2200 MB/s\*  
**Random Read** 240K IOPS\*  
**Random Write** 480K IOPS\*

\*Actual performance may vary.

**HP Z Turbo Drive Dual  
 Pro 512GB SSD**

**Capacity** 512GB  
**Protocol** PCIe  
**Form Factor** M.2 in Half-height, half-length card  
**Controller** NVMe  
**NAND Type** 3D TLC  
**Endurance** 300TBW (TB Written)  
**Reliability (MTBF)** 1.5M hours  
**Interface** PCI Express 3.0 x4 electrical x4 physical

**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

<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	3500 MB/s*
	<b>Sequential Write</b>	2900 MB/s*
	<b>Random Read</b>	460 K IOPS*
	<b>Random Write</b>	500K IOPS*

\*Actual performance may vary.

#### HP Z Turbo Drive Dual Pro 1TB SSD

<b>Capacity</b>	1TB	
<b>Protocol</b>	PCIe	
<b>Form Factor</b>	M.2 in Half-height, half-length card	
<b>Controller</b>	NVMe	
<b>NAND Type</b>	3D TLC	
<b>Endurance</b>	400TBW (TB Written)	
<b>Reliability (MTBF)</b>	1.5M hours	
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	3500 MB/s*
	<b>Sequential Write</b>	3000 MB/s*
	<b>Random Read</b>	580K IOPS*
	<b>Random Write</b>	500K IOPS*

\*Actual performance may vary.

#### HP Z Turbo Drive Dual Pro 2TB SSD

<b>Capacity</b>	2TB	
<b>Protocol</b>	PCIe	
<b>Form Factor</b>	M.2 in Half-height, half-length card	
<b>Controller</b>	NVMe	
<b>NAND Type</b>	3D TLC	
<b>Endurance</b>	500TBW (TB Written)	
<b>Reliability (MTBF)</b>	1.5M hours	
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	3500 MB/s*
	<b>Sequential Write</b>	3000 MB/s*
	<b>Random Read</b>	600K IOPS*
	<b>Random Write</b>	500K IOPS*

\*Actual performance may vary.

#### Intel® 905p Series AIC PCIe SSD

#### Intel® 905p Series AIC 280GB PCIe SSD

<b>Capacity</b>	280GB
<b>Protocol</b>	PCIe
<b>Form Factor</b>	PCIe Card, Half Height
<b>Controller</b>	NVMe
<b>NVM Type</b>	3DXPoint
<b>Endurance</b>	5.11 PBW (PB Written)

**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

	<b>Reliability (MTBF)</b>	1.6M hours
	<b>Operating Temperature</b>	32° to 185° F (0° to 85° C)
	<b>Performance</b>	<b>Sequential Read</b> 2730 MB/s* <b>Sequential Write</b> 2280 MB/s* <b>Random Read</b> 587K IOPS* <b>Random Write</b> 559K IOPS*
	<i>*Actual performance may vary.</i>	
<b>Intel® 905p Series AIC 480GB PCIe SSD</b>	<b>Capacity</b>	480GB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	PCIe Card, Half Height
	<b>Controller</b>	NVMe
	<b>NVM Type</b>	3DXPoint
	<b>Endurance</b>	8.76 PBW (PB Written)
	<b>Reliability (MTBF)</b>	1.6M hours
	<b>Operating Temperature</b>	32° to 185° F (0° to 85° C)
	<b>Performance</b>	<b>Sequential Read</b> 2710 MB/s* <b>Sequential Write</b> 2280 MB/s* <b>Random Read</b> 582K IOPS* <b>Random Write</b> 561K IOPS*
	<i>*Actual performance may vary.</i>	

### Technical Specifications - Hard Drive Controllers

#### HARD DRIVE CONTROLLERS

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



### Technical Specifications - Graphics

#### GRAPHICS

**NVIDIA® Quadro® P400  
2GB Graphics**

**Form Factor**

Dimensions: 2.713” H x 5.7” L  
Single Slot, Low Profile  
Weight: 129 grams

**Graphics Controller**

NVIDIA® Quadro® P400 Graphics Card  
GPU: 256 CUDA cores  
Power: 30 Watts  
Cooling: Active

**Bus Type**

PCI Express 3.0 x16

**Memory**

Size: 2 GB GDDR5, 2000 MHz  
Memory Interface: 64-bit  
Memory Bandwidth: 32 GB/s

**Connectors**

3mDP Outputs\*

**Maximum Resolution**

DisplayPort™ 1.4:  
- up to 3x 5120 x 2880 x 24 bpp @ 60Hz  
- supports Multi-Stream Transport (MST)

**Image Quality Features**

10-bit internal display processing pipeline  
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  
DirectX 12  
Vulkan 1.0  
API support includes:  
CUDA C, CUDA C++, DirectCompute , OpenCL

**Available Graphics Drivers**

Microsoft Windows 10  
Microsoft Windows 8.1  
Microsoft Windows 7  
Linux

HP qualified drivers may be preloaded or available from the HP support Web site:  
<http://welcome.hp.com/country/us/en/support.html>

**Notes**

\*P400, P600 and P1000 only have mini-DisplayPort™ (mDP) video ports.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included  
After market option kit: Two mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

**Form Factor**

Dimensions: 2.713” H x 5.7” 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® P620 2GB Graphics

Single Slot, Low Profile  
Weight: 129 grams

<b>Graphics Controller</b>	NVIDIA® Quadro® P620 Graphics Card GPU: 512 CUDA cores Power: 40 Watts Cooling: Active
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Memory</b>	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 128-bit Memory Bandwidth: 64 GB/s
<b>Connectors</b>	4mDP Outputs *
<b>Maximum Resolution</b>	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
<b>Image Quality Features</b>	10-bit internal display processing pipeline 10-bit scan-out support
<b>Display Output</b>	4 mDP Connectors
<b>Shading Architecture</b>	Full Microsoft DirectX 12 Shader Model 5.1
<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL
<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 8.1 Microsoft Windows 7 Linux

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Notes** \*P620 only have mini-DisplayPort™ (mDP) video ports.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit:Two mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

