

HP Workstations graphics card options



Quick reference guide



Leading-edge professional graphics

HP recommends Windows.

A full range of graphics cards to meet your performance needs—compare features

Graphics segment	Integrated Graphics†				
Graphics model	Intel HD Graphics 2000	Intel HD Graphics 2500	Intel HD Graphics P3000	Intel HD Graphics 4000	Intel HD Graphics P4000
Positioning statement	Readily available entry graphics for your office or entertainment needs	Readily available entry graphics for your office or entertainment needs	Readily available entry graphics for your office, entertainment, or entry 3D needs	Readily available entry graphics for your office or entertainment needs	Readily available entry graphics for your office, entertainment, or entry CAD 3D needs
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)					
HP Z1	•	•	•		•
HP Z220 SFF		•		•	•
HP Z220 CMT		•		•	•
HP Z420					
HP Z620					
HP Z820					
Supported operating systems					
Windows 7	•	•	•	•	•
Red Hat Enterprise Linux®	•	•	•	•	•
SUSE Linux Enterprise Desktop					
HP Linux Installation Kit	•	•	•	•	•
Graphics memory	Shared with system	Shared with system	Shared with system	Shared with system	Shared with system
Memory type	N/A	N/A	N/A	N/A	N/A
Memory bandwidth	N/A	N/A	N/A	N/A	N/A
Other notes					
Connectors	HP Z1: 1 DP	HP Z220 CMT: 1 Single Link DVI-I, 1 DP HP Z220 SFF: 1 VGA, 1 DP HP Z1: 1 DP	HP Z1: 1 DP	HP Z220 CMT: 1 Single Link DVI-I, 1 DP HP Z220 SFF: 1 VGA, 1 DP	HP Z220 CMT: 1 Single Link DVI-I, 1 DP HP Z220 SFF: 1 VGA, 1 DP HP Z1: 1 DP
Max. VGA display resolution	2048x1536	2048x1536	2048x1536	2048x1536	2048x1536
Max. digital display resolution	2560 x1600	2560 x1600 Display Port 1920 x 1200 DVI	2560 x1600	2560 x1600 Display Port 1920 x 1200 DVI	2560 x1600 Display Port 1920 x 1200 DVI
Number of active displays supported per graphics card	2	2	2	2	2
Host interface	Integrated with CPU	Integrated with CPU	Integrated with CPU	Integrated with CPU	Integrated with CPU
Number of PCIe slots required	0	0	0	0	0
ISV certifications	no	no	limited	no	limited
OpenGL Version	3	3.2	3	3.2	3.2
Vertex and pixel shaders	Shader Model 4.0	Shader Model 5.0	Shader Model 4.0	Shader Model 5.0	Shader Model 5.0
DirectX version	DX 10	DX 11	DX 10	DX 11	DX 11
Max. power consumption	shared with system	shared with system	shared with system	shared with system	shared with system

† Available on select processor configurations. Please see product QuickSpecs for details.

Graphics segment	MXM			
Graphics model	NVIDIA Quadro 500M	NVIDIA Quadro 1000M	NVIDIA Quadro K3000M	NVIDIA Quadro K4000M
Positioning statement	Excellent entry level professional 3D graphics.	Superior performance and capabilities at an attractive mid-range price	Get the latest NVIDIA GPU technology providing great performance improvements over its predecessor, the Quadro 3000M	Get the latest NVIDIA GPU technology providing great performance improvements over its predecessor, the Quadro 4000M. Experience the ultimate acceleration for your most demanding applications and datasets for your HP Z1
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)				
HP Z1	•	•	•	•
HP Z220 SFF				
HP Z220 CMT				
HP Z420				
HP Z620				
HP Z820				
Supported operating systems				
Windows 7	•	•	•	•
Red Hat Enterprise Linux®	•	•	•	•
SUSE Linux Enterprise Desktop	•	•	•	•
HP Linux Installation Kit	•	•	•	•
Graphics memory	1 GB	2 GB	2 GB	4 GB
Memory type	DDR3	DDR3	GDDR5	GDDR5
Memory bandwidth	12.8 GB/s	28.8 GB/s	89.6 GB/s	89.6 GB/s
Other notes	HP Z1 Internal Panel can be driven from external source via HP Z1 DP connector	HP Z1 Internal Panel can be driven from external source via Z1 DP connector	HP Z1 Internal Panel can be driven from external source via HP Z1 DP connector	HP Z1 Internal Panel can be driven from external source via HP Z1 DP connector
Connectors	N/A	N/A	N/A	N/A
Max. VGA display resolution	N/A	N/A	N/A	N/A
Max. digital display resolution	Internal Panel: 2560x1440 External Panel: 2560x1600	Internal Panel: 2560x1440 External Panel: 2560x1600	Internal Panel: 2560x1440 External Panel: 2560x1600	Internal Panel: 2560x1440 External Panel: 2560x1600
Number of active displays supported per graphics card	2	2	2	2
Host interface	MXM 3.0	MXM 3.0	MXM 3.0	MXM 3.0
Number of PCIe slots required				
ISV certifications	yes	yes	yes	yes
OpenGL Version	4	4.3	4.3	4.3
Vertex and pixel shaders	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0
DirectX version	DX 11	DX 11	DX11	DX11
Max. power consumption	<35 Watts	42 Watts	75 Watts	100 Watts

