Chyron PRIME

Playout Configuration Guide

Version 4.10

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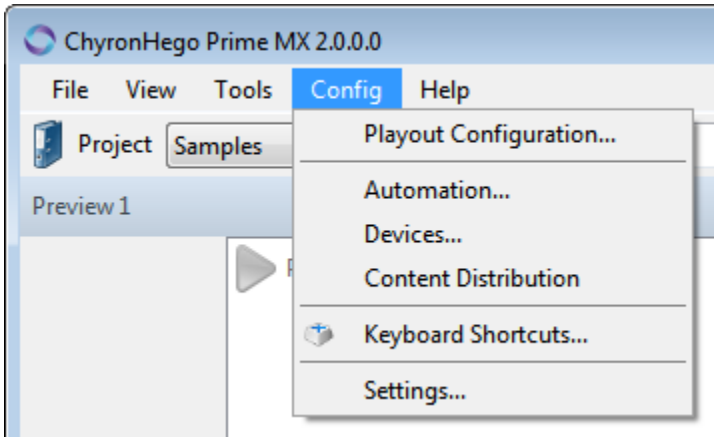
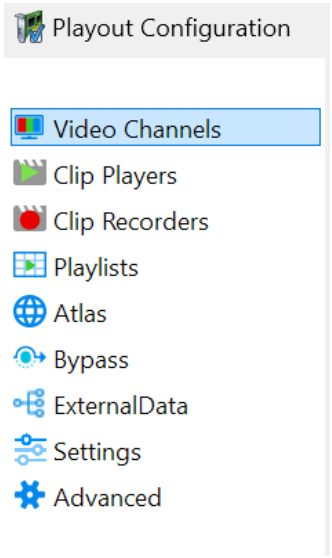
Prime Playout Configuration

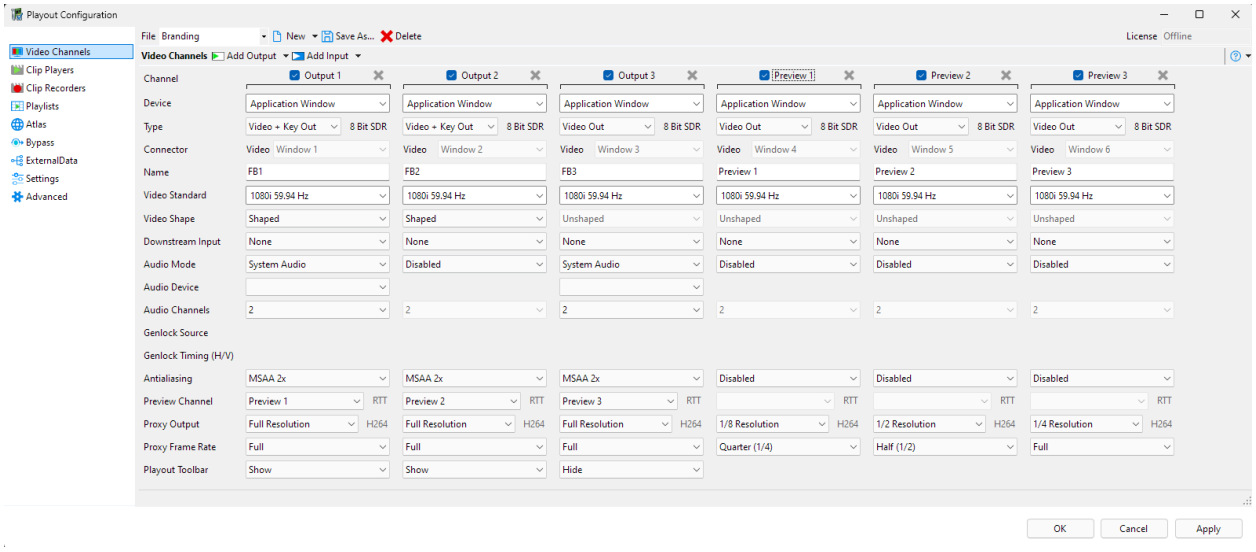
The Playout Configuration Panel may be accessed from the Runtime Playout Interface “Config” main menu:

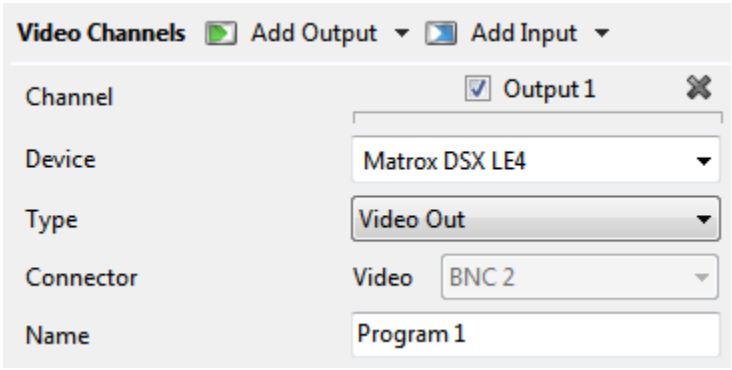




From this dialog you may configure

- Video Channels: Inputs, Outputs, And Preview channels
- Clip Players
- Clip Recorders
- Playlists
- Atlas multiviewer
- Bypass
- External Data
- Settings
- Advanced


Playout Configuration
File Branding
New
Save As...
Delete
License Offline
Video Channels
Add Output
Add Input
Clip Players
Clip Recorders
Playlists
Atlas
Bypass
ExternalData
Settings
Advanced
Channel
Output 1
Output 2
Output 3
Preview 1
Preview 2
Preview 3
Device
Application Window
Type
Video + Key Out
Video Out
8 Bit SDR
Connector
Video
Window 1
Window 2
Window 3
Window 4
Window 5
Window 6
Name
FB1
FB2
FB3
Preview 1
Preview 2
Preview 3
Video Standard
1080i 59.94 Hz
Video Shape
Shaped
Unshaped
Downstream Input
None
Audio Mode
System Audio
Disabled
Audio Device
Audio Channels
2
Genlock Source
Genlock Timing (H/V)
Antialiasing
MSAA 2x
Disabled
Preview Channel
RTT
Proxy Output
Full Resolution
1/8 Resolution
1/2 Resolution
1/4 Resolution
H264
Proxy Frame Rate
Full
Quarter (1/4)
Half (1/2)
Playout Toolbar
Show
Hide
OK
Cancel
Apply


Video Channels
Add Output
Add Input
Channel
Output 1
Device
Matrox DSX LE4
Type
Video Out
Connector
Video
BNC 2
Name
Program 1

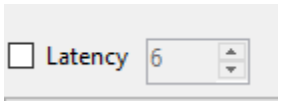
VIDEO CHANNELS

Outputs, Inputs

Add an output or input by clicking their respective toolbar buttons

LATENCY

Latency settings are available for inputs for all inputs. This allows delaying the input video signal as a Fixed length delay through the system.



Channel Properties

We support any output resolution combination as long as the genlock resolution has the same frame rate family. Frame rate families are:

- 23.98/29.97/59.94
- 25/50
- 24/30/60

For example, you cannot have 1080i50 and 1080i60 channels.

Channel	Shows a check box to enable/disable the channel, the direction of the channel (Input or Output/Preview), and a button to remove the channel
Device	Device types (only installed hardware devices will show up) • Matrox DSX LE4 • Matrox Q25 IP • Bluefish444 Epoch Supernova (Deprecated) • NDI® • GPU Output • Desktop Window • Application Window • Sub Channel • Render (Only available on systems with System Type set to “Render”. Used for CAMIO/LUCI previews. • Remote Engine • Network Streams (HTTP, RTMP, RTMPS) • System Audio Input

	• Image Input
Type	Selects between Video Out/Video + Key Out, or Video In/Video + Key In. Note: not all devices support Video + Key Select • SDR 8-bit color depth, 10-bit color depth • HDR 10-bit color depth • HLG 10-bit color depth • S-Log 3 10-bit color depth **LUT** LUT files can be applied to both Input and Output HDR, HLG, S-Log 3 channels (10bit) Supported formats: *.lut *.cube
Connector	Shows the connector to be used for the device. This may change as other devices are added or removed NDI Input: • System: Computer name or IP address • Source: Name of incoming stream NDI Output: • Source: User defined stream name. • Latency: Allows delaying source signal Network Stream: • URL Image: • File: path to use as static image
Name	User defined name that will be shown throughout the application
Video Standard	Output resolution and frame rate to be used for the channel GPU Output: • Size Mode can be set to Scale, Stripe. Scale will scale the output to the monitor size. Stripe will automatically section the output into stripes to fit on the output. Custom Stripe will section the output into custom stripes defined in the C:\ProgramData\ChyronHego\Prime Engine\layout#.xml file Sub Channel: • X and Y position can be specified for the top left hand corner of the sub channel Inputs: • Video Input Filtering: HALF size or Line Doubling

Override Window Appearance	Customizes the selected Desktop Window Output Appearance by overriding position and resolution size
Video Shape	Setting to Shaped Causes Fill output to be pre-multiplied. Note: Video Shape is only enabled if Type is set to Video + Key Out Inputs: ● Frame Synchronizer: Hardware option that synchronizes the video input to the genlock. Enabling this feature adds one additional frame of delay.
Downstream Input	Video input to be used as background video. If set, the Downstream Input can be manipulated from within scenes
Audio Mode	Chooses output audio type: Disabled, Embedded (SDI, NDI, and Network Stream only), AES (SDI only), System Audio or Virtual (used for Atlas output)
Audio Device	Can be set to Primary Sound Driver to use the default audio output from the system, or to any of the audio devices available to the system
Audio channels	The number of audio output channels SDI Input: ● SDI/AES specifies the number of embedded and discrete audio channels to use.
Genlock Source	SDI Output: ● The sync source for Genlock: Genlock Input, SDI Input or Internal
Genlock Timing (H/V)	Horizontal and Vertical timing value for Genlock
Antialiasing	Sets the antialiasing for the output: Disabled, Multi Sample 2x-16x, Coverage Sample (Quality) 8x-16x
Preview Channel	Sets a Preview channel for the output. If a Preview channel is set, scene control panels will show up in the Preview channel when loaded or stopped, and in the Output channel when playing
Channel RTT	Channel Render to Texture: Texture effect applied to a scene enables all scenes on corresponding output to be rendered to other configured channels
Proxy Output (Resolution)	Used to show a proxy of the output in the application window. Disable, ¼, ½ or full resolutions can be selected.
H.264 Preview	Simultaneously stream H.264 along with the configured device type
Proxy Frame Rate	Increases Program performance by allocating more resources to program rather than preview. Full - no frames are skipped Half - every other frame is played (Default Setting) Third - every third frame is played Quarter - every fourth frame is played
Playout Toolbar	Show or Hide Channel in Prime Playout ● Show (Default) - Program Channel will show in the toolbar of Prime playout UI. Will be available for * to cycle between channels. ● Hide - Program Channel will NOT show in the toolbar of Prime playout UI. This will not be included in the * shortcut key to cycle of channels.

SDI
Prime support

IP
Refer to the “IP_Playout_Configuration_Guide” document

NDI
Stream NDI output

GPU
PRIME supports a single GPU card with 4x4k DisplayPort outputs.

Desktop Window
Allows a proxy to show up in the PRIME playout User Interface

Application Window
Offline external window used for offline systems

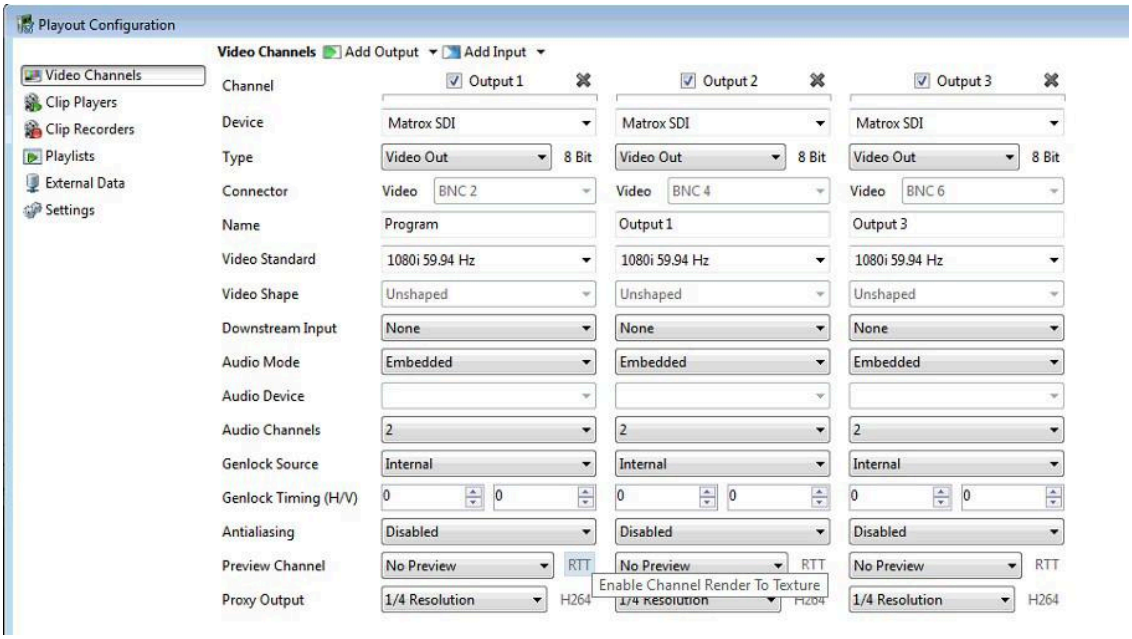
Sub Channel
Allows users the ability to carve up a single output channel into multiple channels. Very useful for Studio monitors.