#### NVIDIA® Quadro® P1000 4GB Graphics

#### Form Factor

Dimensions:2.713" H x 5.7" L  
Single Slot, Low Profile  
Weight: 129 grams

#### Graphics Controller

NVIDIA® Quadro® P1000 Graphics Card  
GPU: 640 CUDA cores

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

Power: 47 Watts  
Cooling: Active  
Cooling: Active

<b>Bus Type</b>	PCI Express 3.0 x16
<b>Memory</b>	Size: 4 GB GDDR5, 2500 MHz Memory Interface: 128-bit memory interface Memory Bandwidth: 80 GB/s memory bandwidth
<b>Connectors</b>	4mDP Outputs*
<b>Maximum Resolution</b>	DisplayPort 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
<b>Image Quality Features</b>	10-bit internal display processing pipeline 10-bit scan-out support
<b>Display Output</b>	4 mDP Connectors
<b>Shading Architecture</b>	Full Microsoft DirectX 12 Shader Model 5.1
<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL
<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 8.1 Microsoft Windows 7 Linux

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Notes** \*P400, P600 and P1000 only have mini-DisplayPort™ (mDP) video ports.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: Two mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

<b>NVIDIA® Quadro® P2000 5GB Graphics</b>	<b>Form Factor</b>	Dimensions: 4.4”H x 7.9”L Single Slot Weight: 260 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P2000 Graphics Card Power: 75 Watts Cooling: Active
	<b>Bus Type</b>	PCI Express 3.0 x16
	<b>Memory</b>	Size: 5GB GDDR5 Memory Bandwidth: 140 GB/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 - Graphics

<b>Connectors</b>	<p>Memory Width: 160-bit</p> <p>4x DisplayPort™ 1.4</p> <p>Factory Configured Option: No adapter included with card After Market Option: No video cable adapter included</p> <p>Additional DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.</p>
<b>Maximum Resolution</b>	<p>DisplayPort™:</p> <ul style="list-style-type: none"> <li>- up to 5120 x 2880 x 24 bpp @ 60Hz</li> <li>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) DP 1.3 &amp; 1.4 ready.</li> </ul> <p>DL-DVI(I) output:</p> <ul style="list-style-type: none"> <li>- up to 2560 x 1600 x 32 bpp @ 60 Hz</li> </ul> <p>Single Link-DVI(I) output:</p> <ul style="list-style-type: none"> <li>- up to 1920 x 1200 x 32 bpp @ 60Hz</li> </ul>
<b>Image Quality Features</b>	<p>HDMI 2.0 (requires DP to HDMI adapter): 5120 x 2880 x 24 bpp @ 60Hz</p> <p>12-bit internal display pipeline (hardware support for 12-bit scanout on supported panels, applications and connection)</p>
<b>Display Output</b>	<p>Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, NVIDIA® Mosaic and nView.</p> <p>Maximum number of displays - 4 direct attached monitors</p> <p>Maximum number of monitors across all available NVIDIA® Quadro® P2000 outputs is 4.</p>
<b>Shading Architecture</b>	Shader Model 5.1
<b>Supported Graphics APIs</b>	<p>OpenGL® 4.5 DirectX® 12</p> <p>API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran software</p>
<b>Available Graphics Drivers</b>	<p>Microsoft Windows 10 Microsoft Windows 7 Professional 64bit Linux® - Full OpenGL® implementation, complete with NVIDIA® Quadro® and ARB extensions</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p>
<b>Notes</b>	<ol style="list-style-type: none"> <li>1. Quadro P2000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.</li> <li>2. Quadro P2000 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately.</li> </ol>

### Technical Specifications - Graphics

<b>NVIDIA® Quadro® P2200 5GB Graphics</b>	<b>Form Factor</b>	Dimensions: 4.4”H x 7.9”L Single Slot, Full Height Weight: 260 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P2200 Graphics Card GPU: 1280 CUDA cores Power: 75 Watts Cooling: Active
	<b>Bus Type</b>	PCI Express 3.0 x16
	<b>Memory</b>	Size: 5GB GDDR5X Memory Bandwidth: 200 GB/s Memory Width: 160-bit
	<b>Connectors</b>	4x DisplayPort™ 1.4  Factory Configured Option: No adapter included with card After Market Option: No video cable adapter included
	<b>Maximum Resolution</b>	Additional DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories. DisplayPort™: - up to 5120 x 2880 x 24 bpp @ 60Hz - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) DP 1.3 & 1.4 ready.  DL-DVI(I) output: - up to 2560 x 1600 x 32 bpp @ 60 Hz  Single Link-DVI(I) output: - up to 1920 x 1200 x 32 bpp @ 60Hz
	<b>Image Quality Features</b>	HDMI 2.0 (requires DP to HDMI adapter): 5120 x 2880 x 24 bpp @ 60Hz 12-bit internal display pipeline (hardware support for 12-bit scanout on supported panels, applications and connection)
	<b>Display Output</b>	Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, NVIDIA® Mosaic and nView. Maximum number of displays - 4 direct attached monitors  Maximum number of monitors across all available NVIDIA® Quadro® P2200 outputs is 4.
	<b>Shading Architecture</b>	Shader Model 5.1
	<b>Supported Graphics APIs</b>	OpenGL® 4.5 DirectX® 12  API support includes:

**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

		CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran software
<b>Available Graphics Drivers</b>		Microsoft Windows 10 Microsoft Windows 7 Professional 64bit Linux® - Full OpenGL® implementation, complete with NVIDIA® Quadro® and ARB extensions
		HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>		<ol style="list-style-type: none"> <li>1. Quadro P2200 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.</li> <li>2. Quadro P2200 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately.</li> </ol>

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<b>Radeon™ Pro WX 3100 4GB Graphics</b>	<b>Form Factor</b>	Low-Profile Single Slot (6.6" Length)
	<b>Graphics Controller</b>	Radeon™ Pro WX 3100 Graphics Card GPU: 512 Stream Processors organized into 8 Compute Units Power: 50 Watts Cooling: Active
	<b>Memory</b>	4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit
	<b>Connectors</b>	2x Mini DisplayPort™ 1.4 plus 1x DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.  Factory Configured: No adapters included After market option kit: One mDP-to-DP cable adapters included  Additional Mini DisplayPort™-to-DisplayPort™, DisplayPort™-to-VGA or DisplayPort™-to-DVI adapters are available as Factory Configuration or Option Kit accessories.
	<b>Maximum Resolution</b>	5K support @ 60Hz <ul style="list-style-type: none"> <li>• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors</li> </ul> 3x 4K support @ 60Hz
	<b>Image Quality Features</b>	Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
	<b>Display Output</b>	3 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
	<b>GPU Architecture</b>	Polaris
	<b>Supported Graphics APIs</b>	DirectX®12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
	<b>Available Graphics Drivers</b>	Windows 10 64-bit (Windows® 7 64-bit available from AMD)

