




# Stream Software

User's Guide

*focused on the future of digital video*

Four horizontal yellow bars of varying lengths, arranged in a row at the bottom of the page.

© 2010 Digital Rapids Corporation. All rights reserved.

Digital Rapids, the Digital Rapids logo, Stream LE, Stream FE, StreamZ, StreamZHD and DRC-Stream are trademarks or registered trademarks of Digital Rapids Corporation. All other trademarks are the property of their respective holders.

Except as permitted by such license, no part of this document may be reproduced, transmitted, or converted in any form or by any means electronic or mechanical for any purpose, without the prior written permission of Digital Rapids Corporation.

Information in this manual is furnished for information only and does not represent a commitment on the part of Digital Rapids Corporation. Information in this manual is subject to change without notice. Digital Rapids Corporation assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.

Digital Rapids Corporation makes no warranties, express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose, regarding the software. Digital Rapids Corporation does not warrant, guarantee or make any representations regarding the use or the results of the use of the software in terms of its correctness, accuracy, reliability, currentness or otherwise. The entire risk as to the results and performance of the software is assumed by you. The exclusion of implied warranties is not permitted by some jurisdictions. The above exclusion may not apply to you.

In no event will Digital Rapids Corporation be liable to you for any consequential, incidental or indirect damages (including damages for loss of business profits, business interruption, loss of business information, and the like) arising out of the use or inability to use the software even if Digital Rapids Corporation had been advised of the possibility of such damages. Because some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitations may not apply to you. Digital Rapids Corporation's liability to you for actual damages from any cause whatsoever, and regardless of the form of the action (whether in contract, tort (including negligence), product liability or otherwise), will be limited to \$50.

Dolby and the double-D symbol are trademarks of Dolby Laboratories.

Dolby Digital in Stream: Confidential unpublished works. © Copyright 1993-2000 Dolby Laboratories. All rights reserved.

Dolby Digital Plus in Stream: Confidential unpublished works. © Copyright 2003–2007 Dolby Laboratories. All rights reserved.

Dolby Pulse in Stream: Confidential unpublished works. © Copyright Dolby Sweden AB, 1998-2009. © Copyright Fraunhofer IIS, 1997-2000.

This revision of the User's Guide covers Stream 3.2.0.

Last revised on February 18, 2010.

# Table of Contents

<b>Getting Started with Stream Software</b> .....	<b>1</b>
<b>Codec Profiles</b> .....	<b>2</b>
Creating a Codec Profile .....	2
Codec Profiles with Multichannel Audio .....	3
Creating Full-Sized SD Codec Profiles .....	3
Creating HD Sized Codec Profiles .....	3
Adding a Codec Profile .....	4
Modifying a Codec Profile .....	4
Fix Aspect Ratio .....	4
Concurrent, Queued and Batch Modes .....	5
Network Transcoding Modes .....	6
Generate Output Filename(s) .....	6
Codec Profile Tips .....	7
Adobe Flash 8 On2 VP6 (Optional) .....	8
Atome (AVC/H.264 - Optional for Stream FE) .....	8
Avid DNxHD (Optional for Stream FE) .....	8
Dicas (H.263/MPEG4/H.264 plus AMR/AAC - Optional) .....	8
Digital Rapids AVC for Web (Optional) .....	8
Digital Rapids Streaming for iPhone (Optional) .....	9
Digital Rapids Studio AVC (Optional for Stream FE) .....	9
DirectShow AVI .....	9
DRC Video .....	9
DVCPPro (DV, DVCPPro 25/50, DVCPPro HD - Optional) .....	9
Image Sequence (Stream FE) .....	10
Kakadu JPEG2000 (Optional) .....	10
Microsoft Smooth Streaming .....	10
Microsoft VC-1 .....	10
Microsoft Windows Media (WM9, VC-1) .....	10
MPEG - MainConcept (MPEG1 and MPEG2) .....	11
Nero Digital (AVC/MPEG4/AAC - Optional) .....	12

QuickTime .....	12
Real Media .....	13
Sorenson ACE (optional) .....	13
AES Audio .....	13
AIFF Audio .....	13
Dolby Digital (AC- 3 audio - Optional) .....	13
Dolby Digital Plus (EC- 3 audio - Optional) .....	13
Dolby Pulse (AAC audio - Optional) .....	14
Nero AAC (audio - optional) .....	14
Thomson MP3 (audio - Stream FE) .....	14
WAV and Broadcast WAV (multichannel audio) .....	14
Closed Captioning/Data (SCC, SAMI, SRT, DFXP) .....	14
<b>Group Codec Profile .....</b>	<b>15</b>
ASF Muxer .....	16
Elementary Stream File .....	16
GXF Wrapper .....	17
LXF Wrapper .....	17
Manzanita TS Muxer .....	17
MOV Muxer .....	18
MPEG-4 Muxer .....	18
MXF Wrapper .....	18
Native RTP .....	18
Smooth Streaming Container .....	19
Adding Codec Profiles to the Group Codec .....	19
Editing a Group Codec Profile .....	20
Output for a Group Codec .....	20

## **Input ..... 21**

<b>Clips for Transcoding .....</b>	<b>21</b>
Video Preview (for Clips for Transcoding) .....	21
Loading a Media File .....	21
Multichannel Audio Files .....	22
Trimming a Media File .....	22
Image Sequence File Source (Stream FE) .....	23
Watch Folder (Stream FE) .....	23
Persistent Watch Folder .....	24
Clip List (Stream FE) .....	24
<b>Video Input .....</b>	<b>25</b>
NTSC/PAL Standard for SD Boards .....	25
Video Preview (for Live Source or Deck Control) .....	25
Persistent Streaming .....	25
Live Source .....	25
Source Profile for SD Boards .....	26



Civolution Teletrax Watermarking .....	44
Google Fingerprinting .....	44
<b>Video Process (Hardware based) .....</b>	<b>45</b>
Cropping .....	45
Deinterlacing .....	45
Deinterlacing for the HD Boards (DRC-5500): .....	45
Deinterlacing for the SD Boards: .....	45
Processing Amplifier (Proc-Amp) .....	46
Filtering and Noise Reduction .....	46
Temporal Noise Reduction .....	46
Spatial Noise Reduction .....	47
Graphics Overlay .....	48
<b>Output .....</b>	<b>48</b>
Monitoring Video and Audio during encoding .....	48
Archive .....	49
Broadcast .....	50
Windows Media DRM .....	51
PlayReady DRM .....	51
Command (Stream FE) .....	51
Project Command Function (Stream FE) .....	53
Publish .....	53
MPEG Muxer (MainConcept) .....	53
DVD (Stream FE) .....	54
Omneon File (MPEG2 Wrapped in MOV) .....	55
FTP (Stream FE) .....	57
E-mail (Stream FE) .....	58
Encrypt (Stream FE) .....	58
<b>Statistics .....</b>	<b>60</b>

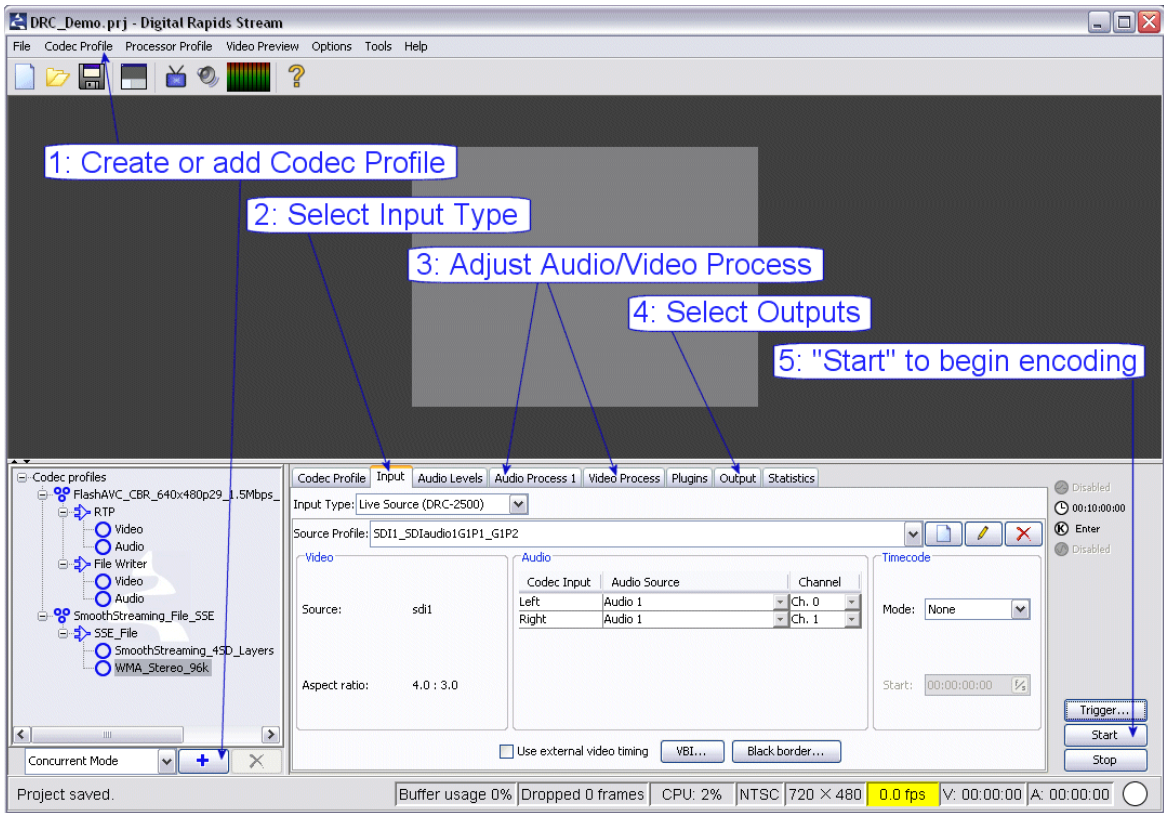
<b>Starting and Stopping Encoding</b> .....	<b>60</b>
Start/Pause/Resume/Stop .....	60
Triggers .....	60
<b>Stream Software Feature Chart</b> .....	<b>63</b>
<b>System Tags</b> .....	<b>69</b>
<b>Troubleshooting</b> .....	<b>71</b>
<b>Encoding Performance</b> .....	<b>75</b>
<b>The Stream SDK</b> .....	<b>79</b>
Using the Web Services API .....	79
<b>Using GPI Triggers</b> .....	<b>83</b>
GPI Configuration .....	83
GPI Schematic .....	84
<b>Stream System Requirements</b> .....	<b>85</b>
<b>Contact Information</b> .....	<b>87</b>
<b>Index</b> .....	<b>89</b>



# Getting Started with Stream Software

There are 5 basic steps to using your Stream system to create a digital video output.

1. Create Codec Profiles (the encoder settings) or add previously created Codec Profiles
2. Select your input video or input files (or deck control with Stream FE)
3. Optional step: Adjust your input video processor and/or audio processor and level controls; you can also add software Plugins
4. Select your outputs for each Codec Profile
5. Click Start to begin encoding, and Stop to end encoding



# Codec Profiles

A codec profile is a file which contains all of the settings that are needed to control the encoding of one output type. For example, to create 3 output files for 3 different target audiences, a Windows Media file at 320x240 and 300kbps, and a H.264 file at 160x120 at 50kbps, and a QuickTime file at 320x240 at 400kbps, you would need to create 3 codec profiles, one for each of your specific target audiences.

## Creating a Codec Profile

To create a Codec Profile use the main menu and select **Codec Profile**, then choose the type of codec you would like to use. Note that a Group codec is a special type of codec used to combine other codecs, and it is covered in its own section, “Group Codec Profile” on page 15.

When you select a regular codec (any codec except the Group codec), the settings window for that particular codec will open. Each codec has different available settings. However, certain settings will be common to most codecs. These may include:

Resolution (width by height in pixels)

Frame rate (frames per second or fps)

Video Data rate (in kbps or Mbps)

Audio data rate (in kbps) – for some codecs the video and audio data rates are combined into one setting

De-interlace – If you want to de-interlace a live video input you will get better results if you use the Stream hardware’s de-interlace function (rather than the codec’s software de-interlace function), so normally you will **disable** the codec’s de-interlace function. If you are using a video file as an input you will not be able to use the Stream hardware’s de-interlace function. The Stream deinterlace plugin is recommended when transcoding files.

Bit rate/type of encode: CBR (constant bit rate), VBR (variable bit rate) or 2-pass encode (note that a 2-pass encode cannot be real-time)

Most codec settings windows will also have an Advanced button. This gives you access to the controls which are specific to the codec you have selected.

Once your codec settings are complete, click the **Save + Add** button to save the codec profile, and to add it to the Codec Profile list that will be used for this project. You may click the **Save** button to save the profile without adding it to the current project’s codec list, or cancel to close the window without saving.

Once your codec profiles have been added to the list, you can select a specific codec profile and some details about that profile will appear on the Profile Tab.

## Codec Profiles with Multichannel Audio

Currently you can make a multichannel audio codec profile for WAV, AVI and WM9/VC-1. If you have the Dolby Digital Surround option you will also be able to create a stereo or 5.1 channel AC-3 or EC-3 file. If you have the Thomson MP3 option you will be able to make a stereo or 5.1 surround mp3 file.

**AVI:** Following the Audio Compressor drop down box you will see a setting button. Click this button and you will see a Number of Channels drop down box.

**Dolby Digital:** Choose a Stereo or Surround codec profile.

**Dolby Pulse:** Choose a Stereo or Surround codec profile.

**Thomson MP3:** Choose the number of channels: mono, stereo or 5.1.

**WAV:** You will see all of the Multichannel audio modes in the Number of Channels drop down box, including a Custom setting so that you can configure your own.

**WM9/VC-1:** Choose “Windows Media Audio 10 Professional” or “Windows Media Audio 9.2” as your Audio Media Type. When you add a new target bit rate (or edit an existing one) you will see 2 channel, 5.1 channel and 7.1 channel options in the Audio Format drop down box.

## Creating Full-Sized SD Codec Profiles

The DRC-500 to DRC-2600 boards use an NTSC input resolution of 720 x 480. PAL input resolution is 720 x 576. You can add VBI lines when using the DRC-1000 to 2600 boards.

Note that the high definition DRC-5550 to 5650 boards can be set to use an NTSC video input resolution of 720 x 486 or 720 x 480.

When using the high definition DRC-5500 series boards you can also choose an input resolution of 720 x 512 (for NTSC) or 720 x 608. This allows you to capture VBI lines.

## Creating HD Sized Codec Profiles

If you have one of the high definition DRC-5550 or DRC-5650/5600 boards, you will be able to encode to an HD file in real time.

Using a system with dual single-core 3.6 GHz processors (or higher speeds or more CPU cores) you will be able to capture in real time to an uncompressed AVI file. You will also be able to capture 1280x720 24P in real time to a WM9 file or to an MPEG2 file (with some restrictions on maximum data rate and other settings). You will not be able to use Stream to capture files at higher resolutions or frame rates in real time to a WM9 file or MPEG2 file without a faster system.

Using a system with dual dual-core 3.0 GHz processors, you will be able to capture MPEG2 file up to full 1920x1080 at 30 fps in real time (with some restrictions on maximum data rate and other settings). A dual quad-core will give you even more real-time MPEG2 options.

If you want to capture to an uncompressed AVI file and then automatically transcode to the other formats, you can use the “Batch Mode” (instead of the default Concurrent Mode) to automate the process. (These modes can be set using the drop down box found in the lower left hand corner of the Stream interface and are explained in a later section.)

## Adding a Codec Profile

Once a codec has been saved, it can be added to the project’s clicking on the blue **+** button at the bottom of the Codec Profile list.

## Modifying a Codec Profile

If you want to remove a codec profile from the list, highlight the codec and then click on the red **X** button. If you want to modify the codec profile, right click on a profile in the list and select **Adjust Profile Settings**. This will re-open the codec’s settings window. After you have made your changes, click **Save**. You will be asked “Do you want to save the new settings to the original profile?” If you click yes, the original profile will be overwritten. If you click no, and you renamed the profile on the settings window before clicking **Save**, your settings will be saved to a new file with the new file name. If you did not rename the profile before clicking **Save**, your modified settings will be used for this project, but the modified profile will not be saved.

## Fix Aspect Ratio

You can right click on a codec profile in your list and select Fix Aspect Ratio. This option allows you to override the resolution that has been defined in the codec profile based on the aspect ratio defined in the Input. (Most of the codecs and players available today do not support automatic aspect ratio correction on playback. MPEG2 is a notable exception as it does handle aspect ratio correctly, but it does not allow for arbitrary aspect ratios.)

For example, if your input has an aspect ratio of 16:9, and your codec profile resolution was 320x240 (a 4:3 aspect ratio), the “fixed” resolution would be 320x180. Without this “fix” the video would look “squished” because the input and output aspect ratios do not match.

**Fix Aspect Ratio > Adjust Height**

This will change the height while keeping the width the same.

**Fix Aspect Ratio > Adjust Width**

This will change the width while keeping the height the same.

**Fix Aspect Ratio > Auto Height Adjustment**

Automatically adjusts the height based on the aspect ratio defined in the Input Profile. Changing source profiles will automatically cause new values to be calculated and applied.

**Fix Aspect Ratio > Auto Width Adjustment**

Automatically adjusts the width based on the aspect ratio defined in the Input Profile. Changing source profiles will automatically cause new values to be calculated and applied.

**Fix Aspect Ratio > Auto Adjustment Disabled**

Disables auto adjustment features. This is the default mode.

**Fix Aspect Ratio > Group**

Note that if you right click on the Codec Profile heading instead of an individual codec profile in the list you will be able to adjust all of the codec profiles in the same way. The default is "Individual Adjustment".

## Concurrent, Queued and Batch Modes

You can encode to more than one codec profile simultaneously in real-time. Exactly how many depends on the codec format, resolution and bit rate, as well as your system's available CPU power and memory. For a rough guide, refer to the Appendix for a chart that shows some benchmark testing that was done using a StreamZ server.

To encode to all of the formats in your Codec Profile list simultaneously, select **Concurrent Mode** from the drop-down box at the bottom of the Codec Profile list. Concurrent Mode is the default mode.

If you want to encode to a codec profile (or profiles) that cannot be encoded in real-time, for example a 2 pass encode, or if you want to encode to multiple formats and do not have enough system resources to encode all of them in real-time, then you will need to switch from Concurrent Mode to Queued Mode or Batch Mode.

**Queued Mode** can be used to transcode to the profiles in the Codec Profile list, one at a time, from a master file. Queued Mode cannot be used for live input (real-time) encodes. To use Queued Mode, create a master file first using Concurrent Mode. The master file is typically an uncompressed or lossless AVI file. Then switch to Queued Mode, select the master file as the input, and

add the codec profiles you want to use into the Codec Profile list. Click the Start button and the master file will be transcoded into the formats in your Codec Profile list.

If you have Stream FE you will also be able to use **Batch Mode** for non-real-time encoding. Batch Mode encodes to a master file first in real-time, typically an uncompressed or lossless AVI file, and then automatically transcodes the master file to the other formats you have selected. (This is more automated than in Queued Mode, where you have to create the master file first, and then select it as an input.)

When you first switch to Batch Mode you will be asked to open a codec profile. This will be the codec used to create the master file. The only restriction is that the codec used to create the master file must be a DirectShow file. (For example, an AVI or MPEG file, but not a QuickTime or DRCvideo file.) You can then add additional files to the Batch List. If you already had codec profiles in your list when you switched to Batch Mode, they will automatically be entered into your new Batch List.

## Network Transcoding Modes

If you have access to a Digital Rapids Transcode Manager system on the same LAN as your Stream system, you will also be able to use **Transcode Manager Mode** and **Transcode Manager Batch** to send jobs to your Transcode Engines for network transcoding.

Select the mode from the drop-down box at the bottom of the Codec Profile list. A new tab will appear after the Output tab called Transcode Mgr Mode. Use this new tab to give your task a label (for reference) and to give the address (IP address or computer name) of the Transcode Manager Server that you will use to manage the network transcode task.

Note that the project must be saved before you can use it in the Network Transcoding Modes. Also, the directory where you are storing the input files and the directory where you want to write the transcoded output files need to be in shared locations that can be accessed by the Transcode Manager Server and Transcode Engines.