Remote Engine
PRIME can connect to a PRIME Remote engine. With this use case users can control multiple instances of the PRIME Engine from a single PRIME User interface.

Channel RTT
A channel render to texture effect may be applied to an individual Prime scene. That scene may be composed of various graphic objects, effects and resources. When that scene is played to output, it can be targeted as a rendered texture available to any other configured Prime channel(s). In addition, any other scenes played to the same output channel as the RTT scene will also be rendered as part of the channel rendered texture output.

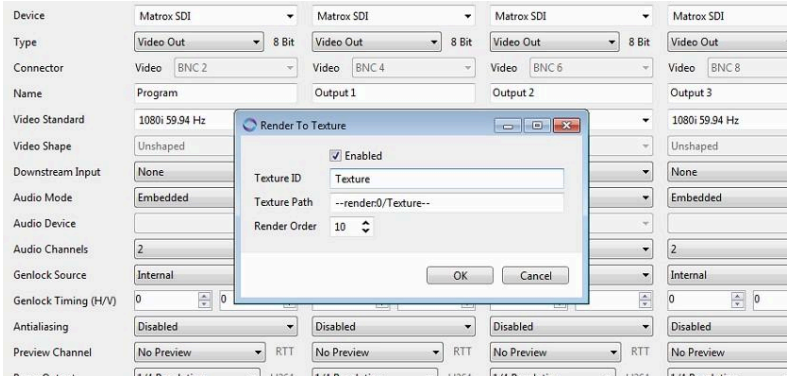
Setup

In PRIME Playout Configuration select the RTT button on the output channel you wish to render to a texture effect.



Render Order

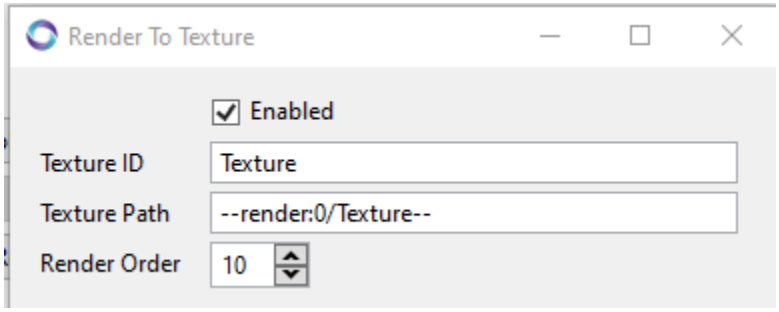
By default this is set to 10. This number will be applied as a negative layer number to the render to texture channel. In this case -10. If you intend to play other scenes to the render to texture channel they may need to be set to -9 or higher to be composited on top of the RTT. Or alternatively adjust the layer of your RTT channel accordingly.



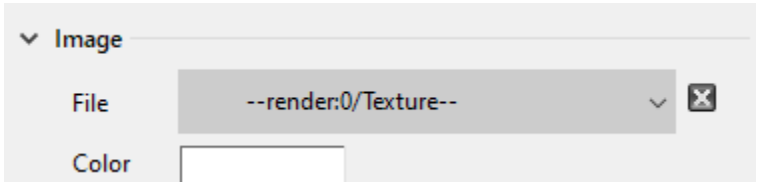
Texture Path

The texture path that is generated must then be applied as an image file path within a Prime scene.

Prime Playout Configuration:

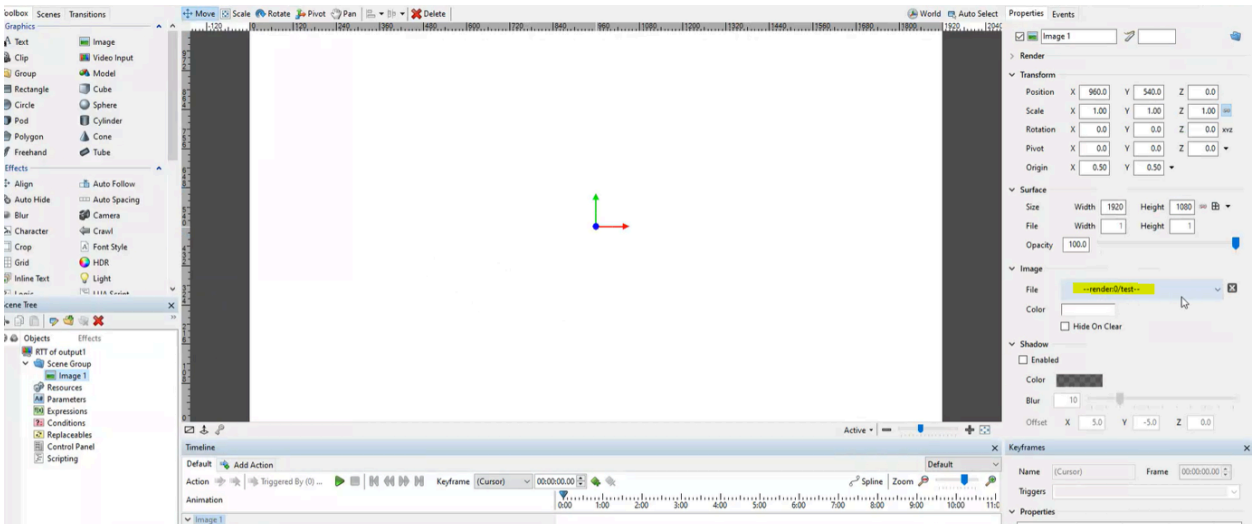


Prime Designer:



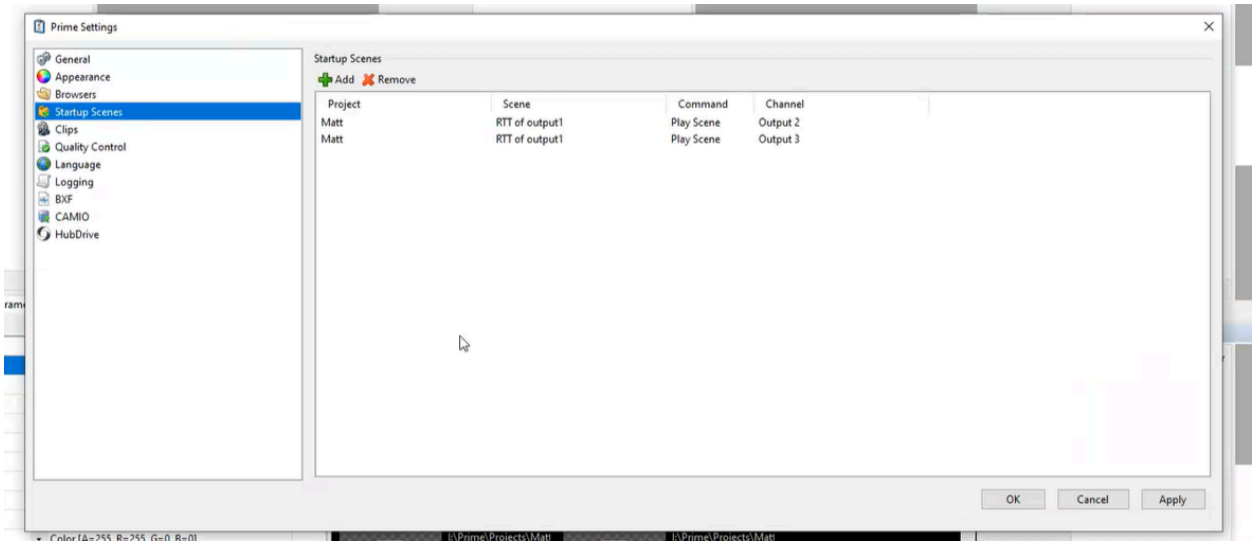
Render to Texture Prime Scene Construction

Create a scene with a full screen image object. Create a new scene and add an image. Paste the texture path into the File property of the Image object. (Note: You will not see any change in Designer). The image path must exactly match the RTT texture path. You can add as many other scene objects in this scene as well.



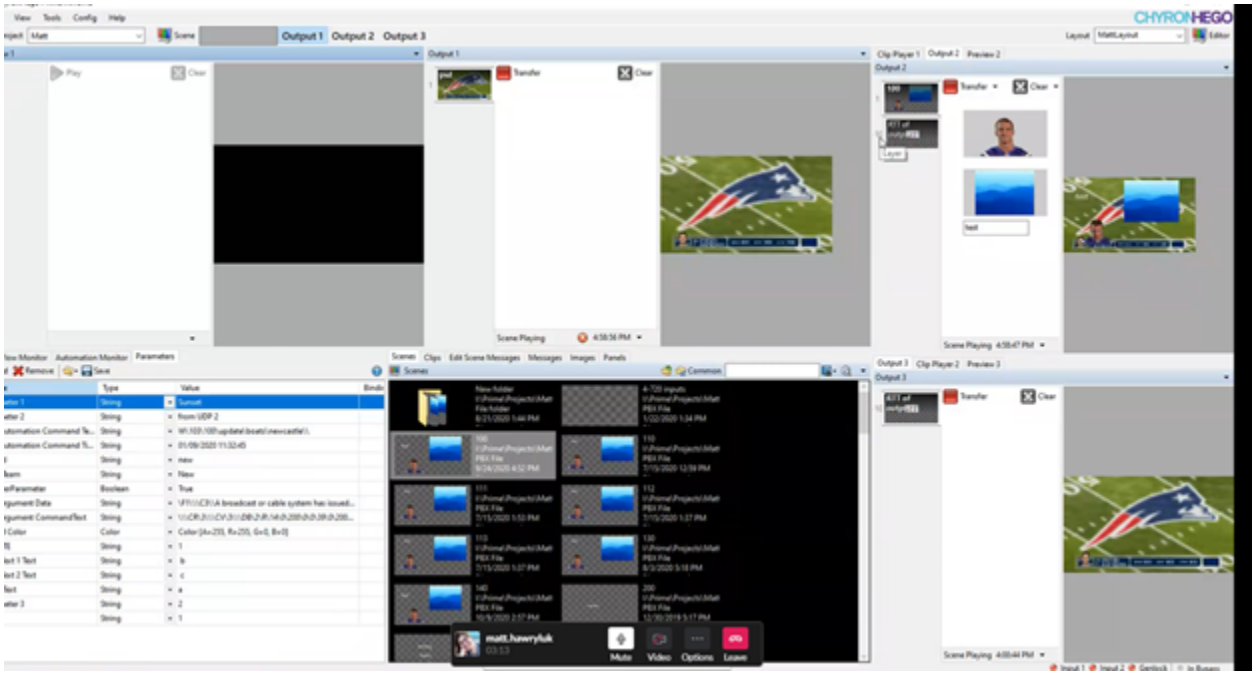
Setting Prime Scene as Channel Output

In Startup Scenes you can set the render to texture scene as the output channel for multiple configured channels.



Render to Texture Output

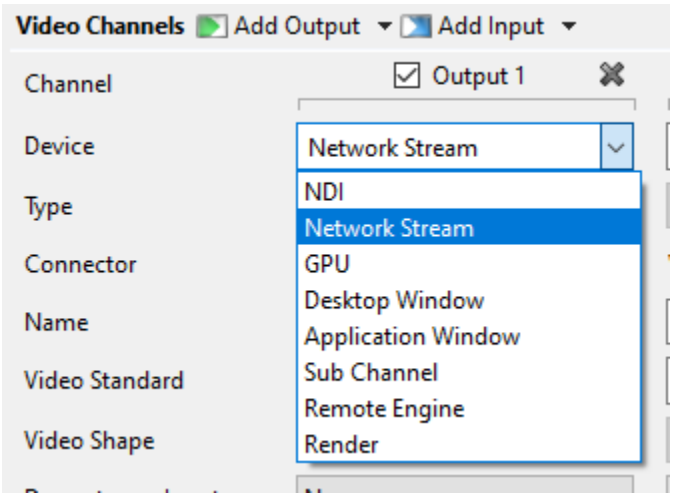
In this example “RTT of output1.pbx” is replicated on output 2 and output 3 (as configured in startup scenes).



