

### Overview

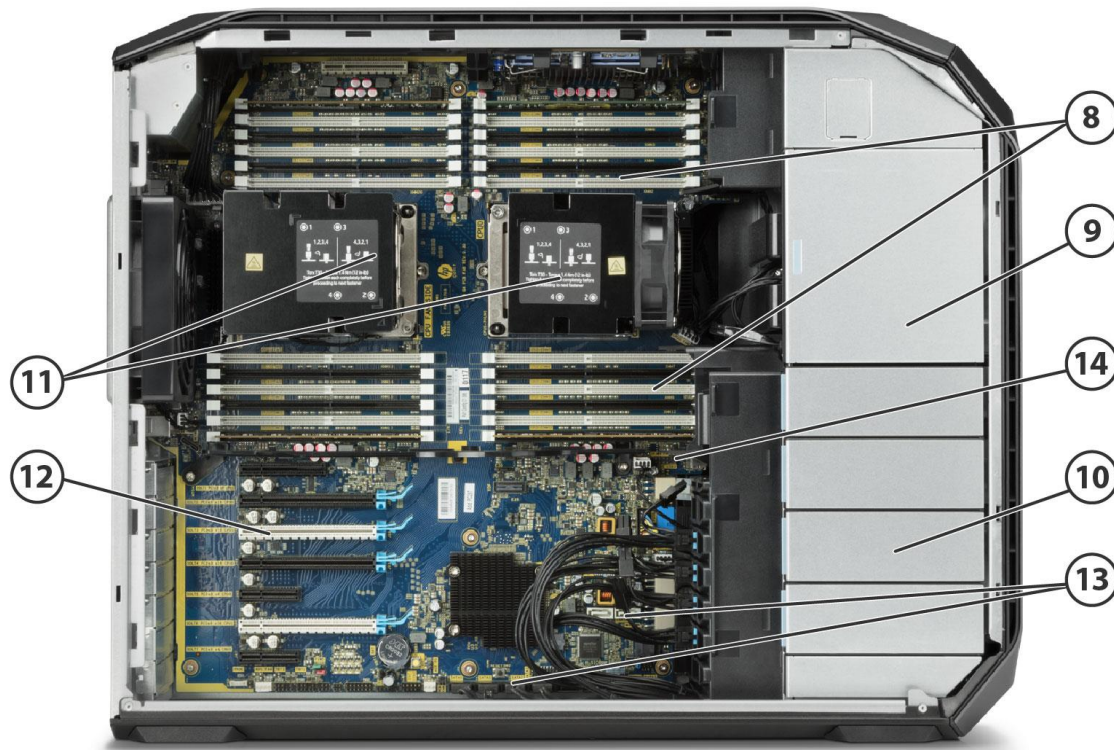
#### HP Z8 G4 Workstation



#### Front view

1. Integrated Front Handle
2. Dedicated 9.5mm Optical Drive Bay
3. Power Button
4. HDD Activity LED
5. Front I/O Entry: 4 USB 3.1 Gen1 (Left-most Port has Charging Capability)  
Front I/O Premium: 2x USB 3.1 Gen1, 2x USB 3.1 Gen2 Type-C™ (Left-most Type-A Port has Charging Capability)  
**Note:** Premium Front IO is shown on Photography
6. Media Card Reader
7. 1 Headset

### Overview



### Internal view

- 8. 24 DIMM Slots for DDR4 ECC Memory
- 9. 2 External 5.25" Bays and Slimline Optical
- 10. 4 Internal 3.5" Bays
- 11. 2 Intel® Xeon® Processors (Skylake SP) family
- 12.
  - Slot 1: PCIe Gen3 x4 – Transforms to PCIe Gen3 x8 when 2<sup>nd</sup> CPU is installed
  - Slot 2: PCIe Gen3 x16
  - Slot 3: PCIe Gen3 x16 – Available ONLY when 2<sup>nd</sup> processor is installed
  - Slot 4: PCIe Gen3 x16
  - Slot 5: PCIe Gen3 x4
  - Slot 6: PCIe Gen3 x16 - Available ONLY when 2<sup>nd</sup> processor is installed
  - Slot 7: PCIe Gen3 x4
- 13. 2 sSATA, 8 SATA (AHCI) Ports
- 14. 3 USB 2.0 Internal Ports, 1 USB 3.0 Gen1 Internal Port

### Overview



### Rear view

15. Choice of 1125W or 1450W, 90% Efficient Power Supplies

16. Rear I/O:

- Rear Power Button

- 6 USB 3.0 Gen1

- 1 Serial

- PS/2 keyboard and mouse

- 2 RJ-45 to integrated Gigabit LAN

- 1 Audio Line-In (can be retasked as microphone)

- 1 Audio Line-Out

- Optional: 2 10GbE LAN ports

### Overview

### Overview

#### Form Factor Operating Systems

##### Minitower

##### Preinstalled:

- Windows 10 Pro 64 for Workstations
- Windows 10 Downgrade to Windows 7
- HP Linux-ready (minimal OS ready for customer OS installation)
- Red Hat® Enterprise Linux® Desktop Workstation (Paper license with 1 year support; no preinstalled OS)

##### Supported:

- Windows 7 Professional 64-bit (downgrade media available by request from HP Support)\*
- Red Hat® Enterprise Linux® Desktop 7.4
- SUSE Linux® Enterprise Desktop 12 SP3
- Ubuntu 16.04 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)

\*Windows 10 is preinstalled. Windows 7 media is available upon request from HP Customer Support. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version.

For detailed Windows 7 OS hardware support information see

<http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf>.

### Available Processors

Name	Cores	Clock Speed (GHz)	Cache (MB)	Memory Speed (MT/s)	Hyper-Threading	Featuring Intel® vPro™ Technology	Intel® Turbo Boost Technology <sup>1</sup>	TDP (W)
Intel® Xeon® Platinum 8180 processor	28	2.5GHz	38.50	2666	YES	YES	3.8GHz	205
Intel® Xeon® Platinum 8160 processor	24	2.1GHz	33.00	2666	YES	YES	3.7GHz	150
Intel® Xeon® Gold 6152 processor	22	2.1GHz	30.25	2666	YES	YES	3.7GHz	140
Intel® Xeon® Gold 6154 processor	18	3.0GHz	24.75	2666	YES	YES	3.7GHz	200
Intel® Xeon® Gold 6148 processor	20	2.4GHz	27.50	2666	YES	YES	3.7GHz	150
Intel® Xeon® Gold 6146M processor	12	3.2GHz	24.75	2666	YES	YES	YES	165
Intel® Xeon® Gold 6146 processor	12	3.2GHz	24.75	2666	YES	YES	YES	165
Intel® Xeon® Gold 6144M processor	8	3.5GHz	24.75	2666	YES	YES	YES	150
Intel® Xeon® Gold 6144 processor	8	3.5GHz	24.75	2666	YES	YES	YES	150
Intel® Xeon® Gold 6142 processor	16	2.6GHz	22.00	2666	YES	YES	3.7GHz	150
Intel® Xeon® Gold 6140 processor	18	2.3GHz	24.75	2666	YES	YES	3.7GHz	140
Intel® Xeon® Gold 6136 processor	12	3.0GHz	24.75	2666	YES	YES	3.7GHz	150

### Overview

Intel® Xeon® Gold 6134 processor	8	3.2GHz	24.75	2666	YES	YES	3.7GHz	130
Intel® Xeon® Gold 6132 processor	14	2.6GHz	19.25	2666	YES	YES	3.7GHz	140
Intel® Xeon® Gold 6130 processor	16	2.1GHz	22.00	2666	YES	YES	3.7GHz	125
Intel® Xeon® Gold 6128 processor	6	3.4GHz	19.25	2666	YES	YES	3.7GHz	115
Intel® Xeon® Gold 6126 processor*	12	2.6GHz	19.25	2666	YES	YES	3.7GHz	125
Intel® Xeon® Gold 5120 processor	14	2.2GHz	19.25	2400	YES	YES	3.2GHz	105
Intel® Xeon® Gold 5118 processor	12	2.3GHz	16.50	2400	YES	YES	3.2GHz	105
Intel® Xeon® Gold 5122 processor	4	3.6GHz	16.50	2666	YES	YES	3.7GHz	105
Intel® Xeon® Silver 4116 processor	12	2.1GHz	16.50	2400	YES	YES	3.0GHz	85
Intel® Xeon® Silver 4114 processor	10	2.2GHz	13.75	2400	YES	YES	3.0GHz	85
Intel® Xeon® Silver 4112 processor	4	2.6GHz	8.25	2400	YES	YES	3.0GHz	85
Intel® Xeon® Silver 4110 processor	8	2.1GHz	11.00	2400	YES	YES	YES	85
Intel® Xeon® Silver 4108 processor	8	1.8GHz	11.00	2400	YES	YES	3.0GHz	85
Intel® Xeon® Bronze 3106 processor	8	1.7GHz	11.00	2133	NO	YES	N/A	85
Intel® Xeon® Bronze 3104 processor	6	1.7GHz	8.25	2133	NO	YES	N/A	85
<p><sup>1</sup>The specifications shown in this column represent the following: (all core maximum turbo steps, one core maximum turbo steps). Turbo boost stepping occurs in 100MHz increments. Processors that do not have turbo functionality are denoted as N/A.</p> <p>*Intel® Xeon® Gold 6126 processor (selected North America public sector customers only), Availability date TBD.</p>								

### Available Processors

#### Disclaimers

When ordering two processors, the second processor must be the same as the first. Intel processor numbers are not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families. See: [http://www.intel.com/products/processor\\_number/](http://www.intel.com/products/processor_number/) for details.

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



### Overview

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

**Slot 1:**  
PCIe Gen3 x4 - Transforms to PCIe Gen3 x8 when 2nd CPU is installed

**Slot 2:**  
PCIe Gen3 x16

**Slot 3:**  
PCIe Gen3 x16 - Available ONLY when 2nd processor is installed

**Slot 4:**  
PCIe Gen3 x16

**Slot 5:**  
PCIe Gen3 x4

**Slot 6:**  
PCIe Gen3 x16 - Available ONLY when 2nd processor is installed

**Slot 7:**  
PCIe Gen3 x4

**Note:** The PCIe x4 and PCIe x8 connectors above are open ended, allowing a PCIe x16 card to be seated in the slot.

#### Expansion Bays (see storage section for more details)

4 internal 3.5" bays (All 4 include acoustic dampening rail assemblies)  
2 external 5.25" bays (175mm depth limit)

1 dedicated 9.5mm slim optical disk drive bay

#### Front I/O

- Base: 4 USB 3.1 Gen1 Type-A connector. Left most connector has charging capability, 1 Combo Headset, 1 Optional Media Card Reader
- Premium: 2 USB 3.1 Gen1 Type-A connector. Left most connector has charging capability, 2 USB 3.1 Gen2 Type-C™ connector, 1 Combo Headset, 1 Optional Media Card Reader

#### Internal I/O

Internal Slot 1 CPU1: PCIe Gen3 x8 - always available  
Internal Slot 2 CPU2: PCIe Gen3 x8 - available when 2nd CPU is installed  
2 USB 2.0 ports available with a single 2x5 header  
1 USB 2.0 port available with a 1x6 header  
1 USB 3.1 Gen1 and 1 USB 2.0 port available with a 2x6 header

**Notes:** The 2x5 header can be converted to a standard (Type-A) USB 2.0 connector through the use of one HP Internal USB Port Kit (EM165AA). This port kit uses one half of the 2x5 header.

The 1x6 header can be converted to a standard (Type-A) USB 2.0 connector through the use of one HP Internal USB Port Kit (EM165AA). This port kit uses 5 pin positions on the header.

The 2x6 header can be converted to a standard (Type-A) USB 2.0 connector through the use of one HP Internal USB Port Kit (EM165AA). This port kit uses one half of the 2x6 header.