HP recommends Windows.

Graphics segment	Professional 2D		
Graphics model	NVIDIA Quadro NVS 310	NVIDIA NVS 300	NVIDIA NVS 510
Positioning statement	The new business standard for multi-display desktop graphics	Business graphics solution to drive all your displays	Excellent four display capable graphics in a low profile design. Replaces the NVS Quadro 450. For the most demanding business applications and ideal for creating display walls.
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)			
HP Z1			
HP Z220 SFF	••	••	•
HP Z220 CMT	••	••	•
HP Z420	•••	•••	••
HP Z620	••••	••••	••
HP Z820	•• + 2 AMO	•• + 2 AMO	•• (AMO only) ¹
Supported operating systems			
Windows 7	•	•	•
Red Hat Enterprise Linux®	•	•	•
SUSE Linux Enterprise Desktop	•	•	•
HP Linux Installation Kit	•	•	•
Graphics memory	512 MB	512 MB	2 GB
Memory type	DDR3	DDR3	DDR3
Memory bandwidth	14 GB/s	12.6 GB/s	28.5 GB/s
Other notes	Low Profile, Active Cooling, Mosaic and nView	Low Profile, Active Cooling, Mosaic and nView	Low Profile, Active Cooling, Mosaic and nView
Connectors	2 DisplayPort outputs, includes 2 DP to single link DVI adapters	DMS-59 output, includes DMS-59 to Dual DVI-I adapter	4 mini-DisplayPort outputs Includes 4 mini-DP to DP adapters
Max. VGA display resolution	2048x1536	1920 x 1080	2048x1536
Max. digital display resolution	2560x1600	2560 x1600 Display Port 1920 x 1200 DVI	3840x2160
Number of active displays supported per graphics card	2	2	4
Host interface	PCI Express Gen2 x16	PCI Express Gen2 x16	PCI Express Gen2 x16
Number of PCIe slots required	1	1	1
ISV certifications	No	No	No
OpenGL Version	4.1	3.3	4.3
Vertex and pixel shaders	Shader Model 5.0	Shader Model 4.1	Shader Model 5.0
DirectX version	DX 11	DX 10.1	DX 11
Max. power consumption	19.5 Watts	17.5 Watts	35 Watts

