Legion EC User Guide

Guide v1.1.2

Revised 5/20/2023

Table of contents

Minimum System Requirements

In today's world many people take playing videos on their computer for granted, thinking any computer should be able to do it easily. Well, this may be true for things like streaming Netflix or watching a YouTube video. Those streams are highly compressed and have very small bitstreams (avg. 3.5 MB/s) so yes most general-purpose PC's can handle that easily. However, we are working with files directly from the content producer. These files not only have minimal compression, but they are also presented at much greater resolution and color depth. This can result in bitstreams that measure in the hundreds of megabits, or for the very large, over a gig!

Keep in mind that single PCI bus lane on most laptops are PCIe 3.0 which can only handle 985 MB/s and they must also accommodate, at the same time, many other data packets not just the ones coming from our video.

Modern systems typically have at least 16 lanes but the number of lanes available on the chipset and CPU can vary greatly and bottleneck's can and do form. When they do our video stream can end up being stalled and/or data packets lost. This results in glitchy playback at best and not being able to maintain correct framerate at worst.

So, establishing what is a suitable minimum component standard can be difficult. We of course recommend using full desktop units with high quality components that are optimized by their manufacture for performance. But we also know that most of you want the convenience of a laptop. Well, the thing about laptops are they are primarily designed for efficiency and minimal power usage. Plus, there is no real standardization. You could have two systems, from two different manufacturers, both advertising the exact same internal components, but potentially exhibit much different performance levels.

Other than bitstream sizes there are several other stresses the system undergoes. Such as very large storage requirements and large memory usage when more and more files are pre-buffered for instant access and playback.

Let's not also forget the considerable changes the operating system goes through any time a program is installed sometimes having to make configuration changes to its own subsystems. These changes can have unforeseen consequences for us down the road.

With all that said, we cannot give any sort of guarantee as to will work best for your situation but we can at least give you a starting point to work from.

CPU:
Intel i7 8th Generation or greater (10 Core or greater i9 or Gen 10 thru 12 preferred.)
AMD Radeon HD 3000 or greater.

Hard Drive:
500Gb or greater (1Tb M.2 type design preferred.)

Memory:
Minium 16Gb but 32Gb or greater is preferred.

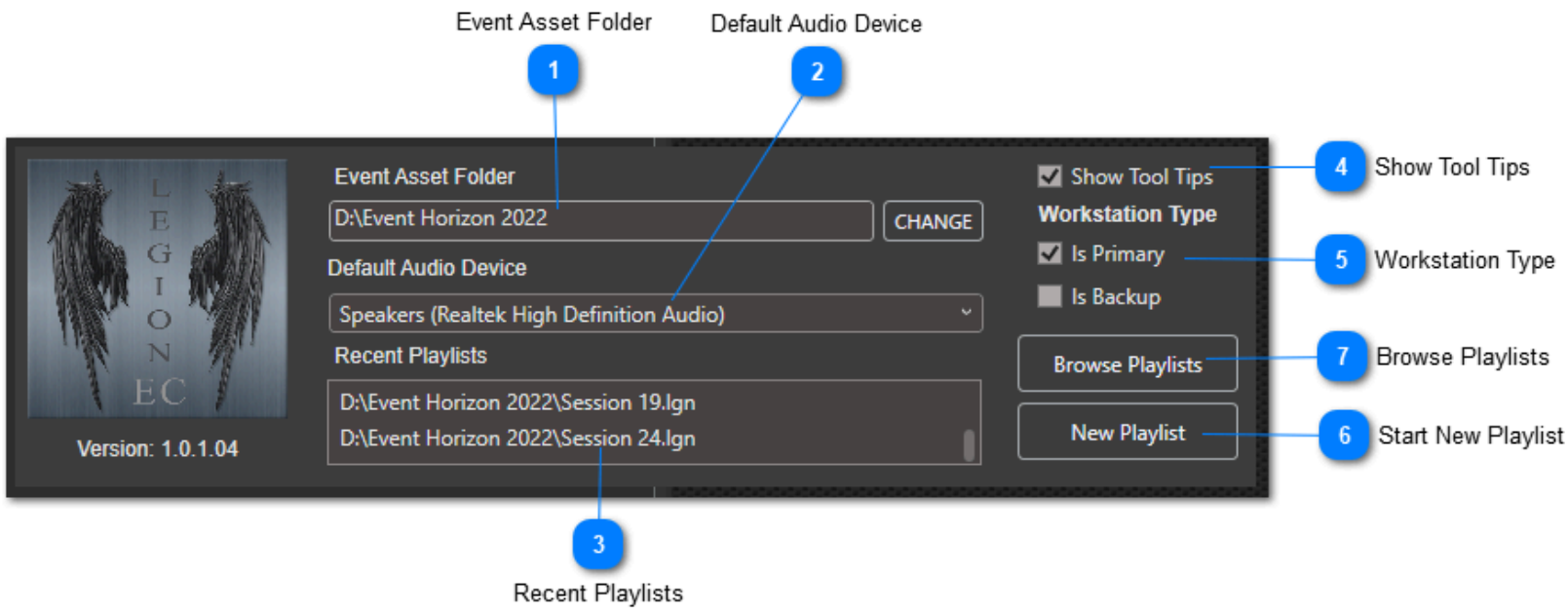
Must have dedicated GPU (not just an integrated CPU one):
Nvidia GTX 1080 based GPU or greater (Quadro preferred.)
AMD Radeon HD 3000 or greater (Pro versions preferred.)

OS:
Windows 10 Pro build 20H1 or greater or Win 10 LTSC build 1809 or greater.

As noted above there are way too many variables associated with the playing of high-resolution video material. However, we can say that you can never have enough computing power. So please consider that when working in the very demanding and competitive world of event productions, performance and reliability should greatly outweigh any sort of budgetary concerns.

Launch Control

When the program is started, the ‘Launch Control’ panel is modeled above the main application window.



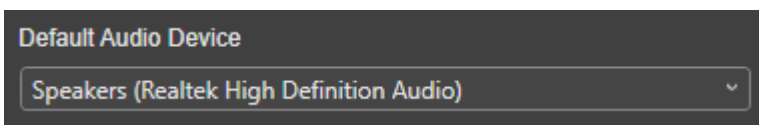
---

1 Event Asset Folder

Establishing the event asset folder is mandatory. To make transferring event files to other storage mediums or computers easier, all assets will be automatically copied into this folder even when resourcing files from other drives and/or folders.

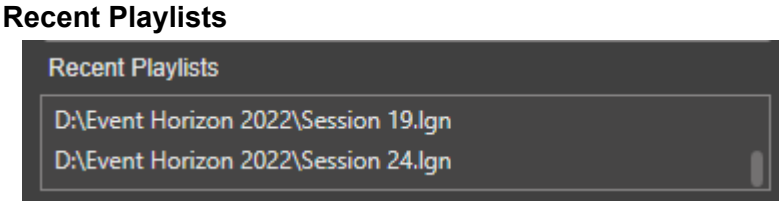
NOTE: Files are copied leaving the original file intact at its source. To prevent excessive use of available drive space on your system it is recommended that you manually add needed event assets directly to the event folder and prevent the system from needing to create wasteful copies.

2 Default Audio Device



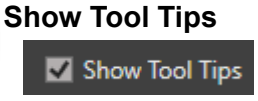
Every new asset added needs to know what audio output to use. In most cases you will probably use the same one. This where you can choose which will be that go-to default. This does not need to be the same one setup in Windows as its default. Although, if this is the first time using Legion or if a previously assigned output no longer exists, the app will automatically revert to the Windows default.

3 Recent Playlists



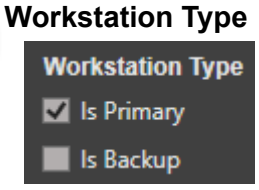
This list displays all playlists currently saved in the event asset folder. Double click an item to reload that file.

4 Show Tool Tips



When enabled each individual control will produce a helpful popup describing its purpose. Due to it sometimes interfering with mouse clicks, it is recommended that this feature be disabled once you feel comfortable with all aspects of the program.

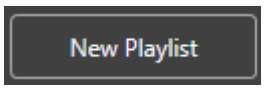
5 Workstation Type



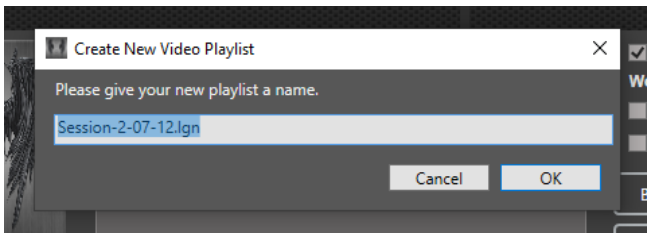
One of the program’s key features is its ability to easily connect to another workstation and use it as a backup that will mimic the primary. If you wish to setup for this scenario select the appropriate role for each of the two workstations

NOTE: As long as the link between the two are enabled all transport commands and edits performed on the primary will instantly occur on the backup as well. Also, if an asset file is added to the primary playlist but does not exist on the backup, a copy of the file will automatically be transferred to the backup for you.

6 Start New Playlist



Click this to create a new playlist.



An input box will open. Simply type in a desired name and click ‘OK’.

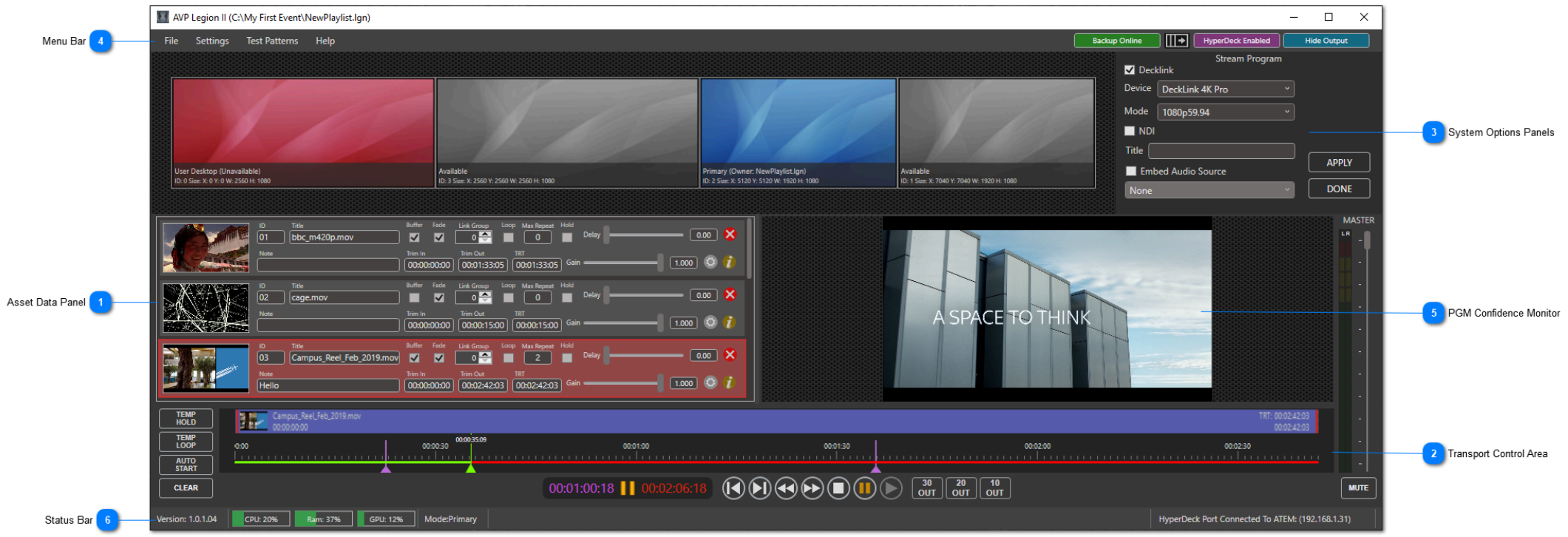
NOTE: Once this is selected the Launch Control will automatically close.

7 **Browse Playlists**

As the name implies, this opens a file browser where you can find a particular playlist file to open.

NOTE: Once a file is selected the Launch Control will automatically close.

Main Application Window



The primary interface is divided into four sections. Bellow are links that outline each in detail:

1 Asset Data Panel

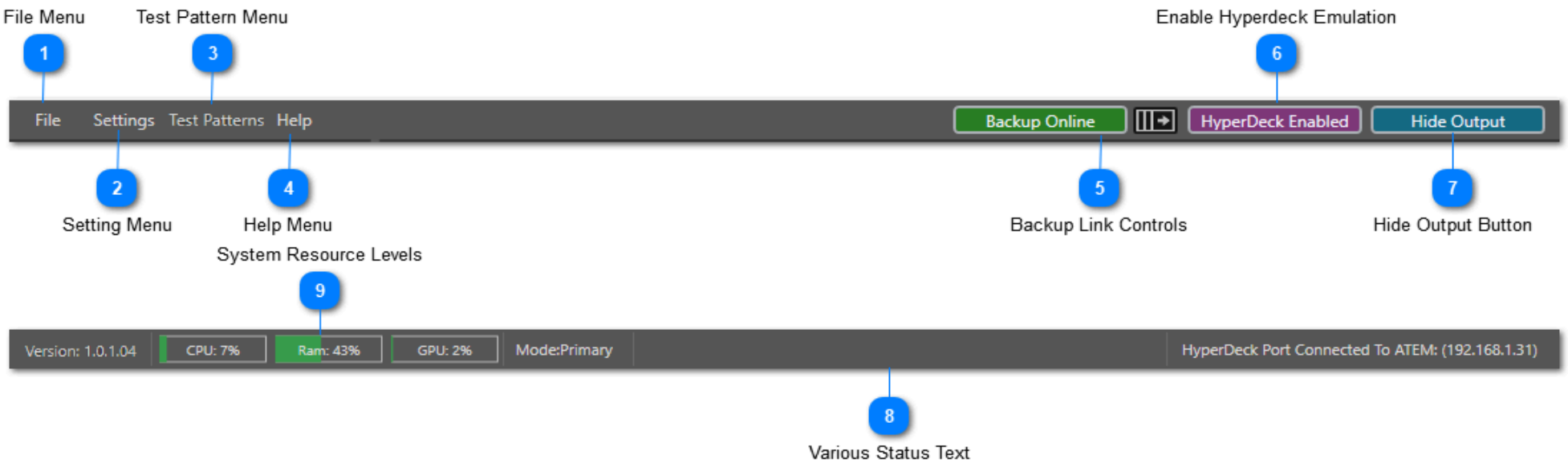
2 Transport Control Area

3 System Option Panels

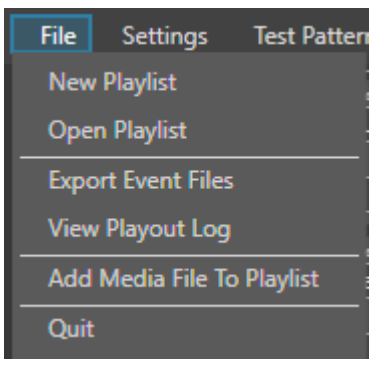
4 6 Menu & Status Bar

TIP: You can grab the slim vertical bar between the asset data panel and the confidence monitor with your mouse and drag it to resize those sections. These adjustments along with the overall size of the window are saved and will be recalled each time the app is started.

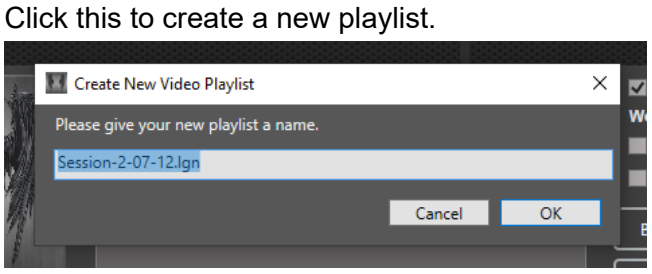
Menu & Status Bar



1 File Menu



New Playlist:
Click this to create a new playlist.



An input box will open. Simply type in a desired name and click ‘OK’. If there is already playlist open, this action will close it and load the new one.

Open Playlist:
Opens a file explorer allowing you to load an existing playlist file. If a playlist is aleady open, this action will replace it.