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

Linux® 64-bit (selected Enterprise distributions)

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

1. HDR content requires that the system be configured with a fully 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. 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.
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 3200 4GB Graphics

#### Form Factor

Low-Profile Single Slot (2.75 "H x 6.6" L)

#### Graphics Controller

Radeon™ Pro WX 3200 Graphics Card  
GPU: 640 Stream Processors organized into 8 Compute Units  
Power: 56 Watts  
Cooling: Active

#### Memory

4GB GDDR5 memory  
Memory Bandwidth: 96 GB/s  
Memory Width: 128 bit

#### Connectors

4x Mini DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.

Factory Configured: No adapters included

After market option kit: One mDP-to-DP cable adapters included

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
 

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

 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  
FreeSync support

**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.

C05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

<b>GPU Architecture</b>	Polaris
<b>Supported Graphics APIs</b>	DirectX® 12 OpenGL® 4.6 OpenCL™ 2.0 Vulkan™ 1.0
<b>Available Graphics Drivers</b>	Windows 10 64-bit Linux® 64-bit (selected Enterprise distributions)
	HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ol>

<b>Radeon™ Pro WX 4100 4GB Graphics</b>	<b>Form Factor</b>	Low-Profile Single Slot (6.6" Length)
	<b>Graphics Controller</b>	Radeon™ Pro WX 4100 Graphics card GPU: 1024 Stream Processors organized into 16 Compute Units Power: 50 Watts Cooling: Active
	<b>Memory</b>	4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit
	<b>Connectors</b>	4x Mini DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.  Factory Configured: Four mDP-to-DP cable adapters included After market option kit: Four mDP-to-DP cable adapters included  Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories.
	<b>Maximum Resolution</b>	5K support @ 60Hz <ul style="list-style-type: none"> <li>1x single-cable 5K monitor, or 2x dual-cable 5K monitors</li> </ul> 4x 4K support @ 60Hz

**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

<b>Image Quality Features</b>	Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
<b>Display Output</b>	4 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
<b>GPU Architecture</b>	GCN 4th Generation
<b>Supported Graphics APIs</b>	DirectX® 12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
<b>Available Graphics Drivers</b>	Windows 10 64-bit Windows® 7 64-bit Linux® 64-bit (selected Enterprise distributions)

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

- 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.
- 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.
- 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.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: Four mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

#### NVIDIA® Quadro® P4000 8GB Graphics Form Factor

Dimensions: 4.4"H x 9.5"L  
Single-slot, full-height  
Weight: 475 grams (without extender)

#### Graphics Controller

NVIDIA® Quadro® P4000 Graphics Card  
GPU: 1792 CUDA cores  
Power: 120 Watts

**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

	Cooling: Active
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Memory</b>	Size: 8GB GDDR5 Memory Bandwidth: 243 GB/s Memory Width: 256-bit
<b>Connectors</b>	4 x DisplayPort 1.4 3-pin mini-DIN connector via optional bracket 1 x 6-pin auxiliary power connector 4-pin header for stereo signal SYNC connector for Quadro® Sync II 2 x SLI connectors
	Factory Configured Option: No video cable adapter included After Market Option: No video cable adapter included
	Additional DisplayPort-to-VGA, DisplayPort-to-HDMI, or DisplayPort-to-DVI adapters are available as accessories
<b>Maximum Resolution</b>	Dual-link internal TMDS (DVI 1.0): - up to 2560 x 1600 x 32 bpp @ 60 Hz  Single-link internal TMDS (DVI 1.0): - up to 1920 x 1200 x 32 bpp @ 60 Hz  HDMI™ 2.0b (requires DP to HDMI adapter): - up to 5120 x 2880 x 24 bpp @ 60Hz  DisplayPort: - up to 4096 x 2160 x 30 bpp @ 60Hz - up to 2560 x 1600 x 30 bpp @ 120 Hz - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)
<b>Image Quality Features</b>	Using two DP outputs, the P4000 can drive one dual DP input display with 5120 x 2880 x 30 bpp @ 60Hz resolution. Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component. HDCP 2.2 support over DisplayPort, DVI, and HDMI connectors NVIDIA 3D Vision™ and other 3D stereo technologies NVIDIA Mosaic and nView
<b>Display Output</b>	Maximum number of displays - 4 direct attached monitors  Maximum number of monitors across all available Quadro P4000 outputs is 4.
<b>Shading Architecture</b>	Shader Model 5.1
<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0  API support includes:

**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.  
c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

		CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
<b>Available Graphics Drivers</b>		Microsoft Windows 10 Microsoft Windows 7 Linux® - Full OpenGL implementation, complete with NVIDIA and ARB extensions
		HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>		<ol style="list-style-type: none"> <li>1. Quadro P4000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.</li> <li>2. Quadro P4000 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately.</li> </ol>
<hr/>		
<b>NVIDIA® Quadro® P5000 16GB Graphics</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 815 grams / 1.80 lbs
	<b>Graphics Controller</b>	NVIDIA® Quadro® P5000 graphics GPU: 2560 NVIDIA® CUDA® Parallel Processing Cores Power: 180 Watts Cooling: Active
	<b>Memory</b>	16GB GDDR5X memory Memory Bandwidth: Up to 288 GB/s Memory Width: 256 bit ECC Memory (disabled by default)
	<b>Connectors</b>	DP (x4) with HDR support DL-DVI(D) 3-pin mini-DIN connector SLI connector NVIDIA® Quadro® Sync connector (compatible with NVIDIA® Quadro® II Sync) One 8-pin auxiliary power connector  Factory configured option: No video cable adapter included with card. After market option Kit: No video cable adaptor included with card.  DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.
	<b>Maximum Resolution</b>	5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

