PRIME Display Matrix Configuration User Guide Version 4.10.9





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*See the separate document on creating EDIDs: GPU Render EDID Guide.pdf



PREREQUISITES

Choosing Correct Cables: DisplayPort

On each Display Matrix PRIME system is an NVIDIA Quadro RTXA5000 with 4 DisplayPort connectors. These DisplayPort GPU outputs will be powering the Display Matrix. It is important to note that all DisplayPort cables support the same infrastructure. However, there is a difference in cable quality. To ensure the highest quality cable is used, it is recommended purchasing a DisplayPort cable which specifically supports up to 4K (2160p 60Hz, 2160p 59.94Hz, 2160p 50Hz). Gold plated cables are highly recommended.

Choosing Correct Cables: HDMI

Some clients may choose to convert their DisplayPort signal to HDMI. In these instances it is important to purchase the proper HDMI cable as well as a proper Display Port to HDMI adapter.. For video wall solutions, it is recommended purchasing a DisplayPort cable which specifically supports up to 4K (2160p 60Hz, 2160p 59.94Hz, 2160p 50Hz). Gold plated cables are highly recommended. Please make sure the Display Port to HDMI adapter also supports up to 4K (2160p 60Hz, 2160p 50Hz). It is really important to check the specifications on the converter and the cable to make sure that it meets the specified requirements..

Choosing Monitors That Fit Your Solution

Verify that the monitors in your configuration natively support the Refresh Rate intended to be used in the Display Matrix solution. Mismatching Refresh Rates will result in stuttering video. (i.e. If you are using 1080p 59.94 as your output, then your monitor should have a native refresh rate of 59.94)

What About HDR?

HDR is supported with NVIDIA Quadro RTXA5000, and as stated above, all DisplayPort cables support the same infrastructure. So once again it is recommended purchasing a DisplayPort cable which specifically supports up to 4K (2160p 60Hz, 2160p 59.94Hz, 2160p 50Hz) which also states in the spec that it is HDR compliant. The same precaution will need to be taken when purchasing HDMI cables for an HDR solution.



CONFIGURING THE DISPLAY MATRIX

Playout Configuration				
	Video Channels 💽 Add Out	put 👻 🚺	Add Input 🔻	
Video Channels	Channel		🔽 Output 1	×
Clip Players	Device	GPU		-
📸 Clip Recorders	Туре	Video Ou	ıt	-
Playlists	Connector	Video N	Monitor 1	•
	Name	Output 1		
	Video Standard	2160p 59	1.94 Hz	•
	Video Shape	Unshaped	d	Ŧ
	Downstream Input	None		•
	Audio Mode	System A	Audio	•
	Audio Channels	2		•
	Genlock Source			-
	Genlock Timing (H/V)	0	* 0	A V
	Antialiasing	Disabled		•
	Preview	No Previe	ew	•
	Matrox Firmware Current	2 In / 6 Out	:	

1) PRIME Playout Configuration Needs To Be Setup Initially As Shown Below

Please note the Video Standard resolution is nonstandard. With this Setup, it allows us to configure 1 GPU across 4 Monitors Maximum



2) Setting up the Display Matrix Mosaic

Launch Nvidia Control Panel and click on **Set Up Mosaic** as shown below.

🛃 NVIDIA Control Panel		
File Edit Desktop Workstation Help		
Back -	Set Up Mosaic Mosaic technology creates a single de Center new configuration Create new confi	tsktop from multiple displays and GPUs. Becel correction is available to create a seamless ima Iden Sync capability Iden
System Information	< <u></u>	

Click on **Create New Configuration**, that opens Nvidia Mosaic Setup Window as shown below.





🔜 NVIDIA Mosaic set up		
Mosaic Displays	Topology: 1 × 2	
1. Select topology 2. Select displays 3. Arrange displays 4. Adjust over	erlap and bezel correction	
Number of displays:	Configuration Name	
2 •	Mosaic setup	
Topology (rows × columns):		
1 × 2 🔹		
Orientation of displays:		
Landscape		
I am using <u>recommended connections</u> for the selected topology.		
Enable Mosaic		
Selected topology:		
	Bac	k <u>N</u> ext
		IN MOAL



Select Number of Displays and Topology one would like to set up along with Configuration Name.

