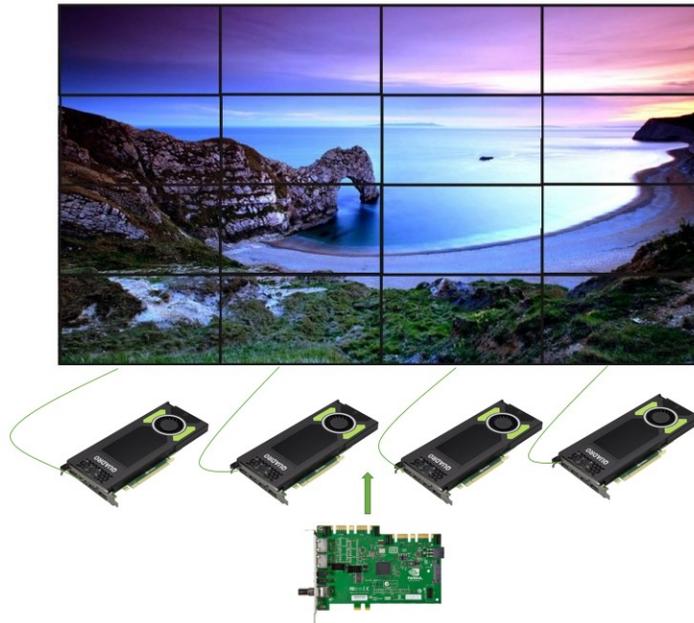


# NVIDIA Quadro Ultra-High-Resolution Video Wall Configuration Guide

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NVIDIA QUADRO<sup>®</sup>  
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## **NVIDIA Quadro Ultra-High-Resolution Video Wall Configuration Guide**

The topics covered by this guide include the following:

- Immersive visualization graphics environments and solutions
- Interactive display walls
- 3D realtime rendering
- Ultra-high-resolution display support
- Using multi-GPU capable systems to drive 4 x 4 display walls
- Native resolutions supported

In order to build interactive ultra-high-resolution display walls a system capable of supporting multiple NVIDIA Quadro M6000, M5000 or M4000 boards plus a Quadro Sync card must be utilized. For less demanding digital signage deployments a system capable of hosting up to two NVS 810 or four (4) NVIDIA NVS 510 boards may be utilized.

In this document, we will explain how to create an NVIDIA Quadro or NVS based system that can drive a 4 x 4 video wall with all display panels at native resolution.

### **Required Hardware:**

- A motherboard, power supply, and system enclosure capable of supporting up to 4 dual-slot width NVIDIA Quadro graphics boards.
- 4x NVIDIA Quadro M6000, M5000 or M4000 professional graphics boards. Each Quadro board can drive up to four displays each.
- 1x Quadro Sync board. A single Quadro Sync board will support up to four Quadro cards and up to 16 attached displays.
- 32 GB or more of system memory.
- DisplayPort 1.2 to DVI adapter dongles if displays support DVI.
- DisplayPort 1.2 to HDMI and DVI to HDMI dongles if displays support HDMI.

### **Workstation PCIe Expansion Slot System Attributes**

The selected workstation should have 4x PCIe x16 Gen 3 slots spaced to support up to 4 Quadro dual-slot width graphic boards (or 4x single-slot width M4000 boards). Each Quadro M6000, M5000 or M4000 can drive up to 4 displays.

### **NVIDIA Mosaic**

The workstation system enclosure, when equipped with four Quadro M6000, M5000 or M4000 graphics boards can drive up to 16 displays; which can be treated as a single large virtual display via NVIDIA Mosaic. Mosaic mode enables display resolutions of up to 16k x 16k resolution to be realized and transparently spans Windows 10, 8.1, 8 or 7, or Linux compliant applications without the need for special API calls from within the application. Configuring Mosaic mode requires no more than standard

Windows or Linux administrative skills and can be accomplished in a matter of minutes via NVIDIA's graphical user interface as presented by the NVIDIA Control panel.

### **3 x 3 Display Wall Configuration Utilizing Quadro M4000 Boards**

- Quadro M4000 8GB of GDDR5 GPU memory and 4 video ports.
- 4x Display Port 1.2 supports up to 3840 x 2160 at 60Hz on each connector.

M4000 3 x 3 video wall configurations require 3 Quadro M4000s and a Quadro Sync board.

All displays need to connect via the same type of cable and utilize identical resolution, color depth and display timing. Since DisplayPort to DVI or HDMI dongles are readily available both of these interfaces (and display supporting them) are suitable for use.

