

DoStudio Encoder Edition

Version 2.3

NetBlender Press

DoStudio Encoder Edition 2.3
By The NetBlender Press Team

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DoStudio Encoder Edition

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Table of Contents

PART I: Introduction	1
How the DSE 2D/3D licensing works	1
What the DoStudio Encoder Does:	2
What the DoStudio Encoder Does Not Do:	2
PART II: Important Blu-ray Spec information.....	3
SECTION 1: Primary Video streams for Standard (2D) Blu-ray Disc.....	4
Valid Video Sizes and Frame Rates for Primary Video	4
DoStudio Encoder Video Sizes and Frame Rates for Primary Video	4
SECTION 2: Secondary Video Streams for Standard (2D) Blu-ray Disc	5
Secondary Video frame sizes and frame rates supported by the DoStudio Encoder..	7
SECTION 3: MVC Encoding for Blu-ray 3D	8
Valid Frame Resolutions and Frame Rates for BD3D Video.....	8
Overview of the MVC Format.....	8
Source Files and the encoding process	8
Part III: Preparing your video for import into DSE.....	10
QuickTime Codecs Supported by DSE:	10
SECTION 1: Exporting your QT files from Final Cut Pro for DSE	10
8-bit/10-bit Uncompressed.....	10
Apple Prores422 / Prores422 HQ	11
XDCAM HD	11
DNxHD	11
SECTION 2: Preparing your Windows environment for QuickTime Playback.....	12
SECTION 3: Exporting Chapter Markers from Final Cut Pro	13
Creating Chapter Markers in Final Cut Pro	13
Exporting your Chapter Markers Using FCP XML Interchange Format	13
PART IV: Using the DoStudio Encoder.....	14
The DoStudio Encoder Interface	15
Start a new project	16
Setting the Output Folder and Notification settings	16
Adding Source video files.....	17
Adding 2D Source Video files.....	18
Adding a Source Video file for Secondary Video	20
Adding 3D Source Video files.....	21
Adding Chapter Markers to your video	23
Importing Chapters from your Final Cut Pro timeline.....	24
Encoding Templates.....	25
Primary Video Templates	25
Secondary Video Templates	25
Apply an Encoding Template	26
Encoding Parameters	27
Encoding Mode.....	27
Number of Passes.....	27
Target Bit Rate	27
Max Bit Rate	27

Bit Rate Considerations for Blu-ray Disc	28
Bit rate Considerations for Blu-ray 3D	28
Custom Templates	28
Submitting your encoding Project to the Batch	29
Encoding Status Window.....	30
Batch encoding multiple projects simultaneously	31
Exporting LPCM Audio from your QuickTime File	32
Using the DoStudio QuickTime Converter.....	33
Part V: Troubleshooting.....	35
Understanding the Encode Specific Log files.....	35
Trouble Shooting Steps.....	36
If the encode fails instantly	36
If the encode fails after more than 1% is completed	37
The first encode works but the second one fails	37
The video does not look ok	37
Click on the Batch Encode does nothing	37

PART I: Introduction

The DoStudio Encoder (DSE) is a high-quality, easy-to-use solution for encoding MPEG-4 AVC encoder for Blu-ray and MPEG-4 MVC files for Blu-ray 3D (BD3D).

DSE is verified for use with the following formats:

- QuickTime files in the following codecs :
 - ProRes422, Prores422 HQ
 - DNxHD
 - Uncompressed 10-bit (AJA, Blackmagic)
 - Uncompressed 8-bit (AJA)
 - XDCAM HD
- Uncompressed AVI
- YUV (UYVY colorspace)

The DoStudio Encoder is a single, stand-alone application that can be installed on any PC workstation, or Intel-based Mac running Windows in Bootcamp. DSE is compatible with Windows XP, Vista, and Windows 7. It is compatible with 32-bit and 64-bit operating systems.

How the DSE 2D/3D licensing works

When you purchase the basic AVC encoding license for DSE, you will only be able to add 2D segments to your batch list. 2D segments accept a single input file and output a single AVC file.

When you purchase the MVC encoding license for DSE, you will have the option to add either a 2D or a 3D segment to your batch list. 3D segments accept two input streams (one for the left eye and one for the right eye).

What the DoStudio Encoder Does:

- It transcodes input files into Blu-ray compliant MVC files for Blu-ray 3D
- It transcodes input files into Blu-ray compliant AVC files for Blu-ray
- It displays your source QuickTime file in the Encoder interface and lets you add chapter marks visually
- It allows you to add multiple source files and batch encode them
- It is a 2-pass encoder

What the DoStudio Encoder Does Not Do:

- It does not convert frame rates and frame sizes – your source files must be in a valid Blu-ray frame size and frame rate
- It does not concatenate multiple source video files into a single elementary stream
- It does not allow segment re-encoding
- It does not include filtering or other image enhancements during the encoding process

PART II: Important Blu-ray Spec information

This section provides important technical details about valid frame sizes, frame rates, and codecs for Blu-ray and Blu-ray 3D. Most importantly, it describes the valid combinations of these various elements.

SECTION 1: Primary Video streams for Standard (2D) Blu-ray Disc

Valid Video Sizes and Frame Rates for Primary Video

If you are making the transition from DVD authoring to Blu-ray authoring, you will find that Blu-ray offers quite a few new frame sizes and frame rates.

Whereas DVD only had two possible video formats: NTSC (720x480 29.97i) or PAL (720x576 50i), the Blu-ray Disc specification includes the following frame sizes and frame rates for primary video streams:

1920x1080	29.97i, 25i, 23.98p, 24p
1440x1080	29.97i, 25i, 23.98p, 24p
1280x720	59.94p, 50p, 23.98p, 24p
720x480	29.97i (4x3 and 16x9)
720x576	25i (4x3 and 16x9)

DoStudio Encoder Video Sizes and Frame Rates for Primary Video

The DoStudio Encoder accepts all valid Blu-ray sizes and frame rates for Primary video except for the 1440x1080 frame size. This frame size is not widely used in professional production.

The following chart describes the frame sizes and resolutions that are supported by DSE:

Horizontal size of frame [pixels]	Vertical size of frame [pixels]	frame rate [Hz]	Progressive/Interlace	Aspect Ratio
1920	1080	29.97	interlace	16:9
		25	interlace	
		23.976	progressive	
		24	progressive	
1280	720	59.94	progressive	16:9
		50	progressive	
		23.976	progressive	
		24	progressive	
720	480	29.97	interlace	4:3 or 16:9
720	576	25	interlace	4:3 or 16:9

SECTION 2: Secondary Video Streams for Standard (2D) Blu-ray Disc

Secondary video streams are used for the Picture-in-Picture feature of Blu-ray Disc. The Secondary video track runs in sync with the primary video track and can be viewed in a picture-in-picture window. The visibility of the secondary video track can be controlled by the viewer with their remote control or menu option, or the Blu-ray author can program the disc to make the secondary video track visible at specific times.

The DoStudio Encoder creates MPEG-4 AVC elementary streams for both primary and secondary video. The Blu-ray Spec allows the following combination of codecs for Primary and Secondary video:

Primary video Streams	Secondary Video Streams		
	MPEG-2	MPEG-4 AVC	VC-1
MPEG-2	allowed	allowed	allowed
MPEG-4 AVC	prohibited	allowed	prohibited
VC-1	prohibited	prohibited	allowed

There are some important bit-rate considerations that the Blu-ray author must know when making a disc with Secondary video for Picture-in-Picture features.

1. The Blu-ray spec defines the total video bit-rate value of Primary video and Secondary video streams (including subtitles) must be less than or equal to 40 Mbps. In practice, it is best to keep your overall bit rate under 38 Mbps due to playback inconsistencies among Blu-ray players.

