

Alchemist File

User Guide



Version History

Date	Version	Release by	Reason for Changes
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30/04/2014	2.0	Jon Metcalf	Edit for V1.0.4.10 release
20/05/2014	3.0	Jon Metcalf	Edit for V1.1.0.6 release
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1. Definitions, Acronyms and Abbreviations

Table 1: Table of Terminology

Term	Definition
API	Application Programming Interface. An API specifies how some software components should interact with each other.
Cadence	A method of carrying low frame rate content, in a high frame rate video transport, by employing a process of repeating field/frames in a predictable sequence.
Container	A file encapsulation system where separate elements (also called 'Essence') are combined into a single file. Also known as a File-Wrapper
Destination folder	Folder where finished jobs are written to (access and authorisation required)
Drop Folder	A folder associated with a Watch Folder Configuration . The folder will act as a repository for files converted by the associated Watch Folder Configuration
EOTF	Electro-Optical Transfer Function. This describes how to turn digital code words into visible light
File Wrapper	A file encapsulation system where separate elements (also called Essence) are combined into a single file. Also known as a Container .
Filmic	Any video content that has a refresh rate of 30Hz, or less.
FIMS	Framework for Interoperable Media Services. A framework of service definitions for implementing media related operations using a Service Orientated Architecture (SOA)
GPU	Graphical Processing Unit. Very efficient, highly parallel compute engine for advanced image processing techniques.
GV File Browser	A service within the Alchemist File system that allows the User to easily browse to and select a source file or, browse to a destination folder.
GV File Node	Service which executes the jobs within the job queue. It performs all data processing (image/audio/metadata). The Node hardware is represented by the GPU.
GV File Client	The User Interface for the GV File framework.
GV File Server	The Service that orchestrates all GV File processes.
GV File Watcher	Service which monitors User specified Watch Folder and automatically adds them to the job queue. The User specifies a profile to be applied to each asset which is copied to Watch Folder and then drops the output into the specified Drop Folder.
GV File	The Snell OD name has been rebranded to GV File. There is no functional difference between GV File and Snell OD.
HDR	High Dynamic Range. Is a representation that allows extended dynamic range (darker darks, brighter whites) by means of new transfer functions (EOTF/OETF) and Wide Color Gamut (WCG), which replaces the traditional CRT gamma curve and BT709 colorspace.

Term	Definition
License file	Defines the quantity of products available
License Server	An application that manages product licenses
Locking code	Lock code based on specific locking criteria. GV File products are locked to host machine the Sentinel License service is installed on.
LUT	Look Up Table: LUT is a term used to describe a predetermined configuration for a specific HDR/Color-space transform.
OETF	Opto-Electronic Transfer Function. Inverse function of EOTF, describes how to turn visible light into digital code words
OOTF	Opto-Optical Transfer Function. End-to-end, camera-to-display non-linearity, intentionally introduced to the signal. Its purpose is to make the image perceptually as close as possible to the real world. Can be referred to as Rendering Intent.
Profile	A Profile defines how a piece of media is transformed / converted. Default profiles and User profiles are available
REST	Representational state transfer. Rest is a simple way of sending and receiving data between client and server. A RESTful web service is a web API implemented using HTTP and REST principles. Request methods include GET, POST, PUT, DELETE
SDR	Standard Dynamic range: traditional CRT gamma curve defined by BT709 colour space in HD and by REC601 in SD.
Watch Folder	A repository folder for source files, where the action of moving a file to the folder, will initiate an automated conversion process
WCG	Wide Color Gamut. ITU-R BT.2020 works together with the HDR functionality to offer a much wider color gamut than the traditional BT.709.
Video 1:1	A term describing high frame rate video. For example, with regard 50i 1:1, the video content is refreshed 50 times per second.

2. Overview copy

The GV File Client offers simple system configuration and management with intuitive and clear control of the job queue. At a glance it is possible to track which jobs are in progress, see estimated completion times, view source file metadata and interrogate both source and destination paths. Job creation is simplified through the use of an integrated browser which offers seamless access to assets on both local and remote shares.

Choose from a selection of preconfigured default Profiles or User Profile can be configured and applied to a job. The Profile creation widget offers intelligence to help the User generate their desired Profile quickly and easily.

Included is a notification system which keeps the User up to date with the state of the various framework services and a watch folder configuration widget to quickly and effectively automate the population of the job queue.

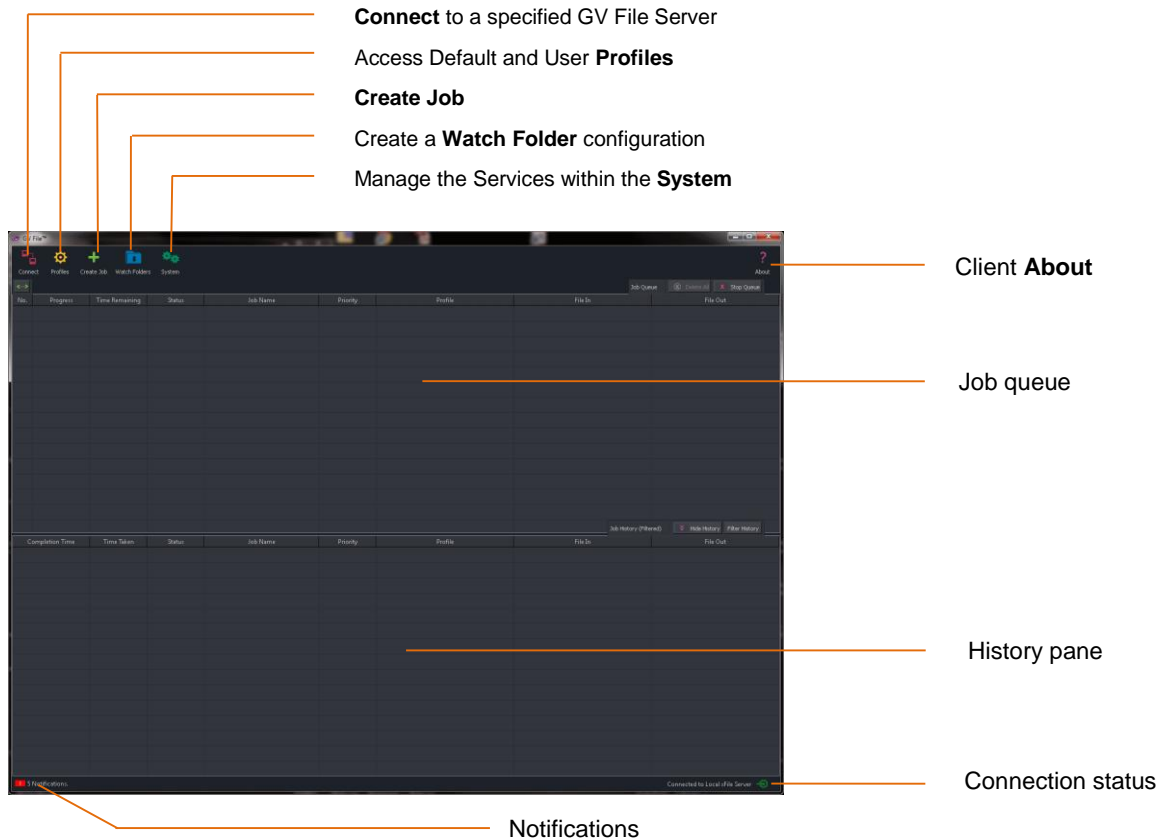
Note: Installation guides can be found here:

[GV File Installation Guide - Windows](#)

[GV File Installation Guide - Linux](#)

Note Linux OS is only supported up to software version V4.0.1.2

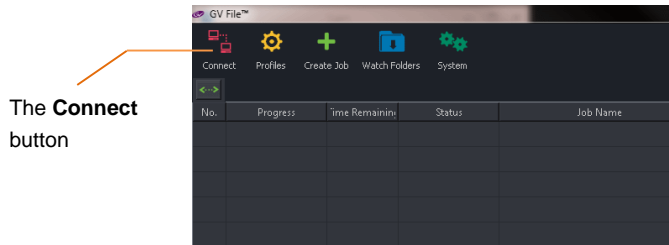
The GV File Client is easily launched via the desktop icon, which is created as part of the installation process.



The screenshot shows the main interface of the GV File Client. It has a dark theme with a top navigation bar containing icons for Connect, Profiles, Create Job, Watch Folders, and System. Below this is a large table for the job queue with columns for File, Progress, Time Remaining, Status, Job Name, Priority, Profile, File In, and File Out. At the bottom, there is a history pane with columns for Completion Time, Time Taken, Status, Job Name, Priority, Profile, File In, and File Out. A status bar at the very bottom shows "Notifications" on the left and "Connected to Local File Server" on the right.

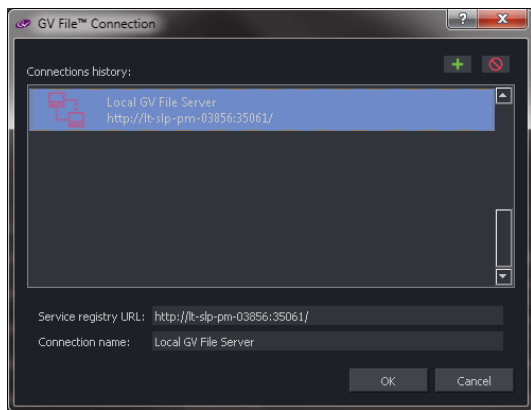
- Connect** to a specified GV File Server
- Access Default and User **Profiles**
- Create Job**
- Create a **Watch Folder** configuration
- Manage the Services within the **System**
- Client About**
- Job queue**
- History pane**
- Connection status**
- Notifications**

Connect is used to configure a connection to a specified GV File Server.

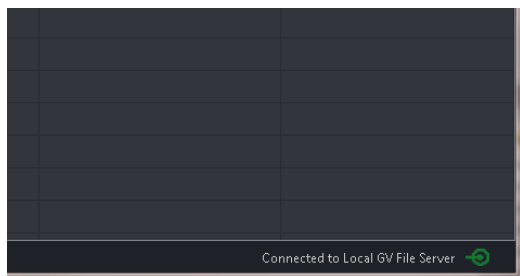


Selecting the Connect button will open the **GV File Connection** window. Only one Server can be connected to, at any one time, but multiple Server configurations can be stored.

Note that multiple Clients may be run on a single work station and each may connect to different GV File Servers.



Confirmation that the GV File Client has successfully connected to the GV File Server, is shown at the bottom of the Client GUI:



3. Profile Management

3.1 Introduction

Profiles are used to control the conversion/transformation applied to a job.

The Alchemist File system is supplied with a number of pre-configured conversion Profiles. These reconfigured Profiles are identified by a **Default** prefix and these cannot be edited or deleted.

However, because there are potentially a huge number of video format, video standard, codec and file wrapper combinations, it would be impractical to try and include all combinations as Default Profiles, hence Alchemist File offers the ability to create custom Profiles.

The Default Profiles can be used as a basis for a User Profile. A User Profile is a Profile that has been custom made by the User.

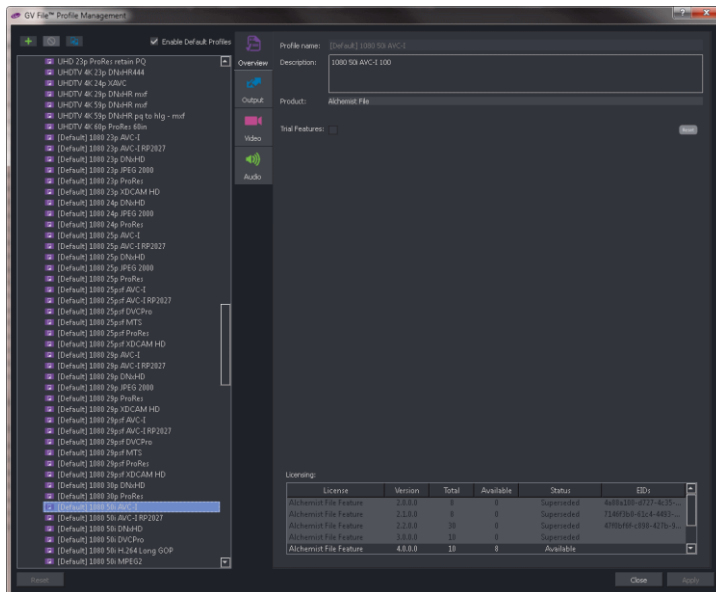
Once custom Profiles are configured, they will appear alongside the Default Profiles, in the list of available Profiles.

There are two methods that can be employed when building a new Profile:

Create a new Profile – This will create a Profile based on the default settings of the Alchemist File. The User can then modify the Profile so that it complies with their specific requirements.

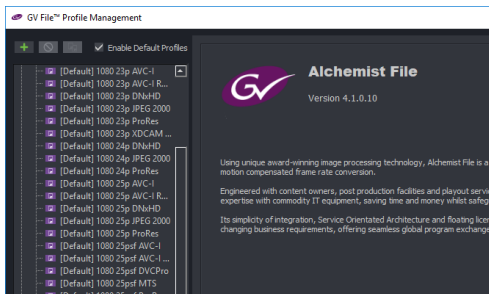
Copy and edit an existing Profile - This method allows the User to duplicate an existing Profile that best matches the requirements of the new Profile. This can then be modified so that it complies exactly with the requirements.

The **Copy** method usually offers the fastest approach, since it requires less parameters to be modified.



3.2 Create a New Profile

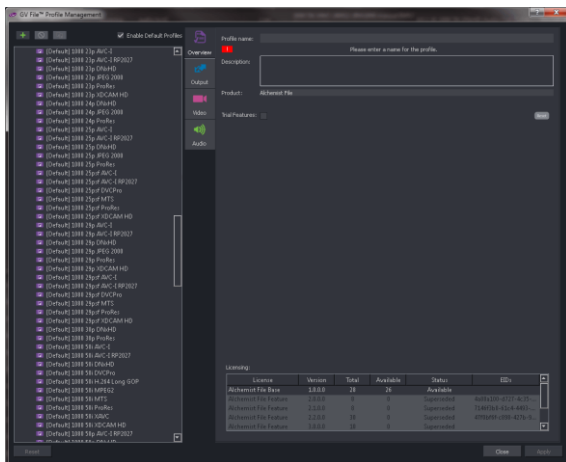
1. Select the Alchemist File product, in the left-hand pane of the **Profile Management** window.



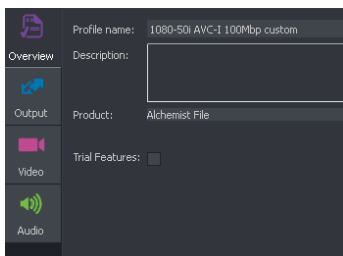
2. Select the **New Profile** icon



The **Profile Management** window will now be in a mode where it can be edited. All parameters will be at their default value.

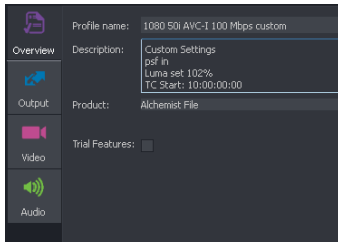


The User will be prompted to give the new Profile a name. This can be anything the User chooses, but it is often useful for the Profile name to describe the properties of the Profile.

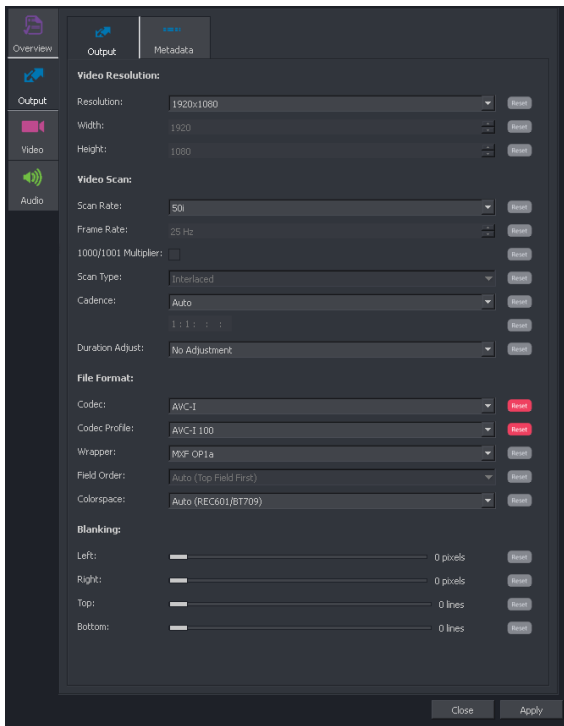


In this example, the output video standard, the video codec and the bit-rate, have all been incorporated into the Profile name. This practice is useful, but not essential. Alternatively, the User could choose to name the Profile by its relevance to a particular customer, or maybe to a particular series of programs.

3. A description may be added if desired. This is useful for future reference.



4. Now the parameters of the new Profile can be edited as per the requirements.



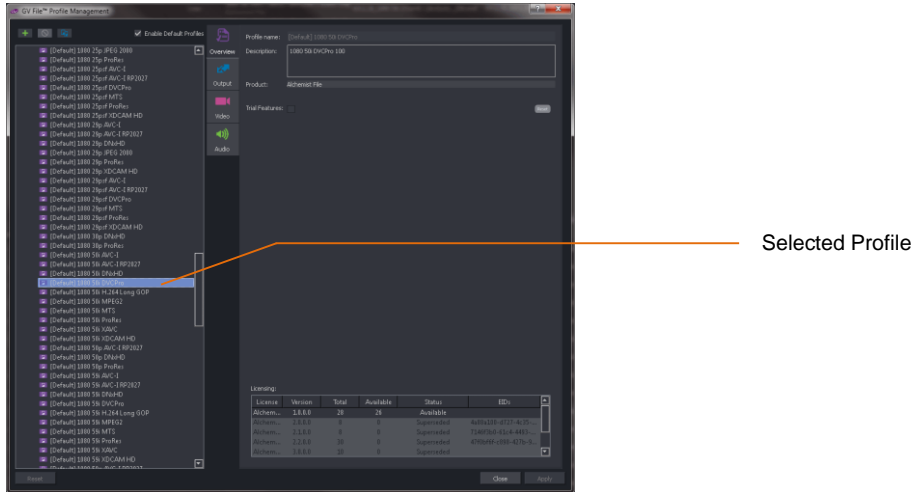
Note: Any parameter adjusted from its default value will set the associated **Reset** button to red.

A red **Reset** button means that it is active and when selected will return the particular parameter to its default value. Upon setting a parameter to default value, the associated **Reset** button will return to grey.

3.3 Copy and Edit an Existing Profile

As an alternative to building a new Profile from scratch, the **Copy** feature may be used. This is usually a quicker method of producing the required Profile.

1. Choose an existing profile that most closely matches the requirements of the required Profile. Click once on the Profile to highlight it.



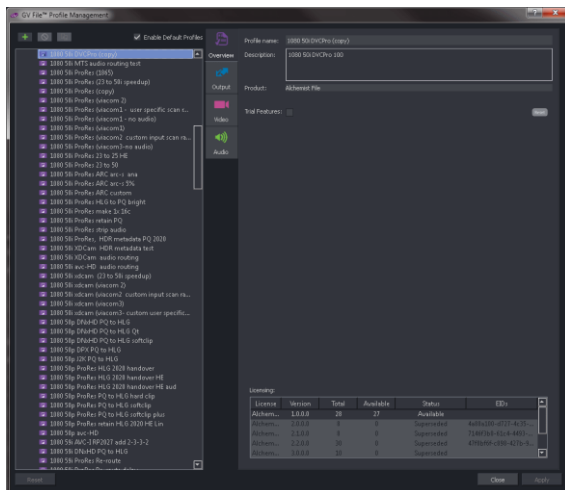
In this example, one of the default Profiles has been chosen. However, it is also possible to copy a custom Profile if required.

Note: The parameters of the Profile currently have black text. This is because the current Profile is a Default Profile and as such, cannot be edited.

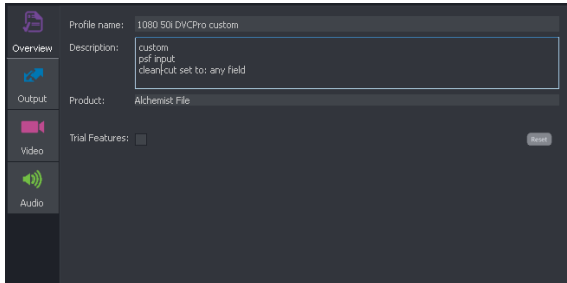
2. Click on the **copy** symbol



This will make a copy of the selected Profile. Note that the name of the Profile will now be appended with the word 'copy' in brackets. Also, note that the parameters within the Profile that the text is now white and can now be edited.

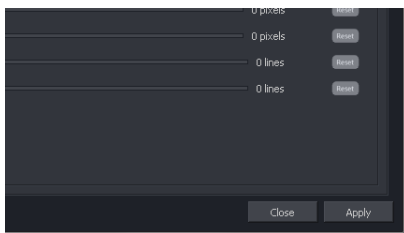


- Now the copied Profile can be edited as required.

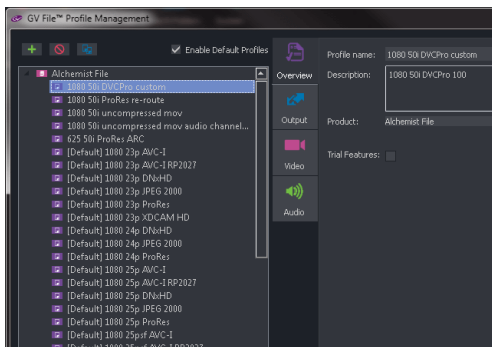


In this example, the name has been edited to something meaningful.

- When editing is complete, select **Apply** to save the new Profile.



- The new User Profile will now appear alongside the default Profiles.

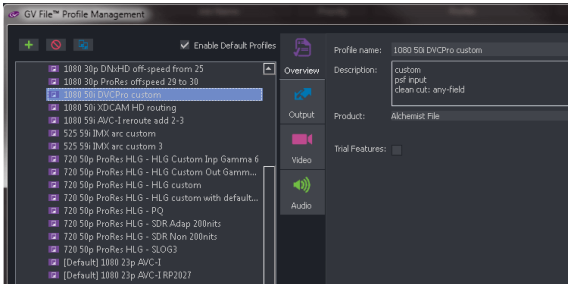


The new Profile is now available for any future job. It will remain so until such time as it is deleted.

3.4 Deleting Profiles

Only custom made Profiles can be deleted. Default Profiles cannot be deleted.

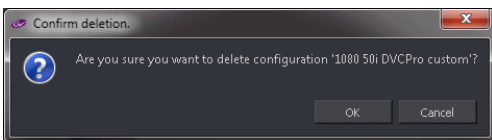
1. Click on the Profile that is to be deleted.



2. Click on the **Delete** symbol.



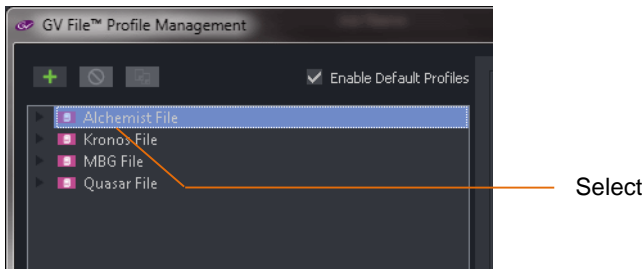
A **Confirm deletion** message will appear



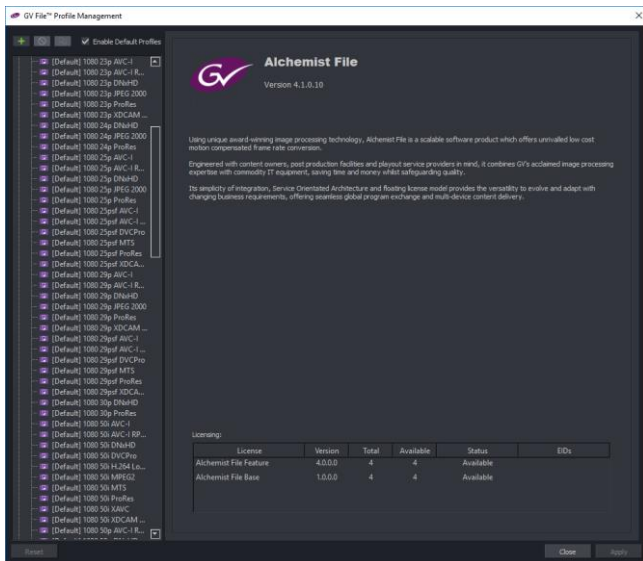
Click **OK** to complete the deletion.

3.5 Licensing Check

Click on the Product to view the License details.



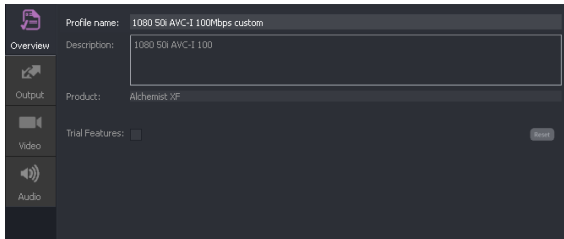
The Product overview window will inform the User of the license type, quantity, status and entitlement ID.



3.6 Overview Tab

3.6.1 Profile Name

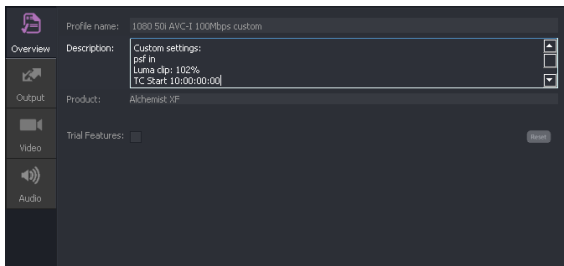
In the Overview tab, a prompt will appear to give the new Profile a name. This can be anything the User chooses, but it is often useful for the Profile name to describe the properties of the Profile. The Profile name may contain the video standard, the codec, the codec bit-rate, etc.



In this example, the output video standard, the video codec, the bit-rate and the file-wrapper type are all incorporated into the Profile name. This practice is useful, but not essential. Alternatively, the User could choose to name the Profile by its relevance to a particular customer, or maybe to a particular series of programs.

3.6.2 Profile Description

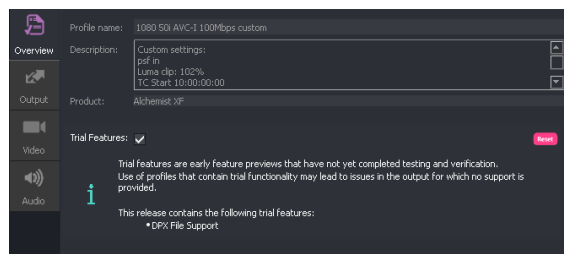
A description can be entered if required. This is often useful for future reference. This field is optional.



3.6.3 Trial Feature

Trial features may be enabled using the check-box.

A **Trial feature** is one which may not have been fully developed or validated. The User can use and experience the feature prior to it becoming a released feature.



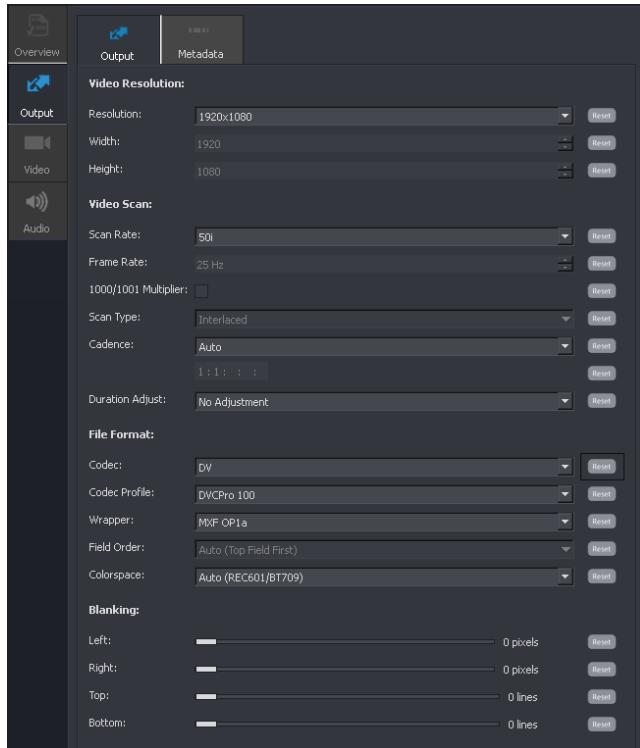
Note: Trial features should not be confused with the trial version of Alchemist File. These are completely different things!

4. Profile Configuration

This section describes the parameters available to configure a User profile.

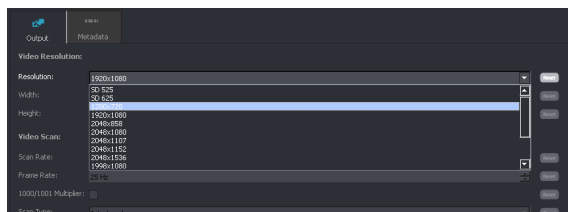
4.1 Output/Output Tab

Here the User can configure the video parameters of the output file.



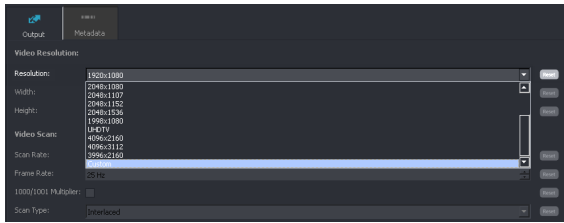
4.1.1 81Output/Output/Video Resolution/Resolution: Various

A drop down menu allows the User to choose the desired output video resolution.



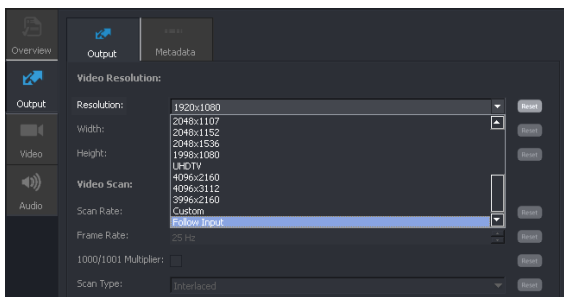
4.1.2 Output/Output/ Video Resolution/Resolution: Custom

From the **Resolution** drop down menu, the User may select the **Custom** setting.



Note: this feature is only available for file types that allow custom resolutions. These include: ProRes, Uncompressed mov, and DPX.

4.1.3 Output/Output/ Video Resolution/Resolution: Follow Input



When **Resolution** is set to **Follow Input** the output resolution will be set to be the same as the input file. This feature has certain restrictions:

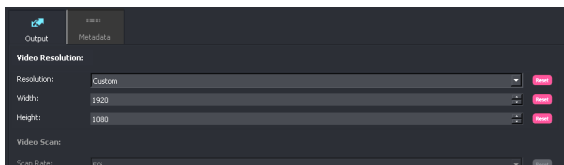
- The output file made will be ProRes/mov.
- The output file scan rate will be Progressive.

4.1.4 Output/Output/ Video Resolution/ Width & Height: Various

The **Custom Width** and **Custom Height** controls will only become active when **Resolution** is set to **Custom**. These controls allow the User to set any desired resolution.

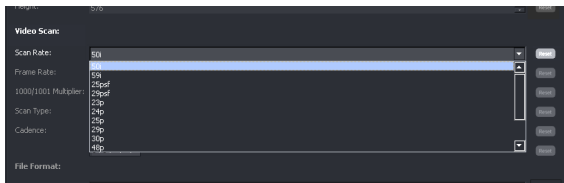


Both controls may be set anywhere between 32 and 8192. Custom settings can either be set by use of the **up/down** arrows, or by simply typing a value in.



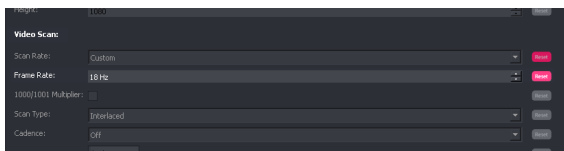
4.1.5 Output/Output/Video Scan/Scan rate: Various

A drop down menu allows the User to choose the desired output video scan rate.



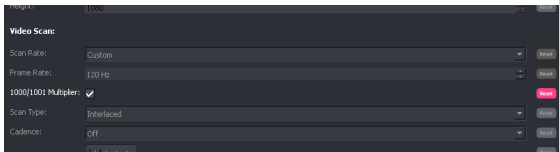
4.1.6 Output/ Output/ Video Scan/ Frame Rate: Various

This control is only active when the **Scan Rate** control is set to **Custom**. When active, the User can define the output frame rate between 12 and 300 fps.



