### Version History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Release by</th>
<th>Reason for Changes</th>
</tr>
</thead>
<tbody>
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<td>Jon Metcalf</td>
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<td>Jon Metcalf</td>
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<td>Edit for V1.1.1.12 release</td>
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<td>04/11/2014</td>
<td>5.1</td>
<td>Jon Metcalf</td>
<td>Edit supported file type table</td>
</tr>
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<td>15/01/2015</td>
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<td>Edit for V2.0.0.10 release</td>
</tr>
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<td>7.0</td>
<td>Jon Metcalf</td>
<td>Edit for V2.1.0.12 release</td>
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<td>7.1</td>
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<td>Edit for V2.1.1.2 release</td>
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<td>7.2</td>
<td>Jon Metcalf</td>
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<td>Jon Metcalf</td>
<td>Image updates</td>
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<td>Jon Metcalf</td>
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<td>08/06/2016</td>
<td>8.3</td>
<td>Jon Metcalf</td>
<td>Edit for V2.2.2.10</td>
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<td>13/09/2016</td>
<td>8.4</td>
<td>Jon Metcalf</td>
<td>Edit for V2.2.3.2</td>
</tr>
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<td>27/09/2016</td>
<td>8.5</td>
<td>Jon Metcalf</td>
<td>Add ‘Auto’ Output Cadence table</td>
</tr>
<tr>
<td>17/12/2016</td>
<td>9.0</td>
<td>Jon Metcalf</td>
<td>Edit for V3.0.0.16</td>
</tr>
<tr>
<td>26/05/2017</td>
<td>9.1</td>
<td>Jon Metcalf</td>
<td>Edit for V3.0.1.10</td>
</tr>
</tbody>
</table>
Table of Contents

1. Definitions, Acronyms and Abbreviations ...................................................................................... 7

2. Overview copy ................................................................................................................................. 9

3. Profile Management ......................................................................................................................... 11
   3.1 Introduction ................................................................................................................................. 11
   3.2 Create a New Profile .................................................................................................................... 12
   3.3 Copy and Edit an Existing Profile ............................................................................................... 15
   3.4 Deleting Profiles ......................................................................................................................... 17
   3.5 Licensing Check ......................................................................................................................... 18

3.6 Overview Tab .................................................................................................................................. 19
   3.6.1 Profile Name ........................................................................................................................... 19
   3.6.2 Profile Description .................................................................................................................. 19
   3.6.3 Trial Feature .......................................................................................................................... 19

4. Profile Configuration ......................................................................................................................... 20
   4.1 Output/Output Tab ....................................................................................................................... 20
      4.1.1 Output/Output/Video Resolution/Resolution: Various ......................................................... 20
      4.1.2 Output/Output/Video Resolution/Resolution: Custom ......................................................... 21
      4.1.3 Output/Output/Video Resolution/Width & Height: Various ............................................... 21
      4.1.4 Output/Output/Video Scan/Scan rate: Various ................................................................. 21
      4.1.5 Output/Output/Video Scan/Frame Rate: Various .............................................................. 22
      4.1.6 Output/Output/Video Scan: 1000/1001 Multiplier .............................................................. 22
      4.1.7 Output/Output/Video Scan/Scan Type: Interlaced / PsF / Progressive .......................... 22
      4.1.8 Output/Output/Video Scan/Cadence ................................................................................. 23
      4.1.9 Duration Adjust .................................................................................................................... 25
      4.1.10 Output/Output/File Format/Codec: Various ................................................................. 26
      4.1.11 Output/Output/File Format/Codec Profile: Various ......................................................... 26
      4.1.12 Output/Output/File Format/Wrapper: various ................................................................. 26
      4.1.13 Output/Output/File Format/Field Order: Various ............................................................ 27
      4.1.15 SDR-HDR Range ................................................................................................................ 28
      4.1.16 Output/Output/Blanking: Left/Right/Top/Bottom .............................................................. 28

   4.2 Output/Metadata .......................................................................................................................... 29
      4.2.1 Output/Metadata/Display Aspect Ratio: 4x3 / 16x9 / 4x3 Full / 16x9 Full ......................... 29
      4.2.2 QuickTime Track Aperture Mode ....................................................................................... 31
      4.2.3 Output/Metadata/Start Timecode ....................................................................................... 31
      4.2.4 Output/Metadata/CDP (SMPTE 334) enable ..................................................................... 34
      4.2.5 Output/Metadata/CEA-608 (Line 21) enable ................................................................. 34
      4.2.6 Output/Metadata/CEA-608 field 1 line number .............................................................. 34
      4.2.7 Output/Metadata/CEA-608 field 2 line number .............................................................. 35
      4.2.8 Output/Metadata/Active Format Description (SMPTE 2016) ........................................... 35

© 2017 SAM

Version Number: 9.1
4.2.9 Output/Metadata/AFD enable .......................................................... 35
4.2.10 Output/Metadata/Coded frame aspect ratio .................................. 36
4.2.11 Output/Metadata/AFD Code ......................................................... 36

4.3 Video/Input Tab .............................................................................. 37
4.3.1 Video/Input/Source Scan/Scan Rate ............................................ 37
4.3.2 Video/Input/Source Scan/Frame rate ......................................... 38
4.3.3 Video/Input/Source Scan/1000/1001 Multiplier ......................... 38
4.3.4 Video/Input/Source Scan/Scan Type ........................................ 38
4.3.5 Video/Input/Source Scan/Field order: Auto/Top field first/Bottom field first ......... 39
4.3.6 Video / Input / Source Cadence / Cadence: Various .................. 39
4.3.7 Video/Input/Colorspace: Auto/REC601/BT709/BT2020 ................ 42
4.3.8 Video/Input/Input Blanking: Left/Right/Top/Bottom .................. 42
4.3.9 Video/Input/Closed Captions ..................................................... 43
4.3.10 Video/Input/DPX Inputs only/Reverse SMPTE 268 Datum .......... 43

4.4 Video/Conversion Tab ................................................................... 44
4.4.1 Video/Conversion/Conversion: Various ..................................... 44
4.4.2 Video/Conversion/Clean-cut: On – Any field / On - Field 1/ On - Field 2/ Off ............... 45
4.4.3 Video/Conversion/Aperture: Sharp/Normal/Anti-alias .................. 46
4.4.4 Video/Conversion/Alias Suppression: Horizontal/Vertical .......... 46
4.4.5 Video/Conversion/Aspect Ratio: Various .................................. 47