NVIDIA Mosaic set up				_ • •
Mosaic Displays	Т	opology: 2 × 2		
1. Select topology 2. Select displays 3. An	range displays 4. Adjust overlap an	nd bezel correction		
Number of displays:		Configuration Name		
4 🔻		Mosaic setup		
Topology (rows × columns):				
2 × 2	•			
1 × 4 2 × 2				
4×1 1 × 2 (Passive stereo)				
2 × 1 (Passive stereo) 1 am using recommended connectio	ns for the selected topology.			
Enable Mosaic				
Selected topology:				
			Back	Next
			Dack	<u>H</u> ox

*Following example shows Number of displays: 4; Topology : 2x2



Click **Next** and Select Displays that you would like to use in this topology on the next page Refresh Rate and Resolution per display can be set here using their respective dropdowns

NVIDIA Mosaic set up			
Mosaic Displays		Topology: 1 × 4	
1. Select topology 2. Select displays Displays for Mosaic: (4 selected) Image: Comparison of the selected of th	3. Arrange displays	Topology: 1 × 4 4. Adjust overlap and bezel correction 4. Adjust overlap and bezel correction Refresh rate: 50.00 F ▼ Resolution per display: 1920 × 1080 1768 × 992 1680 × 1050 1600 × 1024 1600 × 900 1366 × 768 1280 × 1024 1280 × 768 1280 × 768 1280 × 768 1280 × 768 1280 × 768 1280 × 768 1280 × 768 1280 × 768 1176 × 664 1152 × 864 1024 × 768 800 × 600 720 × 740 640 × 480	r Mosaic with sync. e information about your display
0,0 0,1 0,2	4 0,3		
			Back Next



Click **Next** and move on to Arranging Displays in your Topology as shown below

NVIDIA Mosaic set up		- • •
Mosaic Displays	Topology: 2 × 2	
1. Select topology 2. Select displays 3.	Arrange displays 4. Adjust overlap and bezel correction	
Available display sources:		
4 3 2 0,3 0,2 0,1 0	,0	
Topology:		
Total Resolution: 3840 x 2160 pixels		
	<u>B</u> ack <u>N</u> ext	Finish



Drag and Drop Displays according to tour Topology requirements and Click **Apply** and Click **Next** when Topology is applied.

NVIDIA Mosaic set up				- • •
Mosaic Displays		Topology: 2 × 2		
1. Select topology 2. Select displays 3. 4	Arrange displays 4. Adjust over	lap and bezel correction		
 Display arrangement for Mosaic is 	complete. To enable Mosaic, click	'Apply'.		
Topology:	_	_	_	_
	1	2]	
	0,0	0,1		
	3	4		
	0,2	4 0,3		
	0,2	0,3	1	
Total Resolution: 3840 × 2160 pixels			Apply	
			Back Next	Finish



Adjust the overlap and bezel correction looking at the display monitors and click Finish.

Aosaic Displays		Topology: 2 × 2	
. Select topology 2. Selec	t displays 3. Arrange displays 4. Adj	ust overlap and bezel correction	
Select how overlap/bezel co		n	
Use the same setting for al	l vertical or horizontal edges 🛛 🔻		
5elect edges for overlap/be	zel correction		
		*	
	1	2	
	0,0	0,1	
	3	4	
	0,2	0,3	
Total resolution: 3840 x 2	2160 pixels		
Enter overlap/bezel correcti		Compating webs (single)	<u>,</u>
Edges	Correction type	Correction value (pixels))
		Correction value (pixels))
Edges All Vertical	Correction type Bezel Correction 💌	0	
Edges All Vertical	Correction type Bezel Correction 💌	0)
Edges All Vertical	Correction type Bezel Correction 💌	0	
Edges All Vertical All horizontal	Correction type Bezel Correction 💌	0)
Edges All Vertical All horizontal	Correction type Bezel Correction 💌	0) Back Finish



Final Mosaic Setup has been applied that lists all the properties of your Topology One can Click on **Modify** and Modify the Topology to make any changes required or **Disable** the Mosaic Setup to go back to default settings.

🛃 NVIDIA Control Panel					
<u>File E</u> dit Des <u>k</u> top <u>W</u> orkstation <u>H</u> elp					
🕝 Back 🔻 🌍 🛛 🚮					
Select a Task					A
	Set Up Mosaic				
Adjust image settings with preview Manage 3D settings	Mosaic technology creates a sing	le desktop from multiple displays ar	nd GPUs. Bezel correction is avai	lable to create a seamless image.	
Display Change resolution					
Adjust desktop color settings					
Rotate display View HDCP status					
Set up digital audio	Create new configuration				
Set up multiple displays					
Set up stereoscopic 3D				Identify displays	
View rating for games				Tanim / askia/a	
Adjust video color settings Adjust video image settings	Mosaic Displays- 1			Modify Disable	
- Workstation	Topology	2 × 2			
View system topology Set up Mosaic	Refresh Rate Resolution per display	50Hz 1920 ×	1080		
Change ECC state	Total resolution	3840 ×			
Manage GPU Utilization					
			2		
		1	2		
		0,0	0,1		
		3	4		
		0,2	0,3		
		0,2	0,3		
	Sync Capability Information				
	GPU/ Displays		Sync capability		
	Quadro P5000		The capability		
	1. Acer K242HYL				
	2. Acer K242HYL				
	3. Acer K242HYL				
	4. Acer K242HVL				
System Information					
					•