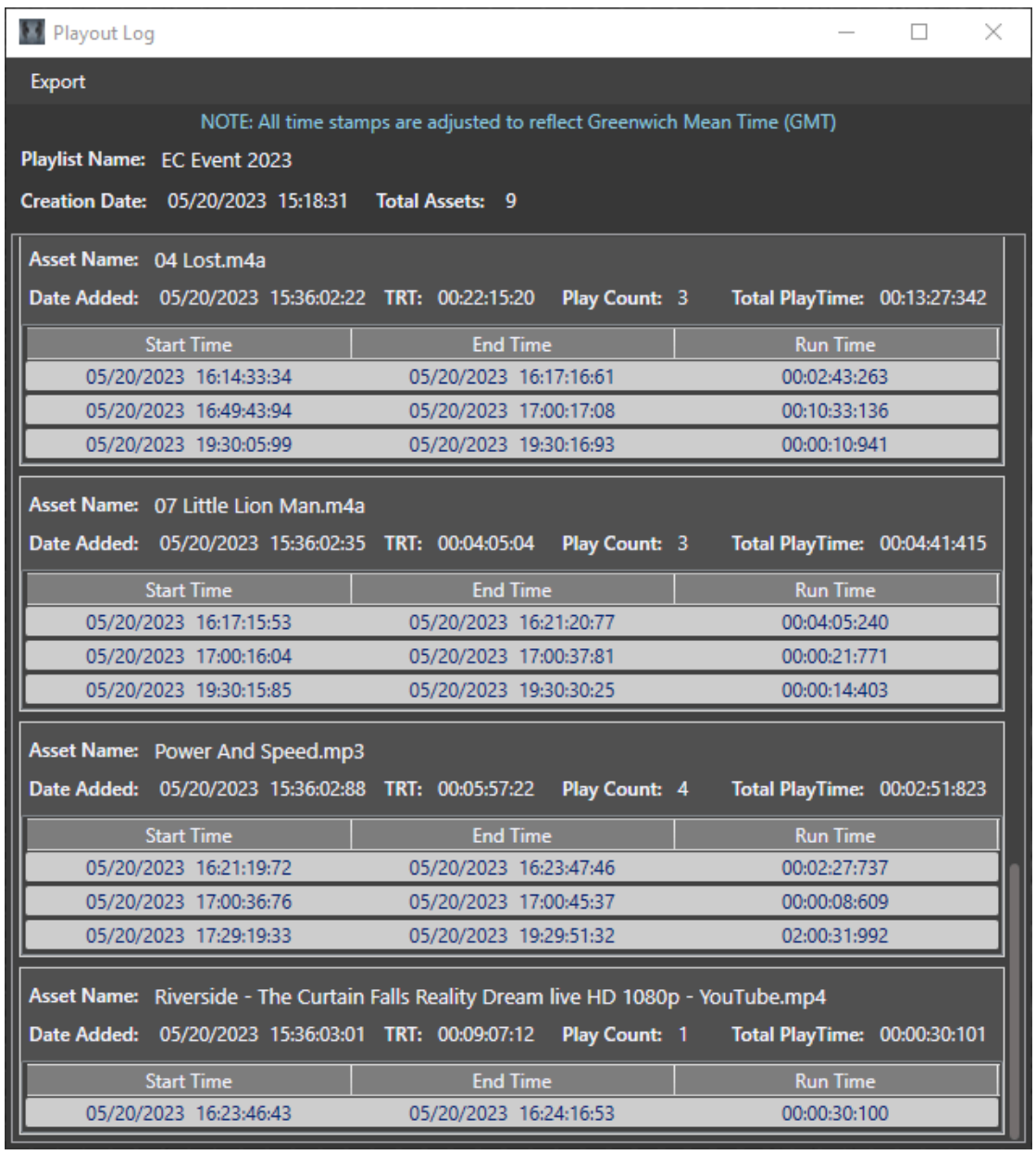
NOTE: You are free to save playlist files anywhere, but it is strongly recommended you keep them in the default event asset folder.

Export Event Files:
Utility to consolidate all current playlist asset files as well as the playlist itself and export them to a folder and drive of your choosing.

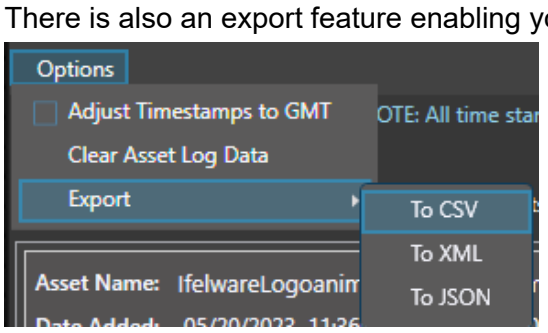
You can then take and copy the folder onto another computer and if equipped with Legion all you need to do is double click on the playlist file and an instance of Legion will launch automatically setting its default event folder path to this new path.

View Playout Log
If it is necessary to report asset usage to any rights-holding organizations, like ASCAP or BMI. Legion now can keep accurate date and time records of all playlist assets being shown.

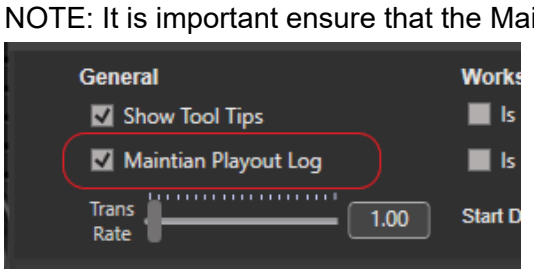
The data is easily viewed by simply clicking this menu item.



There is also an export feature enabling you to save the data to either a CSV, XML or JSON type file.



NOTE: It is important ensure that the Maintain Playout Log option located in global settings is checked.



Add Media File To Playlist:
Opens a file explorer allowing you to choose a desired asset file and add it to the playlist. You are free to make multiple selections and load at the same time.

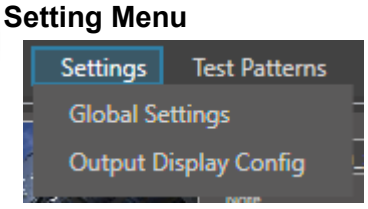
NOTE: It is important to remember that all assets belonging to any playlist must be kept in the event asset folder. This way all elements related to a playlist can be easily moved as one bundle and used on other computers without having to correct the file paths within the playlist.

By default, any file retrieved from other locations will automatically be copied and placed directly into the designated event folder.

To prevent excessive use of available drive space on your system it is recommended that you manually add all needed assets directly to the event folder and prevent the system from needing to create wasteful copies.

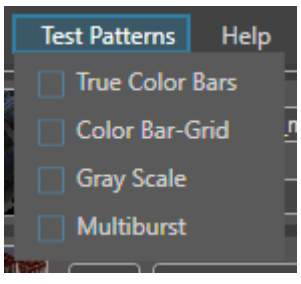
Quit:
Shuts down the entire program.

2 **Setting Menu**

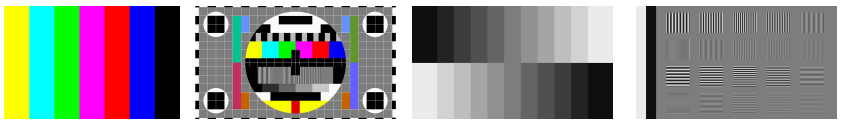


SEE:
Global Properties
Display Selection Panel

3 Test Pattern Menu



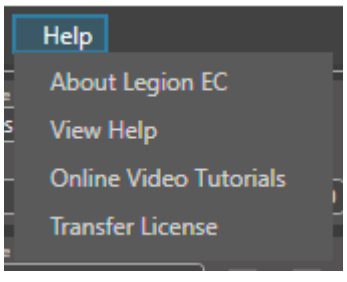
Test Patterns:



Here you can select to output a test pattern by selecting one from the sub menu. Simply click the same sub menu item to remove the test pattern.

NOTE: All test patterns will automatically remove itself anytime an asset is taken to program.

4 Help Menu



About Legion EC:
Should be self explanitory.

View Help:
Your allready here.

Online Video Tutorials:
Provides a link to the IEW Solutions Youtube channel.

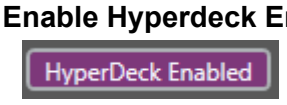
Transfer License:
This menu item only appears if an online activated type of license is currently being used. If a USB dongle is used this item will not appear.

Refer to: How to install or transfer an online license

5 Backup Link Controls

Refer to How To Setup Backup Workstation learn more.

6 Enable Hyperdeck Emulation



If currently connect to an ATEM or some other controller use the HyperDeck protocols to control AV-Playback, then you can toggle this button to enable or temporarily block external commands.

Refer to HyperDeck Emulation to learn more.

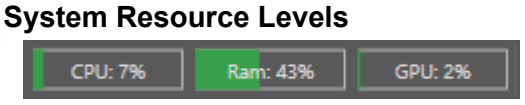
7 Hide Output Button

Use this to toggle whether the program output window is visible or not. When hidden, the physical output will show whatever image or color you have as set as your computer's display background.

8 Various Status Text

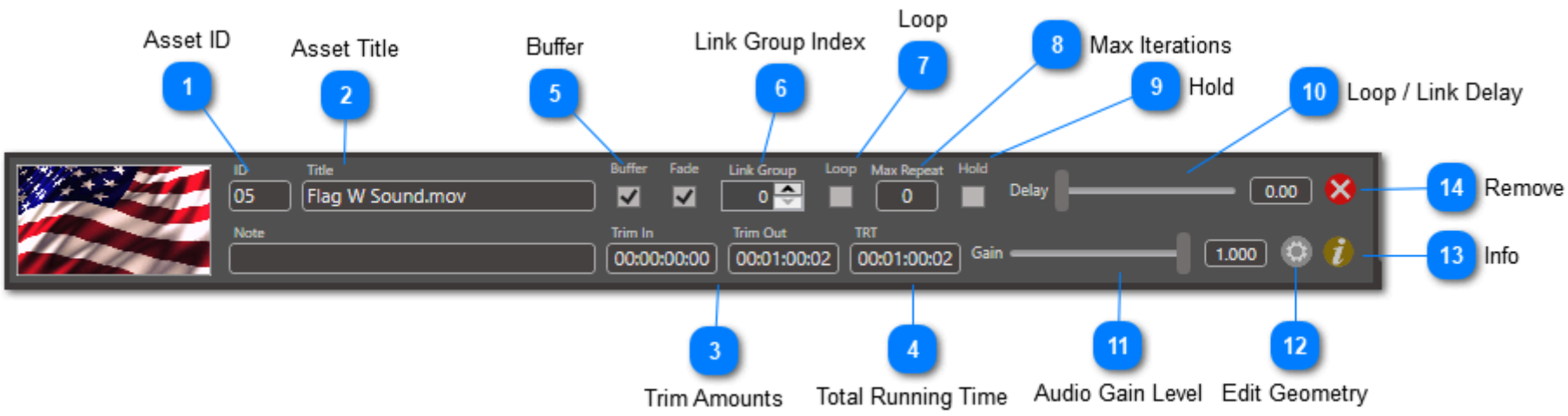
This zone displays status related to various running functions.

9 System Resource Levels

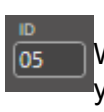


These gauges provide indication of just how much usage stress there is on your system's three most import components. Ample headroom for all three are critical in determining the quality and performance all playback assets. If any of these three components exceed 80 - 85% the gauge will turn red and status text will display a warning advising, you to try and disable buffering on as many playlist assets as you can.

Asset Data Panel



1 Asset ID

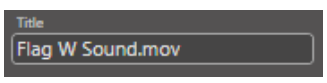


When an asset is added to the playlist a simple two-digit index number is assigned. Other than providing simple reference, it is also the characters you type when selecting an asset using a keyboard. It is also the code used in the writing of some external control commands.

The index number is just a default. You are free edit the ID to any alphanumeric combination you like by double clicking this field and typing in what you like. There are some rules though… You can only use letters A to Z and number 0 to 9. No special characters or punctuation marks allowed, and there must always be at least two or more characters. When using only numbers, any single digits most have a zero forward of it. It is also recommended that you limit it to no more than three characters. When done typing press the enter key.

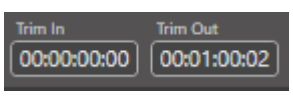
TIP: To perform a selection using a keyboard, simply type the same characters in the ID within 3 seconds. Once the last character is typed that clip will be selected and placed into preview. However, if you miss type a character you will need to wait a few seconds for the buffer to clear before trying again.

2 Asset Title



Displays the asset's title. By default, this is simply it's file name. However, you are free to edit the title by double clicking on the cell and then type in a title you prefer.

3 Trim Amounts

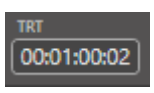


Trim In:
Displays the relative time that has been trimmed off the front of the file and the actual point in the file where play will begin.

Trim Out:
Display the time point within the file's overall duration that play will end.

Both will allow you to type in an exact time code point. *(Hours:Minutes:Seconds;Frames)*
When done hit the enter key.

4 Total Running Time



This read only text simply shows the total running time of either a video or audio file minus any trim in and out amounts.

5 Buffer

Use this checkbox to set whether the asset is open and loaded into memory or not.

NOTE: Before an asset can be played it must first be loaded into memory. If upon selecting an asset that hasn't already been buffered, the system will open and buffer it at that time. Be aware this process may take a few moments before the asset can be played.

On the flip side, you should also pay close to attention to how much of your system's memory is available. Do this to ensure that your computer's memory doesn't become to saturated and performance suffers.

6 Link Group Index

A link group is a set of assets that when linked to each other will play sequentially back-to-back. The index number is used to set multiple groups apart from one another.
To setup a group change this number to something other than zero and set the same number on all other assets you want to play as a group. It is not required you have all the assets in a group right next to each other in the list, but the sequence always flows from top to bottom, so consider that when determining an assets placement in the list.

You can also instruct a group to continually repeat its sequence by enabling the loop flag on the last item in the group. Now when the last asset completes, the first will begin playing again and the sequence will continue.

You can setup as many groups as you like, just be sure to use a different number to set them apart.

NOTE: Anytime an asset belonging to a group is playing you will not be able manually select any other asset.

7 Loop

Check to instruct the asset to continually repeat until either the stop button is pressed or if Max Repeat is set to a number greater than zero, it will automatically stop once that number of iterations has been reached.

When enabled, it is assumed you are expecting to perform a seamless loop. To ensure that any, in and out transitions as well as the hold flag will be disabled. However, If you wish to continue using transition effects in between iterations, you will need to first set the repeat delay to at least match the amount of transition time or greater. Once that is done you are free to re-engage the loop feature.

TIP: If you also set the max repeat, you can also go ahead and re-engage the hold feature. Now on the last iteration, the asset will hold at the out trim point instead of stopping.

8 Max Iterations

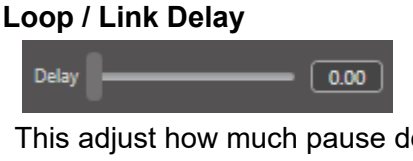
Set this to a number greater than zero if you wish to limit the total number of iterations that will occur when either a single file or a link group is set to loop.

TIP: If you are limiting a linked group, you set this value only on the last asset for that group. The same one that has its loop function enabled.

9 Hold

Check this to instruct the asset to pause and remain visible once play reaches the out trim point. To clear and allow the asset to transition out, simply press the stop button.

10 Loop / Link Delay



This adjust how much pause delay time should occur between loop iteration or transitions between linked group assets.

11 Audio Gain Level

Adjusts the asset output volume.

NOTE: When balancing output levels between other assets, this is the control you need to use for the adjustment to be saved. Do not use the app's master gain control for this purpose. Adjustments made there are only temporary.

12 Edit Geometry

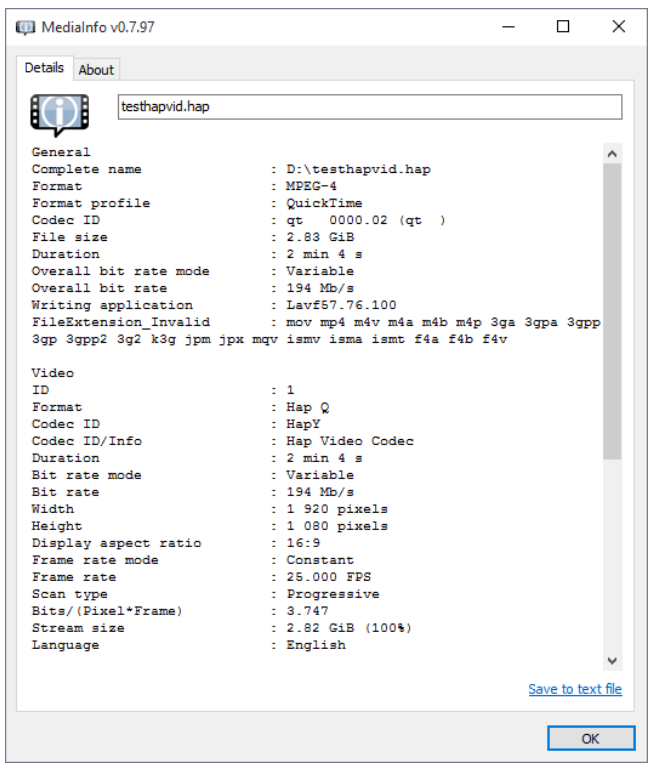
Normally this icon is gray but anytime the asset has edit focus the icon becomes blue. When an asset has edit focus its thumbnail image will appear in the preview monitor, and you are free to make property adjustments using controls found in the assets settings area.

By default, any asset selected to be placed in preview will automatically assume edit focus and will remain even after it is taken to program. Although, if a different asset is taken to preview while the previous one is still playing in program, the newly selected asset will assume edit focus.