4.5 Video/Utilities Tab ........................................................................ 49
4.5.1 Video/Utilities/Luma Gain: +/- 6dB ........................................... 49
4.5.2 Video/Utilities/Chroma Gain: +/- 6 dB ..................................... 49
4.5.3 Video/Utilities/Black Level: +/- 80mV ....................................... 49
4.5.4 Video/Utilities/Luma Clipper: Various ...................................... 50
4.5.5 Video/Utilities/RGB Legalizer: Off/700mV/721mV/735mV/Custom .... 50

4.6 Audio Tab/Input Setup .................................................................. 51
4.6.1 Audio/Input Setup ..................................................................... 52
4.6.2 Audio/Input setup/Number of Input Streams .............................. 52
4.6.3 Audio/Input Setup/Stream Selection ......................................... 52
4.6.4 Audio/Input Setup/Stream Type: Various .................................. 53
4.6.5 Audio/Input Setup/Stream Delay: -250ms to 500ms ................. 54
4.6.6 Audio/Input Setup/Stream Gain: +/- 12dB ................................. 54
4.6.7 Audio/Input Setup/Program Selection & Channel Gain: +/- 12dB .... 55

4.7 Audio Tab/Output Config ............................................................... 57
4.7.1 Audio/Output Config/Bit Depth: Auto/16-bit/24-bit ................. 57
4.7.2 Audio/Output Config/QuickTime Format .................................... 58
4.7.3 Audio/Output Config/QuickTime endianess: Auto/Little endian/Big endian .......... 58
4.7.4 Audio/Output Config/Off Speed ............................................. 59

4.8 Audio/Output Routing .................................................................. 60
4.8.1 Audio/Output Routing: Number of Output Streams .................. 60
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.8.2 Audio/ Output Routing/Action on Missing Input streams</td>
<td>64</td>
</tr>
<tr>
<td>4.8.3 Audio Routing Process</td>
<td>65</td>
</tr>
<tr>
<td>4.8.4 Audio/Input Setup/Audio Program Routing</td>
<td>67</td>
</tr>
<tr>
<td>5. Browser Configuration</td>
<td>69</td>
</tr>
<tr>
<td>5.1 Introduction</td>
<td>69</td>
</tr>
<tr>
<td>5.1.1 Browser Configuration</td>
<td>69</td>
</tr>
<tr>
<td>5.1.2 Using the Browser to Select a Source File</td>
<td>73</td>
</tr>
<tr>
<td>5.1.3 Using the Browser to Select a Destination Folder</td>
<td>75</td>
</tr>
<tr>
<td>6. Creating a Job</td>
<td>76</td>
</tr>
<tr>
<td>6.1 Introduction</td>
<td>76</td>
</tr>
<tr>
<td>6.2 Create Job Procedure</td>
<td>76</td>
</tr>
<tr>
<td>7. The Job Queue</td>
<td>84</td>
</tr>
<tr>
<td>7.1 Description</td>
<td>84</td>
</tr>
<tr>
<td>7.2 History Pane</td>
<td>85</td>
</tr>
<tr>
<td>7.3 Failed Jobs</td>
<td>85</td>
</tr>
<tr>
<td>7.4 Cancelling a Job</td>
<td>85</td>
</tr>
<tr>
<td>7.5 Resubmit a Job</td>
<td>86</td>
</tr>
<tr>
<td>7.6 Delete the Job Queue</td>
<td>86</td>
</tr>
<tr>
<td>7.7 Stop the Job Queue</td>
<td>86</td>
</tr>
<tr>
<td>7.8 Re-prioritise a Job</td>
<td>86</td>
</tr>
<tr>
<td>7.9 Job Info/Overview</td>
<td>87</td>
</tr>
<tr>
<td>8. Watch Folders</td>
<td>89</td>
</tr>
<tr>
<td>8.1 Introduction</td>
<td>89</td>
</tr>
<tr>
<td>8.2 Watch Folder Configuration Example</td>
<td>89</td>
</tr>
<tr>
<td>8.3 How to Setup a Watch Folder Configuration</td>
<td>90</td>
</tr>
<tr>
<td>8.3.1 Create the Physical Folders</td>
<td>90</td>
</tr>
<tr>
<td>8.3.2 Create the Watch Folder Configuration</td>
<td>91</td>
</tr>
<tr>
<td>8.4 Watch Folder Configuration Parameters</td>
<td>93</td>
</tr>
<tr>
<td>8.4.1 Name</td>
<td>93</td>
</tr>
<tr>
<td>8.4.2 Description</td>
<td>93</td>
</tr>
<tr>
<td>8.4.3 Watch Folder Path</td>
<td>93</td>
</tr>
<tr>
<td>8.4.4 File ready when</td>
<td>94</td>
</tr>
<tr>
<td>8.4.5 Drop Folder Path</td>
<td>94</td>
</tr>
<tr>
<td>8.4.6 Profile</td>
<td>94</td>
</tr>
<tr>
<td>8.4.7 Manage</td>
<td>95</td>
</tr>
<tr>
<td>8.4.8 Processing Speed</td>
<td>95</td>
</tr>
<tr>
<td>8.4.9 Priority</td>
<td>96</td>
</tr>
<tr>
<td>8.4.10 xFile Server</td>
<td>96</td>
</tr>
<tr>
<td>8.4.11 Output Filename Pattern</td>
<td>96</td>
</tr>
<tr>
<td>8.4.12 Process Hidden Files</td>
<td>97</td>
</tr>
<tr>
<td>8.4.13 Filter Wildcards</td>
<td>97</td>
</tr>
</tbody>
</table>
8.4.14 Filter Expression .......................................................................................................................... 98
8.4.15 Process Existing Files ..................................................................................................................... 98
8.4.16 Watch Folder Enabled ..................................................................................................................... 99
8.5 Multiple Watch Folder Configurations ............................................................................................... 100
  8.5.1 Multiple Watch Folder Configurations Using Common Watch Folder ........................................... 100
  8.5.2 Multiple Watch Folder Configurations Using Common Watch & Drop Folders ............................ 101

Appendix A.  Supported File Types ............................................................................................................. 102
Appendix B.  Glossary ................................................................................................................................ 106
Appendix C.  xFile Error Strings ............................................................................................................... 109
Appendix D.  DPX Support .......................................................................................................................... 120

List of Tables
Table 1: Table of Terminology .................................................................................................................... 7
Table 2: Output Cadence Auto setting ....................................................................................................... 23
Table 3: Output Filename Format ............................................................................................................... 81
Table 4: Supported File Types .................................................................................................................... 102
Table 5: H264 Long GOP Information ....................................................................................................... 105
Table 6: Glossary of Terms ........................................................................................................................ 106
Table 7: Error Strings ................................................................................................................................ 110
## 1. Definitions, Acronyms and Abbreviations