The NVIDIA Quadro Sync board provides full sync functionality across all displays and supports features such as warp, blend, and projector overlap, all without tearing or display timing artifacts.

### **NVIDIA NVS Mosaic Examples**

Less demanding digital signage applications can be created with NVIDIA NVS boards and NVIDIA Mosaic. When using NVS boards no Quadro Sync is required, so long as all displays are connected to a single NVS 810 or 510 board, Frame Lock is effectively available, along with projector overlap (edge blending) and bezel correction.

### **4 x 4 NVS 810 Digital Signage Solution**

In this system configuration, since each NVIDIA NVS 810 can drive eight simultaneous displays, any system capable of hosting one or two single-slot width full-height form factor x16 PCIe cards can be utilized. Since the NVS 810 is a full-height and low power board almost any ATX compliant tower system can be utilized if two x16 PCIe slots are available. Look for a system with:

- 2x available full height and full length PCIe x16 slots
- 2x NVS 810 boards
- 16 GB or more of system memory
- 500+ Watt power supply
- Mini -DP to DP or Mini DP to DVI adapters (provided with card based on SKU ordered). Mini-DP to HDMI adapters are available separately as accessories.

A system with 2x NVS 810's can drive 16 displays (4 x 4 tiled) with either DP, DVI or HDMI cables depending on available display inputs.

For longer distance runs, it is better to use DP or HDMI with an extender or fiber optic cable to maintain signal integrity.

## **NVS 810 Display Resolution Example**

HD resolution displays (1920 x 1080) when driven by the NVS 810 provide 7690 x 4320 pixel resolution at up to 30 bpp (bits per pixel) at 60Hz. Such a display wall is an ideal digital signage solution for environments dependent of HD resolution still images or video.

## **2 x 2 NVS 510 Digital Signage Solution**

In this system configuration, since each NVIDIA NVS 510 can drive four simultaneous displays, any system capable of hosting single-slot Small Form Factor (SFF) x16 PCIe cards can be utilized. Since the NVS 510 is an SFF and low power board almost any ATX compliant tower system can be utilized if four x16 PCIe slots are available. Look for a system with:

- 1x available SFF PCIe x16 slots
- 1x NVS 510 board
- 16 GB or more of system memory
- 500+ Watt power supply
- Mini-DP to DVI or Mini DP to HDMI adapters (provided with card based on SKU ordered)

A system with 1 NVS 510 can drive 4 displays (2 x 2 tiled) with DP, DVI or HDMI cables depending on available display inputs.

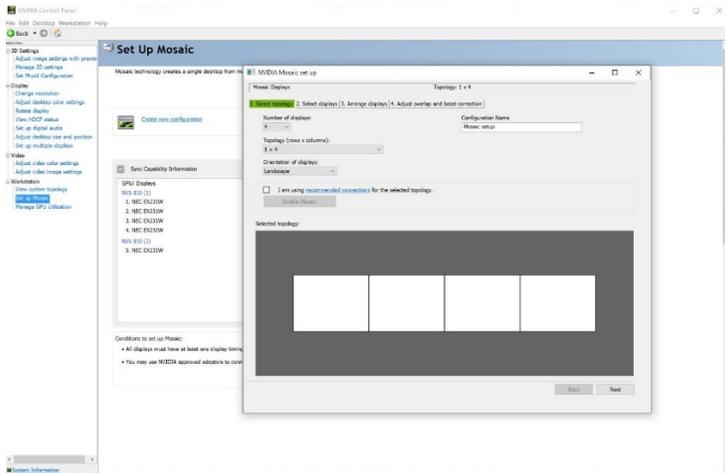
For longer distance runs, it is better to use DO or HDMI with an extender or fiber optic cable to maintain signal integrity.

## **Mosaic Tile configuration with NVIDIA Control Panel**

It is simple and easy to configure mosaic up to a 4 x 4 signage or display wall in Windows 10, 8.1, 8 and Linux operating systems with 64-bit support.