Now if you want to give focus back to the one in program simply click anywhere on its thumb panel, but It is extremely important to remember that in order to safely select any other, including the one in preview, you must only click on this icon/button. Otherwise, if you inadvertently click anywhere else on the asset's thumb panel and it is the one currently in preview, you will end up deselecting it and removing it from the preview slot. Also, If you, do it to any other, then that asset will be taken to preview replacing the one that was already there.

13 Info

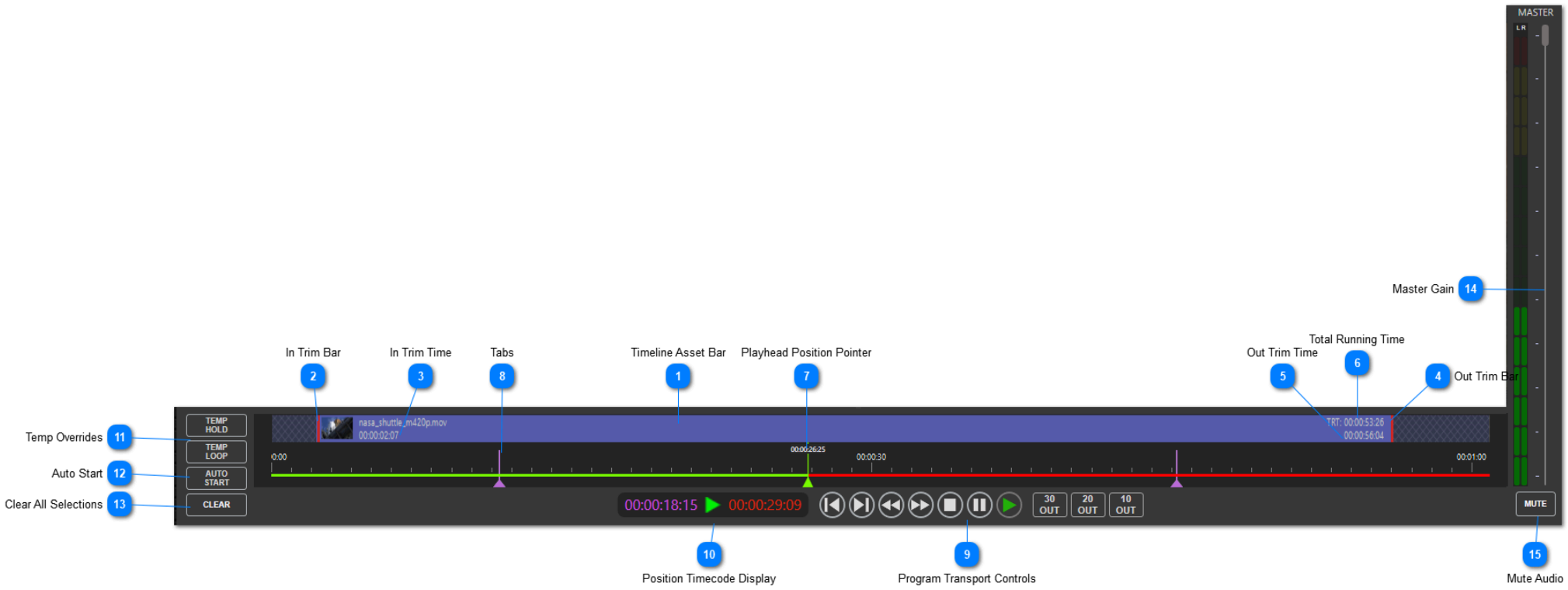
Click on this button to display detailed information of asset's file properties.



14 Remove

Click to permanently remove asset from the playlist.

Transport Control Area

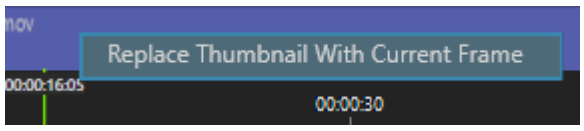


1 Timeline Asset Bar

This graphicly represents the assets entire duration span. The area in solid blue refers to the portion that is played. Trimming either the in or out point reduces the solid area. Trimmed space is shown as a dimmed crosshatch.

Sometimes you may feel the default thumbnail image extracted from a video file is not satisfactory. If that's the case, you can choose instead to replace it another frame within the file.

To replace simply scrub to the frame you wish to use and then right click anywhere inside the asset bar and click this option.

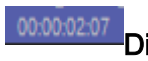


NOTE: The captured image is stored in the "Thumbnails" folder located in the app's root folder. (e.g., C:\IEW Solutions\Legion II\Thumbnails) a will remain there indefinitely. So, it is good practice to flush that folder after an event fully concludes or when these images are just no longer needed. Refer to Global Properties and see 'Clear Captured Thumbnail Images' to learn how.

2 In Trim Bar

Drag to a time point within the file where you want play to begin.

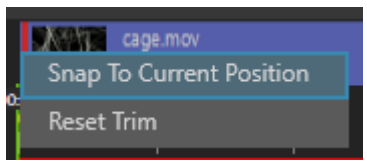
3 In Trim Time



Displays the relative time that has been trimmed off the front of the file and the actual point in the file where play will begin.

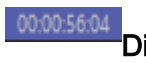
4 Out Trim Bar

Drag to a time point within the file where you to end play.



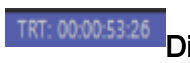
NOTE: Both the IN and OUT trim bars includes a right click menu that you can use to either snap the respective trim to the current play-head position or reset trim points back to either zero (IN) or native duration (OUT).

5 Out Trim Time



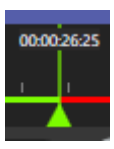
Display the time point within the file's overall duration that play will end.

6 Total Running Time



Displays assets running time after both in and out trim amounts have been subtracted from files original length.

7 Playhead Position Pointer

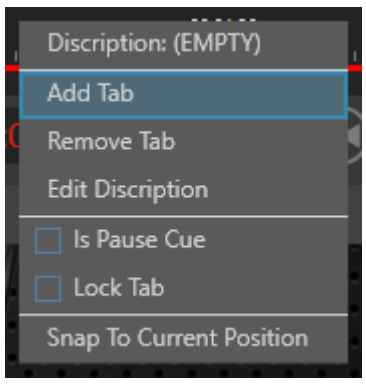


The control tracks left to right in step with the playhead position. Timecode displayed at the top reflects the exact position in time. Click and drag it to manually set the current playhead position. You can also move it more precisely one frame at a time by hovering your mouse over the pointer and using your mouse wheel.

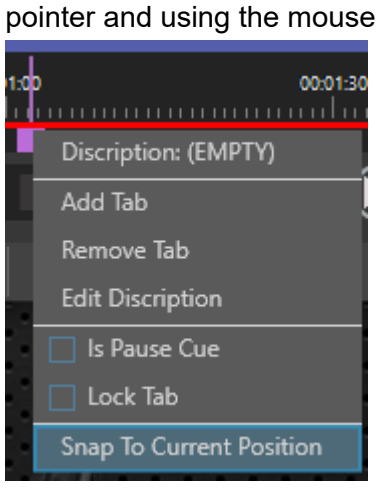
8 Tabs

Tabs are used to mark significant cue points within the asset play. These cue points can aid in countdown callouts for stage direction. (Visualization is described below in “Position Timecode Display”.) They can also make it easy to navigate quickly to a specific timepoint with the Next & Previous Tag transport buttons.

Any number of tabs can be placed along the timeline. To add, simply point your mouse cursor over the timeline at approximately where you would like it to sit, then right click and a popup menu will appear.

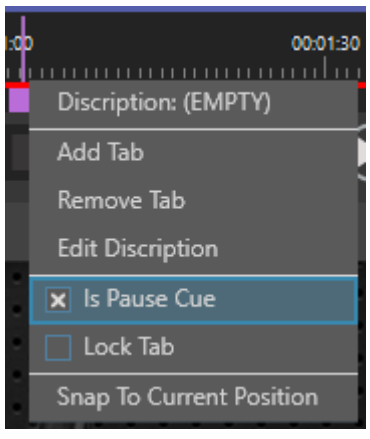


Now select "Add Tag". Once added, you can fine tune their position by click and drag them left or right or by hovering you mouse over the pointer and using the mouse wheel.



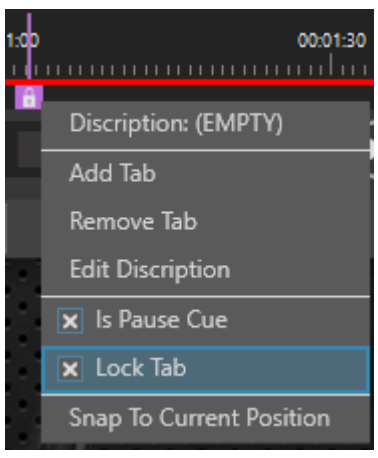
Another way is to move the playhead to the exact position you want and then right click on the tag. This time select “Snap To Current Position”.

A new feature is to use the tag as an automatic pause command.

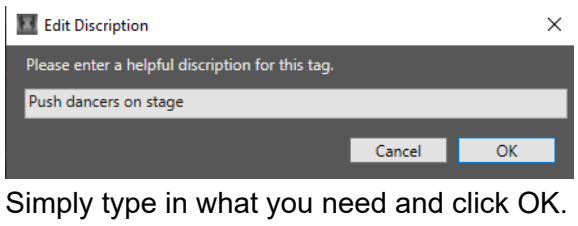


Now when the play head reaches this point, the asset will pause. To resume you can press the spacebar or click on the transport pause button.

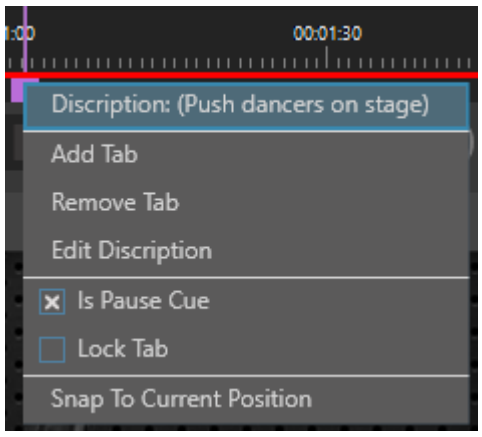
To ensure that the tab cannot be inadvertently moved or edited after it has been placed, check the Lock Tab option.



You can also add a brief description of the tags purpose by again calling up the menu and click “Edit Description”.

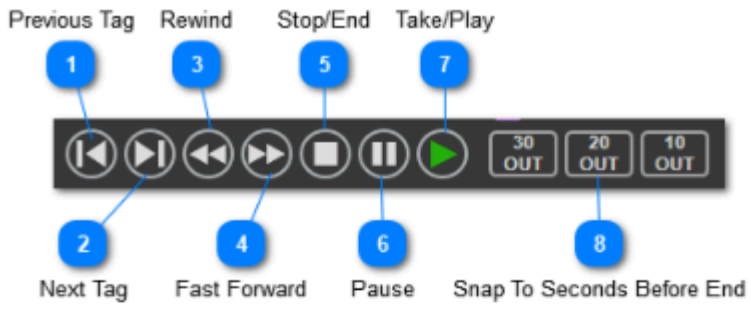


Simply type in what you need and click OK.



So now, if you need to remind yourself of what the tag represents, just right click on the tag and you will see your description.

9 Program Transport Controls



1 Previous Tag

Snap current position back to, if exisits, a previous tag. Otherwise, returns to the IN trim point

2 Next Tag

Snap current position forward to, if exisits, the next tag. Otherwise, snaps to the OUT trim point

3 Rewind

While pressed, current position will move backwards at a rapid pace.

4 Fast Forward

While pressed position will move forward at a faster than normal speed.

5 Stop/End

Stop play and return current position back to in trim point.

6 Pause

Toggles current state between pause and play.

7 Take/Play

Takes asset sitting in preview and pushes it to program then begins playing. You still use this button even when another asset is currently playing. When you do so, the two asset will transition between each other employing which ever effect was configured on each.

8 Snap To Seconds Before End

Snap current position to 30, 20 or 10 seconds before the out trim point.

10 Position Timecode Display

For most situations this displays both elapsed time on the left and a count down time on the right. Both reflect the current playhead position minus any in and out timings So even if you trim off 5 seconds from the start, the elapsed time will always begin at zero and countdown will show zero at the out trim point no matter how much is trimmed off the end.

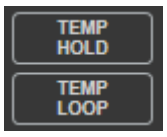
The countdown time on the right will always remain red in color. The left-hand display will generally appear green. However, if you have added any tags to the timeline the display color will change to purple. Also, when there are tags on the timeline, displayed time will be individual countdowns to the next tag position. Once the playhead has move past a tag it will begin counting to the next tag, and so on. If no more tags remain it will simply countdown to the end.

In between the time displays is an icon that indicates the current transport state:

In the case where you are looping an individual asset or a linked group. This icon appears:

Inside is the number of iterations that has occurred since repeat play began.

11 Temp Overrides



Use these to provide a onetime temporary hold at out point or continually repeat any video asset. The buttons remain disable until a video asset is finally taken to program. After the asset is playing you are free to engage either feature.

Temp Hold:
When pressed, the asset will continue but will pause and remain visible at its out trim point. The hold will remain until the stop button is pressed. Once stop is pressed, the asset will transition out and return to its starting point.

Temp Loop:
When pressed the asset will continue to its out trim point but upon reaching it, the playhead will instantly return to the start point and continuing to play. The asset will keep repeating until the stop button is pressed.

NOTE: During to loops all transition effect are canceled to keep the repeat as seamless as possible. However, when stopped the asset's out transition effect will occur.

For both buttons, once the asset has been stopped, these buttons will become disabled again.

12 Auto Start

When checked, upon selecting an asset, instead of brining it preview, the asset will automatically be taken directly to program and begin playing.

13 Clear All Selections

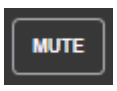
This will clear out all asset selections for preview as well as stop and clear any assets currently running in program.

14 Master Gain

The master audio fader overrides the audio volume of all currently playing assets. This control cannot boost an individual asset's level, it can only temporarily reduce it.

WARNING: Adjustments made here are not saved and should not be used when unifying levels between assets. Refer to Audio Output to learn how to properly save an asset's audio gain.

15 Mute Audio

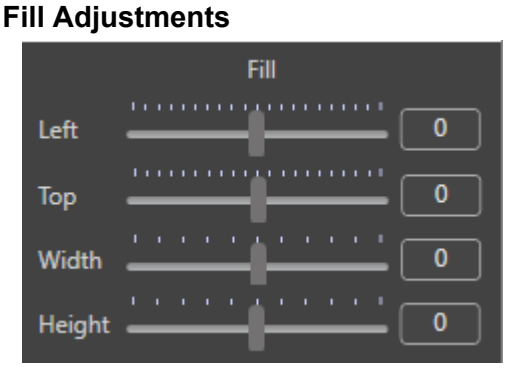


When engaged all audio sounds coming from any running assets will be muted. This includes overlays.

Geometry Window

---

1 Fill Adjustments

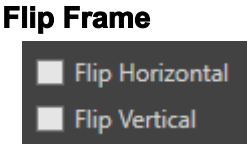


Fill adjustments alter the visible portion (frame) size and position within a fixed container (screen).

2 Rotate Frame

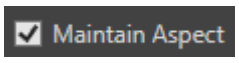
Adjusting this will rotate the frame up to 270 degrees within the confines of our container.

3 Flip Frame



These simply invert the frame on either the X or Y axis.

4 Maintain Aspect

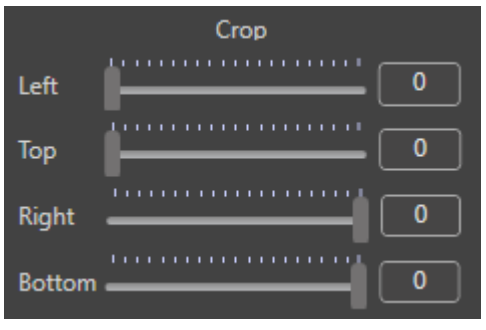


When checked the frame will always maintain the asset native aspect ratio. When enabled independent width and height adjustment are not available. Instead altering either will effect both.

5 Snap Buttons

Use these snap buttons to easily position our frame within the container.