### Table 1: Table of Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td><strong>Application Programming Interface.</strong> An API specifies how some software components should interact with each other</td>
</tr>
<tr>
<td>Cadence</td>
<td>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.</td>
</tr>
<tr>
<td>Destination folder</td>
<td>Folder where finished jobs are written to (access and authorisation required)</td>
</tr>
<tr>
<td>Drop Folder</td>
<td>A folder associated with a <strong>Watch Folder Configuration.</strong> The folder will act as a repository for files converted by the associated Watch Folder Configuration</td>
</tr>
<tr>
<td>EOTF</td>
<td><strong>Electro-Optical Transfer Function.</strong> This describes how to turn digital code words into visible light</td>
</tr>
<tr>
<td>Filmic</td>
<td>Any video content that has a refresh rate of 30Hz, or less.</td>
</tr>
<tr>
<td>FIMS</td>
<td><strong>Framework for Interoperable Media Services.</strong> A framework of service definitions for implementing media related operations using a Service Orientated Architecture (SOA)</td>
</tr>
<tr>
<td>GPU</td>
<td><strong>Graphical Processing Unit.</strong> Very efficient, highly parallel compute engine for advanced image processing techniques.</td>
</tr>
<tr>
<td>HDR</td>
<td><strong>High Dynamic Range.</strong> 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.</td>
</tr>
<tr>
<td>License file</td>
<td>Defines the quantity of products available</td>
</tr>
<tr>
<td>License Server</td>
<td>An application that manages product licenses</td>
</tr>
<tr>
<td>Locking code</td>
<td>Lock code based on specific locking criteria. xFile products are locked to host machine the sentinel service is installed on</td>
</tr>
<tr>
<td>OETF</td>
<td><strong>Opto-Electronic Transfer Function.</strong> Inverse function of EOTF, describes how to turn visible light into digital code words</td>
</tr>
<tr>
<td>Profile</td>
<td>A Profile defines how a piece of media is transformed / converted. <strong>Default</strong> profiles and <strong>User</strong> profiles are available</td>
</tr>
<tr>
<td>REST</td>
<td><strong>Representational state transfer.</strong> 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</td>
</tr>
<tr>
<td>SDR</td>
<td><strong>Standard Dynamic range:</strong> traditional CRT gamma curve defined by BT709 colour space in HD and by REC601 in SD.</td>
</tr>
<tr>
<td>xFile Browser</td>
<td>A service within the Alchemist XF system that allows the User to easily browse to and select a source file or, browse to a destination folder</td>
</tr>
<tr>
<td>xFile Client</td>
<td>The User Interface for the <strong>xFile</strong> framework</td>
</tr>
<tr>
<td>xFile Node</td>
<td>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</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
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<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>xFile Server</td>
<td>The Service that orchestrates all xFile processes.</td>
</tr>
<tr>
<td>xFile Watcher</td>
<td>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.</td>
</tr>
<tr>
<td>xFile</td>
<td>The Snell OD name has been rebranded to xFile. There is no functional difference between xFile and Snell OD.</td>
</tr>
<tr>
<td>Watch Folder</td>
<td>A repository folder for source files, where the action of moving a file to the folder, will initiate an automated conversion process</td>
</tr>
<tr>
<td>WCG</td>
<td>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.</td>
</tr>
<tr>
<td>Video 1:1</td>
<td>A term describing high frame rate video. For example, with regard 50i 1:1, the video content is refreshed 50 times per second.</td>
</tr>
</tbody>
</table>
2. Overview copy

Our xFile Client offers simple system configuration and management with intuitive and clear control of the job queue. At a glance you can 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 create your own user Profile to be applied to a job. Our Profile creation widget offers intelligence to help the user generate their desired Profile quickly and easily.

Included is a notification system which keeps you 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 your job queue.

Note: Installation guide can be found here: https://s-a-m.com/products/alchemy-xf-%E2%80%93-highest-quality-file-based-format-and-framerate-conversion-software/c-24/p-228#gl-tab-2

The xFile Client is easily launched via the desktop icon, which is created as part of the installation process.
**Connect** is used to configure a connection to a specified xFile Server.

![Connect button](image)

Selecting the Connect button will open the xFile™ 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 workstation and each may connect to different xFile Servers.

![Connection window](image)

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

![Connected to Meldot](image)
3. Profile Management

3.1 Introduction

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

The Alchemist XF system is supplied with a number of pre-configured conversion Profiles. These pre-configured Profiles are identified by a Default prefix and these Profiles 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. Therefore, Alchemist XF 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 XF. 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 XF 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.

You 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.
5. When editing is complete, click **Apply** to save the new Profile.

The new Profile will now appear along side the default Profiles.

The new Profile is now available for any future job. It will remain so until such time as it is deleted.
3.3 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.

   ![Selected Profile]

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

   ![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.
3. Now the copied Profile can be edited as required.

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

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

5. The new user Profile will now appear along side 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 you wish to delete.

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, you 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. 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 or disabled. 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 XF. 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 Output/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/ 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.

4.1.4 /Output/Output/Video Scan/Scan rate: Various

A drop down menu allows the User to choose the desired output video scan rate.
4.1.5 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.

4.1.6 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.

4.1.7 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.
4.1.8 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 affect of this setting upon low frame rate inputs, when high frame rate outputs are configured:

Table 2: Output Cadence Auto setting

<table>
<thead>
<tr>
<th>Input file scan rate</th>
<th>Output Scan Rate</th>
<th>50i</th>
<th>59.94i</th>
<th>60i</th>
<th>50p</th>
<th>59.94p</th>
<th>60p</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.98p</td>
<td>Auto</td>
<td>25psf</td>
<td>29.97psf</td>
<td>30psf</td>
<td>50p 2:2</td>
<td>59.95p 2:2</td>
<td>60p 2:2</td>
</tr>
<tr>
<td>23.98p</td>
<td>off</td>
<td>50i</td>
<td>59.94i</td>
<td>60i</td>
<td>50p 1:1</td>
<td>59.94p</td>
<td>60p</td>
</tr>
<tr>
<td>24p</td>
<td>Auto</td>
<td>25psf</td>
<td>29.97psf</td>
<td>30psf</td>
<td>50p 2:2</td>
<td>59.95p 2:2</td>
<td>60p 2:2</td>
</tr>
<tr>
<td>24p</td>
<td>off</td>
<td>50i</td>
<td>59.94i</td>
<td>60i</td>
<td>50p 1:1</td>
<td>59.94p</td>
<td>60p</td>
</tr>
<tr>
<td>25p / 25psf</td>
<td>Auto</td>
<td>25psf</td>
<td>29.97psf</td>
<td>30psf</td>
<td>50p 2:2</td>
<td>59.95p 2:2</td>
<td>60p 2:2</td>
</tr>
<tr>
<td>25p / 25psf</td>
<td>off</td>
<td>50i</td>
<td>59.94i</td>
<td>60i</td>
<td>50p 1:1</td>
<td>59.94p</td>
<td>60p</td>
</tr>
<tr>
<td>29p / 29psf</td>
<td>Auto</td>
<td>25psf</td>
<td>29.97psf</td>
<td>30psf</td>
<td>50p 2:2</td>
<td>59.95p 2:2</td>
<td>60p 2:2</td>
</tr>
<tr>
<td>29p / 29psf</td>
<td>off</td>
<td>50i</td>
<td>59.94i</td>
<td>60i</td>
<td>50p 1:1</td>
<td>59.94p</td>
<td>60p</td>
</tr>
<tr>
<td>30p</td>
<td>Auto</td>
<td>25psf</td>
<td>29.97psf</td>
<td>30psf</td>
<td>50p 2:2</td>
<td>59.95p 2:2</td>
<td>60p 2:2</td>
</tr>
<tr>
<td>30p</td>
<td>off</td>
<td>50i</td>
<td>59.94i</td>
<td>60i</td>
<td>50p 1:1</td>
<td>59.94p</td>
<td>60p</td>
</tr>
</tbody>
</table>

For 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 25psf and an output frame rate of 59.94i; 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 in 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 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 source cadence 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 source cadence 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:

![Image of Mixed Video/Film Custom control settings]

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.

4.1.9 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-XF 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.
4.1.10 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.

4.1.11 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.

4.1.12 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 dropdown 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 a .MOV, an .MJ2 or as an .MXF OP1a.
4.1.13 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 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.


A drop down menu allows the User to set the desired colorspace setting and gamma transfer function. The default value is Auto. In Auto mode the system will choose the appropriate colorspace and gamma transfer function 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).

Note - Alchemist XF supports:

- Conversion from HDR to SDR colorspace/gamma transfer function
- Retention of HDR colorspace/gamma transfer function
- Translation of HDR colorspace/gamma transfer function
- Conversion from SDR to HDR colorspace/gamma transfer function

4.1.15 SDR-HDR Range

This control is only active if the input **Colorspace** control is set to an SDR value, and the output **Colorspace/Transfer Function** control is set to an HDR value.

When this combination is configured, the control will be enabled.

The control **SDR-HDR Range** can be used to define how much of the available output HDR nit range the SDR is mapped into. The User can specify the desired range using the drop down menu.

The default value is: 100 nits

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.

This control allows a User to set the DAR (Display Active Ratio) flag.
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 were present in a non-drop frame source.

Where as, 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.
4.2.4 Output/Metadata/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).

4.2.5 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.

4.2.6 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.
4.2.7 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.

![Screenshot of CEA-608 field 2 line number control](image)

Note – Alchemist XF 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.

4.2.8 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).

![Screenshot of AFD enable control](image)

4.2.9 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).
4.2.10 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.

4.2.11 Output/Metadata/AFD Code

A specific AFD code may be selected from the drop down menu.
4.3 Video/Input Tab

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

4.3.1 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 multiplier).

4.3.4 Video/Input/Source Scan/Scan Type

This control has three possible settings: Auto, Interlaced, or Progressive/PsF.

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/PsF. 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 2:3:2 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.

Alchemy XF 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 vertical 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.

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

Where input files contain SDR colorspace, the **Input Colorspace** control can be set to **Auto**.

Where input files contain HDR colorspace and gamma transfer function, it is important to define the HDR specification from the drop-down menu.

Note that currently, file metadata does not describe HDR colorspace or gamma transfer function so manual configuration is essential when HDR source files are encountered.

### 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/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 18).

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 101).
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 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 the Motion Compensation, and employs a linear interpolation when converting from one frame rate to another.

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 4.6 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 XF ARC feature. Please refer to the User guide: **Alchemist XF - How to configure the ARC** (available from the xFile micro site).

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 to output translation

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

**Output screen aspect** is used to describe the destination screen aspect ratio from the drop down list.
**Source image aspect** is used to define the aspect ratio of the active image within the input screen aspect.

**Source translation** is used to describe the translation required from source to output image.

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/Utilities Tab

The third Video tab relates to the Utilities features.

![Video/Utilities Tab Image]

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

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

![Luma Gain Image]

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

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

![Chroma Gain Image]

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

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

![Black Level Image]
4.5.4 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.

4.5.5 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.
4.6 Audio Tab/Input Setup

The xFile Client offers the following audio modes of operation:

- Audio pass through
- Routing of channels within an audio stream (doesn't include XDCAM, AVCHD/MTS, D10/IMX, MPEG2/MPG/TS)
- Routing of audio streams (doesn't include XDCAM, AVC-HD/MTS, D10/IMX, MPEG2/MPG/TS)
- Audio pitch-shifting (as part of a video off-speeding process)
- Audio re-sampling (as part of a video off-speeding process)
- Audio stripping/discard

The Audio menus are split across three separate tabs.

- Input Setup
- Output Config
- Output Routing

It should be appreciated that due to the sheer number of possible audio channels that can be carried in a video file, fully comprehensive audio routing is not supported. It should be considered that an audio file can carry up to 24 streams of audio, and each stream can carry as many 24 channels (depending on the Codec). Therefore, it is theoretically possible for a video file to carry 576 channels of audio.

To offer fully comprehensive audio routing would be extremely difficult and would require complex, unwieldy menu structures. For this reason, a more practical solution is offered by the xFile Client. Audio stream routing is supported and routing of audio channels within a stream is also supported. However, the routing of audio channels from one audio stream to another is not included.
4.6.1 Audio/Input Setup

The Input Setup menu is used to describe the audio distribution of the source file. It should be considered that the audio distribution in the source file is not fully described by the metadata. Therefore, if a conversion process is to be configured, that includes audio routing, it will be necessary for the User to describe the audio distribution of the source file. This ‘describing’ process is performed in the Input Setup tab.

4.6.2 Audio/Input setup/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.

4.6.3 Audio/Input Setup/Stream Selection

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

Each stream can be selected from the Stream Selection field. The selected stream will appear with a blue background. The default setting for each stream is Passthrough.

The audio stream type applied here will influence how the User can route channels of audio later.
4.6.4 Audio/Input Setup/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.
4.6.5 Audio/Input Setup/Stream Delay: -250ms to 500ms

This control allows a global delay to be configured. This setting will affect all audio channels within the selected stream.