2. The maximum video bit-rate for Secondary video streams must be less than or equal to 7.6 Mb/s.

DSE provides Templates for Primary and Secondary video that help you manage the bit-rate of your encoded video so that it stays within the legal limits of Blu-ray.

The next two tables describe the valid combinations of Video Frame Sizes and Frame rates for Blu-ray as defined by the Blu-ray specification.

Figure 1

Primary video streams				Secondary video streams					
Horizontal size of frame [pixels]	Vertical size of frame [pixels]	frame rate [Hz]	Progressive/Interlace	Horizontal size of frame [pixels]	Vertical size of frame [pixels]	frame rate [Hz]	Progressive/Interlace		
1920 or 1440	1080	29.97	interlace	720	480	29.97	Interlace		
				1920	1080				
				1440	1080				
		25	interlace	25	interlace	720	576	25	interlace
						1920	1080		
						1440	1080		
		23.976	progressive	23.976	progressive	720	480	23.976	progressive
						1920	1080		
						1440	1080		
		24	progressive	24	progressive	720	480	24	progressive
						1920	1080		
						1440	1080		
1280	720	59.94	progressive	720	480	29.97	progressive		
				1280	720	59.94			
		50	progressive	50	progressive	720	576	25	progressive
						1280	720	50	
		23.976	progressive	23.976	progressive	720	480	23.976	progressive
						1280	720		
		24	progressive	24	progressive	720	480	24	progressive
						1280	720		
720	480	29.97	interlace	720	480	29.97	interlace		
720	576	25	interlace	720	576	25	interlace		

Figure 2

Primary video streams			Secondary video streams		
Horizontal size of frame [pixels]	Vertical size of frame [pixels]	Display aspect ratio	Horizontal size of frame [pixels]	Vertical size of frame [pixels]	Display aspect ratio
1920 or 1440	1080	16:9	720	480	16:9 or 4:3
			720	576	16:9 or 4:3
			1920	1080	16:9
			1440	1080	16:9
1280	720	16:9	720	480	16:9 or 4:3
			720	576	16:9 or 4:3
			1280	720	16:9
720	480	4:3	720	480	4:3
		16:9	720	480	16:9
720	576	4:3	720	576	4:3
		16:9	720	576	16:9

As you can see on the previous page, the Blu-ray specification allows you to create secondary video in all of the standard and high definition frame rates and sizes. *Unfortunately, most Blu-ray players CAN NOT playback a secondary video stream that contains high definition video.* Consequently, NetBlender does not recommend using HD video in your secondary video tracks.

Secondary Video frame sizes and frame rates supported by the DoStudio Encoder

The DoStudio encoder only supports standard definition video frame sizes for Secondary Video streams according to the following table:

Horizontal size of frame [pixels]	Vertical size of frame [pixels]	framerate [Hz]	Progressive/Interlace	Aspect Ratio
720	480	29.97	interlace	4:3 or 16:9
720	576	25	interlace	4:3 or 16:9

The following table defines the complete spectrum of combinations of Primary and Secondary video streams supported by DSE:

Figure 1

Primary video streams				Secondary video streams			
Horizontal size of frame [pixels]	Vertical size of frame [pixels]	framerate [Hz]	Progressive/Interlace	Horizontal size of frame [pixels]	Vertical size of frame [pixels]	framerate [Hz]	Progressive /Interlace
1920	1080	29.97	interlace	720	480	29.97	Interlace
		25	interlace	720	576	25	interlace
		23.976	progressive	720	480	23.976	progressive
		24	progressive	720	480	24	progressive
1280	720	59.94	progressive	720	480	29.97	progressive
		50	progressive	720	576	25	progressive
		23.976	progressive	720	480	23.976	progressive
		24	progressive	720	480	24	progressive
720	480	29.97	interlace	720	480	29.97	interlace
720	576	25	interlace	720	576	25	interlace

SECTION 3: MVC Encoding for Blu-ray 3D

Valid Frame Resolutions and Frame Rates for BD3D Video

The Blu-ray Specification allows a limited combination of frame resolutions and frame rates for use with Blu-ray 3D. The following are the only valid frame resolutions and frame rates for BD3D:

- 1920×1080 @ 23.978 fps progressive
- 1280×720 @ 59.94 fps progressive
- 1280×720 @ 50 fps progressive

Overview of the MVC Format

MVC stands for Multiview Video Coding. It is an amendment to the H.264/MPEG-4 AVC video compression standard developed with joint efforts by MPEG/VCEG that enables efficient encoding of sequences captured simultaneously from multiple cameras using a single video stream.

In layman's terms, the MVC format includes a full-frame 2D AVC stream, called the Base View, and a secondary offset file called the Dependent View. The Base view MVC stream is backwards compatible with H.264/AVC, which allows standard 2D Blu-ray players and software to decode stereoscopic video streams. They play the Base View and simply ignore the additional information contained in the Dependent View. The MVC format is highly efficient and the Dependent View only adds about 50% extra bit rate to the overall stream.

It is important to note that the Base and Dependent views do not directly correlate to Left Eye / Right eye streams. While the Base view contains the entire full resolution Left Eye HD stream (and in theory can be viewed on its own), the Dependent view does not contain video information to function as a viewable stream unless paired with the base view. The Dependent view contains offset data that relies on the video stream information contained in the Base view.

Source Files and the encoding process

3D encoding requires two HD source files, one for each "eye". Each source file must be a full-frame HD stream in one of the three valid resolutions for Blu-ray 3D (see above).

The encoder interface requires you to select the appropriate stream for each eye. You make bit rate selections and start the encoding process. Since MVC encoding is really an extension of AVC encoding for Blu-ray, the encoding process is essentially the same - apart from the need for two input video streams.

The output of the encoding process is a little different. The DoStudio MVC encoder outputs two files. It outputs the base view as a single file ("my3dfilm_base.mvc") and the dependent view as a single file ("my3dfilm_dependent.mvc"). You will add both files to the authoring system.

DSE also gives you the option to export a single interleaved MVC file. This file can be played back in Arcsoft's TotalMedia Theatre for proofing the quality of the encode prior to authoring your BD3D. There are also mobile and broadcast applications that use the single interleaved MVC file.

3D sequences

DSE also provides you with the number of 3D sequences you are using. If you are going to encoding your footage for replication set this number to 32. This should be default value for all new projects. If you know your 3D Authoring program can use specify a number then use that number. DoStudio Authoring Edition does not specify a number so it is best to use 32 if you are using DoStudio authoring Edition. Contact your authoring tool for more information what number should be used.

Part III: Preparing your video for import into DSE

In order to successfully encode your video for Blu-ray, your source video must be exported as a QuickTime, Uncompressed AVI or YUV file that is in one of the spec-supported frame sizes and frame rates described in the previous section. DSE will not convert an invalid frame size or frame rate into a valid one during the encoding process.

If you are using QuickTime, your file must be exported in one of the following codecs for input into the DoStudio Encoder.

QuickTime Codecs Supported by DSE:

- AJA 8-bit / 10-bit uncompressed
- Blackmagic 10-bit uncompressed
- Apple ProRes / ProRes HQ
- XDCam HD
- DNxHD

SECTION 1: Exporting your QT files from Final Cut Pro for DSE

The following sections describe the process for exporting your source video files from Final Cut Pro. They are listed by the codec type.

8-bit/10-bit Uncompressed

The uncompressed formats are native to your Final Cut setup depending on which I/O hardware you have installed. If you have a Kona card or other AJA I/O device, you will see the AJA 8-bit and 10-bit uncompressed settings in your Easy Setup. Likewise, you will find Blackmagic versions of these formats if your system has hardware from Blackmagic Design.

