INTRODUCTION

Push the frontier of graphics processing with the new NVIDIA Quadro M6000 12GB or 24GB graphics card. The Quadro M6000 features the top of the line member of the latest NVIDIA® Maxwell-based GPU architecture, delivering a step function improvement in graphics and GPU computing performance over the previous generation NVIDIA Quadro K6000.

Combining breakthrough performance and advanced capabilities in a power-efficient design, the Quadro M6000 GPU enables leading creators/stylists and designers to tackle visualization and analysis workloads of unprecedented size and scope. In addition, the M6000 is an excellent choice for demanding analysis and simulation applications that rely on high performance single precision GPU computing.
PERFORMANCE AND FEATURES
The Quadro M6000 graphics card is based on the NVIDIA Maxwell™ architecture. Key performance features and capabilities include:

- 12GB or 24GB ultra-fast GDDR5 graphics memory lets designers and animators model and render characters and scenes at unprecedented scale, complexity and richness
- 3,072 streaming multiprocessor (SMX) cores deliver faster visualization and compute horsepower than previous-generation products
- Supports four simultaneous displays up to Cinema 4k resolution with DisplayPort™ 1.2
- Ultra-low latency video I/O and support for large-scale visualizations
- Full PCI Express 3.0 support

Quadro Boost: a mechanism that automatically maximizes application performance while staying within the specified power envelope. For workloads that do not reach the allowed power level, the GPU clock is automatically increased to "Boost Clock" in order to leverage the remaining power budget for additional increased performance. The GPU will always try to reach the higher "Boost Clock" in order to maximize application performance.

The Quadro Boost feature will disable "Boost Clocking" in the following scenarios:

- When Quadro Sync, or SLI is enabled, the Quadro M6000 will clock to Base Clock automatically.
- If the user manually selects the "Prefer Consistent Performance" Control Panel option to lock explicitly to Base Clock (can be useful for performance tuning of applications during development).

COMPATIBILITY
The Quadro M6000 is supported on the following HP Z Workstations:

- HP Z840 Workstation
- HP Z640 Workstation

SERVICE AND SUPPORT
The NVIDIA Quadro M6000 has a one-year limited warranty or the remainder of the warranty of the HP product in which it is installed. Technical support is available seven days a week, 24 hours a day by phone, as well as online support forums. Parts and labor are available on-site within the next business day. Telephone support is available for parts diagnosis and installation. Certain restrictions and exclusions apply.
TECHNICAL SPECIFICATIONS

NVIDIA Quadro M6000 12GB Graphics

Form Factor
4.42" H x 10.5" L
Dual Slot
Power: 250 Watts
Weight: ~1030 grams

Graphics Controller
NVIDIA Quadro M6000 Graphics Card based on the GM200 GPU
Core Count: 3072
Base Clock: 1026 MHz
Boost Clock: 1152 MHz
Idle Clock: 324 MHz

Bus Type
PCI Express 3.0 x16

Memory
12GB GDDR5
384-bit memory I/O path
317 GB/s memory bandwidth
ECC Memory (disabled by default)

Connectors
DP (x4)
DL-DVI(I)
3-pin mini-DIN connector
SLI connector
Quadro Sync connector
One 8-pin auxiliary power connector

Factory configured option: No adapter included with card.
Option Kit: No adaptor included with card.

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

Image Quality Features
DisplayPort with Multi-Stream Technology (MST) and High Bit Rate 2 (HBR2), HDMI 1.4, and HDCP 1.3 support
NVIDIA 3D Vision™ technology
NVIDIA Premium Mosaic and nView

Display Output
400 MHz integrated RAMDAC

- Maximum resolution over VGA (through DVI to VGA cable): 2048 × 1536 × 32 bpp at 85 Hz

Dual-link internal TMDS (DVI 1.0)

- Maximum resolution over digital port (single GPU and SLI mode): 2560 × 1600 × 32 bpp
Technical Specifications

at 60 Hz (reduced blanking)

Single-link internal TMDS (DVI 1.0)
- Maximum resolution over digital port (single GPU and SLI mode): 1920 × 1200 × 32 bpp at 60 Hz (reduced blanking)