4.1.7 Output/ Output/ Video Scan: 1000/1001 Multiplier

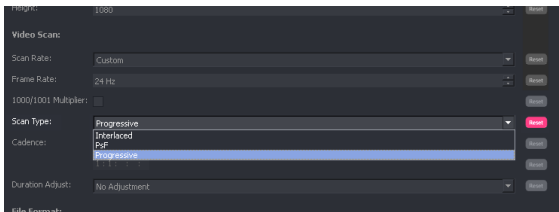
This control is only active when the **Scan Rate** control is set to **Custom**. When active, the User can apply the 1000/1001 multiplier to the defined output frame rate.



In this example the Frame Rate is set to 120 Hz and the 1000/1001 multiplier is set. Hence the actual output frame rate will be: 119.88 Hz

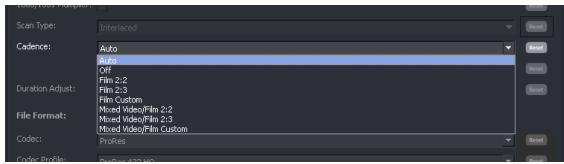
4.1.8 Output/ Output/ Video Scan/Scan Type: Interlaced / PsF / Progressive

This control is only active when the **Scan Rate** control is set to **Custom**. Here the User can define the output scan type as Interlaced, psf or Progressive, using the drop down menu.



4.1.9 Output/Output/Video Scan/Cadence

This control allows the User to set the desired output cadence. A number of preset values are included. An output cadence can be applied to any temporal resolution. The **mixed** options allow **filmic** source segments to maintain the **filmic** look and higher frame rate (video) segments to maintain the **video** look.



Auto

Note; the default is **Auto**. In this mode, the output will maintain the video, or filmic, quality of the source file.

The following table describes the effect of this setting upon low frame rate inputs, when high frame rate outputs are configured:

Table 2: Output Cadence Auto setting

Input file scan-rate	Output Scan Rate						
	Output Cadence setting	50i	59.94i	60i	50p	59.94p	60p
23.98p	Auto	25psf	29.97psf	30psf	50p 2:2	59.95p 2:2	60p 2:2
23.98p	off	50i	59.94i	60i	50p	59.94p	60p
24p	Auto	25psf	29.97psf	30psf	50p 2:2	59.95p 2:2	60p 2:2
24p	off	50i	59.94i	60i	50p	59.94p	60p
25p / 25psf	Auto	25psf	29.97psf	30psf	50p 2:2	59.95p 2:2	60p 2:2
25p / 25psf	off	50i	59.94i	60i	50p	59.94p	60p
29p / 29psf	Auto	25psf	29.97psf	30psf	50p 2:2	59.95p 2:2	60p 2:2
29p / 29psf	off	50i	59.94i	60i	50p	59.94p	60p
30p	Auto	25psf	29.97psf	30psf	50p 2:2	59.95p 2:2	60p 2:2
30p	off	50i	59.94i	60i	50p	59.94p	60p

Example:

If the source file is 23.98p and the output frame rate is configured to be 50i, if the **Output Cadence** control is set to **Auto**, the output generated will be 25psf i.e. low frame rate in, equals low frame rate out.

This also applies when mixed cadence sources are encountered. If the input has for example, segments of 50i 1:1 and segments of 25psf, if an output frame rate of 59.94i is configured; where the input is 50i 1:1, the output will be 59.94i 1:1 and when the input is 25psf, the output will be 29.97psf.

Off

When the Output Cadence control is set to **Off**, the output scan rate will be dictated by the setting of the **Scan Rate** control (see 4.1.4), irrespective of the source file properties.

In scenarios where the source content is Filmic and the output frame rate is configured high (i.e 50i, 59i, etc) a *low to high* frame rate conversion will take place. The Filmic quality of the source will not be maintained at the output.

Film 2:2

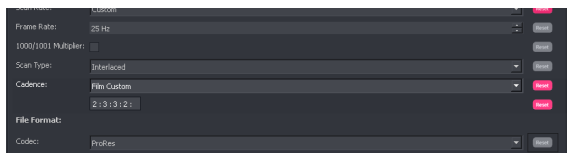
This setting will force output content to contain a 2:2 cadence. If the output is interlaced, the output will have a 2:2 F1/2 (psf) cadence. If the output is progressive, the output will be 2:2 progressive.

Film 2:3

This setting will force output content to contain a continuous 2:3 cadence.

Film Custom

Custom cadences can also be configured.



In this example, a custom cadence of 2:3:3:2 has been configured. This will result in a continuous 2:3:3:2 sequence being applied to the output content. Popular cadences are 2:2:2:4, 5:5, 2:2:3:2:3 etc.

Mixed Video/Film 2:2

This control setting should be used when encountering source content containing a mixture of video and filmic content, when it is desired to maintain the source cadence in the output file.

Note that when **Output Cadence** control is set to **Mixed Video/Film 2:2**, the **Input/Source Cadence – Cadence** control (see section 4.3.6) will automatically be set to **Detect Sharp**. This is because the detector must be switched on for this conversion process to work.

When set, where the source is low frame rate filmic content, the output will have a 2:2 cadence applied. So for example if the output file was 50i, the content would have to be 25psf.

When the source is high frame rate, the output will correspondingly be high frame rate. i.e. 50i 1:1.

Mixed Video/Film 2:3

This control setting should be used when encountering source content containing a mixture of video and filmic content, when it is desired to maintain the visual look of the source, in the output file. This would normally apply to a 59.94Hz output file.

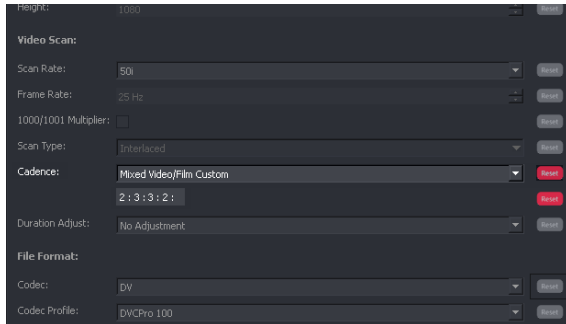
Note that when **Output Cadence** control is set to **Mixed Video/Film 2:3**, the **Input/Source Cadence – Cadence** control (see section 4.3.6) will automatically be set to **Detect Sharp**. This is because the detector must be switched on for this conversion process to work.

When set, where the source is low frame rate filmic content, the corresponding output will have a 2:3 cadence applied. So for example if the output file was 59i, the content would have be 59.94i 2:3.

When the source is high frame rate, the corresponding output will be high frame rate. i.e. 59i 1:1.

Mixed Video/Film Custom

This control setting should be used when encountering source content containing a mixture of video and filmic content, when it is desired to maintain the visual look of the source, in the output file. This would normally apply to a 59.94Hz output file and where an alternative cadence type is desired. The alternative cadence should be entered in the appropriate box:

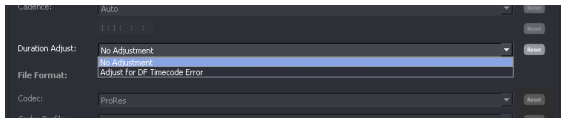


Note that when **Output Cadence** control is set to **Mixed Video/Film Custom**, the **Input/Source Cadence – Cadence** control (see section 4.3.6) will automatically be set to **Detect Sharp**. This is because the detector must be switched on for this conversion process to work.

When the source is filmic, the corresponding output will maintain the filmic quality of the source, by adding the configured custom cadence.

When the source is high frame rate, the output will correspondingly be high frame rate. i.e. 59i 1:1.

4.1.10 Duration Adjust



This control is used specifically where short files are processed, where the output duration defined by timecode, must be the same as the input file length, also defined by timecode.

This control has two possible settings:

- No Adjustment
- Adjust for DF timecode error

No adjustment:

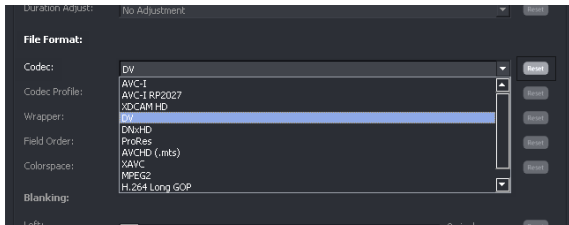
When selected, the actual duration of the output will be as close as possible to actual duration of the source file. Note that because Alchemist File must build output files with an integer number of frames and it is usually the case, that when frame rate converting, output files cannot be the exact same duration as the source file.

Adjust for DF timecode error:

When selected, the output file duration as defined by timecode, will be as close as possible to the input file, as defined by timecode.

4.1.11 Output/ Output/ File Format/ Codec: Various

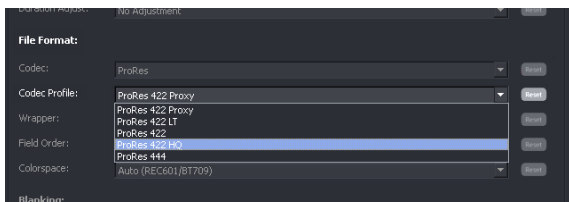
A drop down menu allows the User to choose the desired output video codec.



Note that some codecs are not available with certain file type configurations (i.e. JPEG is not offered when interlaced scan rates are configured). At such times, the codec will not be offered as a selectable item.

4.1.12 Output/ Output/ File Format/ Codec Profile: Various

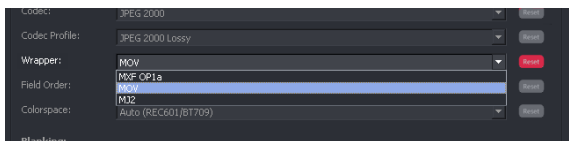
A drop down menu allows the User to set the desired bit-rate and bit-depth, of the codec used in the output file.



Note that the dropdown menu for this parameter will be dependent upon the chosen Codec. In this example the various ProRes profiles are shown.

4.1.13 Output/ Output/ File Format/ Wrapper: various

A drop down menu allows the User to set the desired file wrapper. The client will only offer wrappers which are valid for the format, codec and codec profile selected.



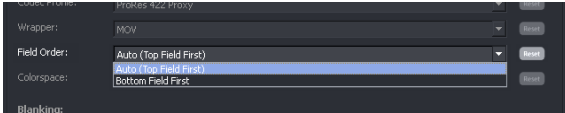
Note that the drop-down menu for this parameter will be dependent upon the chosen **Codec**.

In this example the JPEG profiles has been selected and so the choice is given to wrap the file either as:

- **.MXF OP1a**
- **.MOV**
- **.MJ2**

4.1.14 Output/Output/ File Format/ Field Order: Various

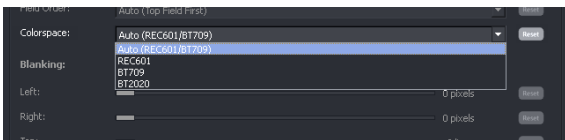
This control is only active when the output file type is interlaced ProRes, DPX or Uncompressed MOV. A User may choose to define the output field order as either TFF (top field first), or BFF (bottom field first), by use of the drop down menu.



Note: When the output is HD, the Auto mode is TFF. When the output is SD, the Auto Mode is BFF.

4.1.15 Output/Output/Colorspace: Auto/REC601/BT709/BT2020

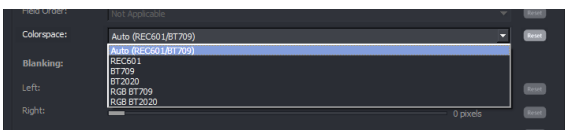
A drop down menu allows the User to set the desired colorspace setting. The default value is **Auto**. In **Auto** mode the system will choose the appropriate colorspace for the chosen output file type. Alternatively the User can choose to manually select the required colorspace.



When set to **Auto** output color space will be set to the appropriate SDR colour space (when the output is HD, or 4K, output colorspace will comply with BT709. When the output is SD output colorspace will comply with REC601).

BT2020 may be manually configured.

JPEG2000 Options

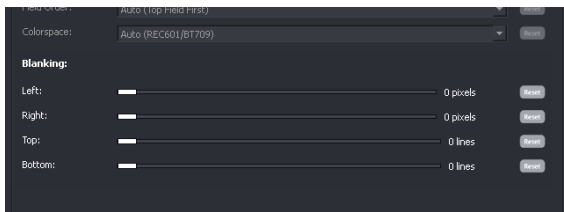


When the output is configure employing a JPEG2000 Codec, an extended Colorspace option menu is available. Options also include:

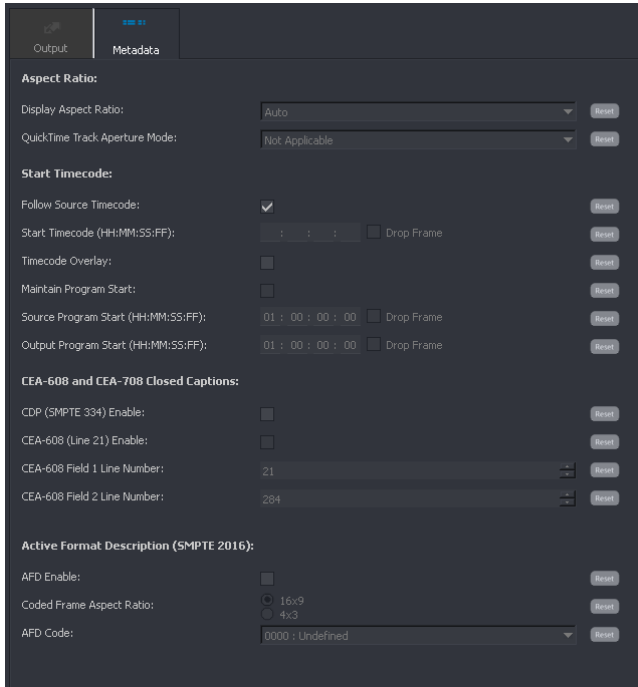
- **RGB BT709**
- **RGB BT2020**

4.1.16 Output/Output/Blanking: Left/Right/Top/Bottom

The Blanking slider controls allow the User to blank areas of the output image. Blanked areas will appear black in the output image.

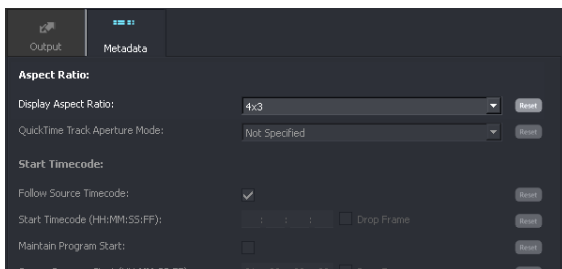


4.2 Output/Metadata



4.2.1 Output/Metadata/Display Aspect Ratio: 4x3 / 16x9 / 4x3 Full / 16x9 Full

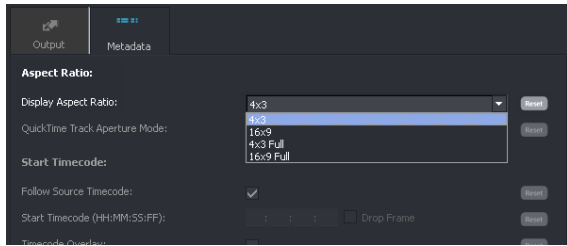
This control is only active when an SD output format is configured*. It allows the User to define the metadata parameter **Display Aspect Ratio**. The default setting is **4x3**.



If an HD, 2K or 4K standard is configured; this control is disabled (greyed out).

*In the event that a custom output resolution is configured in the **Output** menu, then the **Display Aspect Ratio** control will be active. This is because an SD custom resolution could be configured and the User may want to tag the output file as either 4x3 or 16x9. In this case, the default setting of the control **Display Aspect Ratio** is 16x9.

The control has four possible settings, selectable from a drop down menu:



4x3 This setting is applicable for when the output program is to be displayed on a 4x3 video monitor. This setting uses the default values dictated by the specific file format being employed by the output file.

Note that when the output file type utilizes a MOV file wrapper, that default values are based on analogue blanking (625: 702x576 / 525: 702x486). This behaviour is inherent in the MOV file wrapper. All other file types will scale correctly in the digital domain (625: 720x576, 525: 720x486).

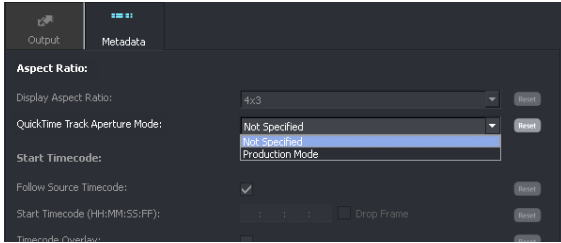
16x9 This setting is used if the SD output program is to be displayed on a 16x9 video monitor. When **16x9** is selected, the spatial scaling will be dictated by the specific file format being employed in the output file.

Note that when the output file type utilizes a MOV file wrapper, that default values are based on analogue blanking values (625: 702x576, 525: 702x486). This will affect scaling to 16x9, where the actual aspect ratio created will be 1.85:1 (true 16x9 = 1.77:1). This behaviour is inherent in the MOV file wrapper. All other file types will scale correctly to 16x9.

4x3 Full This setting is only available when the output file format utilizes a MOV file wrapper. When selected, the output file will be scaled using digital blanking values, (625: 720x576, 525: 720x486) so ensuring the output is exactly 4:3.

16x9 Full This setting is only available when the output file format utilizes a MOV file wrapper. This setting is used if the output program is to be displayed on a 16x9 video monitor. Unlike the **16x9** setting, the **16x9 Full** setting will set spatial scaling values to make the output file display exactly to 16x9.

4.2.2 QuickTime Track Aperture Mode



This control is only active when the output standard is SD, and the output file container is QuickTime.

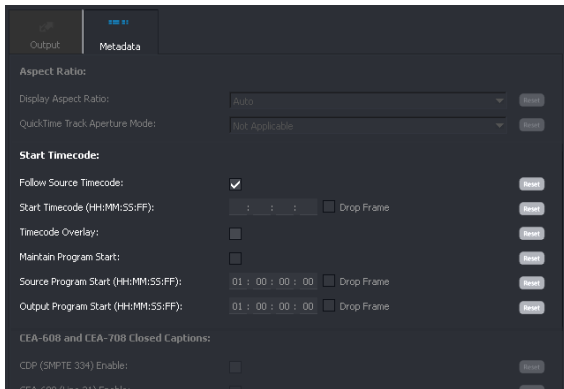
The **Track Aperture Mode** is an optional MOV container atom that stores information for video correction by describing the dimensions of the clean aperture, the production aperture and the encoded pixels.

When MOV files are played in Apple QuickTime player, the DAR setting is ignored unless the **Track Aperture Mode** is set to **Production Mode**.

4.2.3 Output/Metadata/Start Timecode

This control allows the User to define the output timecode count.

The default setting is: **Follow Source Timecode**.



In this mode output timecode will follow source timecode by preloading the output timecode generator with the start timecode value extracted from the source. The output generator will then free run.

Note: Drop frame timecode is designed to faithfully represent real time as shown on a clock on the wall. It achieves this by dropping 2 frame counts every minute, except every tenth minute. For this reason a drop frame conversion doesn't contain all the time code frame counts which would be present in a non-drop frame source.

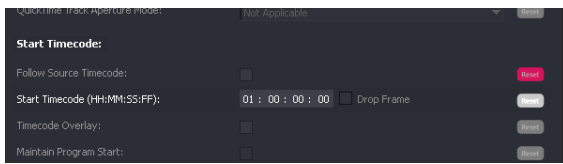
However, non-drop frame timecode includes all timecode counts, but a consequence to this is that timecode time does not represent real time.

In circumstances where the input has no timecode and **Follow source timecode** is enabled, output timecode will use the default value as a starting point i.e. 01:00:00:00

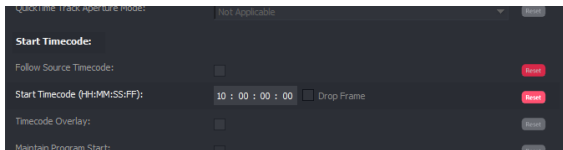
Note that if the output scan rate is set to 59fps, when **Follow source timecode** is enabled, the output timecode will be, by definition, drop frame.

Alternatively, the User can choose to start output timecode from a specific value. Un-checking the **Follow Source Timecode** control will make the **Start Timecode (hh.mm.ss.ff)** control active.

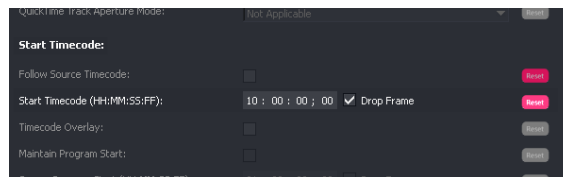
The default timecode value of 1 hour (01:00:00:00) will be displayed.



The **Start timecode (hh.mm.ss.ff)** value may be configured to be any timecode value the User chooses, by simply typing a numerical value:

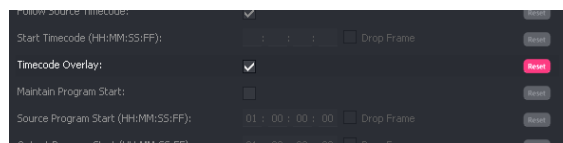


Note that if a 29.97 or 59.94 fps output format is selected in the **Output** menu, the **Drop Frame** control will now become active, allowing the User to define the output timecode as either drop frame, or non-drop frame.

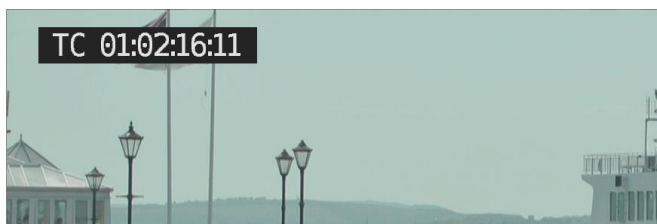


The default setting is **Drop Frame**.

Timecode Overlay

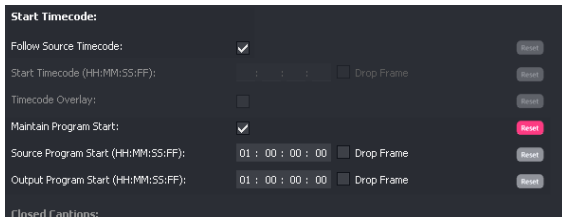


When enabled, a timecode overlay will appear within the active picture area (upper left), of the output video content.



Maintain Program Start

This feature is only applicable for Off-speed processes.



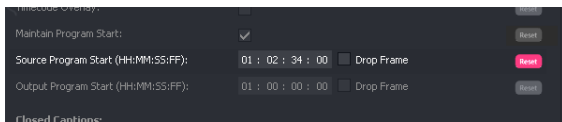
Note that **Maintain Program Start** can only be enabled when **Follow Source Timecode** is enabled.

When off-speeding the duration of a file is altered. In files that contain a pre-run before program start, this feature allows a User to either:

- Maintain the program start TC (same as the source).
- Define the program start.

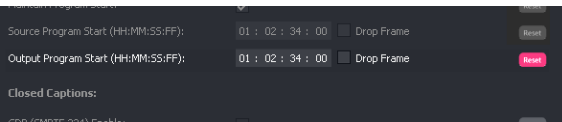
Source Program Start (HH:MM:SS:FF)

This control allows a User to define the program start point, in the source file.



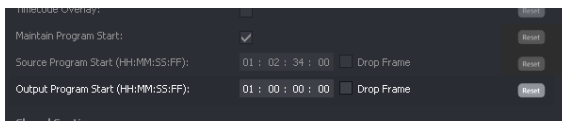
Output Program Start (HH:MM:SS:FF)

This control allows a User to configure the program start point, in the output file.



If it is desired to maintain the program start timecode of the source in the output file, the **Output Program Start** timecode should be set to the same value as the defined **Source Program Start** timecode.

An alternative program start timecode may be configured.



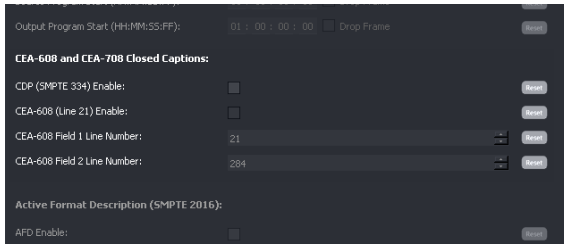
In this example, the User has defined the program start as 01:02:34:00.

The output program start timecode is configured to be 01:00:00:00.

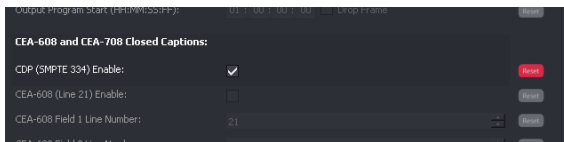
Note: When the source is either 29.97 or 59.94 it is important that the **Source Program Start** timecode is defined in terms of being Drop Frame, or Non drop Frame, for the calibration process to work correction.

When the output is either 29.97 or 59.94, the output Timecode may be defined as either Drop-Frame or Non Drop-Frame.

4.2.4 Output/Metadata/CEA-608 and CEA-708 Closed Captions:



CDP (SMPTE 334) Enable

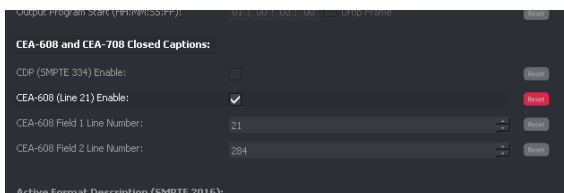


When enabled, the **CDP (SMPTE 334) Enable** control will allow any Closed Captions in the input to be inserted in the output as SMPTE 436M ancillary data.

Note – this control is only active when certain output file types are configured. Where the feature is not supported, the control will be unavailable (greyed out).

Output/Metadata/CEA-608 (Line 21) enable

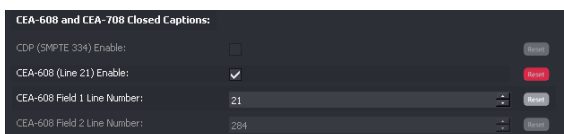
The **CEA-608 (Line 21) enable** control set is only active when **SD 525** is set as the output format, and the IMX/D10 codec, or DPX, is configured. In all other cases the control is inactive.



The control **CEA-608 (Line 21) enable**, when enabled will allow input Closed Captions conforming to CEA 608 to pass to the output, or CEA 708 CB (compatibility byte) to be transposed into the output as CEA608.

Output/Metadata/CEA-608 field 1 line number

The control **CEA-608 field 1 line number** allows the User to configure an alternative output line to carry the CEA608 caption. This can be on any line between line 10 and line 25. Default is line 21.



Output/Metadata/CEA-608 field 2 line number

Similarly, the control **CEA-608 field 2 line number** allows the User to configure an alternative output line to carry the CEA-608 caption. This can be on any line between line 274 and line 288. Default is line 284.



Note – Alchemist File only offers output Closed Captions support of CEA608 (line 21) when the output format is either D10/IMX MXF OP1a, or DPX. Whenever an output file type is configured that is not D10/IMX MXF OP1a, or DPX, the **CEA-608 (Line 21) enable** control will be disabled.

4.2.5 Output/Metadata/Active Format Description (SMPTE 2016)

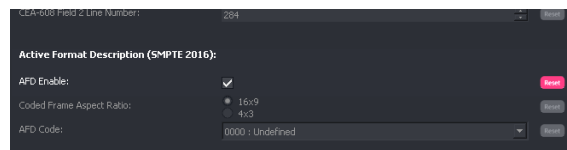
The User can choose to add SMPTE 2016 signalling information to the output file. AFD codes can be selected from a drop down menu. However, this feature is limited to certain output file formats. When the feature is not supported by the chosen output format, the **AFD enable control** will be unavailable (greyed out).



Output/Metadata/AFD enable

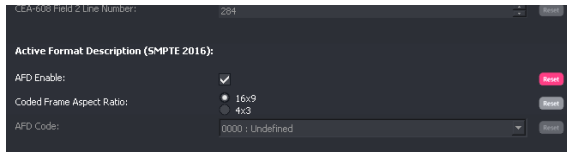
If an output codec is selected that supports the insertion of SMPTE 2016 AFD codes, the User may choose to enable the feature using the AFD enable checkbox.

The **AFD enable** control is default off (unchecked).



Output/Metadata/Coded Frame Aspect Ratio

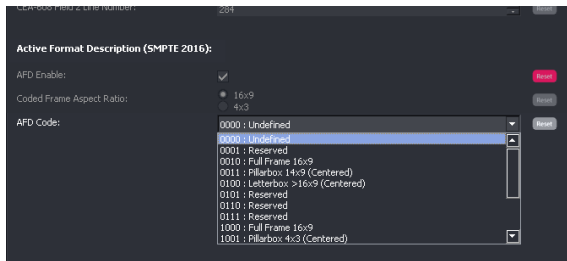
When enabled, the **Coded Frame Aspect Ratio**, and the **AFD code** controls become active.



The coded frame may be set to either 16x9, or 4x3, by selecting the appropriate check box.

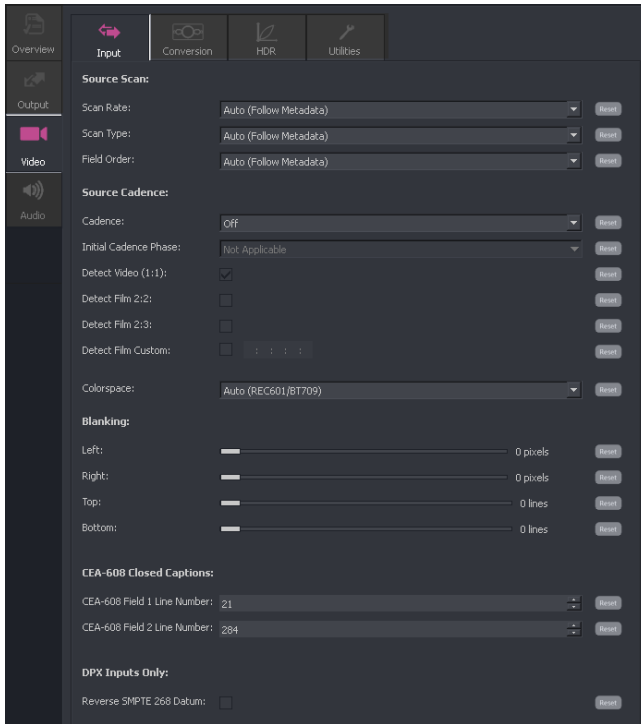
Output/Metadata/AFD Code

A specific AFD code may be selected from the drop-down menu.



4.3 Video/Input

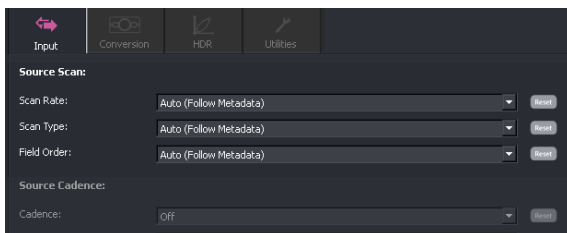
The video menu contains three sub menus: **Input**, **Conversion** and **Utilities**.



4.3.1 Video/Input/Source Scan

Video/Input/Source Scan/Scan Rate

This control has two possible settings: **Auto (Follow Metadata)** and **User Specified**, selectable from a drop down menu.

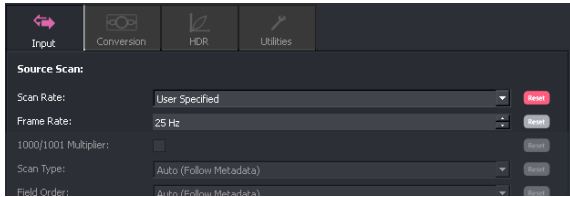


When set to **Auto**, the source frame rate will be determined from the source file metadata.

In circumstances where the metadata in the source file is deemed to be incorrect with respect to frame rate, a User can choose to over-ride the metadata and process the file, manually defining the correct source frame rate. Setting this control to **User Specified** will make the **Frame Rate** control (below) active.

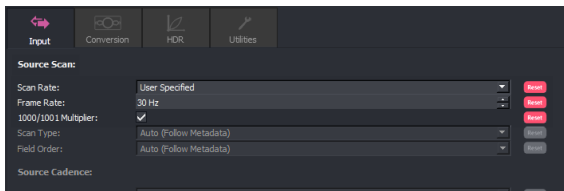
4.3.2 Video/Input/Source Scan/Frame rate

This control is only visible when the **Scan Rate** control (above) is set to **User Specified**. Once active, the User can manually set the source frame rate.



4.3.3 Video/Input/Source Scan/1000/1001 Multiplier

This control is only visible when the **Scan Rate** control (above) is set to **User Specified**. Once active, the User can use this control to define a frame rate that uses the 1000/1001 Multiplier (i.e. 59.94 – set 60Hz and enable the multiplier).