In order to export a file in these formats, it is recommended that you setup your sequence in the 8-bit or 10-bit format of your choosing and edit your video in this sequence. If you have edited your sequence using a different setting, simply copy and paste the elements of the sequence into the new 8-bit or 10-bit uncompressed sequence. Make sure that the video is still appearing as it should (check especially for any issue with the scaling of the image) and render the sequence if necessary.

To export the file, select Export Movie from the file menu and select Current Settings (these will be the uncompressed settings you setup in the Easy Setup). Choose a file name and location for your exported file and click "OK." The time it takes to export the file will vary depending on the size of the file.

Apple ProRes422 / ProRes422 HQ

The ProRes Codec is native to Final Cut Pro and is supported by the QuickTime player on the Mac OS and Windows XP/Vista.

As with the uncompressed formats, it is recommended that you setup your sequence in the ProRes format of your choice and edit your video in that sequence. To export the file, select Export Movie from the file menu and select Current Settings (these will be the ProRes settings you setup in the Easy Setup). Choose a file name and location for your exported file and click “OK.”

XDCAM HD

XDCAM HD is a codec from Sony that is installed with Final Cut Pro. It is a variable bit rate video format that is used by Sony’s XDCAM line of professional cameras and VTRs. The current generation XDCAM HD uses the 4:2:2 profile of the MPEG-2 codec, which has double the chroma-resolution of the previous generations. To accommodate the chroma-detail, the maximum video-bitrate has been increased to 50 Mbit/s.

As with the uncompressed and Prores formats, it is recommended that you setup your sequence in the XDCam HD format and edit your video in that sequence. To export the file, select Export Movie from the file menu and select Current Settings (these will be the XDCam settings you setup in the Easy Setup). Choose a file name and location for your exported file and click “OK”.

DNxHD

DNxHD is a codec provided by Avid Technologies that includes a high quality/small file size algorithm that is similar in quality and performance to Apple Prores. This codec is native to Avid editing applications but is not native to Final Cut. However, Avid provides the codec for installation on a Mac free of charge. The codec can be downloaded here: http://avidtechnology.custhelp.com/cgi-bin/avidtechnology.cfg/php/enduser/std_adp.php?p_faqid=71356

Since DNxHD is not native to Final Cut, you must export your files using QuickTime Conversion in order to export a file using the DNxHD codec. It is recommended that you setup your sequence in either the 10-bit uncompressed format, or the Apple ProRes or ProRes HQ format and edit your video in that sequence. When your video is ready for exporting, select Export Move>Using QuickTime Conversion from the File menu. Select DNxHD from the format selection list.

SECTION 2: Preparing your Windows environment for QuickTime Playback

In order to import QuickTime files from Final Cut Pro into the DoStudio Encoder, you must be able to play the QuickTime files on your Windows workstation using QuickTime. Depending on which codec you used, you may need to download and install the codec prior to attempting to import the QuickTime file into the DoStudio Encoder.

The following list describes where you can find the necessary codecs:

AJA 8-bit / 10-bit Uncompressed	http://www.aja.com/products/software/
Blackmagic 10-bit / Uncompressed	Install the AJA software above
Apple Prores / Prores HQ	Included with your QuickTime installation.
DNxHD	http://avidtechnology.custhelp.com/cgi-bin/avidtechnology.cfg/php/enduser/std_adp.php?p_faqid=71356
XDCam HD	www.calibratedsoftware.com - \$79 decoder for windows



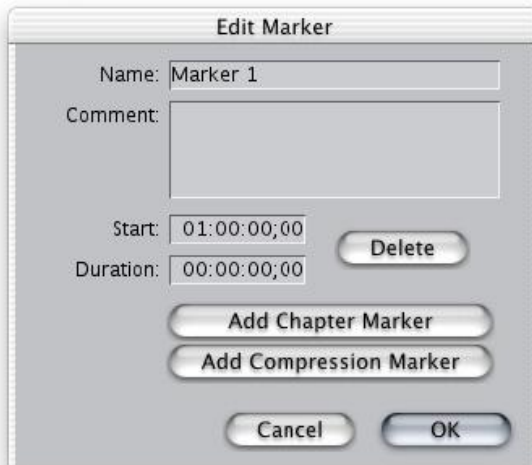
Remember, if you can't play your source QuickTime file in the QuickTime player on your Windows workstation, it will not import successfully into the DoStudio Encoder. It is very important that you setup your Windows environment to playback the QuickTime source files prior to attempting to encode your video.

SECTION 3: Exporting Chapter Markers from Final Cut Pro

You can mark your chapter points in your Final Cut Pro timeline and export them using Apple's Final Cut pro XML. DSE can import the chapter markers and force an I-frame to be created at the location of the chapters.

Creating Chapter Markers in Final Cut Pro

Place the play head in your timeline at the location where you would like to create a chapter. Press "M" to add a marker. Press "M" again to display the Edit Marker dialog box:



Click the Add Chapter marker button and click OK. Do this wherever you want to create a chapter.

Exporting your Chapter Markers Using FCP XML Interchange Format

The DoStudio Encoder uses the Apple XML Interchange file that you can export from Final Cut Pro to import your chapter markers. To export the file, select the sequence that contains your video and your chapter markers, then select File > Export > XML.



Use the default settings as seen in the screenshot above.

The section [“Importing Chapters from your Final Cut Pro Timeline”](#) describes how to import the XML file into the DoStudio Encoder.

PART IV: Using the DoStudio Encoder

This section describes the basic operation of the DoStudio encoder:

The DSE Interface

Starting a new project

Adding a source video file

Adding Chapter Markers

Encoding templates

Submitting your project to the batch

Exporting LPCM Audio from your source QuickTime File

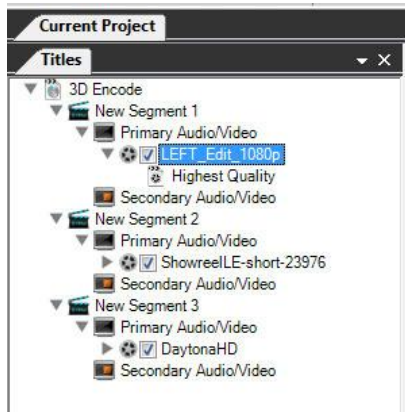
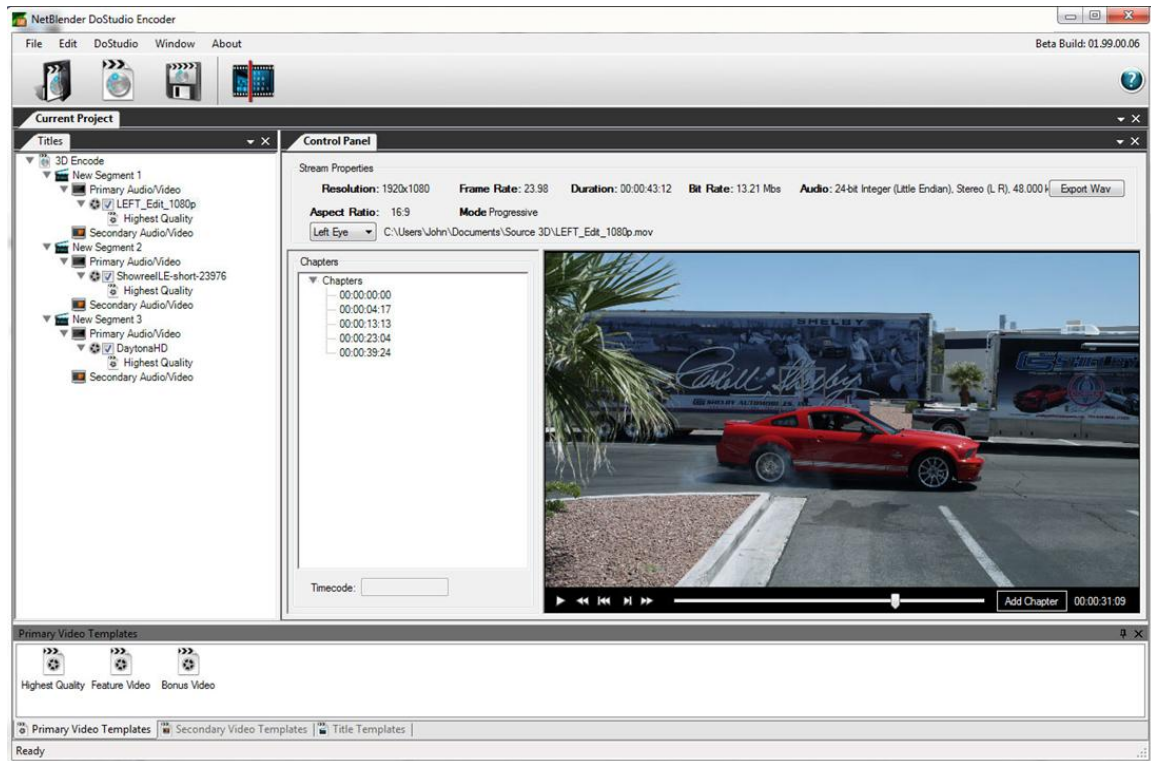
Using the DoStudio QuickTime Converter