<b>Image Quality Features</b>	Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component. HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors NVIDIA® 3D Vision™ and other 3D stereo technologies NVIDIA Mosaic and nView Desktop Management
<b>Display Outputs<sup>1</sup></b>	4x DP1.4 HDR outputs (up to 3840x2160 UHD @ 120Hz refresh, or up to 8K at 30Hz) 1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz and 1920x1200 @ 120 Hz)
<b>GPU Architecture</b>	NVIDIA Pascal™
<b>Supported Graphics APIs</b>	DirectX® 12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows 10 64-bit Windows® 7 64-bit Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>	1- Supports up to a total of 4 displays

### NVIDIA® Quadro® P6000 24GB Graphics

<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 967 grams / 2.14 lbs
<b>Graphics Controller</b>	NVIDIA® Quadro® P6000 graphics GPU: 3840 NVIDIA® CUDA® Parallel Processing Cores Power: 250 Watts Cooling: Active
<b>Memory</b>	24GB GDDR5X memory Memory Bandwidth: Up to 432 GB/s Memory Width: 384 bit ECC Memory (disabled by default)

### Technical Specifications - Graphics

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

### NVIDIA® Quadro® GP100 16GB Graphics

#### Form Factor

Dual Slot (4.4" Height x 10.5" Length)  
Weight: 989 grams +72 grams extender

### Technical Specifications - Graphics

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

**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

Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran

#### Available Graphics Drivers

Windows® 10  
Windows® 7 Professional 64-bit  
Linux®

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included**

**After market option kit: No adapters included**

#### NVIDIA® Quadro® GV100 32GB Graphics

##### Form Factor

Dual Slot (4.4" Height x 10.5" Length)  
Weight: 980 grams + 72 grams extender

##### Graphics Controller

NVIDIA® QUADRO® GV100  
GPU: 5120 NVIDIA® CUDA® Parallel Processing Cores  
Power: 250 Watts  
Cooling: Active

##### Memory

32GB HBM2 memory  
Memory Bandwidth: Up to 870 GB/s  
Memory Width: 5120-bit  
ECC Memory (disabled by default)

##### Connectors

DP (x4) with HDR support  
3-pin mini-DIN connector via optional bracket  
4-pin header for stereo signal  
Quadro Sync connector (compatible with Quadro II Sync)  
One 8-pin auxiliary power connector  
(2x) NVLink for GV100 connectors (via optional kit)

After market option Kit: no power adapter included with card.

DisplayPort™ to VGA, DisplayPort™ to DVI (single-link and dual-link), and DisplayPort™ to HDMI adapters available as accessories.

##### Maximum Resolution

5K support @ 60Hz  
1x single-cable 5K monitor, or 2x dual-cable 5K monitors

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

<b>Image Quality Features</b>	HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode) HDCP 2.2 support over DisplayPort™ and HDMI connectors NVIDIA 3D Vision™ technology NVIDIA Mosaic and nView Desktop Management
<b>Display Outputs</b>	4x DP1.4 HDR2 outputs (up to 5120 x 2880 @ 60Hz)
<b>GPU Architecture</b>	NVIDIA® Volta™
<b>Supported Graphics APIs</b>	DirectX®12, OpenGL® 4.5 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows® 10 64-bit Windows® 8 & 8.1 64-bit Windows® 7 64-bit Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>  Factory Configured (Z4/Z8 G4 Workstation): No adapters included After market option kit: No adapters included

### NVIDIA® Quadro® RTX 4000 8GB Graphics

<b>Form Factor</b>	Full-Height Single Slot (4.4" Height x 9.5" Length) Weight: 550 grams / 1.21 lbs
<b>Graphics Controller</b>	NVIDIA® Quadro® RTX 4000 Graphics IGPU: 2304 NVIDIA® CUDA® Parallel Processing Cores Power: 160 Watts Cooling: Active
<b>Memory</b>	8GB GDDR6 memory Memory Bandwidth: Up to 416 GB/s Memory Width: 384 bit



### Technical Specifications - Graphics

<b>Connectors</b>	<p>3x DP 1.4a and VirtualLink                      Quadro Sync connector (compatible with Quadro II Sync)                      One 8-pin auxiliary power connector</p> <p>Factory configured option: No video cable adapter included with card.                      After market option Kit: No video cable adaptor included with card.</p> <p>DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.</p>
<b>Maximum Resolution</b>	7680x4320 @ 60Hz
<b>Image Quality Features</b>	<p>Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.                      HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors                      NVIDIA® 3D Vision™ and other 3D stereo technologies                      NVIDIA® Mosaic and nView</p>
<b>Display Outputs<sup>1</sup></b>	3x DP 1.4a and VirtualLink <sup>2</sup> (7680x4320 @ 60Hz)
<b>Supported Graphics APIs</b>	<p>DirectX® 12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0                      Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran</p>
<b>Available Graphics Drivers</b>	<p>Windows® 10 64-bit                      Linux® 64-bit</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site:  <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p>
<b>Notes</b>	<p>1- Supports up to a total of 4 displays                      2- VirtualLink's USB-C™ (data) cannot be disabled at a hardware level</p>

<b>NVIDIA® Quadro® RTX 5000 16GB Graphics</b>	<b>Form Factor</b>	<p>Full-Height Dual Slot (4.4" Height x 10.5" Length)                      Weight: 975 grams + 75 grams extender</p>
	<b>Graphics Controller</b>	<p>NVIDIA® QUADRO® RTX 5000                      GPU: 3072 CUDA cores                      Power: 265 Watts                      Cooling: Active</p>
	<b>Memory</b>	<p>16GB HBM2 memory                      Memory Bandwidth: Up to 448 GB/s                      ECC Memory (disabled by default)</p>