4.6.6 Audio/Input Setup/Stream Gain: +/- 12dB

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.
4.6.7 Audio/Input Setup/Program Selection & Channel Gain: +/- 12dB

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:

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.

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.

The L/R channel swap feature may be used to swap the channels within the stereo pair.
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.

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 Audio Tab/Output Config

4.7.1 Audio/Output Config/Bit Depth: Auto/16-bit/24-bit

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.
4.7.2 Audio/Output Config/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.

4.7.3 Audio/Output Config/QuickTime endianess: Auto/Little endian/Big endian

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 endianess** 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 endianess 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.
4.7.4 Audio/Output Config/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 exactly 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.
4.8 Audio/Output Routing

The output audio routing menus allow the User to re-route audio streams in the output. Input audio streams may be routed to alternative positions in the output file, and it is also possible to duplicate audio streams in the output, for example audio stream 1 of the input file could be output as stream 1 of the output file and duplicated as stream 2 of the output file.

It is also possible to re-route audio channels within an audio stream.

4.8.1 Audio/Output Routing: Number of Output Streams

The default setting for this control is **Follow number of Input Streams.**

In this mode, the number of output streams effectively matches the number of audio streams in the input. In this mode of operation audio routing is disabled.

For an audio routing process, the number of output streams must be configured by the User, using the drop down menu.

Most Codecs allow up to 24 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. Usually, this can be any number up to 24. However there are exceptions to this:

- **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 XF 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 max 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 XF 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 five settings:

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

Note – due to the nature of XDCam, audio routing is not permitted when XDCam is selected as the output format.
**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 compliment of 8.

Where the input contains more than 8 input channels, the extra 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.

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 compliment of 4 single channel audio streams.

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 compliment of 8 single channel audio streams.

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 compliment of 16 single channel audio streams.

Any additional audio channels in the input will be discarded.
AVC-HD

When AVC-HD format is selected as an output, by definition, will only have a single output audio stream. Audio Routing is not available and an Automatic Audio Routing mode will be defined instead.

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

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 excess audio channels in the source will be stripped.

D10/IMX

When the output format is configured to be D10/IMX, the User can define the number of output audio channels that the single audio stream can carry as either: 2, 4, or 8.

Note that the D10/IMX specification does not allow a single audio stream with 2 audio channels, but due to Customer requests, such a configuration is possible.

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 excess audio channels in the source will be stripped.

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 (top channels in the top stream) will be passed to the output. All other audio channels in the source will be stripped.
4.8.2 Audio/ Output Routing/Action on Missing Input streams

In situations where a Profile is configured, where the number of input streams is clearly defined (see part 4.6.2 above), and a source file is processed that has less audio streams associated with it, than is defined by the Audio Input Menu, then the User can decide what happens to the un-used output audio streams. Two modes are offered:

- Mute Associated Output streams
- Remove Associated Output Streams

**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. Please refer to section 4.6.13 above.
4.8.3 Audio Routing Process

The **Output Routing** tab will be modified to reflect the selected number of output audio streams (as defined in 4.1.8 above).

In this example, four output streams have been configured.

Note that appropriate **hints** can be displayed to aid the User with the configuration process.

These can be turned **off** by simply un-checking the **Show hints feature**.

In the **Routing Configuration** pane it can be seen that the configured output audio streams are actively shown in the carousel. Inactive or unsupported output streams will be greyed out.
By selecting any of the active audio streams, either in the **Routing configuration** pane, or the **Output routing** pane, the carousel will rotate to bring the selected Output stream menu to the front:

The output audio stream, in this example **Output Stream 3**, will currently have the corresponding stream in the input file routed to it.

This input stream maybe replaced by any other input stream, by simply selecting the required input stream, in the **Input Selection** pane, and dragging it to the **Output Stream 3** box:

This process maybe repeated for any active output audio stream.
The following image depicts another example of audio stream routing:

4.8.4 Audio/Input Setup/Audio Program Routing

Alchemist XF offers the ability to re-route audio programs within an audio stream. If we consider a custom input audio stream, as depicted below:
If the **Output Routing** tab is viewed, this custom input stream will appear pictorially in the carousel.

It is now possible to remap the positions of each audio program within the stream, simply by dragging and dropping within the **Output Stream** box.

In this example, audio **Program 1** has been moved to position of **Program 4**. As a consequence, **Program 2** will move to the former position of **Program 1** and **Program 3** moved to the former position of **Program 2**.

As a consequence, of moving **Program 1** to former position of **Program 4**, **Program 2** will move to the former position of **Program 1** and **Program 3** moved to the former position of **Program 2**.

In this way, audio programs within an audio stream can be re-mapped.

Note – it is not possible to duplicate audio programs within an audio stream, or to route audio programs from one audio stream to another.
5. Browser Configuration

5.1 Introduction

The xFile 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 center.

One of the services in the framework is called the xFile 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 xFile 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 xFile Client click on the System icon.

This will open the System Management window.
2. In the pane on the left hand side, click on the **Local Browser**. This will bring up the **xFile Browser** on the right hand side:

![Configuration tab]

Note: If the **xFile 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 **xFile Browser** will appear by that alternative name in the **System Management** window.

3. In the **xFile Browser** pane, select **Configuration**.

The view will change:

![In this example the Browser has been previously configured with the credentials of a Share location: Temp]

4. To add share locations:

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

- **CustomerX-Source**
- **CustomerX-Destination**

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

Note: The C: drive mentioned above is the C: drive of the Alchemist XF server. If a **xFile Client** is running on a remote work station, this work station will have it’s 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:

   ![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**
7. Repeat the process for the second folder:

In this example: C:/CustomerX-Destination

8. 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.

9. To add a remote **share** where logon credentials have been configured, the full URL path must be entered:
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.
2. To select a file, click on it to highlight it.

![Selected source file metadata]

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

Click OK to select the file.

3. 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 file 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 xFile 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.

![Job Name Image]

3. **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:

![Source file Browse Feature]

The Browser will now open.
4. Click on the Browser to reveal the configured folders.

The configured source folders will now be visible.

5. Double click on the appropriate folder to reveal the files within.
6. Select the appropriate source file.

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

```
<table>
<thead>
<tr>
<th>Video</th>
<th>Format: VC-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td>Bit rate: 44.1 kHz</td>
</tr>
<tr>
<td>Codec</td>
<td>Frame rate: 29.97 fps</td>
</tr>
<tr>
<td>Color</td>
<td>Sampling: 4:2:2</td>
</tr>
<tr>
<td>Timecode</td>
<td>Timecode: SMPTE TC Format</td>
</tr>
</tbody>
</table>
```

From the metadata we can see important parameters of the source file such as: video standard, codec, file wrapper, bit rate, etc. This metadata can be compared to the table of supported file types (section 5.1 above) to confirm compatibility with Quasar XF.