The DoStudio Encoder Interface

The DoStudio encoder is project-based. To add source video for encoding, you create encoding segments, apply a template to your segments, then submit the entire project to the batch encoder.

The DoStudio Encoder allows you to play back your source Quicktime file in the Control Panel and mark chapter points if desired.

Templates are applied via drag-and-drop. Once applied, you can adjust the parameters for each individual encoding segment.



By default, your project includes one Encoding Segment with nodes for Primary and Secondary Video. If your encoding project includes multiple source videos, you will add additional Encoding Segments to your tree and select source videos for each title.

Start a new project

To begin, create a new project or open an existing project. Your project file is called *yourprojectname.dsEp*. You may save your project file in any convenient location on your workstation EXCEPT FOR YOUR WORKSTATION'S DESKTOP.

Setting the Output Folder and Notification settings

When you start a new project, by default you see the project output folder and notification settings in the control panel. (You can click the project name at the top of the Title list to display these settings at any time).

The screenshot shows the 'Control Panel' interface with three main sections:

- Project Settings:**
 - Location: C:\Users\John\Documents\DoStudio Projects\3D Encode.dsEp
 - Output Folder: C:\Users\John\Documents\DoStudio Projects
- Email Notification Settings:**
 - Email: sales@netblender.com
 - User Name: sales
 - Password: [Redacted]
 - SMTP Server: netblender.com
 - SMTP Port: 110
 - Use SSL?
 - Errors: [On]
 - Encoding Stream Begins: [On]
 - Encoding Stream Ends: [On]
 - Send Status Update Every: [Off] Minutes
- Twitter Settings:**
 - User Name: NetBlender
 - Password: [Redacted]
 - Errors: [On]
 - Encoding Stream Begins: [On]
 - Encoding Stream Ends: [On]
 - Send Status Update Every: [30] Minutes

A dropdown menu is open for the 'Send Status Update Every' field in the Twitter Settings section, showing options: Off, 15, 30, 45, 60, 90, 120. The '30' option is currently selected.

Project Settings

You can set the output folder to any local or network accessible folder. This is where your encoded video files will be created.

Notification Settings

The DoStudio Encoder offers two methods of setting up status notifications during an encode: Email and Twitter. Enter your account settings for either or both of these notification options in the control panel. Your account settings will be saved on your workstation so they will appear when you start a new project. The settings are not saved in your project file so you can share your encoding project without sharing your private email and Twitter settings.

You can setup which notifications to receive by using the combo boxes. You can choose to receive a notification when an error occurs, when the encoding starts and ends and you can receive a status update at a regular interval.

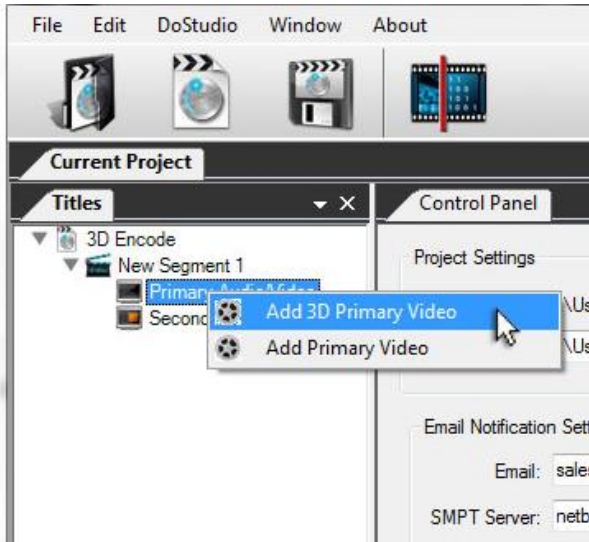
Adding Source video files

Each Encoding Segment in your Segments window contains a node for Primary Audio/Video and Secondary Audio/Video. You will add your source video file to the node that corresponds to the type of video you are encoding. In most cases your video will be a Primary Video stream. You will only use the Secondary video stream if you are planning to use the Picture-in-Picture capabilities of standard (2D) Blu-ray.

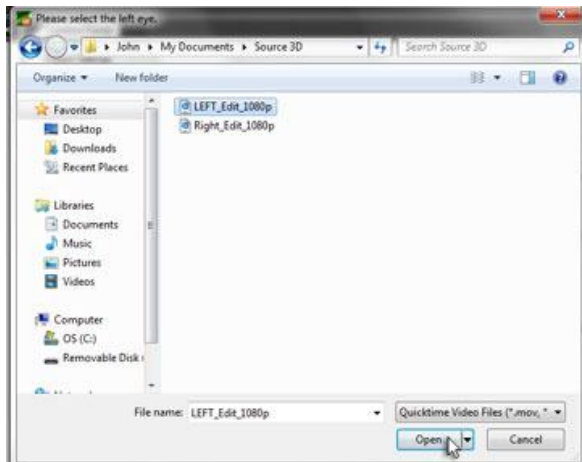
For 3D encoding, you will always create a Primary Video stream. There is no Secondary (PiP) stream in 3D.

You can add 2D and 3D segments to the same encoding project and batch encode them at the same time. It is not necessary to split your 2D and 3D encoding into separate projects.

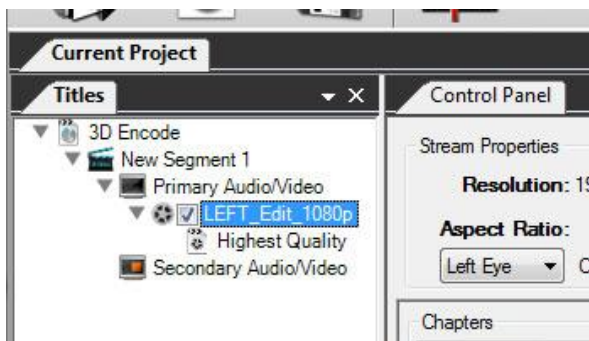
Adding 2D Source Video files



Right-click on the Primary Audio/Video node to display the context menu. Select “Add Primary Video”



You are prompted to select a source video stream. Navigate to your source video file and select it.



You will now see your 2D source video file listed in the Segment tree under the Primary Audio/Video node.