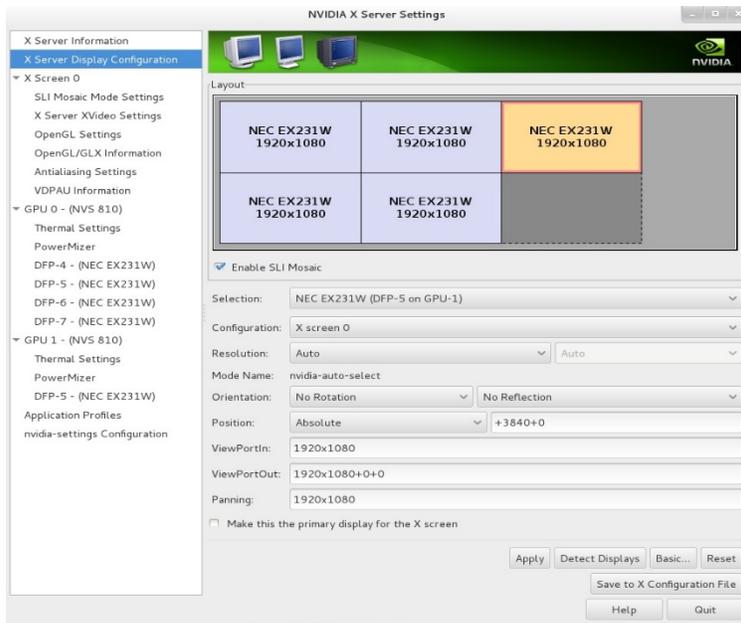
Windows 10, 8.1, 8 or 7 64-bit operating system

- NVIDIA Control Panel -> set up Mosaic -> follow on screen



## Linux Operating system

- Terminal -> `nvidia-settings` for NVIDIA Control Panel
- Turn on SLI Mosaic mode



Note: If more than 4 displays are attached SLI Mosaic mode must be turned on.

## NVIDIA Quadro and NVS DisplayPort 1.2 Support

The following recommended NVIDIA Quadro and NVS graphics boards support two or more DisplayPort 1.2 outputs:

- NVIDIA Quadro M6000 (four DP 1.2)
- NVIDIA Quadro M5000 (four DP 1.2)

- NVIDIA Quadro M4000 (four DP 1.2)
- NVIDIA Quadro K6000 (two DP 1.2)
- NVIDIA Quadro K5200 (two DP 1.2)
- NVIDIA Quadro K5000 (two DP 1.2)
- NVIDIA Quadro K4200 (two DP 1.2)
- NVIDIA Quadro K2200 (two DP 1.2)
- NVIDIA NVS 810 (eight Mini-DP 1.2)
- NVIDIA NVS 510 (four Mini-DP 1.2)
- NVIDIA NVS 315 (two DP 1.2)
- NVIDIA NVS 310 (two DP 1.2)

### DisplayPort to HDMI Adapter Options

The following vendors manufacture DisplayPort to HDMI adapters that are recommended for use with NVIDIA Quadro or NVS boards:

<b>Description</b>	<b>Vendor</b>	<b>Vendor PN</b>	<b>NVIDIA PN</b>
DP to HDMI	BizLink	KS10006A07	030-0224-000
DP to HDMI	BizLink	KS10006-B07	030-0333-000
DP to Mini DP	Freeport	18-94202182	030-0337-000
DP to Mini DP	Astron	3411020-092-H	030-0336-000
Mini DP to DP (latching)	BizLink	KS30011-B07	030-0351-000
Mini DP to DP (Latching)	Simula	CB802E-4000-10H	030-0416-000

### DVI to HDMI Adapters

The following vendors manufacture DisplayPort to HDMI adapters that are recommended for use with NVIDIA Quadro or NVS boards:

<b>Description</b>	<b>Vendor</b>	<b>Vendor PN</b>	<b>NVIDIA PN</b>
DVI to HDMI	Wieson	G8246CE04-005	320-0271-000
DVI to HDMI	Wieson	G8246cE04-006	320-0402-000

### DMS-59 to Dual DisplayPort Adapters

The following vendors manufacture DisplayPort to HDMI adapters that are recommended for use with NVIDIA Quadro or NVS boards:

<b>Description</b>	<b>Vendor</b>	<b>Vendor PN</b>	<b>NVIDIA PN</b>
DMS-59 to dual DP	BizLink	KS20021-A07	030-0141-000
DMS-59 to dual DP	Astron	3411020-089-H	030-0339-000

The ready availability of DisplayPort to HDMI adapters allows NVIDIA Quadro or NVS products to be utilized with existing HDMI AV infrastructure products such as switches and extenders. DVI to HDMI adapters enable the same functionality and also support the higher resolutions offered by HDMI relative to dual-link DVI.

PNY | 100 Jefferson Road | Parsippany | NJ 07054 | Sales 888.333.3657 | Support 800.230.0130 | [www.pny.com/quadro](http://www.pny.com/quadro)

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