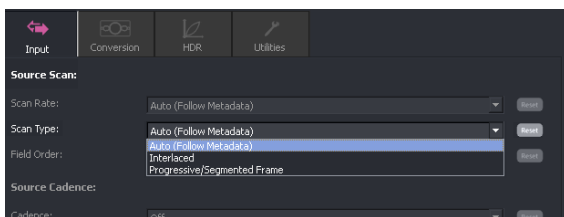


In this example, the frame-rate of the input has been defined to be 30Hz and the 1000/1001 Multiplier has been enabled. Hence, the frame rate of the input file has been defined to be 29.97Hz.

4.3.4 Video/Input/Source Scan/Scan Type

This control has three possible settings:

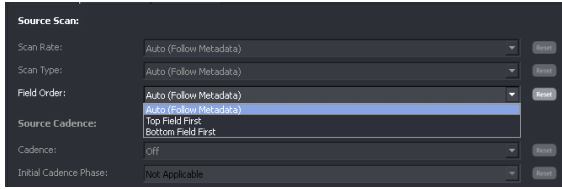
- Auto
- Interlaced
- Progressive/Segmented Frame.



In **Auto**, the system will automatically determine input scan rate from the metadata. This is the default setting.

Alternatively, the User can choose to force the **Scan Type** control to either **Interlaced**, or to **Progressive/Segmented Frame**. This is useful if the associated metadata incorrectly describes the actual video essence.

4.3.5 Video/Input/Source Scan/Field order: Auto/Top field first/Bottom field first



The purpose of this control is to allow the User to force the field order. This is useful if the associated metadata incorrectly describes the actual video essence.

The control has three settings:

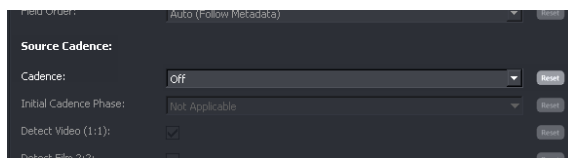
- Auto (Follow Metadata)
- Top field first (TFF)
- Bottom field first (BFF)

When set to **Auto (Follow Metadata)** the field order will be treated as described by the metadata.

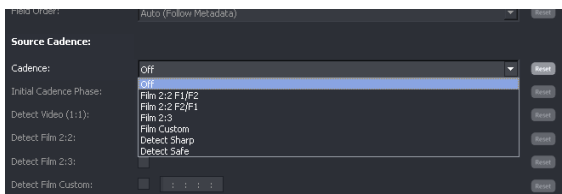
The setting **Top Field First** will process the file as 'top field first' and will ignore the metadata (with respect to this parameter).

The setting **Bottom Field First** will process the file as 'bottom field first' and will ignore the metadata (with respect to this parameter).

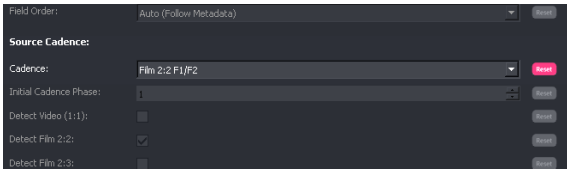
4.3.6 Video / Input / Source Cadence / Cadence: Various



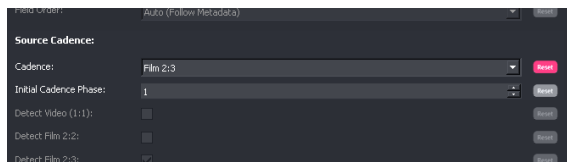
The **Source Cadence** control allows the User to define the source cadence or detect a source cadence. The default setting is **Off**. When **Off**, it is assumed the cadence in the source matches the format defined in the associated metadata i.e. 720 50p would contain a new temporal sample every frame. 1080 59i would contain a new temporal sample every field.



In circumstances where the User is confident that their source content conforms to a particular cadence, then the appropriate cadence type can be selected from the drop-down menu.

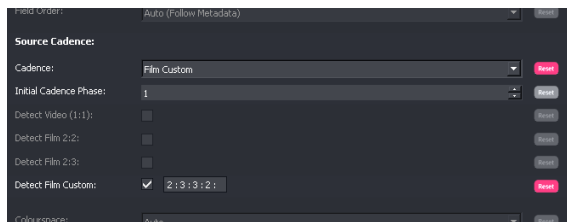


If the source encountered has a 2:3 cadence associated with it and the User chooses to define the input cadence as **Film 2:3**, the **Initial Cadence Phase** control will become active.



This control allows the User to define the phase of the source 2:3 cadence. In this particular scenario, it is essential that the source content has a continuous, unbroken 2:3 cadence associated with it and that the User correctly configures the **Initial Cadence Phase** of the source content. In circumstances where these parameters are unknown, the User should configure the mode to be **Detect**.

The **Cadence** option **Film Custom**, allows the User to define an input cadence that is not available as a preset. There are many different cadence types in use today, usually associated with the 29.97 frame rate. In the following example a custom cadence of 2:3:3:2 has been configured. Where the cadence type configured has a phase sequence, the User must correctly define the phase sequence.



Cadence Detect

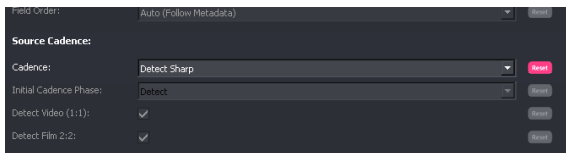
Probably the most useful setting for the **Cadence** control is **Detect**. In this mode it is not necessary for the User to define the source cadence. The system will adaptively detect the source cadence and process the content accordingly.

When the **Cadence** control is set to one of the **Detect modes**, the controls **Detect video (1:1)**, **Detect video 2:2**, and **Detect video 2:3** all become active.

Alchemist File offers two detect modes:

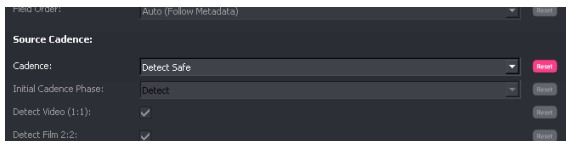
- Detect Sharp
- Detect Safe

Detect Sharp



The **Detect Sharp** mode allows maximum possible vertical resolution. However, this mode is less tolerant of film sequence detection errors.

Detect Safe



The **Detect Safe** mode is more more tolerant to film sequence detection errors. This mode is useful for filmic content that contains mixed cadence regions and also broken cadence regions. Note that this mode does compromise verticle resolution, so results maybe slightly softer than when using the **Detect Sharp** mode.

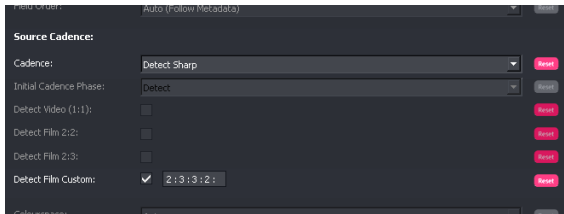
When either **Detect** mode is selected, the controls **Detect video (1:1)**, **Detect video 2:2**, and **Detect video 2:3** will all be enabled. However, the User can choose to disable any or all of these controls and so configure the detector appropriately for the source content being processed.

Note; in the file-based domain, it is not uncommon for source files to have mixed and non-standard cadences. It is possible, that source content containing multiple cadence types is encountered. For example, 1:1, 2:2 and 2:3 cadences may be present, all within the same program. For such content, the **Detect** mode should be configured.

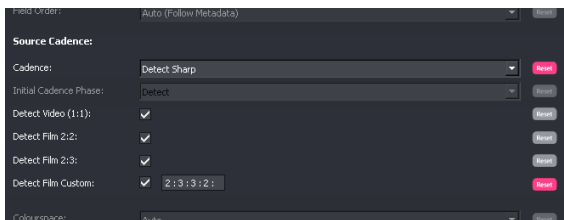
Detect Film Custom

The control **Detect Film Custom** allows the User to define a source cadence type that is not 1:1, 2:2 or 2:3. Common alternative cadences include 2:2:2:4, 2:3:3:2, 2:2:3:2:3 or 5:5 (5:5 is usually associated with animation).

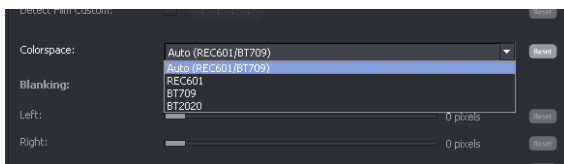
In the following example a custom cadence of 2:3:3:2 has been configured.



Note that the **Detect Film Custom** control can be enabled alongside the other **Detect film** modes:



4.3.7 Video/Input/Colorspace: Auto/REC601/BT709/BT2020



The Input **Colorspace** control is used to define the incoming colorspace. There are four possible settings that can be selected from a drop-down menu:

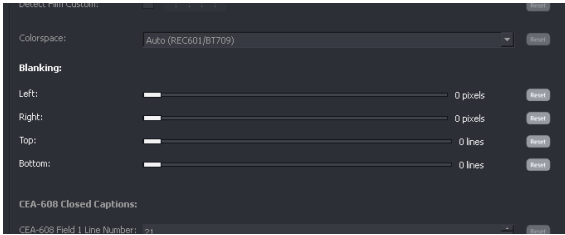
Auto:

- When the incoming file is SD, it will be assumed that the colorspace complies to: REC601.
- When the incoming file is HD, 2K or 4K, it will be assumed that the colorspace complies to; BT709.

Alternatively, the User can manually define the colorspace of the incoming video file. This will be necessary if the incoming colorspace complies to: BT2020

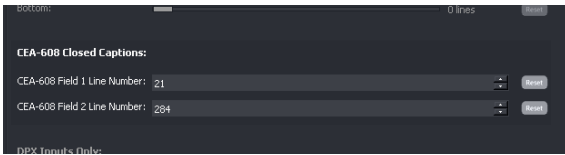
4.3.8 Video/Input/Input Blanking: Left/Right/Top/Bottom

Blanking controls would normally be left in their default settings, but if required, input blanking can be manually configured. Blanked areas will appear black in the output image.

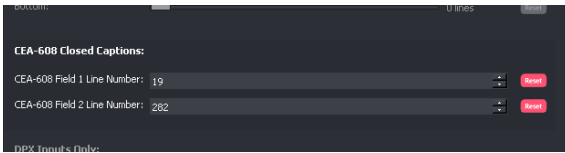


4.3.9 Video/Input/ CEA-608 Closed Captions

This control is only applicable when the input format is SD. This control allows the User to define the input line that Closed Captions are present on. This is usually line 21 of field 1, and line 284 of field 2, which are the default values of these controls.



In circumstances where source CEA-608 closed captions are carried on an alternative input line, these controls allow the User to define these alternative lines:

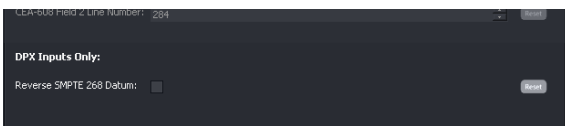


4.3.10 Video/Input/DPX Inputs only/Reverse SMPTE 268 Datum

This control will be disabled unless **Trial features** are enabled (see section 3.6.3, page 20).

DPX files are not wrapped into a file wrapper which offers metadata describing the frame rate. For this reason the User must specify the input frame rate (part 4.3.1, 4.3.2 above).

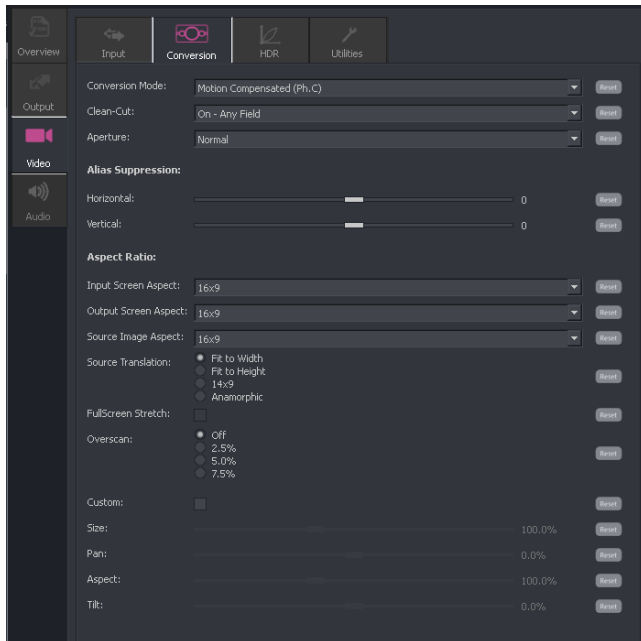
DPX files can either conform the SMPTE268, or to an alternative specification, DVS. The control **Reverse SMPTE 268 datum** should be selected when source DPX files conform the DVS specification.



For additional information regarding DPX support, see Appendix D at the end of this document (page 138).

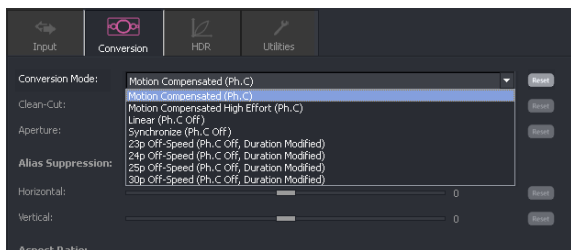
4.4 Video/Conversion Tab

The second **Video** tab relates to **Conversion** parameters.



4.4.1 Video/Conversion/Conversion: Various

The conversion mode may be selected from a drop down menu.

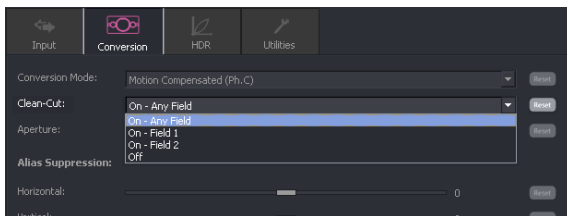


This control offers a choice of several modes of operation:

- Motion Compensated (Ph.C)
- Motion Compensated High Effort (PhC)
- Linear (Ph.C off)
- Synchronize (Ph.C off)
- Off-Speed (Ph.C Off, Duration Modified)

- Motion Compensated (Ph.C)** Is the default and applies Motion Compensated Interpolation when converting from one frame rate to another.
- Motion Compensated High Effort (Ph.C)** Enables a 'high effort' motion compensation mode. In many cases the conversion performance is near indistinguishable from **Motion Compensated (Ph.C)**, however it can be beneficial when converting:
- complex moving, small objects (particularly at low frame rates).
 - moving images which contain fixed burnt in captions.
- This mode will never result in an inferior quality of conversion [when compared to the default **Motion Compensated (Ph.C)**], but it does require more processing resources and hence conversion durations are significantly extended.
- Linear (Ph.C off)** Disables Motion Compensation, and employs a linear interpolation when converting from one frame rate to another. Sometimes referred to as 'frame blending'.
- Synchronize (Ph.C off)** Converts from one frame rate to another by dropping or repeating input pictures as required. Depending on the conversion requested, field or frame based synchronise events could occur.
- Off-Speed (Ph.C Off, Duration Modified)** This mode simulates a VTR verispeed process. No picture building takes place and no conversion artefacts are produced. However, the duration of the program content is modified (i.e. 24 to 25 fps, reduces the duration by 4%). In this mode, associated audio maybe; discarded, pitch-shifted or re-sampled (see section 4.7.3 **Audio Processing**, below). Note that this mode is only offered when input/output frame rate configurations allow it.

4.4.2 Video/Conversion/Clean-cut: On – Any field / On - Field 1/ On - Field 2/ Off

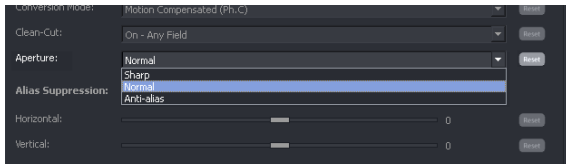


This control allows the User to configure the Clean-cut feature. The default setting is **On - Any field**. Selecting the dropdown menu will offer four options for the Clean-cut feature.

- On - Any field:** Cuts are output on the closest output field boundary to the detected input cut.
- On - Field 1:** Cuts are restricted such that the first field of a new scene always begins on a field 1.
- On - Field 2:** Cuts are restricted such that the first field of a new scene always begins on a field 2.
- Off:** The Clean-cut feature will be disabled.

4.4.3 Video/Conversion/Aperture: Sharp/Normal/Anti-Alias

This control can be used to set the appropriate conversion aperture.



Available settings are **Normal**, **Sharp** & **Anti-alias**. The default setting is **Normal**.

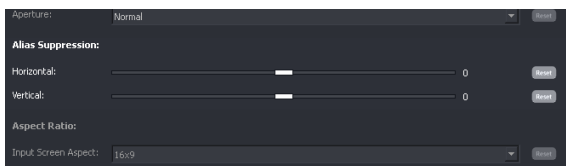
Sharp preserves the most vertical resolution from the input picture.

Normal provides the best compromise for typical input pictures.

Anti-alias is designed to prevent objectionable aliases in the output pictures. Aliasing refers to an artefact associated with sampled signals. This undesirable effect is caused by sampling frequencies being too low to faithfully reproduce the frequencies present in the original source.

4.4.4 Video/Conversion/Alias Suppression: Horizontal/Vertical

The **Alias Suppression** feature allows the User to manually increase or decrease the magnitude of alias suppression. Separate horizontal and vertical controls are available.



Two slider controls are offered. Default setting is zero.

Positive settings increase alias suppression.

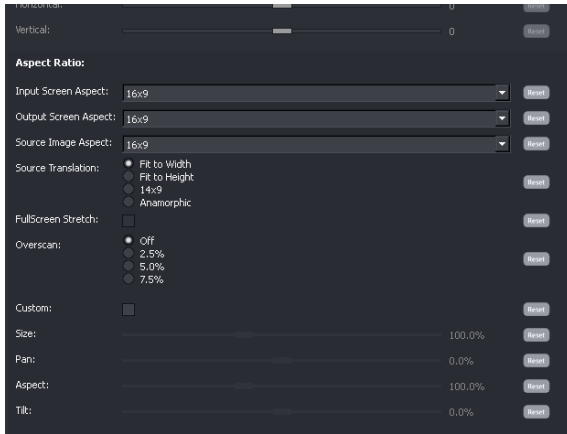
Negative settings decrease suppression.

Alias suppression should be used to balance perceived resolution against unwanted aliasing.

4.4.5 Video/Conversion/Aspect Ratio: Various

Note: a more comprehensive document is available for the Alchemist File ARC feature. Please refer to the User guide: **Alchemist File - How to configure the ARC** (available from the GV File website).

The User can specify aspect ratio translations using either the drop down fields or the custom fields.

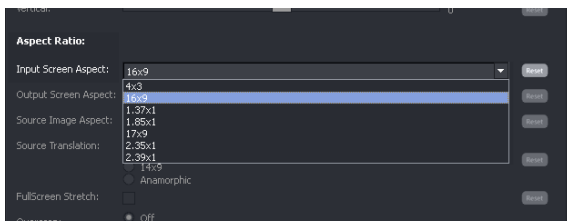


ARC controls include:

- **Input Screen Aspect**
- **Output Screen Aspect**
- **Source Image Aspect**
- **Source Translation**

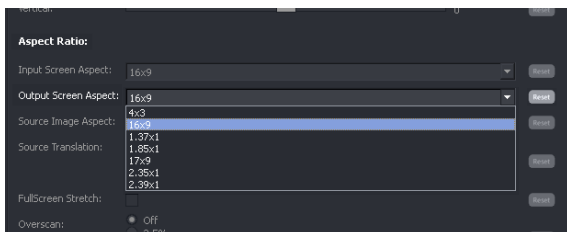
Input Screen Aspect

This control is used to describe the source screen input aspect ratio by selecting the relevant setting from the drop down list:



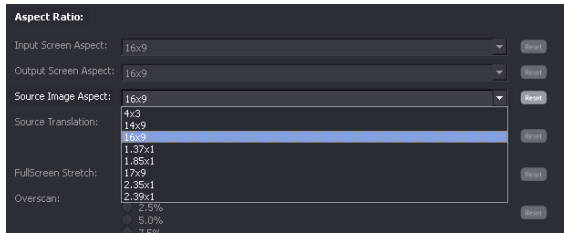
Output Screen Aspect

This control is used to describe the destination screen aspect ratio from the drop down list.



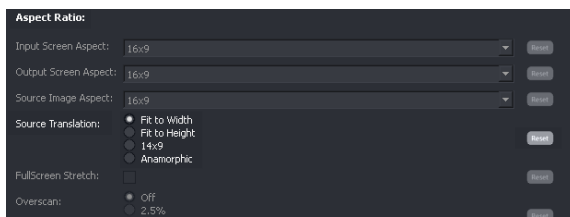
Source Image Aspect

This control is used to define the aspect ratio of the active image within the input screen aspect.



Source Translation

This control is used to describe the translation required from source to output image.



FullScreen Stretch

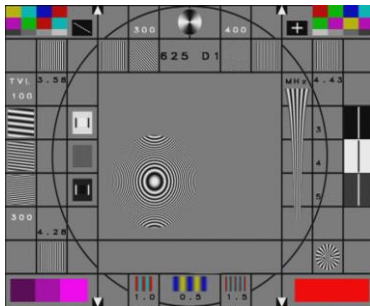


This feature is normally associated with a 4x3 to 16x9 translation.

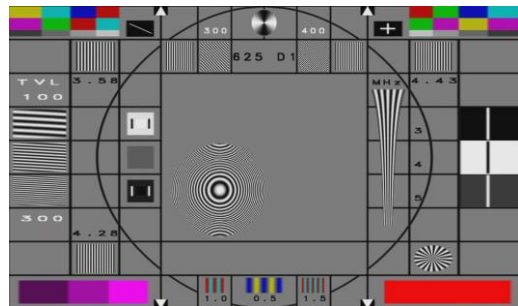
It allows a non-linear aspect ratio conversion to be configured. In such a conversion, the picture content towards the left and right sides is stretched more than the content at the centre.

Example:

Source

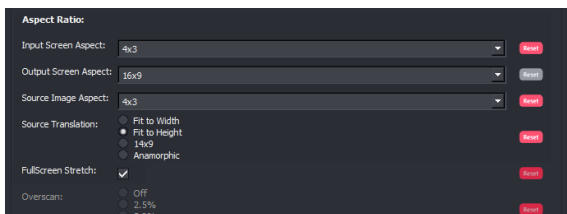


Output



Note that the **FullScreen Stretch** tick box is only active with certain ARC configurations exist:

- The source aspect ratio must be narrower than the output aspect ratio.
- Source Translation must not be set to: **Fit to Width**.



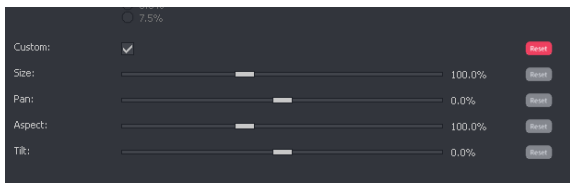
Overscan:



The **Overscan** control allows the picture to be over-scanned by:

- 2.5%
- 5%
- 7.5%

Custom controls can be enabled to activate the custom display setting sliders.



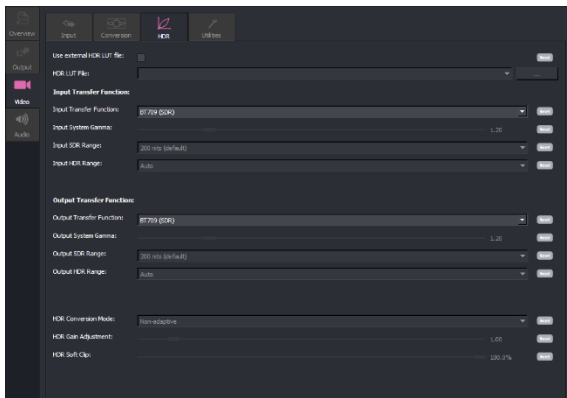
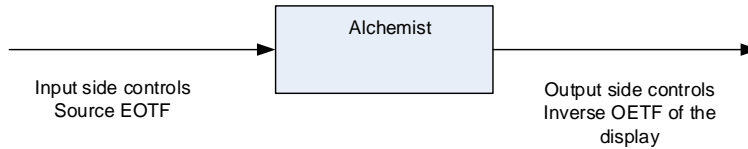
The controls: **Size**, **Pan**, **Asp** and **Tilt** can now be used set any desired **display** settings.

4.5 Video/HDR

Introduction

Alchemist File now includes a full suite of HDR processing tools.

When dealing with HDR from a conversion perspective, the input side controls dictate how the input signal is interpreted (Source EOTF) and the output side controls provides control of the output configuration (Inverse OETF of the display).



Alchemist File supports:

- Up mapping of SDR to HDR.
- Down mapping of HDR to SDR.
- Cross mapping of HDR to other HDR formats.
- Retention of HDR, source to output
- Custom LUTs

Two down mapping modes are available:

- Adaptive Tone Mapping
- Non-adaptive.

GV File products, now include an HDR control suite.

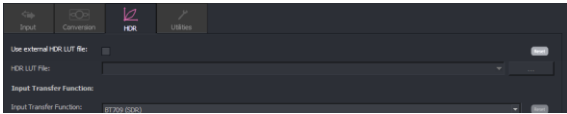
- A basic control surface may be employed, allowing conversions based on the defined parameters for each HDR standard supported.
- Alternatively, an advanced Custom mode may be used to customize the transfer curve allowing the User to adjust the look and feel of the content.
- The Adaptive Tone Mapping employs a more complex conversion algorithm. The process adapts to the levels in the source content and aims to provide an optimized output range during the down mapping process. In this mode, the User is less likely to need to manually set the HDR Gain or SDR Range output.

Supported HDR formats are:

- PQ
- S-Log 3
- HLG

Note: the HDR format HDR10 does not appear as a selectable option. For content compliant to HDR10, the setting PQ can be configured, as PQ and HDR10 have the same HDR curve.

4.5.1 Use external HDR LUT File



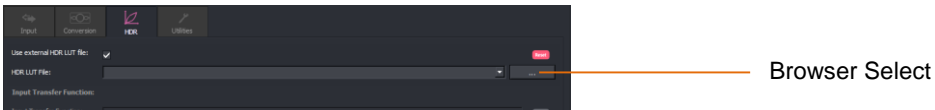
Version V4.1.0.4 introduces the new 'External LUT' feature.

Custom LUTs may be imported into a GV File process.

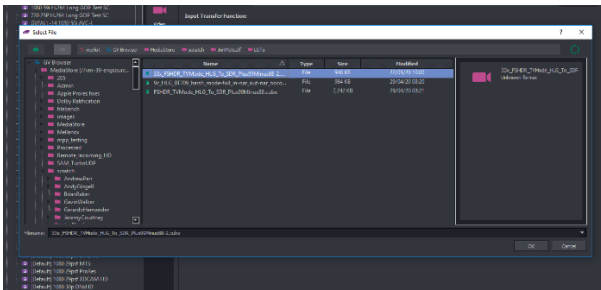
LUT files should be in the form of:

- **.cube**

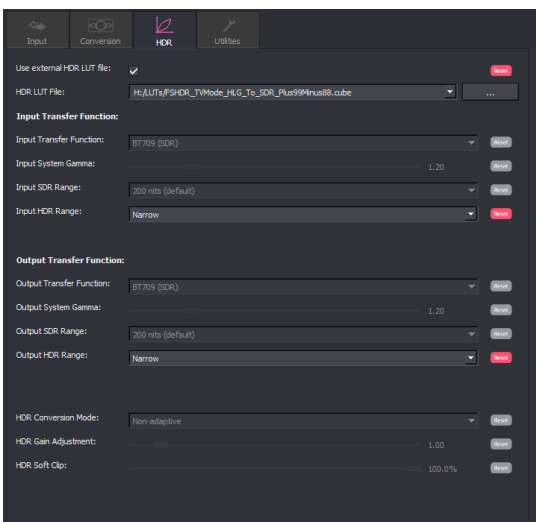
The feature is enabled using the check box. Once enabled, the menu will display the **HDR LUT File** control:



Using the associated Browser, the required LUT file can be selected:

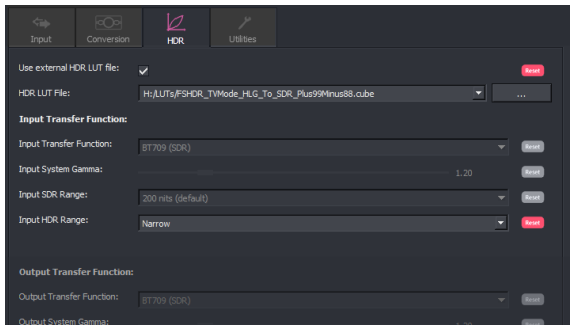


Note that the LUT will control the conversion process hence, with the exception of the HDR Range controls, all the HDR Controls will be greyed out (unavailable) when a LUT process is enabled:



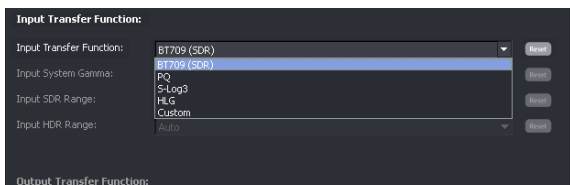
The parameters **Input HDR Range** and **Output HDR Range** are not defined by the LUT, hence these controls should be manually configured.

4.5.2 Video/HDR/Input Transfer Function



This set of controls allow the User to define the input with respect to HDR parameters.

Input Transfer Function



The **Input Transfer Function** control allows the User to define the input with respect to SDR/HDR. The default value is: **BT709 (SDR)**

The input maybe defined to be:

- PQ
- S-Log3
- HLG
- Custom

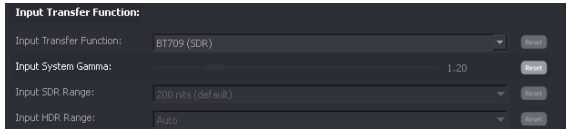
Note that, currently metadata in the source file cannot be relied upon, with respect to the HDR format. When HDR input files are encountered it is necessary to manually define the source with respect to HDR.

Input System Gamma

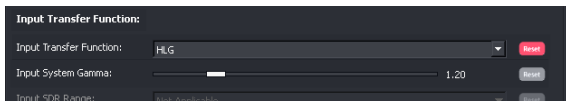
System Gamma, is the overall transformation, also known as the Opto Optical Transfer Function (OOTF), from the light captured by the camera to the light emitted by the display.

Note that control of Input System Gamma is not required when the input conforms the PQ specification. System Gamma is effectively included within the transfer function, hence control is not required.

When the Input is PQ, the Input System Gamma control is disabled.



The **Input System Gamma** control only becomes active when the **Input Transfer Function** control is set to either **HLG** or **S-Log3**.



The **Input System Gamma** control allows the User to define the input with respect to System Gamma.

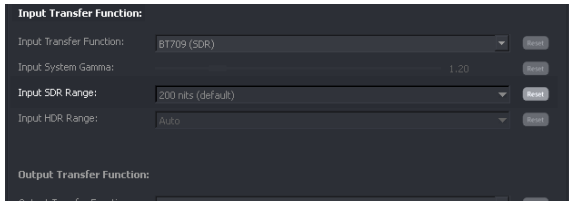
The range of this control is:

- 1.0 to 2.0

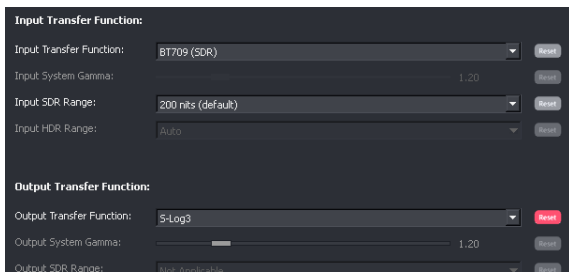
The default value is:

- 1.2

Input SDR range



The Input SDR range control is only active if the **Input Transfer Function** is configured to be BT709 (SDR) and the **Output Transfer Function** is configured to be HDR (PQ, S-Log3, HLG, or Custom).



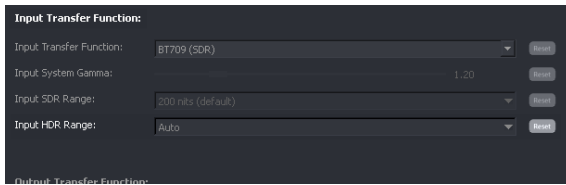
When active, the **Input SDR Range** control may be used to define the input brightness of the input picture, in terms of nits, that is to be mapped into the HDR output.

The range of the control is: **20 to 3000 nits**.

Default value is: **200 nits**

Note: This is an *input* control. The higher the value configured, the darker the output picture will be.

Input HDR Range

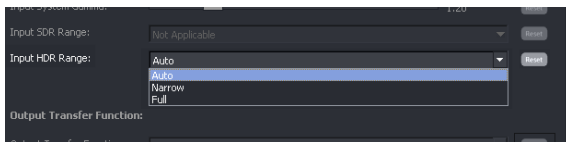


Input HDR Range control maybe used to define the bit range of the 10-bit HDR signal presented at the input.