The Highest Quality template is applied to your segment by default.

To add additional source video files to your project, you need to add additional Encoding Segments to your Segment tree.

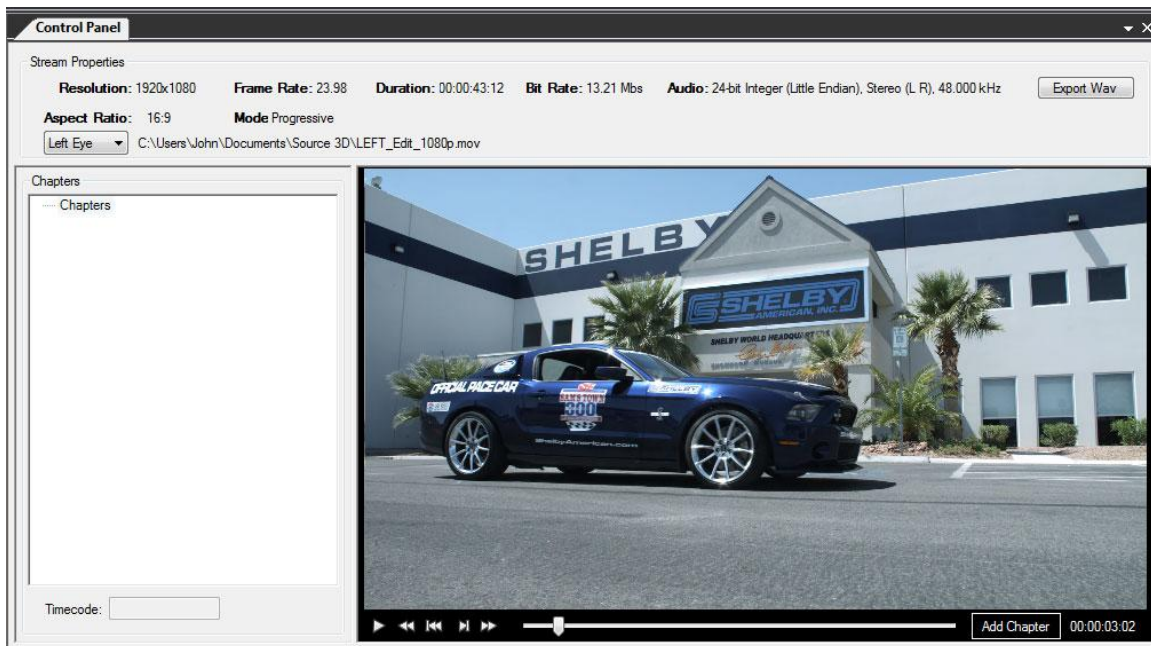



To do this, right-click on the name of your project at the top of the Segment window (in the screenshot to the left, the name of the project is “3D Encode” and select “Add a Segment” from the context menu.

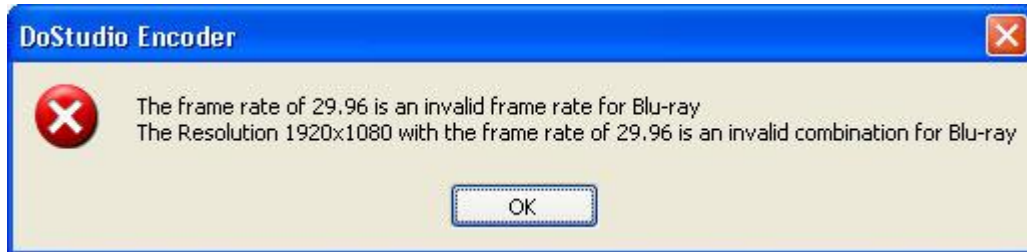
You can add as many Segments as your project requires. Keep in mind that you can add both 2D and 3D segments to the same encoding project.

The checkbox indicates that you would like to encode this video when you submit the batch for encoding. You can uncheck the box to exclude the file from the batch.

The Control panel displays your source video’s properties and a playback window to view your source video and set chapter marks.



 **If you have selected a Source Video File that is not a Blu-ray compliant frame size or resolution you will be notified in a pop-up window that your video is not acceptable for input into the DoStudio Encoder. Please refer to [Part II: Section 1: Valid Video Sizes and Frame Rates for Primary Video](#) for information about valid frame sizes and frame rates for Blu-ray Disc.**

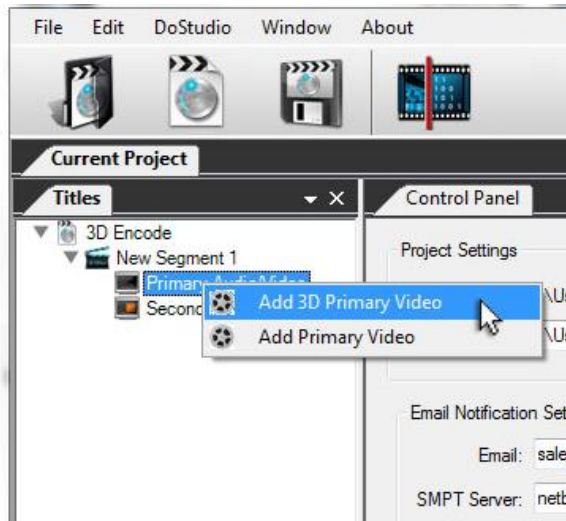


Adding a Source Video file for Secondary Video

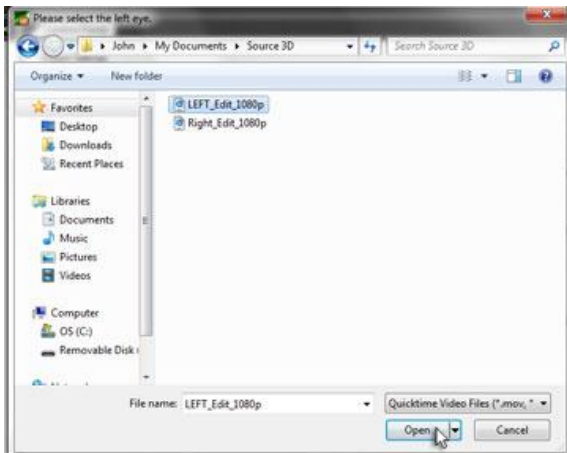
The process for adding a source video file for Secondary video is the same as the process for Primary video. The only difference is that the DoStudio encoder will only accept standard-definition resolution video files for Secondary video. Please refer to [PART II: Section 2: Secondary Video Streams](#) for more information about valid Secondary video formats.

Adding 3D Source Video files

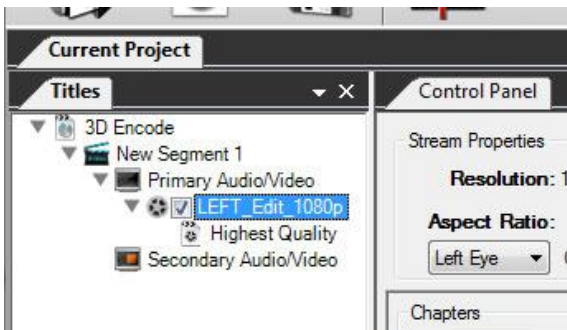
Right-click on the Primary Audio/Video node to display the context menu. Select “Add 3D Primary Video”



You are prompted to select the Left Eye source video stream first. Navigate to your source file for the Left Eye and select it. Next, you are prompted to select the source video stream for the Right Eye.



You will now see your 3D source video file listed in the Segment tree under the Primary Audio/Video node.



You will only see the Left Eye stream listed in the tree.

The Highest Quality template is applied to your segment by default.

To add additional source video files to your project, you need to add additional Encoding Segments to your Segment tree.