## Generate Output Filename(s)

If you right click on the Codec Profiles at the top of the list, one of the options is to Generate Output filenames. This creates output archive filename(s) using the codec profile name and the default output path. For example, if the default path is C:\StreamOutput and the current codec is a QuickTime with a coded profile name of ClientA, then the output archive filename would be C:\StreamOutput\ClientA.mov.

## Codec Profile Tips

### Stream supports the following codecs:

Adobe Flash 8 On2 VP6 (video plus mp3 audio)  
Ateme H.264/AVC (for use in group codec or elementary video streams)  
Avid DNxHD (for use in group codec or elementary video streams)  
Dicas H.263/MPEG4/H.264 (plus AMR/AAC)  
Digital Rapids AVC for Web (H.264 plus audio, mp4 file or broadcast)  
Digital Rapids Streaming for iPhone (H.264 and AAC in TS segments)  
Digital Rapids Studio AVC (H.264 for use in group codec or elementary)  
DirectShow AVI  
DPS (a Leitch/Harris format)  
DRC Ancillary Data  
DRC Video (uncompressed video plus timecode and other metadata)  
DVCPPro (DV, DVCPPro 25/50, DVCPPro HD)  
Image Sequence (18 image formats supported)  
Kakadu JPEG2000  
Microsoft Smooth Streaming Encoder (for 2-pass VBR encoding)  
Microsoft VC-1 (for Windows Media and Smooth Streaming Encoding)  
Microsoft Windows Media (WM9, VC-1)  
MPEG - MainConcept (MPEG1 and MPEG2, including D10, XDCAM)  
Nero Digital AVC/MPEG4/AAC  
QuickTime  
Real Media (RM 8, Helix 9, Helix 10)  
Sorenson ACE (QuickTime Sorenson, MPEG4, AVC, MP3, Flash 7)  
Audio only codecs:  
AES  
AIFF  
Nero AAC (audio - AAC LC, HE, HE v2, DSBR)  
Surcode AC-3 (audio - stereo or surround)  
Thomson MP3  
Wave (audio - multichannel)  
Dolby Digital, Dolby Digital Plus, Dolby Pulse (stereo or surround)  
Closed Captioning/Data (SCC, SAMI, SRT)  
Group (for combining video, audio and a wrapper/processor)

### **Adobe Flash 8 On2 VP6 (Optional)**

This optional codec provides Flash 8 SWF and FLV encoding.

For more information on this codec open the [Adobe\\_Flash8\\_On2\\_Codec.pdf](#) file. For more information about live broadcast using this codec open the [Flash8\\_Streaming.pdf](#) file. Both files are located in C:\Program Files\Digital Rapids\Stream\documents.

### **Ateme (AVC/H.264 - Optional for Stream FE)**

This codec can be used for H.264 elementary stream encoding, and is primarily used in conjunction with the Group Codec profile (see the following section).

For more information on this codec open the [Ateme\\_AVC\\_Settings.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Avid DNxHD (Optional for Stream FE)**

This codec can be used to create DNxHD video in VC-3 files. It is typically used in the Group Codec along with the MXF Processor.

Avid DNxHD VC-3 files can be captured in real time. However, some systems will not be able to wrap DNxHD in MXF in real time. This is a disk I/O issue, not a CPU speed issue, and will be resolved in a future Stream software release. The workaround is to encode the VC3 and audio files in real time, then to use the Tools > MXF Wrapper to do a post-encode wrap. The MXF Wrapper tool can also be used as a command line parameter to do an automatic post-encode wrapping step. This limitation does not apply to transcoding, just to real time encoding.

When wrapping Avid DNxHD in MXF, use the Avid OP-Atom pattern to create files that can be imported into the Avid Media Composer without further rendering. Also, be sure to increase the Video Buffer Size to be as large as one frame, for example, 917504 bytes is a good value for 1080i. Note that OP-Atom is used to wrap MXF files with just one stream, so there will be individual MXF files created for the video stream and one for each mono audio stream.

### **Dicas (H.263/MPEG4/H.264 plus AMR/AAC - Optional)**

This codec is primarily intended for the creation of 3GPP compliant files and live streams.

For more information on this codec open the [Dicas\\_Codec.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Digital Rapids AVC for Web (Optional)**

This codec can be used for archive file creation and/or live streaming, depending on your license. It includes the AVC/H.264 video codec and AAC and MP3 audio codec, as well as the RTP/RTMP Broadcast output.

For more information on this codec open the [DR\\_AVC\\_Web.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Digital Rapids Streaming for iPhone (Optional)**

This codec includes the DR AVC/H.264 video codec, the Dolby Pulse AAC-HE codec, and a transport stream muxer. It is used to create the segmented transport stream files and index files required for video on demand and live iPhone Streaming. For more information open the [DR\\_iPhone.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Digital Rapids Studio AVC (Optional for Stream FE)**

This is an AVC/H.264 elementary stream codec. It can be used to make Bluray compatible elementary stream files, or it can be used in the Group Codec for live RTP streaming or muxed into an MPEG-4 file. If the Transport Stream muxer option has been purchased, it can be used with that muxer as well.

For more information on this codec open the [DR\\_Studio\\_AVC.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **DirectShow AVI**

The DirectShow AVI codec is a wrapper that can be used to contain other codecs. If you install a DirectShow codec on your system, then it will show up in the list of available Video Compressors or Audio Compressors on the Stream DirectShow AVI Profile window.

This allows you to easily add DirectShow codecs to your Stream system. Some commonly added codecs include DivX, MainConcept DV, lossless Huffman YUV (HuffYUV), etc.

### **Uncompressed AVI**

It is common to use an uncompressed AVI as a master file when you need to capture a master file that you can then transcode to other formats.

If you have an AVI codec profile from a previous build of Stream, and it did not specify the audio compressor, you will not be able to use it in Stream 2. Recreate the AVI codec profile in Stream 2.

### **DRC Video**

This is an uncompressed YUV video file that can also include timecode information and additional data such as closed captioning (unlike an uncompressed AVI file). This format does not include audio.

### **DVCPPro (DV, DVCPPro 25/50, DVCPPro HD - Optional)**

This codec can be used to create dif files, but is more typically used with either the DirectShow AVI, or in the Group Codec with a processor (MXF, GXF, LXF).

### **Image Sequence (Stream FE)**

You can enable Strobe Mode and set the time between image captures.

For BMP files you can change the bit format from 24 bits to 32 bits.

For JPG files you can set a maximum file size or file quality.

For YUV files you can choose between YUY2 or UYVY formats.

### **Kakadu JPEG2000 (Optional)**

This codec creates JPEG2000 image sequences. It can also be used in the group codec to create MXF files that include JPEG2000 plus audio.

For more information open the [Kakadu\\_JPEG2000.pdf](#) file located in C:\Program Files\Digital Rapids\Stream\documents.

### **Microsoft Smooth Streaming**

This codec is a VC-1 2-pass VBR codec that can be used to make files for smooth streaming. It is typically used in the Group Codec along with the Smooth Streaming Container set to “File” mode. The resulting files can be played back using an IIS Server. This codec cannot be used for live broadcast - for live smooth streaming you must use the Microsoft VC-1 codec (see the following section).

Open the [Smooth\\_Streaming\\_using\\_Digital\\_Rapids\\_Stream.pdf](#) file located in C:\Program Files\Digital Rapids\Stream\documents for more information.

### **Microsoft VC-1**

This codec is a video elementary stream VC-1 codec. It can be used to make Bluray compatible elementary stream files, or it can be used in the Group Codec along with the ASF muxer to make files or live streams.

This codec can also be used in the Group Codec along with the Smooth Streaming Container for live broadcast of smooth streaming layers to an IIS Server. The Smooth Streaming Container can also be set to “File” mode, and the codec can then be used to make files for smooth streaming.

For more information on this codec open the [VC1\\_Codec.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Microsoft Windows Media (WM9, VC-1)**

This codec can be used to encode video and/or audio WMV files. It cannot be used to create elementary stream files. When you create a Windows Media profile, if you enable both video and audio there must be both a video and audio source selected in your source profile when you encode.

The latest Microsoft codecs will be installed on your system if you have the latest Windows Media Player installed. Otherwise, when you install Stream you may see an information window displayed on your system, warning you to

upgrade your Windows Media codec. At the same time, the Stream installer will copy the **wmfdist\_v11.exe** file you need to upgrade the codec to your system drive. You can run this exe after the Stream installer has finished. If the Stream installer detects that you already have the latest codec installed, you will not see this information window.

There are some optional registry settings that Microsoft supports when using the v.11 codec. Note that these are **system** registry settings, and once they are enabled, they will affect **all** Windows Media encodes on the system. If you need to use these registry settings, please contact Digital Rapids support for a key to unlock this feature.

You may preserve timecode by clicking on the Video Settings button. If you preserve the timecode you will be able to see it in the Windows Media Player by selecting View > Enhancements > Play Speed Settings.

If you plan to do very long duration live streaming of WM9 (longer than 24 hours of continuous live streaming) please contact Digital Rapids Support. There are known clock issues for some systems that can be corrected with the appropriate registry settings, and Digital Rapids can provide you with the appropriate settings for your system.

### **MPEG - MainConcept (MPEG1 and MPEG2)**

This codec can be used to make MPEG1 or MPEG2 files. It has an integrated muxer that can support program stream or transport stream muxing of video and a variety of audio formats, as well as elementary stream creation.

The MPEG - MainConcept menu has a sub-menu that gives you access to various pre-sets. For example, if you pick the DVD pre-set the settings in the Advanced window will be restricted to the settings that are used to make a DVD compliant MPEG2 file.

There are some basic codec settings on the main MPEG Profile window that opens when you first choose the codec. You can increase the quality of your file by increasing the Quality setting. The default value is 30 and the highest value is 50.

For more information on this codec open the [MPEG\\_Encoding\\_Guide.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

#### **Some advanced MPEG2 settings tips:**

To change from the default 4:2:0 sampling to 4:2:2 go to the Advanced Video Settings tab and change from Main Profile to High Profile. In the list on the right hand side click the + next to Sequence Extension, and change the Chroma Format value from 0 to 1.

To change from Program Stream to Transport Stream go to the Multiplexer Settings tab and choose TS or one of the other multiplexor types for Transport Stream: CableLabs (VOD servers), DVB, ATSC (US broadcast), MicroMV, DVHS and HDV .

If you want to create an MPEG file that is larger than 720x480 (NTSC) or 720x576 (PAL) go to the Advanced Video Settings tab and change from Main Level to High Level.

### **Nero Digital (AVC/MPEG4/AAC - Optional)**

The Nero Digital codec can be used to create MPEG4 Part 2 and AVC/H.264 (MPEG4 Part 10) files. You cannot use this codec to create elementary stream files or for live streaming.

The MPEG4 Part 2 files are created with the Simple Profile or Advanced Simple Profile (depending on the pre-set that is chosen). The AVC files are created with the Baseline or Main Profile (depending on the pre-set that is chosen).

For more information on this codec open the [Nero\\_Digital\\_AVC\\_MPEG4.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **QuickTime**

The QuickTime codec is a wrapper that can be used to contain other codecs. If you install a QuickTime codec on your system, then it will show up in the list of available codecs in the Video Compressor or Audio Compressor settings available from the Stream QuickTime Profile window.

This allows you to easily add QuickTime codecs to your Stream system. Some commonly added codec include the Avid codec pack, BlueFish444 codec pack and BlackMagic codec pack.

If you install QuickTime Player 7.4 (or newer) the default codec list will be shorter then with previous versions of the player. To show the complete list, open the QuickTime player, select Edit > Preferences > QuickTime Preferences, then select the Advanced tab, and check the "Enable encoding using legacy codecs" box.

If you purchased Stream FE you will also be able to access the Apple H.264 video and AMR and AAC audio codecs. These codecs cannot be accessed through Stream LE.

### **Uncompressed QuickTime**

To create an uncompressed YUV QuickTime file choose a video compression type of "None". This will cause the Stream software to bypass the QuickTime file writer provided by Apple (which is inefficient on a PC), and cause it to use the Stream file writer. Note that if you later import this uncompressed YUV file into Apple Final Cut Pro you will need to render the files on the timeline.

## Real Media

If you want to create a Real 8, 9 or 10 profile, we recommend you use the Helix 10 Profile and then choose the video codec from the drop-down menu on that page. However, if you need to create a file using the much older RealVideo G2 with SVT codec, then you will need to select the Helix 9 profile.

When creating a Real Helix codec profile you must add at least one Audience by clicking the blue + button. You can then select that Audience and click on the Edit button (the button with the pencil icon) to change the frame rate and to make codec adjustments.

## Sorenson ACE (optional)

If you have Sorenson ACE you can use it to create MPEG4, AVC (H.264), QuickTime, Flash 7 and MP3 codec profiles. To adjust the settings for your codec profile choose a media type, then highlight the video stream or audio stream that you want to adjust (by selecting the data rate for the stream) and then click the Edit button (with the pencil icon) to open a settings window. Note that a frame rate of -1 means 1 source frame to 1 destination frame, and of -2 means 2 source frames to 1 destination frame (half the source frame rate). To see more settings click on the Codec Settings button.

Sorenson ACE is not supported on Windows Vista.

## Audio Only Codecs:

### AES Audio

This audio codec is used within the group codec along with the MXF processor.

### AIFF Audio

This codec can be used to make multichannel audio files. It's primary use is for creating audio files that can be wrapped with MPEG2 in the Omneon MOV file wrapper.

### Dolby Digital (AC- 3 audio - Optional)

This codec can be used to create AC-3 files or streams. These are typically muxed into a Transport Stream and/or used in the Group Codec with a processor. Stereo only and Surround options exist for this codec.

For more information on this codec open the [Dolby\\_Digital\\_Settings.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### Dolby Digital Plus (EC- 3 audio - Optional)

This audio codec is an enhancement to the Dolby Digital codec. It supports both Stereo and Surround. This format is typically used for BluRay authoring or in an mp4 file.

For more information on this codec open the [Dolby\\_DigitalPlus\\_Settings.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Dolby Pulse (AAC audio - Optional)**

This codec can be used to create AAC files or streams. It can be used with the Group Codec profile along with a muxer. It is also included in the Digital Rapids for Web and Digital Rapids Streaming for iPhone codecs.

For more information on this codec open the [Dolby\\_Pulse\\_Settings.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **Nero AAC (audio - optional)**

This codec can be used to create audio files (using the ADTS stream type) or as an elementary stream in conjunction with the Group Codec profile.

When using Nero AAC as an elementary stream within the Group Codec profile use the ADTS stream type when making an MPEG2 Transport Streams or MPEG-4 files. You can also use the ADTS stream type for RTP streaming.

### **Thomson MP3 (audio - Stream FE)**

This codec can be used to make mono, stereo or surround MP3 files. It is also included with the Adobe Flash 8 codec as the included audio codec (mono or stereo only with Flash 8), and with the Digital Rapids AVC for Flash 9 codec.

### **WAV and Broadcast WAV (multichannel audio)**

This codec can be used to make mono, stereo, or user-defined multichannel audio files. It uses the RF64 extension to allow the creation of WAV files that exceed the 2GB WAV file limit, however, not all players will be able to play back WAV files that are bigger than 2GB.

### **Closed Captioning/Data (SCC, SAMI, SRT, DFXP)**

These codec profiles can be used to capture the closed captioning data from line 21 of live NTSC sources.

SCC (Scenarist Closed Caption) files were designed to be used for DVDs. Normally you will choose Field 1 (includes CC1 and CC2 data) and you will enable Drop Frame. (Field 2 includes CC3 and CC4 and is rarely used).

SAMI files (Synchronized Accessible Media Interchange files) were designed by Microsoft to be used for multimedia files. Normally you will choose CC1 as the channel, but CC2 is also available.

SRT (SubRip Subtitle Format) files are used to store timecode and text. They are commonly used for subtitles, but can also be used as a source for Timed Text for MP4.

DFXP files are used to store 608 and 708 closed captioning. You cannot use Stream to create these files, however if you have a DFXP file you can use it as a closed captioning input file for some codec profiles.

## Group Codec Profile

The group codec profile is used when you need to use more than one basic codec profile to create a video and audio elementary stream, and you then need to process those elementary streams (or wrap them) into a single output file or live stream.

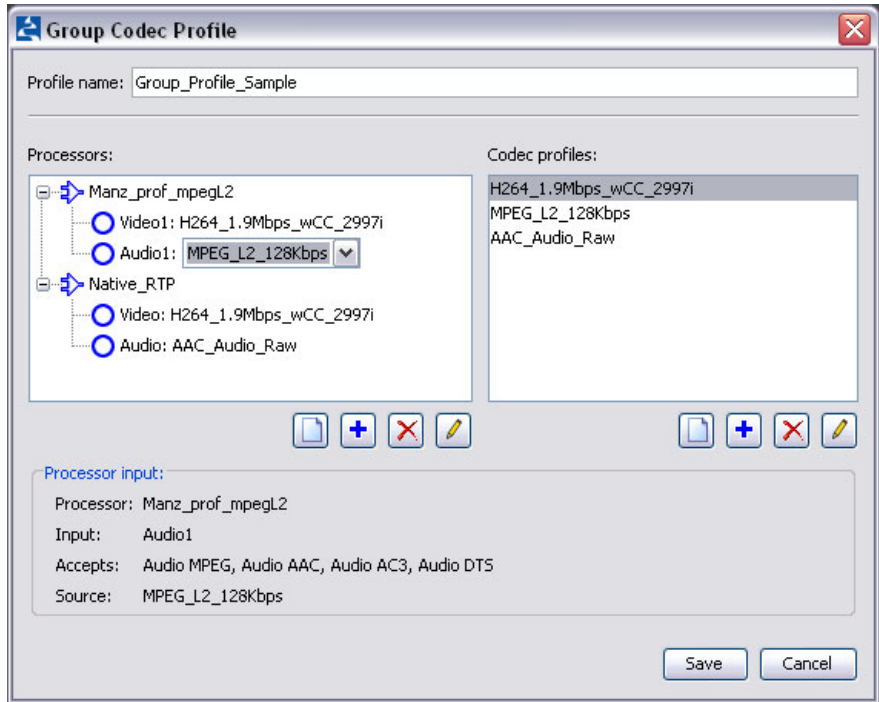
For example, if you are making an H.264 VOD file, and the output must be delivered in a Transport Stream, then you will need to use an H.264 codec and an audio codec and a Transport Stream muxer to generate the final output file.

Currently, the following types of group codec processors are supported:

- ASF Muxer for use with Microsoft VC-1
- Elementary Stream File
- GXF Wrapper for creating Grass Valley/Thomson server files
- LXF Wrapper for creating Leitch/Harris server files
- Manzanita Transport Stream Muxer for delivering VOD files and live transport streams
- MOV Muxer for creating QuickTime files that cannot be processed by the regular QuickTime codec profile: MPEG2 D10 (IMX), DVCPPro, Digital Rapids Studio AVC (H.264)
- MPEG-4 Muxer for combining AVC and audio into a file
- MXF Wrapper for creating MXF files
- Native RTP for delivering live RTP/RTSP streams and RTMP streams
- Smooth Streaming Container for creating files and live streams

Each one of these processors accepts specific codecs as elementary video and elementary audio input types.

To create a new group codec profile, select Codec Profile > Create > Group.



To set up a group codec start by creating a new processor in the left hand panel (by clicking the button with the “new page” icon) or adding one you had previously created (by clicking the button with the blue + icon). When you add a new processor, the processors currently enabled by your license will appear in a list.

## ASF Muxer

The ASF Muxer can be used to create ASF streams for delivery to a Windows Media Server, or to create ASF archive files. Use the VC-1 video codec and the Windows Media Audio codec as elementary streams for this muxer.

## Elementary Stream File

The Elementary Stream File processor can be used to create a video or audio elementary stream file. Normally you will use the group codec to create files or broadcast streams that combine video and audio, but there may be times when you also want to save the elementary streams in addition. This processor allows you to feed the same data stream that you are using in other processors to an elementary stream file, thereby eliminating the need for another encoded data process (with its corresponding CPU usage).

When using this processor, be sure to change the file extension from the default .ES to one that is appropriate for your elementary file.