#### Rear I/O

6 USB 3.1 Gen1 (aka USB 3.0), 1 Serial, PS/2 keyboard and mouse, 2 RJ-45 to integrated Gigabit LAN, 1 Audio Line-In (can be retasked as microphone), 1 Audio Line-Out

Optional: 2 RJ-45 to 10GbE LAN ports

#### Interfaces Supported

10 channel SATA 6.0 Gb/s interface

### Overview

	Factory integrated RAID available for SATA drives (RAID 0 and 1) Internal USB 3.1 Gen1, USB 3.1 Gen2, USB 2.0	
<b>On-board RAID Support</b>	SATA RAID 0 Striped Array Configuration SATA RAID 1 Mirrored Array Configuration SATA RAID 10 Striped/Mirrored Configuration SATA RAID 5 Parity Array Configuration	
<b>Chassis Dimensions (H x W x D)</b>	Footprint:	H: 17.5" [444.5mm] W: 8.5" [215.9mm] D: 21.7" [551.2mm] (measured to the rear of service panel)
	Maximum:	H: 17.5" [444.5mm] W: 8.5" [215.9mm] D: 21.85" [555.2mm] (measured to the embossment for the rear chassis fans)
<b>Packaged Dimensions</b>	H: 25" (636mm) W: 13.1" (332mm) D: 28.9" (734mm)	
<b>Rack Dimensions</b>	5U	
<b>Weight</b>	Exact weights depend upon configuration (System weight only). Minimum: 22.4kg (49.4lbs.) Typical: 23.7kg (52.2lbs.) Maximum: 31.7kg (70lbs.)	
<b>Temperature</b>	Operating: 5° to 35°C (40° to 95°F) Non-operating: -40° to 60°C (-40° to 140°F)	
<b>Humidity</b>	Operating: Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 10% to 90%, non-condensing, 35° C maximum wet bulb	
<b>Maximum Altitude (non-pressurized)</b>	Operating: 3,048m (10,000ft) Non-operating: 9,144m (30,000ft)	
	<b>Note:</b> Above 1524 m (5,000 feet) altitude, maximum operating temperature is reduced by 1° C (1.8° F) per 305 m (1,000 feet) elevation increase	
<b>Power Supply</b>	Choice of: 1125W/100V/15A 90% Efficient wide-ranging, active Power Factor Correction The power delivery system includes four 6+2-pin graphics power cables.  1450W/200V/10A 90% Efficient wide-ranging, active Power Factor Correction The power delivery system includes four 6+2-pin graphics power cables. - Available in limited regions  1450W/100V/20A 90% Efficient wide-ranging, active Power Factor Correction The power delivery system includes four 6+2-pin graphics power cables.  1700W/200V/10A 90% Efficient wide-ranging, active Power Factor Correction The power delivery system includes four 6+2-pin graphics power cables.	
	<b>Notes:</b> The 1125W/100V/15A (1450W at 200V Input Voltage) power supply can also supply 1275W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1125W. An uninterruptible power supply (UPS) is highly recommended if 1275W output power is desired.	

### Overview

The 1125W Power Supply can also supply 1450W of output power when the input voltage is greater than 200V under all conditions.

The 1450W/100V/20A (1700W at 200V Input Voltage) power supply can also supply 1550W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1450W. An uninterruptible power supply (UPS) is highly recommended if 1550W output power is desired.

The 1450W Power Supply can also supply 1700W of output power when the input voltage is greater than 200V under all conditions.

The 1450W/100V/20A chassis is shipped with a 20A power cord and requires a 20A outlet in an environment with 100V/110V. Site modification may be required. Check with your sales lead and click [here](#) for the [Site Prep Guide](#).

The Z8 G4 power supply efficiency reports can be found at these links:

1125W – Link:

[https://plugloadsolutions.com/psu\\_reports/HP%20Inc\\_DPS-1125BB%20A\\_1125W\\_ECOS%204825\\_Report.pdf](https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1125BB%20A_1125W_ECOS%204825_Report.pdf)

1450W – Link:

[https://plugloadsolutions.com/psu\\_reports/HP%20Inc\\_DPS-1450AB%20A\\_1450W\\_ECOS%204826\\_Report.pdf](https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1450AB%20A_1450W_ECOS%204826_Report.pdf)

### Workstation ISV Certifications

See the latest list of certifications at

<http://www.hp.com/united-states/campaigns/workstations/partnerships.html>



### Supported Components

#### Processors

Intel® Xeon® processor Scalable family	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Intel® Xeon® Platinum 8180 processor	Y	Y	1XM54AA	
Intel® Xeon® Platinum 8160 processor	Y	Y	1XM56AA	
Intel® Xeon® Gold 6152 processor	Y	Y	1XM57AA	
Intel® Xeon® Gold 6154 processor	Y	Y	1XM58AA	
Intel® Xeon® Gold 6148 processor	Y	Y	1XM59AA	
Intel® Xeon® Gold 6146 processor	Y	Y	2SQ75AV	
Intel® Xeon® Gold 6146M processor	Y	Y	2SQ76AV	
Intel® Xeon® Gold 6144 processor	Y	Y	2SQ73AV	
Intel® Xeon® Gold 6144M processor	Y	Y	2SQ74AV	
Intel® Xeon® Gold 6142 processor	Y	Y	1XM61AA	
Intel® Xeon® Gold 6140 processor	Y	Y	1XM64AA	
Intel® Xeon® Gold 6136 processor	Y	Y	1XM62AA	
Intel® Xeon® Gold 6134 processor	Y	Y	1XM66AA	
Intel® Xeon® Gold 6132 processor	Y	Y	1XM67AA	
Intel® Xeon® Gold 6130 processor	Y	Y	1XM68AA	
Intel® Xeon® Gold 6128 processor	Y	Y	1XM69AA	
Intel® Xeon® Gold 6126 processor**	Y	Y	5SC22AV	
Intel® Xeon® Gold 5120 processor	Y	Y	1XM70AA	
Intel® Xeon® Gold 5118 processor	Y	Y	1XM71AA	
Intel® Xeon® Gold 5122 processor	Y	Y	1XM72AA	
Intel® Xeon® Silver 4116 processor	Y	Y	1XM73AA	
Intel® Xeon® Silver 4114 processor	Y	Y	1XM74AA	
Intel® Xeon® Silver 4112 processor	Y	Y	1XM75AA	
Intel® Xeon® Silver 4110 processor	Y	Y	TBD	
Intel® Xeon® Silver 4108 processor	Y	Y	1XM76AA	
Intel® Xeon® Bronze 3106 processor	Y	Y	1XM77AA	
Intel® Xeon® Bronze 3104 processor	Y	Y	1XM78AA	

\*Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing system required. Performance will vary depending on your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

\*\*Intel® Xeon® Gold 6126 processor (selected North America public sector customers only), Availability date TBD.

### Supported Components

#### Monitors / Displays

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Z Display Z22n G2		Y	1JS05AA	
HP Z Display Z23n G2		Y	1JS06AA	
HP Z Display Z24i G2		Y	1JS08AA	
HP Z Display Z24n G2		Y	1JS09AA	
HP Z Display Z24nf G2		Y	1JS07AA	
HP Z Display Z27n G2		Y	1JS10AA	
HP Z Display Z27s (4K display)		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	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 300GB 15k SAS SFF	Y	Y	L5B74AA	
<b>NOTE:</b> SAS controller add-in card required				

##### SATA Hard Drives

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>SATA (Serial ATA) Hard Drives for HP Workstations</b>				
500GB SATA 7200RPM 6Gb/s 3.5" HDD	Y	Y	LQ036AA	
500GB SATA 7200RPM 6Gb/s OPAL2 SFF 3.5" HDD	Y	Y	D8N29AA	
1TB SATA 7200RPM 3.5" HDD	Y	Y	LQ037AA	
1TB SATA 7200RPM Ent 3.5" HDD	Y	Y	W0R10AA	
2TB SATA 7200RPM HDD	Y	Y	QB576AA	
4TB SATA 7200RPM Ent 3.5" HDD	Y	Y	K4T76AA	
<b>NOTES:</b>				
Up to (5) 3.5-inch 7200 rpm SATA drives: 500 GB, 1.0, 2.0, 4.0 TB; 20TB max total				

### Supported Components

#### SATA Solid State Drives

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>HP Solid State Drives (SSDs) for Workstations</b>				
HP 256GB SATA SSD	Y	Y	A3D26AA	
HP 512GB SATA SSD	Y	Y	D8F30AA	
HP 1TB SATA SSD	Y	Y	F3C96AA	
HP 2TB SATA SSD	Y	Y	Y6P08AA	
HP 256GB SATA SED OPAL2 SSD	Y	Y	G7U67AA	
HP 512GB SATA SED OPAL2 SSD	Y	Y	N8T26AA	
HP 240GB SATA Enterprise SSD	Y	Y	T3U07AA	
HP 480GB SATA Enterprise SSD	Y	Y	T3U08AA	

#### PCIe Solid State Drives

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>PCIe SSDs for HP Workstations</b>				
HP Z Turbo Drive 256GB MLC Z8G4 SSDModule	Y	Y	1PD50AA	
HP Z Turbo Drive 512GB MLC Z8G4 SSDModule	Y	Y	1PD51AA/AT	
HP Z Turbo Drive 1TB MLC Z8G4 SSDModule	Y	Y	1PD52AA/AT	
HP Z Turbo Drive 256GB TLC Z8G4 SSDModule	Y	Y	1PD53AA	
HP Z Turbo Drive 512GB TLC Z8G4 SSDModule	Y	Y	1PD54AA/AT	
HP Z Turbo Drive 1TB TLC Z8G4 SSDModule	Y	Y	1PD55AA	
HP Z Turbo Drive 256GB SED Z8G4 SSDModule	Y	Y	2SA34AA	
HP Z Turbo Drive 512GB SED Z8G4 SSDModule	Y	Y	2SA36AA	
<b>HP Z Turbo Drive Quad Pro</b>				
HP Z Turbo Drive 256GB MLC Z8 G4 SSD Kit	Y	Y	1PD44AA	
HP Z Turbo Drive 512GB MLC Z8 G4 SSD Kit	Y	Y	1PD45AA/AT	
HP Z Turbo Drive 1TB MLC Z8 G4 SSD Kit	Y	Y	1PD46AA	
HP Z Turbo Drive 256GB TLC Z8 G4 SSD Kit	Y	Y	1PD47AA	
HP Z Turbo Drive 512GB TLC Z8 G4 SSD Kit	Y	Y	1PD48AA/AT	
HP Z Turbo Drive 1TB TLC Z8 G4 SSD Kit	Y	Y	1PD49AA	
HP Z Turbo Drive 256GB SED Z8 G4 SSD Kit	Y	Y	2SA33AA	
HP Z Turbo Drive 512GB SED Z8 G4 SSD Kit	Y	Y	2SA35AA	
HP Z Turbo Drive Quad Pro 2x256GB PCIe SSD	Y	Y	N2M98AA	1
HP Z Turbo Drive Quad Pro 2x512GB PCIe SSD	Y	Y	N2M99AA	1
HP Z Turbo Drive Quad Pro 2x1TB PCIe SSD	Y	Y	T9H99AA	1
HP Z Turbo Drive Quad Pro 256GB SSD module	N	Y	N2N00AA	2
HP Z Turbo Drive Quad Pro 512GB SSD module	N	Y	N2N01AA	2
HP Z Turbo Drive Quad Pro 1TB SSD module	N	Y	T9J00AA	2

### Supported Components

#### HP Z Turbo Drive Dual Pro

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

#### Intel® 905p Series SSD (Optane SSD)

Intel® Optane SSD 905p 280GB AiC**,***	Y	Y	2SC47AA
Intel® Optane SSD 905p 480GB AiC**,***	Y	Y	2SC48AA

**NOTE 1:** Dual M.2 SSD modules plus carrier

**NOTE 2:** M.2 SSD module only, designed to be installed into Quad Pro carrier

\*For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB of system disk is reserved for system recovery software

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

\*\*\* Intel® Optane SSD Available Fall 2018

### Hard Drive Controllers

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>SAS Controller</b>				
MicroSemi SmartHBA2100-4i4e SAS Controller	Y	Y	1FV90AA	