Full range: 0 to 1023

Narrow: 64 to 940

The **Input HDR Range** control is only active when the **Input Transfer Function** is configured to be HDR (PQ, S-Log3, HLG, or Custom).



The **Input HDR Range** control maybe set to:

- **Auto**
- **Narrow**
- **Full**

When in **Auto** mode, if the input is:

- HLG then the auto setting will be: **Narrow**
- PQ then the auto setting will be: **Full**
- S-Log3 then the auto setting will be: **Narrow**

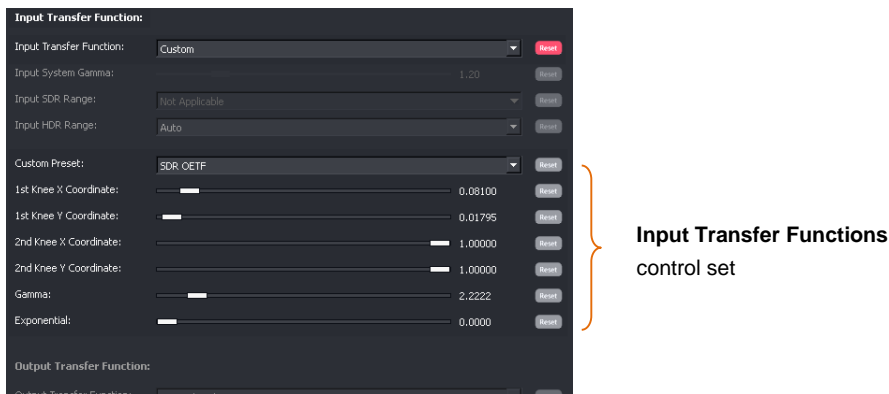
Custom

The Custom control set allow the User to modify the accepted specifications of the various HDR curves, in order to obtain the desired output.

The Input side custom controls are provided as a solution for when an input file is encountered that does not conform to any of the supported formats, with respect to SDR or HDR transfer functions. This maybe as a consequence of one of the supported formats having been modified in some way, or maybe because the input format is not a supported type.

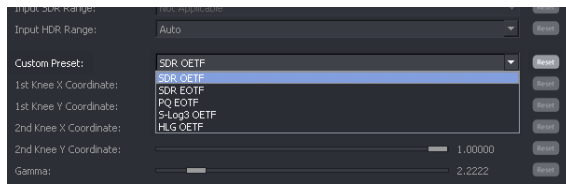
In circumstances where it is desired to use the custom controls as an aid to creativity, it is recommended that the input side is left in default and the output side custom controls are used for this purpose (see section 4.5.2).

When the **Input Transfer Function** control is set to **Custom**, a new suite of controls will appear.



The **Custom** controls allow the User to define a custom HDR curve.

Custom Preset



The **Custom Preset** control allow a starting point to be configured that the custom HDR curve is based on.

The options are:

- SDR OETF (the starting point for the custom curve will be the inverse of this function)
- SDR EOTF
- PQ EOTF
- S-Log3 OETF (the starting point for the custom curve will be the inverse of this function)
- HLG OETF (the starting point for the custom curve will be the inverse of this function)

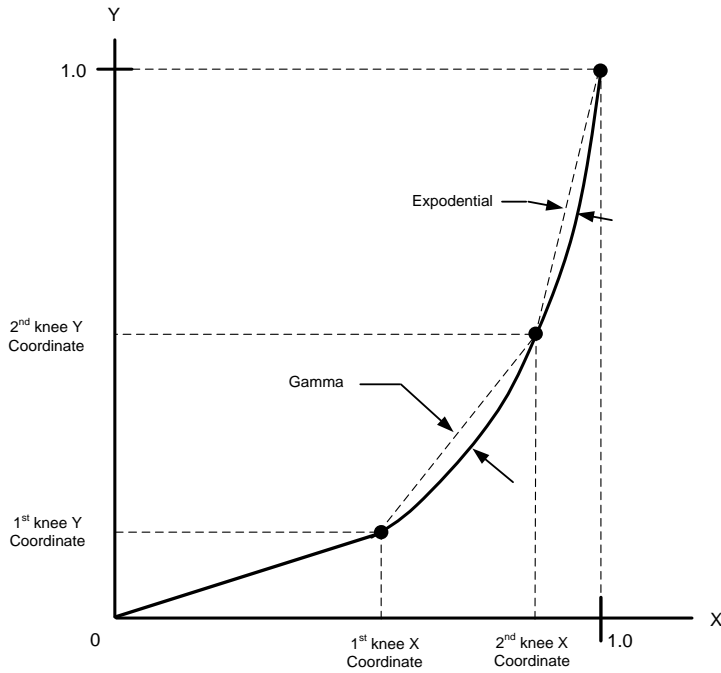
Note:

OETF is an acronym of: Optical Electrical Transfer (Linear Light to Coded representation).

EOTF is an acronym of: Electrical Optical Transfer (Coded to Linear Light representation).

The following controls allow the HDR curve to be defined:

- 1st Knee X Coordinate
- 1st Knee Y Coordinate
- 2nd Knee X Coordinate
- 2nd Knee Y Coordinate
- Gamma
- Exponential

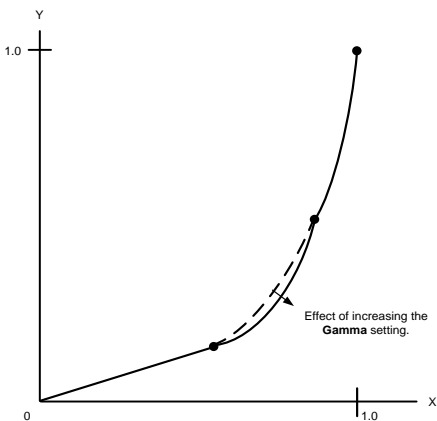


Using the control set, a custom HDR curve can be defined.

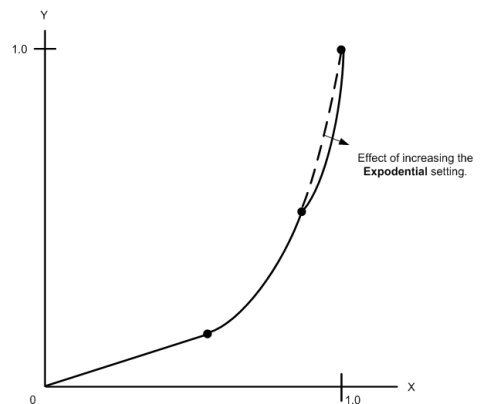
Notes

1. The curve from the Origin to the 1st knee coordinate is linear (straight line)
2. The Gamma control defines the curve between the 1st and 2nd knee coordinates.
3. The Exponential control defines the HDR curve between the 2nd knee & peak white.
4. The curve is designed to have a continuous gradient across the knee points.

The effect of increasing the Gamma & Exponential settings is shown in the following graphs:

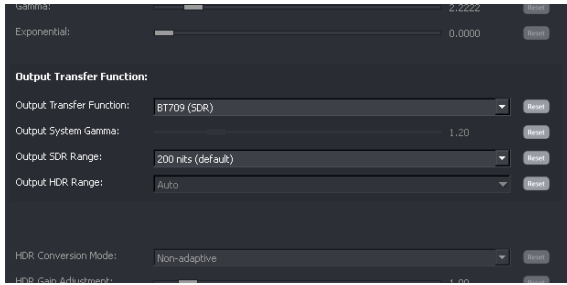


As the setting of the **Gamma** control is increased, the curve between the two knee points is adjusted.



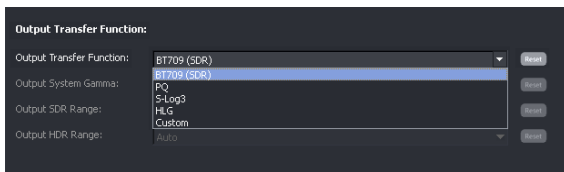
As the setting of the **Exponential** control is increased, the curve above the 2nd knee is adjusted.

4.5.3 Video/HDR/Output Transfer Function



This set of controls allow the User to define the Output with respect to HDR parameters.

Output Transfer Function

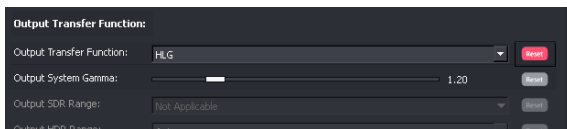


The **Output Transfer Function** control allows the User to define the output with respect to SDR/HDR. The default value is: **BT709 (SDR)**

The input maybe defined to be:

- PQ
- S-Log3
- HLG
- Custom

Output System Gamma



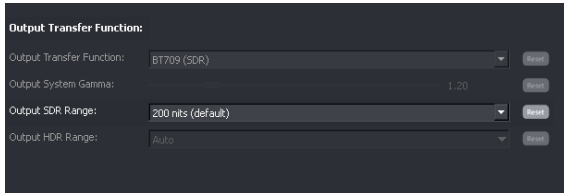
The **Output System Gamma** control is only active when the **Output Transfer Function** control is set to either: HLG or S-Log3.

When active, the **Output System Gamma** control may be set to a value between 1.0 & 2.0.

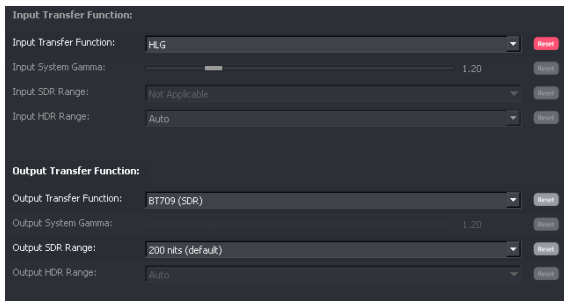
The default value is: 1.2

Note that the gamma curve applied to the signal is the inverse of the output system gamma specified, because the control is intended to compensate for the system gamma curve that will be applied in the display.

Output SDR Range



The **Output SDR Range** control is only active when the **Input Transfer Function** is configured to be HDR (PQ, HLG, S-Log 3, or Custom), and the **Output Transfer Function** is configured to be BT709 (SDR).



When active, the **Output SDR Range** control may be used to define the brightness of the output picture, in terms of nits, when derived from an HDR source.

The range of the control is: 20 to 3000 nits.

Default value is: 200 nits

Note; this is an *output* control. The higher the value configured, the brighter the output picture will be.

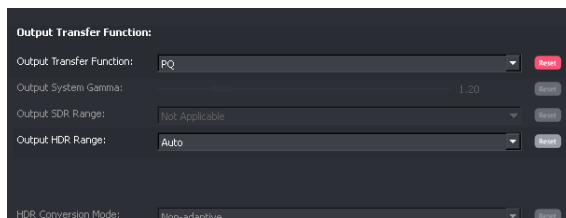
Output HDR Range



The **Output HDR Range** control is used to define the bit range of the 10-bit HDR signal at the output.

Full range: 0 to 1023

Narrow: 64 to 940



The options for the **Output HDR Range** are:

- **Auto**
- **Narrow**
- **Full**

When in **Auto** mode, if the input is:

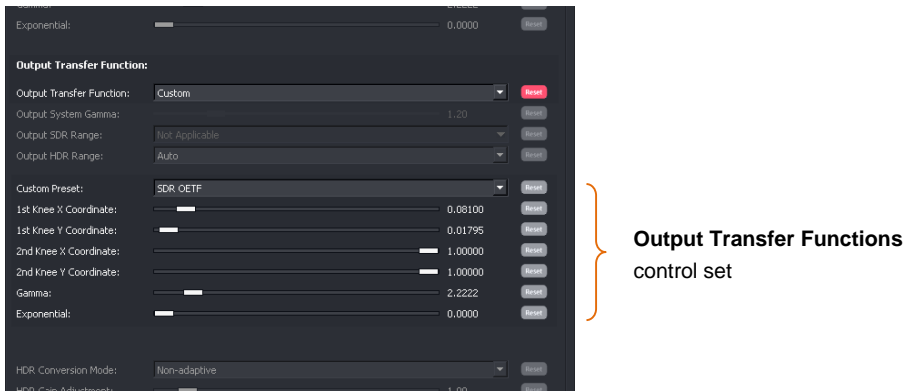
- PQ then the **Auto** setting will be: **Full**
- S-Log3 then the **Auto** setting will be: **Narrow**
- HLG then the **Auto** setting will be: **Narrow**

Custom

The output side custom controls provide an aid to creativity by allowing the various transfer curves to be customised, in order to obtain a transfer that may not be offered by the rigid use of the accepted HDR specifications.

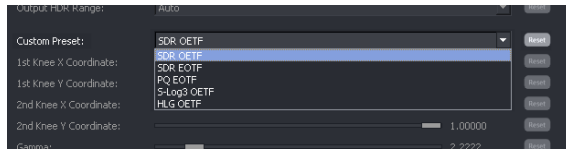
The Custom control set allow the User to modify the accepted specifications of the various SDR/HDR curves, in order to obtain the desired output.

When the **Output Transfer Function** control is set to **Custom**, a new suite of controls will appear.



The **Custom** controls allow the User to define a custom HDR curve.

Custom Preset



The **Custom Preset** control allow a starting point to be configured that the custom HDR curve is based on. The default settings of each option represents the accepted specification of the relevant setting.

Note that, with respect to the HDR formats (PQ, HLG, S-Log3):

- The specification of PQ Curve is defined as EOTF, hence the PQ starting point is: PQ EOTF
- The specification of HLG Curve is defined as OETF, hence the HLG starting point is: HLG OETF
- The specification of S-Log3 Curve is defined as OETF, hence the HLG starting point is: S-Log3 OETF

The options are:

- SDR OETF (the starting point for the custom curve will be the inverse of this function)
- SDR EOTF
- PQ EOTF
- S-Log3 OETF (the starting point for the custom curve will be the inverse of this function)
- HLG OETF (the starting point for the custom curve will be the inverse of this function)

Options also allow an SDR curve to be defined. Because SDR is not usually defined with respect to OEFT, or EOFT, both options are available as a starting point.

Note

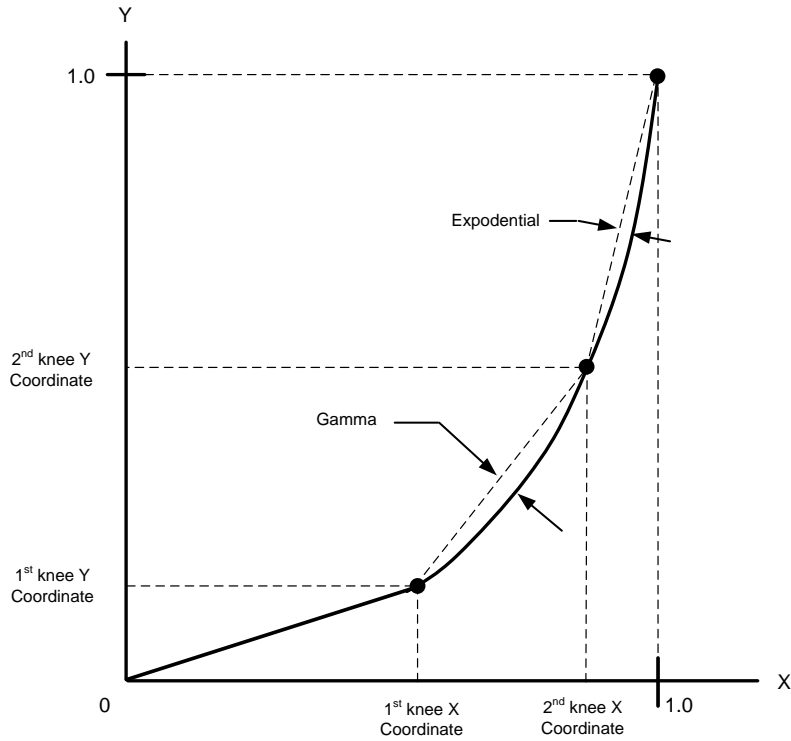
OETF is an acronym of: Optical Electrical Transfer (Linear Light to Coded representation).

EOTF is an acronym of: Electrical Optical Transfer (Coded to Linear Light representation).

Note that, as this is an output transfer function, the curve applied will be the inverse of the curve specified.

The following controls allow the HDR curve to be defined:

- 1st Knee X Coordinate
- 1st Knee Y Coordinate
- 2nd Knee X Coordinate
- 2nd Knee Y Coordinate
- Gamma
- Exponential

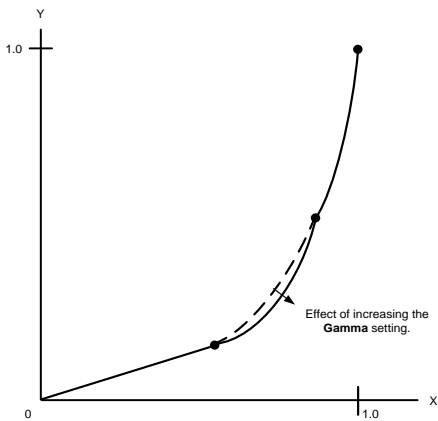


Using the control set, a custom HDR curve can be defined.

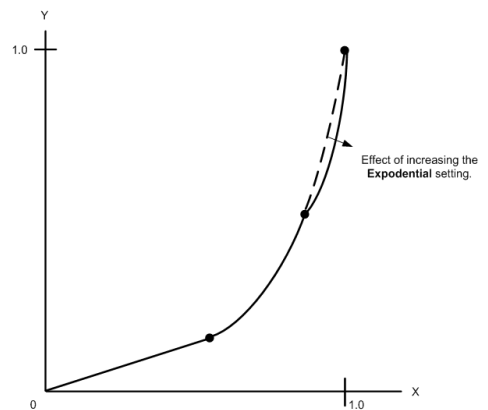
Notes

1. The curve from the Origin to the 1st knee coordinate is linear (straight line).
2. The Gamma control defines the curve between the 1st and 2nd knee coordinates.
3. The Exponential control defines the HDR curve between the 2nd knee & peak white.
4. The curve is designed to have a continuous gradient across the knee points

The effect of increasing the **Gamma & Exponential** setting is shown in the following graph:

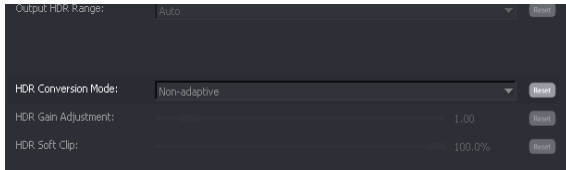


As the setting of the **Gamma** control is increased, the curve between the two knee points is adjusted.



As the setting of the **Exponential** control is increased, the curve above the 2nd knee is adjusted.

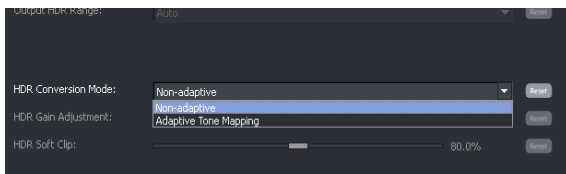
4.5.4 HDR Conversion Mode



The **HDR Conversion Mode** control is only active when an HDR to SDR process is configured.

When down-mapping from HDR to SDR, there are two options for the **HDR Conversion Mode**:

- Non-adaptive
- Adaptive Tone Mapping



In all other modes, Adaptive Tone Mapping is not applicable and the option is not offered.

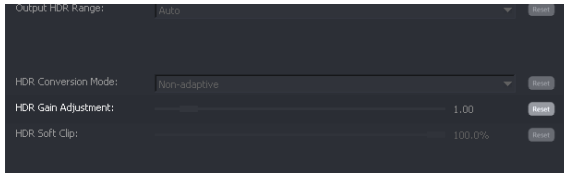
Non-adaptive:

A conversion method employing a more simplistic approach for HDR to SDR conversion. Input picture content is not considered as part of the conversion process.

Adaptive Tone Mapping:

The **Adaptive Tone Mapping** employs a more complex conversion algorithm. The process adapts to source content and aims to retain the look and feel of the HDR qualities in the source, within the parameters of the SDR output.

4.5.5 HDR Gain Adjustment



The **HDR Gain Adjustment** control is active when:

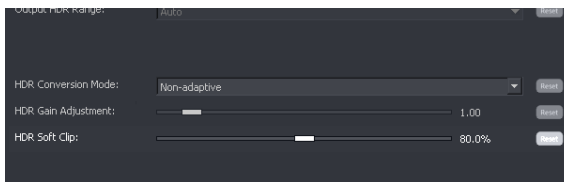
- The input is configured to be HDR (PQ, S-Log3, HLG or Custom).
- The output is configured to be HDR (PQ, S-Log3, HLG or Custom).

When active, the output HDR Gain may be adjusted.

The range of the control is: 0.10 to 10

The default setting is dependent upon the HDR process configured.

4.5.6 HDR Soft Clip



The Soft Clipping enables the peak white to be reduced in areas of the picture which may otherwise be clipped.

In practical terms, this control can be used to add back in detail in the whites which may have been lost as a consequence of applying an HDR curve. Note that this does come at the expense of detail in the blacks.

The **HDR Soft Clip** control is active either when:

- The output is configured to be HDR (PQ, S-Log3, HLG or Custom).
- The input is configured to be HDR (PQ, S-Log3, HLG or Custom).

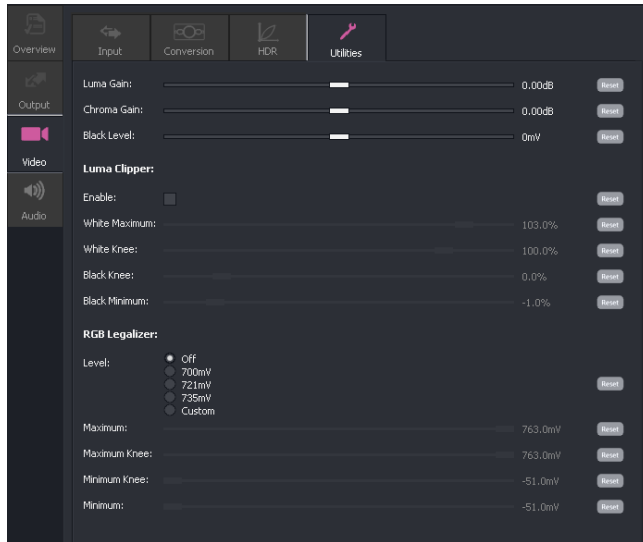
When active, the output HDR Soft Clip may be adjusted.

The range of the control is: 60% to 100%

Note that the default setting is dependent upon the HDR process configured.

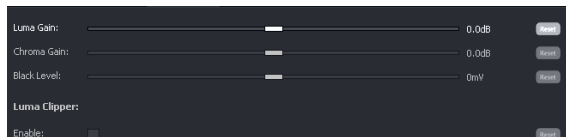
4.6 Video/Utilities

The forth **Video** tab relates to the **Utilities** features.



4.6.1 Video/Utilities/Luma Gain: +/- 6dB

The **Luma gain** may be adjusted using the slider control. The range is +/- 6dB.



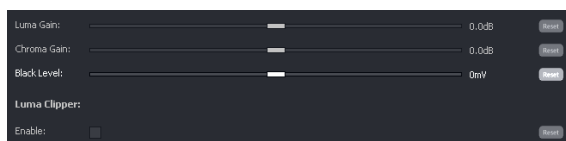
4.6.2 Video/Utilities/Chroma Gain: +/- 6dB

The **Chroma gain** may be adjusted using the slider control. The range is +/- 6dB.



4.6.3 Video/Utilities/Black Level: +/- 80mV

The **black level** may be adjusted using the slider control. The range is +/- 80mV.

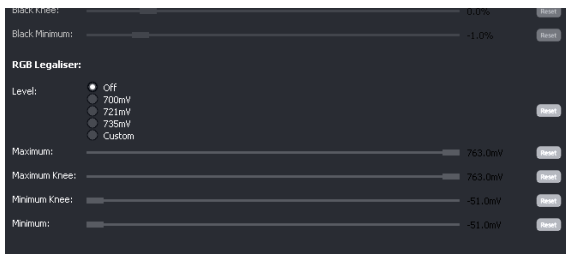


4.6.4 Video/Utilities/Luma Clipper: Various

The Luma Clipper feature is enabled with the tick box. Note that the default setting is **disabled**. When **enabled** the controls: **White Maximum**, **White Knee**, **Black Minimum** and **Black Knee** all become active and may be configured by the User.

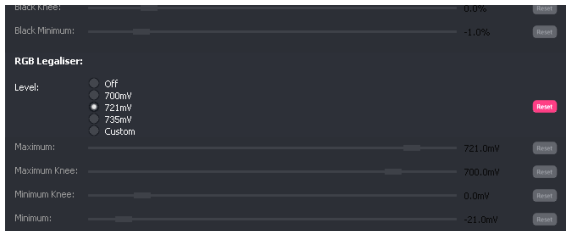


4.6.5 Video/Utilities/RGB Legalizer: Off / 700mV / 721mV / 735mV / Custom

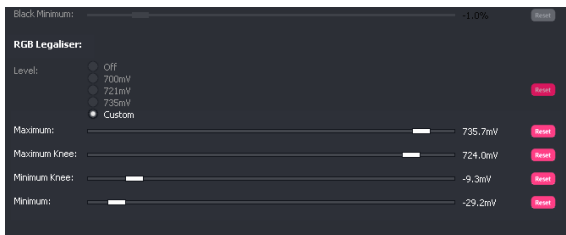


The RGB Legalizer is default **off**.

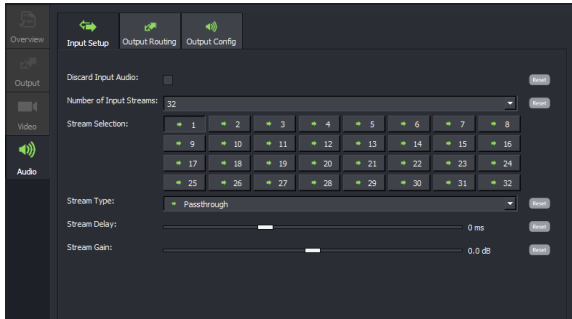
Three preset settings are offered for the RGB Legalizer **Level** control: 700mV, 721mV or 735mV.



Alternatively, a **Custom** setting can be configured. When set to **Custom**, the custom controls become active allowing the User to set any combination of values



4.7 Audio



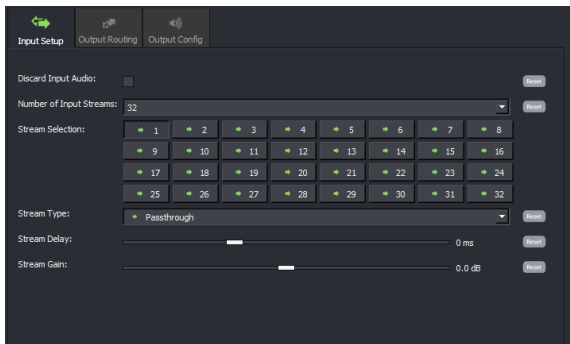
The GV File Client offers the following audio modes of operation:

- Audio pass through
- Routing of audio channels within an audio stream.
- Routing of audio channels between audio streams
- Routing of audio streams
- Audio pitch-shifting (as part of a video off-speeding process).
- Audio re-sampling (as part of a video off-speeding process).
- Audio tone generation
- Audio delay.
- Audio stripping/discarding

The Audio menus are split across three separate tabs.

- Input Setup
- Output Routing
- Output Config

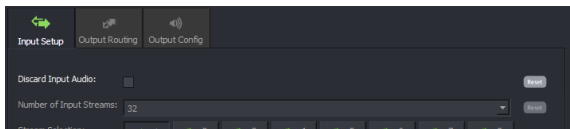
4.7.1 Audio/Input Setup



The **Input Setup** menu is used to describe the audio distribution of the source file.

In circumstances where it is desired to remap the audio distribution as part of a GV File conversion process, it will be necessary to manually describe the input audio distribution. This 'describing' process is performed in the **Input Setup** tab.

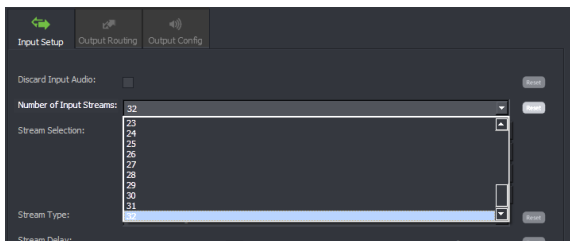
Discard Input Audio



Enabling the **Discard Input Audio** will effectively strip all audio channels, resulting in the output file only containing video essence.

Number of Input Streams

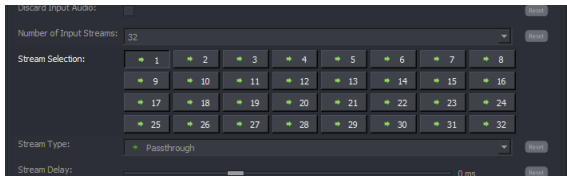
This control allows the User to define the number of audio streams that are present in the input file.



The number of input audio streams maybe defined using the dropdown menu. Up to 32 audio streams is supported.

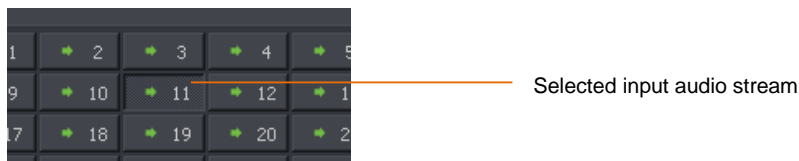
Stream Selection

This menu allows the User to describe each stream of the input file.



Input audio streams can be selected from the **Stream Selection** field.

The selected stream will appear with an indented symbol:



In this example, Input Audio Stream 11 has been selected.

The default setting for each stream is **Passthrough**.

The audio stream type applied here will influence how the User can route audio channels later.

Stream Type: Various

The **Stream Type** drop down menu can be used to define the audio parameters of any selected stream.

The audio type is defined by specific icons:



Passthrough



Mono



Stereo



Surround 5.1



Surround 5.1+2

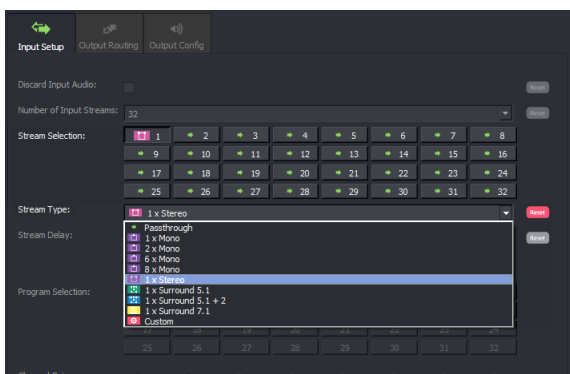


Surround 7.1



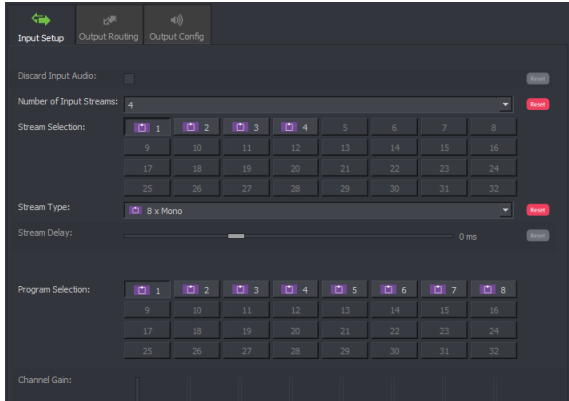
Custom

In this example, Stream 1 is selected and has been defined as a **1 x Stereo** pair.

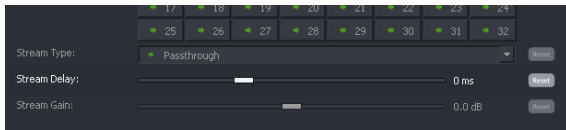


Each input stream will need to be defined to match the audio distribution of the source file.

In the following example, a source file with 4 audio streams has been defined. Each audio stream has been defined to have 8x audio mono channels



Stream Delay



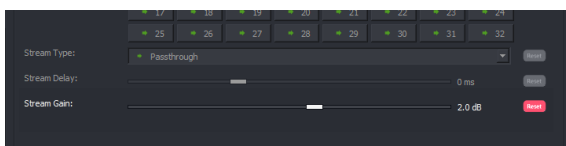
An audio delay may be applied to each input audio stream. Audio is delayed relative to the associated video in the source.

All audio channels within the particular audio stream will have the same audio delay applied.

The range of the **Stream Delay** control is: -250ms to 500ms

Stream Gain

This control is only visible when the selected input stream is set to **Passthrough**. This control allows a global gain setting to be applied to all audio channels carried with the selected stream.