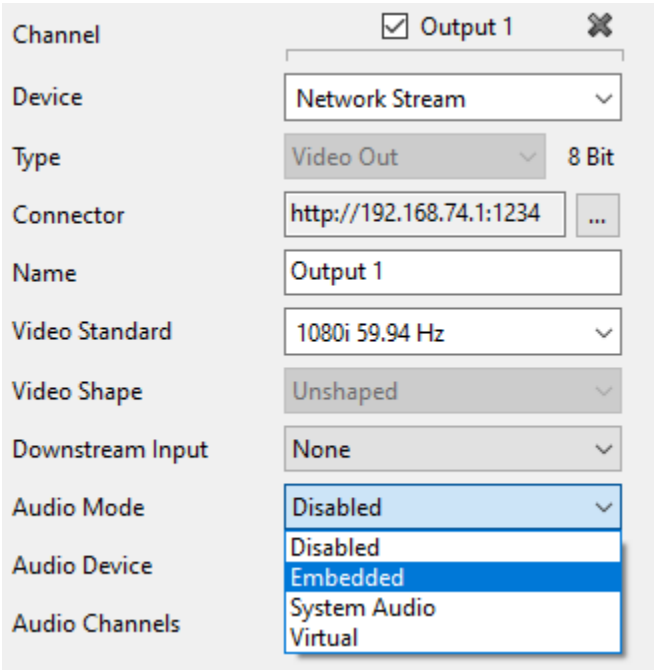
Note: Audio from RTT channel will not be playing on other channels. Only video is passed.

Network Stream Output

PRIME can output a H.264 Network Stream to a targeted streaming service. Select “Network Stream” as device type.



To enable audio on a Network Stream Output, make a selection from the Audio Mode dropdown. Some streaming services require audio to be enabled for proper performance. Audio must be enabled here on the parent channel to allow further audio selections within the Network Stream Settings configuration.

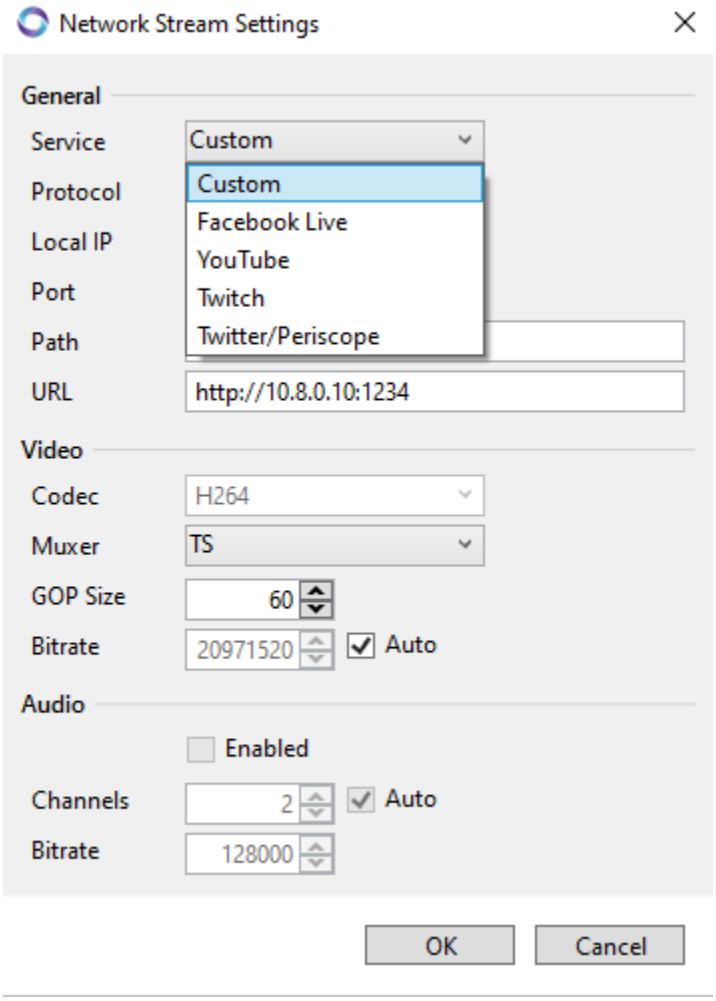


To configure streaming service type, click on the … button in the connector row.

This will open the Network Stream Settings window.

Network Stream Services:

To configure a Network Stream Output, select the appropriate service type from the dropdown list.

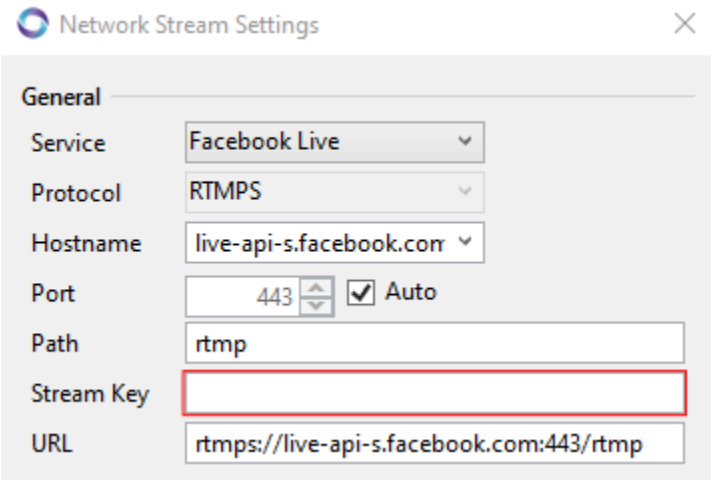


Custom

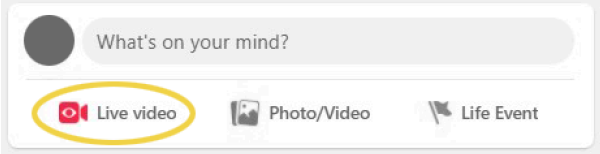
Facebook Live

When Facebook Live service is selected, Prime will dynamically populate fields with recommended settings; RTMPS Protocol, Port 443 (if auto is checked) and URL to rtmps://live-api-s.facebook.com:443/rtmp

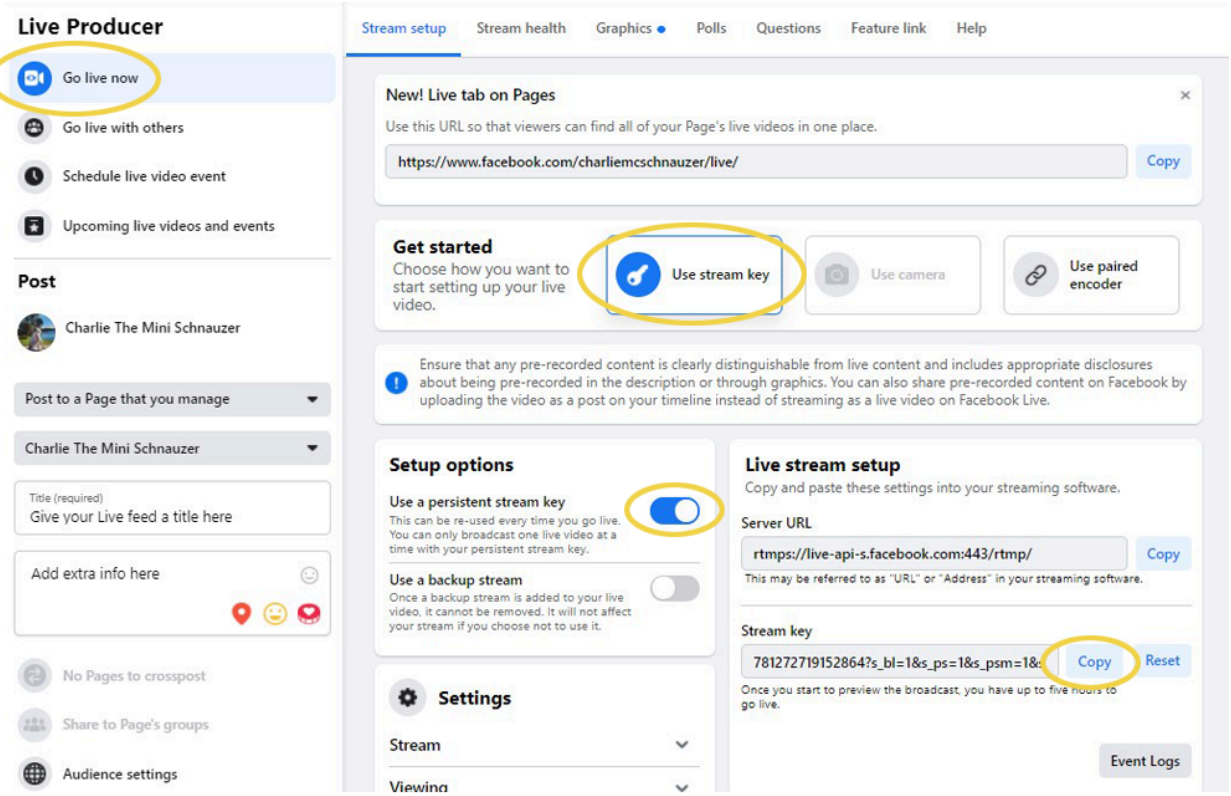
The Stream Key field will appear with a red box highlight to indicate that no Stream Key is blank.



To generate a Facebook live stream key you will need to log into facebook from a web browser. Click on Live Video.

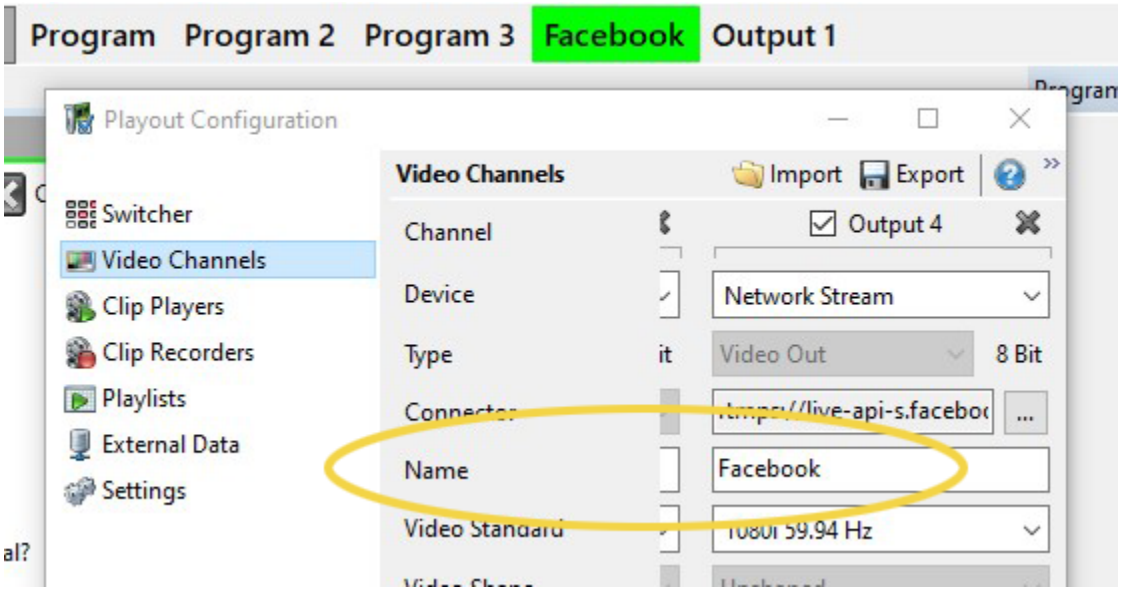


Navigate to the Live Producer page and select “Use Stream Key”. The Live Stream setup section will become visible. Select use a persistent stream key if desired. Select the Copy button next to the Stream Key field.



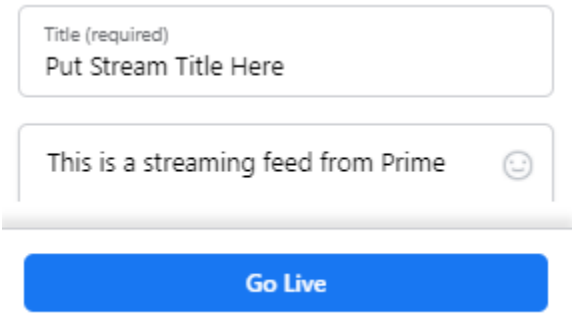
Return to Prime UI and paste the Stream Key from Facebook into Prime's Stream Key field. Select OK. A dialogue prompt will appear stating "Prime needs to be restarted for the new settings to be applied". Restart Prime.

The Network stream Output will be available in Prime Playout with the name assigned to the configured output in the Playout Configuration settings.