## GXF Wrapper

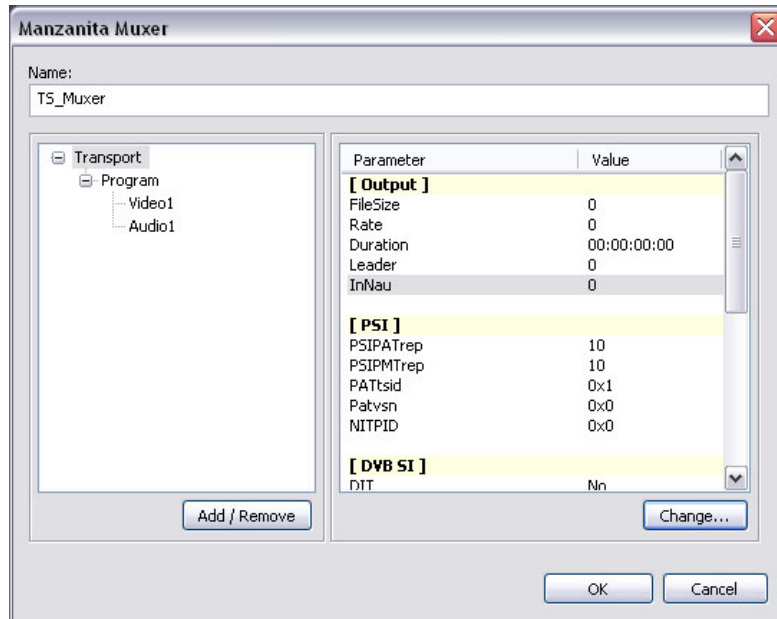
The GXF Wrapper is used to create files used by a Grass Valley/Thomson server. These files can contain MPEG1, MPEG2 or DVCPPro video, plus PCM/WAV audio.

## LXF Wrapper

The LXF Wrapper is used to create files used by a Leitch/Harris server. These files can contain MPEG1, MPEG2 or DVCPPro video, plus PCM/WAV audio.

## Manzanita TS Muxer

The Manzanita transport stream muxer can be used to deliver the video and audio elementary streams in an MPEG2 transport stream. The muxer has 3 "levels" of settings, the Transport level, the Program level, and the media level (for your video and audio elementary streams). Each level has its own settings. When you click on an item at a particular level you can access its settings in the panel to the right.



Once you add the Manzanita TS processor to the Group Codec Profile, clicking on an individual media stream (video or audio) inside the processor will open a drop-down box that will show you the codec that can be used by that media

type. If you have not yet added any codec profiles to the Group Codec Profile, the drop-down box will be blank. However, information about the type of input that the media type accepts will be shown at the bottom of the panel.

For more information about this processor open the [Manzanita\\_TS\\_Muxer.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **MOV Muxer**

The MOV Muxer can be used to create QuickTime files that cannot be created using the regular QuickTime Codec Profile. These files contain MPEG 2 D10, or DV/DVCPPro or AVC/H.264 plus audio.

### **MPEG-4 Muxer**

The MPEG4 Muxer can be used to create several file types that are all based on the ISO/IEC 14496-12 standard (mp4, 3gp, f4v, f4a, mov, m4v, m4a).

For more information about this processor open the [MPEG4\\_Muxer.pdf](#) file which is located in C:\Program Files\Digital Rapids\Stream\documents.

### **MXF Wrapper**

The MXF wrapper can be used to combine video and audio streams into an MXF file. Many operational patterns are supported, with the most common being Op1A, IMX and eVTR.

The processor has 3 “levels” of settings: Container (where you define the operational pattern), Program (a grouping of video and audio essences), and the Video and Audio essence layer (where you define the type of media being used). Each level has its own settings. When you click on an item at a particular level you can access its settings in the panel to the right by selecting the parameter and then clicking the Change button.

Note that if you have already encoded video and audio files that you need to wrap in MXF, you can do so without re-encoding by using the Tools > MXF Wrapper option from the main Stream menu.

### **Native RTP**

The Native RTP processor can be used to stream video and audio packets as native RTP data. The only settings for this processor are the names used to store the processor, and the names used for the video and audio stream. These names are for your reference only, and will not affect the RTP data.

Server setup is done on the Output tab, by activating and clicking the Broadcast button.

## Smooth Streaming Container

The Smooth Streaming Container is used to make the files used by a Microsoft IIS Server for smooth streaming file based or live delivery.

You must set the container to the correct Output Format mode, File or Live, as different types of file will be created depending on this setting. You must also select the corresponding output type, Archive or Broadcast, on the Output tab.

If you are using this container with the Microsoft VC-1 codec you must add a Video program for each smooth streaming layer.

If you are using this container with the Microsoft Smooth Streaming codec then you will only need one video program defined in the container, and the individual layers will be specified in the codec.

Open the [Smooth\\_Streaming\\_using\\_Digital\\_Rapids\\_Stream.pdf](#) file located in C:\Program Files\Digital Rapids\Stream\documents for more information.

Smooth Streaming encoding is only officially supported on the following Operating Systems: Windows Vista, Windows 7, Windows Server 2008.

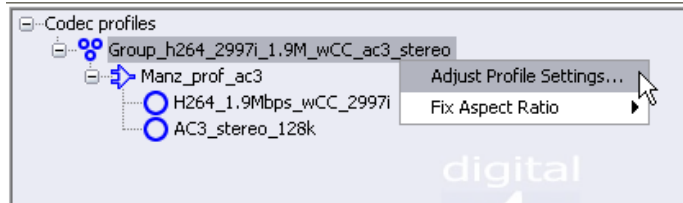
## Adding Codec Profiles to the Group Codec

On the main Group Codec Profile window, the panel to the right is used to add the codec profiles that will be available to your processors. You can add a new codec profile (by clicking the button with the “new page” icon) or adding one you had previously created (by clicking the button with the blue + icon). When you add a new codec, the codecs that you are licensed for that are currently supported by the group codec will appear in a list. The codec profiles you create or add here will appear in the codec profiles list in the left hand panel.

Once you have added a processor and codec profiles, the appropriate choices will appear in the Processors panel on the left, in the drop-down boxes that appear when you select a video or audio stream for the processor.

## Editing a Group Codec Profile

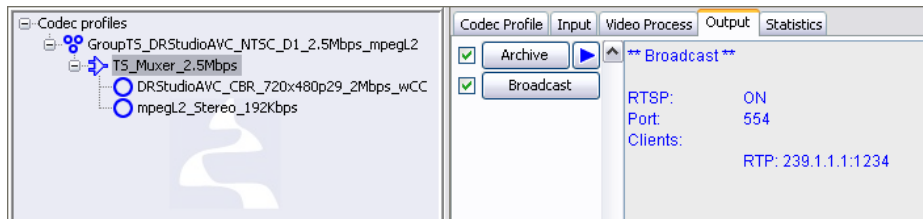
Once you have created a group codec profile, you will see it in the main Stream interface in the codec profiles list. To edit the group codec profile, right click on the group, and then select Adjust Profile Settings.



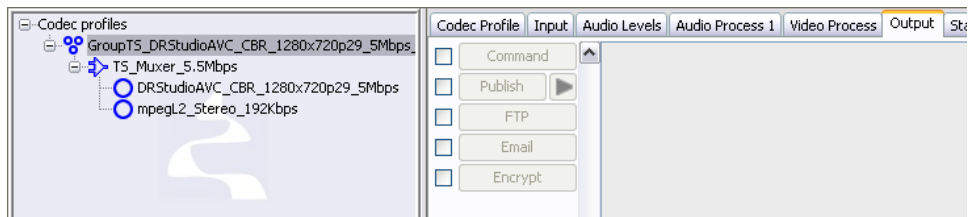
This will re-open the main Group Codec Profile window, and you can then select a processor or a codec and click the edit button (the button with the pencil icon) to open the settings window for the selected item.

## Output for a Group Codec

File output (Archive) or live streaming output (Broadcast) for a group codec are two of the available output options when you choose a group codec processor. Note that some of the group processors only support Archive (file creation), some only support Broadcast (live streaming) and some support both.



Additional output options can be selected if you choose the “root” of the Group Codec, as shown in the following image.



The output options are explained in more detail in “Output” on page 48.

# Input

The Input tab is where you set your input type.

## Clips for Transcoding

- Media Files

- Image Sequence File Source (Stream FE)

- Watch Folder (Stream FE)

- Clip List (Stream FE)

## Video Input

- Live Source

- Deck Control (Stream FE)

- DV Input (DRC-1600 and 2600 boards only)

## Clips for Transcoding

These input options allow you to input clips that can be transcoded to other formats.

### Video Preview (for Clips for Transcoding)

When using these input modes you can play your video file by clicking on the Monitor Source button, the blue “play triangle” found in the main toolbar. You can see some options for the video preview using the main menu’s Video Preview. These affect the preview only, not the final encoded file. Note that the video preview is sensitive to the codec profile that you have currently selected.

### Loading a Media File

Use the Media drop down box to specify whether your media contains video and audio, or just video or just audio.

Note that if you load a media file that contains video and audio it will be loaded into both the video and audio sections of the window. If you load a media file that contains video in one file and audio in another (such as a DPS/DVA file or DRCvideo/WAV file) you will have to load the video and audio separately.

You can also use more than one audio file for your source. Click the “+ Audio” button to add another audio file chooser in the audio area. When you are using multiple audio files it will also be common to use an “Audio Channel Remapper/Selector” plugin to assign the channels of the audio input files to the output channels used by the codec.

Once you have loaded a media file, under the filename you will see the format that was detected by Stream for that file.

To the right of the Filename field you will see a drop-down box. This can be used to force Stream to treat the file you have selected as a specific file type.

For video your choices are: Auto, DirectShow, Windows Media, QuickTime, DRC Video, DPS, MXF, GXF and Red Camera (where MXF, GXF and Red Camera source imports are licensed options).

For audio your choices are: Auto, DirectShow, Wave file, QuickTime, 302M Audio, Pinnacle Audio, Windows Media, MXF and GXF (where MXF and GXF source imports are licensed options)

Note that if you are using MPEG2 files with 302M Audio or Pinnacle Audio, two audio types used in MPEG2 broadcast formats, you must choose them manually as they will not be detected automatically in an MPEG2 file.

### Multichannel Audio Files

Note that under the Audio type selection drop-down box there is a Settings button. Click this button to open a window that will allow you to select which audio channels will be used when you are transcoding the file. For example, if you are encoding a file with 4 audio channels to a file with 2 audio channels, you will be able to pick which of the 4 audio channels will be transcoded to the new file.

You can also use audio Plugins to select which channels to use, to mix-down audio, and to adjust levels during a transcode.

### Trimming a Media File

When you choose Media File as an input type you will see a Trimming section to the right. You may specify an in point and a duration. This may be specified in timecode or in seconds (to the nearest second). Use the small button to the right of the timecode to specify the frame rate of the source file. Note that if this frame rate does not match the frame rate of the source file, this will not change the frame rate of the transcode, it will simply show the incorrect timecode.

When you start transcoding the file, Stream will only be able to “seek” to the in points for DirectShow media files. For other media file types, Stream will start generating data right from the beginning of the file, but it will not write any of that data to your transcoded file until it reaches your in point. This could result in a significant delay before Stream reaches your in point if you plan to encode the last few minutes of a long file.

## Image Sequence File Source (Stream FE)

These are numbered image files typically produced by an animation program. Add the image sequence files and specify a frame rate for the transcoded video. You can also add an audio file (such as wav or mp3) if you want your encoded video to have a sound track.

## Watch Folder (Stream FE)

When you select Watch Folder as an input, you will be able to select a folder on your system, and every time a file is dropped into this folder it will be transcoded and any output options you have set on the Output tab will start automatically.

For example, you may want people to drop files into the folder, to have them made into a single video file, and then to have the file automatically sent to a client using the Email function. Or you may want people to drop files into the folder and then to have those files transcoded individually, and to be uploaded to an FTP server as the transcoding is completed.

If you have one specific type of file that you want to use as an input file type, you may manually select the Video and Audio type, and which audio channels to use for the transcode (much as you can when using a Media File input type).

If you have a mixture of file types for your Watch Folder, you should leave the Video and Audio type set to Auto. Keep in mind that this will not work for some file types, such as MPEG2 files with 302M audio for example, where you must specify the audio type.

You can add media files and data files to Watch Folders. For example, you can add some video files which you do want to transcode and some data files you cannot transcode (e.g., exe files, txt files) but that you do want output (for example, to upload to your FTP site with the transcoded video). Files with file extensions that are not recognized as video or audio media files will use output functions without being transcoded. If you want to use Watch Folder to manage video files but you do not want to transcode these files before transmitting them, you can add the files to a zip file before dropping them into the Watch Folder.

When you select Watch Folder you must select an individual folder to watch for files. Be sure to select the folder, and not to accidentally double click on the folder, which will create a sub-folder which you may not be expecting.

If you will be using a numbered sequence of files, for example an image sequence (Logo001.tga, Logo002.tga, etc.) or a numbered sequence of clips (clip01.avi, clip02.avi, etc.), you can also choose to transcode the files to a

single video file before transmitting the file. To accomplish this, check the "Output to single file" box. You will then be able to fill in all of the numbered file information.

If you want the input files to be deleted after they have been transcoded into their delivery format, check the box at the bottom of the window. Note that files that are not transcoded before they are delivered (e.g., exe files, doc files, etc.) will not be deleted after they are transmitted.

When you are creating a single output file from multiple input files, you may click the Stop button before you have added the last file (as defined by the End at box) to the Watch Folder. When you click the Stop button Stream will stop transcoding the files and will start any additional output options you have set on the Output tab. Otherwise the transcoding will continue until the 'End at' number of files has been reached, and then Stream will start any additional output options you have set on the Output tab.

### **Persistent Watch Folder**

You can set up a project with a Watch Folder as a "persistent" project. That way, should the power be lost, when your computer starts up Stream will be launched, the project with the Watch Folder will be loaded, and the Watch Folder will be active and ready to accept files. This tool can be found in the main Stream menu under Tools > Persistent Watch Folders.

### **Clip List (Stream FE)**

When you use Clip List as an input type you will be creating a list of clips that exist on your system. You can then choose to transcode each clip on the list to another file format (or formats). Note that you can only use single pass codecs, not 2-pass codecs, with the Clip List function.

You can also choose to combine all of the clips in the list into a single clip by enabling the Concatenate output checkbox.

If you have one specific type of file that you want to use in your clip list, you may manually select the Video and Audio type, and which audio channels to use for the transcode (much as you can when using a Media File input type).

If you have a mixture of file types for your clip list, you should leave the Video and Audio type set to Auto. Keep in mind that this will not work for some file types, such as MPEG2 files with 302M audio for example, where you must specify the audio type.

## Video Input

### NTSC/PAL Standard for SD Boards

When your Digital Rapids SD hardware was installed it was set to NTSC or PAL. You can switch video standards by selecting Options > Preferences from the main menu, and then selecting the Hardware tab. If you have SD hardware and are going from PAL to NTSC you will have to re-start your drivers (by re-booting your computer for example). This does not apply to HD hardware, which detects the input standard automatically.

### Video Preview (for Live Source or Deck Control)

When using Live Source or Deck Control you can see your video input by clicking on the Monitor Source button. You can see the options for the video preview using the main menu's Video Preview. These affect the preview only, not the final encoded file. Note that the video preview size is sensitive to the codec profile that you have currently selected.

### Persistent Streaming

Persistent Streaming is used to launch Stream with the selected project loaded and encoding as soon as the system is booted. Typically this is used to allow for recovery from a power loss during a live encoding session to a web streaming output. This will allow Stream to return to live streaming mode almost as fast as the system can boot (usually about 1 minute). To use Persistent Streaming mode you must have previously saved the project you wish to use.

To configure Persistent streaming mode choose the Tools > Persistent Streaming from the main menu. You will be able to add the current project or delete a previously created Persistent Streaming project.

### Live Source

If you have a live video source connected to your Digital Rapids hardware, for example a camera, a tape deck, a DVD player, etc., you can encode the live source to a file. After you select Live Source as an input type, you will need to create a Source Profile, which specifies which video and audio inputs to monitor. Click the Create Source Profile button to open the Source Profile window.

## Source Profile for SD Boards

(For DRC-500 to DRC-2600)

Select a video source and an aspect ratio.

For the DRC-500, in the audio section highlight an audio channel and then click the Edit button. Click the enable audio processor and you will then be able to use the Source drop down box to select the type of audio you are using. Click OK to enable your audio selection. Click the Save button to save your Source Profile and to add it to the Source Profile's drop down list.

For the DRC-1000 to 2600 you will see an Edit button in the audio section. Click that button and an audio selection window will open. Select the audio you want to assign to the 4 stereo audio channels and click ok. Note that if you want to select 2 SDI pairs from one SDI input you must click the SDI button twice.

If you added more than one audio channel to your Source Profile, you can select which one you want to encode on the main interface's Input tab by using the drop down box in the Audio section of the Input tab. (For reference, see the graphic at the end of the following section on HD Boards.)

## Source Profile for HD Boards

(For DRC-5550 to 5650)

**Video:** For Live Source, there is only one video input, the SDI input.

The Video section of the source profile window tells the hardware what to do to the video input before it is passed on to the codec profiles for encoding. The things that can change are:

**Bit/Data Format:** Choose between 8-bit UYVY and 8-bit YUY2

### Conversion:

- None (do not convert the frame size or frame rate); When you select None you will be able to specify how many SD lines you want to capture. This allows you to capture VBI lines, so that you can capture closed captioning information for example. For NTSC you can choose 480, 486 or 512, for PAL you can choose 576 or 608.
- Automatic (do not convert the size but provide options to convert progressive/interlaced, frame rate, and aspect ratio)
- Custom (provide options to convert all settings, including frame size). Generally, the source profile's frame size should be as large as the largest dimension used by the codec profiles you have added to your project.

- List of the normal SD and HD sizes and frame rates. Note that when you pick one of the pre-set conversion types there will be a drop down box active in the Frame rate section that controls whether the frame rate is an Integer (e.g., 30) or Fractional (e.g., 29.97) or Automatic. If you pick Integer all frame rates shown in the list will be integers (except for NTSC, which is always fractional), and if you pick Fractional all frame rates shown in the list change to fractional frame rates (except for PAL and 25 fps based frame rates, which are always integers).

**Aspect Ratio:**

The aspect ratio used by the incoming video (as a basis for the conversion) and the aspect ratio that it is converted to by the hardware (if any conversion is done).

Any video changes defined in the **source profile** are made in hardware. Note that the **codec profiles** can also change the dimensions, interlaced vs. progressive, and the aspect ratio in software. However, if you know you want to format convert from the input video to a different output format you will find the hardware format converter will give you faster and higher quality results.

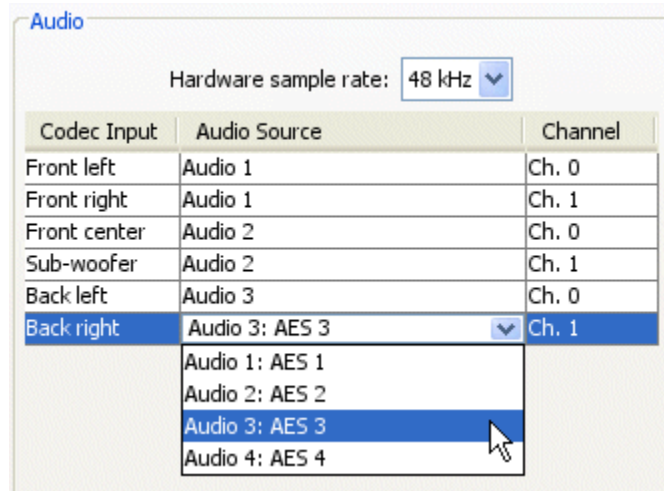
**Audio:**

The DRC-5550 to 5650 board has 4 stereo AES inputs and embedded SDI audio inputs.

In the Audio area of the Source Profile window click the Configure button. You can add the AES inputs by clicking on the numbered AES graphic that you want to add. You can add the embedded SDI audio by clicking on the SDI graphic and then selecting the SDI group and pair. To add another SDI audio group or pair click on the SDI graphic again. To remove an audio input highlight the input and click the Delete button.

Once you have finished selecting all settings click OK to return to the main Source Profile window. Give your Source Profile a name and then click OK to save the source profile.