3) Configure EDID

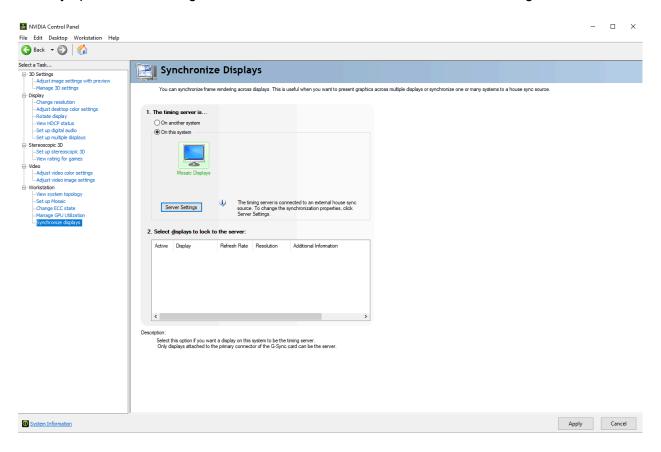
Refer to GPU Render EDID Guide



4) Set NVIDIA Quadro Sync

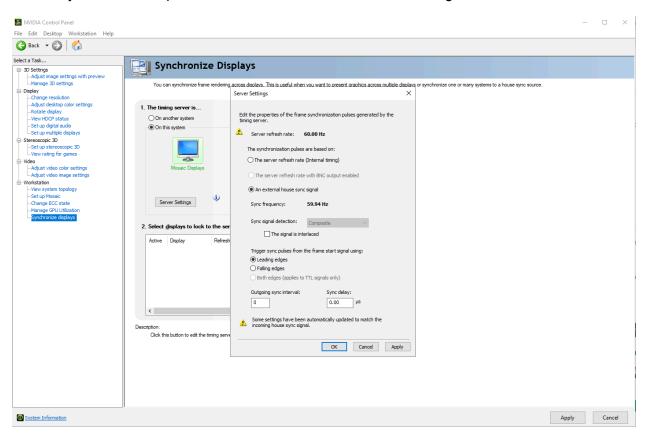
When using the optional Matrox BNC video inputs as part of the PRIME Display Matrix solution, the NVIDIA Quadro Sync must be configured. This ensures that the refresh rate of the monitor is synchronized to the refresh rate of the source video. Both the Matrox and NVIDIA cards should receive reference in, and both can take either bi-level or tri-level sync. This should be configured after the NVIDIA Mosaic.

Open NVIDIA Control Panel and select Synchronize displays. Notice the configured Mosaic is the only option in this configuration. Choose the Mosaic and click Server Settings.





Set the synchronization pulses to be based on an external house signal.





Once the changes have been applied refer to View System Topology. Confirm that Mosaic Displays Timer is locked to house sync signal, that External Sync Signal is Present (In Use), and that the Framelock Sync Pulse is Present.

NVIDIA Control Panel					- 🗆 ×
ile Edit Desktop Workstation Help					
elect a Task					
- 3D Settings	View System Topolo	gy			
Adjust image settings with preview Manage 3D settings 3- Display Change resolution Adjust desktop color settings	This page shows the displays and graphics can	ds connected within	this system.		
Rotate display View HDCP status	Mosaic Displays				
Set up digital audio	System topology	Status	Settings		
Set up multiple displays	Mosaic Displays	510105	occurrigo	0	
- Stereoscopic 3D Set up stereoscopic 3D	Configuration		1 x 3 Topology		
View rating for games	Resolution, refresh rate		5760 × 1080 pixels, 59.94 Hz		
- Video	Display Sync State		Quadro Sync II Server		
Adjust video color settings Adjust video image settings	Timing				
		v	The display is locked to the house sync signal		
View system topology	OS Screen Identifier		3	~	
Set up Mosaic Change ECC state	Displays and Graphics Cards		a w		
Manage GPU Utilization	System topology	Status	Settings		
Synchronize displays	System				
	Driver version		391.33		
	Vertical sync	S	3D Application controlled		
	3D Stereo		Disabled		
	Quadro Sync II (server)				
	Framelock 0	17	Out		
	Framelock 1	1	Out		
	External sync signal	S	Present (In use)		
	Framelock sync pulse	I	Present		
	Sync settings		Synchronize Displays	More	
	🖃 🚎 Quadro P5000 (2 of 2)				
	DVI		Connected: S27B550 EDID (Monitor), <u>Multi-Display Cloning</u> (Disabled)		
	DisplayPort (3)		Connected: U28E570 EDID (Monitor), <u>Multi-Display Cloning</u> (Disabled)		
	DVI		Connected: VN279 (2 of 2) EDID (Monitor), <u>Multi-Display Cloning</u> (Disabled)		
	DisplayPort (1)		Not connected EDID (Monitor), <u>Multi-Display Cloning</u> (Disabled)		
	DVI		Not connected EDID (Monitor)		
System Information	SLI Mode		Disabled		
	Urano Modo		WDDM		