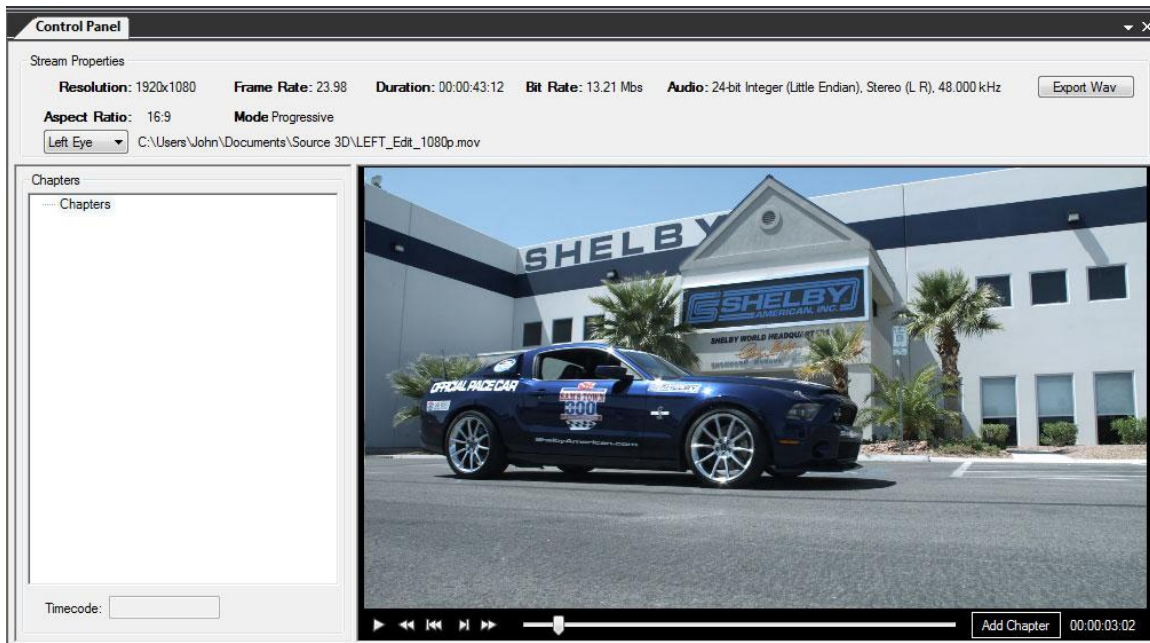
To do this, right-click on the name of your project at the top of the Segment window (in the screenshot above, the name of the project is “3D Encode” and select “Add a Segment” from the context menu.

You can add as many Segments as your project requires.

The checkbox indicates that you would like to encode this video when you submit the batch for encoding. You can uncheck the box to exclude the file from the batch.

The Control panel displays your source video’s properties and a playback window to view your source video and set chapter marks.

You can select which source file to view using the Left/Right selection box found in the Control Panel.



Adding Chapter Markers to your video

Adding chapter markers is useful because DSE will create an I-Frame at the chapter markers which will guarantee frame accuracy for the chapter when you author your disc in DoStudio. You can add chapter markers to your video in two ways:

Add Chapters while viewing the video

Use the play controls under the video window to play, pause, fast forward, rewind, and step frame-by-frame forward or backwards through your video. You can also use the scrub bar to quickly shuttle through your video.



Play controls

Pause the video at the frame where you would like to add a chapter marker and press the “Add Chapter” button. You will see a chapter appear in the Chapters List to the left of the video.

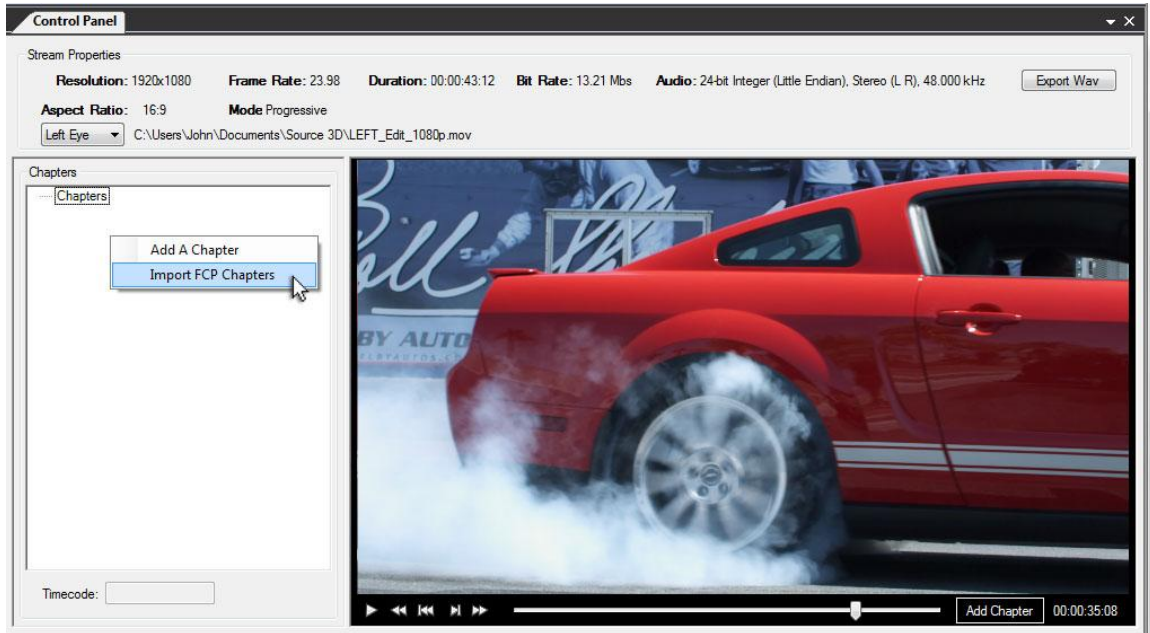
If you are encoding 3D video, you need only view one of your streams and mark chapter points for it.

Add Chapters manually by entering timecode

You can also right-click in the Chapters List to display the context menu. Select “Add a Chapter” to add a blank chapter to the list. Select the chapter and enter the timecode manually in the timecode window at the bottom of the Chapters List.

Importing Chapters from your Final Cut Pro timeline

To import the Chapter Markers you created in Final Cut Pro and exported via Final Cut Pro XML, right-click on the word “Chapters” at the top of the Chapters list to reveal the context menu.



Select “Import FCP Chapters” and select the Final Cut Pro XML file using the dialogue box. You will see the chapter markers you created in your Final Cut sequence appear in your chapters list.

Encoding Templates

How your source video is encoded is determined by several encoding settings that are contained in templates. You must apply a template to your source video in order to encode it.

The process for applying a template is the same for 2D AVC encoding and 3D MVC encoding.

For 3D MVC encoding, you will only use the Primary Video Templates. There is no Secondary Video track on a 3D Blu-ray Disc.