### Technical Specifications - Graphics

<b>Connectors</b>	<p>DP (x4) with HDR support            3-pin mini-DIN connector via optional bracket            4-pin header for stereo signal            Quadro Sync connector (compatible with Quadro II Sync)            One 8-pin auxiliary power connector            (2x) NVLink for RTX 5000 connectors (via optional kit)</p> <p>After market option Kit: no power adapter included with card.</p> <p>DisplayPort™ to VGA, DisplayPort™ to DVI (single-link and dual-link), and DisplayPort™ to HDMI adapters available as accessories.</p>
<b>Maximum Resolution</b>	<p>DisplayPort™ 1.4:            7680x4320 @ 60Hz</p>
<b>Image Quality Features</b>	<p>HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode)            HDCP 2.2 support over DisplayPort™ and HDMI connectors            NVIDIA 3D Vision™ technology            NVIDIA Mosaic and nView Desktop Management</p>
<b>Display Outputs</b>	<p>4x DP1.4 HDR2 outputs (up to 7680x4320 @ 60Hz)</p>
<b>GPU Architecture</b>	<p>NVIDIA® Volta™</p>
<b>Supported Graphics APIs</b>	<p>DirectX®12, OpenGL® 4.5            Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran</p>
<b>Available Graphics Drivers</b>	<p>Windows® 10 64-bit            Windows® 8 &amp; 8.1 64-bit            Windows® 7 64-bit            Linux® 64-bit</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site:  <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p> <p>Factory Configured (Z4/Z6/Z8 G4 Workstation): No adapters included            After market option kit: No adapters included</p> <p>*VirtualLink's USB-C™ (data) cannot be disabled at a hardware level</p>

### Technical Specifications - Graphics

<b>NVIDIA® Quadro® RTX 6000 24GB Graphics</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 995 grams + 75 grams extender
	<b>Graphics Controller</b>	NVIDIA® QUADRO® RTX 6000 GPU: 4608 CUDA cores Power: 295 Watts Cooling: Active
	<b>Memory</b>	24GB HBM2 memory Memory Bandwidth: Up to 672 GB/s ECC Memory (disabled by default)
	<b>Connectors</b>	DP (x4) with HDR support 3-pin mini-DIN connector via optional bracket 4-pin header for stereo signal Quadro Sync connector (compatible with Quadro II Sync) One 8-pin auxiliary power connector (2x) NVLink for RTX 5000 connectors (via optional kit)  After market option Kit: no power adapter included with card.  DisplayPort™ to VGA, DisplayPort™ to DVI (single-link and dual-link), and DisplayPort™ to HDMI adapters available as accessories.
	<b>Maximum Resolution</b>	DisplayPort™ 1.4: 7680x4320 @ 60Hz
	<b>Image Quality Features</b>	HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode) HDCP 2.2 support over DisplayPort™ and HDMI connectors NVIDIA 3D Vision™ technology NVIDIA Mosaic and nView Desktop Management
	<b>Display Outputs</b>	4x DP1.4 HDR2 outputs (up to 7680x4320 @ 60Hz)
	<b>GPU Architecture</b>	NVIDIA® Volta™
	<b>Supported Graphics APIs</b>	DirectX®12, OpenGL® 4.5 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
	<b>Available Graphics Drivers</b>	Windows® 10 64-bit Windows® 8 & 8.1 64-bit Windows® 7 64-bit Linux® 64-bit

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Factory Configured (Z4/Z6/Z8 G4 Workstation): No adapters included**

**After market option kit: No adapters included**

**\*VirtualLink's USB-C™ (data) cannot be disabled at a hardware level**

#### **NVIDIA® Quadro® RTX 8000 48GB Graphics**

#### **Form Factor**

Full-Height Dual Slot (4.4" Height x 10.5" Length)  
Weight: 1070 grams / 2.35 lbs

#### **Graphics Controller**

NVIDIA® Quadro® RTX 8000 Graphics  
GPU: 4608 NVIDIA® CUDA® Parallel Processing Cores  
Power: 295 Watts  
Cooling: Active

#### **Memory**

48GB GDDR6 memory  
Memory Bandwidth: Up to 672 GB/s  
Memory Width: 384 bit

#### **Connectors**

4x DP 1.4a and VirtualLink  
Quadro Sync connector (compatible with Quadro II Sync)  
One 8-pin + 6-pin auxiliary power connector

Factory configured option: No video cable adapter included with card.  
After market option Kit: No video cable adaptor included with card.

DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.

#### **Maximum Resolution**

7680x4320 @ 60Hz

#### **Image Quality Features**

Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.  
HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors  
NVIDIA® 3D Vision™ and other 3D stereo technologies  
NVIDIA® Mosaic and nView

#### **Display Outputs<sup>1</sup>**

4x DP 1.4a and VirtualLink (7680x4320 @ 60Hz)

#### **Supported Graphics APIs**

DirectX®12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

<b>Available Graphics Drivers</b>	<p>Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran</p> <p>Windows® 10 64-bit Linux® 64-bit</p>
<b>Notes</b>	<p>HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p> <ol style="list-style-type: none"> <li>1- Supports up to a total of 4 displays</li> <li>2- VirtualLink's USB-C™ (data) cannot be disabled at a hardware level</li> </ol>

<b>Radeon™ Pro WX 7100 8GB Graphics</b>	<p><b>Form Factor</b> Full-Height Single Slot (9.5" Length )</p> <p><b>Graphics Controller</b> Radeon™ Pro WX 7100 graphics GPU: 2304 Stream Processors organized into 36 Compute Units Power: 130 Watts Cooling: Active</p> <p><b>Memory</b> 8GB GDDR5 memory Memory Bandwidth: 7 Gbps / 224 GB/s Memory Width: 256 bit</p> <p><b>Connectors</b> 4x Display Port 1.4 – HDR ready connectors with HBR3 and MST support.</p> <p>Factory Configured: No video cable adapter included After market option kit: No video cable adapter included</p> <p>Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories.</p> <p><b>Maximum Resolution</b> 5K support @ 60Hz</p> <ul style="list-style-type: none"> <li>• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors</li> </ul> <p><b>Image Quality Features</b> Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling</p> <p><b>Display Output</b> 4 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support</p> <p><b>GPU Architecture</b> GCN 4th Generation</p> <p><b>Supported Graphics APIs</b> DirectX® 12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0</p> <p><b>Available Graphics Drivers</b> Windows 10 64-bit Windows® 7 64-bit</p>
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**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

Linux® 64-bit

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

12. 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.
13. 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.
14. 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.
15. 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 9100 16GB Graphics

##### Form Factor

Dual Slot (4.4" Height x 10.5" Length)

##### Graphics Controller

Radeon™ Pro WX 9100 graphics  
GPU: 4096 Stream Processors  
Power: 250 Watts  
Cooling: Active

##### Memory

16GB HBM2 memory  
Memory Bandwidth: Up to 483 GB/s  
Memory Width: 2048 bit

##### Connectors

6x Mini DisplayPort 1.4 – HDR ready connectors with HBR3 and MST support.