### Graphics

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	Supported # of cards
<b>Graphics Cable Adapters</b>					
HP miniDP-to-DP Adapter	Y	Y			
HP miniDP-to-DP Adapter (2-pack)	Y	N			
HP miniDP-to-DP Adapter (4-pack)	Y	N			
HP miniDP-to-DP Adapter (8-pack)	Y	N			
HP DisplayPort to Dual Link DVI Adapter	Y	Y	NR078AA		
HP DisplayPort to DVI-D Adapter	Y	Y	FH973AA		
HP DisplayPort to DVI-D Adapter (2-pack)	Y	N			
HP DisplayPort to DVI-D Adapter (4-pack)	Y	N			
HP DisplayPort to DVI-D Adapter (6-pack)	Y	N			
HP DisplayPort to VGA Adapter	Y	Y	AS615AA		
HP DisplayPort to HDMI Adapter	Y	Y	K2K92AA		
NVIDIA SLI 2-slot Graphics Connector	Y	Y	2YY84AA		
<b>Entry 3D</b>					
NVIDIA® Quadro® P400 1 <sup>st</sup> GFX 2GB Graphics	Y	Y	1ME43AA/AT		2
NVIDIA® Quadro® P600 1 <sup>st</sup> GFX 2GB Graphics	Y	Y	1ME42AA/AT		2
NVIDIA® Quadro® P620 2GB Graphics	Y	Y	3ME25AA		2
AMD FirePro™ W2100 2GB Graphics	Y	Y	J3G91AA/AT		2

### Supported Components

#### Mid-range 3D

NVIDIA® Quadro® P1000 1 <sup>st</sup> GFX 4GB Graphics	Y	Y	1ME01AA/AT	4
NVIDIA® Quadro® P2000 1 <sup>st</sup> GFX 5GB Graphics	Y	Y	1ME41AA/AT	4
AMD Radeon™ Pro WX 3100 4GB Graphics	Y	Y	2TF08AA	4
AMD Radeon™ Pro WX 4100 4GB Graphics	N	Y	Z0B15AA/AT	4

#### High End 3D

NVIDIA® Quadro® P4000 1 <sup>st</sup> GFX 8GB Graphics	Y	Y	1ME40AA/AT	3
NVIDIA® Quadro® P5000 1 <sup>st</sup> GFX 16GB Graphics	Y	Y	Z0B13AA/AT	3
NVIDIA® Quadro® P6000 1 <sup>st</sup> GFX 24GB Graphics	Y	Y	Z0B12AA/AT	3
NVIDIA® Quadro® GP100 16GB Graphics	Y	Y	1ZE81AA/AT	3
NVIDIA® Quadro® GV100 32GB Graphics	Y	Y	3ME26AA/AT	1
AMD Radeon™ Pro WX 7100 1 <sup>st</sup> GFX 8GB Graphics	Y	Y	Z0B14AA/AT	3
AMD Radeon™ Pro WX 9100 16GB Graphics	Y	Y	2TF01AA/AT	2
NVIDIA® Quadro® Sync II	Y	Y	1WT20AA	

Memory	CTO	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>DDR4-2666 ECC Registered DIMMs</b>					
8GB (1x8GB) DDR4-2666 ECC Reg 1CPU Memory		Y	Y	1XD84AA/AT	
16GB (1x16GB) DDR4-2666 ECC Reg 1CPU Memory		N	Y	1XD85AA/AT	
32GB (1x32GB) DDR4-2666 ECC Reg 1CPU Memory		N	Y	1XD86AA/AT	
64GB (1x64GB) DDR4-2666 ECC LR Memory		N	Y	1XD87AA	

#### NOTES:

For details on the supported memory configurations on the HP Z8 G4 Workstation, please refer to the System Technical Specifications - System Board section of this document.

Sleep (S3 state) support:

- Sleep (S3 state) may not be supported with non-HP validated and qualified 64 GB LR DIMMs.
- Sleep (S3 state) not supported with 128 GB LR DIMMs

DIMMs should be equally distributed across all six memory channels for optimal performance.

Each processor supports up to 6 channels of DDR4 memory. To realize full performance at least 1 DIMM must be inserted into each channel.

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

MT/s = Million Transfers per second

You cannot intermix LR DIMMs with Registered DIMMs. The system will not work.

The Z8 G4 is designed to work ONLY with DDR4 memory. The system will not work with DDR3 memory.

### Multimedia and Audio Devices

### Supported Components

#### Multimedia and Audio Devices

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Integrated Realtek HD ALC221 Audio	Y	N		

#### Optical and Removable Storage

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>HP SlimTray Optical Drives</b>				
HP 9.5mm Slim Blu Ray Disc Writer	Y	Y	K3R65AA	1
HP 9.5mm Slim DVD ROM	Y	Y	K3R63AA	1
HP 9.5mm Slim DVD Writer*	Y	Y	K3R64AA	1
<b>HP SD Card Reader</b>				
HP SD 4 Card Reader	Y	Y	Y0L99AA	
<b>HDD Frame/Carriers</b>				
HP DX175 Removable HDD Carrier	N	Y	1ZX72AA	
HP DX175 Removable HDD Frame/Carrier	N	Y	1ZX71AA	

**NOTE 1:** Installing an optical drive into Z8 G4 requires a 5.25" external bay adapter.

\*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

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP i350-T2 PCIe Dual Port Gigabit NIC	Y	Y	V4A91AA	
Intel® i350-T4 PCIe 4-Port Gigabit NIC	N	Y	W8X25AA	
Intel® Ethernet I210-T1 PCIe x1 Gb NIC	Y	Y	E0X95AA	
Intel® X550-T2 10GbE Dual Port NIC	Y	Y	1QL46AA	
Intel® X710-DA2 10GbE SFP+ Dual Port NIC	Y	Y	1QL47AA	1
Intel® 8265 802.11 a/b/g/n/ac&BT PCIe	N	Y	1QL48AA	
Intel® 9260 802.11 a/b/g/n/ac&BT PCIe	N	Y	6SL33AA	
10GBASE-T Dual NIC Module Z6/8 G4	Y	Y	1QL49AA	
HP 10GbE SFP+ SR 1st Transceiver	Y	Y	C3N53AA	

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



### Supported Components

#### Racking and Physical Security

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Security Cable with Kensington Lock	N	Y	PC766A	
HP Chassis Intrusion Sensor	Y	N		1
HP Z640/Z840/Z8G4 Rail Rack Kit	N	Y	2FZ77AA	
HP Z8 Rack Rail Upgrade Kit	N	Y	2FZ76AA	
HP Keyed Cable Lock 10mm	N	Y	T1A62AA	

**NOTE 1:** Standard on all systems

#### Input Devices

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Wireless Business Slim Keyboard and Mouse	Y	Y	N3R88AA	
Business Slim PS/2 Wired Keyboard	Y	Y	N3R86AA	
USB Business Slim Wired Keyboard	Y	Y	N3R87AA	
USB Premium Wired Keyboard	Y	Y	Z9N40AA	
USB Wired SmartCard CCID Keyboard	Y	Y	E6D77AA	
3Dconnexion CADMouse	Y	Y	M5C35AA	
HP Optical USB Mouse	Y	Y	QY777AA	
HP PS/2 Mouse	Y	Y	QY775AA	
USB 1000dpi Laser Mouse	Y	Y	QY778AA	
HP USB Hardened Mouse	Y	Y	P1N77AA	

#### Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Internal USB Port Kit	N	Y	EM165AA	Note 1
HP eSATA PCI Cable Kit	Y	Y	GM110AA	Note 2
HP Optical Bay HDD Mounting Bracket	N	Y	NQ099AA	Note 3
HP 2.5in HDD/SSD 2-in-1 ODD Bay Bracket	N	Y	K4T74AA	Note 4
HP Z Premium Front I/O 2xUSB-A 2xUSB-C	N	Y	1XM32AA	
HP Power Cord Kit	Y	N		
HP Workstation Mouse Pad	Y	N		Japan Only
HP ENERGY STAR® Certified Configuration	Y	N		

**NOTE 1:** The HP Internal USB Port kit has a single USB 2.0 type A connector.

**NOTE 2:** No hot plug / hot swap supported with eSATA

**NOTE 3:** NQ099AA used to install greater than four 3.5" HDDs in the factory or when purchasing Aftermarket Option (AMO) drives

## Supported Components

**NOTE 4:** K4T74AA used to install greater than four 2.5" HDD/SSDs in the factory or when purchasing Aftermarket Option (AMO) drives

## Software

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Sobey Video Editing SW	Y	N		China Only
SW HP RGS for Z	Y	N		
HP Sure Start Gen3	Y	N		1

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

### Supported Components

#### Operating Systems

#### Support Notes

Windows 10 Pro 64

Windows 7 Professional 64-bit

Note 3, 4

Windows 10 Downgrade to Windows 7

HP Linux® Installer Kit

Note 2

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

Note 1

**NOTE 1:** This second OS must be ordered with the HP Linux® Installer Kit as the first OS.

**NOTE 2:** 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 3:** downgrade media available by request from HP Support.

For detailed Windows 7 OS hardware support information see

<http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf>.

**NOTE 4:** Windows 10 is preinstalled. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version

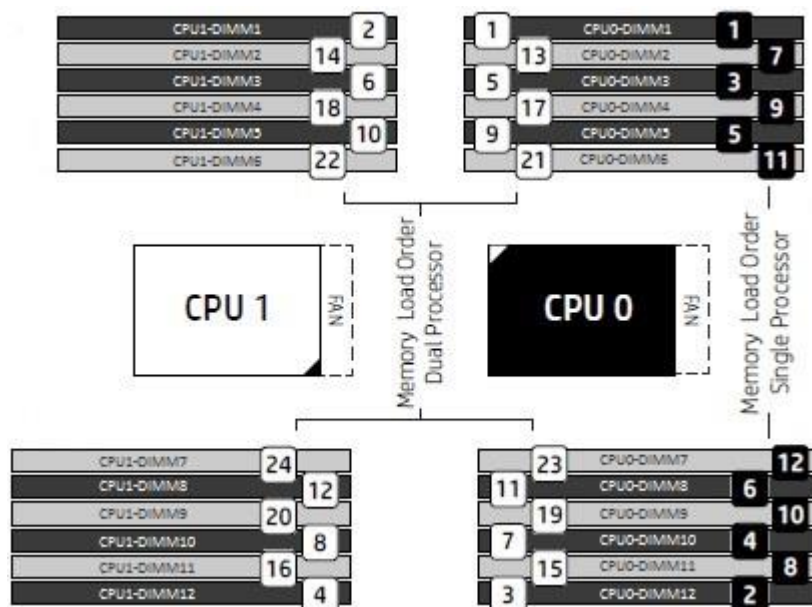
### System Technical Specifications

#### System Board

<b>System Board Form Factor</b>	Custom Form Factor, 16.34"x15.25" (415mm x 387.2mm )
<b>Processor Socket</b>	Dual FCLGA3647 (Socket P)
<b>CPU Bus Speed</b>	UPI: Up to 10.4GT/second, depending on processor
<b>Chipset</b>	Intel® C622 Chipset
<b>Super I/O Controller</b>	Nuvoton SIO15
<b>Memory Expansion Slots</b>	24 slots (12 slots per CPU)
<b>Memory Type Supported</b>	DDR4 R-DIMM (Registered), ECC: 8GB, 16GB, and 32GB DDR4 LR-DIMM (Load Reduced), ECC: 64GB (128GB and 256GB added after initial release)
<b>Memory Modes</b>	NUMA (Non-Uniform Memory Architecture), Memory Node Interleave
<b>Memory Speed Supported</b>	2133MT/s, 2400MT/s, and 2666MT/s

#### Memory Loading Order:

##### Load Order for Single and Dual Processor Configuration



<b>Maximum Memory</b>	Supports up to 768GB using RDIMMs Supports up to 3TB using LRDIMMs*
<b>Memory Configuration (Supported)</b>	<p>Only ECC Registered DIMMs are supported.</p> <ul style="list-style-type: none"> <li>RDIMM (Registered) and LR DIMM (Load Reduction) memory cannot be mixed. All memory installed in the system must be either RDIMM or LR DIMM.</li> <li>Do not install memory modules into memory slots if corresponding processor is not installed.</li> <li>Dual processor configurations with memory modules installed for only one processor is not supported.</li> </ul>

**Notes** For systems installed with 32 bit operating systems, the max accessible system memory is 4GB.

### System Technical Specifications

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

- Sleep (S3 state) support:
- Sleep (S3 state) may not be supported with non-HP validated and qualified 64 GB LR DIMMs.
- Sleep (S3 state) not supported with 128 GB LR DIMMs

The Z8 G4 will support up to 1.5TB at initial release.