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.

7. **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.

The Browser window will now open.
8. 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.

9. **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

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

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

10. 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 anyway critical with regard to availability can be given a **low** priority.

The default value is **Medium**.
11. **In Point / Out Point**

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

![Image](image_url)

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: **Frame** count, **Timecode** or **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.

12. **Processing Speed**: where multiple licenses are available, licenses may be aggregated to allow faster than run-time duration.

![Image](image_url)

Example; if two Alchemist XF 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.

13. **A Profile must be selected from the list of available Profiles**.

![Image](image_url)

Refer to section 3 above for more information on Profiles.
The **Create a new job** window 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 xFile 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 an xFile Client connected to an Alchemist XF system with a single license.

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

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

All processed jobs will appear in the History pane, in the bottom half of the **xFile Client**.

![xFile history pane]

7.3 Failed Jobs

Any failed job will also appear. Failed jobs will be tagged with status **Failed** and will be associated with a red exclamation mark.

```
Date Time | Job Name | Status | Duration |
----------|----------|--------|----------|
23/01/2016 10:47 | Video Editing | Failed | 30.54 mins |
23/01/2016 12:05 | Audio Recording | Failed | 23.45 mins |
23/01/2016 10:34 | Image Composition | Failed | 45.12 mins |
```

Hovering the mouse over the red exclamation mark will cause a **reason for failure** message to pop-up.

```
Failed: Video encoder error - is the destination directory full?
```

Note: a list of failure messages and their respective meanings in available in Appendix B below.

Any aborted job will also appear in the History pane, tagged with a **Cancelled** status.

7.4 Cancelling a Job

A job in progress or one in the queue waiting to be processed can be cancelled anytime by clicking on the job **Cancel** button.
7.5 Resubmit a 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 Re-prioritise a Job

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

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.

Figure 1: Watch Folders

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 XF Watch Folder
- Conversion Profile: [Default] 1080 50i AVC1 100
- Drop Folder: C:\Alchemist XF Drop Folder

Transferring any file into the Watch Folder Alchemist XF 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 AVC1 100) as defined by the Watch Folder Configuration.

The converted file will be written to the Drop Folder: C:\Alchemist XF 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 XF.
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:  
A second folder will be created which will act as the Drop Folder:  
The **Watch Folder Configuration** will have an associated Profile of:  

8.3.1 Create the Physical Folders

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

2. Make a second folder on the local C: drive called: **Alchemist XF Drop Folder**
8.3.2 Create the Watch Folder Configuration

1. In the xFile Client, click on the Watch folders icon.

The following window will now open.

In this example there is only one Watcher called: **xFile Watcher (Merlot:35063)**

Note - **Merlot** 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 when ever 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. Two 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 Quasar XF 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 xFile Server

This field will be automatically populated.

In systems where multiple xFile Servers have been configured, this control allows a specific xFile 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 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.

<table>
<thead>
<tr>
<th>Process Hidden Files</th>
<th>Filter Wildcards</th>
</tr>
</thead>
<tbody>
<tr>
<td>*mxf</td>
<td>*mov</td>
</tr>
</tbody>
</table>

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 XF conversion.

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

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

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

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 XF conversion. Only new files added to the Watch Folder from this time will initiate an Alchemist XF conversion.

If enabled any file currently residing in the Watch Folder will initiate an Alchemist XF 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 XF conversion. When disabled the Watch Folder is inactive. Any files written to the Watch Folder will not cause an Alchemist XF conversion event to occur.

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

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

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 XF 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 DVCPro 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 DVCPro 50 file, that will be placed in the folder Customer X SD

Figure 2: 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.

![Diagram of Watch Folder Configuration Using Common Watch & Drop Folder](image)

Figure 3: Watch Folder Configuration Using Common Watch & Drop Folder
## Appendix A. Supported File Types

### Table 4: Supported File Types

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Codec</th>
<th>File Format</th>
<th>Supported Frame Rate</th>
<th>Supported Audio</th>
<th>CC Support</th>
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<tr>
<td>SD 525</td>
<td>D10 IMX</td>
<td>MXF OP1a / MOV</td>
<td>59i, 29psf</td>
<td>1 s x 2, 4 or 8ch</td>
<td>CEA608 L21 in MXF OP1a only</td>
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<td>SD 525</td>
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<td>59i, 29psf</td>
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<td>No</td>
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** For more information regarding H264 Long GOP/MP4 parameters, see Table 4 below

s = audio streams  
ch = audio channels

**Apple ProRes - Windows:** Due to licensing requirements, the encoding and decoding of Apple ProRes will only be enabled when the xFile Node is installed on a Windows Server operating system.

**Apple ProRes – Linux:** Due to licensing requirements, the encoding and decoding of Apple ProRes file formats is not permitted when an X Window system is running a local session i.e. if an X server is running on the xFile Node host machine, Apple ProRes jobs will not be processed.

Linux distributions offering a graphical environment will default to run level 5. Console/server operating systems will default to run level 3.

Table 5: H264 Long GOP Information

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<th>GOP</th>
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<th>End Rate</th>
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<td></td>
<td>3</td>
<td>1</td>
<td>Var (0.5fps)</td>
<td>1</td>
<td>#</td>
</tr>
<tr>
<td>2/3p</td>
<td>High</td>
<td>4.1</td>
<td>CBM (2/4fps)</td>
<td>2</td>
<td></td>
<td>3</td>
<td>1</td>
<td>Var (0.5fps)</td>
<td>1</td>
<td>#</td>
</tr>
<tr>
<td>2/3p</td>
<td>High</td>
<td>4.1</td>
<td>CBM (2/4fps)</td>
<td>2</td>
<td></td>
<td>3</td>
<td>1</td>
<td>Var (0.5fps)</td>
<td>1</td>
<td>#</td>
</tr>
</tbody>
</table>