DisplayPort 1.2 with MST and HBR2. Each DisplayPort connector has the following capabilities:
- Maximum pixel clock: 592 MPixel/s
- Maximum bandwidth: 17.2 Gbps
- Example maximum resolution: 4096 × 2160 × 30 bpp at 60Hz

HDMI
- Maximum resolution (requires DP to HDMI adapter): 4096 × 2160 × 8 bpp at 60Hz

Shading Architecture
Shader Model 5.0

Supported Graphics APIs
Full OpenGL 4.4
Full DirectX 12
API support includes:
CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran

Available Graphics Drivers
Windows 10
Windows 8.1
Windows 8
Windows 7 Professional
Linux

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

Notes
- NVIDIA GRID VGX Pass Through feature supported on NVIDIA Quadro M6000 to enable direct mapping of GPU to Virtual Machine.
- No display output adapter included.
- For HP Z840 Workstation configurations, the 1125W power supply option must be used.
TECHNICAL SPECIFICATIONS

NVIDIA Quadro M6000 24GB Graphics

Form Factor
4.42” H x 10.5” L
Dual Slot
Power: 250 Watts
Weight: 1023 grams

Graphics Controller
NVIDIA Quadro M6000 Graphics Card based on the GM200 GPU
Core Count: 3072
Base Clock: 1026 MHz
Boost Clock: 1152 MHz
Idle Clock: 324 MHz

Bus Type
PCI Express 3.0 x16

Memory
24GB GDDR5
384-bit memory I/O path
317 GB/s memory bandwidth
ECC Memory (disabled by default)

Connectors
DP (x4)
Dual-Link DVI-I
Optional Stereo
SLI connector
Quadro Sync connector
One 8-pin auxiliary power connector

Factory configured option: No adapter included with card.
Option Kit: No adaptor included with card.

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

Image Quality Features
DisplayPort with Multi-Stream Technology (MST) and High Bit Rate 2 (HBR2), HDMI 1.4, and HDCP 1.3 support
NVIDIA 3D Vision™ technology
NVIDIA Premium Mosaic and nView

Display Output
400 MHz integrated RAMDAC
- Maximum resolution over VGA (through DVI to VGA cable): 2048 x 1536 x 32 bpp at 85 Hz
- Dual-link internal TMDS (DVI 1.0)
  - Maximum resolution over digital port (single GPU and SLI mode): 2560 x 1600 x 32 bpp
QuickSpecs

Technical Specifications

- at 60 Hz (reduced blanking)

Single-link internal TMDS (DVI 1.0)
- Maximum resolution over digital port (single GPU and SLI mode): 1920 × 1200 × 32 bpp at 60 Hz (reduced blanking)

DisplayPort 1.2 with MST and HBR2. Each DisplayPort connector has the following capabilities:
- Maximum pixel clock: 592 MPixel/s
- Maximum bandwidth: 17.2 Gbps
- Example maximum resolution: 4096 × 2160 × 30 bpp at 60Hz

DisplayPort (with MST and HBR2)
- Maximum resolution over digital port (single GPU and SLI mode): 1920 × 1200 × 32 bpp at 60 Hz (reduced blanking)

HDMI
- Maximum resolution (requires DP to HDMI adapter): 4096 × 2160 × 8 bpp at 60Hz

Shading Architecture
- Shader Model 5.0

Supported Graphics APIs
- Full OpenGL 4.4
- Full DirectX 12
- API support includes:
  - CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran

Available Graphics Drivers
- Windows 10
- Windows 8.1
- Windows 8
- Windows 7 Professional
- Linux

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

Notes
- NVIDIA GRID VGX Pass Through feature supported on NVIDIA Quadro M6000 to enable direct mapping of GPU to Virtual Machine.
- No display output adapter included.
- For HP Z840 Workstation configurations, the 1125W power supply option must be used.
## Summary of Changes

<table>
<thead>
<tr>
<th>Date of change:</th>
<th>Version History:</th>
<th>Description of change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1, 2015</td>
<td>From v1 to v2</td>
<td>Added Windows 10 in Available Graphics Drivers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Changed Display Output options</td>
</tr>
<tr>
<td>April 1, 2016</td>
<td>From v2 to v3</td>
<td>Added 24GB option</td>
</tr>
</tbody>
</table>