Factory Configured: No video cable adapter included  
After market option kit: No video cable adapter included

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Graphics

Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories.

<b>Maximum Resolution</b>	8K support @ 60Hz Single monitor, single or dual-cable
<b>Image Quality Features</b>	Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
<b>Display Output</b>	6 full physical mDP 1.4 HDR Ready outputs FreeSync support
<b>GPU Architecture</b>	Vega™
<b>Supported Graphics APIs</b>	DirectX® 12.1 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
<b>Available Graphics Drivers</b>	Windows 10 64-bit Windows 7 available from AMD Linux® 64-bit

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

<b>Notes</b>	<ol style="list-style-type: none"><li>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.</li><li>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.</li><li>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.</li><li>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</li></ol>
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### Technical Specifications - Graphics

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.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: Two mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

<b>NVIDIA® Quadro® Sync II</b>	<b>Part number</b>	1WT20AA
	<b>Dimensions (HxD)</b>	6.0 inches × 4.2 inches
	<b>Devices Supported</b>	NVIDIA® Quadro® P4000 NVIDIA® Quadro® P5000 NVIDIA® Quadro® P6000
	<b>Bus Type</b>	Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector
	<b>PCI Form Factor</b>	Full Height, half length, single slot
	<b>Ports</b>	2 RJ45 connectors for carrying frame lock signals over CAT5 cables. BNC Connector for external house synchronization.
	<b>Internal Connectors</b>	6 NVIDIA SLI® style edge fingers for connection to compatible GPUs <ul style="list-style-type: none"> <li>• Included with the board are 4 12-Inch Short Sync Cables to connect to GPU's</li> <li>• Included with the board are 2 24-Inch Long Sync Cables to connect to GPU's</li> </ul>
	<b>System Requirements</b>	Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector Must be used with NVIDIA Quadro P4000, P5000 or P6000 graphics cards. Requires Quadro driver version R375 or later.
	<b>Temperature - Operating</b>	0° to 55° C
	<b>Temperature - Storage</b>	-40° to 60° C
	<b>Relative Humidity - Operating</b>	10% to 80%
	<b>Power Requirements</b>	Board power dissipation: <15W
	<b>Operating Systems Supported</b>	Windows 10 64-bit Windows 7 64-bit Linux® 64-bit
	<b>Kit Contents</b>	Contains: <ul style="list-style-type: none"> <li>• Quadro Sync II Card</li> <li>• 4 x 12-Inch Short Sync Cables</li> <li>• 2 x 24-Inch Long Sync Cables (Two)</li> <li>• Quick Start Guide</li> </ul>

**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

#### OPTICAL AND REMOVABLE STORAGE

<b>HP 9.5mm Slim DVD Writer</b>	<b>Description</b>	9.5mm height, tray-load	
	<b>Mounting Orientation</b>	Either horizontal or vertical	
	<b>Interface Type</b>	SATA/ATAPI	
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm	
	<b>Supported Media Types</b>	DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
	<b>Disc Capacity</b>	DVD-ROM	8.5 GB DL or 4.7 GB standard
		Full Stroke DVD	< 200 ms (seek)
		Full Stroke CD	< 200 ms (seek)
	<b>Maximum Data Transfer Rates</b>	CD ROM Read	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
		DVD ROM Read	DVD+RW Up to 8X DVD-RW Up to 8X DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X DVD-R Up to 8X
<b>Power</b>	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	
<b>Operating Environmental (all conditions non-condensing)</b>	Temperature	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 80%	
	Maximum Wet Bulb Temperature	84° F (29° C)	
<b>Kit Contents</b>	HP SATA DVD Writer drive, installation guide.		

<b>HP 9.5mm Slim DVD-ROM Drive</b>	<b>Description</b>	9.5mm height, tray-load	
	<b>Mounting Orientation</b>	Either horizontal or vertical	
	<b>Interface Type</b>	SATA / ATAPI	
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm	
	<b>Disc Capacity</b>	DVD-ROM	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications – Optical and Removable Storage

<b>Access Times</b>	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)
<b>Power</b>	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
<b>Operating Environmental (all conditions non-condensing)</b>	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 80%
	Maximum Wet Bulb Temperature	84° F (29° C)
<b>Kit Contents</b>	9.5mm Slim DVD-ROM Drive, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	

#### HP HH DVD Writer (16X RW DVD-R)

<b>Description</b>	HP Half Height DVD Writer	
<b>Mounting Orientation</b>	Either Horizontal or vertical	
<b>Interface Type</b>	SATA	
<b>Dimensions (WxHxD)</b>	146x42x165mm	
<b>Supported Media Types</b>	DVD+R	
	DVD+RW	
	DVD+R DL	
	DVD-R DL	
	DVD-R	
	DVD-RW	
	CD-R	
	CD-RW	
<b>Disc Capacity</b>	DVD-ROM	8.5 GB DL or 4.7 GB standard
	Full Stroke DVD	145ms (seek)
	Full Stroke CD	120ms (seek)
<b>Maximum Data Transfer Rates</b>	CD ROM Read	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
	DVD ROM Read	DVD+RW Up to 13X
		DVD-RW Up to 13X
		DVD+R DL Up to 12X
		DVD-R DL Up to 12X
DVD-ROM Up to 12X		
<b>Power</b>	Source	SATA DC power receptacle
	DC Power Requirements	5 VDC ± 5% -100 mV ripple p-p
		12 VDC ± 10% -200 mV ripple p-p
	DC Current	5 VDC -<1500mA typical, <2000 mA maximum.
	Temperature	41° to 122° F (5° to 50° C)

**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

<b>Operating Environmental (all conditions non-condensing)</b>	Relative Humidity	10% to 90% (Non-Condensing)
<b>Operating Systems Supported</b>	Windows 10, Windows 7 Professional 64-bit. Red Hat Enterprise Linux WS4**,5,6 Desktop/Workstation.	
	No driver is required for this device, Native support is provided by operating system.	
<b>Kit Contents</b>	HP SATA DVD Writer drive, Installation guide.	