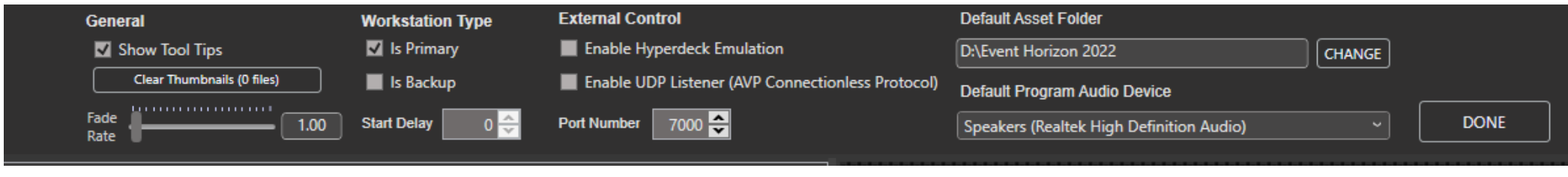
6 Frame Crop Adjustments



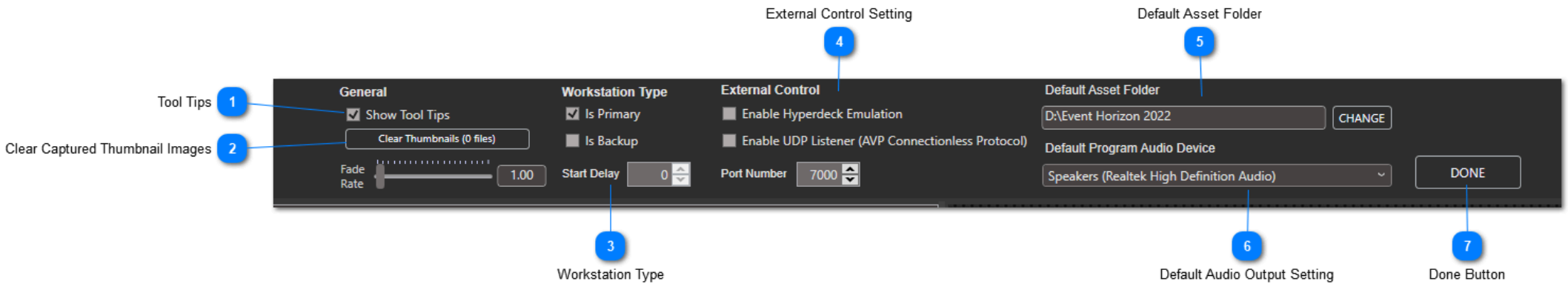
Use the following to blank out portions of our frame.

System Option Panels

These panels will appear at near the top of the main window. When either of these two panels are displayed, both the program monitoring and playlist data area will shrink in height to make room. Conversely, when they are hidden the monitoring and playlist areas will return to their previous sizes.



Global Properties



NOTE: Keep in mind that any changes made are saved in real time.

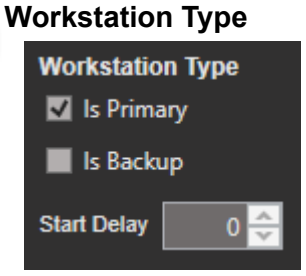
1 Tool Tips

When enabled each individual control will produce a helpful popup describing its purpose. Due to it sometimes interfering with mouse clicks, it is recommended that this feature be disabled once you feel comfortable with all aspects of the program.

2 Clear Captured Thumbnail Images

Anytime you choose to replace an asset's thumbnail image by using the "Replace thumbnail with PGM screenshot" feature, the captured image is stored in the “Thumbnails” folder located in the app’s root folder. The default path is C:\IEW Solutions\Legion II\Thumbnails. After an event concludes and these images are no longer needed, it is recommended that you use this feature to remove them all and save drive space.

3 Workstation Type

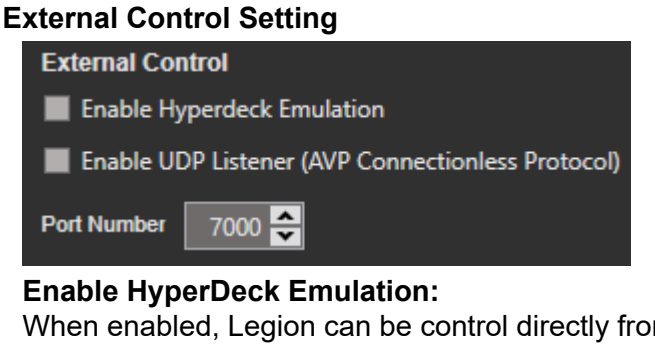


One of the program’s key features is its ability to easily connect to another workstation and use it as a backup that will mimic the primary. If you wish to setup for this scenario select the appropriate role for each of the two workstations

Start Delay:
If workstation is designated to be the backup, you can choose to delay the start of play in sceconds. This can be handy when you prefer to stager play times between a primary and its backup. The default is 0.

NOTE: As long as the link between the two are enabled all transport commands and edits performed on the primary will instantly occur on the backup as well. Also, if an asset file is added to the primary playlist but does not exist on the backup, a copy of the file will automatically be transferred to the backup for you.

4 External Control Setting



Enable HyperDeck Emulation:
When enabled, Legion can be control directly from a Blackmagic ATEM switcher.
See: HyperDeck Emulation

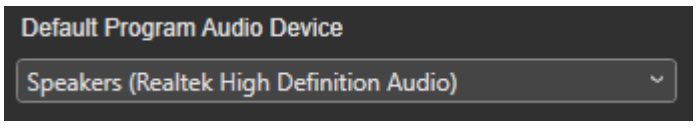
Enable UDP Listener:
When enabled Legion can be controlled externally via an ethernet connection.
See: AVP Protocol Commands

5 Default Asset Folder

Establishing a default asset folder is mandatory. To make transferring event files to other storage mediums or computers easier, all assets will be automatically copied into this folder even when resourcing files from other drives and/or folders.

NOTE: Files are copied leaving the original file intact at its source. To prevent excessive use of available drive space on your system it is recommended that you manually add needed event assets directly to the event folder and prevent the system from having to create wasteful copies.

6 Default Audio Output Setting



Every new asset added needs to know what audio output to use. In most cases you will probably use the same output. This where you can choose which will be the go-to default.

Default Program Audio Device:
If the app is newly installed or any previous selection has become unavailable, the system will revert to the standard audio output devices that has been set in Windows. However, clicking will reveal the list of all currently enabled audio playback devices found on the local computer. If desired, select the one that you wish to be used instead.

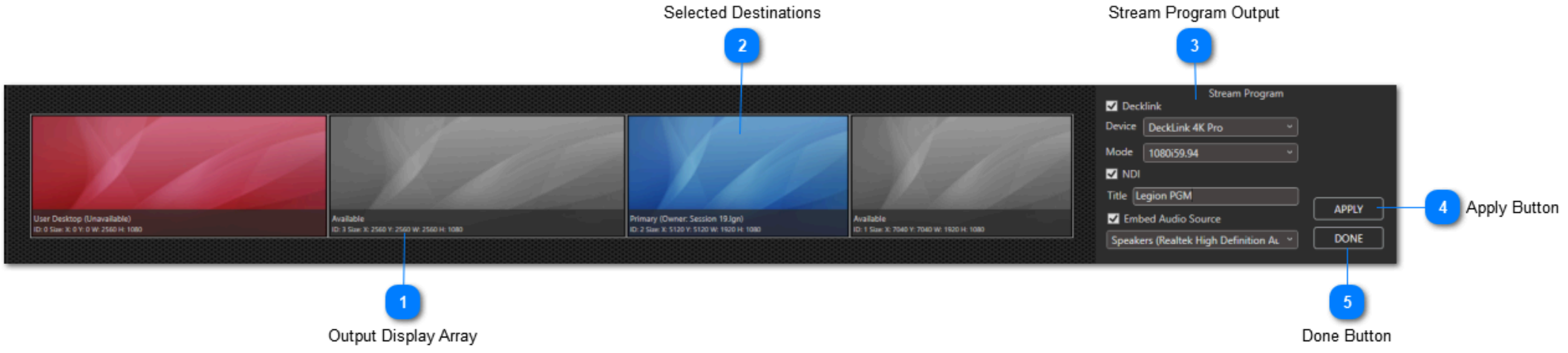
7 **Done Button**

Hides gobal setting panel.

NOTE: If any change to the default audio settings has occurred, you will be prompted to choose whether you want to automaticly apply the change to all current playlist assets. Doing this will initiate a reloading of the playlist.

SEE ALSO:
[Display Selection Panel]

Display Selection Panel



This panel appears over the clip thumbnails after you click ‘Select Video Display Output’ under the Settings menu.

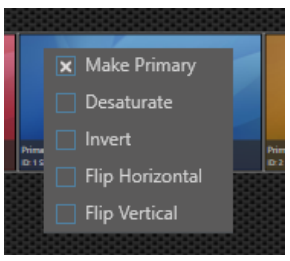
1 **Output Display Array**

The array is much like the one found in Windows “Display Settings” It illustrates the current layout (resolution size and position) of all attached monitor outputs. Legion constantly monitors for any changes to this layout and will update accordingly.

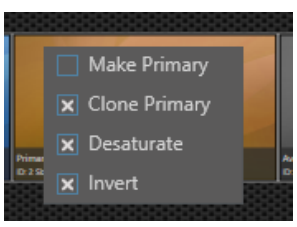
NOTE: To ensure proper setup, the output that has been designated the systems primary user desktop will appear as red and cannot be selected for use. Do not confuse this with Legion’s ‘Primary’ designation, that is simply the apps way illustrating the one that is selected for program out.

2 **Selected Destinations**

Primary/Program:
To select the program output, simply right click on the desired display and select "Make Primary". When the primary is selected the tile will become blue.



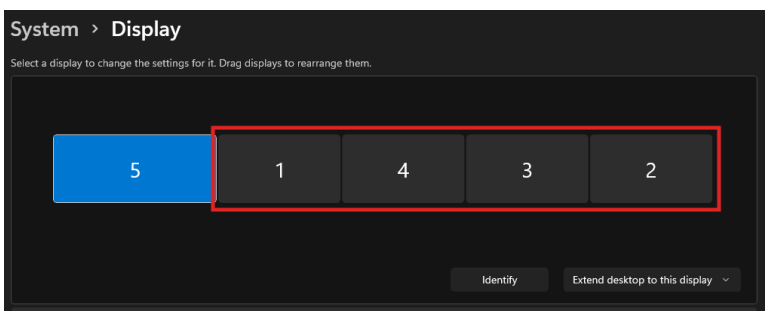
Cloned:
If needed, you can select another output to be a clone of the primary one. This can be handy in situations where a separate alpha mask is needed for a downstream key.
To select, right click on any gray tiles and select “Clone Primary”.



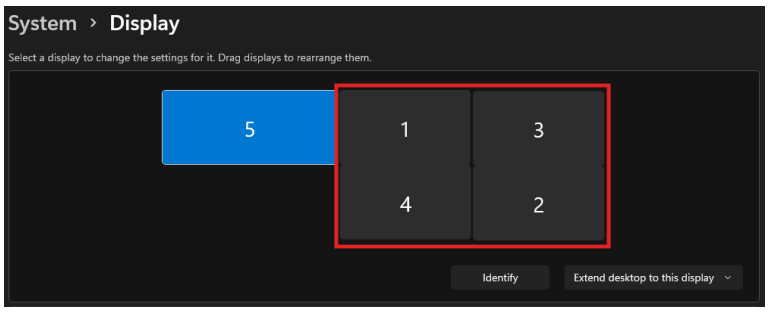
If the cloned output is to be used as an alpha key, that output will need to desaturate all color and/or invert its light and dark shades. Selecting either or both will affect the change.

Spanned:
Another feature is the ability to create spanned pixel spaces. A spanned space effectively extends a single program output across multiple display screens. This is useful when needing to display ultrawide resolutions that exceed the capability of a single output.

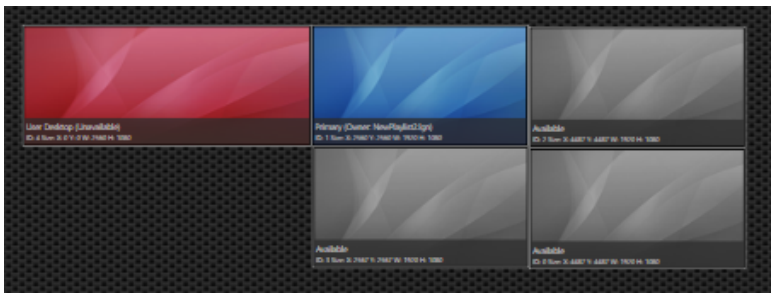
To prepare for a spanned space, first go to Windows Display Settings and ensure that all outputs you wish to use are aligned in the pattern that you require. For example, if you need to provide enough outputs to cover a resolution of 7680 x 1080 then you would need to arrange them all horizontally from left to match the physical arrangement of projectors keeping in mind the display index does not necessarily reflect their physical arrangement.



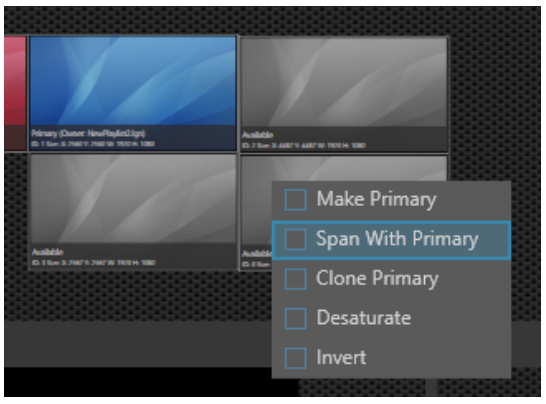
Another example would be like a video wall. You want to display 3840x2160 media using four 1920x1080 monitors.



Now once that has been done you can come back to Legion’s display selection panel and setup the span by first selecting the top and left most output in your arrangement.to be the primary.



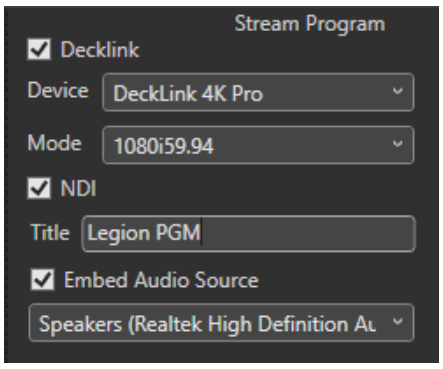
Next right click on the right and bottom most output and select “Span With Primary”.



And now you should have one large output tile.

3 **Stream Program Output**

You have to ability to also output all program activity directly to either a Decklink SDI output and/or NDI stream. This can be done whether or not you are already outputting to a conventional HDMI and/or DP type monitor.



Decklink:
Check to enable the use of a Deckink card as an output.

Device:
Select the appropriate Decklink output.

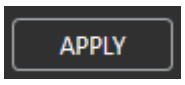
Mode:
Select the desired SDI resolution.

NDI:
Check to create an NDI stream of the program output.

Title:
This is the label that is visible on the receiving end designating the feed.

Embed Audio Source:
Check this to also send program audio with the video feed. Be sure to select the correct audio output device whose signal you want streamed.

4 **Apply Button**



Click to save and apply all changes immediately.

NOTE: Some changes may require the full shutdown of all program play and a posible need to restart of the app's video and/or streaming engine.

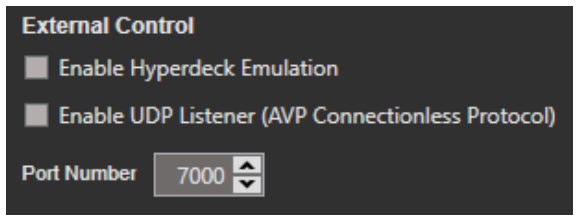
5 **Done Button**

Clicking simply closes the panel.

NOTE: Remember to click Apply before closing if you wish to save any changes.

SEE ALSO:
Global Properties

External Control

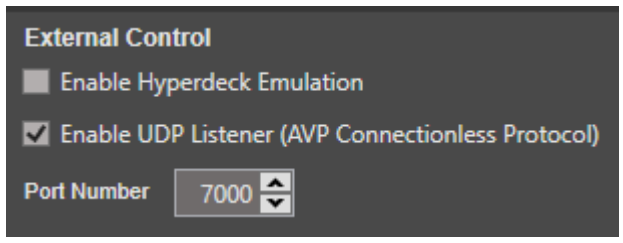


There is several ways that Legion can be controlled externally. The following describes how to use these features

---

AVP Protocol Commands

To begin communicating with Legion from an external controller, first go to Global Settings and enable the UDP listener. After which the listener will begin immediately waiting for command strings on the default port number ‘7000’



NOTE: If you find that port 7000 conflicts with other software apps running on the same computer, you can go ahead and change it using the "Port Number" selection control. Once you have completed the change the port will automatically refresh itself and begin listening on the newly assigned port.

The control protocol is in simple ASCII text strings and is not case sensitive. I do, however, use case formatting in the following explanations simply to reflect clean document formatting.

Every command string needs to start with the prefix “AVP”, followed by playlist unit index (starting from 1) surrounded on each side with the pipe character “|” .
Example: AVP|1|
NOTE: If commands are being recived via the AV-Sync Hub and you want all attached play units to recive the same command then use "-1" as the unit index. If you are incorperating a backup node it will treated as if it were just another play unit so even if all you have is one primary and one backup you will still need to use -1 as the unit id in all strings.
Example: AVP|-1|

Following the opening character string, proceed immediately with the command string. Some commands require an additional integer value. Separate the command name and the number value with a comma “,”.

NOTE: If your choosen control software removes commas from all command strings (e.g Universe V3) you can replace the use of a comma with a space " " instead.