\*3 TB system memory available the first half of 2018.

<b>PCI Express Connectors</b>	Two PCIe Gen3 x16 with latch	
	Two PCIe Gen3 x16 with latch. <ul style="list-style-type: none"> <li>• Enabled only with optional 2nd CPU is installed.</li> </ul>	
	One PCIe Gen3 x8 open-ended connector. <ul style="list-style-type: none"> <li>• Enabled for One PCIe Gen2 x4 slot with 1 CPU</li> <li>• Enabled for One PCIe Gen3 x8 with optional 2nd CPU installed</li> </ul>	
	Two PCIe Gen3 x4 open-ended connectors	
<b>Supported Drive Interfaces</b>	<b>SATA</b>	2 sSATA @6Gb/s, supports RAID 0, 1 and NCQ. 8 sSATA @6Gb/s, Supports RAID 0, 1, 5, 10 and NCQ. Factory integrated RAID is Microsoft Windows only.
		External SATA (eSATA)* Supported on all SATA and sSATA ports configurable with optional eSATA* After-Market Option cable kit) * hot plug / hot swap not supported with eSATA
	<b>Factory Configured RAID</b>	SATA: RAID 0, 1, 10
	<b>Integrated Graphics</b>	None
	<b>Network Controller</b>	<b>Integrated Intel I219LM</b>  Memory Integrated 3KB receive buffer and 3KB transmit buffer Data rates supported: 10/100/1000 Mb/s Compliance IEEE 802.1as/1588, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3i 802.3u, 802.3x, 802.3z Up to 32 programmable filters Bus architecture PCIe 1.0 x1 and SMBus UEFI and PXE Boot ROM support Network transfer rates: 10BASE-T (half-duplex) 10 Mb/s 10BASE-T (full-duplex) 20 Mb/s 100BASE-TX (half-duplex) 100 Mb/s 100BASE-TX (full-duplex) 200 Mb/s 1000BASE-T (full-duplex) 2000 Mb/s Management capabilities: WOL (All Power States, including Max Power Savings), auto MDI crossover, PXE, RSS, Advanced cable diagnostics, AMT 11.20 support, vPro compliant  <b>Integrated Intel X722 for 1GbE</b>  Data rates supported: 1000 Mb/s

### System Technical Specifications

		<p>Compliance IEEE 802.1as/1588v2, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3x</p> <p>Up to 16 UDP/TCP programmable filters</p> <p>Bus architecture: PCIe 3.0</p> <p>UEFI and PXE Boot ROM support</p> <p>Intel iWARP Support (RDMA)</p> <p>Network transfer rates:</p> <p>1000BASE-T (full-duplex) 2000 Mb/s</p> <p>Management capabilities: WOL (Excluding Max Power Savings), auto MDI crossover, PXE, Quad Hash filtering, RSS, Advanced cable diagnostics</p>
	<b>PCI-X Connectors</b>	None
	<b>PCI Card Guide</b>	Yes
	<b>Wake on LAN</b>	Yes, both ports
	<b>Integrated Trusted Platform Module</b>	<p>Trusted Platform Module (TPM) 2.0 (Infineon SLB 9670)</p> <p>Common Criteria EAL4+ Certified</p> <p>Convertible to FIPS 140-2 Certified mode through firmware v7.80</p> <p>TPM Certified products list:</p> <p><a href="https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/">https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/</a></p> <p>CG TPM Certified products list:</p> <p><a href="http://www.trustedcomputinggroup.org/certification/tpm-certified-products/">http://www.trustedcomputinggroup.org/certification/tpm-certified-products/</a></p>
<b>IEEE 1394 Connector(s)</b>	<b>Front</b>	None
	<b>Rear</b>	None
	<b>Internal</b>	None
<b>USB Connector(s)</b>	<b>Front</b>	<p>Front I/O Entry: 4 USB 3.1 Gen1 (Left-most Port has Charging Capability)</p> <p>Front I/O Premium: 2x USB 3.1 Gen1, 2x USB 3.1 Gen2 Type-C™ (Left-most Port has Charging Capability)</p>
	<b>Rear</b>	6 USB 3.0 Gen1, Type A
	<b>Internal</b>	<p>1 USB 3.0 Gen1 available with a single 20-pin shrouded connector. This header supports a USB Media Card reader.</p> <p>1 USB 3.1 G1 single-port header</p> <p>1 USB 2.0 single-port header</p> <p>1x USB 2.0 dual-port header</p>
<b>HD Integrated Audio</b>		Realtek ALC221
<b>Flash ROM</b>		Yes
<b>CPU Fan Header</b>		Two headers for CPU fans
<b>Memory Fan Header</b>		Two headers
<b>Chassis Fan Header</b>		One Rear Chassis Fan Header
<b>Front PCI Fan Header</b>		One Front and one Aux Fan Header
<b>Front User Interface Header</b>		Power Button; Power and HDD Activity LEDs; Power for USB Ports
<b>Front Audio Header</b>		FIO Headset/Mic and Speaker
<b>CMOS Battery Holder - Lithium</b>		Yes
<b>Integrated Trusted Platform Module</b>		<p>Trusted Platform Module (TPM) 2.0 (Infineon SLB 9670)</p> <p>Common Criteria EAL4+ Certified</p> <p>Convertible to FIPS 140-2 Certified mode through firmware v7.80</p> <p>TPM Certified products list:</p> <p><a href="https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/">https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/</a></p>



### System Technical Specifications

<b>Power Supply Headers</b>	Yes			
<b>Clear Password Jumper</b>	Yes			
<b>Serial Port</b>	Yes, on rear panel			
<b>Parallel Port</b>	No			
<b>Keyboard/Mouse</b>	Yes			
<b>Power Supply</b>	1125W/1275W*/1450W* 90% Efficient, Custom PSU (Wide-Ranging, Active PFC)		1450W/1550W*/1700W* 90% Efficient, Custom PSU (Wide-Ranging, Active PFC)	
<b>Operating Voltage Range</b>	90-269 VAC		90-269 VAC	
<b>Rated Voltage Range</b>	100-127 VAC 200-240 VAC	118 VAC	100-127VAC 200-240VAC	118 VAC
<b>Rated Line Frequency</b>	50-60 Hz	400 Hz	50-60Hz	400 Hz
<b>Operating Line Frequency Range</b>	47-66 Hz	393-407 Hz	47-66Hz	393-407 Hz
<b>Rated Input Current</b>	12A @ 100-127 VAC 10A @ 200-240 VAC	12A @ 118 VAC	16A @ 100-127 VAC 10A @ 200-240 VAC	16A @ 118VAC
<b>Heat Dissipation (Configuration and software dependent)</b>	Typical = 2419 btu/hr Max 1 = 4626 btu/hr Max 2 = 5001 btu/hr Max 3 = 5560 btu/hr		Typical = 2970 btu/hr Max 1 = 5962 btu/hr Max 2 = 6080 btu/hr Max 3 = 6519 btu/hr	
<b>Power Supply Fan</b>	(2) Blowers variable speed		(2) Blowers variable speed	
<b>ENERGY STAR Qualified</b> (Configuration dependent)	Yes		Yes	
<b>Power Supply Efficiency</b>	90% Efficient		90% Efficient	
	The Z8 G4 1125W (1450W at 200V Input Voltage) power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1125BB%20A_1125W_ECOS%204825_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1125BB%20A_1125W_ECOS%204825_Report.pdf</a>		The Z8 G4 1450W (1700W at 200V Input Voltage) power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1450AB%20A_1450W_ECOS%204826_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1450AB%20A_1450W_ECOS%204826_Report.pdf</a>	
<b>FEMP Standby Power Compliant @115V (&lt;2W 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) -</b>	TBD		TBD	

### System Technical Specifications

#### Suspend to RAM (S3) (Instantly Available PC)

<b>Built-in Self-Test LED</b>	Yes	Yes
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<b>Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)</b>	Yes	Yes
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\*Input voltage restriction

**NOTE:** The 1125W (1450W at 200V Input Voltage) power supply can also supply 1275W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1125W. An uninterruptible power supply (UPS) is highly recommended if 1275W output power is desired.

The 1125W Power Supply can also supply 1450W of output power when the input voltage is greater than 180V under all conditions.

**NOTE:** The 1450W (1700W at 200V Input Voltage) power supply can also supply 1550W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1450W. An uninterruptible power supply (UPS) is highly recommended if 1550W output power is desired.

The 1450W Power Supply can also supply 1700W of output power when the input voltage is greater than 180V under all conditions.

<b>AUX IN (audio)</b>	No
<b>Clear CMOS Button</b>	Yes
<b>Multibay Header</b>	No
<b>Integrated Gigabit Ethernet</b>	Yes, dual port.
<b>Access Panel Solenoid Lock Header</b>	No
<b>Access Panel Intrusion Sensor Header</b>	Yes, as part of Front UI (Control Panel) cable header
<b>Memory Fan Connector</b>	Yes, blind-mate

### System Technical Specifications

### System Configurations

<b>Example Z8 G4 Configuration #1</b>	Processor Info	1x Intel Xeon 3106 1.7 2133 8C 85 1stCPU					
	Memory Info	16GB DDR4-2666 (2x8GB) RegRAM CPU1					
	Graphics Info	1x NVIDIA Quadro P600 1st GFX					
	Disks/Optical/Floppy	1x 256GB SATA 1st SSD /1x DVD-ROM SATA					
	Power Supply	1125W 90% Custom PSU					
	Other	-					
		115 VAC		230 VAC		100 VAC	
<b>Energy Consumption</b>		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled
	Windows Idle (S0)	75.4		74.8		75.7	
	Windows Busy Typ(S0)	122.04		111.9		113.6	
	Windows Busy Max (S0)	125.4		124.6		126.6	
	Sleep (S3)	6.22	6.26	6.26	6.26	6.33	6.25
	Off (S5)	4.23	4.19	4.19	4.16	4.13	4.12
	Zero Power Mode (ErP)	0.31		0.40		0.29	
		115 VAC		230 VAC		100 VAC	
<b>Heat Dissipation (Btu/hr)</b>		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows Idle (S0)	257.5		255.3		258.5	
	Windows Busy Typ(S0)	416.4		382.0		387.6	
	Windows Busy Max (S0)	427.9		425.1		432.0	
	Sleep (S3)	21.2	21.1	21.3	21.2	21.6	21.3
	Off (S5)	14.4	14.0	14.3	14.2	14.1	14.1
	Zero Power Mode (ErP)	1.04		1.38		0.99	
		115 VAC		230 VAC		100 VAC	

<b>Example Z8 G4 Configuration #2</b>	Processor Info	2x Intel Xeon 4114 2.2 2400 10C 85 1stCPU					
	Memory Info	48GB DDR4-2666 (6x8GB) RegRAM CPU2					
	Graphics Info	1x NVIDIA Quadro P2000 1st GFX					
	Disks/Optical/Floppy	4x 512GB SATA 1st SSD /1x DVD-ROM SATA					
	Power Supply	1125W 90% Custom PSU					
	Other	-					
		115 VAC		230 VAC		100 VAC	
<b>Energy Consumption</b>		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled
	Windows Idle (S0)	105.2		103.3		102.5	
	Windows Busy Typ(S0)	257.4		246.3		260.9	
	Windows Busy Max (S0)	296.2		289.9		297.6	
	Sleep (S3)	8.46	8.35	8.57	8.45	8.58	8.57
	Off (S5)	4.15	4.14	4.31	4.19	4.21	4.15
	Zero Power Mode (ErP)	0.31		0.40		0.29	
		115 VAC		230 VAC		100 VAC	
<b>Heat Dissipation (Btu/hr)</b>		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows Idle (S0)	359.0		352.5		349.8	