Once you have closed the Source Profile window, if you have previously added a codec profile to your project, you will see the audio inputs you have selected in your source profile in the audio section of the Input tab. Click on the Audio Source and on the Channel in the audio section of the input tab to change the audio inputs being used by the currently selected codec profile.



## Additional Input Settings

### Timecode for Live Source

If you want to preserve timecode in your file, you can choose from a variety of timecode options. Note that the codec profile must support timecode.

- None: do not preserve timecode
- Auto-Increment or Time of Day: For Auto-Increment you specify a starting timecode and the timecode will count up automatically. For Time of Day your system's clock will be used to generate the timecode.

There are two additional timecode modes available when you are using Deck Control. These two modes are used to write continuous timecode to a file, even when the source has timecode breaks. (See the Deck Control Section.)

The following additional timecode options are available for the HD board (DRC-5550 to 5650):

- SDI VITC1 (VITC timecode embedded in the SDI signal)
- SDI VITC2 (VITC timecode embedded in the SDI signal)
- SDI LTC (LTC timecode embedded in the SDI signal)
- LTC In (LTC timecode from the LTC input on the breakout box)

### Black Border

For DRC-500 to DRC-2600: If you want to add a black border to your video, "squeezing" your video into the active video area inside the black border, you can click the Black Border button.

For DRC-5550 to 5650 you can use the Border plugin. (See the Plugins section.)

## Capturing VBI Lines for Closed Captioning

VBI lines are typically used by SD video to carry a variety of data, including closed captioning (NTSC) and Teletext (PAL) data. HD closed captions are typically carried in the SDI ancillary data, although some HD decoders may place that captioning data on line 9 for analog HD TV.

### **For DRC-1000 to DRC-2600:**

When you are capturing video you can capture vertical blanking interval data to preserve closed captioning data. (Note: The DRC-Stream 500 hardware cannot capture VBI data.)

- 1) On the Input tab select your input: Live Source or Deck Control.
- 2) On the Input tab enable the “Use external video timing” option. On the Video Process tab you will normally disable the “Enable deinterlacing” option, although this is not required.
- 3) On the Input tab click the VBI button and enable VBI. Depending on your playback device, you may need to capture different numbers of VBI and Black border lines. You may also choose to capture the VBI lines as part of the video frame, or you may enable the “Exclude from frame” option if you want to use the VBI data to create an SCC or SAMI file but you do not want to include the VBI lines in your frame for other codec profiles.

## Capturing VBI data and including it in the frame

The following method is supported by the Vela playback hardware. Depending on the playback device you are using, the exact method may vary.

Follow the first 3 steps above.

- 4) On the Input tab click on the VBI button (if you closed the window in the previous step).

For NTSC set start line 21 and number of lines to 2.

For PAL set start line 15 and number of lines to 8.

Click OK.

- 5) On the Input tab click the Black Border button.

NTSC: set the Top to 26 and the bottom to 2. PAL: set the bottom to 16.

6) Click the Monitor Source button. You will notice the VBI lines with the closed captioning information at the top of the frame. (If you were already monitoring the source you may need to toggle it off then on again to see the VBI.)

7) Select Codec Profile > Create to create your codec profile. Include the Closed Captioning VBI lines and black border lines in the profile. For example:

NTSC: If it is a WM9 profile set it to 720 x 512 (for NTSC).

NTSC: If it is a MPEG2 profile use the Advanced Settings button and then select the Advanced Video Settings. Change the "Profile ID" to High Level. Click OK to return to the main MPEG Profile window, and set the frame size to 720 x 512.

PAL: If it is a MPEG2 profile use the Advanced Settings button and then select the Advanced Video Settings. Change the "Profile ID" to High Level. Click OK to return to the main MPEG Profile window, and set the frame size to 720 x 608.

8) Set an Output file name and then click Start to encode your video clip.

If you used the settings outlined above you will be able to use the "Closed-Captioning Decoder" (available as a short cut in your Start > Programs > Digital Rapids folder). This will allow you to verify that there is closed captioning data in the live source and that there is closed captioning data in the encoded file. Note that it is intended to be used as a verification tool rather than to produce an accurate log of the text.

Note: Depending on your specific playback device you may have to adjust the number of VBI lines you are capturing, and then number of Black Border lines you need to "pad" your video frame.

### **Capturing VBI data and excluding it from the frame**

If you enable the VBI and you exclude it from the frame, you will still be able to capture the VBI data in a SCC or SAMI file, or directly in the user defined data in an MPEG2 file (as set by the MPEG2 codec profile).

Note that the closed captioning in the MPEG2 data is the type of closed captioning required for broadcast (608/708). It is not the type of closed captioning required by DVDs. In order to add closed captioning to your DVD you will have to make an SCC file and use your DVD authoring software to include the closed captioning in your DVD.

### **Closed Captioning for DRC-5550 to 5650 SD SDI**

For the DRC-5550 to 5650, the SD VBI data can be passed on to the codecs without including it in the video frame by enabling the "enable VBI follow" checkbox on the Input tab. You can use the VBI data to preserve closed captioning data using SCC, SAMI and MPEG2 codec profiles.

If you want to include the VBI data in the frame, you can do so using the source profile. In the Source Profile choose "None" as your Video conversion type. For NTSC you can choose to capture 480 or 486 or 512 lines. For PAL you can choose to capture 576 or 608 lines.

Note that you cannot use hardware format conversion if VBI capture is enabled.

## Upres Mode for DRC-500 to 1600 (Single Stream Mode)

You can start Stream in Upres mode and that will allow you to capture more than the default lines. This may be useful for example, if you need to capture 720x486 instead of the board's default 720x480 (for NTSC).

The DRC-500 can capture up to 800x600. The DRC-1000 to 1600 can capture up to 1024x768.

To use the board in Upres mode create a Stream shortcut on the desktop and edit the shortcut properties in the Target field to read "C:\Program Files\Digital Rapids\Stream\Stream.exe" -singlestream. Launch the Stream application using this edited shortcut. You will be asked to enter the desired frame size when you create your output profile.

## Deck Control

The Deck Control input type is standard with Stream FE and an option for Stream LE. You will be able to use Deck Control if your deck is equipped with RS422 control (using the Sony protocol). Stream cannot control a deck using IEEE-1394 (Firewire) control. Connect your VTR to your computer's serial port using a RS422 to RS232 converter. If you have the DRC-5550 to 5650 board you can also use the RS422 port on your breakout box instead of the RS232 port on your computer.

Select Deck Control as your input type, and the Deck Control window will open.

## Deck Configuration

On the Deck Control window select Options > Configure from the menu. Click the New Configuration button to set up the deck configuration. Select a COM port, a Timecode Source type (LTC or VITC), and a preroll time for your deck in seconds. When you click OK you will be asked to save a Deck Configuration Profile. You can edit your setting later by clicking on the Edit (pencil icon) button or delete a deck configuration from the list by using the Delete (red x) button. Once you have created a Deck Configuration Profile it will appear in the drop-down list.

If you notice that your deck is consistently off by a few frames you can use the Advanced Settings button on the Deck Configuration window. You will be able to select a Timecode offset by the number of frames that your deck is off. If you are using some types of RS422 adapters (e.g., a DV LANC adapter) and the deck control window is having trouble reading timecode from your deck, you will be able to correct the problem by using the “Set a time limit between consecutive queries to the timecode” check box and to specify a time in milliseconds. (For the DV LANC adapter a time of 5 ms corrects the problem.)

### Changing Settings

If you need to change the Source Profile (the video and audio inputs) for your Deck Control, or any of the other options on the Input tab, you can do so without closing the Deck Control window. Simply drag it out of the way. If you do close the Deck Control window you can re-open it by clicking the Show Deck Control Window button at the bottom of the Media Selection tab's window.

### External Timing

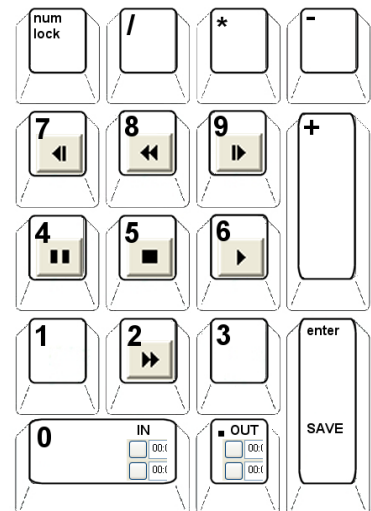
For the DRC-500 to 2600, on the Input tab you will also see a “Use external video timing” check box. Enable this to lock your video timing to your video input for frame accurate deck control. You must also turn off deinterlacing for frame accurate deck control. If deinterlacing is enabled you will be off by approximately one frame. (This does not apply to the DRC-5550 to 5650 board.)

### Create a Capture List Using the Logger

To create a capture list, click the Logger button. If you have not yet configured the deck you must close the Logger and use the Deck Control's Options > Configure menu item, then re-open the Logger to connect to the deck. Use the tape transport buttons to play/stop/pause the tape. Use the jog forward/jog back buttons to move frame by frame. Use the rewind and fast forward buttons to move through the tape quickly. Use the eject button to eject the tape. Under the timecode box is a slider. You can use this to shuttle through the tape.

Note that many of the buttons have keyboard shortcuts for ease of operation.

For each clip you must enter an in-point, out-point, and/or duration (you must enter 2 of these to define the clip). You must also enter a clip name and a reel name. The clip name will be automatically incremented after you click



the Add button. If you enter a clip name that includes a number, such as Clip001, then the clip name will be automatically incremented including the padded zeros. A comment may also be added. If you want to edit an item in the list, you can select the item and then click the Edit button.

When you exit the Logger you will be asked if you want to save the changes. If you say yes any clips which have been marked with a check mark will be added to the Deck Control clip list, overwriting the existing list. Any clips which do not have a check mark will not be added to the Deck Control clip list. You may multi-select clips in the Logger and use the Mark and Unmark buttons to affect all of the selected clips. If you say no the Logger will be closed without adding the list or any changes to your list to the Deck Control list. Any changes you have made to the list will be lost.

Once you have added your Log to the Deck Control window you can save the list with the File > Save menu item. If you have a list that you saved previously you can append it to the current list using File > Append.

On the Input tab you will see a Select Capture Profile button. If you have previously created a capture list using the Logger you may click this button to open a list from the CaptureProfiles directory.

### **Timecode**

If you want to add timecode to your file, you can choose from a variety of timecode options. Note that the codec profile must support timecode.

The timecode options are the same as when you select “Live Source” as your input type (see “Timecode for Live Source” on page 28), with the addition of two more modes which are specific to Deck Control. These two additional modes are used to write continuous timecode to a file, even when the source has timecode breaks.

- **Tracking - Duration:** The starting timecode is used and the timecode increments upwards until the clip duration has been reached (the output timecode in the capture list is ignored).
- **Tracking - Outpoint:** The starting timecode is used and the timecode increments upwards until the marked outpoint has been reached (the clip duration in the capture list is ignored).

Other controls found on the Input tab when Deck Control is selected are the same as the ones found when Live Source is selected as an input type.

## FLEx Files, ALE files, and CMX 3600 Files

You can import or append a FLEx file, an Avid Log file, or a CMX 3600 EDL files in the Deck Control window by selecting File > Append, and then changing the “Files of type” drop down box at the bottom of the Open window to “FLEx (\*.flx)” or “Avid Log (\*.ale)” or “All Files” (for the CMX 3600 EDL file).

When the file is imported or appended, it will be converted to the Digital Rapids xml capture log format.

## Using the Logger as a stand alone tool

You can also install the Logger as a stand alone tool on a system without Digital Rapids hardware. When the Logger is run as a stand alone tool it will have its own Configuration button and File > Save As/Open menu.

# Audio Levels and Audio Process

The **Audio Levels** tab includes sliders for Volume control. The C button above each slider returns the slider to its default position of 0 dB.

There are an **Audio VU Meters** and **Audio Mute** button available in the main tool bar. If you click on the VU Meter button it will open a full sized VU Meters window. The VU Meters give you a visual indication of the loudness of the audio signal. If you turn up the volume control sliders, the VU Meters will show the audio signal increasing. Always make sure that they audio signal does not hit the top of the scale, as that will cause digital clipping which will be clearly audible. As is standard for Digital VU meters, the top of the VU Meter scale is marked as 0 dBFS (dB Full Scale).

The **Audio Process** tab will only appear when you are using a standard definition board (DRC-500 to DRC-2600) and are using Live Source or Deck Control as an input.

Some codecs can only handle one audio input (mono or stereo) while some can handle multichannel audio. You select the audio source that will be used by the codec on the Input tab. Which ever audio source you highlight on the Input tab, a corresponding Audio Process # tab will appear.

The second set of sliders are for Bass and Treble control.

To the right you will see two graphs, one for EQ and one for Dynamic Range Compression/Expansion. Clicking on a graph will open the controls for the respective function.

## Using EQ

This feature is available for the DRC-500 to DRC-2600 boards. It is available during video capture from a live source or deck control.

The EQ window has two dB vs. frequency graphs. The one on the top shows you the effect of currently selected EQ band. The one on the bottom shows you the cumulative effect of all of your EQ band's settings. There are seven bands that you can control. You can activate a band by clicking on the EQ button to the left of the main slider. Each band can be set to a mode using the drop down box at the bottom of the slider:

**EQ** – This is a notch controller, where you raise or lower the dB of a frequency range and control the range of frequencies affected.

**Shelf Low** – Raise or lower the dB below the frequency you set

**Shelf High** – Raise or lower the dB above the frequency you set

**Butterworth Low** – cuts off the frequencies above the frequency you set. This cut off is a gradual curve. The frequency you set is the – 3 dB point.

**Butterworth High** – Cuts off the frequencies below the frequency you set. This cut off is a gradual curve. The frequency you set is the – 3 dB point.

## Using Dynamic Range Compression/Expansion

This feature is available for the DRC-500 to DRC-2600 boards. It is available during video capture from a live source or deck control.

This feature is useful when you are dealing with audio with very loud and/or very quiet sections, and you want to automatically adjust these extreme sections to produce a more consistent volume.

**Below Threshold Ratio (in:out)**: adjusts the gain applied to low volume signals

**Above Threshold Ratio (in:out)**: adjusts the gain applied to high volume signals

**Threshold**: defines the point where the normal volume signal is located.

**Energy Level Detection**: You may want to leave very sudden, short term changes in volume unchanged. For example, you may not want to reduce the volume of a sudden bang, even if it is in a quiet section. If that is the case, enable this function.

You have 3 time settings: **Time Constant** (overall duration of the sudden change), **Attack Time Constant** (the time the change takes to reach its peak), **Decay Time Constant** (the time the change takes to return to a normal volume).

# Plugins

## Software Plugins Overview

The Plugins are 8-bit software based video processing tools. These tools can be used during transcoding or during ingest from a live source (as long as your system has enough CPU resources to keep up with the combined requirements of the live ingest and of the software plugins you have selected). Plugins are assigned to a specific codec profile. That is, each codec profile in your project can be assigned its own set of plugins, independent of any other codec profiles present in your project. After you have added at least one codec profile to your project the Plugins tab will be available.

The standard plugins included with Stream LE are:

- Cropping
- Deinterlace

The additional standard plugins included with Stream FE are:

- 601/709 Color Space Conversion
- Audio Channel Remapper/Selector
- Audio Down Mix 5.1 to Stereo
- Audio Level
- Audio Stereo to Mono
- Black and White
- Border
- Color Space Converter
- Field Dominance Converter
- Gamma
- Graphics Overlay
- Inverse Telecine
- Rotate Image
- Scaler
- Timecode Overlay
- Video Overlay
- Video Proc Amp

You can also use the "Add DirectX Filters" button to add DirectShow and DMO third party plugins to the list.

There are also optional plugins (which can be purchased separately):

- Civolution NexGaurd Watermarking (forensic watermarking)
- Civolution Teletrax Watermarking (video tracking)
- Google Fingerprinting (video identification)

## Keyframing and Previewing Plugins

The Graphics Overlay, Video Overlay and Watermarking plugins can be keyframed, that is, they can change over time by creating points in time (keyframes) where the settings for that plugin will change. If you enable the “interpolate” option then the settings will change gradually over time from one keyframe setting to the next. For example, if you want a graphic overlay to fade up over 30 frames, then you would set a first keyframe where the mixer setting is at 0 (completely transparent) and you would set a second keyframe at 30 frames where the mixer setting is at 1 (completely opaque) and you would check the interpolate option. The plugin will then calculate the mixer setting needed from the first frame to the 30th frame in order to fade up the graphic overlay gradually. If you do not enable the “interpolate” option, then the settings will remain the same without changing until the next keyframe is reached, and then the settings will change immediately to the new settings.

All plugins use at least one keyframe, the first keyframe, which includes the initial settings. If you do not want the settings to change over time, you do not have to add any more keyframes. After you add a plugin (using the blue + button at the bottom of the Plugin list) and change at least one setting for that plugin, the Apply button will become active. This is the button that applies the current settings to the current keyframe. If you make changes to the settings and do not click the Apply button and you move to another keyframe, any changes you made to the settings will be lost. This includes the interpolate option. If you decide to enable the interpolation option for a keyframe, you must click the Apply button in order to save the new interpolate setting for that keyframe.

The Max Keyframe box at the top of the plugins tab indicates the maximum range of the keyframe slider. Note that this does not have to be the entire length of your clip. The final keyframe will be applied for the entire duration of your clip. For example, if you choose a Cropping plugin and apply one keyframe at the beginning of the keyframe slider, that keyframe will be used for the entire clip, no matter what the clip’s duration may be.

Next to the Max Keyframe box you will see a Frame Rate drop down box. Enter in the fps that is used by your video input or video clips.

If you apply more than one keyframe then you will see a red mark on the keyframe bar for each keyframe and a green mark on each bar for the keyframe you are currently on. To move between keyframes use the “>” button

to go to the next keyframe and the "<" button to go to the previous keyframe. As you drag the slider on the keyframe slider you will see a blue mark on the keyframe bar that indicates your current position.

To preview the effect once you have added a plugin, you must choose one of the input patterns. You can choose between a preset graphic at common sizes, the same preset graphic at any custom size you specify, or a custom image (at the full image size). Once you have added a keyframe you may click the Preview button at the bottom of the Plugin list (near the lower left hand corner of the interface). Once you have previews the keyframes, scrubbing between the keyframes with the keyframe slider will show you what the effect will look like between keyframes.

### Copying Plugins

If you have more than one codec profile in your project, you may copy a plugin along with all of its current settings from one codec profile to another. Select the codec profile that has the Plugin you want to copy. Then click the plugin you want to copy (in the plugin list), and drag and drop it onto the codec profile you want to copy the plugin to.

Once you have copied a plugin, it is completely independent from the original plugin. That is, changing the settings on one copy of the plugin will not change the settings on the other copy.

### Plugin Order

Plugins will be applied in the order that they are shown in the plugin list. For example, if you apply a Graphic Overlay plugin, and then a Scaling plugin, the graphic that you applied with the Graphic Overlay plugin will be scaled by the Scaling plugin. If you want to change the order of the plugins, you can use the blue up and down arrow buttons to move them to an earlier or later position in the list.

## Plugin Settings

### 601/709 Color Space Conversion Plugin Settings

This plugin allows you to convert to/from the SD 601 color space from/to the HD 709 color space.

## Black and White Plugin Settings

This plugin removes the chroma from the video, converting the output to a gray-scale output.

## Border Plugin Settings

The Border plugin adds a black border to the image. This plugin increases the size of the frame by the number of pixels you set for top, left, bottom and right.

## Color Space Converter Plugin Settings

The Color Space Converter plugin converts between different RGB and YUV color spaces. You may want to convert the color space if, for example, your source file was encoded using one color space, but the codec you are encoding to requires another color space. For example, QuickTime codecs often use an RGB color space, Real Video and Helix files use an I420 color space, and uncompressed AVI files typically use a YUV color space.

Color space options: I420, YUY2, UYVY, RGB24, RGB32, DRCYUY2 10-bit, DRC UYVY 10-bit, DRC YUY2 16-bit, DRC YUV Planar.

## Cropping Plugin Settings

The Cropping Plugin removes pixels from the edge of the image. This plugin decreases the size of the frame by the number of pixels you set for top, left, bottom and right.

## Deinterlace Plugin Settings

This plugin deinterlaces the video based on the method you choose. If you choose Auto, the plugin will attempt to determine if the source is interlaced. If the plugin determines that the source is deinterlaced then the Motion Adaptive (Field Interpolate) method will be used. If it determines that the source is not interlaced then it will not use the plugin.