M = I or P frame interval  
N = GOP length
## Appendix B. Glossary

### Table 6: Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aliasing</td>
<td>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.</td>
</tr>
<tr>
<td>AVC-Intra</td>
<td>Advanced Video Codec - Intra: A professional, high efficient, codec developed by Panasonic</td>
</tr>
<tr>
<td>AVC-HD</td>
<td>A consumer version of the AVC codec, developed by Panasonic for consumer camcorders. Usually wrapped in an MTS container.</td>
</tr>
<tr>
<td>Bit-rate</td>
<td>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)</td>
</tr>
<tr>
<td>Cadence</td>
<td>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 &amp; 2:3</td>
</tr>
<tr>
<td>Closed Captions</td>
<td>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</td>
</tr>
<tr>
<td>Codec</td>
<td>Codec is derived from the words ‘Compression’ and ‘Decoder’. A codec performs the task of video compression</td>
</tr>
<tr>
<td>Color-space</td>
<td>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</td>
</tr>
<tr>
<td>Container</td>
<td>A file encapsulation system where separate elements (also called ‘Essence’) are combined into a single file. Also known as a File-Wrapper</td>
</tr>
<tr>
<td>DNxHD</td>
<td>Digital Nonlinear Extensible High Definition. DNxHD is a professional HD video codec developed by AVID. DNxHD has a maximum bit-rate of 220Mbps</td>
</tr>
<tr>
<td>DVCPro</td>
<td>Is a professional video codec developed by Panasonic. DVCPro has a maximum bit-rate of 100Mbps</td>
</tr>
<tr>
<td>Essence (video essence)</td>
<td>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</td>
</tr>
<tr>
<td>Fallback</td>
<td>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</td>
</tr>
<tr>
<td>File Wrapper</td>
<td>See Container</td>
</tr>
<tr>
<td>Filmic</td>
<td>Any video content that has a refresh rate of 30Hz, or less.</td>
</tr>
<tr>
<td>GPU</td>
<td>Graphical Processing Unit. Very efficient, highly parallel compute engine for advanced image processing techniques.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>H.264</td>
<td>H.264 is a common video codec. H.264 is only ever wrapped with an MP4 container.</td>
</tr>
<tr>
<td>Interlace</td>
<td>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</td>
</tr>
<tr>
<td>JPEG 2000</td>
<td>A file compression system developed by the Joint Photographic Experts Group in Year 2000</td>
</tr>
<tr>
<td>Linear (conversion)</td>
<td>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</td>
</tr>
<tr>
<td>Motion Estimation</td>
<td>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 generate new output frames</td>
</tr>
<tr>
<td>MPEG IMX</td>
<td>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</td>
</tr>
<tr>
<td>.mj2</td>
<td>Is a JPEG2000 file wrapper</td>
</tr>
<tr>
<td>.mov</td>
<td>Is the file extension for Apple QuickTime files</td>
</tr>
<tr>
<td>.mp4</td>
<td>MPEG-4 is a common video and audio container</td>
</tr>
<tr>
<td>.mts</td>
<td>Is a video file-wraper (also known as a container) usually associated with AVC-HD. Very similar to MT2S</td>
</tr>
<tr>
<td>.mt2s</td>
<td>Is a video file-wraper (also known as a container) usually associated with AVC-HD. Very similar to MTS</td>
</tr>
<tr>
<td>.mxf</td>
<td>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</td>
</tr>
<tr>
<td>MXF OP1a</td>
<td>Is a specific video file-wraper (also known as a container) type based on the MXF format</td>
</tr>
<tr>
<td>NAS</td>
<td>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</td>
</tr>
<tr>
<td>Native (resolution)</td>
<td>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.</td>
</tr>
<tr>
<td>OS</td>
<td>An Operating System is the software that manages computer hardware and software resources</td>
</tr>
<tr>
<td>Phase Correlation</td>
<td>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</td>
</tr>
<tr>
<td>Progressive</td>
<td>Method of scanning a video picture where each line is scanned sequentially</td>
</tr>
<tr>
<td>Psf</td>
<td>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.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SAN</td>
<td>Is an acronym for <strong>Storage Area Network</strong>. A SAN offers block based storage which appears to the client OS as a disk</td>
</tr>
<tr>
<td>SD</td>
<td>Acronym for <strong>Standard Definition</strong>. A standard definition television system usually refers to a PAL 625 or NTSC 525 interlaced systems</td>
</tr>
<tr>
<td>Source file</td>
<td>Location of the source file. Path can be entered explicitly or via the browse feature (access and authorisation is required)</td>
</tr>
<tr>
<td>Slow-PAL</td>
<td>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</td>
</tr>
<tr>
<td>Telecine</td>
<td>A process that converts optical film frames into video</td>
</tr>
<tr>
<td>Teletext</td>
<td>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</td>
</tr>
<tr>
<td>TCC</td>
<td>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</td>
</tr>
<tr>
<td>XAVC</td>
<td>Is Sony’s version of the AVC codec</td>
</tr>
</tbody>
</table>
Appendix C. xFile Error Strings

If for any reason, a xFile system fails to process a particular job, an entry will be made in the xFile client history pane, where a red exclamation mark will be associated with the failed statement:

When a User hovers the mouse cursor over the red exclamation mark an error string will be returned, offering useful information as to the reason for the failure.

Below, these error strings are listed and explained.
### Table 7: Error Strings

<table>
<thead>
<tr>
<th>No</th>
<th>Error String</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>xFile Node received an invalid parameter in the FIMS Transform request</td>
</tr>
<tr>
<td>2.</td>
<td>xFile Node received a request to process an unknown video format in the FIMS Transform request</td>
</tr>
<tr>
<td>3.</td>
<td>The capability of the xFile Node is unknown, cannot process FIMS Transform request</td>
</tr>
<tr>
<td>4.</td>
<td>The xFile Node does not have sufficient OpenCL resources to process the job request.</td>
</tr>
<tr>
<td>5.</td>
<td>xFile Node encountered an unexpected error when processing FIMS Transform request.</td>
</tr>
<tr>
<td>6.</td>
<td>xFile Node has encountered an unexpected error.</td>
</tr>
<tr>
<td>7.</td>
<td>xFile Node could not find the Solution Profile</td>
</tr>
<tr>
<td>8.</td>
<td>xFile Node could not find the Job Profile</td>
</tr>
<tr>
<td>9.</td>
<td>xFile Node could not find the Sink Profile</td>
</tr>
<tr>
<td>10.</td>
<td>xFile Node could not find the source file</td>
</tr>
<tr>
<td>11.</td>
<td>xFile Node could not find the destination directory</td>
</tr>
<tr>
<td>12.</td>
<td>xFile Node failed to apply job specific settings</td>
</tr>
<tr>
<td>13.</td>
<td>xFile Node Worker failed to initialise</td>
</tr>
<tr>
<td>14.</td>
<td>xFile Node service was stopped during a running job</td>
</tr>
<tr>
<td>15.</td>
<td>xFile Node was unable to retrieve all profiles from the xFile Server</td>
</tr>
<tr>
<td>16.</td>
<td>xFile Node unable to obtain all required licenses</td>
</tr>
<tr>
<td>17.</td>
<td>xFile Node detected a Licensing Error during processing</td>
</tr>
<tr>
<td>18.</td>
<td>xFile Node Worker encountered an unexpected error during processing</td>
</tr>
<tr>
<td>19.</td>
<td>xFile Node could not start xFile Node Worker</td>
</tr>
<tr>
<td>20.</td>
<td>xFile Node Worker failed.</td>
</tr>
<tr>
<td>21.</td>
<td>Instance of xFile Node Worker already running</td>
</tr>
<tr>
<td>22.</td>
<td>xFile Node failed to create the Job Profile</td>
</tr>
<tr>
<td>23.</td>
<td>xFile Node cannot process the source file because it is an unsupported format</td>
</tr>
<tr>
<td>24.</td>
<td>Apple ProRes CODEC is only supported on a xFile Node running server grade OS</td>
</tr>
<tr>
<td>25.</td>
<td>Internal Error. Failed to cancel</td>
</tr>
<tr>
<td>26.</td>
<td>The file extension may not be valid or the file could be corrupt</td>
</tr>
<tr>
<td>27.</td>
<td>Node: Video encoder error – is the destination directory full?</td>
</tr>
</tbody>
</table>
The xFile Node returns errors as a string to the xFile Client to enable the client to display error hints to the user.