Load clip to standby: ‘LoadClip’ + ‘,’ + ## (clip ID)
NOTE: Clip ID is what ever is currently appearing in the clips ID column.
Complete example to load clip third down for the top, that is still using the default ID in the first playlist unit: AVP|1|LoadClip,03

Start playing program: ‘PgmStart’ + ‘,’ + ## (operational flag)
Set the operational flag to ‘-1’ to start the clip currently sitting in standby.
You can also use a clip's ID number to take it straight to program, bypassing the ‘LoadClip’ function.
Note: There will a slight delay when taking a clip straight to program. This is due to the fact that it must still be placed into standby first before it is executed to program.
Example to play clip in currently in preview: AVP|1|PgmStart,-1
Example to load clip ID '2A' and take it straight to program: AVP|1|PgmStart,2A

Stop program: ‘PgmStop’
Complete example to stop clip: AVP|1|PgmStop

Pause program: PgmPause’
Complete example to stop clip: AVP|1|PgmPause
Note: The pause command is a toggle, simply send the command again to resume program play.

Fast forward clip: ‘FForward’
Set the operational flag to the desired faster then normal speed.
The range of speed is entered as an integer value between 1000 to 4000. (1000 = normal and 4000 = 4X faster)
To end the fast forward and resume normal play speed then set flag to '0'
Complete example to start fast forward on the currently selected clip to 3.5X speed: AVP|1|FForward,3500
To end fast forward on the currently selected clip: AVP|1|FForward,0

Rewind clip: ‘Rewind’
Set the operational flag to activate or deactivate rewind. (1 = On , 0 = Off)
Complete example to begin rewind of the currently selected clip: AVP|1|Rewind,1
To end and resume nomal play: AVP|1|Rewind,0
Note: The pause command is a toggle, simply send the command again to resume play.

Set current position: ‘SetPosition’ + ‘,’ + **timecode*
*The current position is formatted as a timecode string (‘hh:mm:ss:ff’.)
Complete example to set clip position to 30 seconds and 12 frames: AVP|1|SetPosition,00:00:30:12

Advance to time out: ‘GotoTimeOut’ + ‘,’ + ## (operational flag)
Set the operational flag using numbers 1 to 4 (1=60sec, 2=30sec, 3= 20sec, 4=10sec)
Complete example to advance to 10 seconds out: AVP|1|GotoTimeOut,4

Advance to next tag: ‘NextClip’
Complete example to select the next clip: AVP|1|NextClip

Go back to previous tag: ‘PrevClip’
Complete example to select the previous clip: AVP|1|PrevClip

Advance to next tag: ‘NextTag’
Complete example to advance to next tag marker: AVP|1|NextTag

Go back to previous tag: ‘PrevTag’
Complete example to advance to the previous tag marker: AVP|1|PrevTag

Enable Temp Hold: ‘TmpHold’
Complete example to togle the temp hold: AVP|1| TmpHold
Note: The command is a toggle, simply send the command again to disable.

Enable Temp Loop: ‘TmpLoop’
Complete example to togle the temp looping: AVP|1| TmpLoop
Note: The command is a toggle, simply send the command again to disable.

Clear All Selected: ‘Clear’
Complete example to clear all selected: AVP|1| Clear

Hide Program Output: ‘HidePGM’
Complete example to toggle between whether program output is visible or not: AVP|1| HidePGM

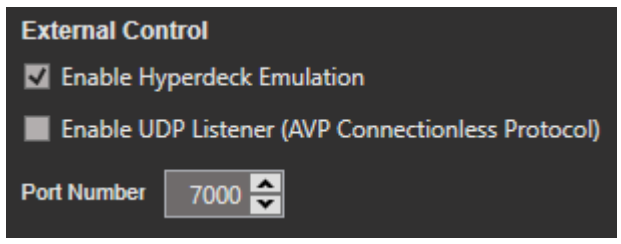
Enable Auto Start: ‘AutoStart’
Complete example to togle the auto start feature: AVP|1| AutoStart
Note: The command is a toggle, simply send the command again to disable.

SEE ALSO
HyperDeck Emulation

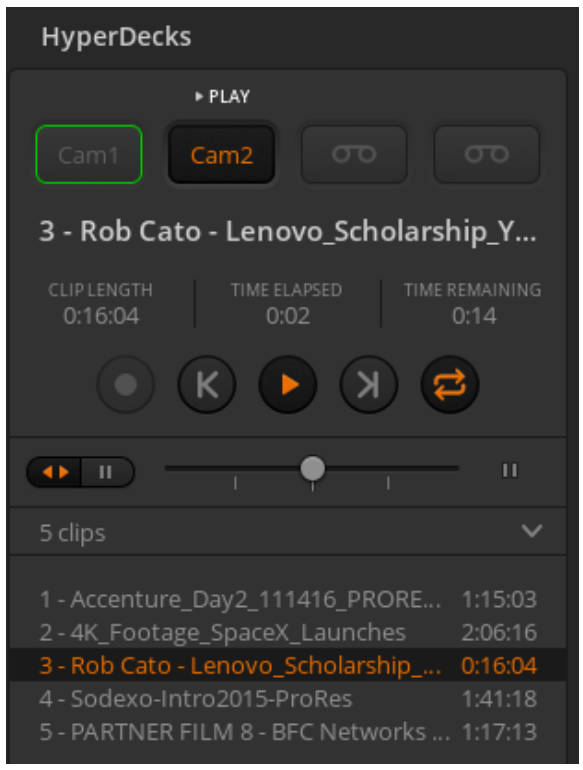
HyperDeck Emulation

Blackmagic ATEM users will really appreciate this feature.

When “HyperDeck Emulation” is enabled, AVP presents itself on the network and to an ATEM switcher as if it was an actual HyperDeck video play unit. This means that you can use the ATEM’s built-in deck control feature to control Legion II.



To enable, first go to Global Settings and select Enable Hyperdeck Emulation. After which the system will immediately begin waiting for an ATEM to atempt connection.



There is an enormous potential of having a robust play-out solution like AV-Playback integrate directly with an ATEM switcher. Now you can take advantage of the switcher’s autoplay feature This feature automatically instructs Legion to play anytime the assigned input is selected. On top of that, last minute file additions can be added to an event playlist with so much more ease. No more worrying about whether the file is the correct resolution or frame rate, since the output is a computer display, the feed into the switcher’s HDMI port will always remain the same. All the current transport controls in the ATEM are enabled including the jog and shuttle. The ATEM will even be able to update automatically when clips are either added or removed from the AVP playlist.

SEE ALSO
AVP Protocol Commands

Shortkeys

Operational Commands:

Shortcut	Command	Description
↑ UP ARROW	Previous Asset	Select previous clip and place in standby.
↓ DOWN ARROW	Next Asset.	Select next clip and place standby.
##	Select asset by ID	Type the same characters that appear in the clip's ID column within 3 seconds. Once the last character is typed the asset will be selected and placed into preview. **NOTE: If you miss type a character you will need to wait a few seconds for the buffer to be cleared before retyping.**
ENTER	Start playback	Starts playback from punch in point.
SPACE	Pause playback	Function is a toggle. press again to resume.
ESC	End playback	Ends playback and returns to punch in point.
RIGHT ARROW	Advance program position forward	Advance current position 1 frame. Hold key to quickly repeat.
LEFT ARROW	Move Program Position Back	Rewind current position 1 frame. Hold key to quickly repeat.
TAB	Next Cue Tag	Jump position forward to next cue tag.
SHIFT + TAB	Previous Cue Tag	Jump position back to previous cue tag.
HOME	Goto In Point	Jump position back to current punch in point.
END	Goto Out Point	Jump position forward to current punch out point.
DELETE	Remove asset	Permanently deletes the selected asset from playlist
F1	Preview 10 Seconds Out	Advances current position to 10 seconds before end of clip
F2	Preview 20 Seconds Out	Advances current position to 20 seconds before end of clip
F3	Preview 30 Seconds Out	Advances current position to 30 seconds before end of clip
ALT + I	Set Punch In Point	Set in point to the current scrub bar location.
ALT + O	Set Punch Out Point	Set out point to the current scrub bar location.
ALT + T	Insert Cue Tag	Set tag at current scrub bar location.
ALT + L	Toggle Temp Loop	Function is a toggle. press again to disable.
ALT + F	Toggle Temp Hold	Function is a toggle. press again to disable.
+	Increase Master Volume	Increase current master gain 1%.. Hold key to quickly repeat.
-	Decrease Master Volume	Decrease current master gain 1%.. Hold key to quickly repeat.
M	Mute Audio	Function is a toggle. press again to un-mute.
C	Clear All Selected	Clears the selection of all clips and closes any open clips.
H	Toggle Hide PGM	Toggles the visibility of the program output.
F1	10 Seconds Out	Advances current position to 10 seconds before the end of clip
F2	20 Seconds Out	Advances current position to 20 seconds before the end of clip
F3	30 Seconds Out	Advances current position to 30 seconds before the end of clip
F6	60 Seconds Out	Advances current position to 60 seconds before the end of clip
?	Toggle the display of tooltips	Toggles whether or not to allow the displaying of contrrol tooltips.

How To's

As with any complex program, step by step instructions are vital in ensuring proper operation.

Below are links to a few written tutorials that cover what you need to get started.

We also offer number of video tutorials on our IEW Solutions YouTube channel, each delving into these subjects and more.
https://www.youtube.com/channel/UCz941LVUW_Y70NBY0CeEtEw

Configure your computer for best graphic performance

Some PC desktops and most all high-quality laptops are equipped with two separate GPU's a general purpose Integrated one that is basically a subcomponent of the actual CPU chip and a much more powerful Discrete one. The discrete GPU in a desktop is typically a separate graphics card. However, for laptops, manufactures acquire a chip from Nvidia or AMD and embed it directly into their motherboard design.

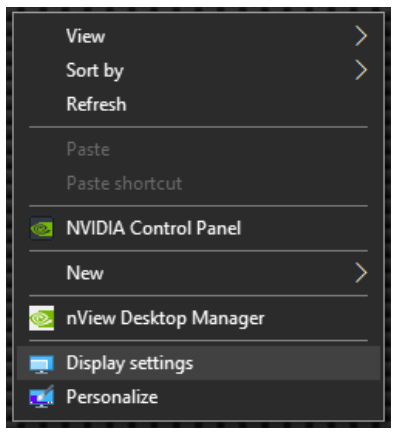
In the wild-wild west of laptop manufactures, system architecture can vary significantly, but one thing though that is pretty much a given, especially in older ones, is that the laptop's own screen is directly wired to the integrated GPU and any external outputs (DP & HDMI) are fed from the discrete one. Beware, most USB-C / Thunderbolt adaptors are handled via the CPU and its integrated GPU.

The operating is now responsible for choosing which one to use for each application. Most of the time it chooses based on which display is the primary desktop, because that is the domain in which the OS resides in. So, if we keep the primary desktop on the laptop's integrated monitor, by default when an application is launched, the OS assigns the integrated GPU to support the app's graphics needs.

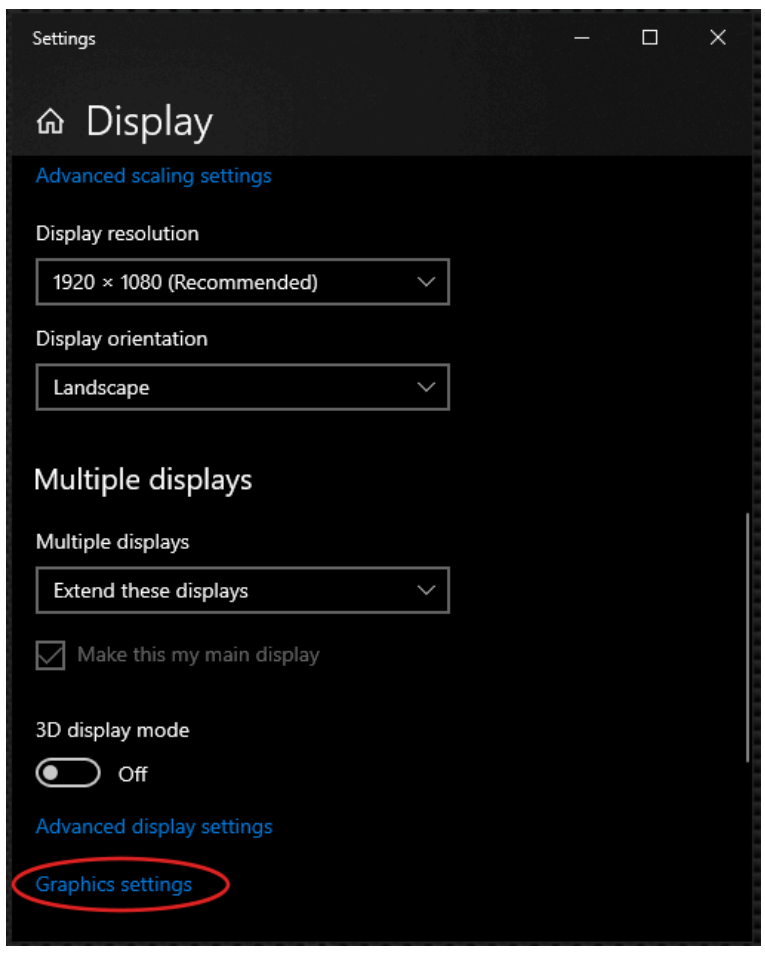
Since we are working with high resolution videos with minimal compression, the integrated GPU in most situations can't handle these large bitstreams the way a discrete one can. This may result in poor playback performance. Previously both Nvidia and AMD had offered a way to forcefully assign applications to run on either the Discrete or Integrated GPU. However, since Windows 10 version 1803 and later now provide the ability to set graphics performance per application internally, both manufactures has begun to stop including this feature in their driver set.

Customizing Graphics Performance Preference for a Desktop App

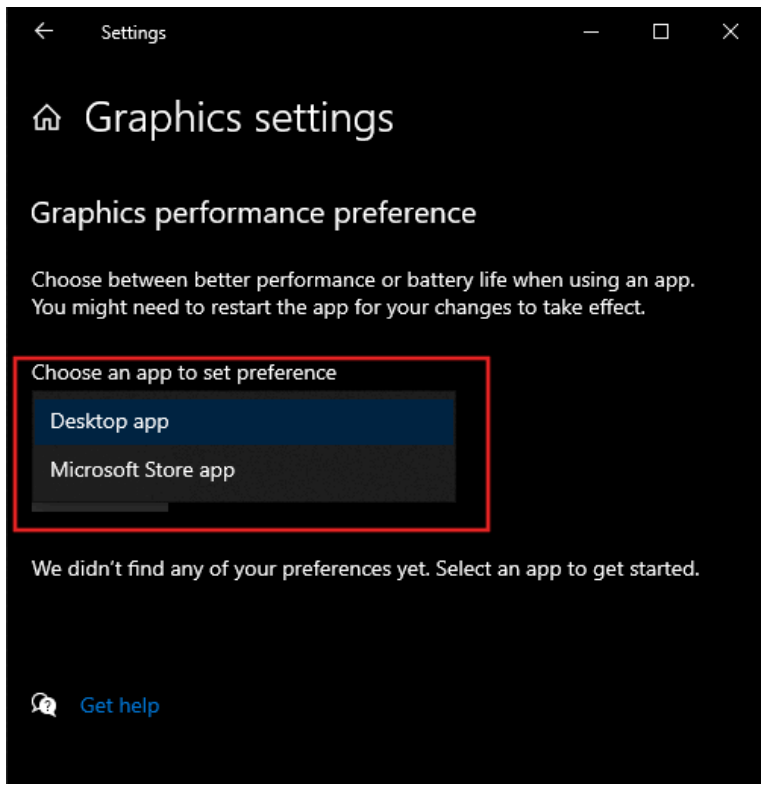
Right-click on the Desktop and select Display settings.



Select Graphics settings



Under "Choose and app..." Click the down arrow.