Graphics segment	Entry 3D			
Graphics model	NVIDIA Quadro 410	AMD FirePro™ V3900	NVIDIA Quadro 600	NVIDIA Quadro K600
Positioning statement	Powerful entry level 3D graphics at a great price.	Blazing entry level professional 3D graphics at an unbelievable price.	Delivering exceptional value to the entry level professional graphics market	Step up to the new Kepler GPU architecture and experience better performance with entry level professional workflows.
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)				
HP Z1				
HP Z220 SFF	•	•	•	•
HP Z220 CMT	•	•	•	•
HP Z420	••	••	••	••
HP Z620	••	••	••	••
HP Z820	••	••	••	••
Supported operating systems				
Windows 7	•	•	•	•
Red Hat Enterprise Linux®	•	•	•	•
SUSE Linux Enterprise Desktop	•	•	•	•
HP Linux Installation Kit	•	•	•	•
Graphics memory	512 MB	1 GB	1 GB	1 GB
Memory type	DDR3	DDR3	GDDR3	GDDR3
Memory bandwidth	14 GB/s	28.8 GB/s	25.6 GB/s	29 GB/s
Other notes	Low Profile, Active Cooling, Mosaic and nView	Low Profile, Active Cooling	Low Profile, Active Cooling, Mosaic and nView	Low Profile, Active Cooling, DisplayPort HBR2 and MST, Mosaic and nView
Connectors	1 dual link DVI-I, 1 DP outputs Includes one DP to DVI-I adapter	1 DL DVI-I, 1 DP outputs Includes one DP to single link DVI adapter	1 DL DVI-I, 1 DP outputs Includes one DP to single link DVI adapter	1 DL DVI-I, 1 DP outputs No video adapter included
Max. VGA display resolution	2048x1536	2048x1536	2048x1536	2048x1536
Max. digital display resolution	3840x2160	2560x1600	2560x1600	3840 x 2160 (on DP output only)
Number of active displays supported per graphics card	2	2	2	2
Host interface	PCI Express Gen2 x16	PCI Express Gen2 x16	PCI Express Gen2 x16	PCI Express Gen2 x16
Number of PCIe slots required	1	1	1	1
ISV certifications	Yes	Yes	Yes	yes
OpenGL Version	4.3	4.2	4.3	4.3
Vertex and pixel shaders	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0
DirectX version	DX 11	DX 11	DX 11	DX 11
Max. power consumption	<35 Watts	<50 Watts	40 Watts	41 Watts

HP recommends Windows.

Graphics segment	Midrange 3D	
Graphics model	NVIDIA Quadro 2000	NVIDIA Quadro K2000
Positioning statement	Superior performance and capabilities at an attractive mid-range price	Step up to the new Kepler GPU architecture and experience segment leading performance/watt in medium sized professional workflows.
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)		
HP Z1		
HP Z220 SFF		
HP Z220 CMT	•	•
HP Z420	••	••
HP Z620	••	••
HP Z820	•••	•••
Supported operating systems		
Windows 7 Professional 64-bit	•	•
Red Hat Enterprise Linux®	•	•
SUSE Linux Enterprise Desktop (90 day license)	•	•
HP Linux Installation Kit	•	•
Graphics memory	1 GB	2 GB
Memory type	GDDR5	GDDR5
Memory bandwidth	41.6 GB/s	64 GB/s
Other notes		DisplayPort HBR2 and MST, Mosaic and nView
Connectors	1 DL DVI-I, 2 x DP outputs Includes one DP to single link DVI adapter	1 DL DVI-I, 2 x DP outputs No video adapter included
Max. VGA display resolution	2048x1536	2048x1536
Max. digital display resolution	2560x1600	3840 x 2160 (on DP output only)
Number of active displays supported per graphics card	2	4
Host interface	PCI Express Gen2 x16	PCI Express Gen2 x16
Number of PCIe slots required	1	1
ISV certifications	Yes	yes
OpenGL Version	4.1	4.3
Vertex and pixel shaders	Shader Model 5.0	Shader Model 5.0
DirectX version	DX 11	DX 11
Max. power consumption	62 Watts	51.1 Watts