If you are capturing from a Live Source or Deck Control you will get better deinterlacing results if you use the hardware deinterlacing. Do not enable both hardware deinterlacing and this software plugin.

## Field Dominance Converter Plugin Settings

The Field Dominance Converter plugin allows you to switch the field order. There are two settings:

Top field to bottom field (shift picture up one line): All picture lines are shifted up one line and a black line is added at the bottom. Note that the original top line is deleted permanently.

Bottom field to top field (shift picture down one line): All picture lines are shifted down one line and a black line is added at the top. Note that the original bottom line is deleted permanently.

## Gamma Plugin Settings

The gamma plugin can be used to boost the brightness on a curve (rather than as a linear function as with simple brightness and contrast controls). You may find the gamma controls useful when you are adjusting the levels of a video signal that you want to make into a digital file that will play back on a computer VGA monitor. Typically gamma values around 1.8 will give good results when adjusting video for display on a computer monitor.

Note that if you are capturing from a Live Source or Deck Control the hardware gamma controls will also be available to you.

## Graphics Overlay Plugin Settings

The Graphics Overlay plugin allows you to overlay a still image over your video. If you use a file without an alpha channel or transparency layer, the graphic will be treated as one solid block. If you use a PhotoShop psd file with transparency, then the transparency in the psd file will be used to determine the transparency for the graphic overlay (NOT the alpha channel in the file, even if it is a 32-bit psd file with an alpha channel). However, if you save a PhotoShop file with an alpha channel as a 32-bit bmp file, and use the resulting 32-bit bmp file as a graphic overlay, then it will use the alpha channel to determine the transparency for the graphic overlay. Some overlay samples can be found in the Overlays folder in your Stream directory.

Load the graphic you want to use by using the browse button at the end of the Filename field.

The Mixer slider controls the transparency of the graphic, where 0 is completely transparent and 1 is completely opaque.

The Position X and Y control the position of the upper left hand corner of the graphic. Position 0, 0 puts the top left hand corner at the top left hand corner of the image. Position 0.5, 0.5 puts the top left hand corner at the middle of the image. Position 1, 1 puts the top left hand corner at the bottom right of the image (off screen). You can also use negative values to position the graphic.

The Scale X and Scale Y settings control the size of the graphic, where 1, 1 is full size, 0.5, 0.5 is half size, etc.

## Inverse Telecine Plugin Settings

This plugin is used to take NTSC 29.97 fps material that originated from film, went through a telecine process to convert the 24 fps film material to 29.97 NTSC material, and now needs to be returned to the original 24 fps material.

Note: **DO NOT** use the hardware deinterlace option at the same time as you use this plugin.

This plugin can handle media from film source with a regular 3232 telecine pattern (A, A, A, B, B, C, C, C, D, D), whether it is clean, unbroken cadence or broken cadence. It can also handle 2332 cadence detection, and mixed film and video source types.

**Frame Rate:** Set this to the desired output frame rate.

**Source Type:** Unknown, Film, Video (default Unknown)

The Source Type parameter is intended as a hint to the plugin, to indicate the original type of the source media.

UNKNOWN is the default value, and should be used in all cases when the source is either unknown or known to be of mixed types (e.g. film and video). When you use this source type the output frame rate will be changed from the video frame rate to film frame rate (23.976 / 24 fps).

FILM mode is used when you know that all of the content is from film.

Tip: for Film mode, leave the Look Ahead value set to 10 for your first attempt. When you use this source type the output frame rate will be changed from the video frame rate to film frame rate (23.976 / 24 fps).

VIDEO mode is used when you know that all of the content is from video, and you want to use the plugin to perform deinterlacing of the video footage. When you use this source type the output frame rate will maintain the video input frame rate (29.97 / 30 fps).

**Look Ahead:** 10 - 50 (default 10)

This value sets how many frames will be examined when attempting to determine the telecine pattern. Setting the Look Ahead value higher than the default of 10, causes the plugin to look at more fields when trying to determine the telecine pattern.

Setting the value higher may work well if the pattern is weak in the first few frames of the footage and then becomes strong, for example, if there's a fade up at the start of otherwise clean film source footage.

However in the case of a very weak but consistent telecine pattern a higher Look Ahead value may actually "muddy the water", since the plugin must calculate tolerances and luma variances across too many frames to be feasible for the strength of the pattern.

Setting the look ahead value too high may also cause performance issues. Lower values of the Look Ahead work better in most cases.

**Fixed Cadence:** False/True (default False)

Set this to True only if the source media is of unbroken telecine cadence. In this case the plugin will not try to detect new source mode types or cadence breaks once an initial cadence has been detected.

This parameter will provide the best results in cases of unbroken cadence in which the telecine pattern may be weak in sections, but strong at the start.

When used with the A Frame setting below, it can also be used when the cadence is weak at the start, but the start frame for the telecine pattern is known.

**A Frame:** 0 - 50 (default 0)

This parameter can be used in conjunction with Fixed Cadence = True to specify the frame number of the first frame in the Telecine pattern.

If set to a value of zero, the plugin will attempt to determine the first valid A frame, and then will assume the pattern is unbroken from that point forward.

If set to a value greater than zero the plugin will use this frame number as the first A frame and perform the inverse telecine regardless of the actual telecine cadence of the media.

**Interpolate Fields:** False/True (default False)

If set to True when the Source Type = UNKNOWN , then the plugin will interpret sections of the media where a cadence pattern cannot be determined to be from a video source, and will remove interlacing in those sections.

If set to True when the Source Type = Video, then the plugin will always remove the interlacing in the media.

This deinterlacing may introduce a general softening effect in the output.

**Field Motion Threshold:** 0 - 1.0 (default 0.5)

This parameter can be used in conjunction with Interpolate Fields = TRUE, and is valid only when Source Type = VIDEO and input frame rate = output frame rate.

In that case, this setting is used to tweak the interfield motion detection algorithm, that determines when to interpolate fields (based on the amount of inter field motion). The default value of 0.5 is best for most clean video, but experimentation may yield better results for some footage.

## Rotate Image Plugin Settings

This plugin allows you to rotate the video image by +90 degrees or -90 degrees. It is most commonly used when preparing video for display on a mobile phone or other mobile device.

## Scaler Plugin Settings

The Scaler Plugin allows you to change the width and height of the video image in pixels. You can also adjust the vertical and horizontal filter. Negative values for the filter setting will make the edges softer, and positive values will make the edges sharper.

## Timecode Overlay Plugin Settings

This plugin allows you to overlay timecode on the video. There are three timecode modes:

- Timecode from Live Source: The timecode is read from the live source (as set on the Input tab).
- Render Timecode: The timecode is rendered in hh:mm:ss:ff using the start time you specify (in frames). This can be used when transcoding or capturing from a live source. The frame rate used is the frame rate of the source.
- Date and Time: The system date and time are used.

Note that for real-time timecode overlay you must use a font size of 320 or less. For NTSC timecode burn-in, to place the timecode centered in the lower part of the image, a Horizontal offset of 220, Vertical offset of 380, and font size of 60 would be typical.

## Video Overlay Plugin Settings

The Video Overlay plugin allows you to set a video file to use as an overlay and a graphic still image file to use as an alpha channel mask for the video overlay. The graphic still image file you use can be a 32-bit bmp file with an alpha

channel or a Photoshop file with transparency. The alpha channel of the bmp file or transparency of the psd file will be used as the alpha channel for the video overlay.

The mixer can be used to determine the transparency of the opaque areas of the video overlay.

### **Video Proc Amp Plugin Settings**

This plugin allows you to adjust the settings typically associated with video proc amp settings, namely Brightness, Contrast, Blue Gain, Red Gain, Blue Offset, Red Offset and Hue.

Note that these are the same as the Hardware video proc amp settings, so if you are capturing video using a DRC board, you can use the hardware Video Processing settings instead of the software plugin.

### **Civolution NexGaurd Forensic Watermarking**

This optional plugin allows you to add an invisible forensic watermark to your video image. As well as embedding the watermark the plugin produces the log files that is required by the NexGaurd database.

### **Civolution Teletrax Watermarking**

The Teletrax plugin is used to embed watermarks for content tracking and monitoring. As well as embedding the watermark the plugin produces the three log files that are required by the Teletrax database for the tracking and monitoring functions.

### **Google Fingerprinting**

The Google Fingerprinting plugin is used to create an xml file at the time of the encode that can be uploaded to YouTube and used to find any footage that matches the xml fingerprint file.

# Video Process (Hardware based)

The controls on the Video Process tab are hardware-based processors that can be used to alter the video input signal when you are using Live Source or Deck Control as an input type. Because they alter the video input, they are “global” settings, meaning that the changes made on the Video Process tab will be used by all codec profiles in the project. The video process controls include Cropping, Processing Amplifier (Proc-amp), Horizontal/Vertical filtering, Noise reduction control and Graphic Overlay controls.

Video Process controls cannot be used when you are transcoding a file. When you are transcoding a file you must use the Plugins to alter the video image.

## Cropping

The hardware Cropping controls affect how much video is removed from the top, bottom, and sides of the incoming video. Typically you would use cropping to remove the black areas which often surround a video image (known as ‘underscan’), or the large black bars above and below the image found in letterboxed material.

Keep in mind that when you remove lines from the video, you are not changing the size that will be used by the codec profile. This means that if you crop 20 lines from the height of your video, the picture will be “stretched” to fit the size of your codec profile. If you don’t want this to happen, you must also reduce the vertical height of your codec profile by 20 lines.

## Deinterlacing

Each frame of video from an NTSC or PAL source will contain 2 interlaced fields. Video that is displayed on a computer VGA monitor will be displayed frame by frame. In order to display the video correctly on a computer VGA monitor, it must be deinterlaced.

**Deinterlacing for the HD Boards (DRC-5500):** Deinterlacing is set in your Source Profile (on the Input tab).

**Deinterlacing for the SD Boards:** An Enable Deinterlacing box will be found on the Video Process tab. Check the Enable Deinterlacing to use the Stream hardware’s deinterlacing feature. If you plan to deinterlace the video the hardware deinterlacing will give you superior quality compared to a codec’s software deinterlacing. (Do not use both the hardware deinterlacing and the codec’s software deinterlacing.)

Note that Temporal Noise Reduction (3D noise reduction) can only be used if hardware deinterlacing is enabled.

## Processing Amplifier (Proc-Amp)

The Processing Amplifier (Proc-Amp) controls affect the brightness, contrast, saturation, and hue (hue for SD boards in NTSC mode only). You can also set individual color gain and color balance.

The gamma controls can be used to boost the brightness on a curve (rather than as a linear function as you do with the simple brightness and contrast controls). You may find the gamma controls useful when you are adjusting the levels of a video signal that you want to make into a digital file that will play back on a computer VGA monitor. Typically gamma values around 1.8 will give good results when adjusting video for display on a computer monitor.

## Filtering and Noise Reduction

When you filter a video signal you are reducing the high frequency part of the video signal. In ideal situations, high frequency signals are created in response to details in the image, such a fine lines. In practice, high frequency signals are often noise, so filtering out some of the high frequency signal is a good idea.

The Horizontal and Vertical filtering controls allow you to override the default filtering values used by the Stream drivers. For example, you may want to turn up the filtering (over-soften) because the video contains noise from the camera it was shot with, or you may choose to under filter a very clean video source in order to bring out additional detail.

Adding more filtering (over-filtering) will make it easier for the codec to compress the video stream at the expense of some of the detail in the image.

You will also be able to apply Temporal or motion adaptive 3D noise reduction. Temporal noise reduction works best with low level noise such as tape noise or noise caused by low lighting levels.

When you are adjusting the noise reduction you can temporarily disable it by clicking and holding down the disable button at the end of the drop down box. This allows you to compare the video source and the video with the noise reduction applied, so that you can check the effect.

## Temporal Noise Reduction

Temporal noise reduction compares images in sequence over a predetermined period of time, blending the images between fields or frames. The simplified theory is that by blending data over time you can reduce the overall noise content of the resulting image. This is used in the film industry to remove film grain from blue or green screen shots. Successive samples of the same blue or green screen scene are blended together which will effectively cancel out the noise found in any individual frame. The problem with typical

noise reduction algorithms is that if there is any motion in the individual scene you will get a motion blur (trails) artifact in the processed frame. One answer to this is to limit the blending process to a specific range of frames or to restart the process every few frames. This is very visible in the noise reduction found in some software codecs. Every few frames the noise reduction will reset and the noise will suddenly reappear only to disappear several frames later, then the process starts over again.

The DRC-Stream hardware uses a very advanced form of temporal noise processing called motion adaptive 3D noise reduction. Motion adaptive 3D noise reduction combines the information in multiple frames of video using the information obtained from the motion adaptive de-interlacing in order to decide how much processing is applied to each pixel in the final frame. Because each pixel is calculated individually the result will be more precise noise reduction with less motion blurring artifacts than would otherwise be normally possible. Note that Temporal Noise Reduction can only be used if deinterlacing is enabled.

There are three possible settings for the 3D motion adaptive noise reduction:

None: No noise reduction is applied

Optimal: A predetermined amount of noise reduction is applied.

Custom: You are free to set the amount of noise reduction applied. Too much noise reduction will result in motion trails effect.

If you choose the Custom option, you will be presented with the Temporal Noise Reduction window. You can set the amount of noise reduction applied and preview the output in real-time. Selecting OK saves the current setting.

## **Spatial Noise Reduction**

If you have an SD board (DRC-500 to DRC-2500) you will also be able to apply Spatial or 2D noise reduction. Spatial noise reduction works best with single pixel 'salt and pepper' type noise such as video dropouts. Spatial and Temporal noise reduction can be used separately or together.

Spatial or 2D noise reduction only affects the current frame of video, specifically targeting high frequency noise which is not part of the structure of the image. It specifically attempts to deal with high frequency noise which is not part of the edge of an object in the picture or other structures in the video.

There are three settings for 2D noise reduction:

None: No noise reduction is applied

Optimal: A predetermined amount of noise reduction is applied. This has been determined by testing with many hours of video.

Extreme: A greater amount of noise reduction is applied at some loss of overall picture sharpness.

## Graphics Overlay

When you are using a Live Source or capturing using Deck Control you can use a hardware graphic overlay, as a title board, watermark or a logo for example. A 32 or 24 bit graphic can be used.

A 32 bit bmp sample and a Photoshop psd file that shows how this bmp file was created is located in the Overlays folder in your Stream directory. Note that the 32-bit bmp file does use the alpha channel in the file to determine the transparency for the graphic overlay. However, if you use a Photoshop file the transparency in the file will be used to determine the transparency for the graphic overlay and NOT the alpha channel in the Photoshop file.

To use this function, click the Graphic Overlay Settings button. Use the checkbox at the top of the Settings window to enable this function. Browse for a file to use as your overlay.

Set a default fade duration.

Set the position and scale your graphic if desired.

Click OK to save your settings and close the window.

Click the up arrow to fade up the graphic using your fade duration and the down arrow to fade down the graphic using your fade duration. Click the slider button to open a slider that will allow you to manually fade up and down the overlay.



## Output

The output tab controls where the final encoded video will be stored, broadcasted, published or delivered. The output tab is context sensitive to the codec profile currently selected in the codec profiles list. Each codec profile will have its own output options.

## Monitoring Video and Audio during encoding

While you are encoding you will be able to monitor your video and audio.

If your CPU usage is high during a live encode you will be able to reduce it slightly by toggling the Monitor Source button off.

While you are encoding, the audio preview that you hear will be the audio from the **source**. The video you are seeing will be the video from the **encoder**. The audio **preview** from the source **will not** be in sync with the video from the encoder. However, the encoded audio will be in sync with the encoded video, so **the final encoded file or stream will be in sync**.

While you are encoding, you may mute the audio preview by clicking the “toggle audio mute” button found above the VU meters. This will not mute the audio in the encoded file.

While you are encoding all of the Video Process and Audio Process controls will be available to you. For example, while you are encoding you can adjust the volume of the audio. This will affect the volume of the audio in the encoded file or stream.

## Archive

An archive file is a file saved to a hard drive.

**For HD Boards:** For HD output in real time you must direct the output file to the RAID. Do not use the default OutputMedia folder found on your C drive. That drive will not be able to keep up with HD data rates.

**Tags:** You may want to use “tags” in your archive file name, to automatically insert information such as the date and time into the file name. (See “System Tags” on page 69 for more information on Tags.)

**Progressive Download:** For AVC MP4 files, this option will perform a post encode step that will move the file’s “index” from the end of the file to the beginning of the file. After this step, when the file is downloaded from a web server the viewer will be able to start playing the file before the download is complete.

**Rollover Mode:** For Windows Media and Real Helix you will be able to encode to a single file (default) or to automatically start a new file based on the encoded file size or duration. The root file name will automatically be appended by an incrementing number, so that a new file will not over-write an existing file. Note that if you use system tags in your file name the tags will only be calculated at the end of the first file, so for example, if you used a time tag it would only be the time of the first file.

**Use Custom Block Size:** When you are encoding an MPEG file you will be able to set a custom block size.

**Helix 10 DRM:** When you are using Helix 10 you will see an “Enable DRM” option. In order to use DRM you must obtain a license from RealNetworks. You must also obtain a special build of the DRM software from RealNetworks, that has been customized to work with Digital Rapids boards.

## Broadcast

Use this option when you want to stream a live source to a video server and broadcast to the internet or an intranet. The following codecs can be used for live streaming:

- Atime (used in the Group Codec)
- Dicas (H.263/MPEG 4/H.264 plus AMR or AAC audio, RTP/RTSP)
- Digital Rapids AVC for Web
- Digital Rapids Streaming for iPhone
- Digital Rapids Studio AVC Encoder (used in the Group Codec)
- Adobe Flash 8 On2 VP6
- MainConcept MPEG2 Transport Stream
- Microsoft VC-1 (used in the Group Codec for ASF and Smooth Streaming)
- Microsoft Windows Media
- Real Helix

Please refer to the documentation for a specific codec for more information about setting up that codec for live streaming. Documents can be found in C:\Program Files\Digital Rapids\Stream\Documents.

If you are using the Group Codec, the following processors can be used for live streaming:

- ASF Muxer (for VC-1)
- Manzanita TS Muxer (UPP/RTP)
- Native RTP (for RTP/RTSP and Flash RTMP)
- Smooth Streaming Container (for delivery to an IIS Server)

Each processor has settings that are specific to the media server or player intended to play back the live stream.

Output of a Native RTP broadcast stream can be decoded and played by a software player (such as the QuickTime player) or by some Set Top Boxes. Alternately the output can be sent to a media server that handles RTP packets, such as the Darwin Media Server. For basic information about setting up a Darwin Media Server on a Windows OS, please see [Darwin\\_Streaming\\_Server\\_Setup.pdf](#), which is located in C:\Program Files\Digital Rapids\Stream\documents.

## Windows Media DRM

When you have a Windows Media codec in your Codec Profiles list, and you have selected that codec, you will see a WM9 DRM button. This function allows you to connect to one of the currently supported DRM license providers and to exchange key information, so that the encoded media has been encrypted with the appropriate key.

Note that Stream does not support the use of .drm files.

In order to use this function you must have an agreement in place with the Windows Media DRM license provider that you have selected.

Alternatively, you may generate key values yourself and make your own xml files that can be called by the “Basic DRM Key Retrieval” option. These xml files can be retrieved from a URL (using http and port 80, or https and port 443) or from a file on your LAN. A sample xml file that can be used for this purpose, [Basic\\_WM DRM\\_Response.xml](#), can be found in C:\Program Files\Digital Rapids\Stream\documents.

## PlayReady DRM

When your output is a Smooth Streaming file or live broadcast one of your output options will be PlayReady DRM. This is a digital rights management technology from Microsoft. When you encode your media it is encrypted using a set of keys. A PlayReady license acquisition URL that identifies where to make a request for a valid license for a piece of content is included in the header of the encoded media. When the media is played back the player attempts to acquire the license needed to decrypt the file for playback, or to redirect the viewer to a web site where they can acquire the license.

For more information on PlayReady in Digital Rapids Stream please see [PlayReady\\_DRM.pdf](#), which can be found in C:\Program Files\Digital Rapids\Stream\documents.