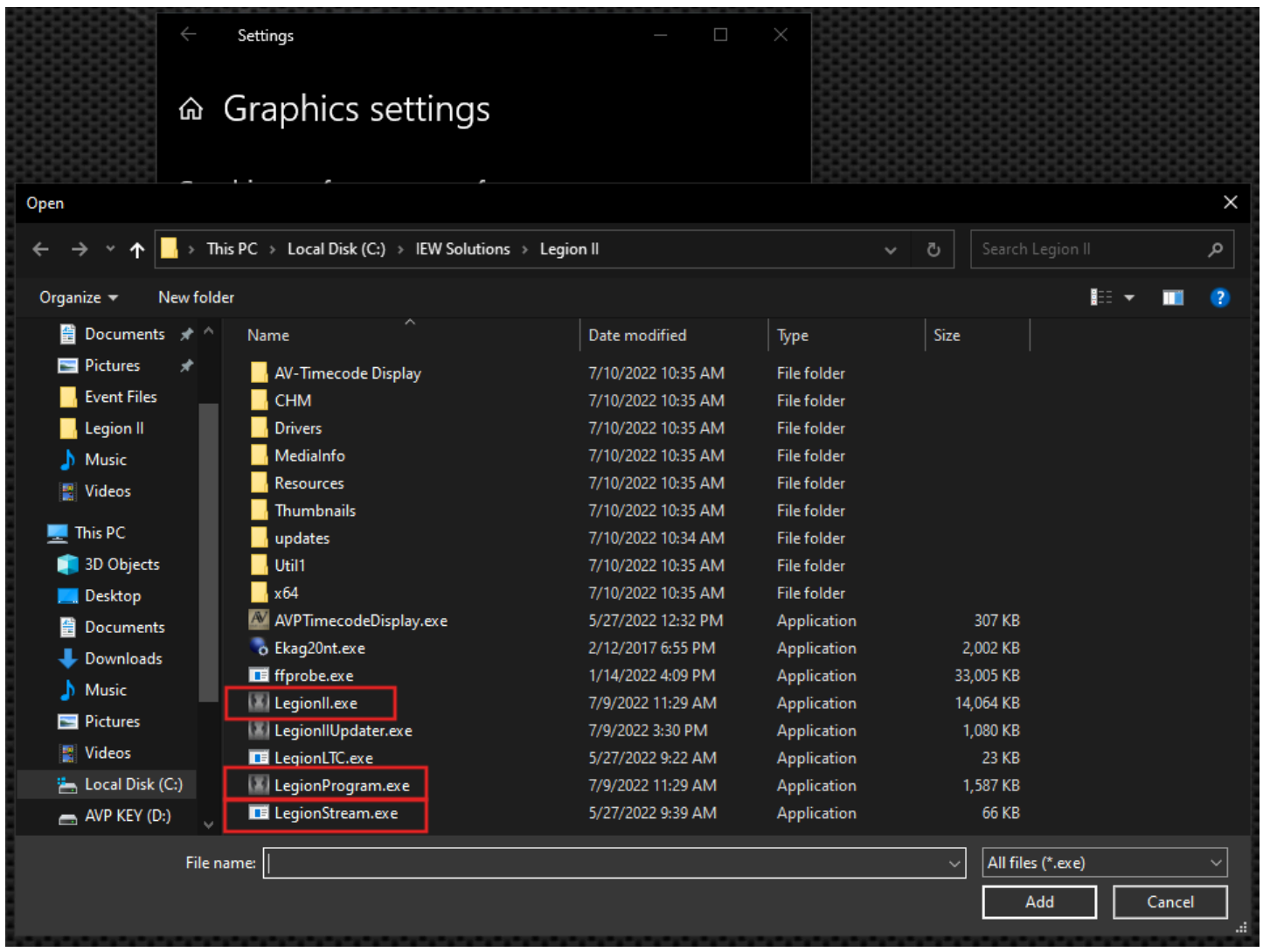


Specify the app type:
- Microsoft Store app – Universal applications installed from Microsoft Windows Store.
- Desktop app – Classic applications not installed from Microsoft Windows Store.

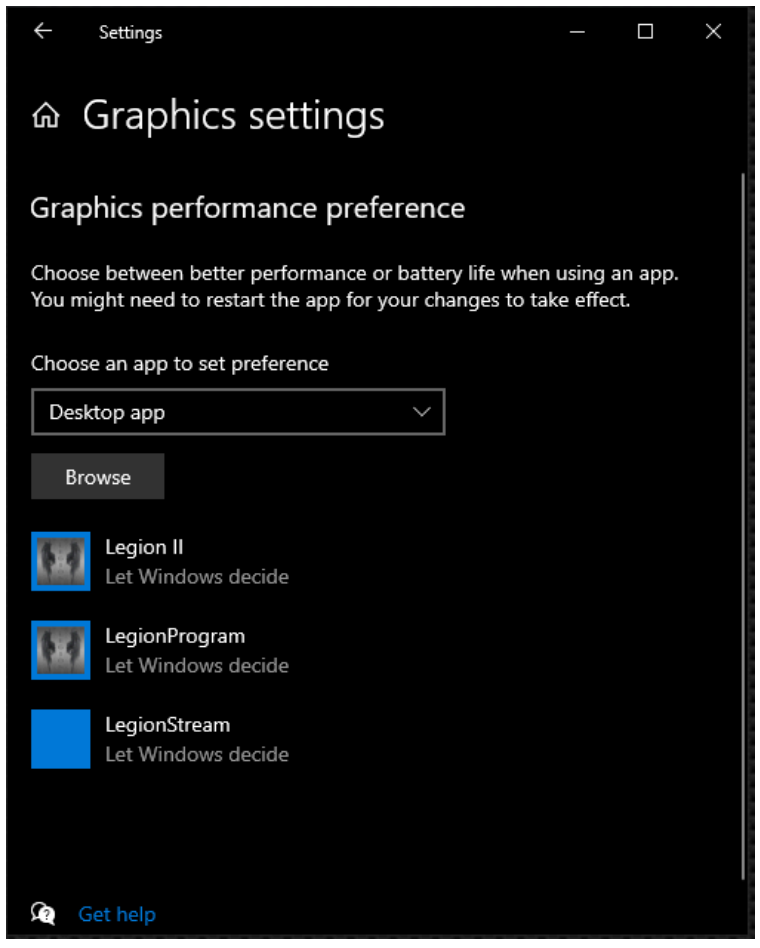
NOTE! On systems running Windows 10 version prior to 1903, Desktop app and Microsoft Store app will be listed as Classic app and Universal app, respectively.

For us we need to choose "Desktop app".

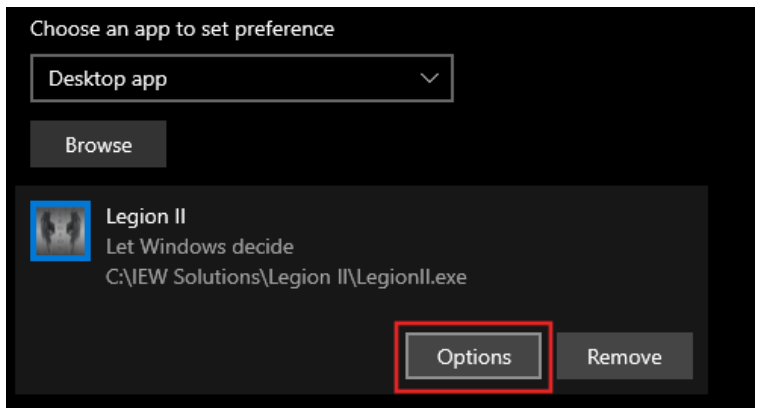
Next click on the "Browse" button.



In File Explorer, select the desired application's executable file and click Add. There are three executable files we need add, "LegionII.exe", "LegionProgram.exe" and "LegionStream.exe". You will need to do each one at a time.

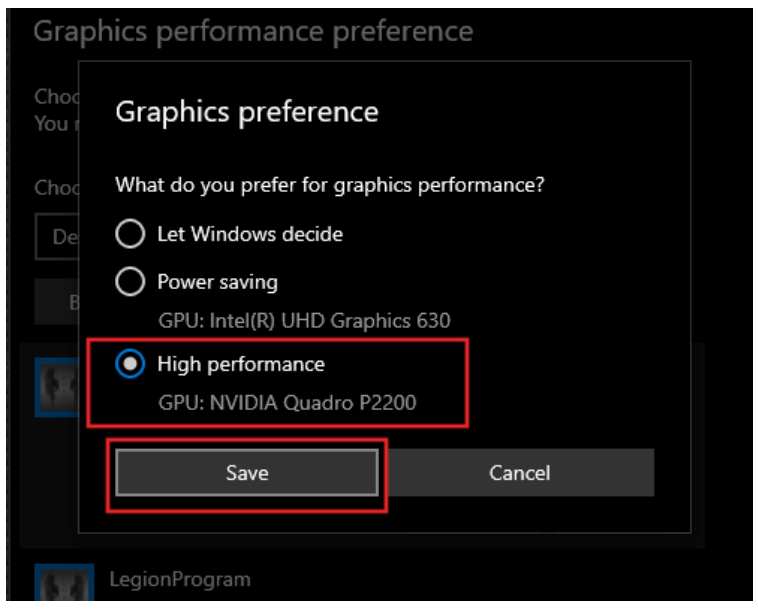


Now one at a time, select one of the three and click Options.



The Graphic preference menu should appear, with the following options to choose from:
- Let Windows decide – Automatically selects the Integrated GPU when running 2D apps and the Discrete GPU when running 3D apps. This is the default setting.
- Power saving – Selects the integrated GPU, which provides lower performance but consumes less power.
- High performance – Selects the discrete GPU, which provides better performance but consumes more power.

In our case, be sure to choose the “High Performance” setting and click Save.



After all three have been set Legion will now have the discreet GPU handle most of the rendering needs.

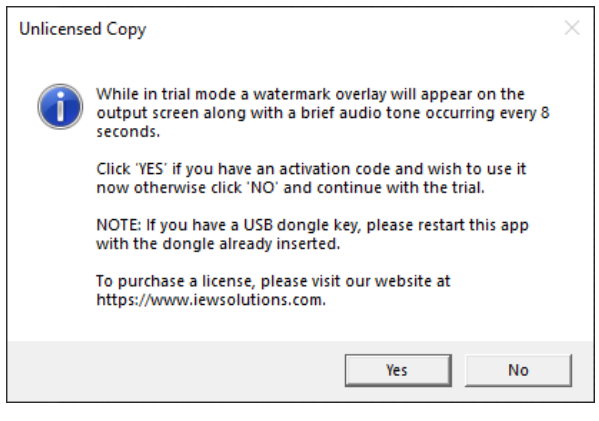
Getting Started

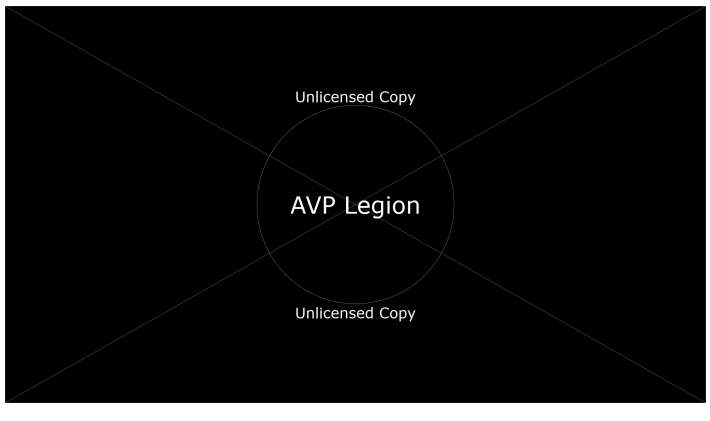
The purpose of this guide is to provide a basic outline Legion's layout as well as some step-by-step instructions on creating a playlist, assigning your outputs, adding assets and finally how to display them to your audience.

This guide is assuming you have already installed the program, so we won't bore you with that part. We are also going to assume this is the first time the Legion app has been launched on your computer.

First step is to launch Legion EC by double clicking on its desktop icon.

Anytime the app is launched and unable to find a valid license key on the system this dialog will appear.

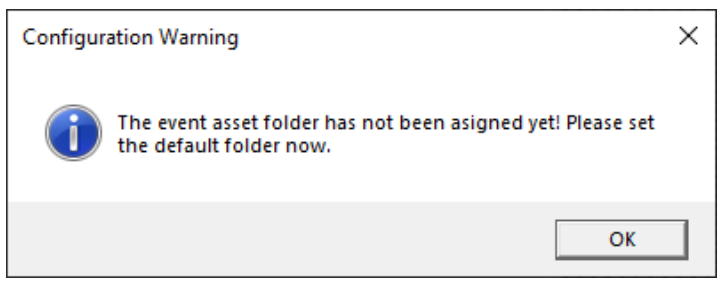




It is to inform you that while operating in a trial mode a water mark will appear over the program output as well as a brief tone will be heard every 8 seconds.

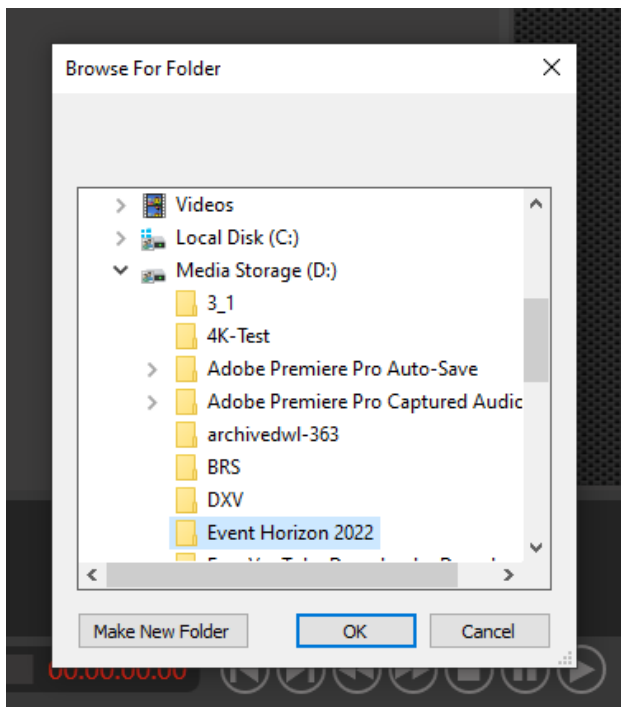
You can refer to How to install or transfer an online license to learn how to install a license. For now, you can just click 'NO'.

The next prompt to appear is a dialog box asking you to assign the event asset folder.



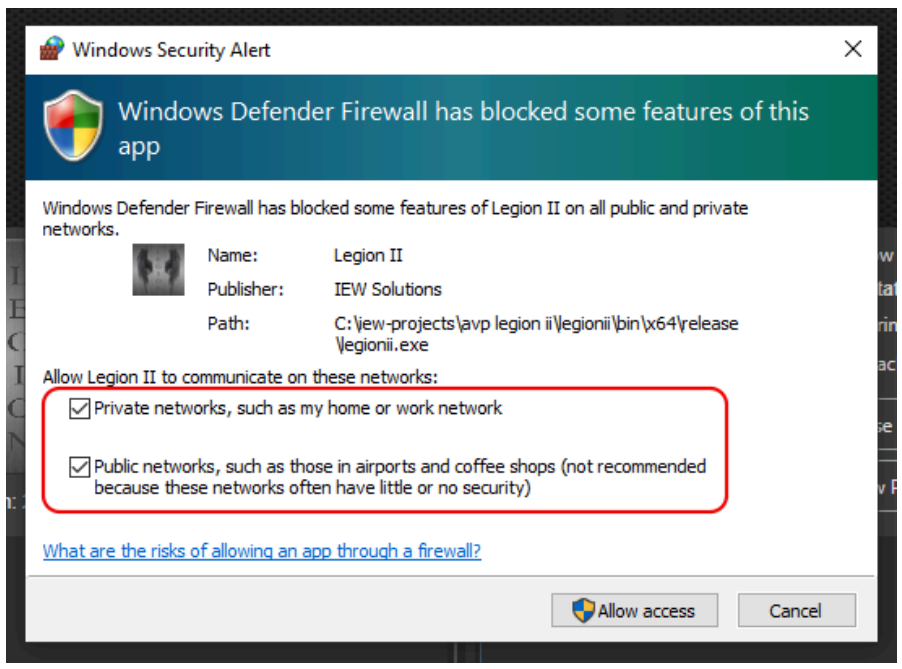
Just so you know, the folder you choose is where all files, including playlist files, are going to be saved. Even if you retrieve assets from other locations, anytime you add a file to the playlist, that file will automatically be copied and placed into this folder.

Click 'OK' and a folder browser will appear. You can use this to either select an existing folder or create a new one. If creating a new one, be sure to select it before clicking the 'OK' button.



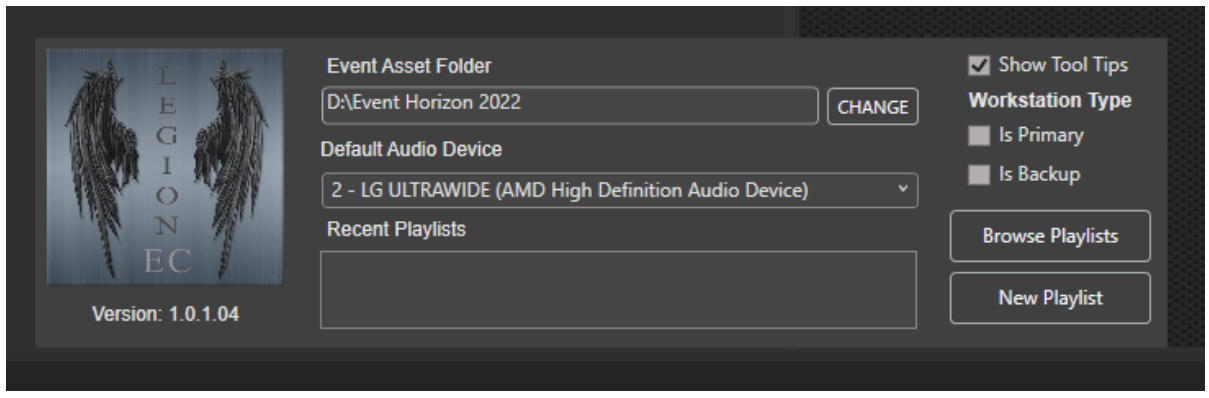
Since Legion relies heavily on the use of UDP packets to communicate with its many different components, and because this may be the first time the app has been launched, Windows will need to ask you for permission to allow it through the firewall.