Graphics segment	High 3D				
Graphics model	NVIDIA Quadro 4000	NVIDIA Quadro K4000	AMD FirePro™ V7900	AMD FirePro™ W7000	NVIDIA Quadro K5000
Positioning statement	Accelerate your entire workflow with a powerful single slot card	New Kepler GPU architecture unleashes new heights in performance compared to previous graphics solutions delivering outstanding performance in medium to large design workflows.	Handles demanding workloads while supporting up to 4 simultaneous displays, creating a superior visual environment	New GCN GPU architecture provides superb graphics performance for medium to large design workloads and offers seamless GPU computing capabilities previously unseen in this class of card.	Step up to the latest NVIDIA GPU technology to fluidly handle some of the most demanding product design and digital creation workloads around.
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)					
HP Z1					
HP Z220 SFF					
HP Z220 CMT	• (AMO only) ¹	• (AMO only) ¹	• (AMO only) ¹	• (AMO only) ¹	
HP Z420	•	•	•	•	•
HP Z620	•	••	•	••	••
HP Z820	••	••	••	••	••
Supported operating systems					
Windows 7	•	•	•	•	•
Red Hat Enterprise Linux®	•	•	•	•	•
SUSE Linux Enterprise Desktop	•	•	•	•	•
HP Linux Installation Kit	•	•	•	•	•
Graphics memory	2 GB	3 GB	2 GB	4 GB	4 GB
Memory type	GDDR5	GDDR5	GDDR5	GDDR5	GDDR5
Memory bandwidth	89.6 GB/s	134 GB/s	160 GB/s	153.6 GB/s	173 GB/s
Other notes	3rd party stereo connector	DisplayPort HBR2 and MST, Mosaic and nView, 3rd party Stereo connector	AMD Eyefinity Technology	AMD Eyefinity Technology, DisplayPort HBR2 and MST	NVIDIA SLI Connector, Stereo Adaptor available, ECC memory support, DisplayPort MST and HBR2, Mosaic and nView
Connectors	2 x DP, 1 Dual-Link DVI-I outputs, includes one DP to single link DVI adapter	2 x DP, 1 Dual-Link DVI-I outputs. No video adapter included	4 x DP outputs, includes two DP to single link DVI adapters	4 x DP outputs No video adapters included	2 x DP, 1 Dual-Link DVI-I, 1 Dual-Link DVI-D, 1 Stereo (optional), No Video Adapter Cables included.
Max. VGA display resolution	2048x1536	2048x1536	2048x1536	2048x1536	2048 x 1536
Max. digital display resolution	2560x1600	3840 x 2160 (on DP output only)	2560x1600	4096x2160	3840x2160
Number of active displays supported per graphics card	2	4	4	4 Direct, 6 using DP MST	4 Direct, 6 using DP MST
Host interface	PCI Express Gen2 x16	PCI Express Gen2 x16	PCI Express Gen2 x16	PCI Express Gen3 x16	PCI Express Gen2 x16
Number of PCIe slots required	1	1	1	1	2
ISV certifications	Yes	yes	yes	yes	yes
OpenGL Version	4	4.3	4.1	4.2	OGL 4.3
Vertex and pixel shaders	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0	Shader Model 5.0
DirectX version	DX 11	DX 11	DX 11	DX 11.1	DX11
Max. power consumption	142 Watts	80 Watts	<150 Watts	<150 Watts	122 Watts

HP recommends Windows.

Graphics segment	Ultra 3D	Maximus
Graphics model	NVIDIA Quadro 6000	NVIDIA Tesla C2075 ²
Positioning statement	The most powerful professional graphics in the Z workstation lineup. Data integrity and precision is assured with ECC memory and fast double precision capabilities	Combine the power of a Quadro card and Tesla to crunch through extraordinary design and GPU computing workloads simultaneously!
Supported HP Workstations (• single; •• dual; ••• triple; •••• quad)		
HP Z1		
HP Z220 SFF		
HP Z220 CMT		
HP Z420	• (AMO Only) ¹	•
HP Z620	•	•
HP Z820	••	••
Supported operating systems		
Windows 7 Professional 64-bit	•	•
Red Hat Enterprise Linux®	•	•
SUSE Linux Enterprise Desktop (90 day license)	•	•
HP Linux Installation Kit	•	•
Graphics memory	6 GB	6 GB
Memory type	GDDR5	GDDR5
Memory bandwidth	144 GB/s	144 GB/s
Other notes	NVIDIA SLI Connector, Includes 3D Stereo connector, ECC memory support, Mosaic and nView	Must be configured with supported Quadro graphics card. Requires CUDA, OpenACC, or OpenCL enabled applications.
Connectors	2 x DP, 1 Dual-Link DVI-I, 1 Stereo outputs Includes one DP to single link DVI adapter	0
Max. VGA display resolution	2048 x 1536	N/A
Max. digital display resolution	2560 x 1600	N/A
Number of active displays supported per graphics card	2	0
Host interface	PCI Express Gen2 x16	PCI Express Gen2 x16
Number of PCIe slots required	2 PCIe	2 PCIe
ISV certifications	Yes	Yes
OpenGL Version	OGL 4.3	N/A
Vertex and pixel shaders	Shader Model 5.0	N/A
DirectX version	DX 11	N/A
Max. power consumption	<225 Watts	<225W

1 After-market option.

2 NVIDIA Tesla C2075 requires the 1125w Power Supply for the HP Z820 Workstation

Screen image courtesy of ANSYS.

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