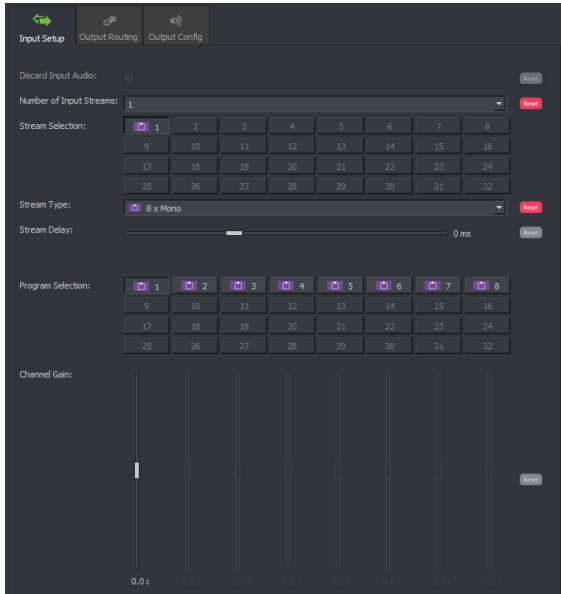


The range of the **Stream Gain** control is: +/- 12dB

Program Selection & Channel Gain

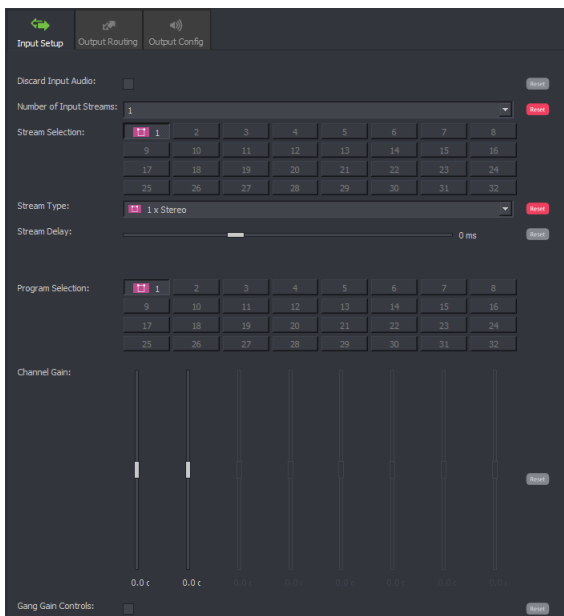
When an input stream is defined as anything other than **Passthrough**, a new set of controls will appear. The actual controls seen will depend upon what the stream is defined as.

Some examples are shown below:



1x Input Audio stream defined as: **8 x Mono**

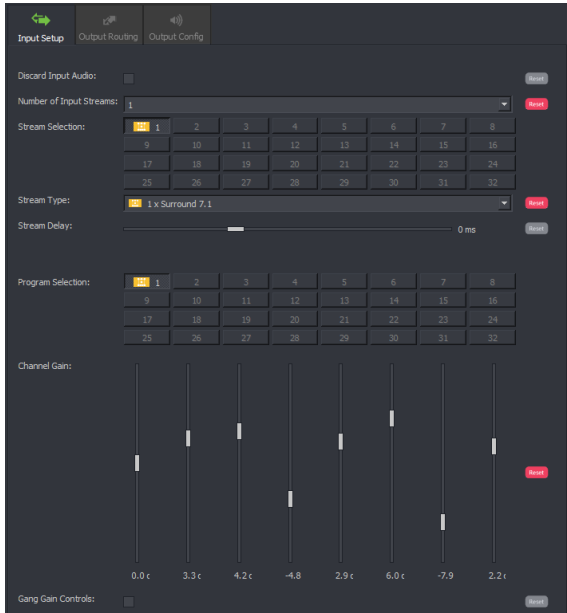
Each channel may be selected using the **Program Selection** matrix and the gain of each channel may be configured using the **Channel Gain** control



1x Input Audio stream defined as: **1 x Stereo**

The stereo program may be selected using the **Program Selection** matrix and the gain of each channel may be configured using the **Channel Gain** control.

The **Gang gain controls** feature may be selected so any gain setting is applied equally to both channels, using just one of the sliders.

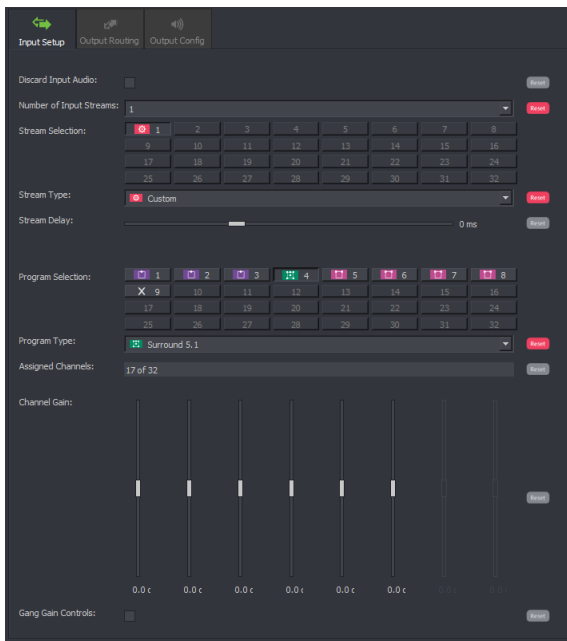


1x Input Audio stream defined as:

1 x Surround 7.1

The program may be selected using the **Program Selection** matrix and the gain of each channel may be configured using the **Channel Gain** control.

The **Gang Gain Controls** feature may be selected so any gain setting is applied equally to all the channels of the surround sound program.



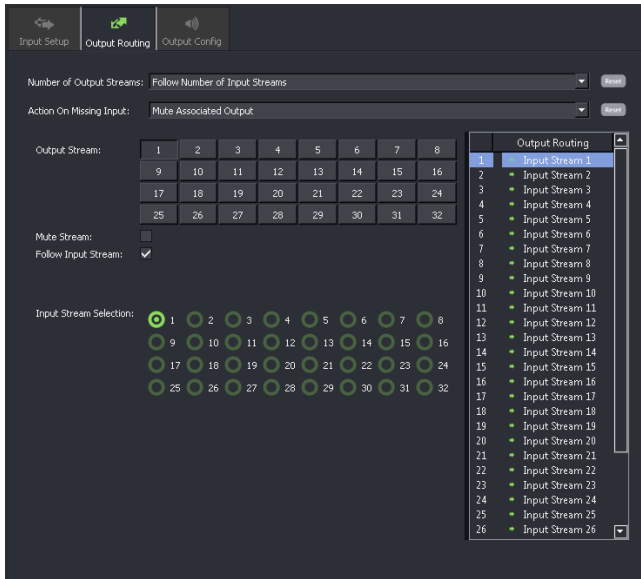
1x Input Audio stream defined as:

Custom

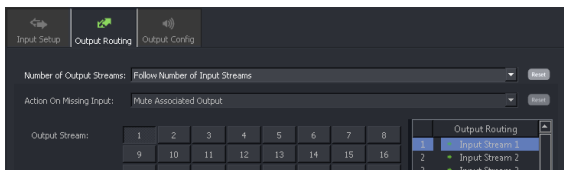
Each program within the selected stream may be selected using the **Program Selection** matrix and defined using the **Program Type** drop down menu.

The gain of each channel may be configured using the **Channel Gain** control.

4.7.2 Audio/Output routing



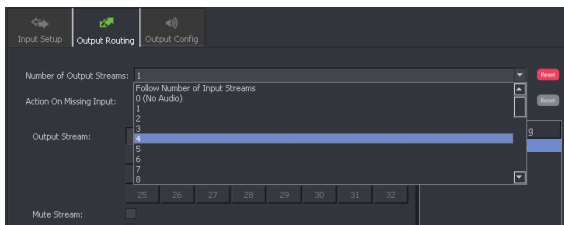
Number of Output Streams



Here the number of output audio streams may be defined.

The default setting is **Follow Number of Input streams**. When selected, the number of output audio streams will be defined by the number of audio streams present in the input file.

Alternatively, the number of output audio streams can be selected using the drop-down menu:



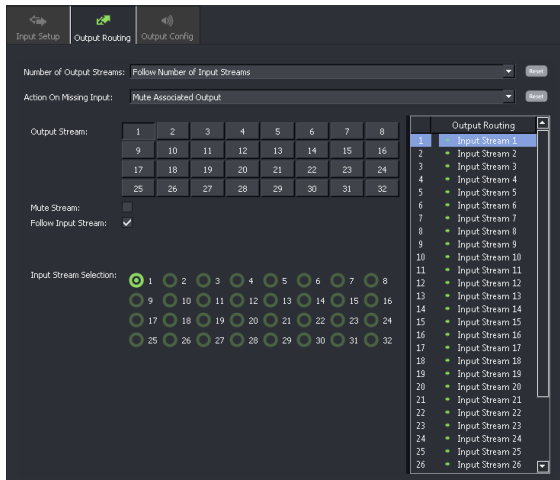
Most video codecs allow up to 32 audio streams to be configured, although the actual number depends on the codec of choice. In the above example the output has been configured to have 4 output audio streams.

Note that the ability to define the number of output streams will depend on the particular output file format of choice. This can be any number up to 32. However there are exceptions to this.

Please refer to Table 4, **Supported File Types** (Appendix A, below) for details of audio support by codec.

Note that if the **Number of Output Streams** is set to: 0 (no audio), all audio from the input will be stripped.

Number of Output Streams: Follow Number of Input Streams



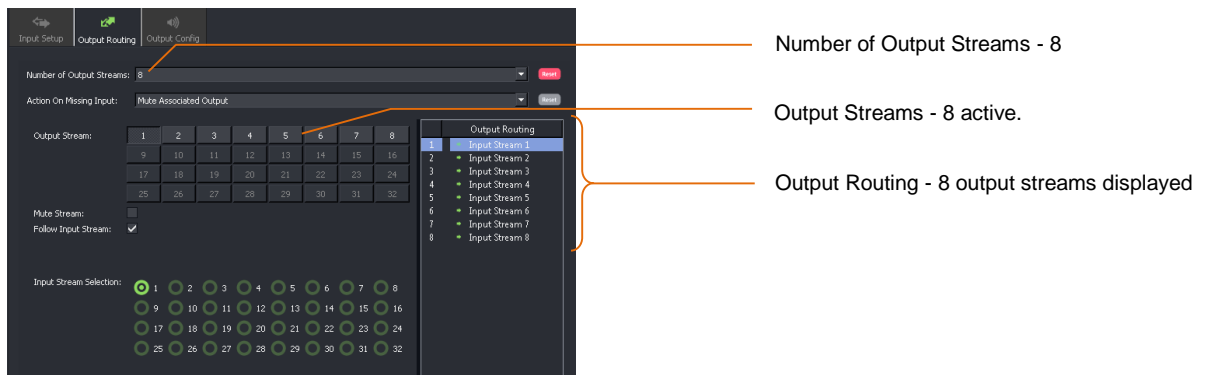
When the **Number of Output Streams** is configured to be **Follow Number of Input Streams**, the number of output streams will be defined by the input.

The menu will display routing options for the full complement of 32 audio streams.

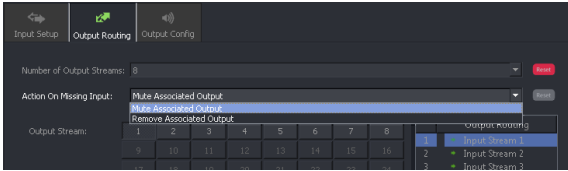
Number of Output Streams: 1 to 32

If the number of output streams is defined (1 to 32), the routing option menu will be modified to reflect the new setting:

In this example: The output has been defined to have 8 audio channels



Action On Missing Input:



This menu has two possible setting:

- Mute Associated Output
- Remove Associated Output

In circumstances where the output has been configured to have more audio streams than the input, the setting of the control **Action On Missing Input** will define what happens to the additional audio streams configured in the output.

Mute Associated Output streams: Any missing input streams defined by the profile will result in corresponding muted audio streams in the output.

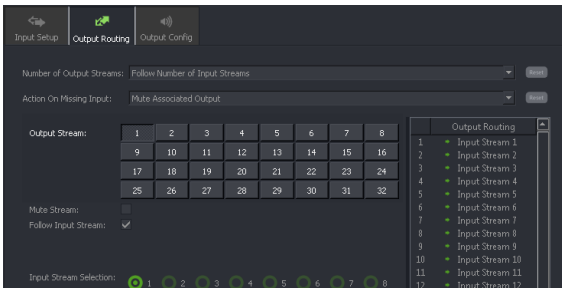
Remove Associated Output Streams: Any missing input streams defined by the Profile, will result in the corresponding audio streams in the output being removed.

Once the number of output streams has been set, an audio routing process can now be configured.

Note: this control is ineffective when the output file type is XDCam.

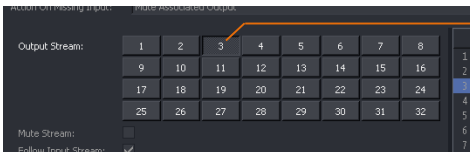
The setting will effectively be 'Mute Associated Output' (although this setting is 'greyed out' it is still the enforced behaviour).

Output Stream



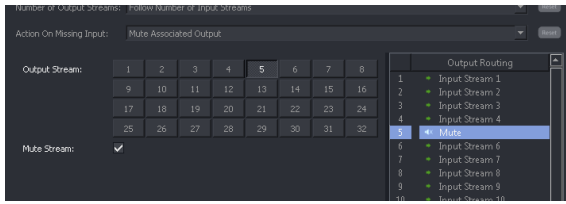
The **Output Stream** matrix allows specific output to be selected as part of an audio routing process.

The selected output stream will be indented to identify that it has been selected:



Output Stream 3 selected

Mute Stream

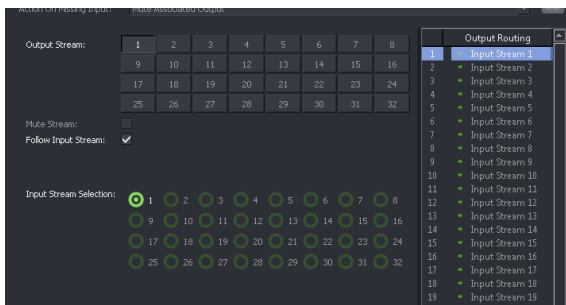


When the **Mute Stream** control is activated, the selected output stream will be muted (no active audio) but the stream will still be present in the output.

Note that the **Output Routing** pane will confirm the selected stream is muted.

Follow Input Stream

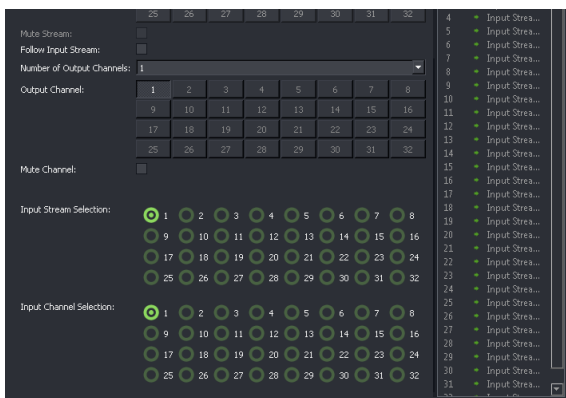
When **Follow Input Stream** is selected, each output stream, by definition, will be derived from the corresponding input stream. This is the default setting.



As each output stream is selected, the corresponding input stream will be highlighted to indicate the associated routing.

The **Output Routing** pane will confirm the configured routing.

When the **Follow Input Stream** is deactivated, a full routing menu will be exposed.

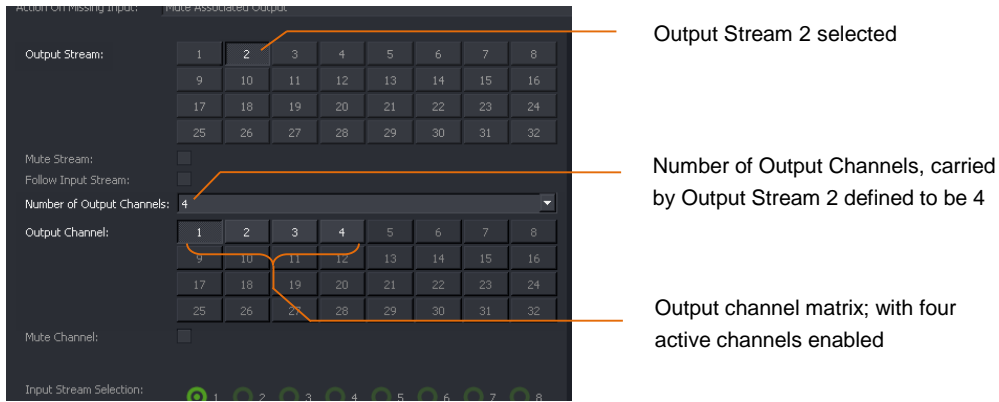


Number of Output Channels

Note - this control is only exposed when the control **Follow Input Stream** is deactivated (unchecked).

This control allows the number of output channels, of a particular output stream, to be defined.

In this example, output stream 2 has been defined to carry 4 output channels:



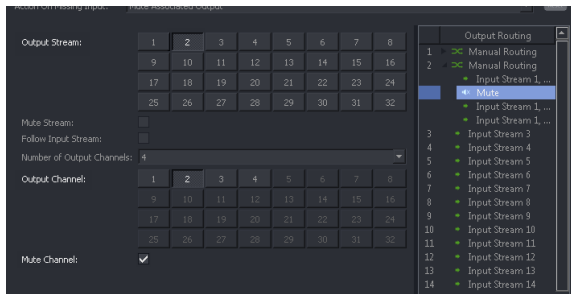
Mute Channel

Note - this control is only exposed when the control **Follow Input Stream** is deactivated (unchecked).

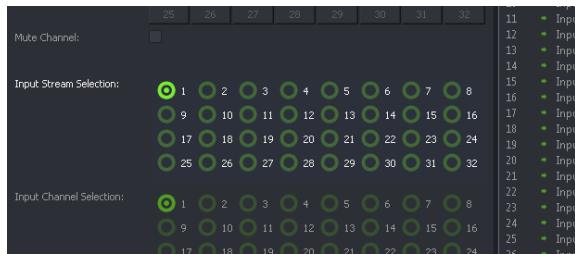
The **Mute Channel** control enables the User to mute any particular output channel, within an output stream.

In the following example, output stream 2, channel 2 has been muted.

Note that the **Output Routing** panel is modified to confirm the muted channel.



Input Stream Selection



The **Input Stream Selection** matrix allows the User to define the particular input audio stream that an input channel is to be routed from, as part of a channel routing process.

Input Channel Selection



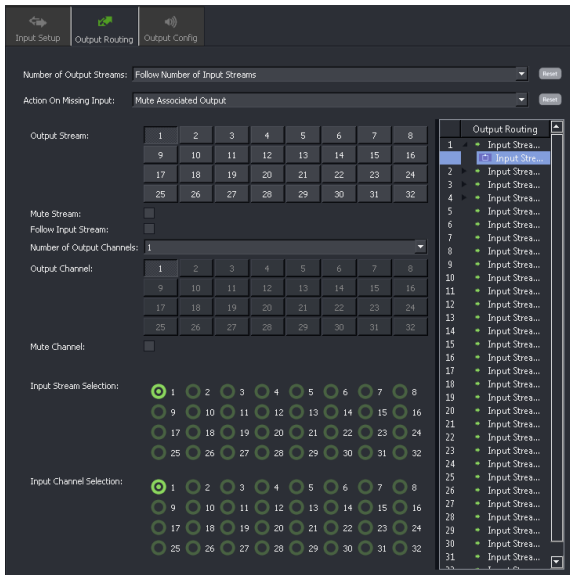
Note - this control is only exposed when the control **Follow Input Stream** is deactivated (unchecked).

The **Input Channel Selection** matrix allows the User to define the particular input audio channel that an input channel is to be routed from, as part of a channel routing process.

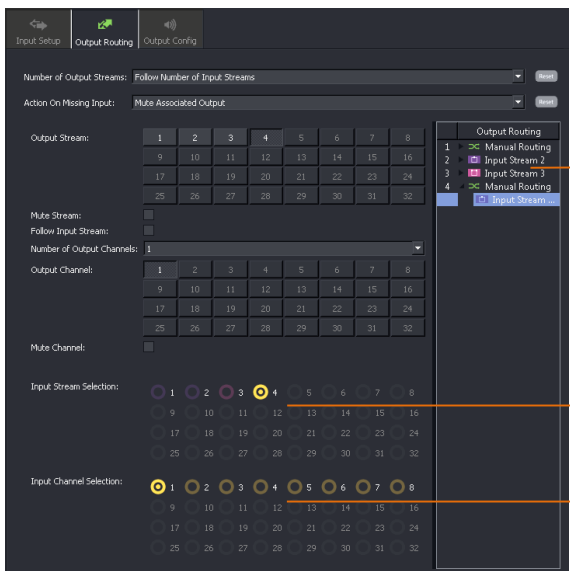
Audio Channel Routing

Using the **Audio Channel Matrix**, any input audio channel, from any input audio stream may be routed to any output audio channel, in any output audio stream.

Where the **Input Setup** has not been defined (i.e. set to pass-through), the icons within the **Input Stream Selection** matrix, the **Input Channel Selection** matrix and the **Output routing** pane, will all be colored green:



Where the input audio distribution has been defined in the **Input Setup** menu, the **Output Routing** menu will be color coded accordingly:

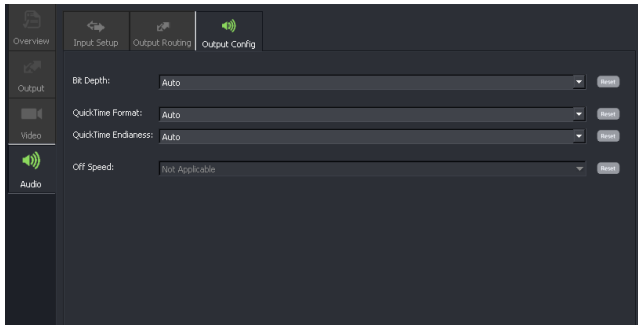


Output Routing pane reflects **Input Setup**

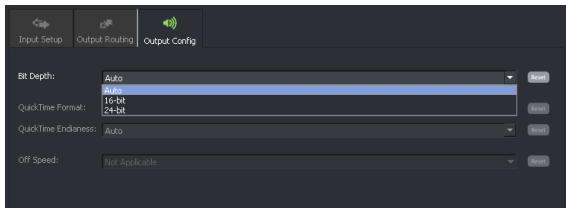
Input Stream Selection matrix modified to reflect defined **Input Setup**

Input Channel Selection matrix modified to reflect defined **Input Setup**

4.7.3 Audio / Output Config



Bit Depth



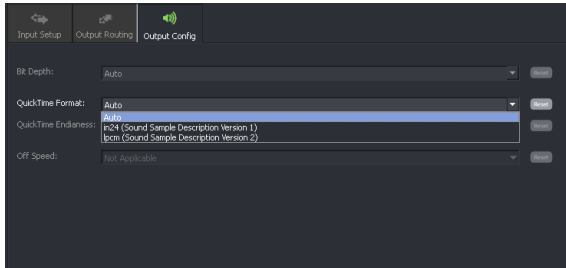
This control allows the User to apply a global setting for the bit depth of the audio in the output file. Three settings are available:

- **Auto**
- **16 bit**
- **24 bit**

When set to **Auto**, the bit depth of the output audio will faithfully follow that of the input. However, the User may choose to make all output audio channels either **16** or **24** bit. These settings will apply to all output audio streams.

QuickTime Format

This control is only active when the output file format is QuickTime (.mov).



Three settings are available:

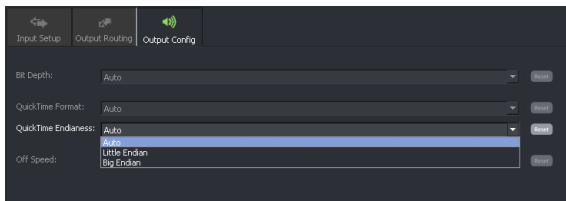
- **Auto**
- **in24 (Sound Sample Description Version 1)**
- **ipcm (Sound Sample Description Version 2)**

The User can manually choose the QuickTime audio version that will be associated with the output file.

When this setting is left in **Auto** mode, if the input file being processed is a QuickTime format, then the QuickTime audio format employed in the output file will be matched to the input.

In circumstances where the input file is not a QuickTime file format and the **QuickTime format** is set to **Auto**, then the output file will default to the more recent **ipcm** QuickTime format.

QuickTime Endianness



This menu item is only seen when the output file format is set to QuickTime (.mov).

When the output file container is QuickTime, the User can choose the **QuickTime Endianness** from a dropdown menu.

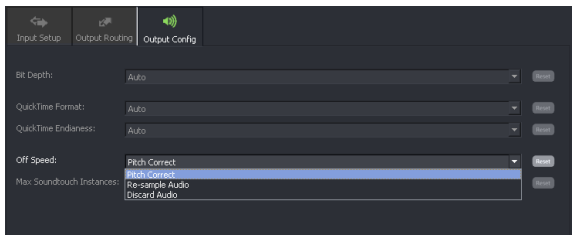
Three settings are available:

- **Auto**
- **Little Endian**
- **Big Endian**

When this setting is left in **Auto** mode, if the input file being processed is a QuickTime format, then the QuickTime Endianness format employed in the output file will be matched to the input.

In circumstances where the input file is not a QuickTime file format and the **QuickTime format** is set to **Auto**, then the output file will default to the **Big Endian** format.

Off Speed



The **Off Speed** control allows a User to configure what happens to the audio as part of an off-speeding process. Three settings are offered:

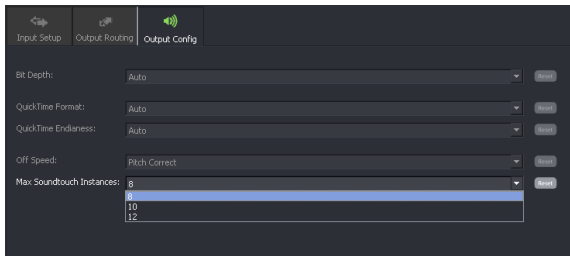
- **Re-sample audio**
- **Pitch Correct**
- **Discard Audio**

Re-sample Audio: This mode mimics what happens to the audio when doing a VTR verispeed process. As the video is played at a different rate, the pitch of the audio will be affected. For example a 24 fps to 25 fps off-speed process will make the duration of the program 4% shorter and this will have the effect of lifting the pitch of the audio by a proportional amount.

Pitch Correct: In this mode, the pitch-shifting of the audio that is associated with the Re-sample method explained above, is pitch shifted back to the pitch level of the source. The output audio, sounds the same as the source.

Discard Audio: A User can choose to remove the audio track altogether. This may be desirable if the associated audio is not pcm, and will be compromised by the off-speeding process.

Max Soundtouch Instances



This menu is only active when the conversion mode is set to **Off-Speed**.

In circumstances where groups of audio channels are carried in separate streams (like stereo pairs, or Dolby surround sound programs) it is important that any audio processing maintains the relative audio phase of the audio channels within the group.

This control enables the User to define the grouping of audio channels. The relative phase of all audio channels within the defined group will be maintained.

The **Max Soundtouch Instances** menu has three possible settings: 8, 10 or 12

5. Browser Configuration

5.1 Introduction

The GV File framework benefits from a **Service Orientated Architecture (SOA)** which has been engineered to support a wide range of deployments from a single node through to a cluster of nodes within a data centre.

One of the services in the framework is called the **GV File Browser** and this enables the User to **browse** both local and remote shares. Whilst not a mandatory service, the Browser alleviates the need for the User to type explicit file paths, making job creation a simple and quick process.

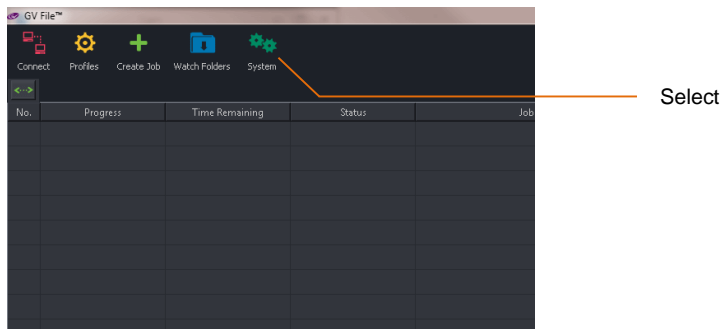
Before the Browser can be used, it must first be configured. It is assumed that the GV File Browser has been successfully installed using the Installation Guide.

The following procedure describes how to add a **Shared** location to the **Browser**. This location may then easily be used as a repository for source, or converted files.

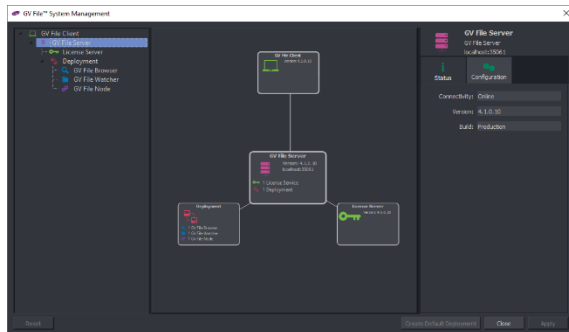
Note that a share location may be remote from the server. In such circumstances the location must be identified by a complete URL path. A remote share cannot be identified as a **mapped** drive on the host machine.

5.1.1 Browser Configuration

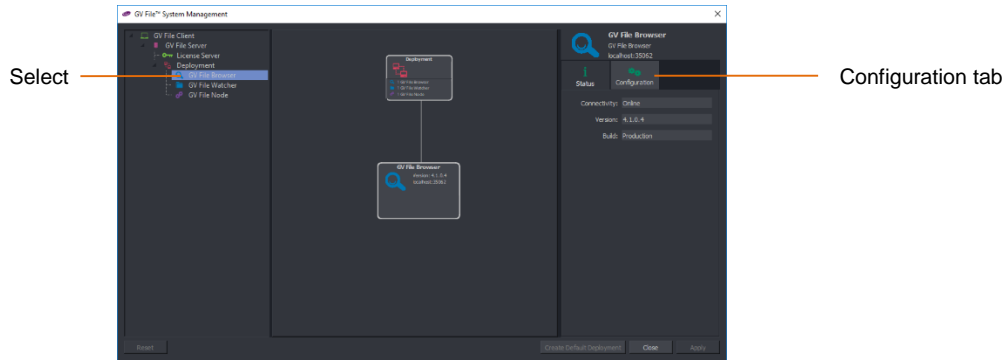
1. In the GV File Client click on the **System** icon.



This will open the **System Management** window.



- In the pane on the left hand side, click on the **Local Browser**. This will bring up the **GV File Browser** on the right hand side:

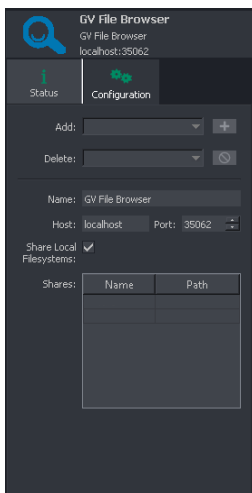


Note: If the **GV File Browser** has been installed as per the **Installation Guide**, it will appear in the **System Management** window as **Local Browser**.

However, an alternative name could have been used in which case the **GV File Browser** will appear by that alternative name in the **System Management** window.

- In the **GV File Browser** pane, select **Configuration**.

The view will change:



- To add share locations:

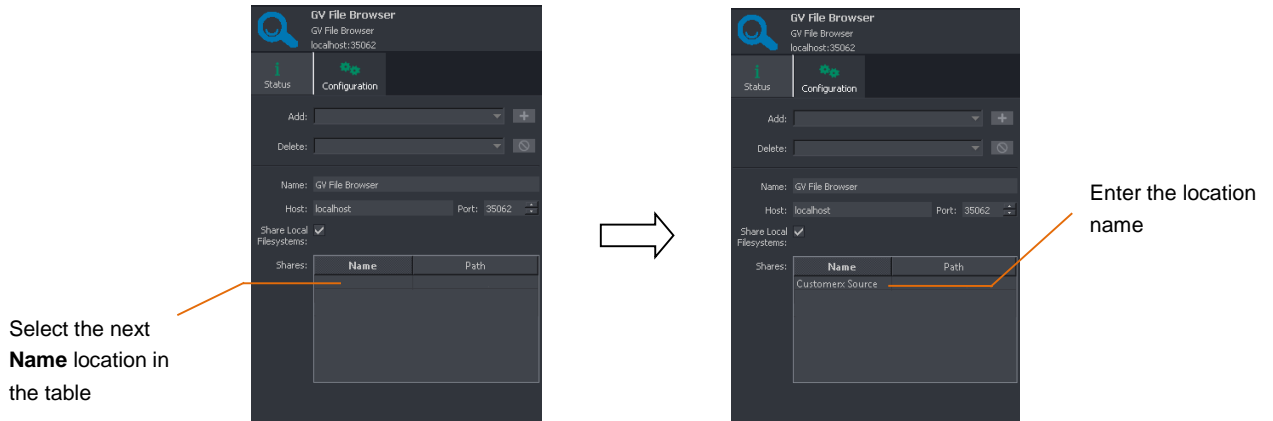
Consider that two folders have been created on the *C: Drive* of the Alchemist File Server, called:

- CustomerX-Source*
- CustomerX-Destination*

It is desired that these folders can be accessed via the **GV File Browser**.