### System Technical Specifications

	Windows Busy Typ(S0)	878.3		840.5		890.2	
	Windows Busy Max (S0)	1010.7		989.1		1015.6	
	Sleep (S3)	28.8	28.5	29.2	28.8	29.2	29.2
	Off (S5)	14.1	14.1	14.6	14.2	14.3	14.1
	Zero Power Mode (ErP)	1.04		1.36		0.99	

<b>Example Z8 G4 Configuration #3</b>	Processor Info	2x Intel Xeon 5120 2.2 2400 14C 105 1stCPU					
	Memory Info	96GB DDR4-2666 (12x8GB) RegRAM CPU2					
	Graphics Info	1x NVIDIA Quadro P4000 1st GFX					
	Disks/Optical/Floppy	4x 2TB 7200 RPM SATA 1st HDD /1x DVD RW SATA					
	Power Supply	1125W 90% Custom PSU					
	Other	-					

<b>Energy Consumption</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled
	Windows Idle (S0)	125.7		123.6		125.8	
	Windows Busy Typ(S0)	340.7		332.9		343.7	
	Windows Busy Max (S0)	417.1		411.8		426.1	
	Sleep (S3)	9.28	9.10	9.24	9.15	9.49	9.26
	Off (S5)	4.15	4.14	4.32	4.10	4.21	4.16
	Zero Power Mode (ErP)	0.31		0.41		0.30	

<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)	429.3		422.0		429.5	
	Windows Busy Typ(S0)	1162.7		1136.0		1172.9	
	Windows Busy Max (S0)	1423.4		1405.3		1453.9	
	Sleep (S3)	31.6	31.0	31.5	31.2	32.4	31.5
	Off (S5)	14.1	14.1	14.7	13.9	14.3	14.2
	Zero Power Mode (ErP)	1.05		1.38		1.03	

<b>Example Z8 G4 Configuration #4</b>	Processor Info	2x Intel Xeon 6152 2.1 2666 22C 140 CPU					
	Memory Info	192GB DDR4-2666 (24x8GB) RegRAM CPU					
	Graphics Info	2x NVIDIA Quadro P5000 GFX					
	Disks/Optical/Floppy	6x 1 TB SATA SSD /1x DVD RW SATA					
	Power Supply	1125W 90% Custom PSU					
	Other	-					

<b>Energy Consumption</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled
	Windows Idle (S0)	161.1		157.8		160.4	
	Windows Busy Typ(S0)	524.7		500.7		496.1	
	Windows Busy Max (S0)	644.2		624.2		652.7	
	Sleep (S3)	10.3	10.2	10.2	10.1	10.1	10.1

### System Technical Specifications

	Off (S5)	4.14	4.01	4.19	4.19	4.16	4.15
	Zero Power Mode (ErP)	0.31		0.41		0.31	
<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)	549.6		538.4		547.5	
	Windows Busy Typ(S0)	1790.4		1708.6		1692.6	
	Windows Busy Max (S0)	2198.1		2129.8		2227.0	
	Sleep (S3)	35.3	34.9	35.0	34.7	34.5	134.3
	Off (S5)	14.1	13.6	14.3	14.3	14.2	14.1
	Zero Power Mode (ErP)	1.06		1.39		1.04	

<b>Example Z8 G4 Configuration #5</b>	Processor Info	2x Intel Xeon 6136 3.0 2666 12C 150 CPU					
	Memory Info	768GB DDR4-2666 (24x32GB) RegRAM CPU2					
	Graphics Info	2x NVIDIA Quadro P6000 GFX					
	Disks/Optical/Floppy	HP Z Turbo Quad Pro 4x1TB + 4x 1 TB SATA SSD /1x DVDRW SATA					
	Power Supply	1450W 90% Custom PSU					
	Other	-					

<b>Energy Consumption</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled
	Windows Idle (S0)	194.0		192.6		197.0	
	Windows Busy Typ(S0)	640.2		622.0		647.0	
	Windows Busy Max (S0)	788.0		761.3		800.6	
	Sleep (S3)	21.1	19.7	19.7	18.8	21.3	19.8
	Off (S5)	4.24	4.22	4.53	4.51	4.24	4.21

<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)	662.1		657.2		672.3	
	Windows Busy Typ(S0)	2184.3		2122.3		2207.7	
	Windows Busy Max (S0)	2688.8		2597.8		2731.7	
	Sleep (S3)	72.3	67.5	67.5	64.1	72.6	67.7
	Off (S5)	14.4	14.4	15.4	15.4	14.4	14.3

**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

<b>System Configuration (Entry level)</b>	Processor Info	2-Intel® Xeon® Gold 6134 processor 3.2GHz 8C CPU					
	Memory Info	96GB (12x8GB) DDR4-2666 ECC Memory RDIMMs					
	Graphics Info	1-NVIDIA® Quadro® P400 2GB					
	Disks/Optical	1-500GB SATA 7200RPM 3.5" HDD / 1-HP 9.5mm Slim Blu Ray Disc Writer					
	Power Supply	1125 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	3.6	19
	Hard drive Operating (random reads)	3.7	19

System Configuration (Mid-range)	Processor Info	2-Intel® Xeon® Gold 6146 processor 3.2GHz 12C CPU	
	Memory Info	384GB (24x16GB) DDR4-2666 ECC Memory RDIMMs	
	Graphics Info	1-NVIDIA® Quadro® P6000 24GB	
	Disks/Optical	2-300GB 12Gb/s 15K RPM SAS HDD / 1-HP 9.5mm Slim Blu Ray Disc Writer	
	Power Supply	1450 W	

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.6	20
	Hard drive Operating (random reads)	3.8	23

### ENVIRONMENTAL DATA

Environmental Requirements	Temperature	Operating: 5° to 35° C (40° to 95° F) Non-operating: -40° to 60° C (-40° to 140° F)
	Humidity	Operating: 8% to 85% RH, non-condensing Non-operating: 8% to 90% RH, non-condensing
	Maximum Altitude	Operating: 3,048 m (10,000 feet) Non-operating: 9,144 m (30,000 feet)
	Dynamic (new)	<b>Shock</b> Operating: ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g) square: 422 cm/s, 20g <b>NOTE:</b> Values represent individual shock events and do not indicate repetitive shock events.
	Cooling	<b>Vibration</b> Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g²/Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g²/Hz <b>NOTE:</b> Values do not indicate continuous vibration. Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation, up to 3048 m (10,000 feet)

### Physical Security and Serviceability

Access Panel	Tool-less Includes system board and memory information.
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### System Technical Specifications

<b>Optical Drive</b>	Tool-less, 2 <sup>nd</sup> Optical Drive requires a 5.25" bay carrier
<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 tool-free internal chassis components.
<b>Color-coordinated Cables and Connectors</b>	Yes
<b>Memory</b>	Tool-less
<b>System Board</b>	Tool-less, retained by Front Card Guide and Top Memory Fan Holder
<b>Dual Color Power and HD LED on Front of Computer</b>	No
<b>Configuration Record SW</b>	Yes
<b>Over-Temp Warning on Screen</b>	Yes. Temp-Caution and Temp Critical are provide via the WMI interface. Tools like the HPPA can display the Critical and Caution state.
<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>	No
<b>Cable Lock Support</b>	Yes, Kensington Cable Lock (optional): Prevents entire system theft only. 3mm x 7mm slot at rear of system
<b>Universal Chassis Clamp Lock Support</b>	No
<b>Solenoid Lock and Hood Sensor</b>	No
<b>Rear Port Control Cover</b>	No
<b>Serial, USB, Audio, Network, Enable/Disable Port Control</b>	Yes. USB controls are Front, Rear and Internal
<b>Removable Media Write/Boot Control</b>	No
<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, prevents an unauthorized person from changing the workstation configuration
<b>NIC LEDs (integrated) (Green &amp; Amber)</b>	No
<b>CPUs and Heatsinks</b>	Yes
<b>Power Supply Diagnostic LED</b>	No
<b>Front 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
<b>Internal Speaker</b>	Yes
<b>System/Emergency ROM Flash Recovery</b>	Recovers corrupted system BIOS
<b>Cooling Solutions</b>	Air cooled forced convection

### System Technical Specifications

<b>Power Supply Fans</b>	2x – Dual Side Inlet Blowers
<b>CPU Heatsink Fan</b>	80mm x 25mm 5-wire PWM for each CPU
<b>Chassis Fan</b>	Rear: 120mm x 38mm Front: 120mm x 25mm (PCIe zone)
<b>Memory Heatsink Fan</b>	Front 92mm x 25mm (upper memory bank); Front 80mm x 25mm (lower memory bank)
<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, prevents removal of the access panel and all internal components including optical and storage devices
<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> <li>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</li> </ul>
<b>Trusted Platform Module Chip</b>	Yes
<b>Integrated Chassis Handles</b>	Yes, front and rear
<b>Power Supply</b>	Tool-less, rear access direct-connect (blind-mate)
<b>PCIe Card Retention</b>	Yes, tool-less Rear (all) Middle (full-height cards) Front (full-length cards with extenders)
<b>Flash ROM</b>	Yes.SPI ROM
<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
<b>BIOS</b>	
<b>BIOS 32-bit Services</b>	Standard BIOS 32-bit Service Directory Proposal v0.4 BIOS supports 32 and 64-bit Operating systems.
<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.

### System Technical Specifications

<b>Replicated Setup</b>	Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigurationUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
<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. Supports ACPI 5.0 for full compatibility with 64-bit operating systems.
<b>Ownership Tag</b>	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen.
<b>Remote Wakeup/Remote Shutdown</b>	System administrators can power on, restart, and power off a client computer from a remote location.
<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

### System Technical Specifications

<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 Computing Group TPM Specification Version 2.0 (Infineon SLB 9665). Common Criteria EAL4+ 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>
<b>UHCI</b>	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 3.0 Specification
<b>SMBIOS</b>	System Management BIOS Reference Specification, Version 2.8

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

### Social and Environmental Responsibility

**Eco-Label Certifications & Declarations** This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

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

The Z8 G4 is registered EPEAT® Gold in the US and Canada. EPEAT® registration varies by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at <http://www.hp.com/go/options>

#### Batteries

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

### System Technical Specifications

**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. The following customer-configurable internal components may not be low-halogen: 3 ½" SAS HDDs. Service parts obtained after purchase may not be low-halogen.

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

**HP Inc. Corporate Environmental Information** For more information about HP's commitment to the environment: [Sustainability Report](#)

Eco-label certifications:

<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>

ISO 14001 certificate:

<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

- Additional Information**
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. [Product Disassembly Instructions](#)
  - Plastic parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
  - This product is >90% recycle-able when properly disposed of at end of life.

**Packaging** HP Workstation product packaging meets the [HP's General Specification for the Environment](#)

- Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment
- Does not contain ozone-depleting substances (ODS)
- Does not contain heavy metals (lead, mercury, cadmium or hexavalent chromium) in excess of 100 ppm sum total for all heavy metals listed
- Maximizes the use of post-consumer recycled content materials in packaging materials
- All packaging material is recyclable
- All packaging material is designed for ease of disassembly
- Reduced size and weight of packages to improve transportation fuel efficiency
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards formatting

**Packaging Materials**  
**Internal**  
**External**

Cushions and plastic bags made of low density polyethylene (LDPE).

Outer carton, accessories carton, and insert made of corrugated paper board.

**Manageability**  
**Industry Standard Specifications**

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) 11.20



### System Technical Specifications

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 11.20 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)
- 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 Z8 G4 Workstation supports Intel® vPro™ technology when configured as outlined below:

- Intel® Xeon® processor E5-1600 v5 or E5-2600 v5 product family featuring Intel® vPro™ Technology
- Intel® C622 chipset
- Intel® I219LM GbE LAN

### Remote Manageability Software Solutions

The HP Z8 G4 Workstation is supported on the following remote manageability software consoles:

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

### System Software Manager Service, Support, and Warranty

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

On-site Warranty and Service (**Note 1**): Three-years, limited warranty and service offering delivers on-site, next business-day (**Note 2**) service for parts and labor and includes free telephone support (**Note 3**) 8am - 5pm. Global coverage (**Note 2**) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering. 24/7 operation will not void the HP warranty.

**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

### System Technical Specifications

hardware and software. Toll-free calling and 24x7 support service may not be available in some countries.