## Command (Stream FE)

This option allows you to enter in a command line function that will start an external application once encoding/transcoding has stopped. Any application that can be called from a command shell can be run at the end of an encode using this feature by typing the path and filename of the external command into this box.

**Example 1:**

Call a batch file which copies the finished encoded file from the C drive to the E drive and then deletes the original.

Create a batch file called c:\utils\move.bat

Add this to the Command box (including the entire path and file name)

Call the Archive file C:\output\news.wmv

Contents of the move.bat file:

```
copy E:\output\news.wmv D:\final
del E:\output\news.wmv
```

You can use wildcards in your batch file, so alternatively you could use:

```
copy E:\output\news* D:\final
del E:\output\news*
```

**Example 2:**

Move a Stream archive output file that uses a Stream system tag (a time stamp) from the default OutputMedia directory to another folder (either a local folder or a network folder)

For the Archive file name enter Clip\_%T%. The %T% is a Stream system tag which will be replaced with the time that the file was encoded. For example, if the file was a Windows Media file encoded at 4:18 PM the name would be Clip\_4\_03\_18 PM.wmv (where the time is HH\_MM\_SS AM/PM). Note you could also use %D% to append the date to the file as well, e.g., Clip\_%D\_%T% would append both the date and time to the file name.

For the Command function in Stream, enable the function, click the Command button and enter: C:\Temp\Test\move.bat "%PROF.ARCHIVE.FILENAME%"

Note that the "%PROF.ARCHIVE.FILENAME%" is the tag that gives the entire path and filename for the archive file just created.

In the move.bat file referenced above, the contents of the bat file:

```
move %1 D:\Temp\Test\
```

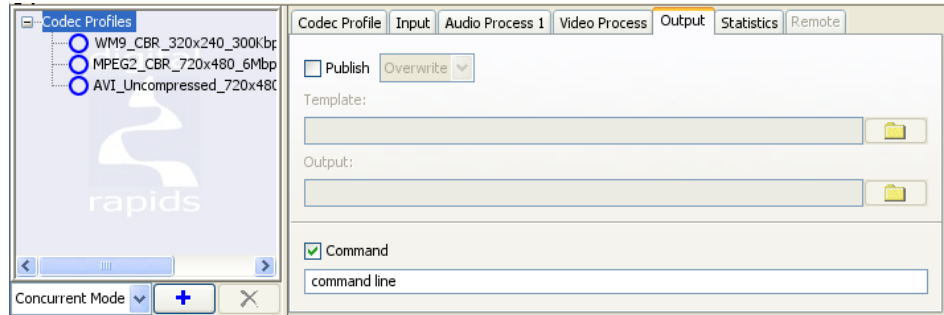
This moves the file to the D:\Temp\Test\ directory. You can edit the bat file in Notepad and change this to any drive or folder, either local or on your network.

Note the %1 in the bat file will be replaced by the archive file name, using the tag in the Command function.

## Project Command Function (Stream FE)

This function is very similar to the Command function, except instead of operating on a codec-by-codec basis, it operates after encoding has finished for all codec profiles.

To access the Project Command Function highlight the Codec Profiles heading and then choose the Output tab.



## Publish

This feature allows you to use a Publish Template file which includes tags. The Publish Output file will be your template with your tags replaced by the information from the encode. For example, you could create an encoding report which shows the details of the encoding session, or an html web page which includes an embedded player with a tag for your archived video file. There are some sample template files installed for you in your Stream\PublishTemplates folder.

To access the Publish command on a codec-by-codec basis, select the codec you want to publish data for, and enable the Publish button. Be sure to use Codec Profile-Level tags for your published output.

To access the Publish command for the entire project (a Stream FE feature), select the Codec Profiles heading and then choose the Output tab. Be sure to use Project-Level tags for your published output.

A list of all tags can be viewed by choosing Help > System Tags.

## MPEG Muxer (MainConcept)

The MainConcept MPEG Muxer can be used to do a post-encode muxing step on the MPEG2 video elementary streams and audio streams you just created during the encoding step. This allows you to perform custom muxing that is not supported by the standard MainConcept MPEG codec profile, such as muxing

AC-3 audio files, or multiple audio files all with their own language codes. As an example, please see the sample VOD projects included with Stream that have the MPEG Muxer set up for a CableLabs encode.

Note that there is also a MainConcept Muxer Tool available (found in Tools > MPEG2 > Muxer) which can be used to mux together previously encoded MPEG2 video elementary streams and audio streams.

You can find more information about muxing settings by opening the Stream\Documents\MPEG\_Encoding\_Guide.pdf file and then looking in the Advanced Multiplexing section.

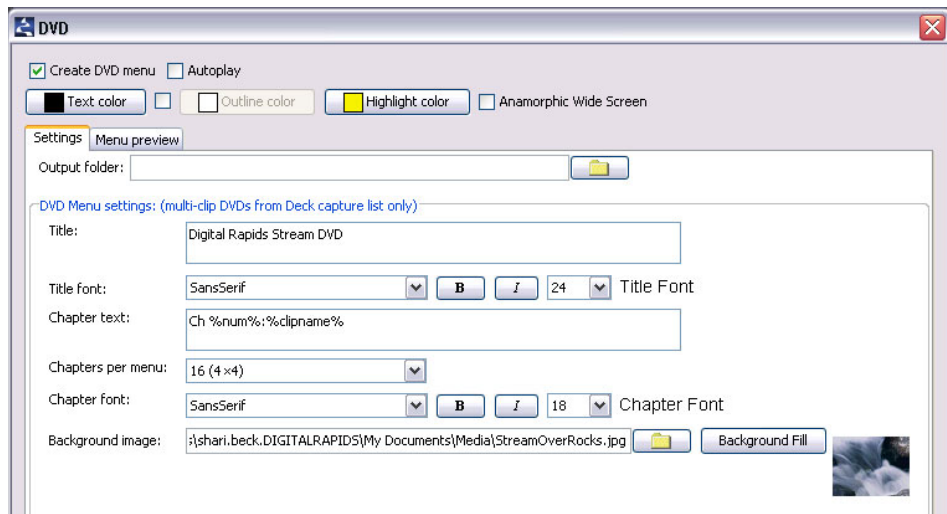
## DVD (Stream FE)

DVD output can be used to save your files as DVD ready folders and files with an automatically created simple menu structure. When the DVD output is used with Deck Control and a capture log you can create a DVD with a menu and chapter points. If you use the DVD output with a single clip (either from a live source, a single clip in a capture log, or a single transcoded media file) then your DVD output will not have a menu or any chapters.

If you are using Deck Control to capture your clips and make a DVD with a menu and chapters, then Concatenate Output must be enabled. You must also enable the "Force I-frame at inpoints" in the MPEG codec profile. The in-points on the capture log will be used as chapter points for your DVD.

Note that you will only see this option when you are using an MPEG2 codec profile that was created with the Codec Profile > Create > MPEG2 - MainConcept > DVD option.

When you click the DVD button the following window will open:



You can use it to change the text that is shown as the title of the DVD, choose between a 4x4 or 3x3 chapters per menu, and choose a background image (a jpg, gif or png file). You must also set a Output folder (for your Video\_TS and Audio\_TS folders) and a Temporary items folder that will be used while creating the DVD folders.

The Chapter names text is based on tags (a list of valid tags is shown when you hover your mouse over the text box, and is shown below).

Use tags to create unique chapter names.  
Valid tags are:  
%% - %  
%num% - Chapter #  
These tags take values from the Capture Profile:  
%clipname% - name of the clip  
%comment% - clip comment  
%tapename% - tape that clip was from  
%inpoint% - in point of clip  
%outpoint% - outpoint of clip

You can change the text color and the text outline color (or disable the outline by disabling the check box. The highlight color is the color that will be shown when you are on a chapter selection.

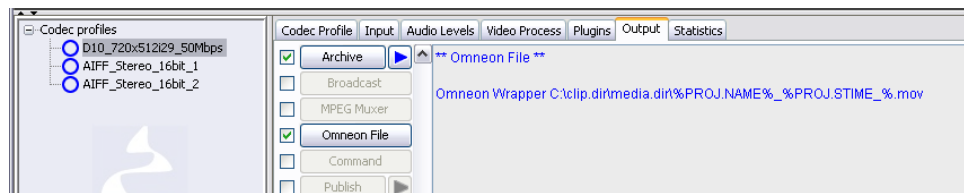
If you are using anamorphic footage you can enable the Anamorphic check box.

You can switch between the Preview and Contents tab to see the effect of your changes on your DVD menu.

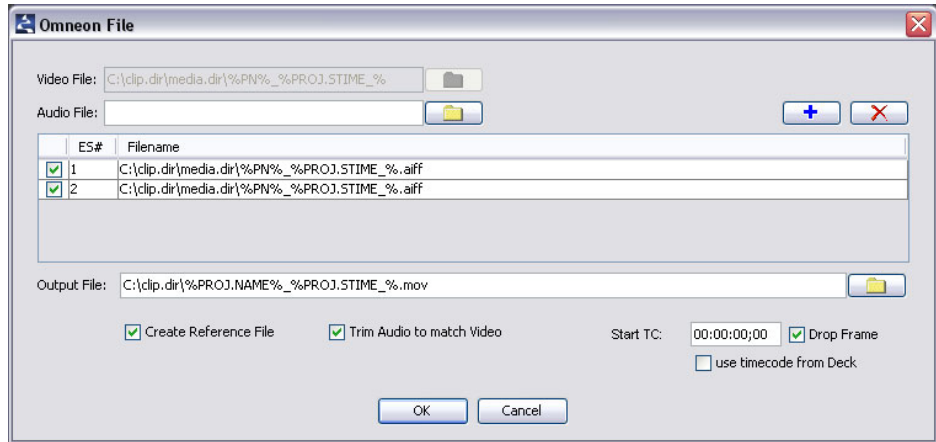
## Omneon File (MPEG2 Wrapped in MOV)

If you have purchased the Omneon MOV Output option one of the MPEG2 output options will be Omneon File. This post-encode step wraps the MPEG2 archive file plus AIFF or PCM/WAV audio files in an MOV file.

To set up the project, add an MPEG2 video elementary stream codec profile (video only, multiplexing type set to None). If you are encoding NTSC add a Field Dominance Converter plugin, as the Omneon server only supports top field first video. Add AIFF or PCM/WAV audio codec profiles. Set an Archive file name for each of the elementary stream files. Select the MPEG codec profile and enable the Omneon File output, then click the Omneon File button.



On the Omneon File window the Video file is the archive filename of the video codec profile. Also the Audio elementary streams are filled in with any AIFF or WAV file archive names that are in the project. If you do not want to use one of the audio outputs in the Omneon output, then disable its checkbox.



If you are creating a **reference file** then you must use the specific output directory structure expected by the Omneon server. On the root of one of your drives create a new folder called clip.dir, and a new subfolder called media.dir. Any drive may be used, but you must use the root of the drive, not a sub-folder. When encoding video and audio files you must save the archive output files to clip.dir\media.dir. You must save the Omneon output file to clip.dir. The same drive must be used for video, audio, and reference file output.

## FTP (Stream FE)

Send your archived file using ftp. To enter an item, click the FTP button, and then click the Add button. This will open an FTP Item window. Enter in the information for that item.

It will often make sense to use Stream system tags to represent the destination file name (%OF%.%OE%) and source file (%PROF.ARCHIVE.FILENAME%), which will provide the full path and file extension of the archive file).

When you click OK the item will be added to your FTP list.

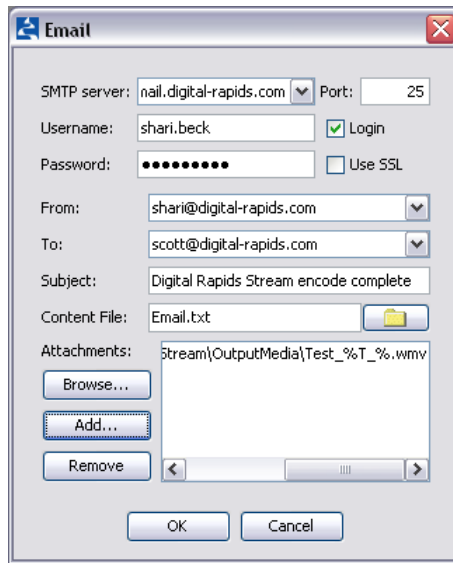
You can then add another item to the same folder by clicking the destination folder name and then clicking the Add button.

If you want to send some items to a different FTP site, you can click the Add button and create a new FTP Item with the new server information.

If you need to edit the information, you will edit the level that you have highlighted. For example, if you need to change information about the server, but not information about the folder or files, highlight the server information before you click the Edit button.

## E-mail (Stream FE)

Send an e-mail to tell someone that the encode is complete and/or to e-mail them a file.



Enter your SMTP mail server, the port used by the server, your e-mail address and your e-mail password. Enter the e-mail address of the person the email is from and the person the e-mail is to.

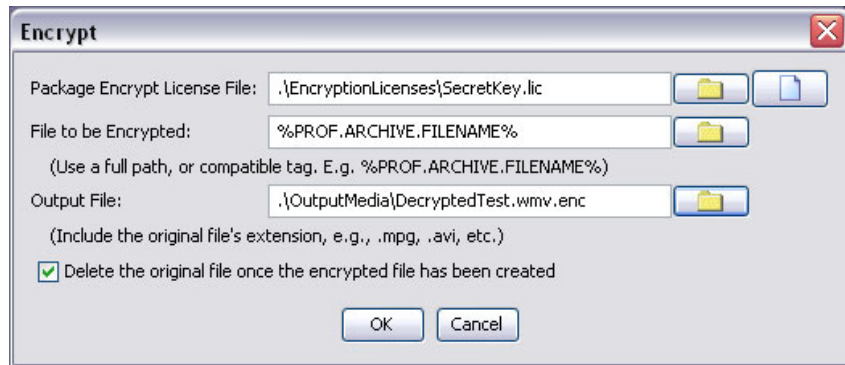
Modify the Subject if desired, and enter a Content File to show in the body of your e-mail message. This can be a simple text file, or it could be a text output from the Stream Publish command, with information automatically filled in. (There is a sample Email.txt file in the Stream\PublishTemplates folder which you can use as a sample for the Publish Template. Set your Publish Output file and enter that as the Content File in the Email window.)

You may also add attachments to your e-mail. The attachments could include the video file you just encoded, or other supporting files. If you want to attach the video file the recommended tag to use would be %PROF.ARCHIVE.FILENAME%. This tag is used to provide the full output archive filename, including the path and file extension.

## Encrypt (Stream FE)

You can use this function to encrypt an archive file after the encode has finished using 192-bit AES encryption.

The first time you use this function you will need to create a license file. This is the file that will be also be used to decrypt the file. Enable the Encrypt function and click the Encrypt button.



Click the “Create a new package encryption license file” button. Type in a file name and click the Save button. You will then be asked to enter a password. This password is used to create the license file, not used decrypt the file. Should you ever need to recreate the license file you will need to enter in the same password. You will be asked to confirm your password, and then the license file will be created.

If you already have a license file you would like to reuse, you can browse to this license file instead of creating a new one.

Enter the full path and full name of the file to be encrypted, or simply enter in a tag that includes the full path, i.e., %PROF.ARCHIVE.FILENAME%.

Enter an output file name including the file extension (e.g., avi, mpg, etc.). If you do not include the file extension, the decrypted file will not have a file extension. If you do not give a path for the output file it will go into the main Stream directory by default. If you would like it to go into the OutputMedia sub-folder be sure to include that in the path name, or use the browse button to select the encrypted file location.

Optionally, you may choose to “delete the original file once the encrypted file has been created”. That way the original, unencrypted file will not be accidentally left on the hard drive, and only the encrypted copy will be in the Output media folder.

To decrypt the file choose Tools > Launch Package Decryptor. On the Package Decryptor window choose File > Package Decrypt. This will open a window that will prompt you to select the file you want to decrypt. Once you have selected an encrypted file, a second window will open that will prompt you to open the license file needed to decrypt the file. This is the same license file that was used to encrypt the file.

# Statistics

The Statistics tab displays real-time feedback **during** encoding. The display is context sensitive to the codec profile chosen in the codec profile list. Some codecs provide statistics during encoding and some do not. For example, you will see statistics when using Windows Media and Real Helix, but not during MPEG encoding.

Note that during encoding you will see the CPU usage and Buffer usage go up. Should the CPU usage exceed 100% the buffer will start to fill. When the CPU usage drops under 100% the buffer usage should drop back down. Should the buffer usage also reach 100% you will start to see the Dropped Frames counter go up.

If the CPU usage does not reach 100% but you still see the Buffer usage go up, your drives may not be able to keep up with the output data. If you have an HD board, make sure you are directing HD file outputs to the RAID and not to the C drive.

You may also see your CPU usage stay low, but your buffer usage go up, if you are encoding on a multi-core CPU system, but using a codec that cannot take advantage of all of the cores. For example, if you are encoding using the Flash 8 On2 codec, which can only use one core, and you are using a system with 4 CPU cores, a CPU usage of only 25% is the maximum that can be used by that codec before it starts to fill the buffer.

# Starting and Stopping Encoding

## Start/Pause/Resume/Stop

You can start and stop encoding using the buttons found in the lower right hand side of the interface.

For live encoding, after you have clicked the Start button it will change to a Pause button. If you click the Pause button, it will change to a Resume button. If you click the Resume button it will continue recording to the same file.

## Triggers

You may use triggers to start and stop encoding. To select which trigger you want to use click the Trigger button found directly above the Start button. You may start encoding based on a GPI trigger, a keystroke or LTC (when using

Stream FE with a DRC-500 to DRC-5650 board). You may stop encoding based on a GPI trigger, duration or a keystroke, or LTC (when using the DRC-5650 board).

For LTC trigger on the DRC-500 to 2600 you must use the **left** audio input for the LTC trigger. Once you press Start, the Stream app will start “listening” for the LTC you have entered as the trigger, and once it detects the timecode you set, it will start the encoder. Note that due to encoder startup delays, the encoder may take anywhere from one frame to a few frames to actually start writing the first frame, so the in-point of the file will be slightly later than the LTC you entered as the trigger.

For more information on setting up a GPI trigger and making GPI cables, please see “Using GPI Triggers” on page 83.



# Stream Software Feature Chart

- = standard feature
- o = optional feature

**Features are subject to change without notice.**

Input Formats (File-Based)	Stream LE	Stream FE
AVI	•	•
MPEG1 & 2 (including VOB), MPEG4/H.264	•	•
QuickTime (Media and Reference files)	•	•
Microsoft Windows Media / SMPTE VC-1	•	•
WAV (incl. RF64, Broadcast WAV) and MP3	•	•
Avid DNxHD in MXF	o	o
MXF	o	o
Omneon (MOV reference files only); Note some third party MPEG2 decoders may allow this to work with self-contained files also	•	•
GXF	o	o
LXF	o	o
DV/DVCPPro 25/50/100(HD) in AVI, MXF, GXF, LXF	o	o
DV/DVCPPro 25 in MOV	o	o
Red Camera (R3D files)		o
Image sequence input (SD, HD, Film)		•
JPEG2000 in MXF	o	o
AES3 audio (SMPTE 331M and 302M, AES3-2003) wrapped in TS or MXF	•	•

<b>Output Formats (Video only or Video + Audio)</b>	<b>Stream LE</b>	<b>Stream FE</b>
Adobe Flash 8 On2	o	o
Ateme H.264/AVC elementary stream encoder		o
Avid DNxHD		o
Dicas 3GPP (H.263, H.264, MPEG-4 Part 2, AAC and AMR)	o	o
Digital Rapids AVC for Web (MP4, MOV, M4V, .FLV/F4V, 3GP)	o	o
Digital Rapids Streaming for iPhone	o	o
Digital Rapids Studio AVC (H.264 Elementary Streams)		o
DirectShow AVI	•	•
DRC Video (uncompressed YUV plus timecode and cc)	•	•
DV/DVCPPro 25/50/100(HD) (in AVI)	o	o
DV/DVCPPro 25/50/100(HD) (in MXF, MOV)		o
DV/DVCPPro 25/50 (in LXF, GXF)		o
Image Sequence (18 still image formats)		•
JPEG2000 (image sequence or in MXF)		o
Microsoft Smooth Streaming	•	•
Microsoft Windows Media (VC-1, WMV, Microsoft Silverlight)	•	•
Microsoft VC-1 (Elementary Streams, Closed Captions, etc)	•	•
MPEG MainConcept: MPEG-1 and MPEG-2 (4:2:0 and 4:2:2, compatible with CableLabs® VOD specifications) +	o	•
MPEG-2 Broadcast (UDP/RTP with RTSP)	o	•
QuickTime 7 (AVC/H.264 and AAC, AMR for FE only)	•	•
RealVideo, RealAudio (Helix) 9 & 10	•	•

+ CableLabs is a registered trademark of Cable Television Laboratories, Inc.