Note: The *C: Drive* mentioned above is the *C: drive* of the Alchemist File server. If a **GV File Client** is running on a remote work station, this work station will have its own *C: Drive*. It is important to understand that these are different locations.

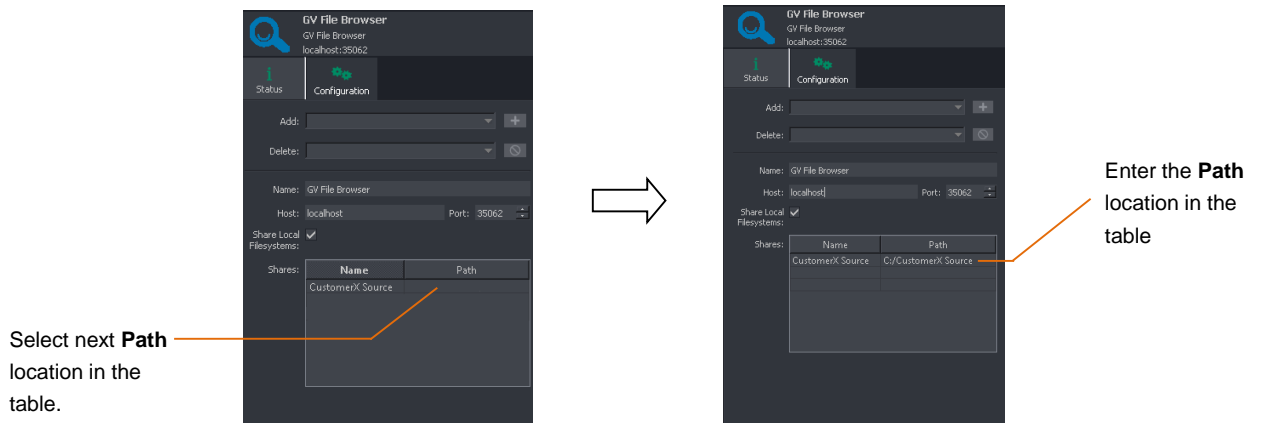
5. In the Browser **Configuration** tab, select the next **name** location in the table:



Enter the name of the new share location. In this example: **CustomerX Source**

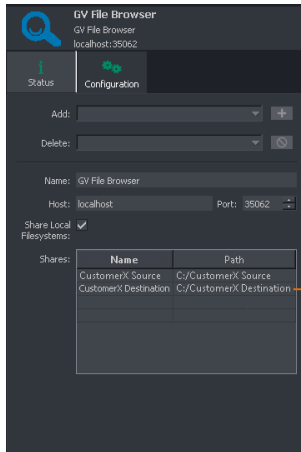
Note: The name entered must not contain special characters such as: - , . () # ; : / < >

6. In the **Path** location, enter the path to the folder being added, in this example: *C:/CustomerX-Source*



- Repeat the process for the second folder:

In this example: *C:/CustomerX-Destination*



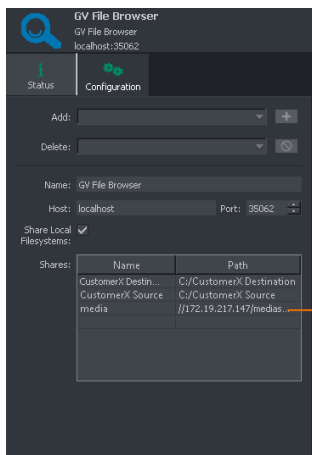
Name and path entered for the second folder.

- Click **Apply** to update the Browser.

Now, when creating new jobs, the locations *CustomerX-Source* and *CustomerX-Destination* will be available from the Browser tool in the **Create Job** window.

Note: To access remote shares the service must be configured with the correct logon credentials otherwise it will not have permission to browse and serve the directory structure to the Client.

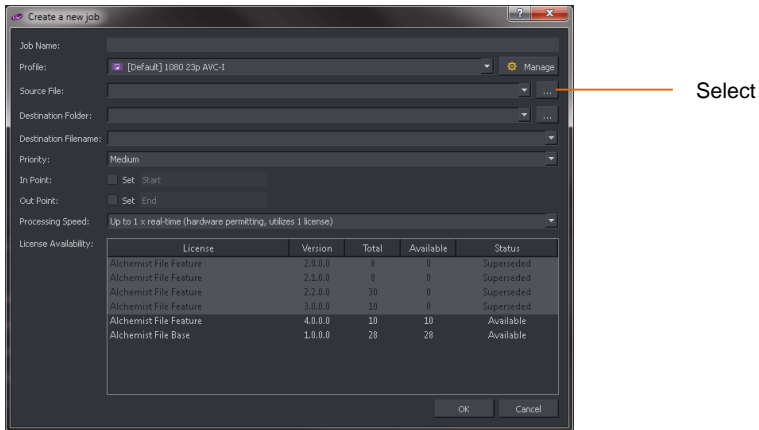
- To add a remote share where logon credentials have been configured, the full URL path must be entered:



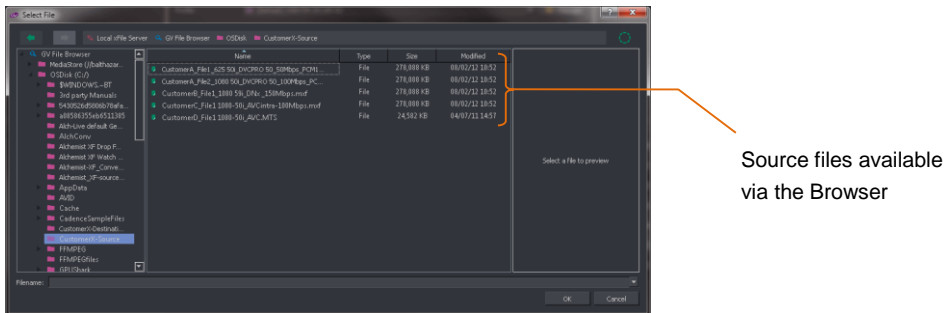
Name and Path entered for the remote share.

5.1.2 Using the Browser to Select a Source File

1. In the **Create a new job** window, click the **Source file** browse button to search for files.

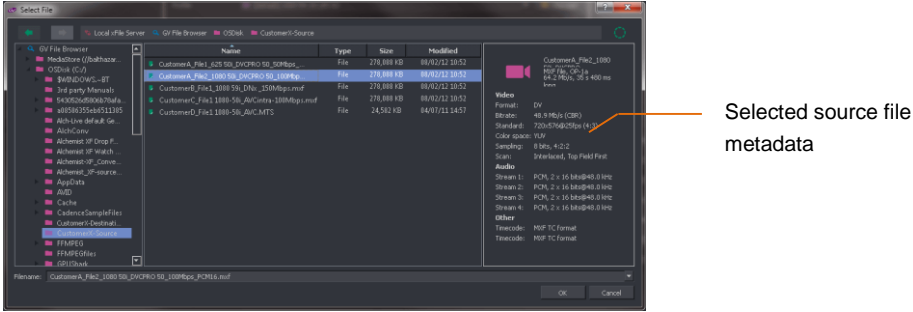


The Browser will list the files located in the chosen directory.



Note: The Browser may be used like Windows Explorer. Sub-folders below the directory configured in the Browser may be accessed via the Browser.

- To select a file, click on it to highlight it.



Note that the metadata of the source file will be displayed in the right-hand pane of the **Select File** window.



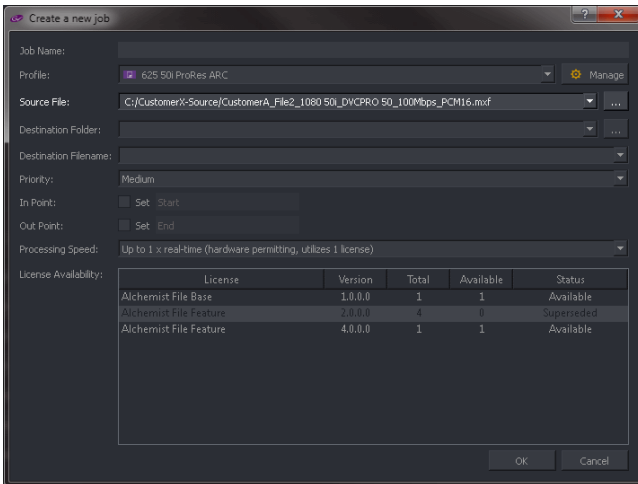
From the metadata, important parameters of the source file such as: video standard, codec, file wrapper, bit rate, etc. can be seen.

This metadata can be compared to the table of supported file types (Table 3, Appendix A, below) to confirm compatibility with Alchemist File.

Note: DPX metadata is not read by Alchemist File and when selected as a source file, this pane will not populate.

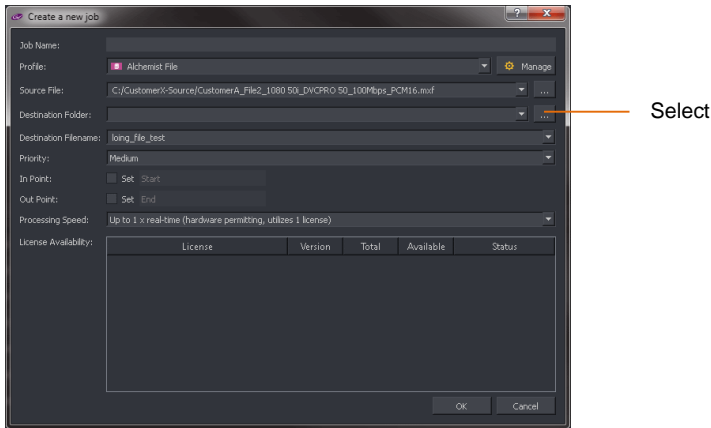
Click **OK** to select the file.

- Now in the **Create a new job** window, the **Source File** field will be populated.

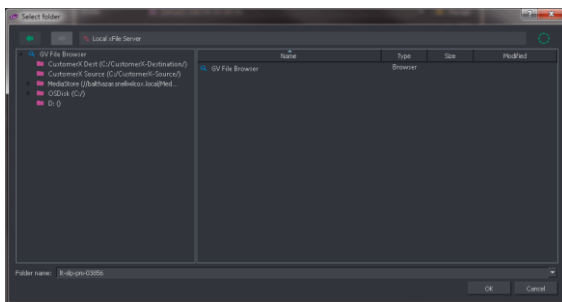


5.1.3 Using the Browser to Select a Destination Folder

1. In the **Create a new job** window, click the **Destination Folder** browse button to search for files.

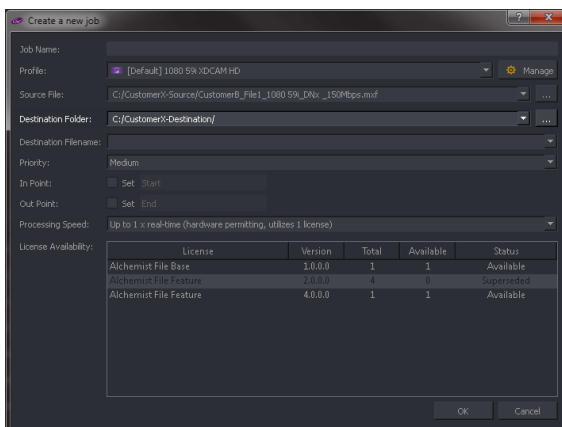


The Browser will list the configured folders.



2. To select the desired destination folder, double-click on it.

The **Destination folder** field will now be populated:



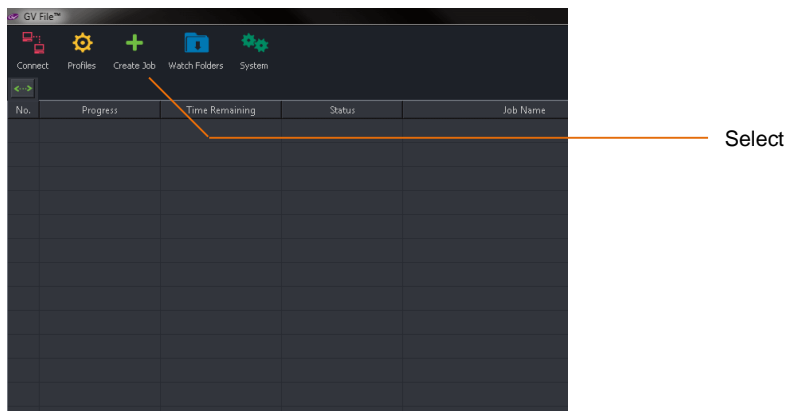
6. Creating a Job

6.1 Introduction

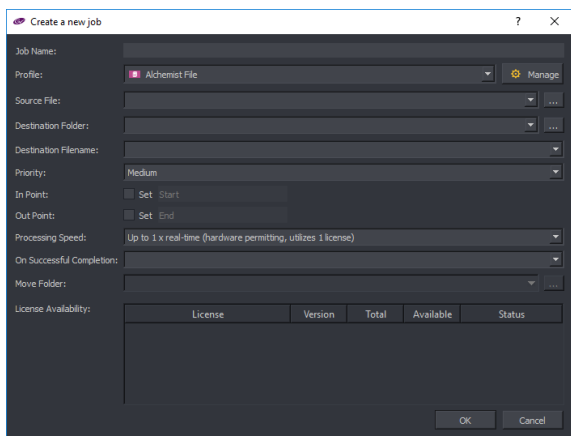
The procedure described below, explains the simple process to manually add a job to the job queue. The procedure assumes that the Browser has been configured (as described above in section 5) and that the source file exists in a location configured in the Browser.

6.2 Create Job Procedure

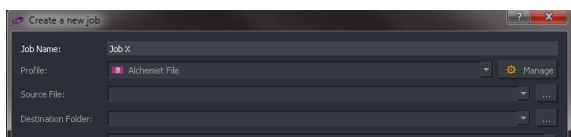
1. In the GV File Client, click on the **Create Job** icon.



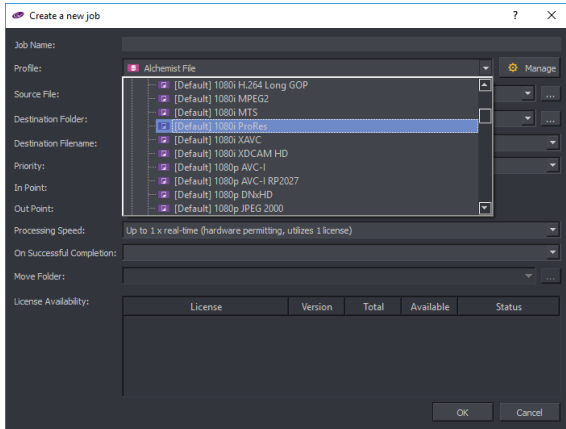
The **Create a new job** window will now open.



2. **Job Name:** Enter an appropriate job name. This name will appear when the job is added to the job queue and is useful for future reference.



3. **Profile:** A Profile can be selected from the list of available Profiles.

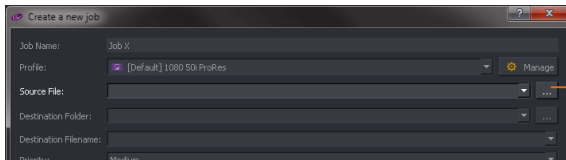


Refer to section 4 above for more information on Profiles.

4. **Source File:** The name and path of the source file needs to be entered into the **Source File** field. The easiest method to do this is via the **Browser**. See section 5 above.

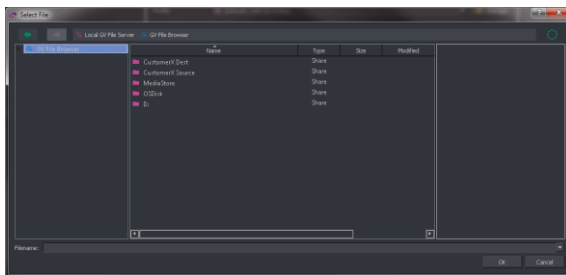
Alternatively, the source file can be selected by entering the full URL path and file name.

Click on the **Source file** browse icon:

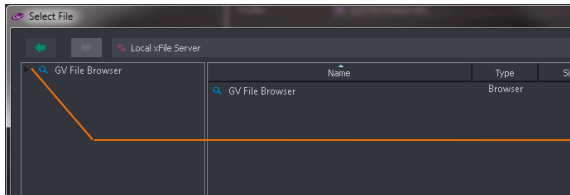


Select to initiate source file **Browser** feature

The Browser will now open.

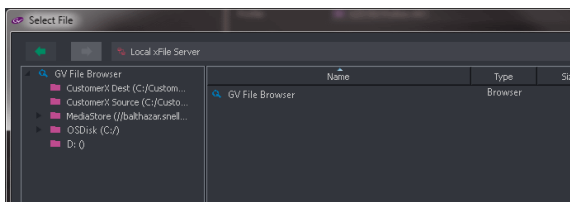


- Click on the Browser to reveal the configured folders.

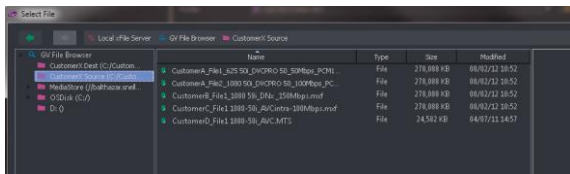


Select the Browser
(click on arrowhead)

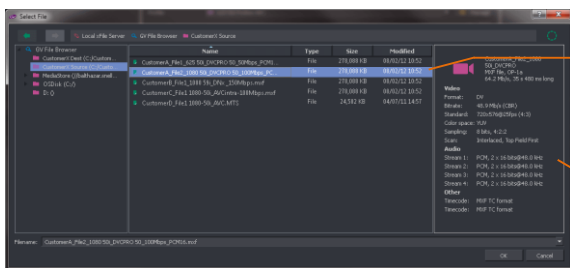
The configured source folders will now be visible.



- Double click on the appropriate folder to reveal the files within.



- Select the appropriate source file.



Select a source file

Selected file metadata

Note that upon selecting the source file, the right hand pane will populate with selected metadata from the source file.



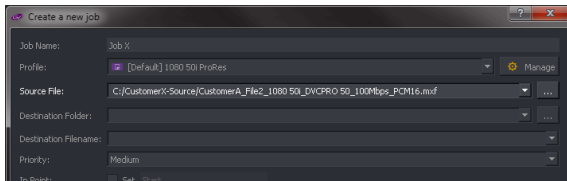
From the metadata important parameters of the source file will be displayed, such as:

Video standard, codec, file wrapper, bit rate, etc.

This metadata can be compared to the table of supported file types (Appendix A, below) to confirm compatibility with GV File.

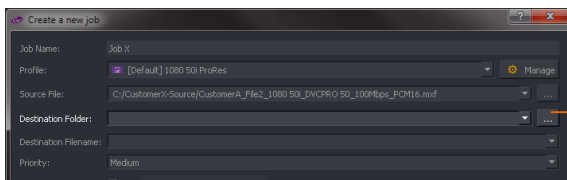
Note: DPX files do not contain metadata and when selected as a source file, this pane will not populate.

The **Source File** field will now be configured.



- 8. Destination Folder:** The destination folder needs to be defined. As with the source file, the easiest method of doing this is to use the Browser.

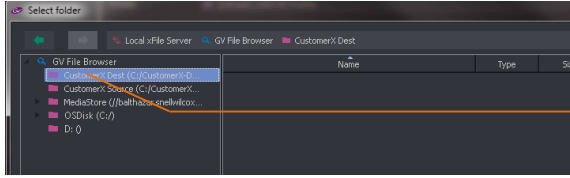
Click on the **Destination Folder** browse icon.



Select **Destination Folder** Browser

The Browser window will now open.

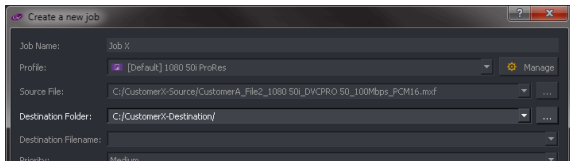
9. Select the appropriate destination folder.



Select desired destination folder.

Click **OK**.

The **Create a new job** window will now be populated with the destination folder configured.



10. **Destination Filename:** Either explicitly add a **Destination Filename** (by simply typing the desired filename in) or use output filename patterns to automatically label the destination filename.

The various output filenames can be seen in the following table. These can be concatenated or mixed with explicit characters:

Example 1: %Source%_%Profile%

Example 2: CustomerX_%Format%_%Codec%

Filename patterns are chosen by typing '%' in the **Destination Filename** field. A list of available filename patterns will appear.

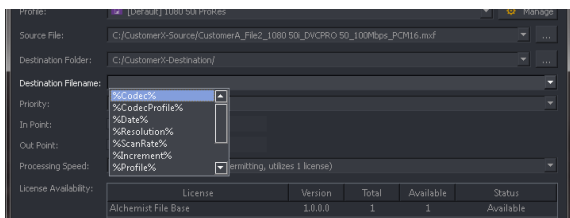
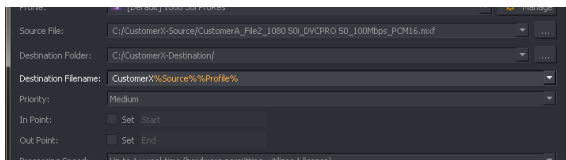


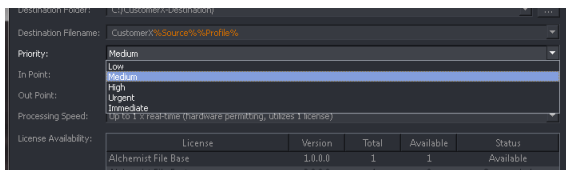
Table 3: Output Filename Format

Filename Type	Description
%Codec%	The output Codec type will be added to the filename, eg. DNxHD
%CodecProfile%	The output Codec Profile will be added to the filename, eg. DNxHD 185Mbit 10Bit
%Date%	The Date of the completed conversion will be added to the filename
%Format%	The output Format will be added to the filename, eg. 1080 50i
%Increment%	The unique Job ID will be added to the filename
%Profile%	The Profile name will be added to the filename
%Source%	The Source filename will be added to the filename
%Wrapper%	The output Wrapper type will be added to the filename, eg. MXF OP1a

In this example, the User has typed the word *CustomerX*, and added two filename patterns: *Source* and *Profile*.



11. The Priority of the job can be selected from a drop-down menu.



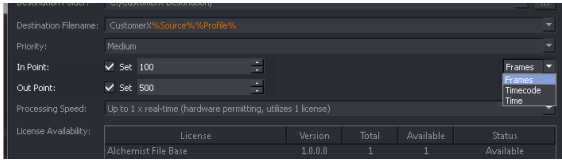
Setting a higher priority will promote the job up the job queue. Setting a priority of **High** will ensure that the job is processed before all **Medium**, and **Low** priority jobs currently in the queue. Similarly, a job given a priority of **Urgent** will be processed before all **High**, **Medium** and **Low** jobs currently in the job queue.

Any job that is not in any way critical with regard to availability, can be given a **low** priority.

The default value is **Medium**.

12. In Point / Out Point

In normal circumstances any job configured will process the source file from start to finish. However, Alchemist File offers the ability to define an **In Point** and **Out Point**, so enabling a User to process just part of a source file:



In this example, an **In Point** of 100 frames, and an **Out Point** of 500 frames, has been configured. So the output file will start 100 frames into the source file and will have duration of 400 frames.

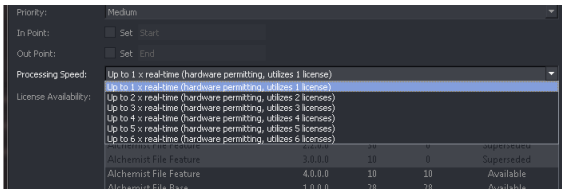
The User can choose to define the **In Point** and **Out Point** by:

- **Frames**
- **Timecode**
- **Time.**

This is useful for testing a conversion process without having to process the entire source file. For example setting up an ARC process can be a process of trial and error, so just converting a few frames can mean this process is far more efficient.

13. Processing Speed

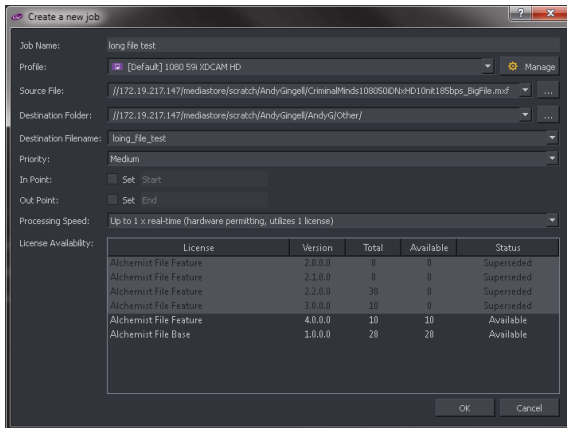
Where multiple licenses are available, licenses may be aggregated to allow faster than run-time duration.



Example; if two Alchemist File licenses are available, processing speed can be up to twice as fast (i.e. a one hour duration program can be processed in 30 minutes).

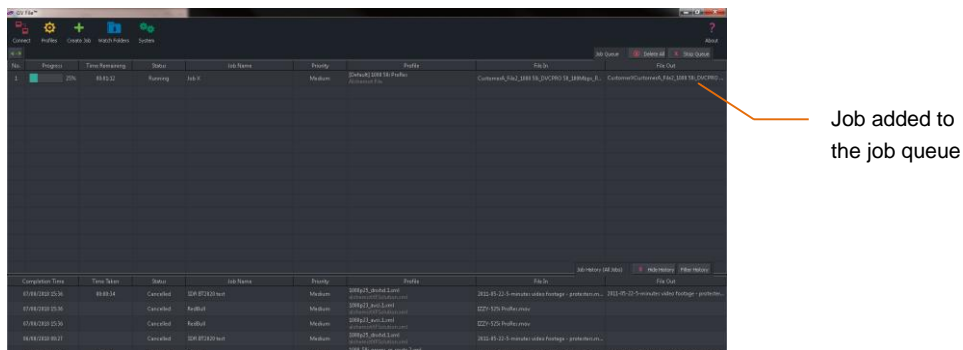
Note – actual processing time will be dependent upon the compute resources of the host machine.

14. The **Create a new job** has now been configured.



Note: Confirmation of available licensing is displayed in the **License availability** field.

Click on **OK** and the job will now be added to the job queue in the GV File Client.



The job will process automatically when it reaches the top of the job queue.

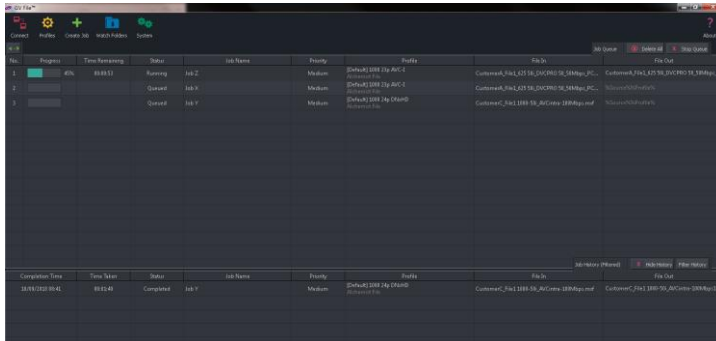
7. The Job Queue

7.1 Description

Jobs can be added to the job queue either via manual configuration (described in section 5), or via a Watch Folder Configuration (see section 8 below). There is no limit to the number of jobs that can be added to the job queue.

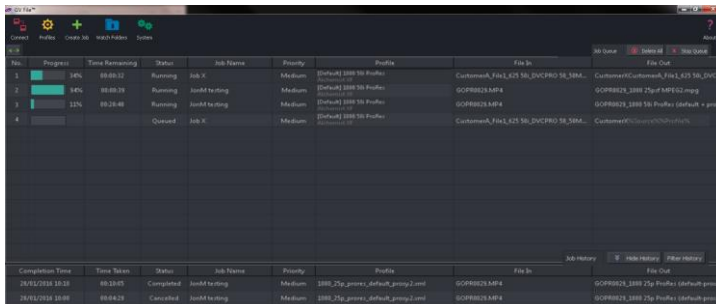
Jobs may be prioritised, cancelled, resubmitted and the job queue may be stopped at any time.

The following example depicts a GV File Client connected to an Alchemist File system with a single license.



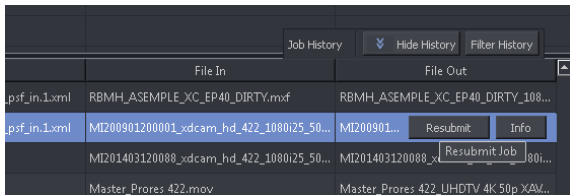
When only a single license is available, Alchemist File will process the job queue, one job at a time.

However, if multiple licensed Nodes are available, then Alchemist File can simultaneously process multiple jobs. In the following example, three licensed Nodes are available and so three jobs are processed simultaneously.



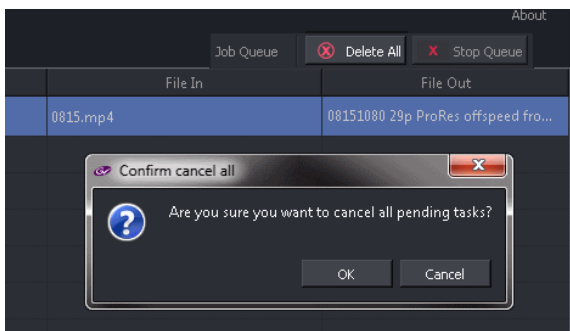
7.5 Resubmit Job

Any job in the History pane can be submitted to the queue but clicking on the job followed by the **Resubmit** button. Profiles may be modified during the resubmit process.



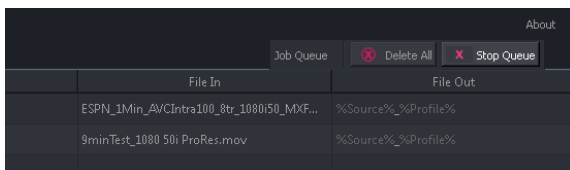
7.6 Delete the Job Queue

The entire current job queue can be deleted by clicking on the Delete All button:



7.7 Stop the Job Queue

The entire job queue can be stopped by clicking on **Stop Queue**.



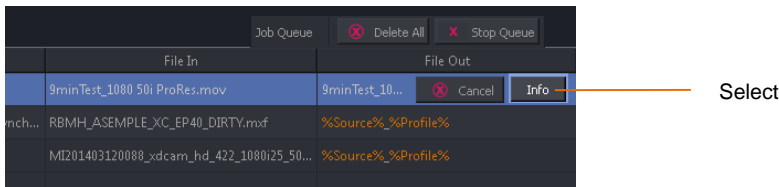
7.8 Reprioritise a Job

Jobs which are queued may have their priority modified by clicking on the **Priority** cell of the relevant job.

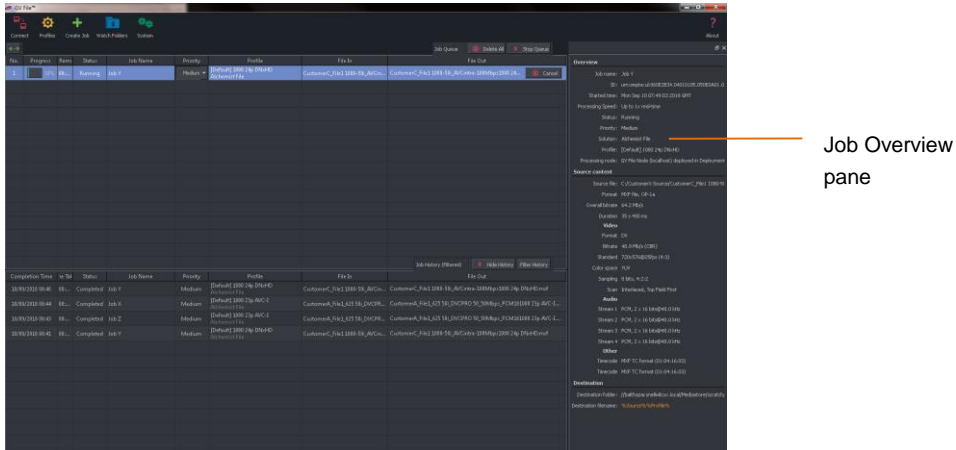
Status	Job Name	Priority	Profile
Running	Duration testing	Medium	[Default] 1080 59p AVC-I RP2027
Queued	Duration testing	Medium	1080 59i ProRes Proxy (add 2-2-3-2-3)
Queued	Duration testing	Medium	[Default] 1080 23p JPEG 2000

7.9 Job Info/Overview

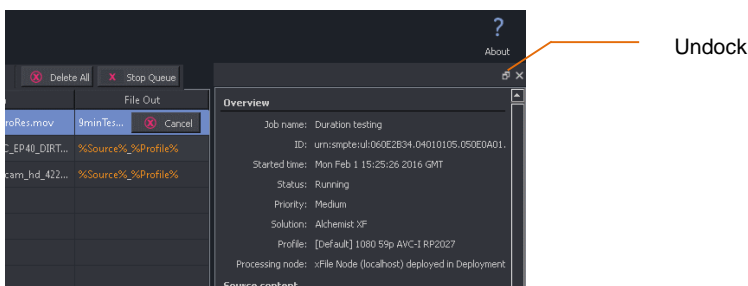
A job overview of any job can be accessed by selecting a particular job and clicking on the **Info** button.