HP Care Pack Services are extended service contracts that go beyond the standard limited 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>. Additional HP Care Pack Services information by product is available at: <http://www.hp.com/hps/carepack>. Service levels and response times for HP Care Packs may vary depending on your geographic location. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

#### 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

#### Global Series SKUs

As part of its commitment to hardware, software, and solution innovation, HP is proud to introduce this breakthrough platform configuration stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware and software designed and tested to work with all HP Z Workstation platforms through their end of life. These components and their corresponding HP Workstation platform compatibility are outlined in this section.

HP Stable & Consistent Offerings are available worldwide to all HP Workstation customers—no special programs, no additional cost—no kidding. Simply select your hardware and software components when you customize your HP Workstation and be assured that you'll be able to buy that same configuration throughout the lifecycle of the product.

#### Processors

Product #	Offering
1XM69AA	Intel® Xeon® Gold 6128 processor
1XM74AA	Intel® Xeon® Silver 4114 processor
1XM76AA	Intel® Xeon® Silver 4108 processor

#### Hard Drives

Product #	Offering
LQ037AA	1TB SATA 7200 RPM

#### Graphics

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

#### Memory

Product #	Offering
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD
TBD	TBD

#### Optical and Removable Storage

Product #	Offering
TBD	TBD
TBD	TBD



### Technical Specifications - Processors

Intel® Xeon® Platinum 8180 processor

Intel® Xeon® Platinum 8160 processor

Intel® Xeon® Gold 6152 processor

Intel® Xeon® Gold 6154 processor

Intel® Xeon® Gold 6148 processor

Intel® Xeon® Gold 6142 processor

Intel® Xeon® Gold 6136 processor

Intel® Xeon® Gold 6140 processor

Intel® Xeon® Gold 6134 processor

Intel® Xeon® Gold 6132 processor

Intel® Xeon® Gold 6130 processor

Intel® Xeon® Gold 6128 processor

Intel® Xeon® Gold 6126 processor\*

Intel® Xeon® Gold 5120 processor

Intel® Xeon® Gold 5118 processor

Intel® Xeon® Gold 5122 processor

Intel® Xeon® Silver 4116 processor

Intel® Xeon® Silver 4114 processor

Intel® Xeon® Silver 4112 processor

Intel® Xeon® Silver 4108 processor

Intel® Xeon® Bronze 3106 processor

Intel® Xeon® Bronze 3104 processor

\*Intel® Xeon® Gold 6126 processor (selected North America public sector customers only), Availability date TBD.

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Technical Specifications - Hard Drives

STORAGE/HARD DRIVES

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

### Technical Specifications - Hard Drives

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

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

<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)

#### 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)

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

<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
<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)

### Technical Specifications - Hard Drives

**1TB SATA 7200 rpm  
6Gb/s 3.5" HDD  
(Enterprise Class)**

<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)	<table> <tr> <td><b>Single Track</b></td><td>0.32ms</td></tr> <tr> <td><b>Average</b></td><td>7.45ms</td></tr> <tr> <td><b>Full Stroke</b></td><td>14.2ms</td></tr> </table>	<b>Single Track</b>	0.32ms	<b>Average</b>	7.45ms	<b>Full Stroke</b>	14.2ms
<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>	<table> <tr> <td><b>Sequential Read</b></td><td>up to 226MB/s</td></tr> <tr> <td><b>Sequential Write</b></td><td>up to 226MB/s</td></tr> </table>	<b>Sequential Read</b>	up to 226MB/s	<b>Sequential Write</b>	up to 226MB/s		
<b>Sequential Read</b>	up to 226MB/s						
<b>Sequential Write</b>	up to 226MB/s						
<b>Enterprise Class Features</b>	High Reliability						

### 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
<b>Buffer</b>	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
<b>Rotational Speed</b>	7,200 rpm
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)

#### 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
<b>Buffer</b>	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)
<b>Rotational Speed</b>	7,200 rpm
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)

### 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>	<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)

#### 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>	<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

#### 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
<b>Endurance</b>	388TBW (TB Written)
<b>Reliability (MTTF)</b>	1.5M hours
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm

### Technical Specifications - Hard Drives

	<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
<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
<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
	<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

### Technical Specifications - Hard Drives

<b>HP 2TB SATA 6Gb/s SSD</b>	<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>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>HP Enterprise Class 240GB SATA SSD</b>	<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>Performance</b>	<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
	<b>Enterprise Class Features</b>	High Endurance NAND Power Loss Protection End-to-End Data Protection
<b>HP Enterprise Class 480GB SATA SSD</b>	<b>Capacity</b>	480GB
	<b>Protocol</b>	SATA
	<b>Form Factor</b>	2.5"
	<b>Controller</b>	AHCI
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	4,400TBW (TB Written)
	<b>Reliability (MTTF)</b>	2.0M hours
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm



### Technical Specifications - Hard Drives

		<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>Performance</b>	<b>Sequential Read</b> 540 MB/s <b>Sequential Write</b> 460 MB/s <b>Random Read</b> 93K IOPS <b>Random Write</b> 74K IOPS
		<b>Enterprise Class Features</b>	High Endurance NAND Power Loss Protection End-to-End Data Protection
<b>PCIe SSDs for HP Workstations</b>	<b>HP Z Turbo Drive G2 256GB SSD</b>	<b>Capacity</b>	256GB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe
		<b>NAND Type</b>	MLC
		<b>Endurance</b>	150TB
		<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> 2800 MB/s <b>Sequential Write</b> 1100 MB/s <b>Random Read</b> 250K IOPS <b>Random Write</b> 180K IOPS
	<b>HP Z Turbo Drive G2 512GB SSD</b>	<b>Capacity</b>	512GB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<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> 2800 MB/s <b>Sequential Write</b> 1600 MB/s <b>Random Read</b> 260K IOPS <b>Random Write</b> 260K IOPS
	<b>HP Z Turbo Drive G2 1TB SSD</b>	<b>Capacity</b>	1TB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe

Technical Specifications - Hard Drives

<b>NAND Type</b>	3D MLC	
<b>Endurance</b>	600TB	
<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>	3000 MB/s
	<b>Sequential Write</b>	1700 MB/s
	<b>Random Read</b>	360K IOPS
	<b>Random Write</b>	330K IOPS

### 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>	MLC
	<b>Endurance</b>	150TB
	<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> 2800 MB/s
		<b>Sequential Write</b> 1100 MB/s
		<b>Random Read</b> 250K IOPS
		<b>Random Write</b> 180K IOPS
<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 MLC
	<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> 2800 MB/s
		<b>Sequential Write</b> 1600 MB/s
		<b>Random Read</b> 260 K IOPS
		<b>Random Write</b> 260K IOPS
<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>	600TB
	<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> 3000 MB/s
		<b>Sequential Write</b> 1700 MB/s
		<b>Random Read</b> 360 K IOPS
		<b>Random Write</b> 330K IOPS
<b>HP Z Turbo Drive G2 256GB SED SSD</b>	<b>Capacity</b>	256GB
	<b>Protocol</b>	PCIe

### Technical Specifications - Hard Drives

	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	MLC
	<b>Endurance</b>	150TBW (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> 2800 MB/s
		<b>Sequential Write</b> 1100 MB/s
		<b>Random Read</b> 250K IOPS
		<b>Random Write</b> 180K IOPS
	<b>Self-Encrypting Drive Support</b>	OPAL 2
<b>HP Z Turbo Drive G2 512GB SED SSD</b>	<b>Capacity</b>	512GB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	MLC
	<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>	<b>Sequential Read</b> 2800 MB/s
		<b>Sequential Write</b> 1600 MB/s
		<b>Random Read</b> 260K IOPS
		<b>Random Write</b> 260K IOPS
	<b>Self-Encrypting Drive Support</b>	OPAL 2
<b>HP Z Turbo Drive G2 256GB TLC SSD</b>	<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>Endurance</b>	75TBW (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> 2800 MB/s
		<b>Sequential Write</b> 320 MB/s (1100 MB/s max/Turbo)
		<b>Random Read</b> 250K IOPS
		<b>Random Write</b> 180K IOPS
	<b>Capacity</b>	512GB

### Technical Specifications - Hard Drives

<b>HP Z Turbo Drive G2 512GB TLC SSD</b>	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	150TBW (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> 2800 MB/s
		<b>Sequential Write</b> 660 MB/s (1600 MB/s max/Turbo)
<b>HP Z Turbo Drive G2 1TB TLC SSD</b>		<b>Random Read</b> 260K IOPS
		<b>Random Write</b> 260K IOPS
	<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>	300TBW (TB Written)
	<b>Reliability (MTBF)</b>	1.5M hours
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
<b>HP Z Turbo Drive Quad Pro 256GB SSD module</b>	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 3000 MB/s
		<b>Sequential Write</b> 1150 MB/s (1700 MB/s max/Turbo)
		<b>Random Read</b> 360K IOPS
		<b>Random Write</b> 330K IOPS
	<b>Capacity</b>	256GB (one M.2 PCIe NVMe module)
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Capacity</b>	512GB (one M.2 PCIe NVMe module)
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
<b>HP Z Turbo Drive Quad Pro 512GB SSD module</b>	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Capacity</b>	1TB (one M.2 PCIe NVMe module)
<b>HP Z Turbo Drive Quad Pro 1TB SSD module</b>	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)

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

<b>Capacity:</b>	256GB (one M.2 PCIe NVMe module)
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)

### Technical Specifications - Hard Drives

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

<b>Capacity:</b>	512GB (one M.2 PCIe NVMe module)
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)

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

<b>Capacity:</b>	1TB (one M.2 PCIe NVMe module)
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)

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

<b>Capacity:</b>	2TB (one M.2 PCIe NVMe module)
<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)

<b>Intel® 905p Series AIC PCIe SSD</b>	<b>Intel® 905p Series AIC 280GB PCIe SSD</b>	<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)
		<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>Intel® 905p Series AIC 480GB PCIe SSD</b>		<b>Random Read</b> 587K IOPS
			<b>Random Write</b> 559K IOPS
		<b>Capacity</b>	480TB
		<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> 27100 MB/s
			<b>Sequential Write</b> 2280 MB/s

Technical Specifications - Hard Drives

Random Read	582K IOPS
Random Write	561K IOPS

Technical Specifications - Hard Drive Controllers

HARD DRIVE CONTROLLERS

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



### Technical Specifications - Graphics

#### GRAPHICS

<b>NVIDIA® Quadro® P400 1st GFX 2GB Graphics</b>	<b>Form Factor</b>	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P400 Graphics Card GP107 GPU 256 NVIDIA® CUDA® cores Max Power: 30 Watts
	<b>Bus Type</b>	PCI Express 3.0 x16
	<b>Memory</b>	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 64-bit Memory Bandwidth: 32 GB/s
	<b>Connectors</b>	3mDP Outputs
	<b>Maximum Resolution</b>	DisplayPort™ 1.4: - up to 3x 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>	3 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: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>

#### Notes

<b>NVIDIA® Quadro® P600 1st GFX 2GB Graphics</b>	<b>Form Factor</b>	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P600 Graphics Card GP107 GPU 384 NVIDIA® CUDA® cores Max Power: 40 Watts
	<b>Bus Type</b>	PCI Express 3.0 x16

### Technical Specifications - Graphics

<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®
<b>Notes</b>	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>

#### NVIDIA® Quadro® P620 2GB Graphics

<b>Form Factor</b>	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
<b>Graphics Controller</b>	NVIDIA® Quadro® P620 Graphics Card GP107 GPU 512 CUDA cores Max Power: 40 Watts
<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

### Technical Specifications - Graphics

<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
<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> <p>*P620 only have mini-DisplayPort™ (mDP) video ports.</p> <p>Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included            After market option kit:Two mDP-to-DP Adapters included</p> <p>Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:</p> <ul style="list-style-type: none"> <li>- 2MY05AA - HP miniDP-to-DP Adapter Cables</li> <li>- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables</li> </ul>