<b>Output Formats (Audio Only)</b>	Stream LE	Stream FE
AES3 audio (SMPTE 331M, AES3-2003) (*included only when MXF writer is enabled)		*
AIFF	•	•
Dolby® Digital and Dolby® Digital Plus (stereo or surround, File ONLY or file + Live)	0	0
Dolby Pulse (AAC-LC, AAC-HE, stereo or surround)	0	0
Nero AAC	0	0
Thomson MP3 audio (stereo and surround)	0	•
WAV audio (multi-channel, RF64, Broadcast WAV)	•	•

<b>Output Formats (Processors used in the Group Codec)</b>	Stream LE	Stream FE
ASF Muxer	•	•
Elementary Stream File	•	•
GXF Wrapper		0
LXF Wrapper		0
Manzanita TS Muxer		0
MOV Muxer (*included with MPEG2, DVCPPro, DR AVC, Ateme)		*
MPEG-4 Muxer (*included with DR AVC or Ateme)		*
MXF Wrapper		0
Native RTP (*included with DR AVC or Ateme)		*
Smooth Streaming Container	•	•

<b>Other Output Options</b>	Stream LE	Stream FE
Closed Caption file support (SCC, SAMI, SRT, DFXP)	•	•
Group Codec	•	•
Omneon (MOV) Output and Tools > Omneon Wrapper	0	0
RTMP Streaming broadcast option (*included with the DR AVC for Web bundle, optional for use with DRC Studio AVC or Ateme)		*
Tools > H.264 > CC Embedder (*included with DR Studio AVC or Ateme)		*
Tools > MPEG2 > Muxer (*included with MPEG2 MainConcept)	*	*
Tools > MXF Wrapper (*included with MXF Wrapper option)		*

<b>General Functionality</b>	Stream LE	Stream FE
Capture/encode from live video and audio inputs	•	•
Capture/encode to files from decks with RS-422 control	0	•
Transcode from source media files	•	•
Watch Folder for media file inputs		•
Batch Encoding (real-time capture with auto transcode)		•
Timecode (preserve, auto increment or time of day)	•	•
VBI capture (with Closed Caption support)*	•	•
CC 608 and 708 capture from SDI and HD SDI	•	•
Clip Lists (multiple input clips to multiple or concatenated output)		•
Duration-based encoding	•	•

\* For DRC-1000 to DRC-5650 boards

<b>Audio Processing Controls</b>	Stream LE	Stream FE
Multiple channel audio	•	•
Volume	•	•
Sample rate conversion	•	•
Hardware 7-Band Parametric EQ *	•	•
Hardware Dynamic Range Exp/Comp *	•	•
Hardware Bass/Treble *	•	•
Software audio processing plugins (all boards)		•

\* For DRC-500 to DRC-2600 boards

<b>Video Processing Controls</b>	Stream LE	Stream FE
Hardware deinterlacing	•	•
Horizontal & Vertical Filtering	•	•
Spatial noise reduction (2D) *	•	•
Temporal noise reduction (3D)	•	•
Hardware Proc Amp controls	•	•
Gamma Correction	•	•
Hardware scaling, cropping, graphic overlay	•	•
Software video processing plugins: deinterlacing, cropping	•	•
Software video processing plugins (except watermarking)		•
Software watermarking plugin: Civolution CompoTrack		o
Software watermarking plugin: Civolution Teletrax		o
Software watermarking plugin: Thomson NexGuard		o

\* For DRC-500 to DRC-2600 boards

<b>Publishing and Advanced Output</b>	Stream LE	Stream FE
CEA-608 and 708 Closed Captioning support	•	•
Template-based publishing interface	•	•
Log publishing – per codec	•	•
Log publishing – per project or persistent (all projects and codecs)		•
DVD publishing (menuless or chapter-based menu from deck capture points or clip list)		•
Direct DVD publishing to Rimage Producer III, Rimage Professional and Primera multi-disc production systems		•
E-mail notification		•
Automated FTP distribution		•
Media file encryption/decryption		•
Support for third-party Windows Media DRM providers (Entriq, SyncCast, thePlatform, generic)	•	•

<b>Workflow and Application Integration</b>	Stream LE	Stream FE
GPI and keystroke trigger	•	•
LTC timecode encode start trigger, stop trigger for DRC-5650	•	•
Controllable via Digital Rapids Broadcast Manager		o
Integration with Digital Rapids Transcode Manager	•	•
Web Services (SOAP) API	o	o
WDM (Windows Driver Model) drivers*	•	•

\* DRC-500 to DRC-2600 boards

# System Tags

Tags can be used to add automatically generated text strings into file names, reports, html pages, etc.

System Tags are pre-programed tags that can use data that is available from the system at the end of an encode, such as the date, time, file name, CPU usage, number of dropped frames, etc.

Filename example: C:\Output\%BN%-%R%-%T\_%.wmv uses the tags for Project name (%BN%), resolution (%R%), and time (%T\_%). The output file name would look like C:\Output\MyProject-320x240-4\_10\_51\_PM.wmv

Encoding a second file without changing any settings within the Stream app would generate a unique filename encoded with the current time. By using a combination tags you can create a default output filename which will automatically generate a unique filename.

There is a sample VideoEncodingReport.html in the Stream\PublishTemplates folder that uses system tags to generate a report.

There is a sample Player\_WM\_Template.html in the Stream\PublishTemplates folder that uses system tags to generate a web page that includes an embedded WM Player that will automatically link to the archived WMV file.

Note that in the table of system tags there are some that have a Description of "safe for use in file names", or simply "safe". These tags expand to values that don't contain colons or slash characters, and are therefore safe to use in filenames. For example, %T% expands to "12:34:56PM" but %T\_% will expand to "12\_34\_56PM".

To open a full list of system tags from the Stream software use the main menu to select Help > System Tags.

The list can also be opened from:

C:\Program Files\Digital Rapids\Stream\documents\SystemTags.html.



# Troubleshooting

## **Checking SD hardware**

If you suspect that you have a problem with your Digital Rapids board, you can run the Test App that was installed with your Stream software. Open the Stream folder (by default it is in C:\Program Files\Digital Rapids\Stream). If you have a DRC-500 board run the DRIdahoTest.exe file. If you have a DRC-1000 to 2600 run the DRColoradoTest.exe file. Run the automated test, and if you see any failures then please contact Digital Rapids Support.

## **Unable to select live source as an input type**

Your DRC hardware has not been properly installed or drivers have not been properly installed. To check on the Digital Rapids drivers in Windows XP, right click on My Computer and choose Manage. Click Device Manager. Click the + symbol next to Digital Rapids Devices. Right click on the Digital Rapids device and choose Properties. The Device Status will be displayed on the Device Properties window.

## **Codec Profile > Create only shows Windows and Real as options**

Additional options such as Quicktime, Direct Show and any purchased options will only be enabled once the product has been registered. You can register your product on line from the Digital Rapids web site by selecting Tools > Register Online from the Stream menu.

## **When starting Stream software, a message appears saying that the hardware is disabled.**

The product has not been registered within 30 days of the software installation and your grace period has expired. You can register your product on line from the Digital Rapids web site by selecting Tools > Register Online from the Stream menu.

## **Dropping frames when encoding video**

Not all codecs perform well in a real time environment. Codec factors include file resolution (width x height), data rate, encoder complexity, and codec type. System factors include CPU, memory PCI bandwidth and hard drive speed.

You should be able to encode a full sized (720x480 or 720x576) uncompressed AVI on most systems. Other efficient codecs include WM9 (Microsoft) and MPEG1 and MPEG2 (MainConcept).

Less efficient codecs include QuickTime, Real Helix, MPEG4 and Flash 7 (with Sorenson ACE) or Flash 8 (with On2 VP6). With these less efficient codecs you should be able to encode to a 320x240 sized file in real time on most systems.

Should you need to encode to a full sized clip on a system that cannot encode to the file format you want in real time, encode to an uncompressed AVI in real time, and then transcode to your final output format.

When encoding the CPU status at the bottom of the Stream window will climb up as you put more demands on the system. If the CPU usage reaches 100% then the buffer will start to fill. If the buffer reaches 100% then the encoded file will start to drop frames.

If you are using a system with multiple CPU cores, but the codec you have selected cannot use multiple cpu cores, then your CPU usage may look low when the buffer begins to fill. For example, the Flash 8 On2 codec can only use one CPU core, so on a quad-core system, a CPU usage of 25% (or slightly more) during encoding indicates that 100% of 1 of the 4 CPU cores is being used by the codec, and since none of the other CPU cores can be used by the codec simultaneously, you have reached your processing limit for that codec.

### **Can't preview the audio**

You will not be able to preview the audio until you have at least one codec profile in your list. If you have more than one audio channel enabled in your source profile, each codec profile in your list can be assigned an audio channel independent of the other codec profiles using the Audio drop-down box on the input tab.

### **Video preview is not updating**

Occasionally you will change a setting and the video preview will not update correctly. If this happens toggle the Monitor Source button off then on again.

### **Video preview stops during encoding**

Check to make sure you have selected Video Preview > Source. The Video Preview > Encoder option only works for some codecs.



### **Buffer usage is higher than normal during encoding**

Check to make sure you have selected Video Preview > Source. The Video Preview > Encoder option requires some buffering so it will increase your Buffer usage.

### **Can't encode: check codec profile**

When you can't encode you will normally see a red X next to the codec profile. Double click the profile to open an error window or hover your mouse over the codec profile to see the message as a tool tip. Common problems are no archive file name or other output modes selected, or trying to encode only video with a codec that is expecting video and audio.

### **Unable to use MPEG files as a DirectShow Media Files Input source**

A DirectShow filter for MPEG has not been installed on the system. Note that if you have install the MainConcept option with your Digital Rapids Stream you will have an MPEG codec. If you have purchased a DRC-500 without the MPEG option you can download codecs that include a DirectShow filter for MPEG from [http://www.free-codecs.com/Video\\_Codecs.htm](http://www.free-codecs.com/Video_Codecs.htm).

### **Can't connect to the deck or can't start the deck capture**

The Logger and Deck Control window have changed slightly from Stream 1.5.

When you run the Logger as a stand-alone app you will see a Configuration button that will allow you to create a deck configuration file (with port, timecode type, etc. specified). When you run the Logger from the Deck Control window the Logger will use the deck configuration you set in the Deck Control window (Options > Configure).

You now start the capture using the Start button on the main interface.

### **Can't create an AVI file that is over approximately 512GB in size**

If you are using Windows XP SP2 or earlier, this is a known issue. Update to SP3 or refer to <http://support.microsoft.com/kb/927544> for the Microsoft hotfix.

After this fix has been applied, you should be able to create files up to 1.7 TB in size.

### **Can't use a 3GP file as a source file in Stream**

By default 3GP files use the QuickTime decoder. If your .3gp file cannot be decoded, try switching the input from "Auto" to "DirectShow".

## Can't control the hardware using Windows Remote Desktop

If you are logged on using Remote Desktop, you must be the first person logged in. To force this (logging out other users) run Mstsc in a Command window with the following -v and -console options (replacing the server.ip.address with your server ip address):

For XP Service Pack 3: `Mstsc -v:server.ip.address -admin`

For XP Service Pack 2 or older:

```
Mstsc -v:server.ip.address -console
```

## Vista Issues

Disable the Vista power saving mode. When Vista enters "power saving mode" (hibernation), the DRC Stream hardware is disabled, and when you return to the normal mode and attempt to use the DRC Stream hardware again, it cannot be re-enabled without rebooting the system.

Turn off the Vista UAC (user account control) before installing the Stream software (including drivers for the DRC Stream hardware). Keep the UAC off when using the Stream software.

After encoding an archive file, when you click on the Play button next to the Archive button to open the file, if the file would normally be played back in Windows Media Player the player will open, but the file will not be loaded. This same player behavior can be seen outside of Stream in Windows Explorer by right-clicking on a media file and selecting "Open with" and selecting the Windows Media Player: namely the player will open, but the file will not be loaded.

The Stream Software User's Guide cannot be opened from the main Stream Help menu. It can be opened from the Vista Start Menu shortcut.

# Encoding Performance

You will find that some codecs use more CPU and Buffer space than others.

If you are doing a live encode, keep an eye on the status bar at the bottom of your window. Once your CPU and Buffer space has reached 100% you will start dropping frames.

**NOTE:** Results **will vary** depending on the specific footage being encoded.

## Live Encoding with single Quad Core X3230 system

Codec Profile	Bit Rate (CBR)	Stream Type	Peak/Ave Buffer	Peak/Ave CPU
Dicas H.263 @ 176x144 + Dicas MPEG4 @ 240x180 + Dicas H.264 @ 320x240	140 kbps 200 kbps 300 kbps	RTP	0 / 0	25 / 16
Dicas H.264 @ 176x144 + Dicas H.264 @ 320x320 + Dicas H.264 @ 384x288	150 kbps 300 kbps 200 kbps	RTP	0 / 0	39 / 27
WM9 VC-1 @ 720x480p 29.97fps	2 Mbps	HTTP Push	11 / 5	31 / 16
MPEG2 TS @ 720x480p 29.97fps	5 Mbps	RTSP/RTP TS	3 / 2	56 / 12
H264 TS @ 720x480i 29.97fps CABAC IBBP-Frame	2 Mbps	RTSP/RTP TS	18 / 2	82 / 58
Flash8 On2 VP6 @ 640X480p 29.97fps	1.5 Mbps	RTMP Push	1 / 0	33 / 13

### Notes:

- Tests performed with Video Preview disabled in Stream.
- The Flash8 On2 VP6 codec can only use one of the 4 CPU cores in the system for encoding.

## Transcoding with single Quad Core X3230 system

Codec Profile	Bit Rate and Type	Encoding Frame Rate (fps)	Peak/Ave Buffer	Peak/Ave CPU
1 x WM9 VC1 @ 720X480 Progressive	2 Mbps CBR	48.3	0/0	50/35
<b>2x</b> VC1 @ 720x480p29	2Mbps CBR	45.9	0/0	80/58
1x MPEG2 @ 720x480p29	5Mbps CBR	50.1	0/0	85/35
<b>2x</b> MPEG2 @ 720x480p29	5Mbps CBR	41.6	0/0	99/61
1x H264 @ 720x480i29 CABAC IBBP-Frame	2Mbps CBR	31.6	4/0	83/68
1x H264 @ 720x480p29 CABAC IBBP-Frame	2Mbps CBR	39.2	4/0	86/70
1x H264 @ 720x480i29 Baseline IP-Frame	2Mbps CBR	38.6	4/0	78/66
1x H264 @ 720x480p29 Baseline IP-Frame	2Mbps CBR	38.0	4/0	80/67
1x On2 Flash8 @ 640X480p29	1.5Mbps CBR	51.6	0/0	46/32
<b>2x</b> On2 Flash8 @ 640X480p29	1.5Mbps CBR	48.3	1/0	78/65
1x On2 Flash8 @ 720X480p29	1.5Mbps VBR	52.1	1/0	42/31

### Notes:

- Tests performed with Video Preview disabled in Stream.
- Each instance of the Flash8 On2 VP6 codec can only use one of the 4 CPU cores in the system for encoding.



## Transcoding with dual dual-core CPUs: two of Intel Dual XEON 5160 3.0 GHz

<b>Profiles (For SD, all encoded from a 720x480 30 fps source) (For HD, source in matched output)</b>	<b>Encoding Rate (fps)</b>	<b>Average CPU Usage</b>
2 at 720x480, MPEG2 MP@ML, 30 fps, 6Mbps, CBR	72.0	50%
2 at 720x480, WM9, 30 fps, 1.5 Mbps, CBR	77.1	79%
4 of WM9, 720x480, 480x360, 320x240, 240x180	65.1	85%
4 at 320x240: WM9, MPEG2, Helix 10, QuickTime	38.6	70%
4 at 720x480: WM9, MPEG2, Helix 10, QuickTime	24.5	55%
1 at 1280x720, of MPEG2, MP@HL, 60 fps, 18Mbps	69.7	
1 at 1920x1080, of MPEG2, MP@HL, 30 fps, 18Mbps	30.2	
1 at 1280x720, of WM9, 24 fps, 6Mbps	34.3	
1 at 1920x1080, of WM9, 30 fps, 9Mbps	14.7	
1 of Digital Rapids AVC (Nero Digital), 720x480, 30fps		
1 of Flash 8 (On2), 720x480, 30fps		
1 of Flash 8 (On2), 480x360, 30fps		
1 of Ateme/Manzanita H.264 transport stream for STB		

## Live Encoding with dual Xeon 3.6 GHz CPUs (single-core) system

<b>Profiles (single codec used)</b>	<b>Average Buffer (Peak)</b>	<b>Average CPU (Peak)</b>
WM9 (720x480, 1500k CBR)	14 (16)	31 (49)
QuickTime, Codec: None (RGB) (640x480) (Depth: millions of colors)	12 (32)	17 (42)
Sorenson ACE MOV (720x480, 1250kbps VBR)	1 (16)	79 (95)
Sorenson ACE MPEG4 (536x402, 512kbps, VBR)	10 (63)	51 (59)
Sorenson ACE AVC H.264 (320x240, 800kbps, VBR)	0 (5)	51 (89)
Sorenson ACE SWF (560x420, 950kbps, VBR)	2 (24)	49 (67)
Sorenson ACE FLV (560x420, 1024kbps, VBR)	10 (50)	52 (60)
Helix 10 (720x480, 1500kbps VBR) (note: encoding complexity set to Low)	1 (3)	45 (69)
Helix 9 (720x480, 1500kbps VBR)	0 (2)	57 (91)

## Live Encoding with dual Xeon 3.6 GHz CPUs (single-core) system

<b>Profiles (multiple codecs used)</b>	<b>Average Buffer (Peak)</b>	<b>Average CPU (Peak)</b>
WM9 (720x480, 1500kbps CBR) WM9 (480x360, 750kbps CBR) WM9 (320x240, 512kbps CBR)	13 (19)	76 (100)
MPEG2 for DVD (720x480, 6000kbps VBR) WM9 (720x480, 1500kbps CBR) (Note: MPEG2 encoder quality set to 40)	19 (75)	70 (82)
Helix 10 (480x360, 768kbps CBR) Helix 10 (320x240, 512kbps CBR) (Note: encoder processes complexity set to medium)	0 (12)	81 (100)
WM9 (320x240, 512kbps CBR) Helix 10 (320x240, 512kbps CBR) Sorenson MOV (320x240, 512kbps VBR)	2 (4)	82 (99)



# The Stream SDK

If you are a developer, you may be interested in acquiring the Stream SDK. This is available only to qualified customers. To acquire the SDK please contact your regional Digital Rapids Technical Support or Sales. They will provide you with a Mutual Non-Disclosure Agreement form to fill in and return, and providing the terms are agreeable to both parties, the Stream SDK will be emailed to you.

The Stream SDK is available in 3 levels:

- The High-level SDK provides you with Web Service calls to control the Stream Server service and one or more instance of encoder.exe.
- The Mid-level SDK provides the mid-level C APIs and the creation of user generated xml files used to run Stream projects
- The Low-level SDK is not normally given out, except in special cases. It is used to access raw video and audio data from the DRC hardware, and is based on the Microsoft COM architecture.

Support for the Stream SDK is limited, and is not provided by the regular Digital Rapids Technical Support staff. Instead an SDK support contact will be provided when you are sent the Stream SDK.

## Using the Web Services API

The Web Services API provides you with one way to control the Stream Server service and one or more instance of the Digital Rapids encoder.exe.