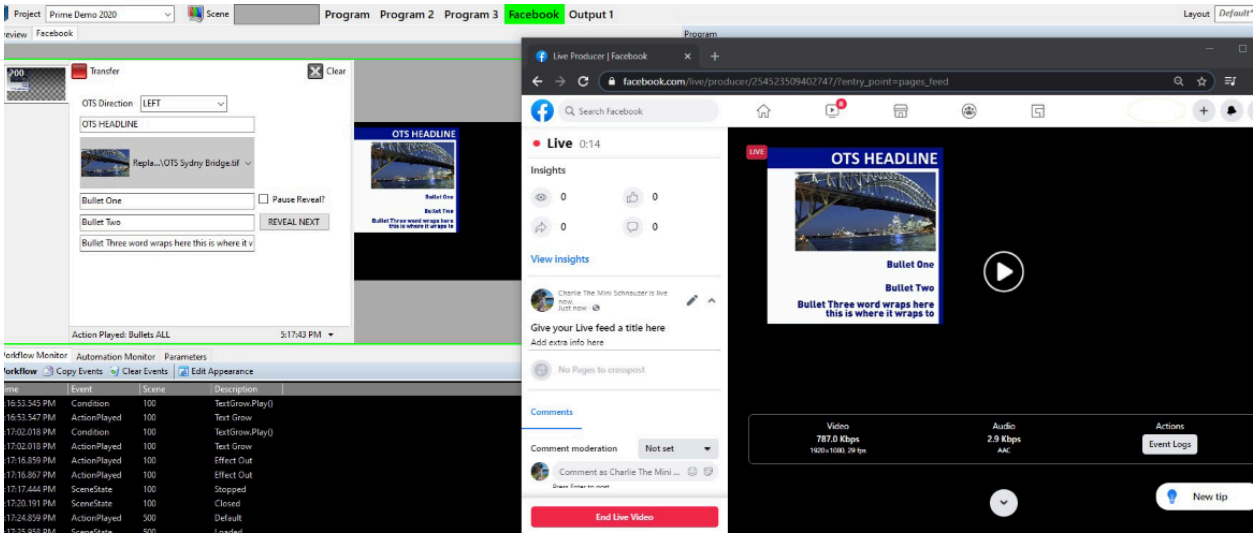


Turn on/off visibility of the Network stream output via the View menu.

When you wish the Facebook Live Network stream output in Prime to begin streaming to Facebook, select the “Go Live” button in Facebook. *Facebook does require that you give the Live feed video a title.*



Once “Go Live” has been selected, any Prime graphics played to the Facebook Live Network stream Output will be streamed to the configured Facebook page.

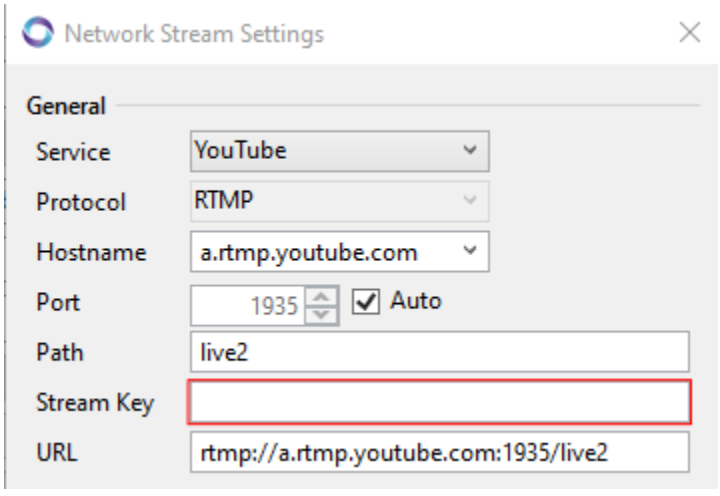


Refer to Facebook's Help Center for Video format guidelines and restrictions for live streaming on Facebook.

YouTube

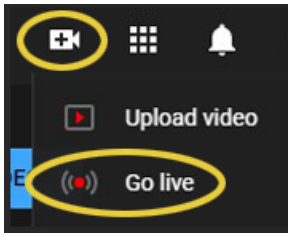
When YouTube is selected in the Service dropdown, Prime will dynamically populate fields with recommended settings; RTMP Protocol, Port 1935 (if auto is checked) and URL to tmp://a.rtmp.youtube.com:1935/live2

The Stream Key field will appear with a red box highlight to indicate that no Stream Key is blank.



To generate a YouTube live stream key you will need to log into YouTube from a web browser. Click on the icon that looks like a camera with a Plus symbol, and select Go Live. If you haven't

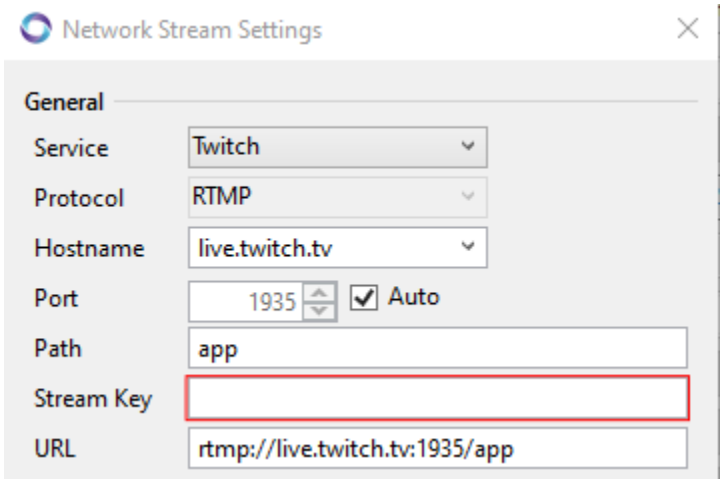
already, follow the prompts to verify your channel. Enabling your first live stream may take up to 24 hours (this is a restriction enforced by YouTube). Once enabled, you can live stream instantly.



Twitch

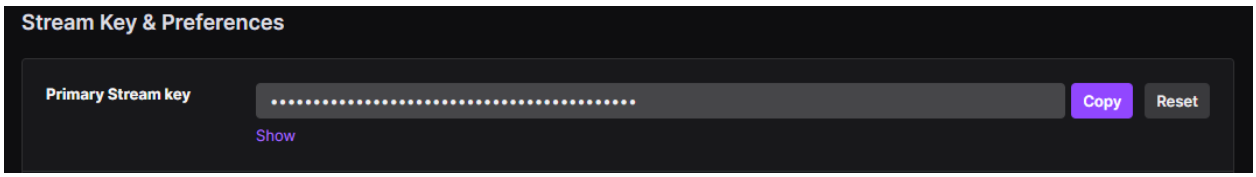
When Twitch is selected in the Service dropdown, Prime will dynamically populate fields with recommended settings; RTMP Protocol, Port 1935 (if auto is checked) and URL to rtmp://live.twitch.tv:1935/app

The Stream Key field will appear with a red box highlight to indicate that no Stream Key is blank.



To generate a Twitch stream key you will need to log into Twitch from a web browser. In Twitch, click on the profile icon at the top right of the page. Select Settings from the menu dropdown. After the profile page has loaded click the Channel and Videos tab.

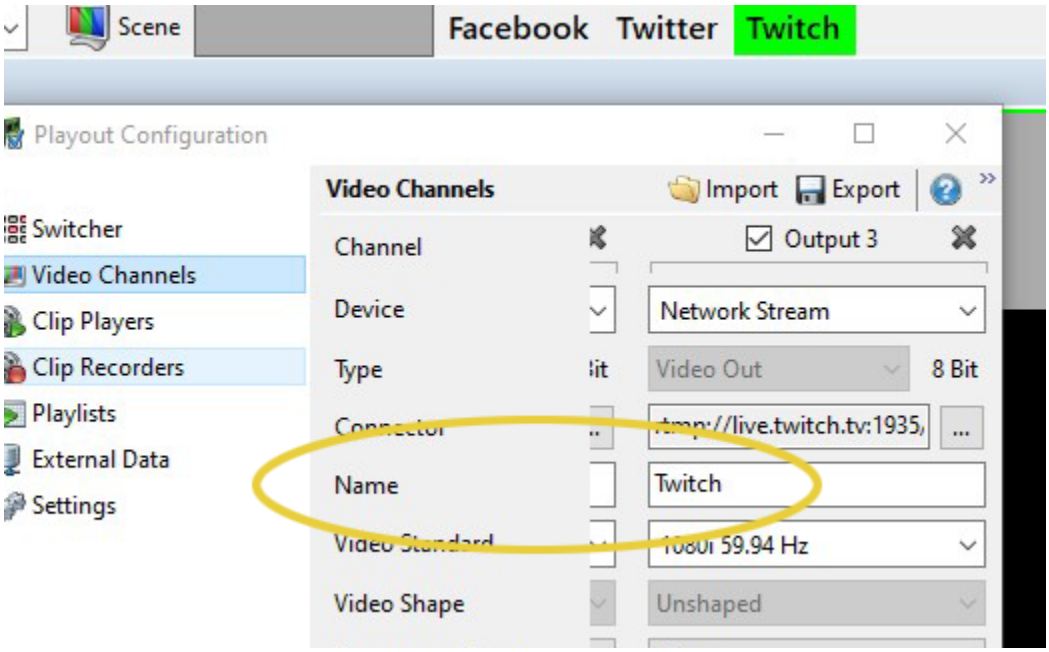
Click the Copy button next to the Primary Stream Key field.



Paste the value into the Stream Key Field in the Network Stream Settings in Prime.

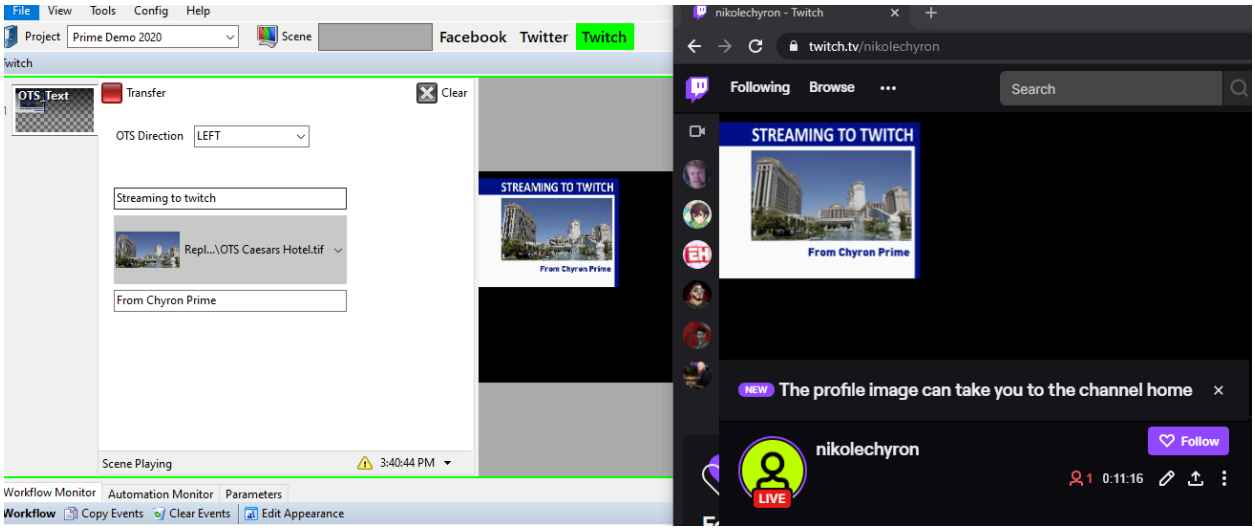
Select OK. A dialogue prompt will appear stating “Prime needs to be restarted for the new settings to be applied”. Restart Prime.

The Network stream Output will be available in Prime Playout with the name assigned to the configured output in the Playout Configuration settings.



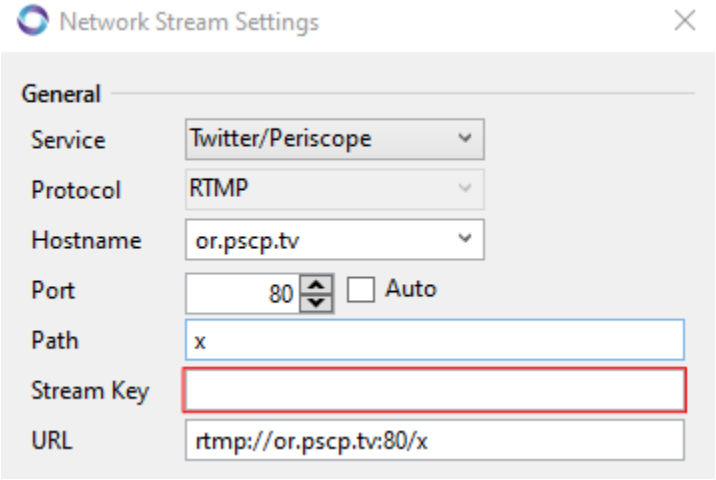
Turn on/off visibility of the Network stream output via the View menu.

Return to Twitch and select the Profile icon at the top right of the page. Select channel from the dropdown menu. twitch.tv/ACCOUNTNAME page is loaded and stream should be Live. Any Prime graphics played to the Twitch Network stream Output will be streamed to the configured Twitch account.