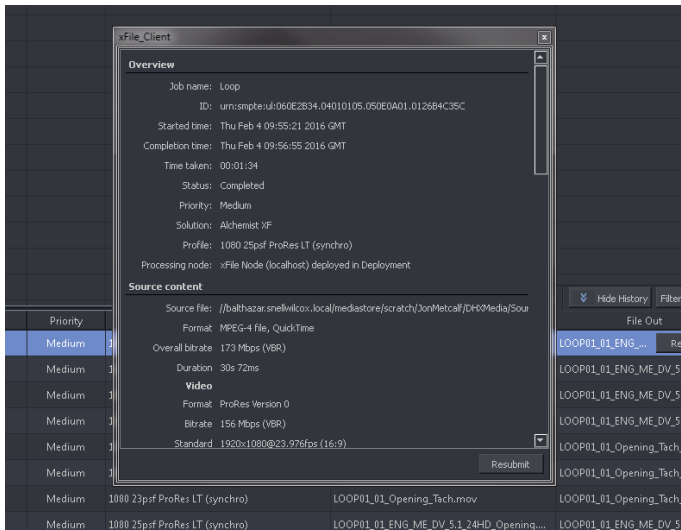
Upon clicking **Info**, an **Overview** pane will open.



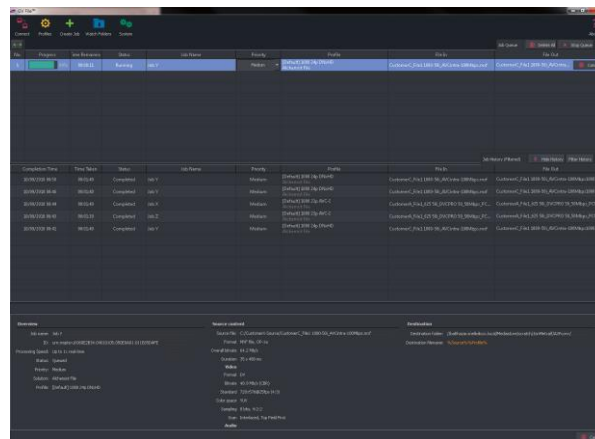
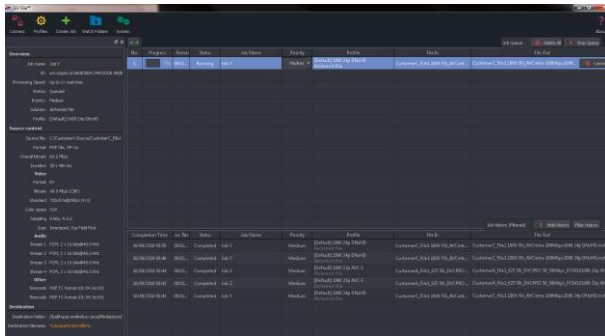
The job overview window may be placed anywhere on the User's desktop by clicking the **Undock** button.



Example of an undocked info window.



The job overview can also be docked at either side of the client or at the bottom as shown. This is achieved by clicking the cursor on the top of the info window and dragging to either side, or to the bottom of the Client GUI.



8. Watch Folders

8.1 Introduction

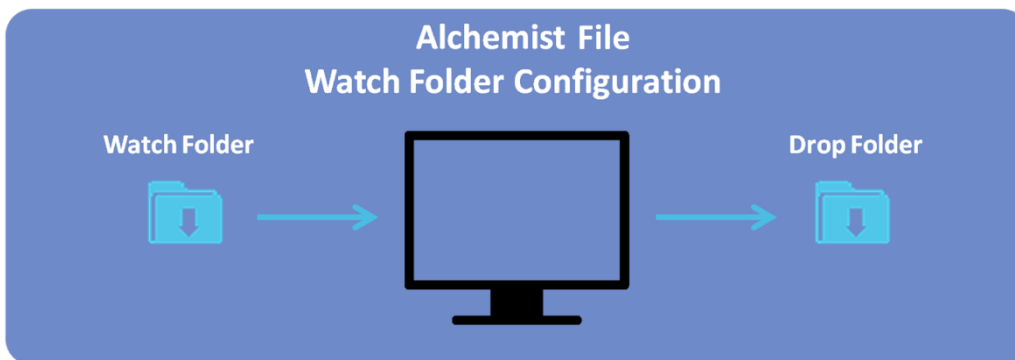
There is another optional service in the framework called the **GV File Watcher**. This enables automatic population of the job queue using specified Watch Folders and associated Drop Folders.

Before the Watcher can be used, it must first be configured. It is assumed the **GV File Watcher** has been successfully installed using the Installation Guide.

The term **Watch Folder** refers to a specified folder which is watched or monitored. The term Drop Folder defines where the output file is written to.

A **Watch Folder Configuration** describes the combination of associated Watch Folder, the associated **Drop Folder** and the associated Profile defining the conversion required.

Once the **Watch Folder Configuration** is complete, any media file placed in the Watch Folder will automatically create a job and add it to the queue. When the job reaches the top of the queue, it will be converted in accordance with the associated Profile.



Note: currently the Watch Folder feature does not support DPX file types.

8.2 Watch Folder Configuration Example

Example: A Watch Folder Configuration has the following parameters associated with it:

- Watch Folder: *C:\Alchemist File Watch Folder*
- Conversion Profile: *[Default] 1080 50i AVCI 100*
- Drop Folder: *C:\Alchemist File Drop Folder*

Transferring any file into the Watch Folder **Alchemist File Watch Folder** will automatically create a job and add it to the queue. When the job reaches the top of the queue, it will be converted in accordance with the associated Profile (in this case: *[Default] 1080 50i AVCI 100*) as defined by the Watch Folder Configuration.

The converted file will be written to the Drop Folder: *C:\Alchemist File Drop Folder*

For customers who frequently deliver content of a specific file format and video standard, the Watch Folder functionality offers a simple and convenient method of automated file conversion via Alchemist File.

8.3 How to Setup a Watch Folder Configuration

The following procedure explains how to setup a Watch Folder Configuration with Watch and Drop Folders existing on the local server.

The Watch and Drop folders will reside on the local C: drive

A folder will be created which will act as the Watch Folder:

Alchemist File Watch Folder 1

A second folder will be created which will act as the Drop Folder:

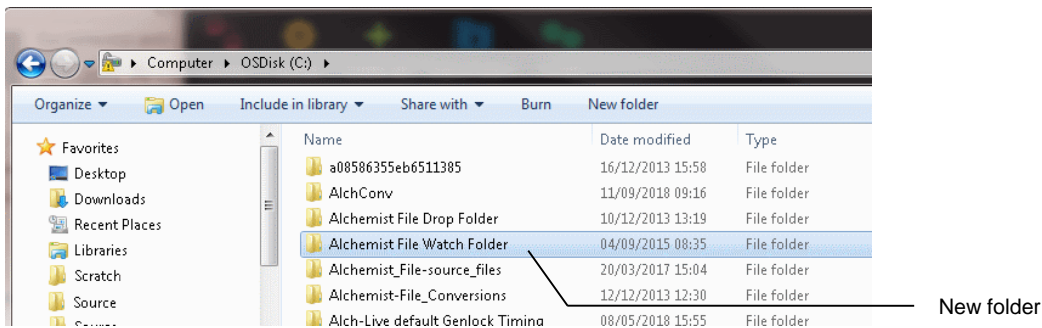
Drop Folder 1

The **Watch Folder Configuration** will have an associated Profile of:

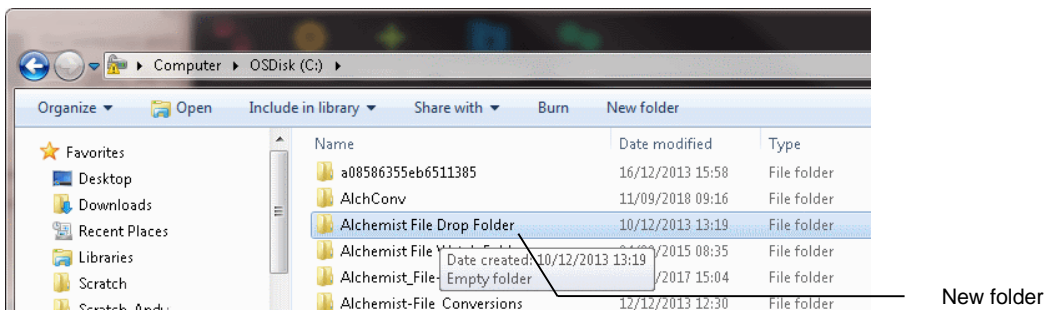
[Default] 1080 50i AVCI 100

8.3.1 Create the Physical Folders

1. Make a folder on the local C: drive called: *Alchemist File Watch Folder*

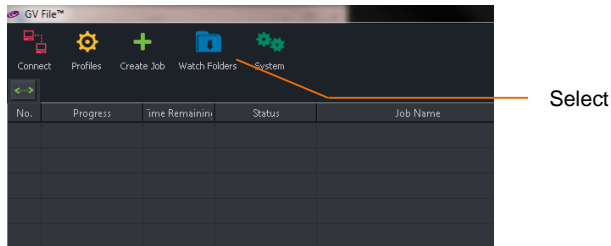


2. Make a second folder on the local C: drive called: *Alchemist File Drop Folder*

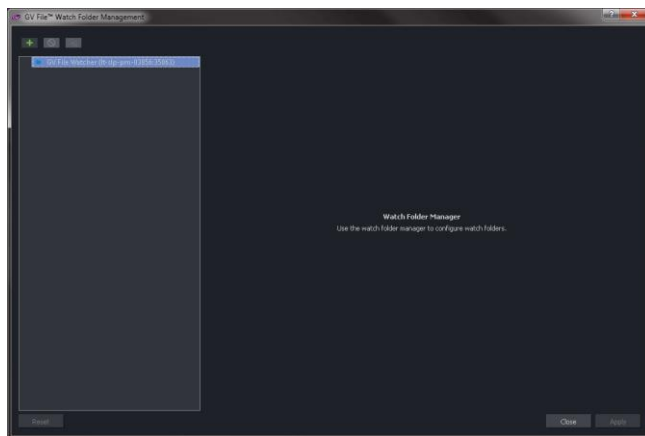


8.3.2 Create the Watch Folder Configuration

1. In the GV File Client, click on the **Watch folders** icon.



The following window will now open.



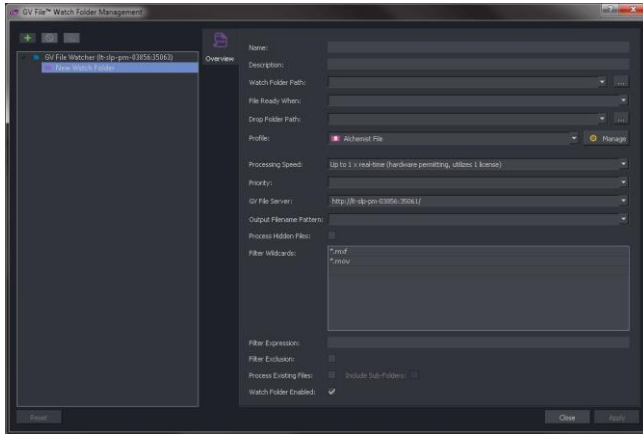
In this example there is only one Watcher called: **GV File Watcher (It-slp-pm-03856:35063)**

Note - **It-slp-pm-03856** is the name of the host computer.

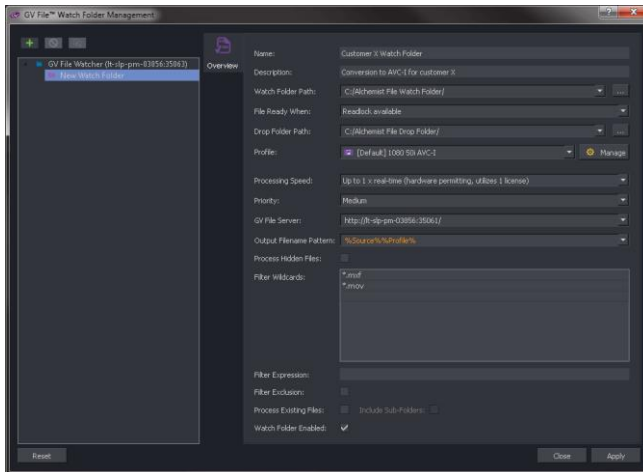
2. Click on the **New Watch Folder** symbol.



This will modify the window.



It is now necessary to populate this window with the parameters of the **Watch Folder Configuration**.

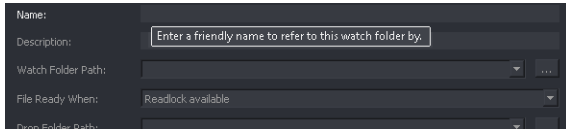


8.4 Watch Folder Configuration Parameters

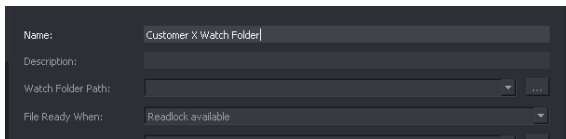
8.4.1 Name

Any new Watch Folder Configuration will need a name. This can be anything the User chooses.

Note whenever the cursor is hovered over a configurable parameter, a hint will pop-up:



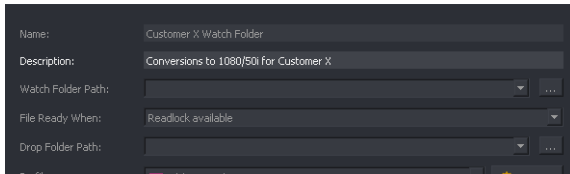
Enter a name for the Watch Folder.



Note: this does not need to be the same as the actual folder name that is being watched.

8.4.2 Description

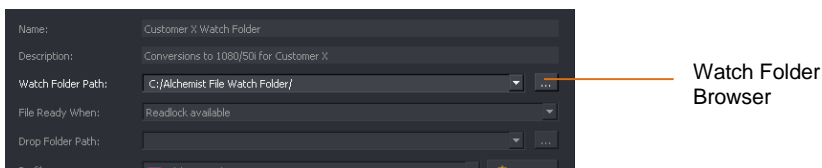
A **Description** of the Watch Folder Configuration may be entered.



This is often useful for future reference. This field is optional.

8.4.3 Watch Folder Path

Specify the URL of the Watch Folder Path. This is where the source file will be read from.

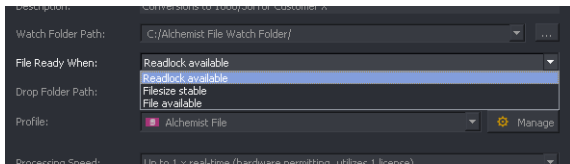


This field can easily be configured via the Browser.

8.4.4 File Ready When

The **File Ready When** control is used when large files are moved into the Watch Folder. Three options are offered:

- Readlock available
- Filesize stable
- File available

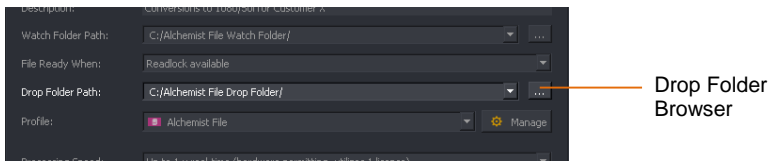


The **Readlock available** option is only applicable in a Windows environment. When selected, a conversion can commence once the **Readlock** code is available.

In a Linux system, there is no concept of a **Readlock** code, so it is recommended that one of the other options; **Filesize stable** or **File available** is selected in a Linux environment.

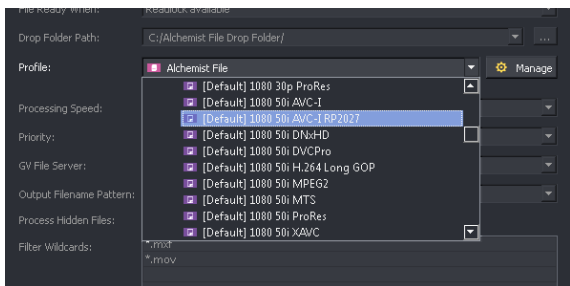
8.4.5 Drop Folder Path

Specify the URL of the **Drop Folder Path**. This is where the converted file will be written to.



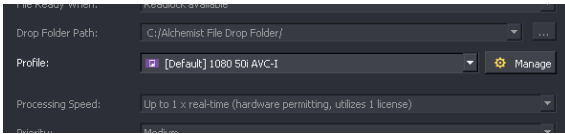
8.4.6 Profile

Specify the **Profile** to be associated with the Watch Folder Configuration.



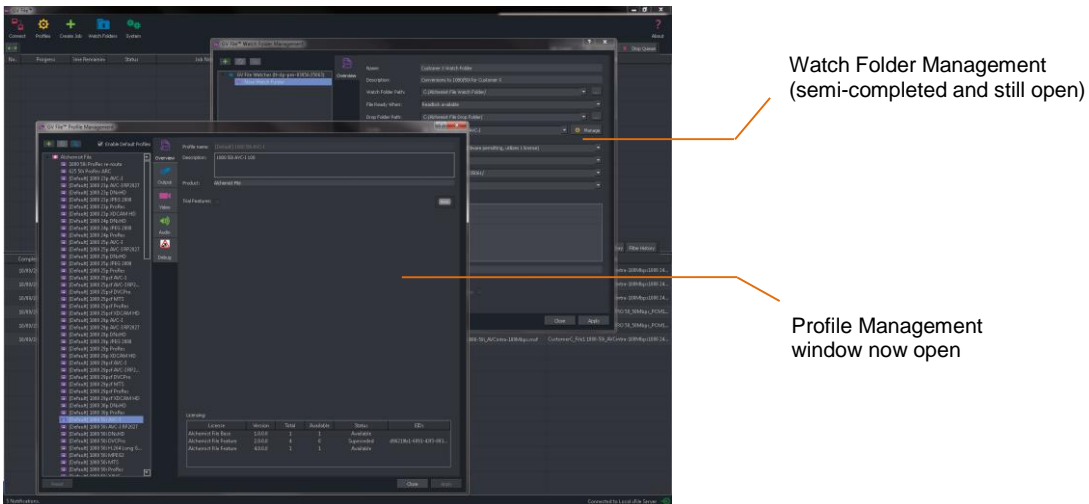
8.4.7 Manage

The Profile **Manage** feature box can be used to create or edit a Profile whilst in the middle of creating a Watch Folder Configuration.



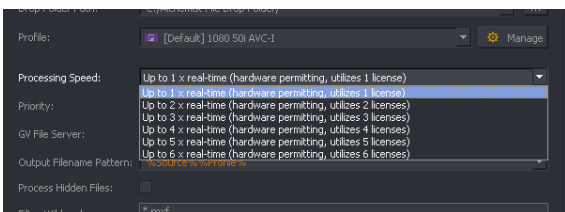
If the Watch Folder Configuration is part way through and the desired Profile does not currently exist, it is not necessary to end the Watch Folder Configuration process, build a new Profile and then start the Watch Folder Configuration from the beginning.

Selecting the **Manage** icon will bring up the **Profile Management** window, without closing the Watch Folder Management window.



8.4.8 Processing Speed

Where multiple licenses are available, licenses may be aggregated to allow faster than run-time duration.

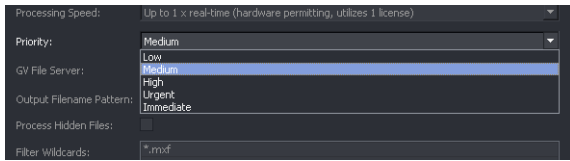


Example; if two Alchemist Live licenses are available, processing speed can be up to twice as fast (i.e. a one hour duration program can be processed in 30 minutes).

Note – actual processing time will be dependent upon the resources of the host machine.

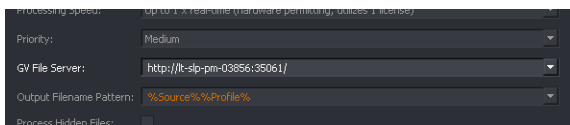
8.4.9 Priority

The priority of any job initiated via the Watch Folder Configuration can be set in this field. The default value is **Medium**. All jobs originating from this particular Watch Folder Configuration will be set to the priority as set in this field.



8.4.10 GV File Server

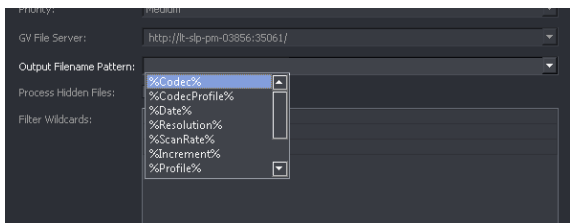
This field will be automatically populated.



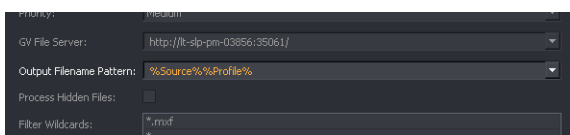
In systems where multiple GV File Servers have been configured, this control allows a specific GV File Server to be set, with respect to the Watch Folder Configuration.

8.4.11 Output Filename Pattern

Typing % will reveal the output filename pattern options.



File naming pattern concatenations of multiple *presets* may be configured:

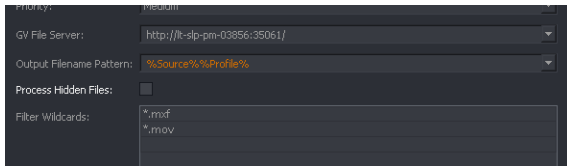


In this example, the output filename will be a concatenation of the source file name and the Profile name.

See Table 3, section 6.2 above for more information on filename patterns.

8.4.12 Process Hidden Files

Some video files have hidden files associated with them. Enable this control if hidden files are to be processed through to the output.

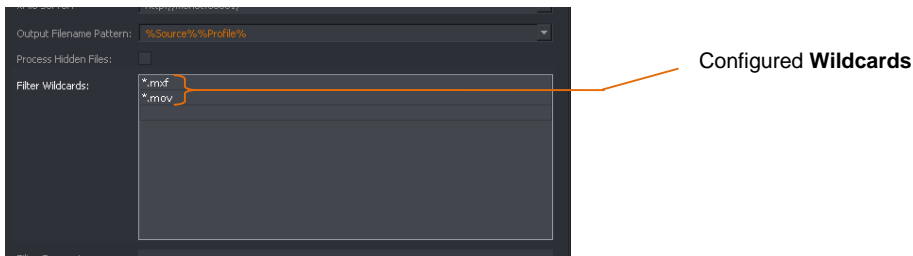


8.4.13 Filter Wildcards

Because a Watch Folder is just a folder on a PC, or server, files may be added to the folder that are not video files and it would be undesirable that such files should initiate an Alchemist File conversion.

The **Filter Wildcard** feature allows the User to specify only certain file types to initiate an Alchemist File process.

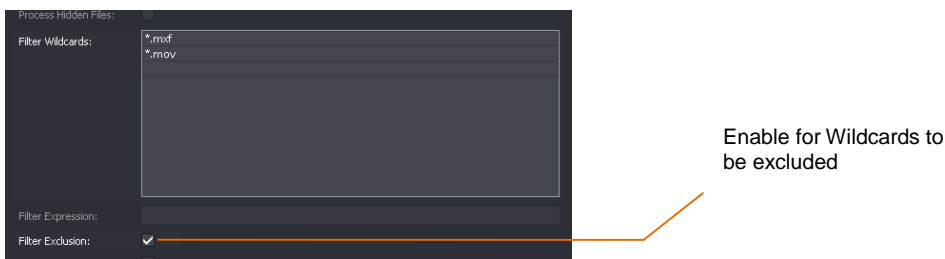
In the example below the default wildcards are depicted. Only files with the file extension **.mxf** or **.mov** moved into the Watch Folder, will initiate an automated Alchemist File process.



Note: currently the Watch Folder feature does not support DPX file types. DPX files are effectively excluded by the default setting of the **Filter Wildcards** feature, meaning that if DPX files are written to an active Watch Folder, they will not initiate an Alchemist File process. If the settings of the **Filter Wildcards** feature are set such that DPX files are no longer excluded, then DPX files written to the Watch Folder will initiate an Alchemist File process. However, the results will be very undesirable and it's important that this scenario is avoided.

Alternatively, the Wildcard Filter may be used to exclude certain file types from initiating an Alchemist File process.

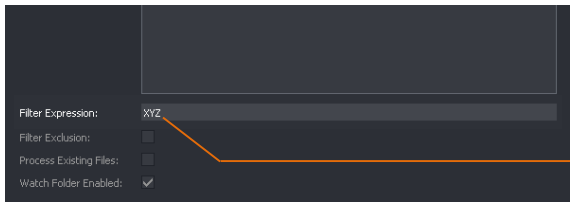
In the following example, word documents have been excluded.



To make Wildcards excluded, the **Filter Exclusion** box should be ticked.

8.4.14 Filter Expression

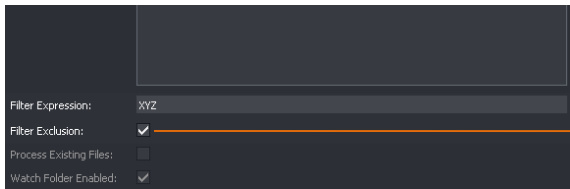
Similar to the **Filter Wildcards** feature, the **Filter Expression** feature allows the User to exclusively process only files where the file name contains a specific expression. In the following example only file names containing the word **XYZ** dropped into the Watch Folder will initiate an Alchemist File process.



Configuring a **Filter Expression**

Alternatively, the **Filter Expression** feature may be used to exclude certain file names from initiating an Alchemist File process.

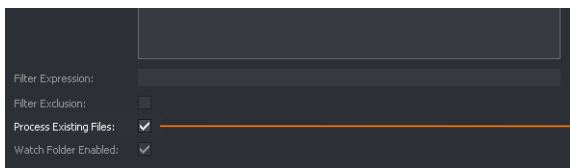
In the following example, documents with a file name containing **XYZ** have been **excluded**.



Making the **Filter Expression** exclusive.

8.4.15 Process Existing Files

The default setting of this control is **disabled**. When disabled, at the point in time that the Watch Folder is made active, any files currently residing in the Watch Folder will not initiate an Alchemist File conversion. Only new files added to the Watch Folder from this time will initiate an Alchemist File conversion.

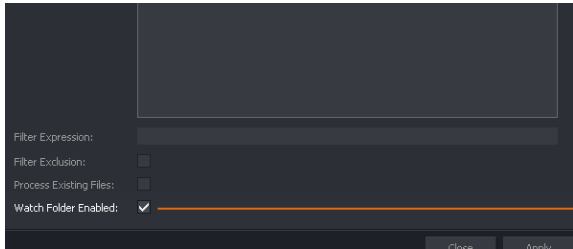


Process Existing Files enable.

If **enabled** any file currently residing in the Watch Folder will initiate an Alchemist File conversion. Multiple files will initiate multiple jobs to the job queue.

8.4.16 Watch Folder Enabled

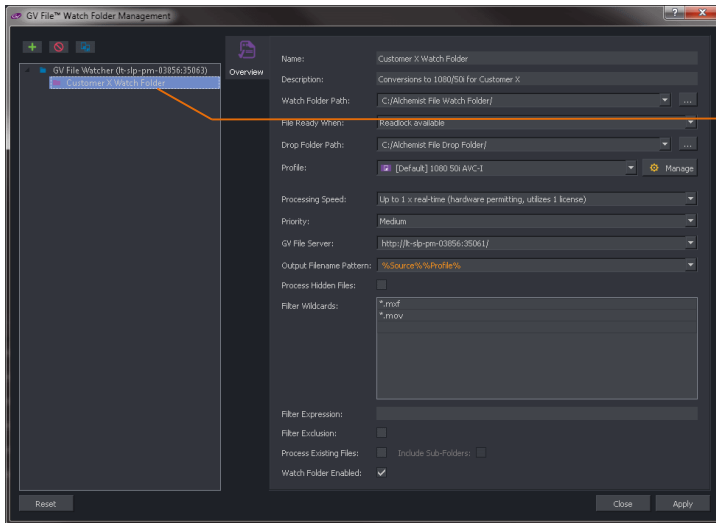
When **enabled**, the Watch Folder is active. Any file (except excluded files) written to the Watch Folder will initiate an automated Alchemist File conversion. When disabled, the Watch Folder is inactive. Any files written to the Watch Folder will not cause an Alchemist File conversion event to occur.



Enabling the Watch Folder

Select **Apply** to complete the Watch Folder Configuration

The new Watch Folder will now appear in the Watch Folder Management window.



Confirmation of new Watch Folder Configuration

Once the Watch Folder Configuration has been completed and enabled, the act of moving a file into the Watch Folder will initiate the creation of a job automatically, removing the need for the User to create jobs manually.

An Alchemist File system can be setup with many Watch Folder Configurations. For customers with requirements to convert large numbers of files, careful use of the Watch Folder feature can drastically reduce the need for human interaction.

8.5 Multiple Watch Folder Configurations

It should be appreciated that a single Watch Folder can be used in multiple Watch Folder Configurations.

8.5.1 Multiple Watch Folder Configurations Using Common Watch Folder

Suppose a particular Watch Folder is used in two separate Watch Folder Configurations:

Watch Folder Configuration 1

Parameters:

- Watch folder: *Customer X Watch Folder*
- Profile: *[Default] 1080 50i AVCI 100*
- Drop Folder: *Customer X HD*

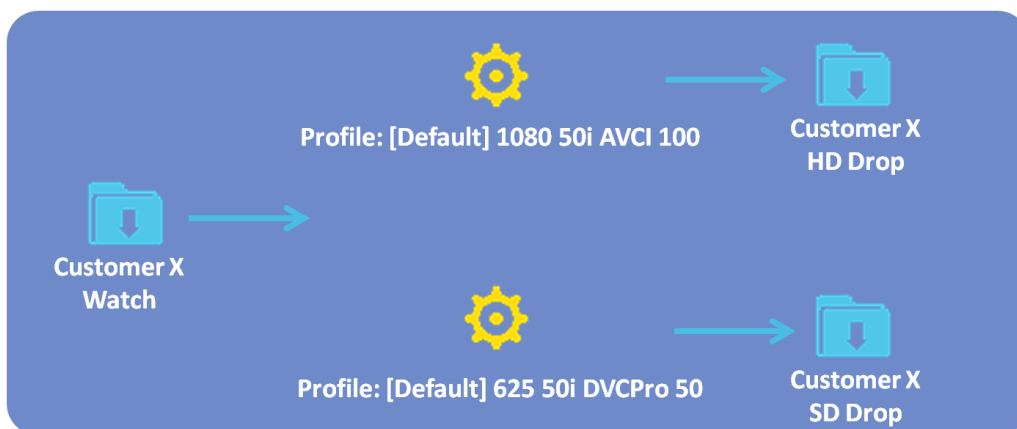
Watch Folder Configuration 2

Parameters:

- Watch folder: *Customer X Watch Folder*
- Profile: *[Default] 625i DVCPPro 50*
- Drop Folder: *Customer X SD*

In such a scenario, the act of writing a source files into the Watch Folder *Customer X Watch Folder* will initiate two separate job configurations that will be added to the job queue.