NOTE: To make sure you do not have trouble in the future with varying network topographies, it is wise to enable for both Private & Public networks.



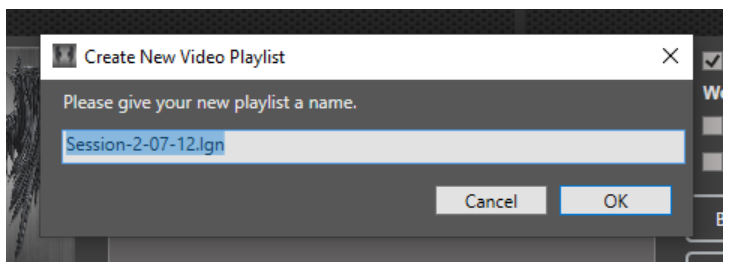
Typically, you only need to do this once. However, anytime a new update with a different version number is installed you will prompted to do this again. Also, when a few more of Legion's functions become active, there will be more of these same prompts popping up.

Now we finally get to the launch control.

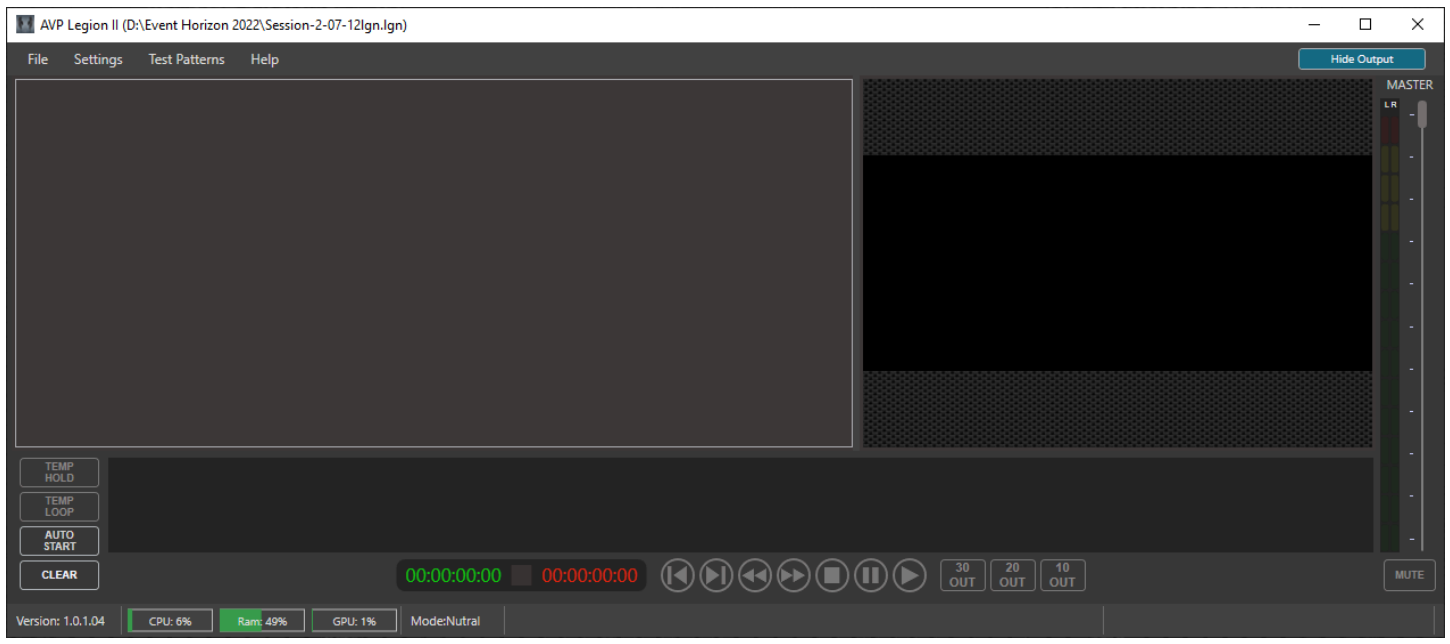


The launch control gives you easy access to some important settings that need to be set before the app can continue. For the most part, since the asset folder has already been set and the default audio output, if not changed, will display the output that is set as the default in Windows.
Please refer to Launch Control and get more detailed info on the launch control panel.

All we need to do now is create a playlist. Click on 'New Playlist' and type in a title for it and click 'OK'.



At this point the launch panel disappears revealing a very empty interface.



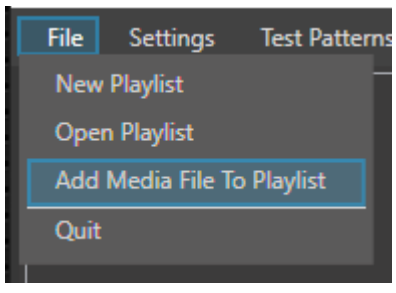
Typically, this is when you may want to assign your program output. This is especially important when you have several active displays attached to the computer. By default, anytime a new playlist is created the system will search for the first available output and configure you program pixel space to match that display's resolution. If the one chosen is not the one you want you will need reasign it by going to the 'Settings' menu and clicking on "Output Display Config".

Refer to Display Selection Panel to learn more about configuring the program output.

NOTE: The app will never allow the Windows primary desktop to be used so, If perhaps you're on a laptop and have no external monitors connected, the system will create a virtual space so you can at least review assets using the program confidence monitor.

Now that the output has been set let's add our first asset. There are three different way you can go about adding files:

1) In the main menu click on File || Add Media File To Playlist.



2) Right click on a blank area within the thumbnail array or data table panels.

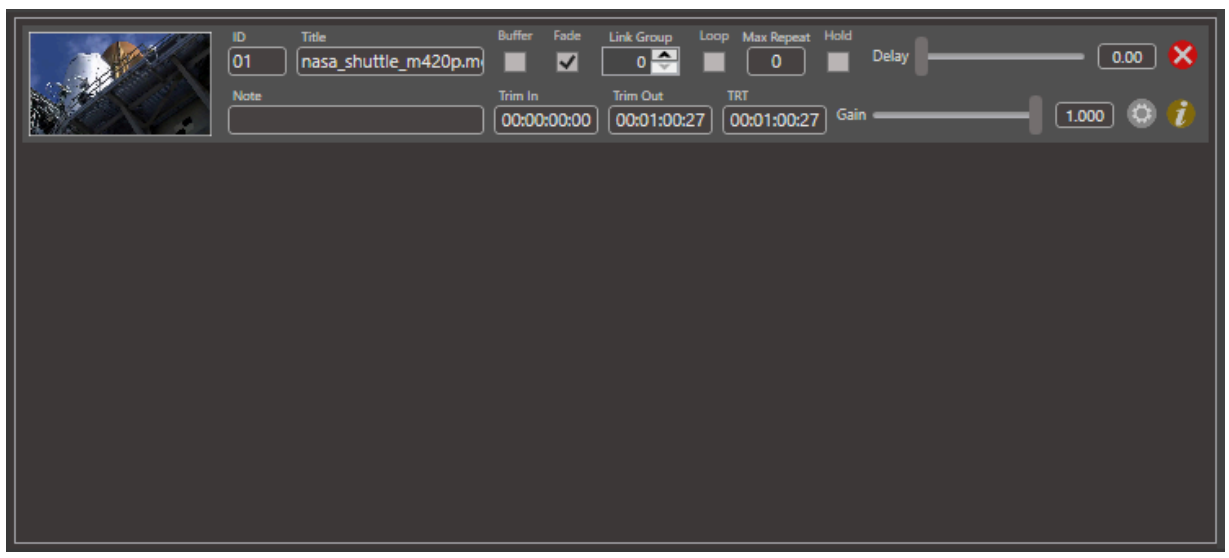
3) Using Window File Explorer select and drag media files directly to a blank area on the thumbnail array panel.

NOTE: It is important to remember that all assets belonging to a playlist must be kept in the event asset folder. This way all elements related to a playlist can be easily moved as one bundle and used on other computers without having to correct the file paths within the playlist.

By default, any file retrieved from other locations will automatically be copied and placed directly into the designated event folder.

To prevent excessive use of available drive space on your system it is recommended that you manually add all needed assets directly to the event folder and prevent the system from needing to create wasteful copies.

Once the asset is loaded, we now see a new entry in the asset list.

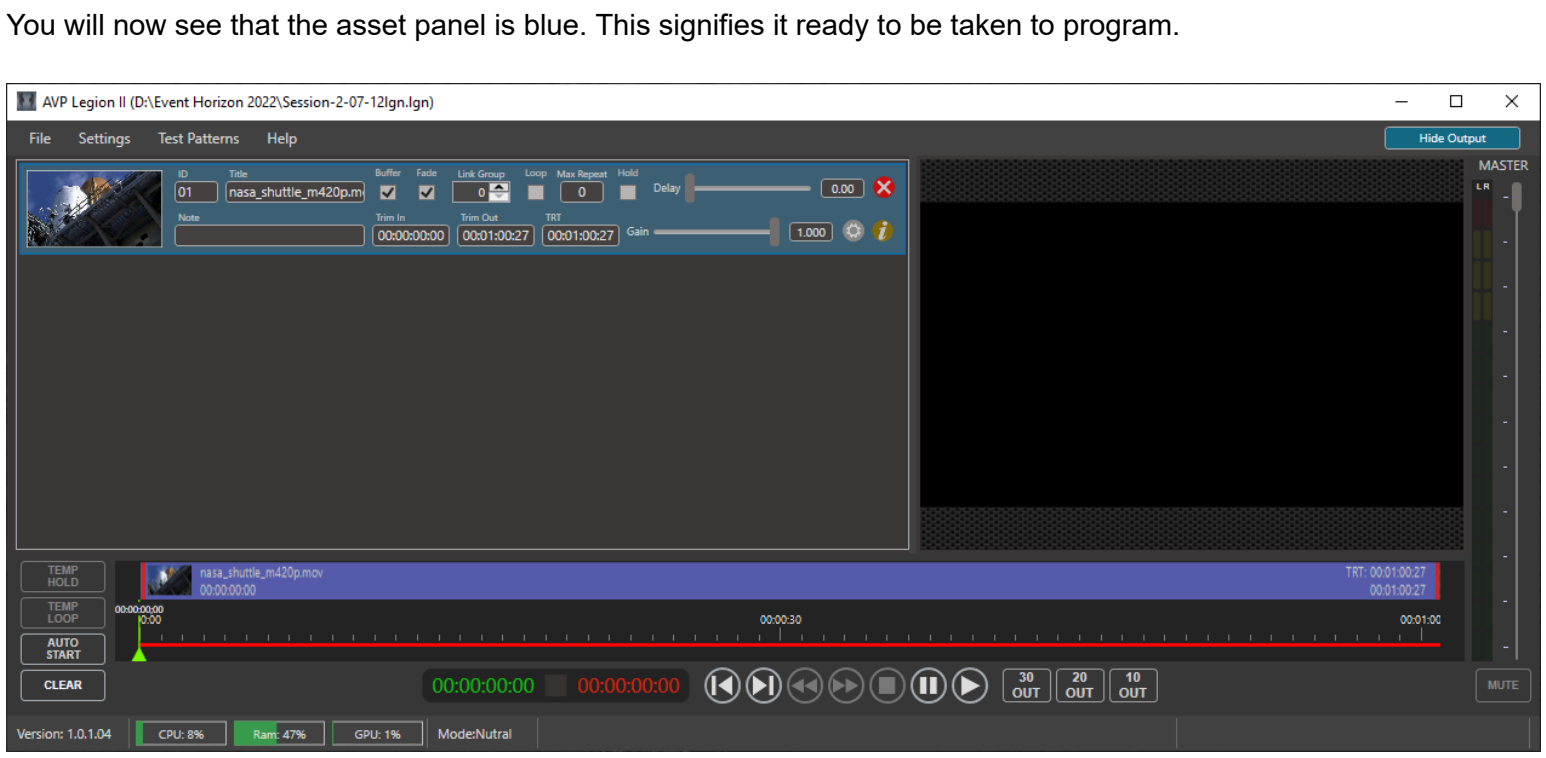


Refer to Asset Data Panel to learn more about the ways assets are cataloged and manipulated.

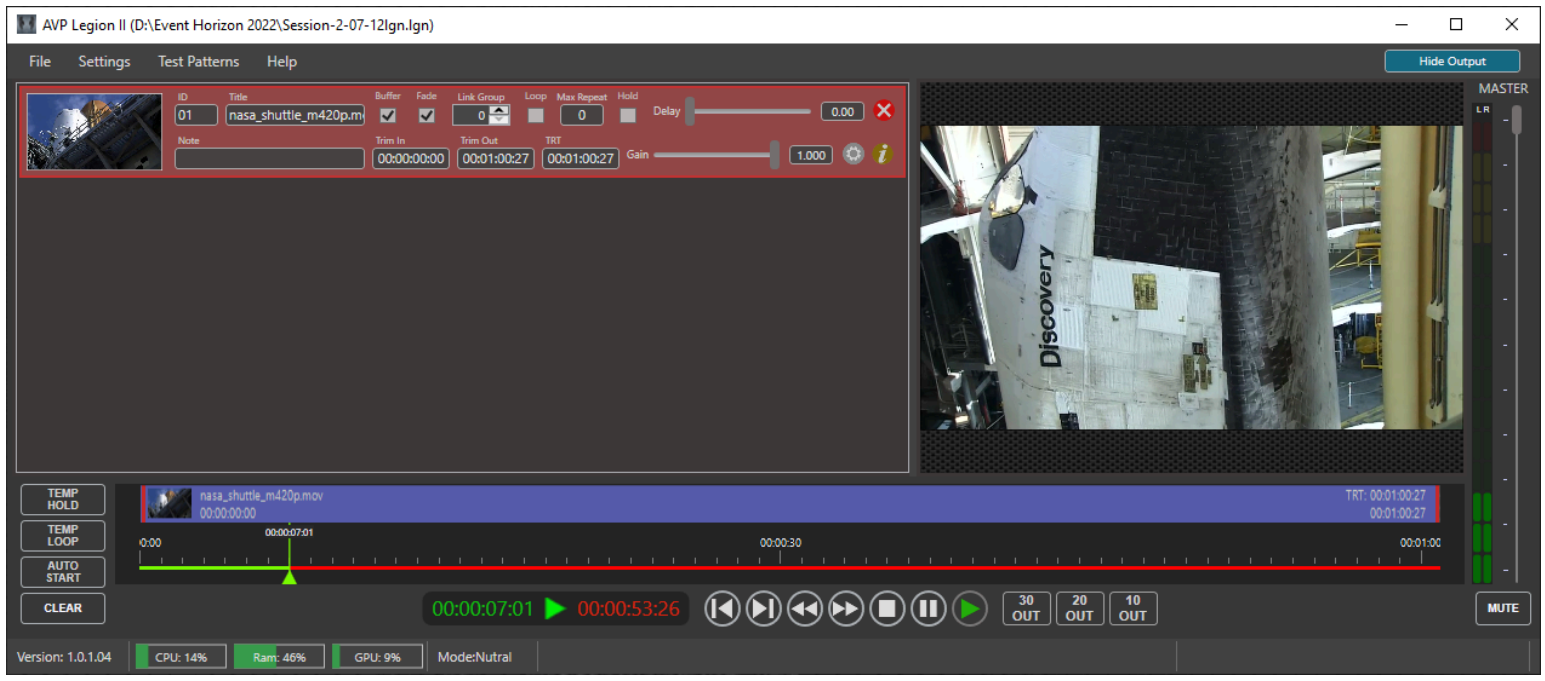
Now all that's left is to play the new asset. Start by clicking most anywhere within the new asset panel.

TIP: Asset standby selection will not occure if you click on any of the text boxes, check boxes or sliders. It is recomended that you aim for the thumbnail image to be sure the asset is selected.

You will now see that the asset panel is blue. This signifies it ready to be taken to program.



To take the asset to program and let play, simply click on the transport play button.  Once in program the asset panel turns red. This signifies it is now playing in program.



What's left is to repeat steps above and continue building your playlist.

Here we have a few more and when we select another while one is playing you can see the next one standing by to be taken.

If we want, we can now click on the play button and when we do a default cross-fade between to two will now occur. When the transition is done the previous clip is now stopped and reset to its starting point and the new file continues until it is stops.

Select another to wash rinse and repeat.