Twitter/Periscope

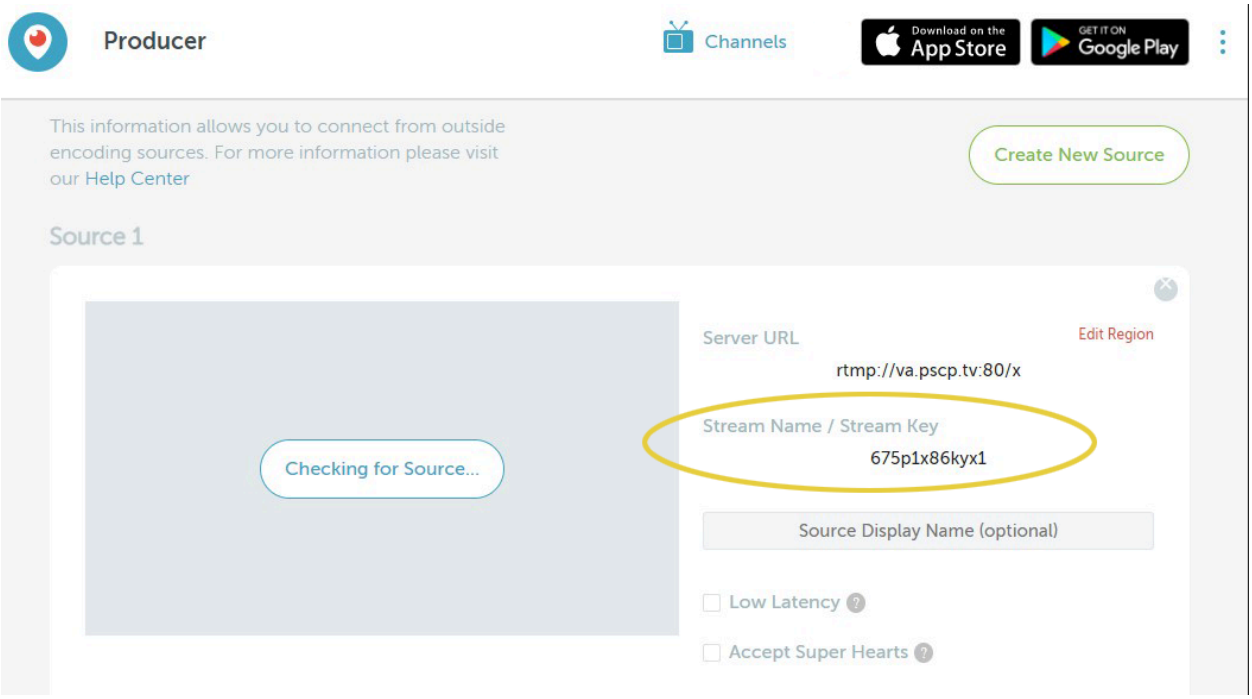
When Twitter/Periscope is selected in the Service dropdown, Prime will dynamically populate fields with recommended settings; RTMP Protocol, Port 80 (if auto is checked) and URL to rtmp://or.pcsp.tv:1935/x



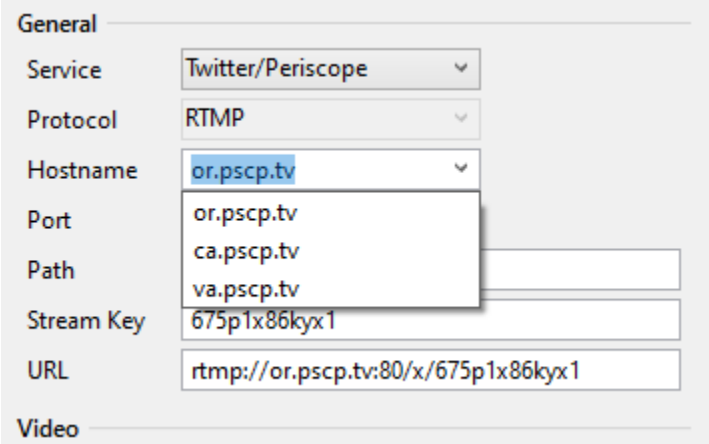
The Steam Key field will appear with a red box highlight to indicate that no Stream Key is blank.

Login to Periscope in a web browser. Click the account icon between Channels and the Add on App store at the top right. Select the Producer button. The Producer page will open. Select create new source.

Copy the Stream Key from Periscope/Twitter to the Steam Key field in Prime.

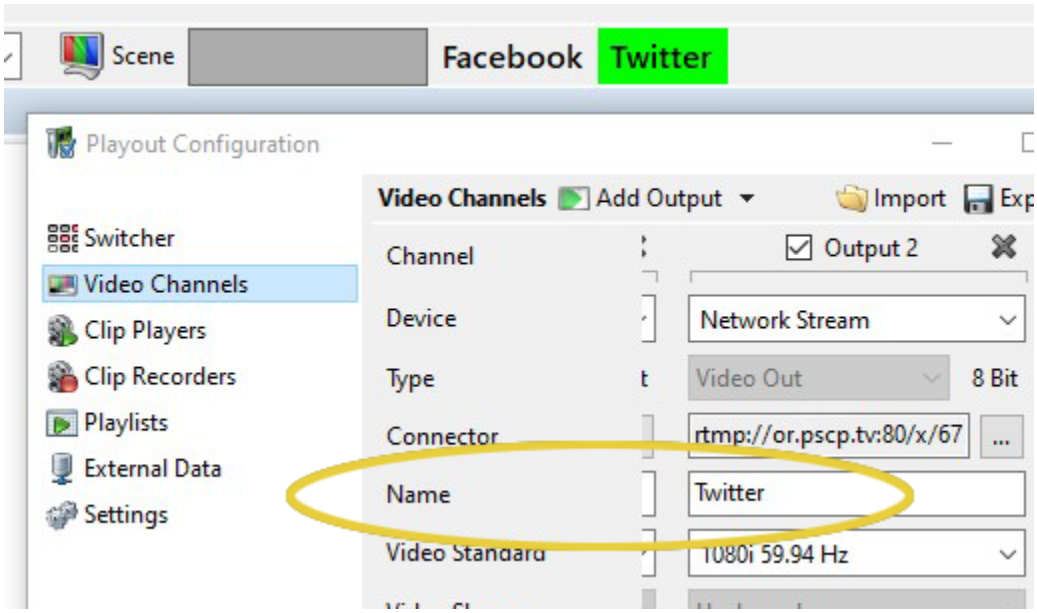


Select the hostname region closest to your streaming location from the dropdown. *VA Virginia, OR Oregon and CA California.* The URL field will dynamically update to match the region selected.



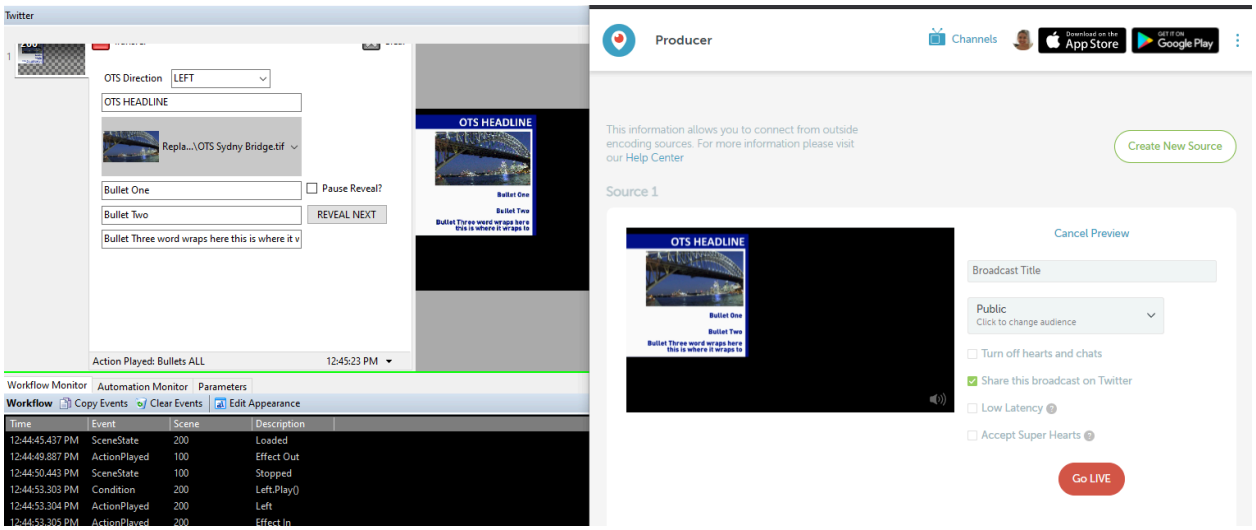
Select OK. A dialogue prompt will appear stating “Prime needs to be restarted for the new settings to be applied”. Restart Prime.

The Network stream Output will be available in Prime Playout with the name assigned to the configured output in the Playout Configuration settings.

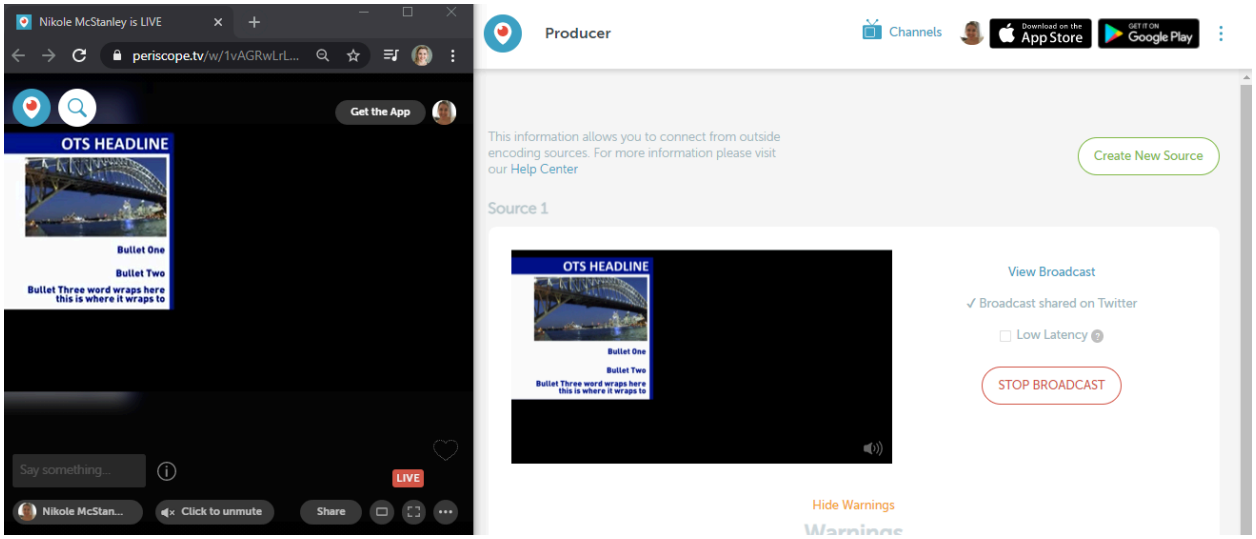


Turn on/off visibility of the Network stream output via the View menu.

When you wish the Twitter/Periscope Live Network stream output in Prime to begin streaming to Periscope, select the “Go Live” button.

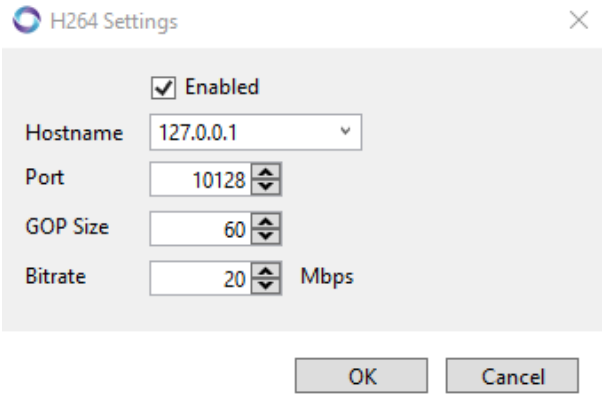


Once “Go Live” has been selected, any Prime graphics played to the Twitter/Periscope Live Network stream Output will be streamed to the configured Periscope account.



H.264 Previews

A PRIME output can simultaneously stream H.264 in addition to its configured device type (SDI, GPU, NDI etc...). All output types, including Preview channels, support H.264 streams with the exception of Remote Engines and Sub Channels. When H.264 is configured, both the primary output type and the H.264 stream will render PRIME scenes.



NDI considerations

NDI® is a registered trademark of Vizrt NDI AB
https://ndi.video/

NDI operates most efficiently in a dedicated network with high bandwidth and high availability. This is in contrast to unmanaged environments such as the public Internet or networks where video rides along with data without priority. While a single stream of HD video can possibly be delivered on a Fast Ethernet (100 Mbps) network, Gigabit (1000 Mbps) networks are essential in production workflows. A typical NDI stream consisting of 1080i HD video yields a data rate up to 100 Mbps per stream. This extremely efficient stream is designed to have very low latency

and allows multiple streams to be stacked together on a single Gigabit network. Even so, a production environment may require more capacity based on the type and quantity of simultaneous NDI video streams in a particular workflow. The following table is intended as a guide for calculating bandwidth needs based on video resolutions and frame rates. It should be noted, however, that NDI is not deterministic. Bandwidth needed for NDI video streams should be based on determination of the average utilization required4

Bandwidth Requirements. The approximate bandwidth required per NDI video stream for common video resolutions and frame rates.