- One process will make a 1080/50i AVCI file, which will be placed in the folder **Customer X HD**.
- Second process will make a 625i DVCPPro 50 file, that will be placed in the folder **Customer X SD**

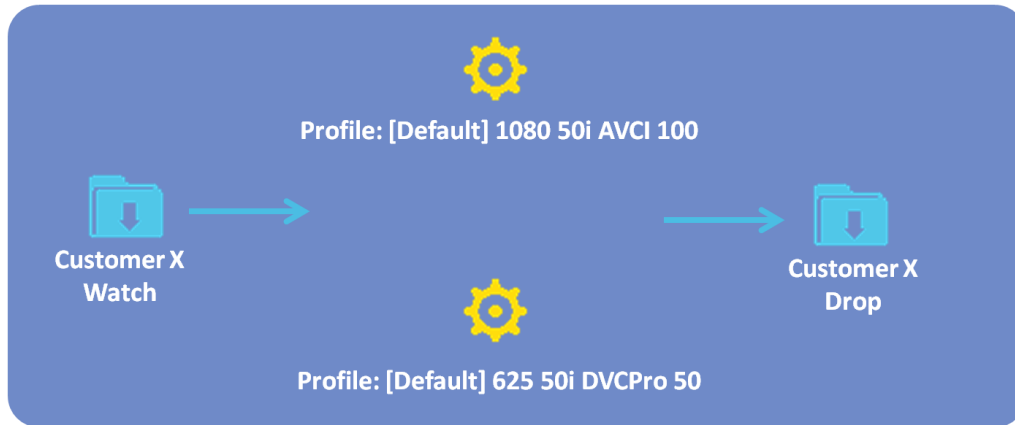


Watch Folder Configuration Using Common Watch Folder

8.5.2 Multiple Watch Folder Configurations Using Common Watch & Drop Folders

Similarly, multiple **Watch Folder Configurations** can write files to the same **Drop Folder**. In this scenario, the act of writing a file to the Watch Folder, will initiate two separate job configurations that will be added to the job queue. Both processed jobs will be written to a common Drop Folder:

- One process will make a 1080/50i AVCI 100 file, which will be placed in the folder **Customer X Drop**.
- Second process will make a 625i DVCPro 50 file, which will also be placed in the folder **Customer X Drop**.



Watch Folder Configuration Using Common Watch & Drop Folder

Appendix A. Supported File Types

A comprehensive list of supported file types is available in the document 'GV File – Supported File Types'. This can be downloaded from the website here:

[GV File - Supported File Types.pdf](#)

Appendix B. Glossary

Table 4: Glossary of Terms

Term	Definition
Aliasing	An artefact associated with sampled signals. This undesirable effect is caused by sampling frequencies being too low to faithfully reproduce the frequencies present in the original signal.
AVC-Intra	Advanced Video Codec - Intra: A professional, high efficient, codec developed by Panasonic.
AVC-HD	A consumer version of the AVC codec, developed by Panasonic for consumer camcorders. Usually wrapped in an MTS container.
Bit-rate	A phrase used to describe the data density of a video or audio file. Usually expressed in Mbps (10 ⁶ bits of data per second).
Cadence	The pattern of video fields that create a net frame rate lower than the video frame rate that carries them. Typical cadences would include 2:2 & 2:3.
Closed Captions	Closed captioning is a term describing several systems developed to display text on a television or video screen to provide additional or interpretive information to viewers who wish to access it.
Codec	Codec is derived from the words ' C ompression' and ' D ecoder'. A codec performs the task of video compression.
Color-space	Color-space is a system where the color of an individual pixel is defined by the percentage of its component colors. For example RGB color space defines a pixel's color by the percentages of red, green and blue contained there in.
Container	A file encapsulation system where separate elements (also called 'Essence') are combined into a single file. Also known as a File-Wrapper.
DNxHD	Digital Nonlinear Extensible High Definition. DNxHD is a professional HD video codec developed by AVID. DNxHD has a maximum bit-rate of 220Mbps.
DVCPPro	Is a professional video codec developed by Panasonic. DVCPPro has a maximum bit-rate of 100Mbps.
EOTF	Electro-Optical Transfer Function. Describes how to turn digital code words into visible light
Essence (video essence).	Essence files are the actual video and audio files contained within the video file. The essence files may be compressed using a codec, or maybe uncompressed, prior to wrapping in the container file.
Fallback	A term associated with motion compensated conversion. On the rare occasion complex motion may not yield useable motion vectors. Fallback allows such content to fall back to a more appropriate algorithm to create output frames. Advance solutions offer adaptive fallback modes.
File Wrapper	See Container .
Filmic	Any video content that has a refresh rate of 30Hz, or less.

Term	Definition
GPU	Graphical Processing Unit. Very efficient, highly parallel compute engine for advanced image processing techniques.
H.264	H.264 is a common video codec. H.264 is only ever wrapped with an MP4 container.
HDR	High Dynamic Range. Is a representation that allows extended dynamic range (darker darks, brighter whites) by means of new transfer functions (EOTF/OETF) and Wide Color Gamut (WCG), which replaces the traditional CRT gamma curve and BT709 colour space.
Interlace	Interlaced video is a technique of doubling the perceived frame rate of a video signal without consuming extra bandwidth. Since the interlaced signal contains the two fields of a video frame captured at two different times, it enhances motion perception to the viewer.
JPEG 2000	A file compression system developed by the Joint Photographic Experts Group in year 2000.
Linear (conversion)	Is a technique used for video standards conversion, where output field/frames are made by basic blending of input fields/frames. The technique is much simpler than motion prediction and is less demanding upon hardware, but yields inferior results.
Motion Estimation	Is the process of deriving motion vectors, usually from adjacent frames in a video sequence. For frame rate conversion these motion vectors are used to generation new output frames.
MPEG IMX	Is an SD video codec developed by Sony. It is a development of the Sony Betacam tape format and can have a bit-rate up to 50Mbps.
.mj2	Is a JPEG2000 file wrapper.
.mov	Is the file extension for Apple QuickTime files.
.mp4	MPEG-4 is a common video and audio container.
.mts	Is a video file-wrapper (also known as a container) usually associated with AVC-HD. Very similar to MT2S.
.mt2s	Is a video file-wrapper (also known as a container) usually associated with AVC-HD. Very similar to MTS.
.mxf	MXF is an acronym of Material eXchange Format . MXF is a container format for professional digital video and audio media defined by a set of SMPTE standards.
MXF OP1a	Is a specific video file-wrapper (also known as a container) type based on the MXF format.
NAS	Is an acronym for Network Attached Storage . A NAS offers both storage and a file system and appears to a client OS as a file server which drives can be mapped to.
Native (resolution)	The actual resolution of a video signal. If the native resolution is not supported by a display device, a form of rescaling maybe applied to make it viewable. Native resolution describes the resolution prior to any scaling.
OETF	Opto-Electronic Transfer Function. Inverse function of EOTF, describes how to turn visible light into digital code words.

Term	Definition
OOTF	Opto-Optical Transfer Function. End-to-end, camera-to-display non-linearity, intentionally introduced to the signal. Its purpose is to make the image perceptually as close as possible to the real world. Can be referred to as Rendering Intent.
OS	An Operating System is the software that manages computer hardware and software resources.
Phase Correlation	An advance method of motion estimation, based on the spectral analysis of two successive fields / frames. For frame rate conversion, phases correlation has proven to be the most reliable and robust technique of motion estimation, ensuring the output is near indistinguishable from the source.
Progressive	Method of scanning a video picture where each line is scanned sequentially.
Psf	Psf: an acronym for 'Progressive Segmented Frame'. Is a method of transporting a progressive video frame, in an interlaced video system. Both fields of a psf frame represent the same temporal event. Pairing the interlaced fields will form a perfect progressive frame.
SAN	Is an acronym for Storage Area Network . A SAN offers block based storage which appears to the client OS as a disk.
SD	Acronym for Standard Definition . A standard definition television system usually refers to a PAL 625 or NTSC 525 interlaced systems.
Source file	Location of the source file. Path can be entered explicitly or via the browse feature (access and authorisation is required).
Slow-PAL	A PAL television standard defined as having a temporal resolution of less than 25 Hz. Usually applied to film originated content of 24, or 23.98 fps.
Telecine	A process that converts optical film frames into video.
Teletext	Teletext is a television information retrieval service created in the UK in the early 1970s. Teletext is a means of sending text and diagrams to a properly equipped television screen. It offers a range of text-based information, typically including news, weather and TV schedules. Subtitle information is also transmitted within the television signal.
TCC	NVIDIA Tesla Compute Cluster Mode. Professional NVIDIA GPUs which offer a graphics output need to have TCC mode enabled if they are to be used as a compute engine. Enabling TCC will disable the graphical output.
XAVC	Is Sony's version of the AVC codec.

Table 5: Error Strings

No	Error String
1.	<i>GV File Node received an invalid parameter in the FIMS Transform request</i>
2.	<i>GV File Node received a request to process an unknown video format in the FIMS Transform request</i>
3.	<i>The capability of the GV File Node is unknown, cannot process FIMS Transform request</i>
4.	<i>The GV File Node does not have sufficient OpenCL resources to process the job request.</i>
5.	<i>GV File Node encountered an unexpected error when processing FIMS Transform request.</i>
6.	<i>GV File Node has encountered an unexpected error.</i>
7.	<i>GV File Node could not find the Solution Profile</i>
8.	<i>GV File Node could not find the Job Profile</i>
9.	<i>GV File Node could not find the Sink Profile</i>
10.	<i>GV File Node could not find the source file</i>
11.	<i>GV File Node could not find the destination directory</i>
12.	<i>GV File Node failed to apply job specific settings</i>
13.	<i>GV File Node Worker failed to initialise</i>
14.	<i>GV File Node service was stopped during a running job</i>
15.	<i>GV File Node was unable to retrieve all profiles from the GV File Server</i>
16.	<i>GV File Node unable to obtain all required licenses</i>
17.	<i>GV File Node detected a Licensing Error during processing</i>
18.	<i>GV File Node Worker encountered an unexpected error during processing</i>
19.	<i>GV File Node could not start GV File Node Worker</i>
20.	<i>GV File Node Worker failed.</i>
21.	<i>Instance of GV File Node Worker already running</i>
22.	<i>GV File Node failed to create the Job Profile</i>
23.	<i>GV File Node cannot process the source file because it is an unsupported format</i>
24.	<i>Internal Error. Failed to cancel</i>
25.	<i>The file extension may not be valid or the file could be corrupt</i>
26.	<i>Node: Video encoder error – is the destination directory full?</i>

The GV File Node returns errors as a string to the GV File Client to enable the client to display error hints to the User.

1. Error Message:

GV File Node received an invalid parameter in the FIMS Transform request

Reason:

This failure message should only be seen if Alchemist File is being controlled via a third party application through the FIMS Transform Service API.

While processing a FIMS Transform Request the GV File Node detected an invalid parameter and could not continue.

Suggestions:

- i. Check the parameters of the 3rd party application **request**.
- ii. Run the same job from the GV File client to check validity.

2. Error message:

GV File Node received a request to process an unknown video format in the FIMS Transform request

Reason:

This failure message should only be seen if Alchemist File is being controlled via a third party application through the FIMS Transform Service API.

The FIMS Transform Request contained a request to process a video format that the GV File Node does not support.

Suggestions:

- i. Check the parameters of the 3rd party application **request**.
- ii. Run the same job from the GV File client to check validity.

3. Error message:

The capability of the GV File Node is unknown, cannot process FIMS Transform request

Reason:

It was not possible to detect the capability of the underlying hardware. Therefore the GV File Node is unable to process the FIMS Transform request.

It could be a problem with the permissions of the profiles directory in the GV File Node installation, which prevented the GV File Node service from writing the Node Capability XML file. Or the GV File node has encountered unsupported hardware

Suggestions:

- i. Check log file GV File Node Info.log in Snell logs directory.
- ii. Check the permissions of the directory <install path>/GV File Node/nodeinfo
- iii. Confirm the target hardware meets the target hardware specification.

4. Error message:

The GV File Node does not have sufficient OpenCL resources to process the job request.

Reason:

The GV File Node does not have sufficient OpenCL resources to process the job request. This could be because the solution requires GPU acceleration and none were found on the GV File Node.

Suggestions:

- i. Check that the GPU type is supported.
- ii. If the GPU is an NVIDIA Tesla or Quadro, check that it is currently configured to be in TCC mode and not WDDM (Windows Platform only).
- iii. Confirm that a GPU with sufficient resources is installed.

5. Error message:

GV File Node encountered an unexpected error when processing FIMS Transform request.

Reason:

This failure message should only be seen if Alchemist File is being controlled via a third party application through the FIMS Transform Service API.

While processing the FIMS Transform request the GV File Node encountered an unexpected error.

Suggestions:

- i. Check the parameters of the 3rd party application **request**.
- ii. Run the same job from the GV File client to check validity.

6. Error Message:

GV File Node has encountered an unexpected error.

Reason:

The GV File Node encountered an expected error either before or during processing.

Suggestions:

- i. Try running the job again.
- ii. If job persistently fails contact Snell Support

7. Error message:

GV File Node could not find the Solution Profile

Reason:

The GV File Node has not been able to load the Solution Profile from the <install path>/GV File Node/profiles directory. This may happen in a system where the GV File Node is running on a different PC/Server from the GV File Server and comms between the two has been lost. Or, the permissions of the <install path>/GV File Node/profiles directory have been modified.

Suggestion:

- i. Check comms between GV File Server and GV File Node.
- ii. Check the permissions of the <install path>/GV File Node/profiles directory.

8. Error Message

GV File Node could not find the Job Profile

Reason:

The GV File Node has not been able to load the Solution Profile from the <install path>/GV File Node/profiles directory. This may happen in a system where the GV File Node is running on a different PC/Server from the GV File Server and comms between the two has been lost. Or, the permissions of the <install path>/GV File Node/profiles directory have been modified.

Suggestion:

- i. Check comms between GV File Server and GV File Node.
- ii. Check the permissions of the <install path>/GV File Node/profiles directory.

9. Error Message:

GV File Node could not find the Sink Profile

Reason:

The GV File Node has not been able to load the Solution Profile from the <install path>/GV File Node/profiles directory. This may happen in a system where the GV File Node is running on a different PC/Server from the GV File Server and comms between the two has been lost. Or, the permissions of the <install path>/GV File Node/profiles directory have been modified.

Suggestion:

- i. Check comms between GV File Server and GV File Node.
- ii. Check the permissions of the <install path>/GV File Node/profiles directory.

10. Error Message

GV File Node could not find the source file

Reason:

The GV File Node has not been able to find the source file defined in the FIMS Transform request.

Suggestions:

- i. The path entered for the Source File, in the Create Job window is incorrect.
- ii. The source file has been deleted or moved between time of configuration and running the job.
- iii. The source file is on an associated share which is no longer reachable from the host PC/Server.

11. Error Message:

GV File Node could not find the destination directory

Reason:

The GV File Node has not been able to find the configured destination directory defined in the FIMS Transform request.

Suggestions:

- i. The path entered for the Destination Folder, in the Create Job window is incorrect.
- ii. The Destination Folder has been deleted or moved between time of configuration and running the job.
- iii. The Destination Folder is located on an associated share which is no longer reachable from the host PC/Server.

12. Error message:

GV File Node failed to apply job specific settings

Reason:

This failure message should only be seen if Alchemist File is being controlled via a third party application through the FIMS Transform Service API.

The GV File Node has failed to set job specific settings. Providing all files are available and the job specific setting conform to our API this should not occur.

Suggestions:

- i. Check the parameters of the 3rd party application **request**.
- ii. Run the same job from the GV File client to check validity.

13. **Error message:**

GV File Node Worker failed to initialise.

Reason:

The GV File Node failed to initialise the GV File Node Worker. This could be due to running a solution that is not compatible with the version of the GV File Node, or the underlying hardware is not capable of supporting the desired solution.

Suggestions:

- i. Confirm source file is a supported file type. Example; although XAVC codec is supported and QuickTime file-wrapper is also supported, however XAVC with a QuickTime wrapper as a combination is not supported at the present time.

14. **Error message:**

GV File Node service was stopped during a running job.

Reason:

The GV File Node service was stopped, by the User, during a running job. As this prevents the license from being checked, the GV File Node Worker will also be stopped and the job terminated.

15. **Error message:**

GV File Node was unable to retrieve all profiles from the GV File Server.

Reason:

The GV File Node was unable to retrieve all of the required profiles from the GV File Server. This may happen in a system where the GV File Node is running on a different PC/Server from the GV File Server and comms between the two has been lost.

Suggestion:

- i. Check comms between GV File Server and GV File Node.

16. **Error message:**

GV File Node unable to obtain all required licenses.

Reason:

The GV File Node has not been able to check out all of the licenses defined in the Solution Profile. Or, a valid license is not present.

17. Error Message:

GV File Node detected a Licensing Error during processing.

Reason:

The GV File Node has detected a licensing problem therefore the job will be terminated. This could be because the license server has become un-reachable, mid-job.

Suggestion:

- i. If the license server is on a separate PC/Server, from the GV File Server, check comms link between the two.

18. Error Message:

GV File Node Worker encountered an unexpected error during processing

Reason:

The GV File Node Worker has encountered an unexpected error. The error is written to the GV File Node log and a customer facing message is sent to the client. This is because the error message could be a low level system message such as an exception.

Suggestion:

- i. Try running the job again.
- ii. If job persistently fails, make into Support issue.

19. Error Message:

GV File Node could not start GV File Node Worker.

Reason:

The GV File Node Worker failed to start the GV File Node Worker, maybe the program is missing or the permissions are not set correctly.

Suggestion:

- i. Check the application <install path>/GV File Node/SnellOD_NodeWorker.exe exists and has the correct permissions to execute.
- ii. Check that there isn't already a **SnellOD_NodeWorker** application running.

20. **Error Message:**

GV File Node Worker failed.

Reason:

The GV File Node Worker has failed. This is most likely caused by a crash due to an unhandled exception.

Suggestion:

- i. Try running the job again.
- ii. If job persistently fails contact Snell Support.

21. **Error Message:**

Instance of GV File Node Worker already running.

Reason:

The GV File Node Worker has failed to start. This is due to an instance of the GV File Node Worker already running.

Suggestion:

- i. This shouldn't happen in the field. If seen contact GV File Support.
- ii. Check that there isn't already a GV File_NodeWorker application running.
If there is, try to terminate the GV File_NodeWorker application and try to run the job again.

22. **Error Message:**

GV File Node failed to create the Job Profile.

Reason:

The GV File Node failed to create the Job Profile. This could be due to permissions on the profile directory in the GV File Node installation or an invalid parameter.

Suggestion:

- i. Check the permissions of the <install path>/GV File Node/profiles directory.
- ii. If using a third party application test the job using the GV File Client.

23. Error Message:

GV File Node cannot process the source file because it is an unsupported format.

Reason:

The GV File Node cannot process the source file because it does not have a suitable de-multiplexer available. The GV File Node cannot process the source file as it is in a format that is not supported.

Suggestions:

- i. Check if the source file is a supported file type.
- ii. Check the source file is a supported combination of Codec and File Wrapper.
- iii. Check the source file contains a supported video format.

24. Error Message:

Internal Error. Failed to cancel.

Reason:

Failed to cancel the job, use this error to try again.

25. Error Message:

The file extension may not be valid or the file could be corrupt.

Reason:

The source file may not be a compatible file type, or possibly the source is corrupt.

Suggestions:

- i. Check that the source file is a supported file type (see supported file types table in the Alchemist User Guide).
- ii. If the file is a supported format, try running the file on a 3rd party application, to check the integrity of the file.

26. Error Message:

Node: Video encoder error – is the destination directory full?

Reason:

The Directory containing the configured destination folder does not have enough free space for the output file to be written to.

Suggestions: Change directory or make space on chosen directory.

Appendix D. DPX Support

Input DPX support:

- RGBA planar
- Y Cb,Cr planar (4:2:2)
- RGB interleaved
- RGBA interleaved
- ARGB interleaved
- CbYACrYA interleaved (4:2:2:4)
- CyYCr interleaved (4:4:4)
- CbYCrA (4:4:4:4)

Bit depths of 8, 10, 12, 16 and 32 are supported. Conversions from RGB to YUV assume REC 709 colour space.

The character limit on the source file would be governed by the OS in use. For example Windows has a filename character limit of 260.

Output DPX support:

- RGB 10bit (little endian)

Other rules for DPX

- Underscores are not required. Our reader looks for the last number in the filename and uses this as the index number. For example “1080_50i_Test_0000001.dpx” the last number would be “0000001”.
- Source files do not need to start at zero, but the sequence must be sequential – a break in the sequence will stop the conversion.
- At present all conversions from RGB to Rec.709 assume Rec.709 colour space.

Appendix E. Audio Routing – XDCam / AVC-HD / D10-IMX / MPEG2

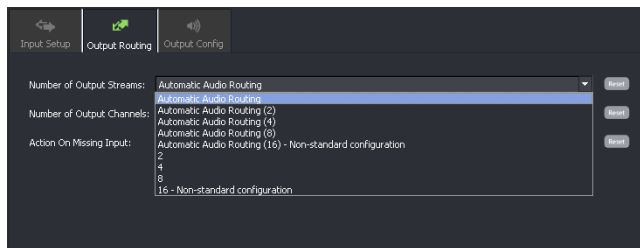
Certain Codec types that GV File supports are limited in the number of audio streams/channels they support. This has implications to any audio routing process:

The implicated codecs are:

- **XDCam** defined to carry only 2 or 4 or 8 or 16, single channel audio streams.
Note that XDCam is not legally specified to carry 16 channels of audio, but Alchemist File does allow a User to configure 16 channels if they so desire.
- **AVC-HD** defined to only carry 1 audio stream containing an even number of channels up to a maximum of 8.
- **D10/IMX** is defined to carry only a single audio stream, containing either 2, 4 or 8 audio channels. Note that D10/IMX is not legally specified to carry only 2 channels of audio, but Alchemist File does allow a User to configure 2 channels if they so desire.
- **MPEG2** is defined to carry only a single audio stream, containing 2 audio channels.

XDCam

When the output format is configured as XDCam, the User can define the number of output streams to be either: 2, 4, 8, or 16 using the drop down menu.



This drop down menu offers a choice of nine settings:

- **Automatic Audio Routing**
- **Automatic Audio Routing (2)**
- **Automatic Audio Routing (4)**
- **Automatic Audio Routing (8)**
- **Automatic Audio Routing (16) – Non-standard Configuration**
- **2**
- **4**
- **8**
- **16 – Non-standard Configuration**

Automatic Audio Routing: When selected, the actual number of output audio streams will be determined by the audio essence present in the input:

For an input containing either 1 or 2 audio channels, the output will be configured to have 2 single channel audio streams. When the input has just 1 audio channel, the second output stream will be padded with a single muted audio channel.

For an input containing either 3 or 4 audio channels, the output will be configured to have 4 single channel audio streams. When the input has just 3 audio channel, the forth output stream will be padded with a single muted audio channel.

For an input containing either 5, 6, 7 or 8 audio channels, the output will be configured to have 8 single channel audio streams. When the input has less than 8 audio channels, the output will be padded with muted audio channels to make the full complement of 8.

Where the input contains more than 8 input channels, only the top 8 channels from the input will be passed to the output. All other channels of input audio will be discarded.

Automatic Audio Routing (2): When selected, the output will only ever contain 2 single channel audio streams.

When the input has just 1 audio channel, the second output stream will be padded with a single muted audio channel.

Only the top 2 channels from the input will be passed to the output. Any additional audio channels in the input will be discarded.

Automatic Audio Routing (4): When selected, the output will only ever contain 4 single channel audio streams.

When the input has just 1, 2, or 3 audio channels, the output streams will be padded with single muted audio channels, to make the full complement of 4 single channel audio streams.

Only the top 4 channels from the input will be passed to the output. Any additional audio channels in the input will be discarded.

Automatic Audio Routing (8): When selected, the output will always contain 8 single channel audio streams.

When the input has less than 8 audio channels, the output streams will be padded with single muted audio channels, to make the full complement of 8 single channel audio streams.

Only the top 8 channels from the input will be passed to the output. Any additional audio channels in the input will be discarded.

Automatic Audio Routing (16) – Non-standard Configuration: When selected, the output will always contain 16 single channel audio streams.

When the input has less than 16 audio channels, the output streams will be padded with single muted audio channels, to make the full complement of 16 single channel audio streams.

Only the top 16 channels from the input will be passed to the output. Any additional audio channels in the input will be discarded.

2 - When selected, the output will always contain 2 single channel audio streams.

Using the audio routing tools, any 2 input audio channels can be selected and passed to the output.

4 - When selected, the output will always contain 4 single channel audio streams.

Using the audio routing tools, any 4 input audio channels can be selected and passed to the output.

8 - When selected, the output will always contain 8 single channel audio streams.

Using the audio routing tools, any 8 input audio channels can be selected and passed to the output.

16 Non-standard Configuration - When selected, the output will always contain 16 single channel audio streams.

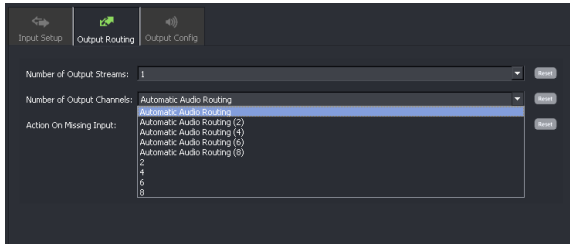
Using the audio routing tools, any 16 input audio channels can be selected and passed to the output.

AVC-HD

When AVC-HD format is selected as an output, by definition, will only have a single output audio stream.

The output audio stream can either contain 2, 4 or 8 audio channels, dependent upon the number of audio channels in the input.

The output audio stream can be defined using the drop-down list:



This drop down menu offers a choice of five settings:

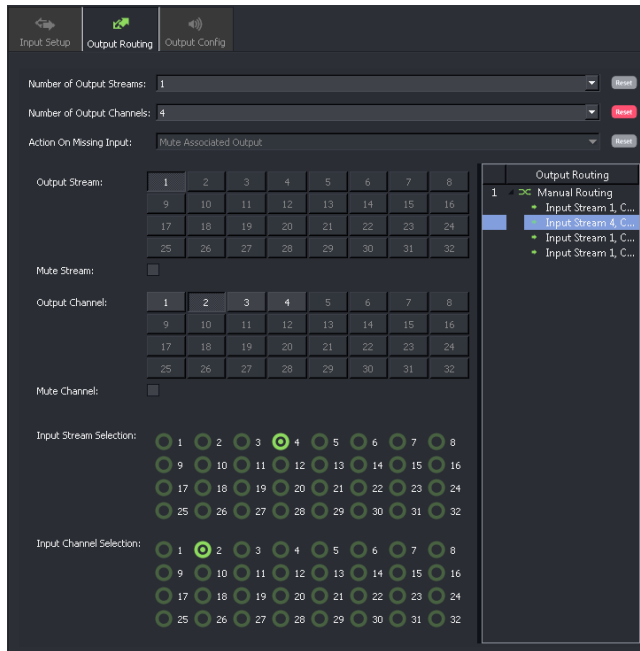
- **Automatic Audio Routing**
- **Automatic Audio Routing (2)**
- **Automatic Audio Routing (4)**
- **Automatic Audio Routing (8)**
- **2**
- **4**
- **8**

When one of the **Automatic Audio Routing** options is selected, the relevant number of input audio channels from the input will be routed to the output.

Where the number of defined output channels is greater than the number of audio channels in the source, the output will be padded with mute audio channels.

Where the number of defined output channels is less than the number of audio channels in the source, the uppermost channels in the source will be routed and the excess audio channels in the source will be stripped.

Alternatively, choosing one of the manual routing options: **2**, **4**, or **8**, will enable the User to select specific channels from the source, using the audio routing tools, which are to be routed to the output:



In this example, the number of output channels has been defined to be 4.

Output audio channel 2, is routed from input audio stream 4, channel 2.

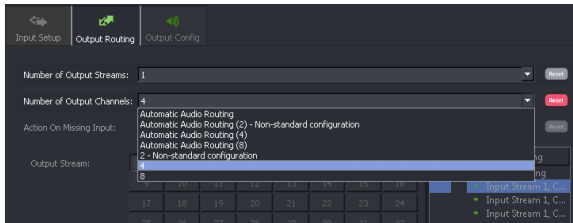
Each audio channel may be selected and configured in turn.

D10/IMX

When the output format is configured to be D10/IMX, the audio output is defined to be a single audio stream that can legally carry either 4 or 8 audio channels.

However, although the D10/IMX specification does not allow a single audio stream with 2 audio channels, due to customer requests, such a configuration is possible.

The User can define the number of output audio channels that the single audio stream can carry as either: 2, 4, or 8 using the drop-down menu. Routing maybe either automatic or manual.



This drop down menu offers the following options:

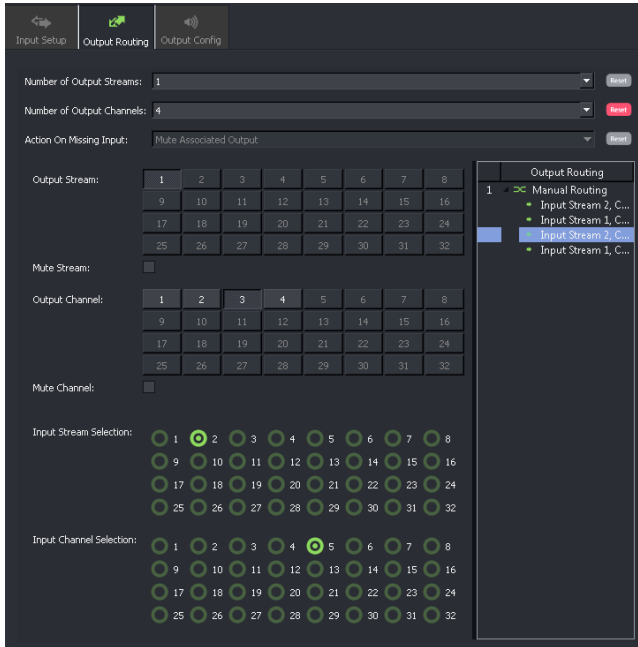
- **Automatic Audio Routing**
- **Automatic Audio Routing (2) – Non-standard Configuration**
- **Automatic Audio Routing (4)**
- **Automatic Audio Routing (8)**
- **2 – Non-standard Configuration**
- **4**
- **8**

When one of the **Automatic Audio Routing** options is selected, the relevant number of input audio channels from the input will be routed to the output.

Where the number of defined output channels is greater than the number of audio channels in the source, the output will be padded with mute audio channels.

Where the number of defined output channels is less than the number of audio channels in the source, the uppermost channels in the source will be routed and the excess audio channels in the source will be stripped.

Alternatively, choosing one of the manual routing options: **2**, **4**, or **8**, will enable the User to select specific channels from the source, using the audio routing tools, which are to be routed to the output:



In this example, the number of output channels has been defined to be 4.

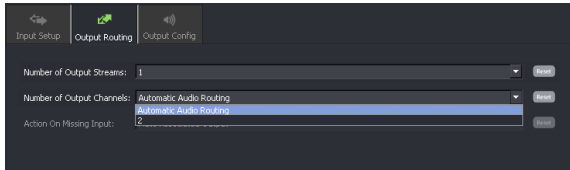
Output audio channel 3, is routed from input audio stream 2, channel 5.

Each audio channel may be selected and configured in turn.

MPEG2

When the output format is configured to be MPEG2, by definition the output can only have a single output audio stream, which can carry only two audio channels. Only two audio channels in the source will be passed to the output. All other audio channels in the source will be stripped.

Routing can be automatic or manual. This can be selected from the drop down menu.

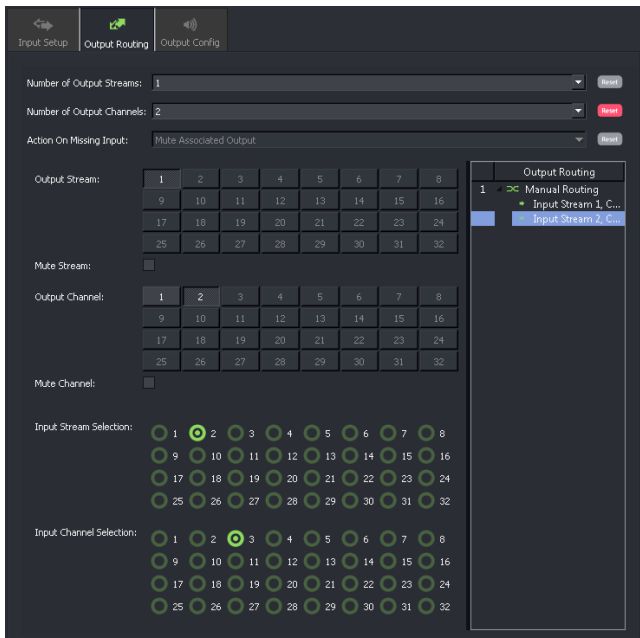


This drop down menu offers the following options:

- Automatic Audio Routing
- 2

When the **Automatic Audio Routing** option is selected, the top 2 input audio channels from the input will be routed to the output. If the input only contains a single mono audio channel, the output will be padded with a single audio mute channel.

When Manual Routing is selected (**2**), the User can select any specific channels from the source, using the audio routing tools, which are to be routed to the output:



In this example, the number of output channels has been defined to be 2.

Output audio channel 2, is routed from input audio stream 2, channel 3.

Both output audio channels may be selected and configured in turn.