1. **Error Message:**

   *xFile Node received an invalid parameter in the FIMS Transform request*

   **Reason:**

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

   While processing a FIMS Transform Request the xFile 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 xFile client to check validity.

2. **Error message:**

   *xFile 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 XF 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 xFile Node does not support.

   **Suggestions:**

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

3. **Error message:**

   *The capability of the xFile Node is unknown, cannot process FIMS Transform request*

   **Reason:**

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

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

   **Suggestions:**

   i. Check log file xFile Node Info.log in Snell logs directory.
   
   ii. Check the permissions of the directory <install path>/xFile Node/nodeinfo
   
   iii. Confirm the target hardware meets the target hardware specification.
4. **Error message:**

   *The xFile Node does not have sufficient OpenCL resources to process the job request.*

   **Reason:**

   The xFile 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 xFile 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:**

   *xFile Node encountered an unexpected error when processing FIMS Transform request.*

   **Reason:**

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

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

   **Suggestions:**
   
   i. Check the parameters of the 3rd party application *request*.

   ii. Run the same job from the xFile client to check validity.

6. **Error Message:**

   *xFile Node has encountered an unexpected error.*

   **Reason:**

   The xFile 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:

_xFile Node could not find the Solution Profile_

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

Suggestion:

i. Check comms between xFile Server and xFile Node.

ii. Check the permissions of the <install path>/xFile Node/profiles directory.

8. Error Message

_xFile Node could not find the Job Profile_

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

Suggestion:

i. Check comms between xFile Server and xFile Node.

ii. Check the permissions of the <install path>/xFile Node/profiles directory.

9. Error Message:

_xFile Node could not find the Sink Profile_

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

Suggestion:

i. Check comms between xFile Server and xFile Node.

ii. Check the permissions of the <install path>/xFile Node/profiles directory.
10. **Error Message**

   *xFile Node could not find the source file*

   **Reason:**
   The xFile 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:**

   *xFile Node could not find the destination directory*

   **Reason:**
   The xFile 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:**

   *xFile Node failed to apply job specific settings*

   **Reason:**
   This failure message should only be seen if Alchemist XF is being controlled via a third party application through the FIMS Transform Service API.
   The xFile 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 xFile client to check validity.
13. **Error message:**

   *xFile Node Worker failed to initialise.*

**Reason:**

The xFile Node failed to initialise the xFile Node Worker. This could be due to running a solution that is not compatible with the version of the xFile 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 XDCam codec is supported and QuickTime file-wraper is also supported, however XDCam with a QuickTime wrapper as a combination is not supported at the present time.

14. **Error message:**

   *xFile Node service was stopped during a running job*

**Reason:**

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

15. **Error message:**

   *xFile Node was unable to retrieve all profiles from the xFile Server*

**Reason:**

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

**Suggestion:**

i. Check comms between xFile Server and xFile Node.

16. **Error message:**

   *xFile Node unable to obtain all required licenses*

**Reason:**

The xFile 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:**

   *xFile Node detected a Licensing Error during processing.*

**Reason:**

The xFile 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:**

1. If the license server is on a separate PC/Server, from the xFile Server, check comms link between the two.

18. **Error Message:**

   *xFile Node Worker encountered an unexpected error during processing*

**Reason:**

The xFile Node Worker has encountered an unexpected error. The error is written to the xFile 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:**

1. Try running the job again.
2. If job persistently fails, make into Support issue.

19. **Error Message:**

   *xFile Node could not start xFile Node Worker*

**Reason:**

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

**Suggestion:**

1. Check the application <install path>/xFile Node/SnellOD_NodeWorker.exe exists and has the correct permissions to execute.
2. Check that there isn’t already a SnellOD_NodeWorker application running.
20. **Error Message:**
   
   *xFile Node Worker failed.*

   **Reason:**
   
   The xFile 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 xFile Node Worker already running.*

   **Reason:**
   
   The xFile Node Worker has failed to start. This is due to an instance of the xFile Node Worker already running.

   **Suggestion:**
   
   i. This shouldn't happen in the field. If seen contact xFile Support.
   
   ii. Check that there isn't already a SnellOD_NodeWorker application running. If there is, try to terminate the SnellOD_NodeWorker application and try to run the job again.

22. **Error Message:**
   
   *xFile Node failed to create the Job Profile*

   **Reason:**
   
   The xFile Node failed to create the Job Profile. This could be due to permissions on the profile directory in the xFile Node installation or an invalid parameter.

   **Suggestion:**
   
   i. Check the permissions of the `<install path>/xFile Node/profiles` directory
   
   ii. If using a third party application test the job using the xFile Client
23. Error Message:

*xFile Node cannot process the source file because it is an unsupported format*

**Reason:**
The *xFile* Node cannot process the source file because it does not have a suitable de-multiplexer available. The *xFile* 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:

*Apple ProRes CODEC is only supported on a xFile Node running server grade OS*

**Reason:**
The licence for Apple ProRes stipulates that only server grade operating systems can be used. This is a licensing restriction imposed by Apple Inc. Therefore ProRes processing can only be performed on Linux OS that is running headless and Windows Server operating systems. Systems based on Windows XP, Windows 7 and Windows 8, will not support processing or creating Apple ProRes files.

25. Error Message:

*Internal Error. Failed to cancel*

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

26. 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.
27. **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
- YCbCr 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.