Example NDI video stream	Approximate bandwidth required
1 x UHDp60 video stream	250 Mbps
1 x UHDp30 video stream	200 Mbps
1 x 1080p60 video stream	125 Mbps
1 x 1080i60 video stream	100 Mbps
1 x 720p60 video stream	90 Mbps
1 x SD video stream	20 Mbps

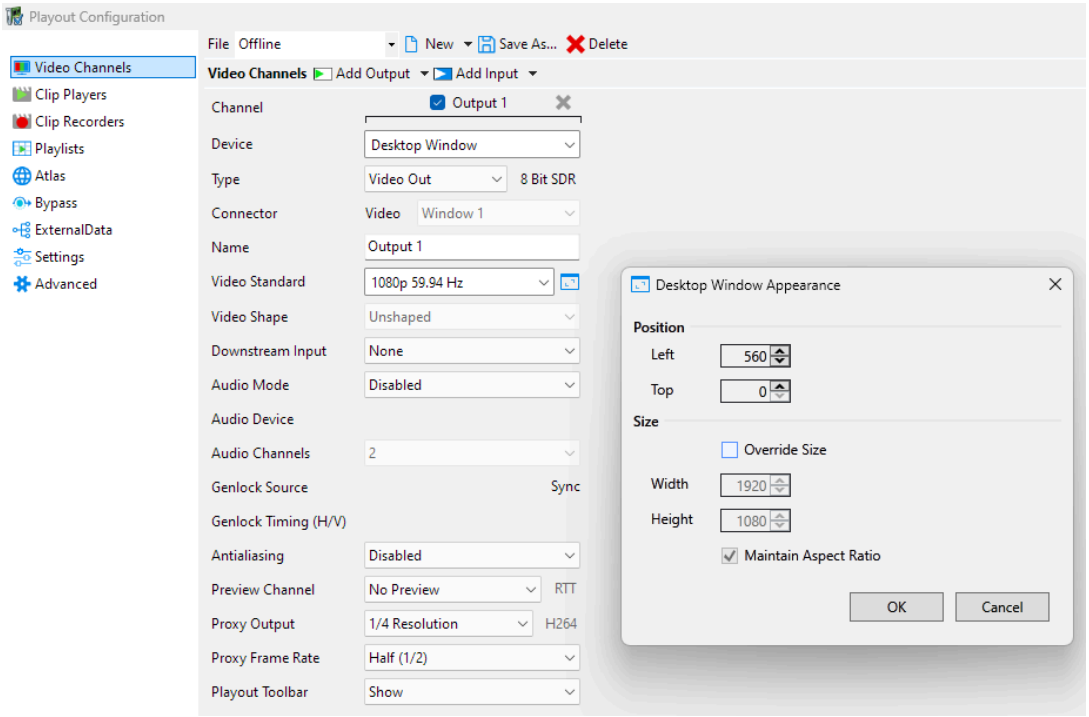
Starting in PRIME 4.10, Prime's NDI integration now supports 10-bit HDR using the HLG transfer function defined in Rec. 2100 as adopted for broadcast television workflows. Prime customers must be licensed in order to use this feature. The PQ transfer function is not supported in Prime 4.10, nor is NDI-based Genlock.

*Please contact your Chyron sales representative for NDI (SDR and HLG based HDR) licensing information.

Desktop Window Output | Override Window Appearance

Exclusive to Desktop Window Outputs, selecting the blue Override Window Appearance button next to Video Standard, users can customize their desktop window experience by overriding the position and size.

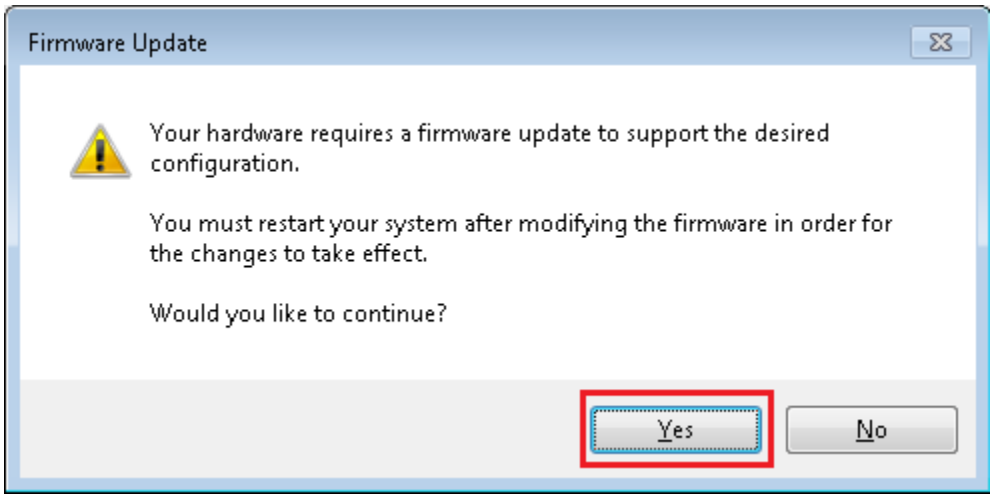
Default **Position:** Left = 560, Top = 0
Default **Size** (Resolution)**:** Defaults to selected or customized Video Standard resolution

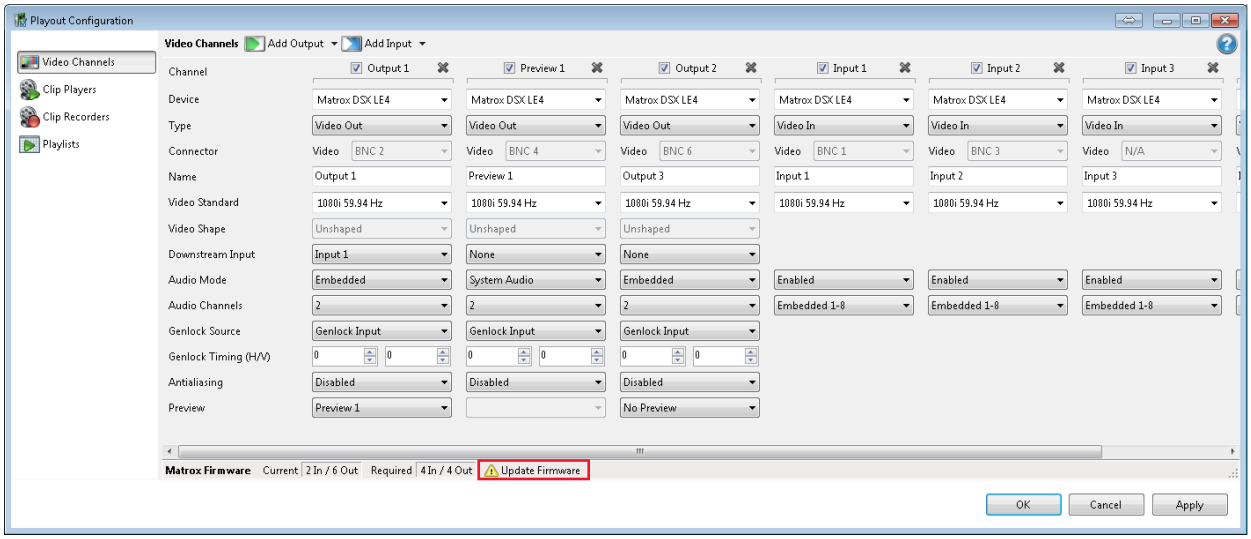


Example: x4 Desktop Window Outputs, each with a customized Override Window Appearance

Flashing the Matrox Board

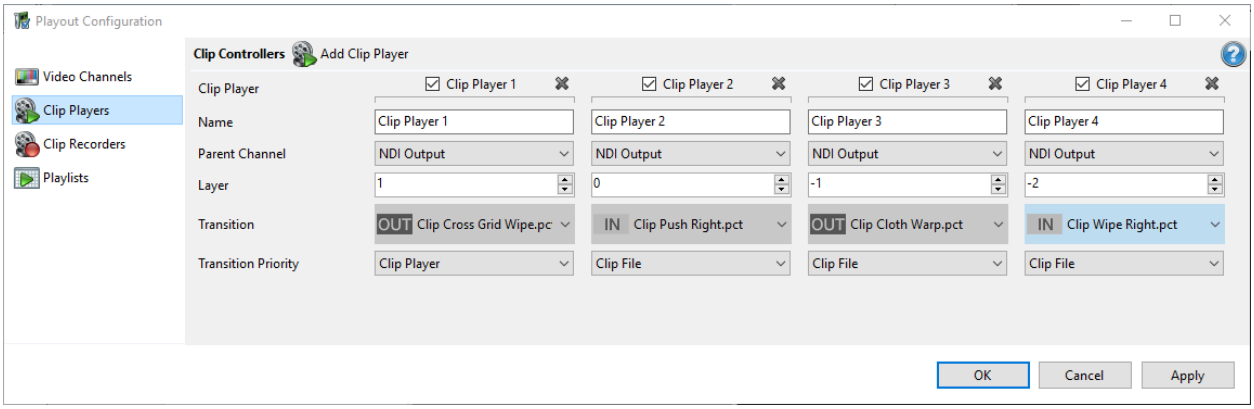
When you change the channel configuration that doesn't match the current board configuration you will be prompted the following:





Clip Players

Configures the number available clip players for the system. Clip Players can play clip scene files directly to a Layer on an output channel. Click the Add Clip Player toolbar button to add new clip players.

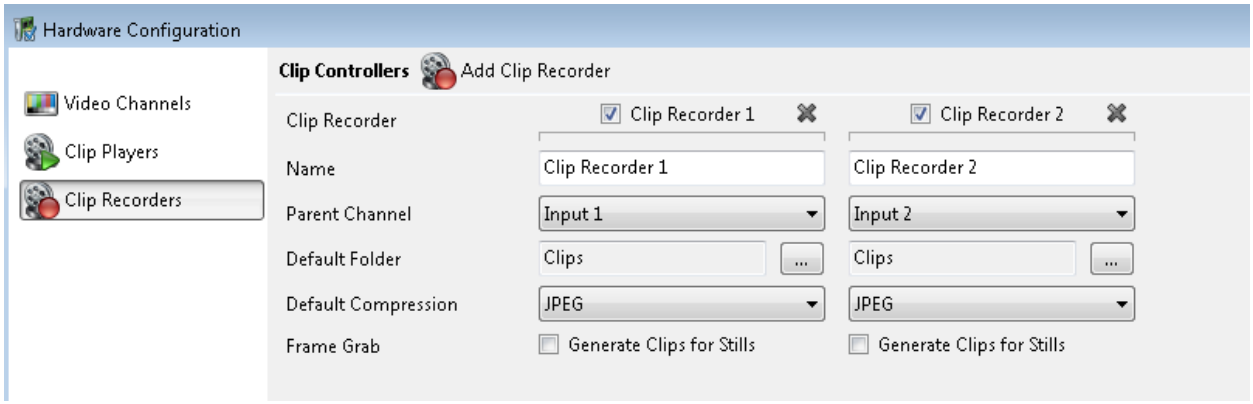


Clip Player Properties

- **Name -** Assign a user-friendly name to identify the Clip Player throughout the application
- **Parent Channel -** Select a channel from the list. The list will be populated from the configure **output** channels in the “Video channels” section.
- **Layer -** Assign a layer number for which this clip player will use in the output channel. The higher the number the more forward in the order it will play. You can assign negative or positive numbers. If you assign -5 it will likely be a background clip in that channel unless another clip player or graphic scene has a higher negative value.
- **Transition –** Select a file based transition. File based transitions can be created using the Scene Designer. See the Main PRIME User Guide.
- **Transition Priority –** Allows you to select which clip, incoming or outgoing, has the top most priority when transitioning between clips

Clip Recorders

Configures the number of available clip recorders on the system. Click the Add Clip Recorder toolbar button to add new clip recorders

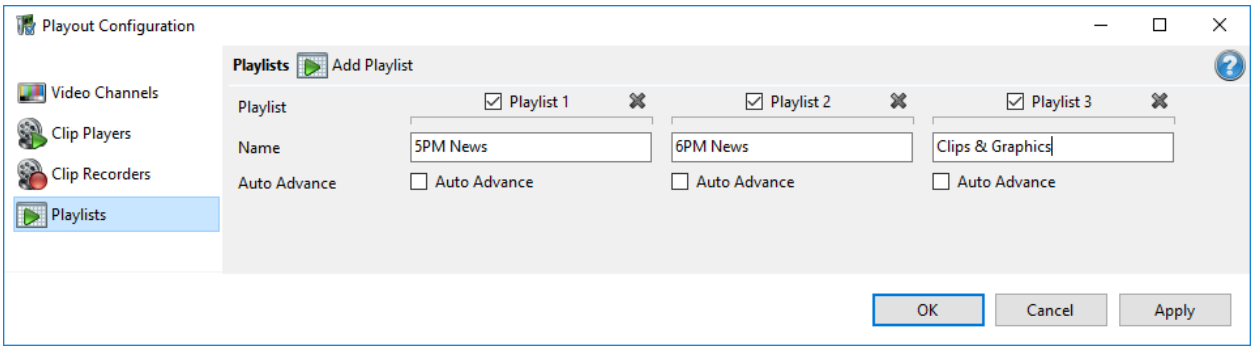


Clip Recorder Properties

- **Parent Channel** - Select a channel from the list. The list will be populated from the configure input channels in the “Video channels” section.
- **Name** - Assign a user-friendly name to identify the Clip Player throughout the application
- **Default Folder –** Sets the default folder to which recorded clips will be saved
- **Default Compression –** Sets the default compression of recorded clips: None (uncompressed), JPEG (better for footage), LZO (better for graphics)
- **Frame Grab –** If set, causes clip player meta data files to be generated when frame grabs are captured