Primary Video Templates

Primary Video templates define your encoding parameters for primary video. The DoStudio Encoder provides the following Primary Video Templates by default:

- Highest Quality – 90 minutes on a BD25, no Secondary video and no high-bandwidth audio. (VBR: Target: 35 mb/s, Max: 38 mb/s)
- Feature Video – 120 minutes on a BD25, no Secondary video and space for LPCM or other high-bandwidth audio (VBR: Target: 25 mb/s, Max: 35 mb/s)
- Bonus Video – Medium quality video: 180 minutes on a BD25 (VBR: Target 18 mb/s, Max: 30 mb/s)

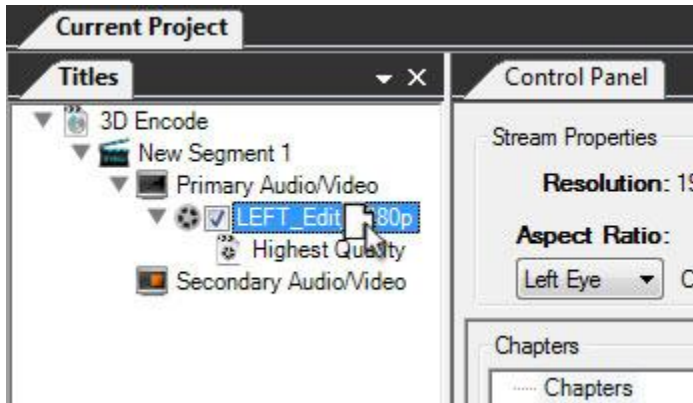
Secondary Video Templates

Secondary Video templates define your encoding parameters for Secondary video. The Blu-ray spec limits the bit-rate of Secondary video to 7.6 mb/s, so your Secondary video template will not allow you to exceed the legal limits for Blu-ray.

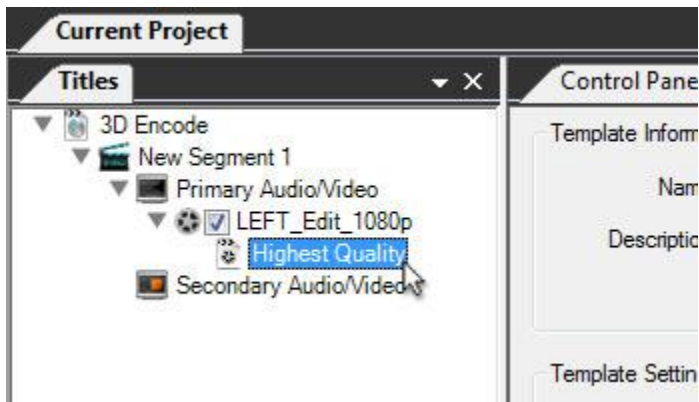
The DoStudio Encoder provides the following Secondary Video Templates by default:

- Single PiP track – no Secondary audio, (CBR: Target: 7.0 mb/s)
- Single PiP track – Secondary Audio (CBR: Target: 6 mb/s)
- 2 PiP tracks – no Secondary audio (CBR: Target: 3.6 mb/s)
- 2 PiP tracks – Secondary Audio (CBR: Target: 3 mb/s)

Apply an Encoding Template



To apply an Encoding Template, simply drag the desired template from the template window at the bottom of the screen on to your source video file contained in the Segments list.



You will see the template listed in the Segments list underneath the source file it is applied to. Click on the template to see its properties in the control panel.

You can edit the encoding parameters for a specific clip after you have applied the template.

Encoding Parameters

The screenshot shows a 'Control Panel' window with the following settings:

- Template Information for LEFT_Edit_1080p.mov**
 - Name: Highest Quality
 - Description: 90 minutes on a BD25, no Secondary video and no highbandwidth audio.
- Template Settings**
 - Encoding Mode: Variable Bit Rate (dropdown menu)
 - Number Of Passes: 2 (dropdown menu)
 - Target Bit Rate: 35000 Kbps (text input with a slider below it)
 - Max Bit Rate: 38000 Kbps (text input with a slider below it)

Encoding Mode

You can select either Constant Bit Rate (CBR) or Variable Bit Rate (VBR).

Number of Passes

You can select single or 2-pass mode. In 2-pass mode, the encoder performs an analysis pass, and then encodes your video in a second pass. In single pass mode, the analysis is performed concurrently with the encoding process.

Target Bit Rate

For CBR encodes, use the slider bar to set a value for your desired bit rate. Your video will be encoded at this bit rate throughout the entire clip.

For VBR, use the slider bar to set a value for the average bit rate. You will set the Maximum (peak) bit rate for your VBR encode in the next field.

Max Bit Rate

For VBR encodes, set the maximum bit rate for your encode in the available box. Keep in mind that the maximum recommended bit rate for Blu-ray video is 38 mb/s.

Bit Rate Considerations for Blu-ray Disc

The maximum video bit rate allowed for Blu-ray is 40 Mbps, but in practice it is best not to exceed 38 Mbps due to playback performance issues on some Blu-ray players when your video does in fact approach the 40 Mbps rate. The DoStudio Encoder limits you to 38 Mbps in order to maximize playback compatibility.

In practice, you should be conservative when determining how high of a bit rate to allow for. Trying to squeeze out the highest possible bit rate for your project can lead to player compatibility and disc space issues. If your project calls for multiple audio tracks, or if you plan to use LPCM audio, DTS-HD Master Audio or Dolby TrueHD, you will need to limit the video data rate so as not to exceed the overall bit rate allowed by Blu-ray. A general recommendation is to not exceed 43 Mbps for your combined video and audio bit rate.

Bit rate Considerations for Blu-ray 3D

When you encode a 3D MVC file, you select the target and max bit rate for the base view stream only. The bit rate and corresponding file size of the dependent view file is relative to the bit rate of the base view and cannot be manually controlled. The dependent view is not actually a complete video stream. Rather it contains offset information and video data that can only be displayed when combined with the base view. The overall bitrate of the combined MVC files is approximately 50% higher than the base view file by itself.

Custom Templates

To create your own custom template, you can duplicate an existing template and edit its encoding parameters or you can add a new template from scratch.

To add a new template, right click in the Template window and select Add Template from the context menu. Select the new template in the template window to display the encoding parameters in the control panel. Give the template a name and enter your desired parameters and click save. You can update the parameters in your template at any time.

To duplicate a template, right-click on the template in the Template window and select “Duplicate Template” from the context menu. You can rename the new template and adjust its encoding parameters in the control panel.

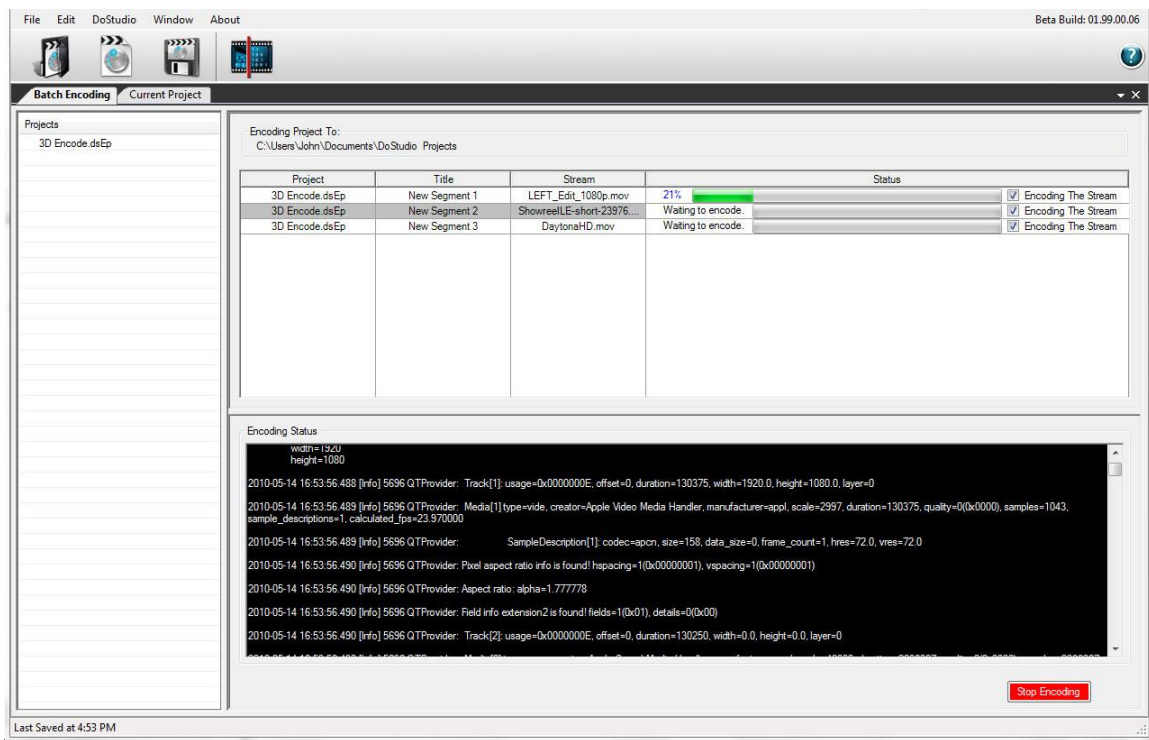
You can also import a template that has been created by another user. Right-click in the Template Window and select “Import Template”.