4) Dual GPUs Configuration

*Please Note, this step is critical if your Chyron system came with a secondary video card for Windows. You must set two additional NVIDIA settings within the NVIDIA Control Panel. If you do not set these properties you will experience unexpected results in PRIME and also Output stuttering and visual tearing on Prime Engine Channels.

After setting up your Mosaic, please go to the NVIDIA Control Panel > (Under) 3D Settings > Manage 3D settings > Click on the Program Settings Tab

PRIME's Executable

- Select the PRIME version you want to apply the setting to
- For the video card that is connected to the Windows Desktop Monitor, please set the CUDA GPUs and OpenGL rendering GPU options to that particular video card in which PRIME Playout/Scene Designer and Windows will be using.
 - In this case, I have set the Quadro P620 to PRIME's executable

Slobal Settings Program Settings		
1. Select a program to customize:		
Prime (c:/program files/chyron	V Add Remove 🗠 Resto	re
Show only programs found on the settings for this prog		
Feature	Setting	^
CUDA - GPUs	Quadro P620	
CUDA - Sysmem Fallback Policy	Use global setting (Driver Default)	
Enable overlay	Use global setting (Off)	
Exported pixel types	Use global setting (Color indexed overlays	
Low Latency Mode	Use global setting (Off)	
Max Frame Rate	Use global setting (Off)	
Multi-Frame Sampled AA (MFAA)	Use global setting (Off)	
OpenGL GDI compatibility	Use global setting (Auto)	
OpenGL rendering GPU	Quadro P620	
Power management mode	Prefer maximum performance	





PRIME Engine's Executable

- Select the PRIME Engine executable
- For the video card in which you have up to 4 displayports connected and set up for Mosaic, please set the CUDA GPUs and OpenGL rendering GPU options to that particular video card in which PRIME Engine will be using.
 - In this case, I have set the RTX A5000 to PRIME Engine's executable

obal Settings Program Settings	
1. Select a program to customize:	
😰 Prime Engine (c:/program files/c	✓ Add Remove @ Restore
Show only programs found on this c	omputer
2. Specify the settings for this program	:
Feature	Setting ^
CUDA - GPUs	NVIDIA RTX A5000
CUDA - Sysmem Fallback Policy	Use global setting (Driver Default)
Enable overlay	Use global setting (Off)
Exported pixel types	Use global setting (Color indexed overlays
Low Latency Mode	Use global setting (Off)
Max Frame Rate	Use global setting (Off)
Multi-Frame Sampled AA (MFAA)	Use global setting (Off)
OpenGL GDI compatibility	Use global setting (Auto)
OpenGL rendering GPU	NVIDIA RTX A5000
Power management mode	Prefer maximum performance

Description:

Select the GPU to be used by OpenGL applications. Choosing a GPU that is part of an SLI or Mosaic group will effectively



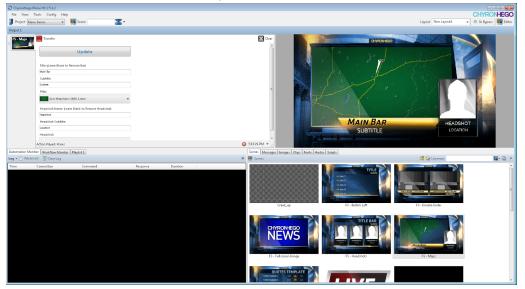


6) Double check Windows display settings

It's important to make sure that the Windows Display settings are set properly. Right-click on the desktop and navigate to the Display Settings. Ensure that Scale and Layout as well as Display Resolution are using the recommended settings.

7) Play graphics

Launch Prime Application and Play any Scene on the Output channel, it should display the Graphic across all those 4 Display devices





ABOUT US

Chyron is ushering in the next generation of storytelling in the digital age. Founded in 1966, the company pioneered broadcast titling and graphics systems. With a strong foundation built on over 50 years of innovation and efficiency, the name Chyron is synonymous with broadcast graphics. Chyron continues that legacy as a global leader focused on customer-centric broadcast solutions. Today, the company offers production professionals the industry's most comprehensive software portfolio for designing, sharing, and playing live graphics to air with ease. Chyron products are increasingly deployed to empower OTA & OTT workflows and deliver richer, more immersive experiences for audiences and sports fans in the arena, at home, or on the go.

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