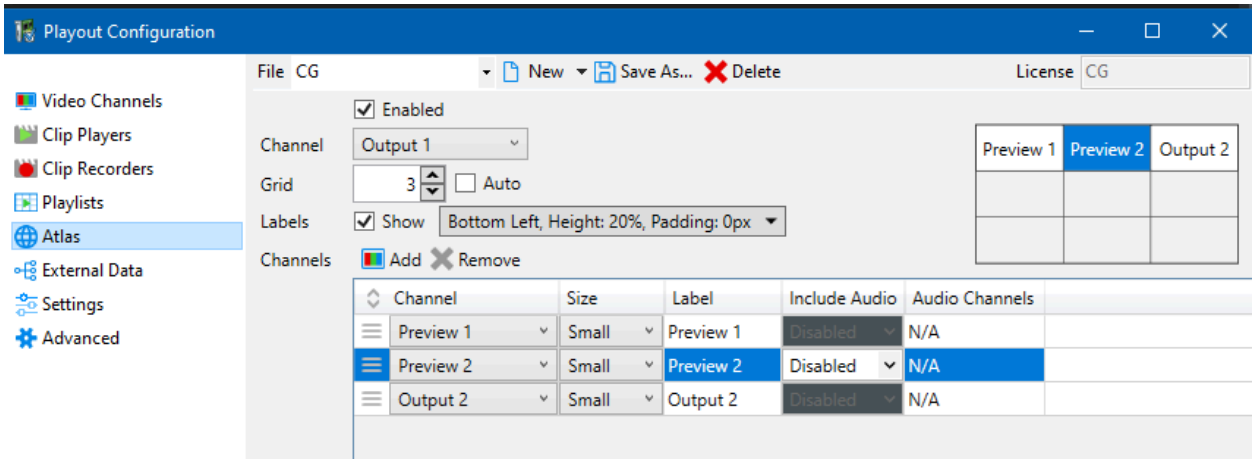
PLAYLISTS

Configures the number of playlist windows to create on startup. Use the Add Playlist button to add new playlist windows.



- **Name** - Assign a user-friendly name to identify the Playlist throughout the application
- **Auto Advance –** Auto advance mode will automatically cue the next item in the playlist

ATLAS

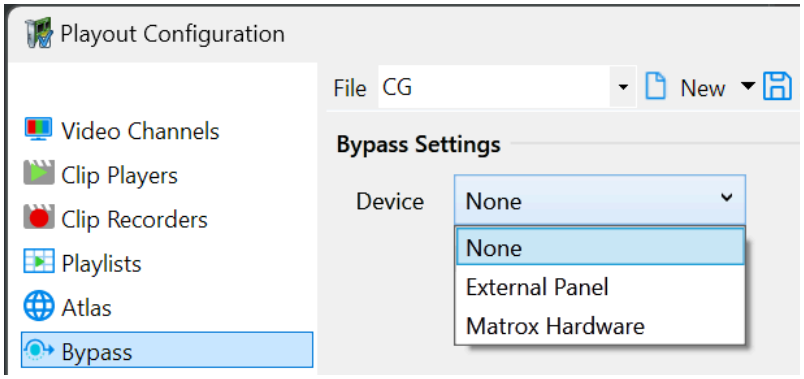


Users can define an H264 output stream for all the available outputs. This will stream to a web browser or third party application as a MultiViewer

Bypass

As referenced in the PRIME User Guide, systems with a compatible Matrox DSXLE4 card can switch between Bypass and In Circuit directly in PRIME Playout.

Compatible Matrox DSX LE4 cards for PRIME Bypass:
DSX LE4 FH / X2
DSX LE4 FH / 4
DSX LE4 FH / 8



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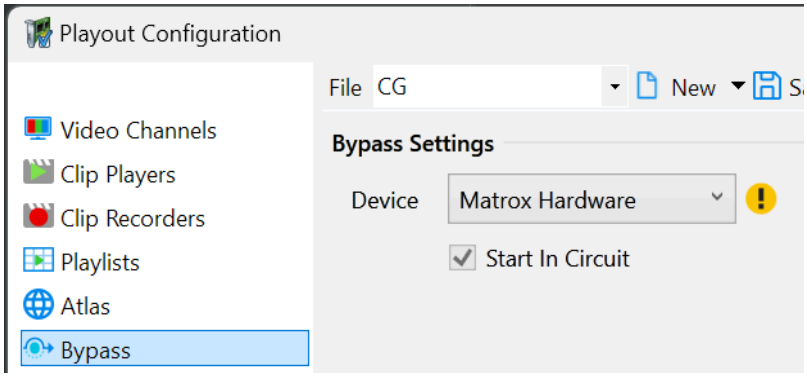


Bypass Settings

PRIME Playout > Config > Playout Configuration > Bypass

- Device
  - **None** (Disables PRIME Bypass functionality only.
  - **External Panel** (select for external bypass panel operation)
    - When selected, the external bypass panel is in control of bypass
  - **Matrox Hardware** (select for PRIME software bypass operation)

- Start in Circuit (Matrox Hardware Device Only)
  - When checked - PRIME will startup In Circuit

***Known Limitation with Matrox Hardware Device -** Start In Circuit will always be checked and grayed out. You cannot uncheck this. PRIME can not startup in Bypass when using Matrox Hardware Device. User will need to start PRIME first and then select Go In Bypass.

For new settings (Brand new system) - Device will default to None

If coming from previous settings, Bypass Device setting will use External Bypass Device (even if the Supported Matrox card is present or the physical External Bypass panel is absent) similar to how it is in 4.8.

Bypass Not Available Scenarios
When PRIME Bypass is not available, the menu will display Not Available.
Not available indicates that either None, an incompatible Matrox card, or External Panel has been selected within the Bypass Playout Configuration. If External Panel is selected and you still receive Not Available, either it is not connected or has thrown an error.

Bypass Yellow Exclamation Mark - Bypass is Not Available for the selected device

Device Yellow Excalamation Mark explanation:
Matrox Hardware
Not Available.
Bypass is only supported on the following Full Height Matrox Boards:
DSXLE4/4
DSXLE4/8
DSXLE4/X2

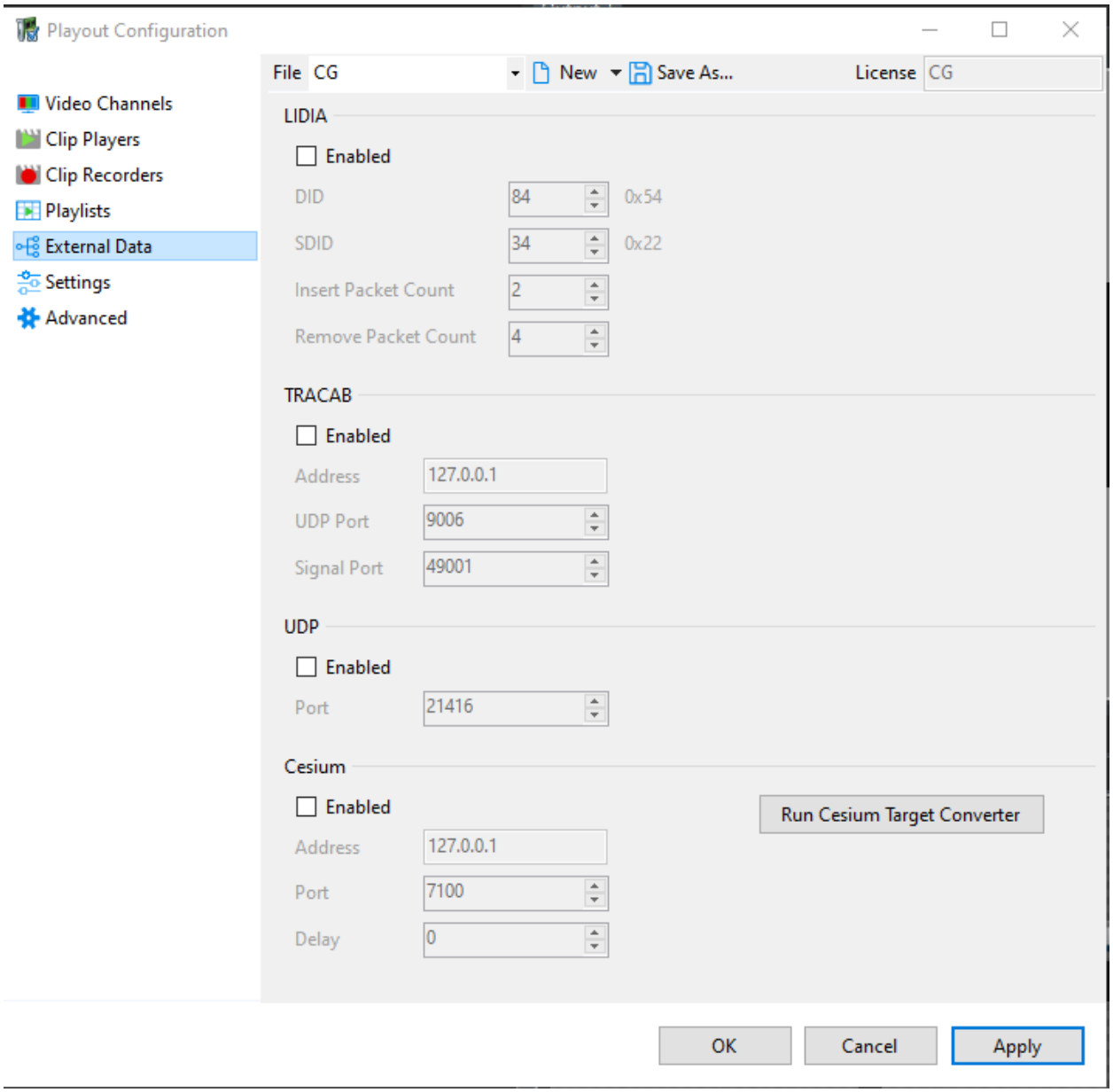
Supported board not detected on this system.

External Panel
Not Available.
Unspecified Bypass Panel error reported. Check if Bypass Panel is connected.

When a compatible Matrox card is detected and Device is set to Matrox Hardware, Bypass will automatically be invoked if PRIME is closed, crashes, or power is lost to the physical system.

In order for Bypass to work as intended, Matrox card I/O topology must be configured to certain specifications. Please contact your Chyron support specialist for Matrox configuration guidelines based on your DSX LE4 card and your desired setup.

External Data

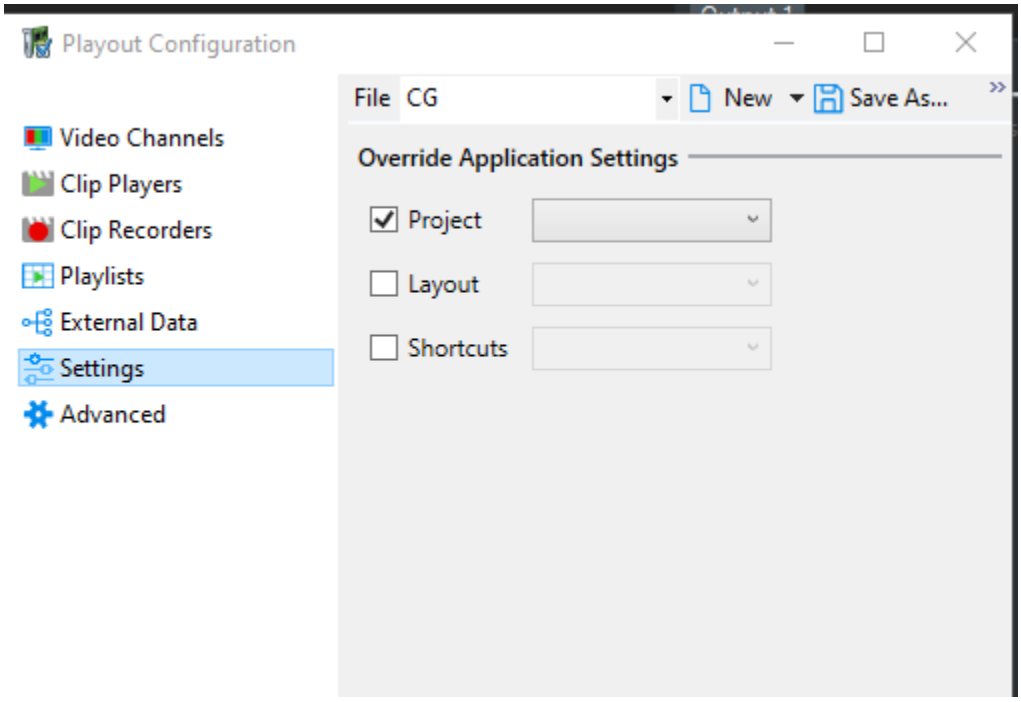


- LIDIA: Refer to the separate **PRIME Lidia.pdf** file in the documents folder
- TRACAB: Allows Chyron TracAb data to stream directly into PRIME's render engine
    - **Address:** The IP Address of the Tracab system broadcasting the data.
    - **UDP Port:** The main Tracab transmission data port
    - **Signal Port:** Port to receive addition event data
- UDP: Allows external parameter data to stream directly into PRIME's render engine