SEE ALSO

[Main Application Window]

[Launch Control]

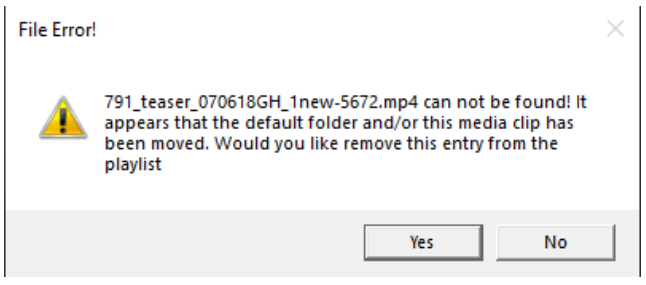
Handling media files

Here we discuss Legion's new strict enforcement of a centralized media file folder strategy and how you benefit.

Centralized file storage:

In previous versions, anytime a file was added to the playlist, the full path to its original location would be stored. When a playlist asset was selected to play, the system would find the file using this individual file path. For the most part this worked okay, but if that file was ever moved from that location the system would not be able to find it and would error anytime you tried calling it up. This is even more problematic if you needed to transfer an entire event to another computer. First off you would need to go hunting for them possibly in numerous locations, then pilling them into a single portable drive.

Fine you now have downloaded the files on the portable to the new computer. But if you didn't place them using the exact same drive and folder paths, anytime you try load the original playlist, none of the embedded file paths will match. Consequently, causing repeated errors as the system tries to load each one.



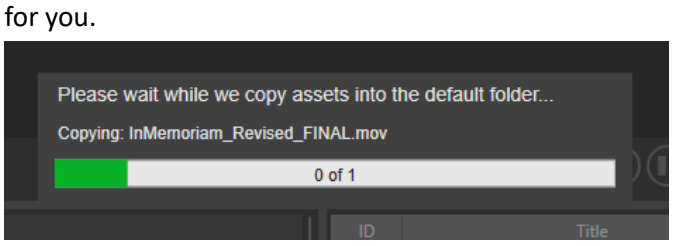
Now you have no choice but to rebuild the entire playlist from scratch.

By insisting that every file be contained in one folder, ('Event Asset Folder'), the playlist does not need to keep track of all the various locations instead it just only stores the file name itself. The path where the file came from is striped off. Now when a file is called up, the system only must query the one default event folder to find it.

Now if we need to move all the event files to another computer, or just move it to another drive, we simply copy the one folder and move it. Remember the actual playlist XML files are also contained in that same folder.

You may be now asking… Well, what if the actual path to the event folder isn't the same as what it was on the previous computer? It's simple, when you launch Legion and get to the launch control panel, change the 'Event Asset Folder' to point at the new folder location. As soon as you do that the 'Recent Playlist' list box should repopulate showing any playlist contained in that folder. Just double click the one you want, and everything will load as if it was still at the old location.

Don't worry Legion will go about enforcing this policy without asking you to jump thru hoops. You can still grab a file from a thumb drive or any other drive or folder location even from one on remote network. Its just that when you ask it to be included in the playlist Legion will end up making a copy and automatically place it into the assigned event folder for you.



NOTE: To prevent excessive use of available drive space on your system it is recommended that you manually add all needed assets directly to the event folder and prevent the system from needing to create wasteful copies.

SEE ALSO

Launch Control

Global Properties

Setup a primary & backup configuration

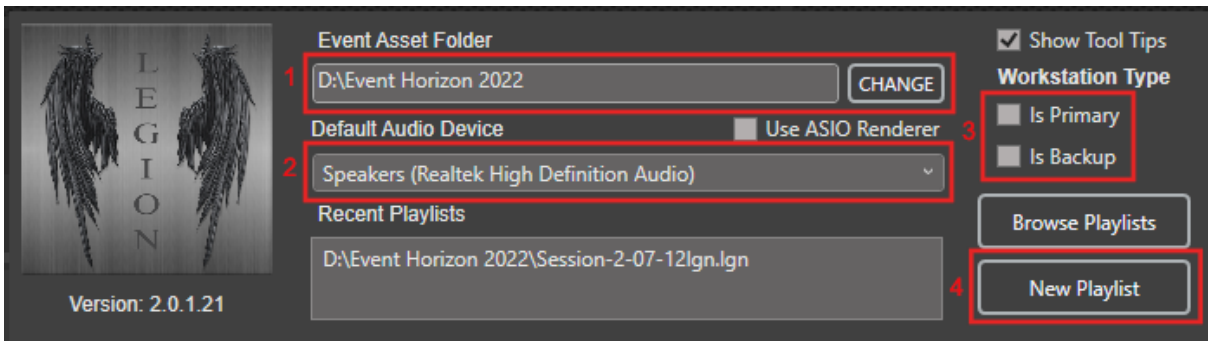
Instrumental in the success of a live multi-media event, is to have a backup solution for many of the supporting systems involved. This tutorial outlines the steps you need to take in order to make a secondary workstation act as a direct backup and is ready to take over when necessary.

Another unique feature of this app is the fact that when the link between the primary and backup is enabled, any edits made to the playlist along with changes made to its assets are automatically duplicated on the backup unit. This saves you from having to manually perform those same edits on the backup.

Communication between nodes is handled using a basic ethernet connection. So, the first thing we need to do is make sure one has been established where both are sharing the same sub net IP's. Unlike earlier A/V-Playback versions, Legion II no longer requires both machines to have inconvenient usernames and passwords for Windows login. Nor do we need to deal with aggravation of ensuring that network file sharing is configured properly. Now all file transfers can be performed internally.

So now that we have two separate networked computers, and each have a copy of Legion II installed we can begin.

Go ahead and launch Legion on both and hold when the launch control panel appears.



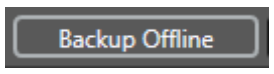
1) Let's make sure that each have an appropriate asset folder established. Just so you know the folder name and locations do not need to be the same, but it might be a good idea to do so at least to give your work flow some continuity.

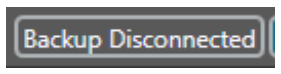
2) Next be sure that the correct audio output is selected especially on the backup unit.

It should be noted that if the primary playlist happens to be utilizing different audio outputs for various assets or if using a multichannel ASIO output device, it is being assumed that the backup may not have these exact same devices available. With that in mind all backup assets are stripped of those settings and will only use this chosen default.

3) Next is to designate which is the primary and which is the backup by checking the appropriate option under 'Workstation Type'.

4) Now all you need to do is create a new playlist for both instances. **Be sure the file name used on the backup is exactly the same as the primary one.**

OK, now we see some additional buttons appear near the top right. This one 

on the primary and this one 

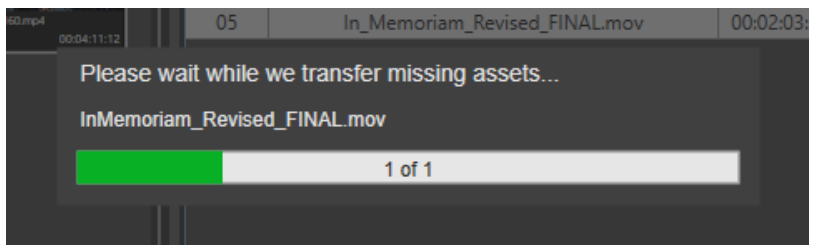
on the backup. These buttons provide you current link status as well giving you a way toggle the connection. Clicking this button from either workstaion will effect the same change.

When the link is enabled the the primary will look like this, 

and the backup is like this 

. If you want, you can go ahead and enable the link now.

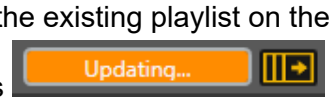
OK, now we can build our playlist. From this point forward you only need to work from the primary unit.
As files are added you will see those same assets appear in the backup's playlist. Here is the cool thing… If actual file doesn't currently exist in the backup's event folder, the system will automatically transfer a copy of the file to the backup for you.



Once an asset file is done loading on both machines, you free click on it in the primary machine taking it to preview. Remember, when a new file is added, it still needs to be buffered. When you take it to preview, it will buffer on both. Now you can take it to program, and it will begin playing on the backup as well.

TIP: Play between the two will be close in time but more than likely they will not be in absolute sync. However, we have found that after the asset is in preview, if you click on the pause button instead of the play button, when you click pause again the two will run very close to perfect sync.

Going forward from here:
From this point, most of the activities performed on the primary will be duplicated on the backup as well. This includes all program transport functions, (preview commands are not transferred.) and any individual property adjustments performed on all media assets.

There are however times when you may need to perform a forced update of the backup's playlist. Like when loading on the primary, a preexisting playlist which does not exist already on the backup.
In this situation, you can, go ahead and create a new blank playlist on the backup unit then after loading the existing playlist on the primary go ahead and click this  button that sits next to the "Backup Online" button. While it is working the buttons will look like this 

When done updating buttons will return normal colors and you are ready to proceed.

WARNING: Any time you perform a forced refresh playback on both machines will stop and all selections for preview and program will be cleared.

How to install or transfer an online license

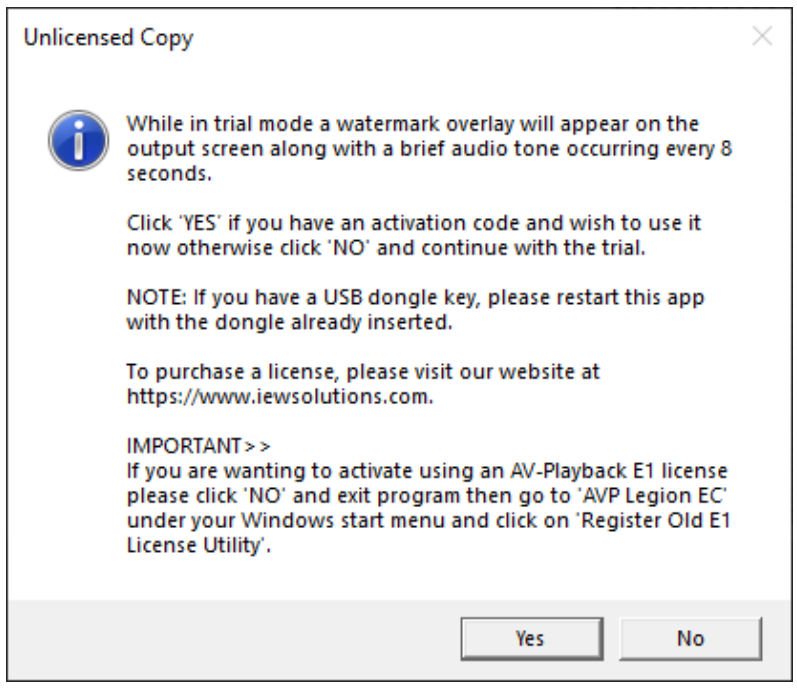
Activating for the first time:

For customers that did not purchase a USB license dongle and instead choose to activate their copy using our online activation server, please follow these simple steps:

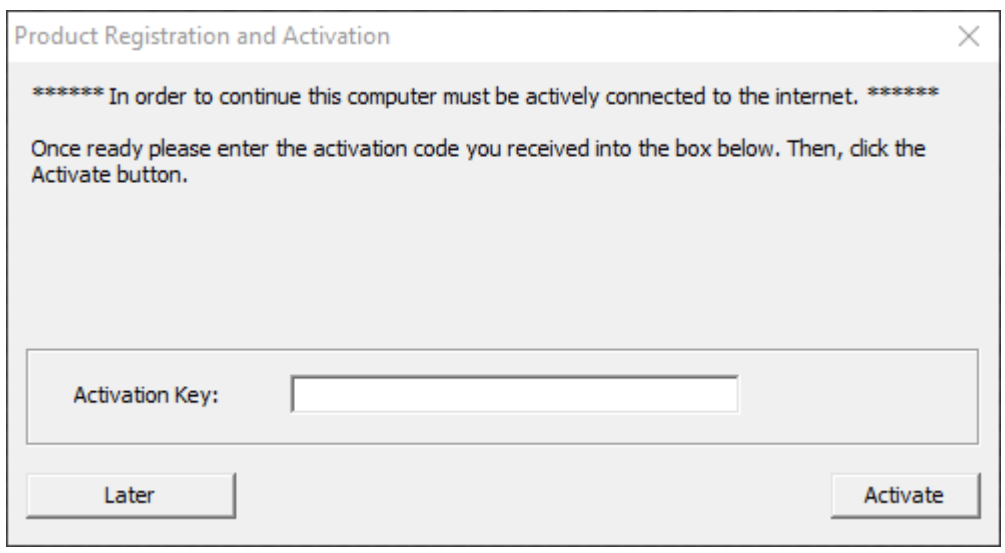
1) First ensure that your computer is connected to the internet.

2) Launch the Legion II app.

3) Anytime no license is detected on the computer this popup window will appear.



3) Go ahead and click the “Yes” button.



4) When this Registration & Activation dialog appears. Go ahead and insert the activation code you received into the text box labeled "Activation Key" and then click "Activate".

If all goes well you will see a small dialog confirming your license has been activated.

TIP: Before you continue you may want to close Legion and relaunch it to ensure that it truly recognizes the active license.

WARNING: If you purchased multiple licenses, it is very important you keep an accurate record of which key code was used to activate each computer. In order to transfer a license later you will need that exact same code used to activate.

It is also very important to remember to properly deactivate the license before you attempt to reformat and/or reinstall windows. Not doing so will make the license invalid and you may be required to purchase a new one to get back up and running again.

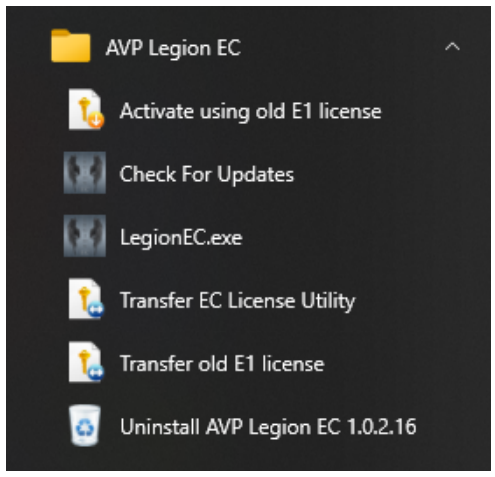
Transfer a license:

it is still possible to transfer the embedded license to another computer by following these simple steps.

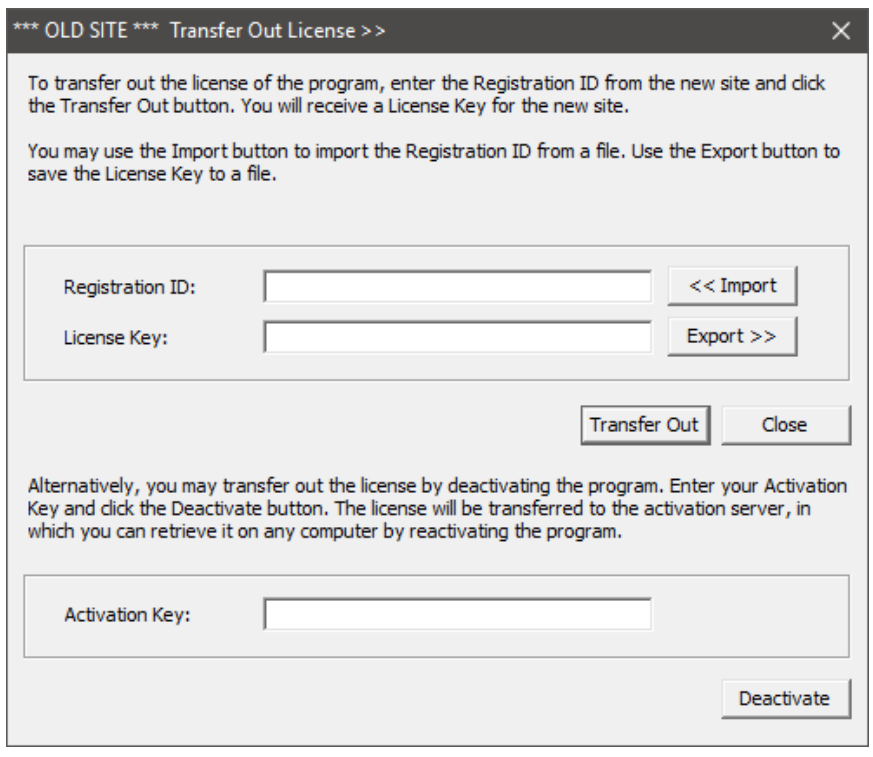
1) First you will need to ensure that both the old and new computers are connected to the internet.

2) Next ensure the Legion application closed on both.

3) On the unit you are wanting to transfer from, go to its Windows ‘Start’ menu, scroll down and click on “Legion II” then click on “Transfer EC License Utility”.



This window will now appear:



2) Enter the activation key you used originally into text box labeled Activation Key and click Deactivate.

3) At this point the current license status is encoded into the License Key and then sent back to the server. The Key on the present computer has now been destroyed.

You are now free to reuse that activation key on the new compter.