#### HP 9.5mm Slim BDXL Blu-Ray Writer

<b>Description</b>	9.5mm height, tray-load	
<b>Mounting Orientation</b>	Either horizontal or vertical	
<b>Interface Type</b>	SATA/ATAPI	
<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm	
<b>Supported Media Types</b>	BD-ROM BD-R BD-RE DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
<b>Disc Capacity</b>	DVD-ROM	8.5 GB DL or 4.7 GB standard
	Blu-ray	25 GB (single-layer) 50 GB (dual-layer) 100/128 GB (BDXL)
	Full Stroke DVD	< 230 ms (seek)
	Full Stroke CD	< 220 ms (seek)
	Blu-ray	< 230 ms (seek) (Full Stroke Blu-ray)
	Startup Time	(Time to drive ready from tray loading)
		BD-ROM (SL/DL) 25S / 28S
		BD-R (SL/DL) 25S / 28S
		BD-RE (SL/DL) 25S / 28S
		DVD-ROM (SL/DL) 18S / 18S
		DVD-R (SL/DL) 25S / 25S
		DVD-RW 25S
		DVD+R (SL/DL) 25S / 25S
		DVD+RW 25S
		CD-ROM 15S
<b>Maximum Data Transfer Rates</b>	CD ROM Read	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
	DVD ROM Read	DVD+RW Up to 8X DVD-RW Up to 8X

**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

		DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X DVD-R Up to 8X
	Blu-ray	BD-ROM Up to 6X BD-ROM DL Up to 6X BD-R Up to 6X BD-R DL Up to 6X BD-R Up to 6X BD-RE SL/DL Up to 6X
<b>Power</b>	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
<b>Operating Environmental (all conditions non-condensing)</b>	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 80%
	Maximum Wet Bulb Temperature	84° F (29° C)
<b>Kit Contents</b>	9.5mm Slim BDXL Blu-Ray Writer, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	
	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.	

<b>HP SD Card Reader</b>	<b>Description</b>	Supports hardware ECC (Error Correction Code) function Supports hardware CRC (Cyclic Redundancy Check) function Supports SD 4-bit parallel transfer mode
	<b>Interface Type</b>	USB 3.1 G1 High-speed interface
	<b>Dimensions (WxHxD)</b>	1.15 x .9 x .15 in (29.00 x 23.6 x 3.15 mm) Fits conveniently in the Front IO Bay
	<b>Supported Media Types</b>	Secure Digital Card (SD) Secure Digital High Capacity (SDHC) SD Extended Capacity Memory Card (SDXC) SD Ultra High Speed II(SD UHSII)
		These additional media types are supported with a card adapter.  miniSD miniSD High Capacity Micro SD Memory Card (MicroSD) Micro SD High Capacity Memory Card (MicroSDHC)
		<a href="#">Test Parameters/Conditions - Power applied, unit operating on system ±5%</a>
	<b>Kit Contents</b>	SD card reader

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications – Optical and Removable Storage

<b>Approvals</b>	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT
<b>Weight</b>	0.35 lbs. (0.16 kg)

### Technical Specifications - Controller Cards

#### CONTROLLER CARDS

<b>HP Thunderbolt-3 Dual Port2 PCIe 1-port I/O Card</b>	<b>Data Transfer Rate</b>	Supports up to 40 Gb/s (40,000 Mb/s)
	<b>Devices Supported</b>	Thunderbolt™, Thunderbolt™ 2 and Thunderbolt™ 3 certified for Windows devices
	<b>Bus Type</b>	PCIe Slot. Slot 4 only
	<b>Ports</b>	Two Thunderbolt™ 3 external USB type-C output connectors (Rear) Two full size DisplayPort input connectors (Rear)
	<b>Internal Connectors</b>	One 2x5-Pin header connector
	<b>System Requirements</b>	Genuine Windows 10 Professional 64-bit, slot 4 PCH PCIe slot.
	<b>Temperature - Operating</b>	50° to 131° F (10° to 55° C)
	<b>Temperature - Storage</b>	-22° to 140° F (-30° to 60° C)
	<b>Relative Humidity - Operating</b>	20% to 80%
	<b>Compliances</b>	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwan BSMI CNS13438, Korea MIC
	<b>Operating Systems Supported</b>	Genuine Windows 10 Professional 64-bit.
	<b>Kit Contents</b>	HP Thunderbolt™ 3 Dual Port PCIe I/O Card, 2- DisplayPort cables, GPIO (General-Purpose Input/Output) cables, Installation documentation and warranty card.

\*Maximum speed requires DisplayPort™ and PCIe aggregation.

### Technical Specifications - Networking and Communications

#### NETWORKING AND COMMUNICATIONS

<b>Integrated Intel I219 PCIe GbE Controller</b>	<b>Connector</b>	RJ-45
<b>Controller</b>	<b>Data Rates Supported</b>	Intel I219 GbE platform LAN connect networking controller 10/100/1000 Mbps
<b>Boot ROM Support</b>	<b>Connect Speed LED Indicators</b>	PXE, UEFI Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Amber = 100Mbps</li> <li>• Green = 1000Mbps</li> </ul>
<b>Management Capabilities</b>		Wake-On-LAN, Intel® Active Management Technology™ (AMT) 11.1x <b>NOTE:</b> Intel® AMT™ is not available on Intel Core X configs.