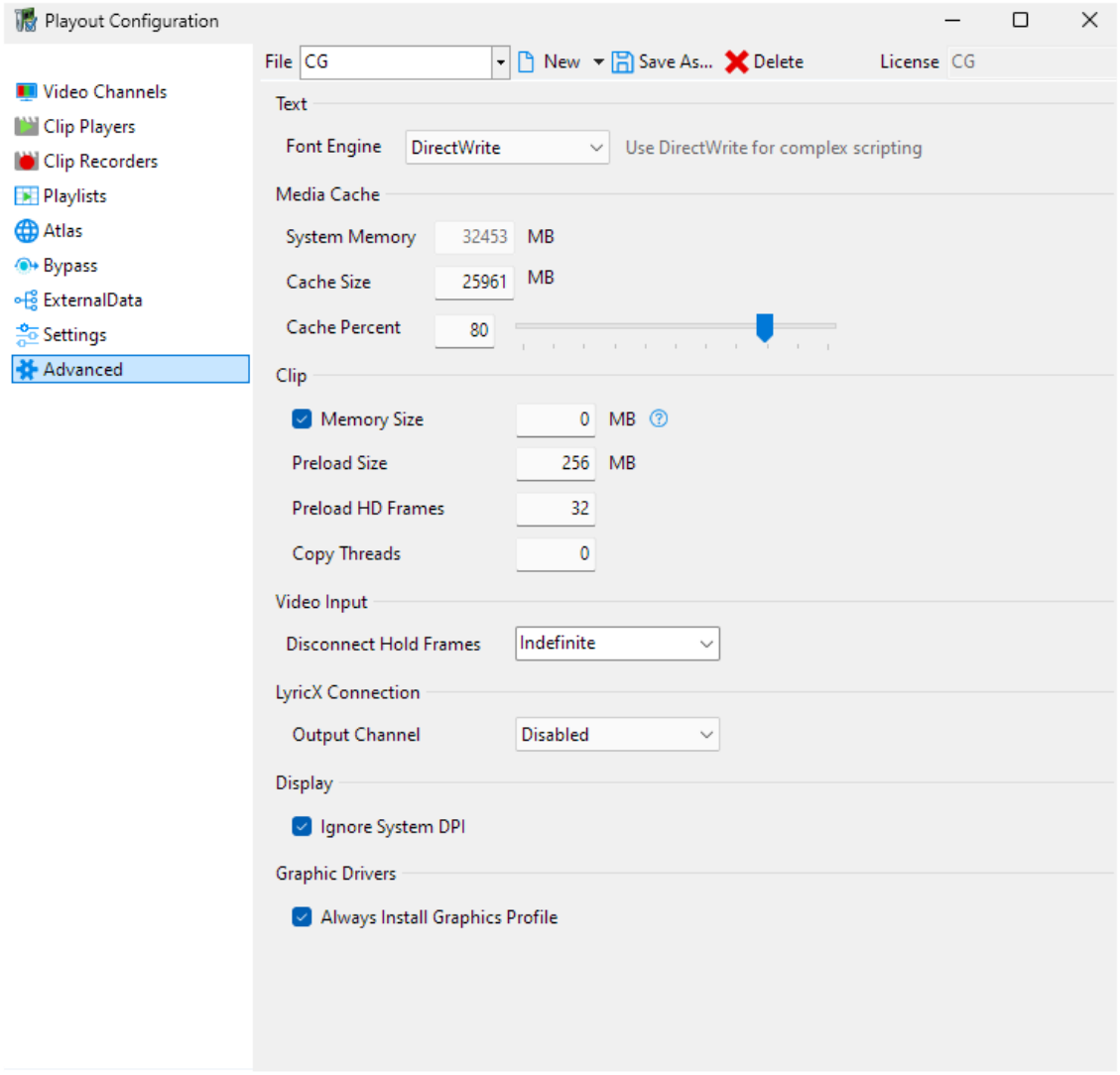
- Cesium: Allows Pan, Tilt and Zoom (PTZ) data from the Chyron Cesium application. This enables PRIME Augmented Reality

SETTINGS

The settings dialog allows users to overwrite the default PRIME startup settings. Users can start up with a defined Project, Layout and or shortcuts file.



ADVANCED



Text

Font Engine – Switches between GDI & DirectWrite

Media Cache

System Memory – Read only indicator of available System RAM

Cache Size – Set a defined size for PRIME to cache scene elements.

Cache Percent - Assign a percentage of System Memory.

Clip

Memory Size - This can be adjusted to enhance clip performance playback. Suggested memory size: HD=1024 MB, 4K=4096 MB, 0 = Automatic (Legacy)

Preload Size* - Assign how much read ahead to load clips.

Preload HD Frames* - Assign a user-friendly name to identify the Playlist throughout the application

Clip Preload settings work in tandem.

Copy Threads - Increase this setting for additional CPU Threads to improve clip codec playback performance. For example, if your PRIME graphics use a lot of ProRes clips, increasing the number of CPU threads the system uses for clip processing helps improve clip playback performance.

***Please Note:** The higher this value, the more impact it will have on overall PRIME and system performance. This can impact realtime output and input channel performance.

Default Value = 0
Max Threads = 64

Video Input

Disconnect Hold Frames: If an interruption occurs with the video input source, the video texture will display the last valid frame received for this many frames before going to black

LyricX Connection

Allows a LyricX output channel to be routed to a PRIME output. Refer to the PRIME Lyric Mode Configuration Guide for more information.

Output Channel: Specifies the PRIME output channel which will rendered LyricX.

Display

Ignore System DPI - only affects Desktop Window outputs

- If checked, will ignore the system display scaling for the window. For instance, a desktop window set to 1920x1080 on a monitor with 200% scaling would remain at 1920x1080.

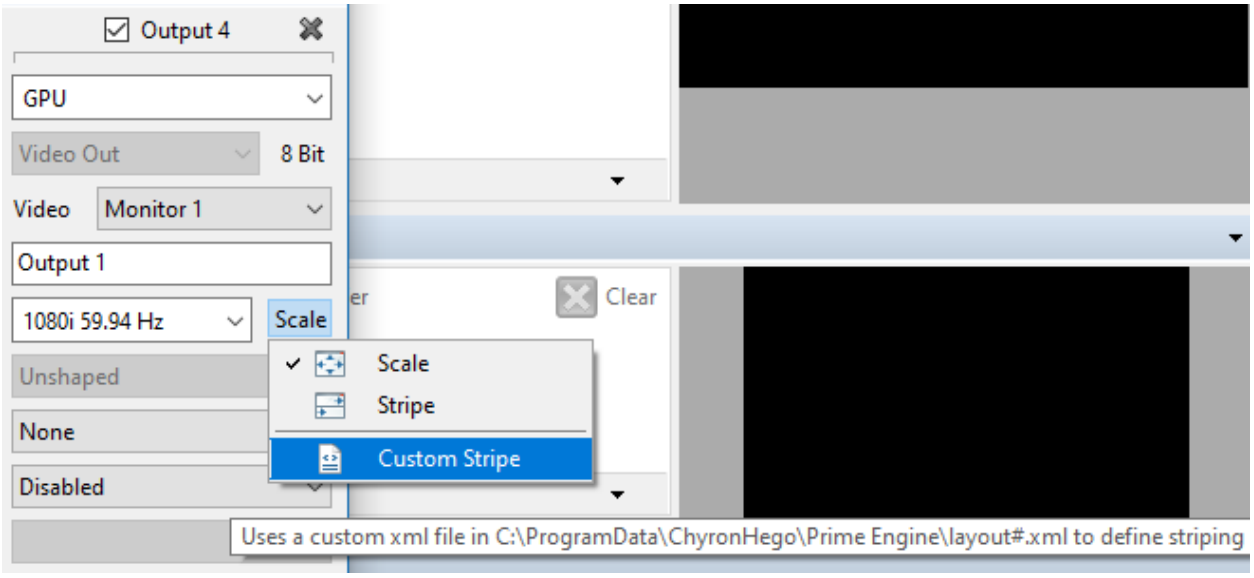
- If unchecked, system display scaling will apply to the window. For instance, a desktop window set to 1920x1080 on a monitor with 200% scaling would be scaled up to 3840x2160.

Graphic Drivers

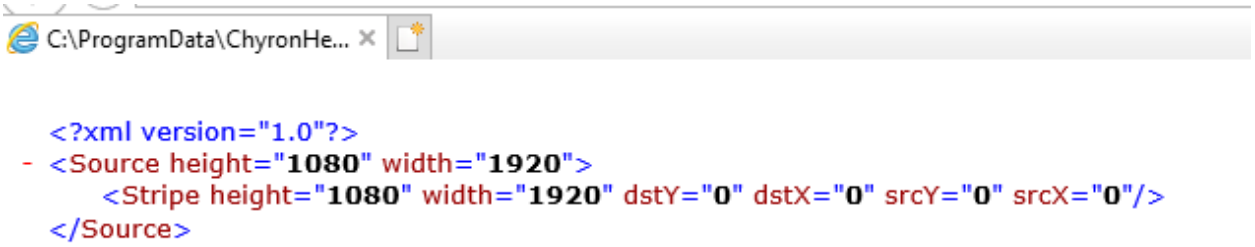
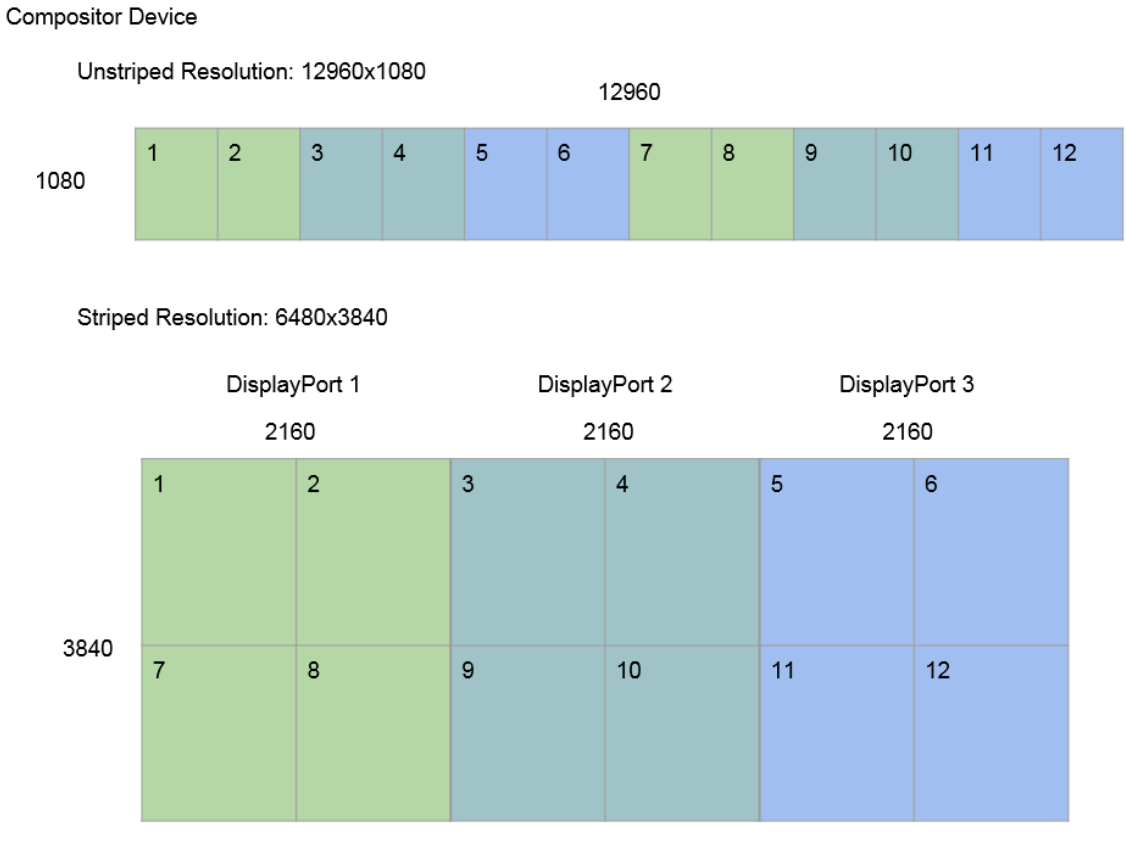
Always Install Graphics Profile - Prime Engine requires a specific graphics profile (low level driver settings) to run properly. When Prime Engine is installed the profile is installed however updating graphics drivers overwrites this profile. This setting installs the necessary profile on startup for PRIME to run properly.

GPU Striping/Scale

Press the “Scale” button to choose the options



- Scale: This will scale the PRIME output to the specified output of the target monitor.
- Stripe: This will truncate the video by dividing the video into sections to fit the monitor resolution.
- Custom: Modify the file “C:\Program Data\ChyronHego\Prime Engine\Layout.xml” to define the striping.



Compositor Device for Striping