1. When you installed Stream you also installed the DRC Stream Server as a service. There are two possible ways to prepare this service for remote control.
  - Launch the Stream Server application. From the Windows Start menu, choose Start > Programs > Digital Rapids > Stream > Stream Server. Or you can launch StreamServer.exe from C:\Program Files\Digital Rapids\Stream. This will open the Digital Rapids Stream Server application and place a blue Digital Rapids icon in your system tray.
  - Use the Windows Control Panel to access the local services (Control Panel > Administrative Tools > Services). Scroll down the list and look for the DRC Stream Server service. Double click on this service to open the Properties window. You can set the service to Automatic, and start the service if it is not currently started.

Use **only one** of these two methods to prepare the Stream Server service for remote control, to avoid conflicts.

The Web Service can be enabled using the Stream Server application. From the application's menu select Options > Preferences to access the settings. If you make changes you will need to close the Stream Server application, and then either restart the application or restart the service.

2. Launch at least one instance of the core encoding application, Stream Encoder Process. You can launch the Stream Encoder Process via the API using the launchEncoder command. Refer to the API documentation for more information about launching the Stream Encoder Process using the launchEncoder command.

To launch the Stream Encoder Process manually use Start > Programs > Digital Rapids > Stream Encoder Process or open a command prompt window and launch "encoder.exe -remote". (The encoder.exe app is found by default in C:\Program Files\Digital Rapids\Stream). If you have more than one DRC hardware device installed in your system, the Streaming Hardware Selection window will open and you will need to select the device you want to use.

Note that for a DRC-2000 or 2600 (a dual channel board) you will need to start two instances of the Stream Encoder Process to enable you to access both channels of the board.

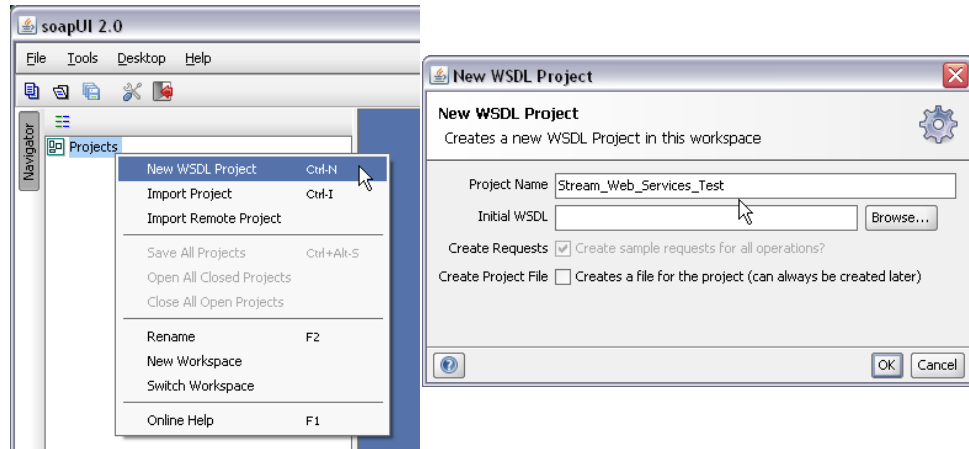
You will see an additional blue Digital Rapids icon in your system tray for each instance of the Stream Encoder Process.

3. If you will be running a post-encode process that requires the Batch Processor (such as the FTP function), then you will also have to launch the DRBatchServer.exe. This will add a gray Digital Rapids icon to your system tray.

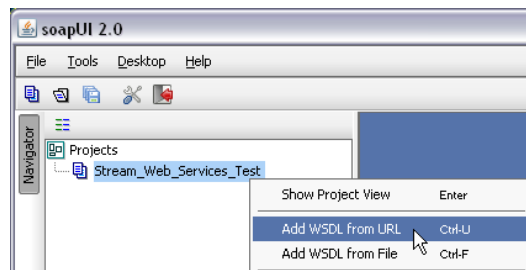


There are many available tools that can inspect and call methods on a Web Service. These tools can be used to quickly experiment with the API. One of these tools is SoapUI (www.soapui.org). The following instructions show you how to get started with SoapUI.

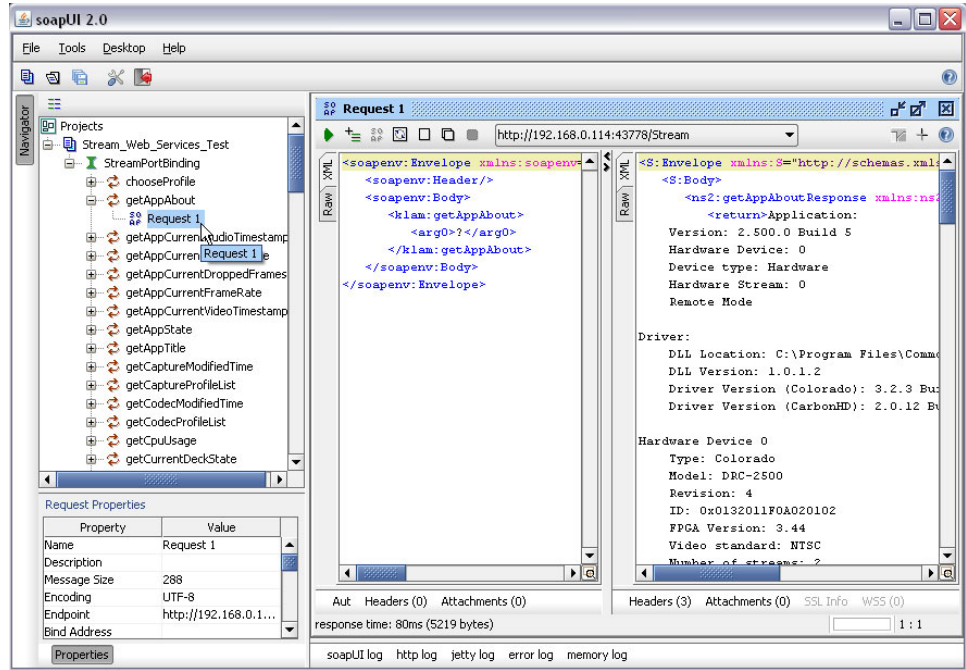
1. Launch SoapUI. Right click on “Projects” and choose “New WSDL Project”. Fill in a Project Name and click OK.



2. Right click on your newly added project, and select “Add WSDL from URL”. This will open a window that will allow you to enter the WSDL URL. By default, for Stream this is `http://<ipaddress>:port/Stream?wsdl`, where the ipaddress and port must be exactly what is entered in the Stream Server Preferences, for example, `http://192.168.0.144:43778/Stream?wsdl`. Note that if the Stream Server Preferences uses the numerical ip address, you cannot substitute localhost in the WSDL URL dialog in SoapUI.



When you click OK you will be asked if you want to “Create default request for all operations”. Select Yes. SoapUI will add the SOAP/http Binding for the Stream "StreamPortBinding" PortType to your project and create nodes for each operation.



4. Expand an operation node as you will see Request 1. Double click on Request 1 to open the Request Editor in the right hand pane of the SoapUI.

If the default request created by soapUI needs values to be supplied in the request, a “?” will be shown in the request editor. Replace/remove any values as required and click the button with the green arrow icon to submit the request. (This green arrow button is the one found above the Request Editor.)

The request will run in the background and its response will be displayed in the Response panel, found to the right of the Request Editor panel.

For more information, and sample code, please obtain the Stream SDK.

# Using GPI Triggers

GPI triggers are physical connections between two pieces of equipment. Typically GPI triggers are based on a change of state on a monitored pin of the serial port. For instance you could create a GPI trigger which was operated by the alarm closure of an alarm system, or a port on a piece of broadcast equipment.

Because of the variety of configurations possible, each GPI cable should be custom manufactured by someone who understands both pieces of equipment to be connected. If you are not comfortable reading electrical schematics, and building custom cables you should provide the included schematic to a qualified technical engineer. (See the end of this section for a GPI Schematic.)

## GPI Configuration

Stream supports GPI inputs which can be configured in a variety of ways. Both COM ports are supported and the state of the trigger pins can be configured to match most situations.

To configure your GPI input select the Trigger button from the lower right of the main interface. Click on the GPI tab. Create a new GPI profile by clicking on the New Profile button (at the end of the drop-down box). You will be asked to set your Com Port, GPI Switch (CTS or DSR) and the Trigger State (Closed or Open). You can then use the Save As button to save the GPI profile.

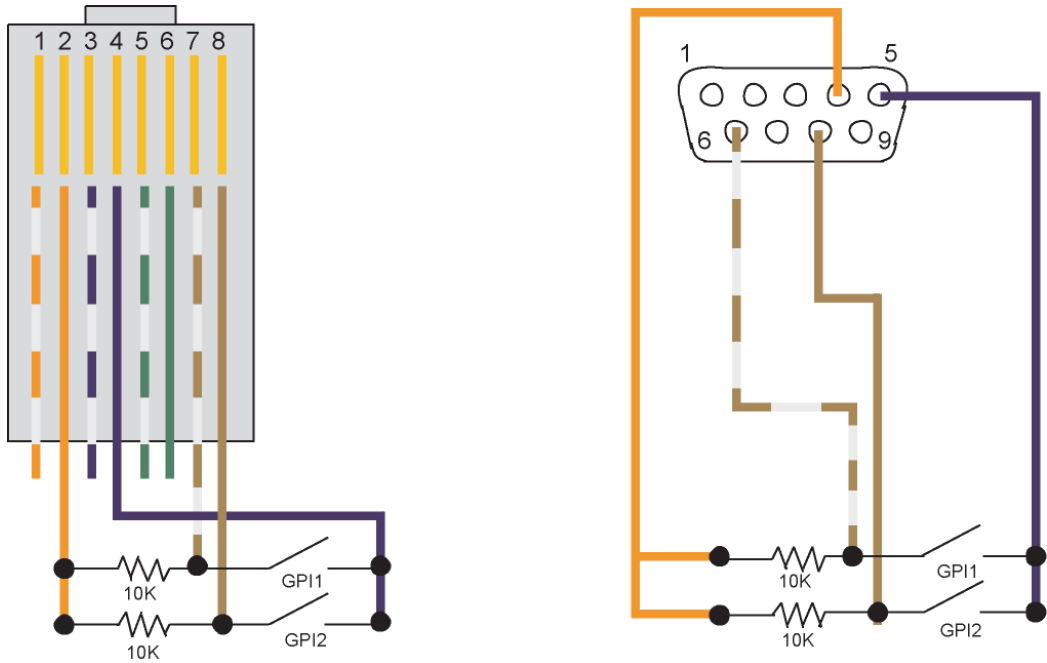
The GPI profile settings will be displayed under the drop-down box. Note that there are separate GPI settings for Starting and Stopping encoding. Set up both states. Choosing 'Okay' on the Trigger Settings window will arm the system for GPI triggering.

If you do not want to use GPI triggers return to the GPI tab and use the drop-down box to choose Disabled from the GPI profile list.

Once you have created GPI profiles you will be able to choose an existing GPI profile using the drop-down profile list. After you have selected an existing GPI profile choose OK to arm the GPI trigger.

## GPI Schematic

Note: GPI requires the installation of a 10k ohm resistor between DSR and DTR and between CTS and DTR. This can be installed in-line in the cable where it is convenient.



Signal Name	Signal Color	RJ45	DB9	Miranda Little Red LTC Reader
SIN	Green/White	6	2	N/C
SOut	White/Green	3	3	N/C
DTR	Orange/White	2	4	N/C
GRND	Blue/White	4	5	White/Violet
DSR	White/Brown	7	6	Violet
RTS	White/Orange	1	7	N/C
CTS	Brown/White	8	8	White/Orange
RIN	White/Blue	5	9	N/C

# Stream System Requirements

## **For System with Digital Rapids SD Hardware and Stream 3 Software (For HD systems please see the DRC Hardware Guide)**

**CPU:** minimum Pentium 4 Intel processor

Recommended CPU: Dual Intel processors at 3 GHz or higher; dual quad-cores recommended for systems for encoding AVC/H.264.

Note: The number of streams that you can encode in real time (and their resolution/bit rate) is dependant on the speed of your CPU.

**Memory:** minimum 512MB PC-133 SDRAM; Recommended 1GB or more

**PCI slot:** Recommended: 64 bit 66MHz PCI slot or faster

Digital Rapids boards will also work in 32 bit 33MHz PCI slots or PCI-X slots. If used in a PCI-X slot, the bus speed will fall back to 66MHz.

### **Hard Drive:**

For SD capture: 7200 RPM IDE hard drive (or faster / higher RPM drive)

**Graphics Display card:** VGA card supporting Direct Show with minimum: 128MB RAM, Recommended: 256MB RAM or higher; Minimum: 1024 x 768 resolution

**Operating System:** Recommended: Windows XP SP3 (or higher) or Windows Server 2003; Microsoft Vista is supported within the limitations listed in the Troubleshooting section. (Digital Rapids boards will also work on Microsoft Windows 2000 SP4, but Stream 3.0 is not officially supported on this OS.)

### **DirectX:**

DirectX 8.1 or higher is required. DirectX 9 or higher recommended.

Note: Windows XP includes DirectX 8.1.

(If you are using Windows 2000 with Digital Rapids hardware you MUST install DirectX 9 or higher BEFORE you install the Digital Rapids hardware. It is on the Digital Rapids CD or you can download it from Microsoft.)

**QuickTime:** If you would like to make QuickTime files using Stream 2.3 or higher you must install QuickTime 7. Note that Stream 2.3 or higher is **not** compatible with QuickTime 6.

**Please see [www.digital-rapids.com](http://www.digital-rapids.com) for the latest system information.**



# Contact Information

## North and South America

Digital Rapids Corporation  
90 Allstate Parkway, Suite 700  
Markham, Ontario L3R 6H3  
Canada

905-946-9666 voice  
416-352-0716 fax

Sales: sales.na@digital-rapids.com; 905-946-9666 x 212 (North America)  
sales.la@digital-rapids.com; +54-11-4700-0051 (Latin America)

Technical Support: support.na@digital-rapids.com; 905-944-3513 (direct dial)  
or using the main line: 905-946-9666 x 113

General and OEM: info@digital-rapids.com

## Europe, Africa, Middle East

Digital Rapids Corporation Ltd.  
Passfield Business Centre  
Lynchborough Road  
Passfield, Hampshire  
GU30 7SB  
UK

+44-1428-751012 voice  
+44-1428-751013 fax

Sales: sales.eu@digital-rapids.com; +44-1428-751012

Technical Support: support.eu@digital-rapids.com; +44-1428-751012

## Asia Pacific

Digital Rapids Asia Ltd. (China)  
45/F, The Lee Gardens  
33 Hysan Avenue, Causeway Bay  
Hong Kong  
China

+852-3180-2382 voice  
+852-3180-2383 fax

Sales: sales.cn@digital-rapids.com; +852-3180-2382 (China)  
sales.ap@digital-rapids.com; +61-2-9546-1300 (Australia)  
sales.in@digital-rapids.com; +91 124 4354107 (India)

Technical Support:  
support.cn@digital-rapids.com; +852-3180-2382 (China)



# Index

- 3GPP 8
- 601/709 Color Space Conversion 38
- A**
  - AAC audio 14
  - AC3 file 3
  - AES Audio 13
  - AIFF Audio 13
  - ALE files 34
  - Archive file 49
  - ASF Muxer 16, 18
  - Aspect Ratio 4
  - Aspect Ratio (HD) 27
  - Ateme 8
  - Audio (HD board) 27
  - Audio during encoding 48
  - Audio Process 34
  - Audio Source selection 27
  - Audio, multichannel 22
  - AVC/H.264 8
  - AVI Uncompressed 9
  - Avid DNxHD 8
- B**
  - Batch Mode 5
  - Bit/Data Format 26
  - Black and White Plugin 39
  - Black Border 28
  - Border Plugin 39
  - Broadcast 50
  - Broadcast WAV 14
- C**
  - Clip List 24
  - Closed Captioning 14
  - CMX 3600 Files 34
  - Codec Profiles 2
  - Color Space Converter Plugin Settings 39
  - Command 51
  - Concurrent Mode 5
  - Contact Information 87
  - Cropping 45
  - Cropping Plugin Settings 39
- D**
  - Darwin Media Server 50
  - Date and Time Overlay 43
  - Deck Control 31
  - Decrypt 59
  - Deinterlace Plugin 39
  - Deinterlacing 45
  - Dicas 8
  - Digital Rapids AVC for Web 8
  - Digital Rapids Streaming for iPhone 9
  - Digital Rapids Studio AVC 9
  - DNxHD 8
  - Dolby Digital 13
  - Dolby Digital Plus 13
  - Dolby Pulse AAC 14
  - DPS Files 21
  - DRC Video 9
  - DRM, WM9 51
  - Duration trigger 61
  - DVD Output 54
  - Dynamic Range Comp/Exp 35
- E**
  - Elementary Stream File Processor 16
  - E-mail 58
  - Encrypt 58
  - EQ 35
- F**
  - Field Dominance Converter Plugin 40
  - Filtering 46
  - Fix Aspect Ratio 4
  - Flash 8 8
  - Flash AVC 8
  - FLEx Files 34
  - Format conversion (HD) 26
- G**
  - Gamma controls 40, 46
  - Gamma Plugin 40
  - Generate Output filenames 6
  - Google Fingerprinting 44
  - GPI trigger 60
  - GPI Triggers 83

- Graphics Overlay 48
- Graphics Overlay Plugin Settings 40
- Group Codec 15
- GXF source import 22
- GXF Wrapper 17
- H** Helix 10 DRM 49
- Horizontal/Vertical filtering 45
- I** Image Sequence 10
- Image Sequence File Source 23
- In point 22
- Input 18
- Inverse Telecine Plugin 41
- iPhone codec 9
- J** JPEG2000 10
- K** Kakadu JPEG2000 10
- Keyframing Plugins 37
- Keystroke trigger 60
- L** Live Source 25
- Live streaming 50
- Logger 34
- LTC trigger 60
- LXF Wrapper 17
- M** Manzanita TS Muxer 17
- Media File 21
- Microsoft Smooth Streaming 10
- Microsoft Smooth Streaming Container 19
- Microsoft VC-1 10
- Microsoft Windows Media 10
- MP3 14
- MPEG (MainConcept) 11
- MPEG Muxer 53
- MPEG-4 Muxer 18
- Multichannel Audio 3, 22
- Mute audio 34
- MXF source import 22
- MXF Wrapper 18
- N** Native RTP 18
- Nero AAC 14
- Nero Digital 12, 14
- Network Transcoding 6
- NexGaurd Watermarking 44
- Noise Reduction 46
- Noise reduction 45
- NTSC or PAL 25
- O** Omneon File 55
- Output 48
- Output Filename 6
- P** PAL or NTSC 25
- Pause/Resume encoding 60
- Persistent Streaming 25
- Persistent Watch Folder 24
- PlayReady DRM 51
- Plugins 36
- Proc-Amp 46
- Proc-amp 45
- Processing Amplifier 45
- Processing Amplifier (Proc-Amp) 46
- Progressive Download 49
- Project Command 53
- Publish 53
- Q** Queued Mode 5
- QuickTime 12
- R** Real Helix 13
- Real Time Encoding 75
- Rollover Mode 49
- Rotate Image Plugin 43
- RTP processor 18
- S** SAMI 14
- Scaler Plugin Settings 43
- SCC 14
- Single Stream Mode 31
- Smooth Streaming 10
- Smooth Streaming Container 19
- Software Plugins 36
- Sorenson ACE 13
- Source Profile 26
- Source Profile for HD Boards 26
- Spatial Noise Reduction 47
- SRT 14
- Statistics Tab 60
- System Requirements 85

- T** Tags 49
  - Teletrax Watermarking 44
  - Telnet 79
  - Temporal Noise Reduction 46
  - Thomson MP3 14
  - Timecode 28
  - Timecode Overlay Plugin 43
  - Transcoding 21
  - Triggers 60
  - Trimming 22
  
- U** Uncompressed AVI 9
  - Uncompressed QuickTime 12
  - Underscan 45
  - Upres Mode 31
  
- V** VBI Capture 29
  - VC-1 10
  - VC-3 8
  - Video Input 25
  - Video Overlay Plugin Settings 43
  - Video Preview (Clips) 21
  - Video Proc Amp Plugin 44
  - Video Process 45
  - VU Meters 34
  
- W** Watch Folder 23
  - Watermarking, NexGaurd 44
  - Watermarking, Teletrax 44
  - WAV 14
  - Windows Media 10
  - Windows Media DRM 51