<b>Integrated Intel I210 (not available on Intel Core X configs)</b>	<b>Connector</b>	RJ-45
<b>Controller</b>	<b>Data Rates Supported</b>	Intel® I210 10/100/1000 Mbps
<b>Boot ROM Support</b>	<b>Connect Speed LED Indicators</b>	PXE, UEFI Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Amber = 100Mbps</li> <li>• Green = 1000Mbps</li> </ul>
<b>Management Capabilities</b>		Wake-On-LAN

<b>Intel® I210-T1</b>	<b>Networking Interface</b>	RJ-45
<b>System Interface</b>	<b>Networking Speeds Supported</b>	PCI Express 2.1 x1 10Mbps, 100Mbps, 1Gbps
<b>Cabling (up to 100m)</b>	<b>Power Consumption (active-typical)</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps 0.81W
<b>Physical Dimensions</b>	Length: 6.7cm (2.64 inches) (Bracket) Width: 1.8cm (0.709 inches) Full-height end bracket: 12.07cm (4.755 inches) Low-profile end bracket: 8cm (3.15 inches)	

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



### Technical Specifications - Networking and Communications

<b>Connect Speed LED Indicators</b>	<p>Link/Activity LED</p> <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> <p>Speed LED</p> <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>
<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

<b>Intel® I350-T2</b>	<b>Networking Interface</b>	2 x RJ-45
	<b>System Interface</b>	PCI Express 2.1 x4
	<b>Networking Speeds Supported</b>	10Mbps, 100Mbps, 1Gbps
	<b>Cabling (up to 100m)</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
	<b>Power Consumption (active-typical)</b>	4.4W
	<b>Physical Dimensions</b>	Length: 13.54cm (5.33 inches) Width: 6.89 (2.71 inches) Full-height end bracket: 12.0cm (4.725 inches) Low-profile end bracket: 7.92cm (3.117 inches)
	<b>Connect Speed LED Indicators</b>	<p>Link/Activity LED</p> <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> <p>Speed LED</p> <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>
	<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
	<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

<b>Intel® I350-T4</b>	<b>Networking Interface</b>	4 x RJ-45
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**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.

005527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Networking and Communications

<b>System Interface</b>	PCI Express 2.1 x4
<b>Networking Speeds Supported</b>	10Mbps, 100Mbps, 1Gbps
<b>Cabling (up to 100m)</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
<b>Power Consumption (active-typical)</b>	5W
<b>Physical Dimensions</b>	Length: 13.54cm (5.33 inches) Width: 6.89 (2.71 inches) Full-height end bracket: 12.0cm (4.725 inches) Low-profile end bracket: 7.92cm (3.117 inches)
<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>
<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

<b>Intel® X550-T2</b>	<b>Networking Interface</b>	2 x RJ-45
	<b>System Interface</b>	PCI Express 3 x4
	<b>Networking Speeds Supported</b>	100Mbps, 1Gbps, 2.5Gbps, 5Gbps, 10Gbps
	<b>Cabling (up to 100m)</b>	Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps, 2.5Gbps, or 5Gbps Cat6a (or higher) for 10Gbps
	<b>Power Consumption (active-typical)</b>	3.9W at 100Mbps 5.5W at 1Gbps 11.2W at 10Gbps
	<b>Physical Dimensions</b>	5.2 in x 2.7 in (without bracket)
	<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Amber = &lt;10Gbps</li> <li>• Green = 10Gbps</li> </ul>

**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.

c05527757 — DA — 15954 — Worldwide — Version 23 — February 6, 2020



### Technical Specifications - Networking and Communications

<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

#### Intel® X710-DA2 10GBASE-SR Converged Network Adapter

<b>Networking Interface</b>	2 SFP+ Ports for LC SFP+ Transceivers
<b>System Interface</b>	PCI Express 3.0 x8
<b>Networking Speeds Supported</b>	1Gbps, 10Gbps
<b>Cabling</b>	LC fiber optic cabling with LC SFP+ Transceivers
<b>Power Consumption (active-typical)</b>	4.3W
<b>Physical Dimensions</b>	6.578 in x 2.703 in
<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>

<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

**Note:** Windows 7 is NOT supported

#### 10GbE SFP+ SR Transceiver

<b>Connector Type</b>	LC
<b>Cable Type</b>	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.
<b>Cable Length</b>	2-300m
<b>Wavelength</b>	850nm
<b>Form Factor</b>	SFP+
<b>Physical Dimensions</b>	0.47(h) x 0.54(w) x 2.19(d) inches (1.19 x 1.38 x 5.57 cm)
<b>Operating Temperature</b>	0C to 45C (32F to 113F)
<b>Operating Humidity</b>	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.

### Technical Specifications - Networking and Communications

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

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### 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 efficiency 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
August 13, 2018	From v6 to v7	Added	Footnote to Networking and Communications section
		Changed	Operating Systems section
August 24, 2018	From v7 to v8	Changed	Format
September 21, 2018	From v8 to v9	Added	Intel Optane SSD 905p AiC 280GB & 480GB
September 26, 2018	From v9 to v10	Changed	NVIDIA Quadro P6000 Graphics specs
February 11, 2019	From v10 to v11	Added	NVIDIA Quadro RTX 5000 16GB and NVIDIA Quadro RTX 6000 24GB Graphics, added Intel Core i9-9980XE, Intel Core i9-9920X, Intel Core i9-9820X and Intel Core i7-9800X processors
		Changed	Storage section and Format changes
May 8, 2019	From v11 to v12	Changed	Storage and Graphics sections
June 12, 2019	From v12 to v13	Changed	Storage section
June 24, 2019	From v13 to v14	Changed	RAID Support
July 15, 2019	From v14 to v15	Changed	Corrected Intel 905p Series AiC 480GB PCIe SSD
July 18, 2019	From v15 to v16	Changed	HP SD 4 Card Reader part number
July 23, 2019	From v16 to v17	Changed	Windows 10 Pro High End added to Processors and under Intel Core X-series Processors Preinstalled Power supply-high end section re-arranged
September 1, 2019	From v17 to v18	Added	Footnote to Memory section, Added HP Z Turbo Drive 1TB SED TLC Z4/Z6 G4 SSD Kit & module to Storage section, Added Intel® Wi-Fi 6 AX200 & BT PCIe to Networking section
October 26, 2019	From v18 to v19	Changed	Graphics section
November 1, 2019	From v19 to v20	Added	HP QX310 Removable NVMe Frame/Carrier w/PCIe card to Optical and Removable Storage section
December 5, 2019	From v20 to v21	Added	Intel Xeon W-2200, Intel Core i9-10900X X-series processors and added new HP Z4 G4 Memory Cooling Solution on Other Hardware section
		Changed	Storage / Hard Drives, Memory and System Board sections
January 2, 2020	From v21 to v22	Changed	Front I/O and Rear I/O Overview subsections and changed Storage section
February 6, 2020	From v22 to v23	Changed	Storage / Hard Drives, Optical and Removable Storage and Physical Security and Serviceability

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