#### AMD FirePro™ W2100 2GB Graphics

<b>Form Factor</b>	Low Profile, half length (full-height bracket included)
<b>Graphics Controller</b>	AMD FirePro™ W2100 professional graphics based on Oland GPU. GPU: 320 Stream Processors organized into 5 Compute Units GPU Frequency: 630Mhz Power: 26W Cooling: Active
<b>Bus Type</b>	PCI Express® x8, Generation 3.0
<b>Memory</b>	2GB DDR3 memory Memory Bandwidth: up to 28.8 GB/s Memory Width: 128 bit
<b>Connectors</b>	<p>2x DisplayPort™ 1.2 connectors</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>
<b>Maximum Resolution</b>	<p>DisplayPort™ 1.2:</p> <ul style="list-style-type: none"> <li>- up to 4096x2160 x 24 bpp @ 60Hz</li> </ul> <p>Dual Link DVI(I) (requires adapter cable):</p> <ul style="list-style-type: none"> <li>- up to 2560 x 1600 x 32 bpp @ 60Hz</li> </ul> <p>Single Link-DVI(I)(requires adapter cable):</p>

### Technical Specifications - Graphics

- up to 1920 x 1200 x 32 bpp @ 60Hz

VGA (requires adapter cable):

- up to 1920 x 1200 x 32 bpp @ 60Hz

**Image Quality Features** Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling.

**Display Output** 2 x DisplayPort™ 1.2a  
Maximum number of displays: 2

**Shading Architecture** Shader Model 5.0

**Supported Graphics APIs** OpenCL™ 1.2, DirectX® 11.2/12, OpenGL® 4.4

OpenGL® 4.4 support with driver release 14.301.xxx

OpenCL™ 1.2 conformance expected with drive release 14.301.xxx

**Available Graphics Drivers** Windows10 (64-bit)  
Windows 8.1 (64-bit)  
Windows 7 (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>

**Notes** Depending on the card model, native DisplayPort™ connectors and/or certified DisplayPort™ active or passive adapters to convert your monitor's native input to your card's DisplayPort™ or Mini-DisplayPort™ connector(s) may be required. See [www.amd.com/FirePro](http://www.amd.com/FirePro)™ for details.

#### NVIDIA® Quadro® P1000 1st GFX 4GB Graphics

##### Form Factor

Dimensions: 2.713" H x 5.7" L

Single Slot, Low Profile

Cooling: Active

Weight: 129 grams

##### Graphics Controller

NVIDIA® Quadro® P1000 Graphics Card

GP107-860 GPU

640 NVIDIA® CUDA® cores

Max Power: 47 Watts

##### Bus Type

PCI Express 3.0 x16

##### Memory

Size: 4 GB GDDR5, 2500 MHz

Memory Interface: 128-bit memory interface

Memory Bandwidth: 80 GB/s memory bandwidth

##### Connectors

4mDP Outputs

##### Maximum Resolution

DisplayPort™ 1.4:

- up to 4x 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

4 mDP Connectors

### Technical Specifications - Graphics

<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®
<b>Notes</b>	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>NVIDIA® Quadro® P2000 1st GFX 5GB Graphics</b>	<b>Form Factor</b>	Dimensions: 4.4"Hx7.9"L Single Slot Cooling: Active Weight: 260 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P2000 Graphics Card Power: 75 Watts
	<b>Bus Type</b>	PCI Express 3.0 x16
	<b>Memory</b>	Size: 5GB GDDR5 Memory Bandwidth: 140 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  HDMI 2.0 (requires DP to HDMI adapter): 5120 x 2880 x 24 bpp @ 60Hz
	<b>Image Quality Features</b>	12-bit internal display pipeline (hardware support for 12-bit scanout on supported panels, applications and connection)  Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, NVIDIA® Mosaic and nView.

### Technical Specifications - Graphics

<b>Display Output</b>	<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>	

<b>Radeon™ Pro WX 3100 4GB Graphics</b>	<p><b>Form Factor</b></p> <p><b>Graphics Controller</b></p> <p><b>Memory</b></p> <p><b>Connectors</b></p> <p><b>Maximum Resolution</b></p> <p><b>Image Quality Features</b></p> <p><b>Display Output</b></p> <p><b>GPU Architecture</b></p>	<p>Low-Profile Single Slot (6.6" Length)</p> <p>Polaris12 GL GPU: 512 Stream Processors organized into 8 Compute Units Power: 50 Watts Cooling: Active</p> <p>4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit</p> <p>2x Mini DisplayPort™ 1.4 plus 1x DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.</p> <p>Factory Configured: No adapters included After market option kit: One mDP-to-DP cable adapters included</p> <p>Additional Mini DisplayPort™-to-DisplayPort™, DisplayPort™-to-VGA or DisplayPort™-to-DVI adapters are available as Factory Configuration or Option Kit accessories.</p> <p>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</p> <p>Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling</p> <p>3 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support</p> <p>Polaris</p>
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### Technical Specifications - Graphics

<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) 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>

<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. 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>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.</li> </ol>
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<b>Radeon™ Pro WX 4100 4GB Graphics</b>	<b>Form Factor</b> <b>Graphics Controller</b> <b>Memory</b> <b>Connectors</b> <b>Maximum Resolution</b>	Low-Profile Single Slot (6.6" Length) Polaris 11 Baffin GL XT GPU: 1024 Stream Processors organized into 16 Compute Units Power: 50 Watts Cooling: Active 4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit 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. 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
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### Technical Specifications - Graphics

**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

**GPU Architecture** GCN 4th Generation

**Supported Graphics APIs** DirectX®12  
OpenGL® 4.5  
OpenCL™ 2.0  
Vulkan™ 1.0

**Available Graphics Drivers** 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

4. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
5. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
6. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

#### NVIDIA® Quadro® P4000 1st GFX 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: GP104 with 1792 CUDA cores  
Power: 120 Watts

##### Bus Type Memory

PCI Express 3.0 x16  
Size: 8GB GDDR5  
Memory Bandwidth: 243 GB/s  
Memory Width: 256-bit

##### Connectors

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



### Technical Specifications - Graphics

	<p>SYNC connector for Quadro® Sync II</p> <p>2 x SLI connectors</p> <p>Factory Configured Option: No video cable adapter included</p> <p>After Market Option: No video cable adapter included</p> <p>Additional DisplayPort-to-VGA, DisplayPort-to-HDMI, or DisplayPort-to-DVI adapters are available as accessories</p>
<b>Maximum Resolution</b>	<p>Dual-link internal TMDS (DVI 1.0):</p> <ul style="list-style-type: none"> <li>- up to 2560 x 1600 x 32 bpp @ 60 Hz</li> </ul> <p>Single-link internal TMDS (DVI 1.0):</p> <ul style="list-style-type: none"> <li>- up to 1920 x 1200 x 32 bpp @ 60 Hz</li> </ul> <p>HDMI™ 2.0b (requires DP to HDMI adapter):</p> <ul style="list-style-type: none"> <li>- up to 5120 x 2880 x 24 bpp @ 60Hz</li> </ul> <p>DisplayPort:</p> <ul style="list-style-type: none"> <li>- up to 4096 x 2160 x 30 bpp @ 60Hz</li> <li>- up to 2560 x 1600 x 30 bpp @ 120 Hz</li> <li>- supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)</li> </ul> <p>Using two DP outputs, the P4000 can drive one dual DP input display with 5120 x 2880 x 30 bpp @ 60Hz resolution.</p>
<b>Image Quality Features</b>	<p>Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.</p> <p>HDCP 2.2 support over DisplayPort, DVI, and HDMI connectors</p> <p>NVIDIA 3D Vision™ and other 3D stereo technologies</p> <p>NVIDIA Mosaic and nView</p>
<b>Display Output</b>	<p>Maximum number of displays</p> <ul style="list-style-type: none"> <li>- 4 direct attached monitors</li> </ul> <p>Maximum number of monitors across all available Quadro P4000 outputs is 4.</p>
<b>Shading Architecture</b>	<p>Shader Model 5.1</p>
<b>Supported Graphics APIs</b>	<p>OpenGL 4.5</p> <p>DirectX 12</p> <p>Vulkan 1.0</p> <p>API support includes:</p> <p>CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran</p>
<b>Available Graphics Drivers</b>	<p>Microsoft Windows 10</p> <p>Microsoft Windows 7</p> <p>Linux - Full OpenGL implementation, complete with NVIDIA and ARB extensions</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site:</p> <p><a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p>

### Technical Specifications - Graphics

#### Notes

1. Quadro P4000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.
2. Quadro P4000 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately.

#### NVIDIA® Quadro® P5000 1st GFX 16GB Graphics

#### Form Factor

Full-Height Dual Slot (4.4" Height x 10.5" Length)  
Weight: 815 grams / 1.80 lbs

#### Graphics Controller

NVIDIA® Quadro® P5000 graphics  
GPU: 2560 NVIDIA® CUDA® Parallel Processing Cores  
Power: 180 Watts  
Cooling: Active

#### Memory

16GB GDDR5X memory  
Memory Bandwidth: Up to 288 GB/s  
Memory Width: 256 bit  
ECC Memory (disabled by default)

#### Connectors

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.

#### Maximum Resolution

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

#### Image Quality Features

Advanced support for 8-bit, 10-bit, and 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

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

4x DP1.4 HDR outputs (up to 3840x2160 UHD @ 120Hz refresh, or up to 8K at 30Hz)

### Technical Specifications - Graphics

1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz and 1920x1200 @ 120 Hz)

**GPU Architecture** NVIDIA Pascal™

**Supported Graphics APIs** DirectX®12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0  
Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran

**Available Graphics Drivers** 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:

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

**Notes** 1- Supports up to a total of 4 displays

#### NVIDIA® Quadro® P6000 1st GFX 24GB Graphics

**Form Factor** Full-Height Dual Slot (4.4" Height x 10.5" Length)  
Weight: 967 grams / 2.14 lbs

**Graphics Controller** NVIDIA® Quadro® P6000 graphics  
GPU: 3840 NVIDIA® CUDA® Parallel Processing Cores  
Power: 250 Watts  
Cooling: Active

**Memory** 24GB GDDR5X memory  
Memory Bandwidth: Up to 432 GB/s  
Memory Width: 384 bit  
ECC Memory (disabled by default)

**Connectors** 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.

### Technical Specifications - Graphics

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>	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 Outputs¹</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

<b>NVIDIA® Quadro® GP100 16GB Graphics</b>	<b>Form Factor</b>	Dual Slot (4.4" Height x 10.5" Length) Weight: 989 grams +72 grams extender
	<b>Graphics Controller</b>	NVIDIA® QUADRO® GP100 GPU: 3584 NVIDIA CUDA® Parallel Processing Cores Power: 235 Watts Cooling: Active

### Technical Specifications - Graphics

<b>Memory</b>	<p>16GB HBM2</p> <p>Memory Bandwidth: Up to 717 GB/s</p> <p>Memory Width: 4096-bit</p> <p>ECC Memory (disabled by default)</p>
<b>Connectors</b>	<p>DP (x4) with HDR support</p> <p>DL-DVI(D)</p> <p>3-pin mini-DIN connector via optional bracket</p> <p>4-pin header for stereo signal</p> <p>Quadro Sync connector (compatible with Quadro II Sync)</p> <p>One 8-pin auxiliary power connector</p> <p>(2x) NVLink connectors</p> <p>Factory configured option: 8-pin power adapter included with card.</p> <p>After market option Kit: 8-pin power adapter 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</p> <p>1x single-cable 5K monitor, or 2x dual-cable 5K monitors</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)</p> <p>HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors</p> <p>NVIDIA 3D Vision™ technology</p> <p>NVIDIA Mosaic and nView Desktop Management</p>
<b>Display Outputs</b>	<p>4x DP1.4 MST &amp; HDR2 outputs (up to 5120 x 2880 @ 60Hz)</p> <p>1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz)</p> <p>1x Single-link DVI-D output (up to 1920 x 1200 @ 60 Hz)</p> <p>HDMI™ 2.0b (up to 5120 x 2880 @ 60Hz)*</p> <p>*requires DP to HDMI adapter</p>
<b>GPU Architecture</b>	NVIDIA Pascal™
<b>Supported Graphics APIs</b>	<p>DirectX®12 , OpenGL® 4.5, Vulkan™ 1.0</p> <p>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</p> <p>Windows® 7 Professional 64-bit</p> <p>Linux®</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site:</p> <p><a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p>

### Technical Specifications - Graphics

Factory Configured (Z840 Workstations): No adapters included  
 Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: No adapters included

<b>NVIDIA® Quadro® GV100 32GB Graphics</b>	<b>Form Factor</b>	Dual Slot (4.4" Height x 10.5" Length) Weight: 980 grams + 72 gram extender
	<b>Graphics Controller</b>	NVIDIA® QUADRO® GV100 GPU: 5120 NVIDIA® CUDA® Parallel Processing Cores Power: 250 Watts Cooling: Active
	<b>Memory</b>	32GB HBM2 memory Memory Bandwidth: Up to 870 GB/s Memory Width: 5120-bit 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 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.
	<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™ 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

### Technical Specifications - Graphics

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

#### Available Graphics Drivers

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:

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

Factory Configured (Z4/Z8 G4 Workstation): No adapters included  
After market option kit: No adapters included

#### Radeon™ Pro WX 7100 1st GFX 8GB Graphics

#### Form Factor Graphics Controller

Full-Height Single Slot (9.5" Length )  
Radeon™ Pro WX 7100 graphics  
GPU: 2304 Stream Processors organized into 36 Compute Units  
Power: 130 Watts  
Cooling: Active

#### Memory

8GB GDDR5 memory  
Memory Bandwidth: 7 Gbps / 224 GB/s  
Memory Width: 256 bit

#### Connectors

4x Display Port 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

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

#### Maximum Resolution

5K support @ 60Hz  

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

#### Image Quality Features

Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling

#### Display Output

4 full physical DP1.3 HBR3 / DP1.4 HDR outputs  
FreeSync support

#### GPU Architecture

GCN 4th Generation

#### Supported Graphics APIs

DirectX®12  
OpenGL® 4.5  
OpenCL™ 2.0

### Technical Specifications - Graphics

#### Available Graphics Drivers

Vulkan™ 1.0  
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:

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

#### Notes

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

#### 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



### Technical Specifications - Graphics

After market option kit: No video cable adapter included

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>

#### Notes

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

### 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.

<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>

### 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>Operating Systems Supported</b>	Windows 10, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat® Enterprise Linux®(RHEL) WS4**, 5, 6 Desktop/Workstation SUSE Linux® Enterprise Desktop 10 & 11
	<b>Kit Contents</b>	HP SATA DVD Writer drive, installation guide.

\* No driver is required for this device. Native support is provided by the operating system.

<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

### Technical Specifications – Optical and Removable Storage

<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
<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 $\pm$ 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>Operating Systems Supported</b>	Windows 10, Windows 8.1, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat® Enterprise Linux®(RHEL) WS4**, 5, 6 Desktop/Workstation SUSE Linux® Enterprise Desktop 10 & 11	
	No driver is required for this device. Native support is provided by the operating system.	
<b>Kit Contents</b>	9.5mm Slim DVD-ROM Drive, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	

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

<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)

### Technical Specifications – Optical and Removable Storage

	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
		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 $\pm$ 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>Operating Systems Supported</b>	Windows 8.1, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000.	
	Red Hat® Enterprise Linux®(RHEL) WS4**, 5, 6 Desktop/Workstation	
	SUSE Linux® Enterprise Desktop 10 & 11	
	No driver is required for this device. Native support is provided by the operating system.	
<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	

### Technical Specifications – Optical and Removable Storage

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 3.0 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. Memory Stick Micro (M2) 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>Operating Systems Supported</b>	Windows 10
		No driver is required for this device. Native support is provided by the operating system.
	<b>Kit Contents</b>	Media card reader
	<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

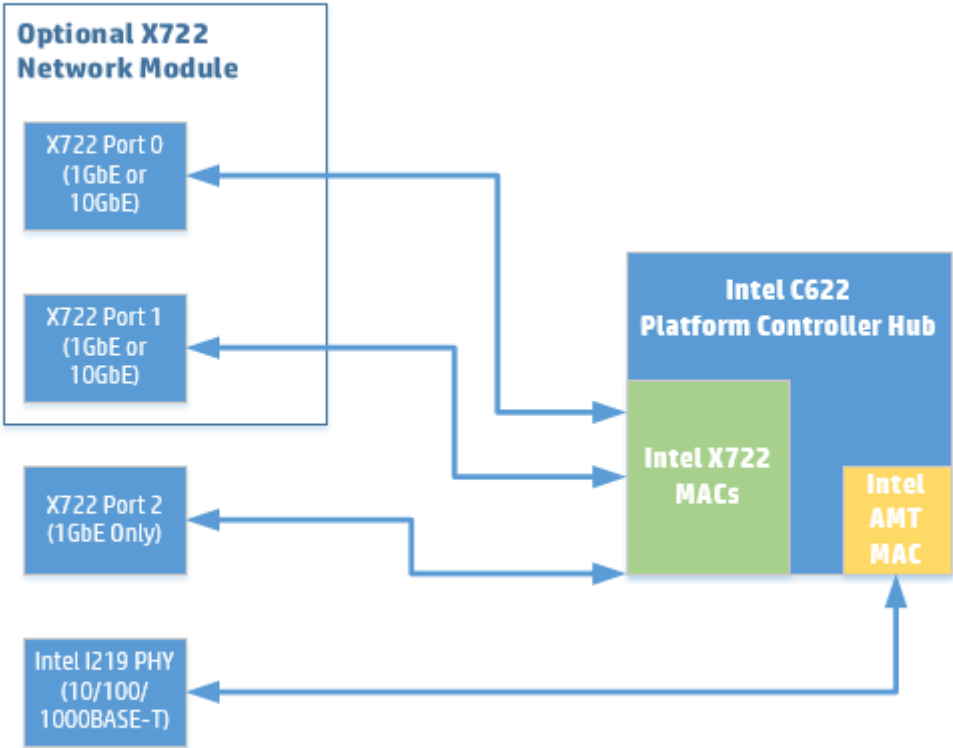
#### CONTROLLER CARDS

<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 card, full height PCIe slots
	<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, available dedicated 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.

NETWORKING AND COMMUNICATIONS

HP Z6 Gen4 and HP Z8 Gen 4  
Integrated Network Architecture



**Note:** When an optional X722 network module is not installed in the system, a “dummy” port is enumerated as Function 0 of the Intel X722 MACs, which allows for the X722 Port 2 on the Motherboard to enumerate.

Integrated Intel I219LM	Connector	RJ-45
	Controller	Intel I219LM
	Data Rates Supported	10/100/1000 Mbps
	Boot ROM Support	PXE, UEFI
	Connect Speed LED Indicators	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>

Management Capabilities Intel® Active Management Technology™ 11



### Technical Specifications - Networking and Communications

<b>Integrated Intel X722 for 1GbE</b>	<b>Connector</b>	1 RJ-45
	<b>Controller</b>	Intel X722 for 1GbE
	<b>Data Rates Supported</b>	1000 Mbps
	<b>Boot ROM Support</b>	PXE, UEFI
	<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>Green = 1000Mbps</li> </ul>
	<b>Management Capabilities</b>	Wake-On-LAN

<b>HP Z Dual 10GbE Network Module</b>	<b>Networking Interface</b>	2 RJ-45
	<b>System Interface</b>	Cabled from Dedicated Rear I/O Slot
	<b>Networking Speeds Supported</b>	1Gbps, 10Gbps
	<b>Cabling (up to 100m)</b>	Cat5e (or higher) for 1Gbps Cat6a (or higher) for 10Gbps
	<b>Power Consumption (active-typical)</b>	5.5W at 1Gbps 11.2W at 10Gbps
	<b>Physical Dimensions</b>	0.875 in x 3 in x 2.75 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>Amber = 1Gbps</li> <li>Green = 10Gbps</li> </ul>
	<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)

<b>Intel® I210-T1</b>	<b>Networking Interface</b>	1 RJ-45
	<b>System Interface</b>	PCI Express 2.1 x1
	<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>	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)

### Technical Specifications - Networking and Communications

<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® I350-T2</b>	<b>Networking Interface</b>	2 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>	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® I350-T4</b>	<b>Networking Interface</b>	4 RJ-45
	<b>System Interface</b>	PCI Express 2.1 x4
	<b>Networking Speeds Supported</b>	10Mbps, 100Mbps, 1Gbps

### Technical Specifications - Networking and Communications

<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>Aquantia® AQN-108</b>	<b>Networking Interface</b>	RJ-45
	<b>System Interface</b>	PCI Express 3 x1
	<b>Networking Speeds Supported</b>	100Mbps, 1Gbps, 2.5Gbps, 5Gbps
	<b>Cabling (up to 100m)</b>	Cat5e (or higher) for all speeds
	<b>Power Consumption (active-typical)</b>	3.5W at 5Gbps, 3.0W at 2.5Gbps
	<b>Physical Dimensions</b>	3.72 in x 3.18 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;5Gbps</li> <li>Green = 5Gbps</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

### Technical Specifications - Networking and Communications

<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>
	<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® X710-DA2 10GBASE-SR Converged Network Adapter</b>	<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)

### Technical Specifications - Networking and Communications

**Hardware Certifications** 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

<b>10GbE SFP+ SR Transceiver</b>	<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

<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

<b>Intel® 9260 WLAN</b>	<b>Networking Speeds</b>	802.11ac MU-MIMO (up to 1.73Gbps using 160MHz channels)
	<b>IEEE WLAN Standards</b>	IEEE 802.11a/b/g/n/ac
	<b>Bluetooth</b>	5.0
	<b>System Interface</b>	PCI Express 2.1 x1
	<b>Antenna</b>	2x2

### Summary of Changes

#### SUMMARY OF CHANGES

Date of change:	Version History:		Description of change:
September 20, 2017	From v1 to v2	Added	Specs for the Power Supply section
		Changed	The System Configurations section and changed notes for the NVIDIA Quadro P4000, P5000 & P6000 Graphics
November 1, 2017	From v2 to v3	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, Networking and Communications, Other Hardware and Memory sections, changed Front view info on the Overview section, changed Operating Systems section, changed Processors section, changed System Board section, Physical Security and Serviceability section
November 10, 2017	From v3 to v4	Added	Windows 10 to the supporting systems by the 9.5mm Slim DVD-ROM drive
		Removed	Microsemi 3152-8i SAS ROC RAID Controller from SAS controller on the Hard Drive Controllers section.
November 29, 2017	From v4 to v5	Added	Processors, hard drives and graphics to offerings, added Declared Noise Emissions information
		Changed	Wattage links on power supply section updated and Voltage links on efficiency section updated
January 30, 2018	From v5 to v6	Changed	Factory configured option to yes on Networking and communications for : Intel® 8265 802.11 a/b/g/n/ac&BT PCIe
		Removed	NVIDIA SLI Graphics Connector from Graphics Cable Adapters section
February 14, 2018	From v6 to v7	Removed	RAID 5 and 10 references from “Factory integrated” in interfaces supported section
March 27, 2018	From v7 to v8	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
		Added	Intel Xeon processors added
August 13, 2018	From v8 to v9	Added	Footnote to Networking and Communications section
		Changed	Operating Systems section
September 6, 2018	From v9 to v10	Added	Integrated Network Architecture Diagram on The Networking and Communications section
September 6, 2018	From v10 to v11	Changed	Power Supply section
September 21, 2018	From v11 to v12	Added	Intel Optane SSD 905p AiC 280GB & 480GB
November 19, 2018	From v12 to v13	Added	Intel Xeon Gold 6128 processor
		Changed	NVIDIA Quadro P6000 Graphics specs
January 2, 2019	From v13 to v14	Added	NVIDIA Quadro P620 2GB Graphics
January 8, 2019	From v14 to v15	Added	HP DX175 Removable HDD Carrier into the HDD Frame/Carriers section
		Changed	Intel Xeon Gold 6126 processor specs
January 9, 2019	From v15 to v16	Added	Intel Xeon Gold 6126 processor footnote
January 23, 2019	From v16 to v17	Added	Intel 9260 802.11 a/b/g/n/ac&BT PCIe to Networking section and added HP Z Turbo Drive Dual Pro series to Storage section

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