Submitting your encoding Project to the Batch

When you are ready to encode your video, click the “encode” button in the toolbar. This will open the batch encode window and submit your project to the batch.



Your project will begin the encoding process immediately. All of the video streams in your project will appear in the Batch Encoding window. A progress bar indicates the encoding status of each video stream.



You can stop the encoding process by clicking the red “Stop Encoding” button at the bottom of the screen. You can stop encoding one stream while continuing to encode the others in your batch by de-selecting the stream’s checkbox next to the words “Encoding the Stream.”

Once you have stopped an encode, you need to re-submit the project to the batch to start the process again.

Encoding Status Window

While your video is encoding, a real-time log of the encoder's activity is displayed in the Encoding Status Window. You can monitor the progress of your encoding job and view error messages in this window.

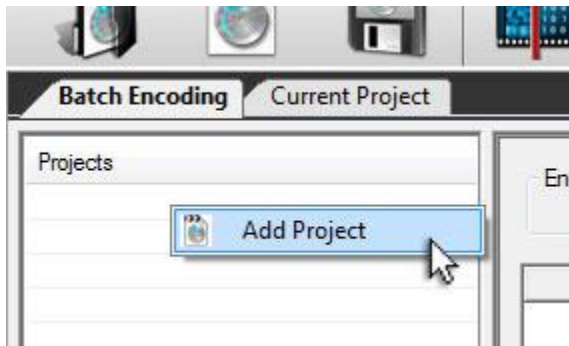
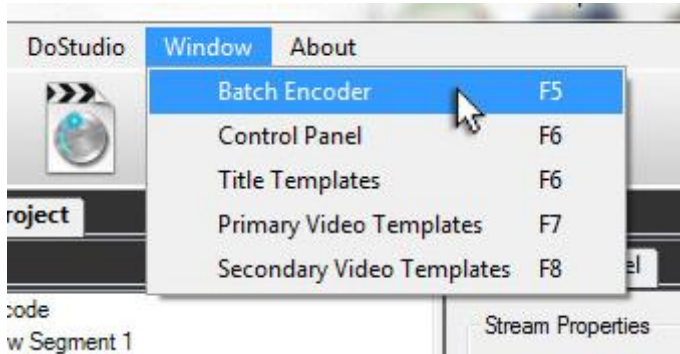


```
Encoding Status
width=1920
height=1080
2010-05-14 16:53:56.488 [Info] 5696 QTProvider: Track[1] usage=0x0000000E, offset=0, duration=130375, width=1920.0, height=1080.0, layer=0
2010-05-14 16:53:56.489 [Info] 5696 QTProvider: Media[1] type=vide, creator=Apple Video Media Handler, manufacturer=appl, scale=2997, duration=130375, quality=00x00000, samples=1043,
sample_descriptors=1, calculated_fps=23.970000
2010-05-14 16:53:56.489 [Info] 5696 QTProvider: SampleDescriptor[1] codec=apcn, size=158, data_size=0, frame_count=1, fves=72.0, vres=72.0
2010-05-14 16:53:56.490 [Info] 5696 QTProvider: Pixel aspect ratio info is found! hspacing=1(0x00000001), vspacing=1(0x00000001)
2010-05-14 16:53:56.490 [Info] 5696 QTProvider: Aspect ratio: alpha=1.777778
2010-05-14 16:53:56.490 [Info] 5696 QTProvider: Field info extension2 is found! fields=1(0x01), details=0(0x00)
2010-05-14 16:53:56.490 [Info] 5696 QTProvider: Track[2] usage=0x0000000E, offset=0, duration=130250, width=0.0, height=0.0, layer=0
```

You can select and copy the text in the Encoding Status Window by right-clicking to reveal a context menu.

Batch encoding multiple projects simultaneously

To submit several projects to the batch simultaneously, open the Batch window by selecting it from the Window menu.



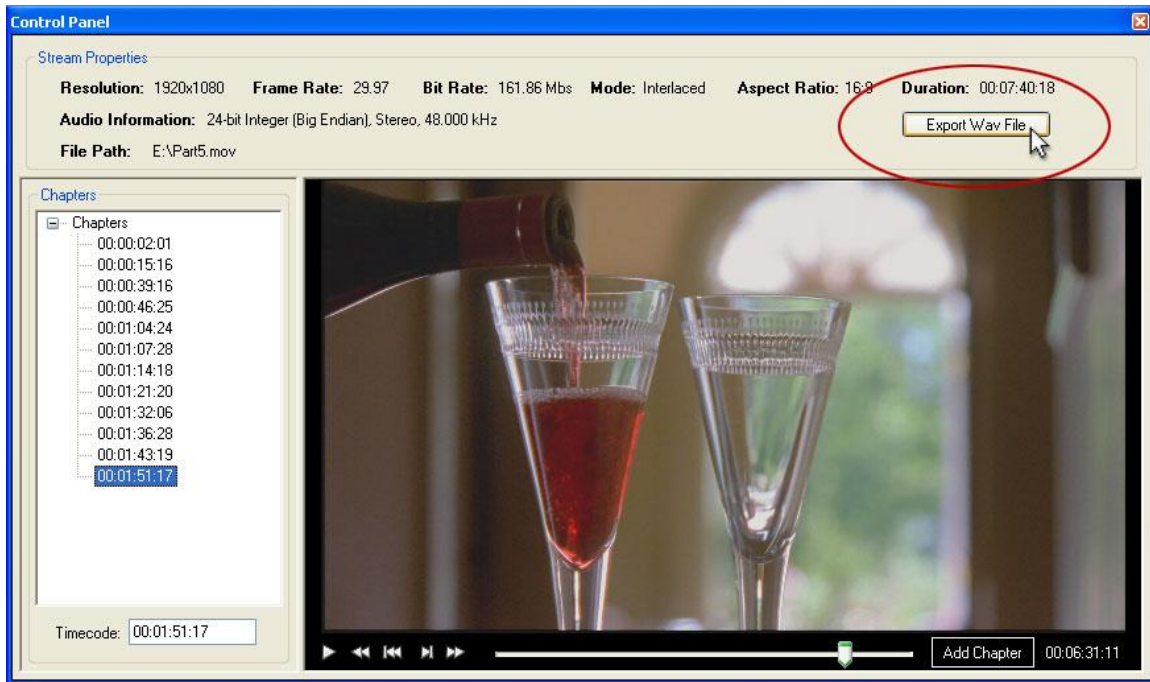
Right-click in the Batch Encoding Window and select “Add Project” to add your project to the batch. You can add multiple encoding projects to the batch list.



Click the “Start Encoding” button to submit the batch and the encoding process will begin. You will see progress bars for each of the source videos.

Exporting LPCM Audio from your QuickTime File

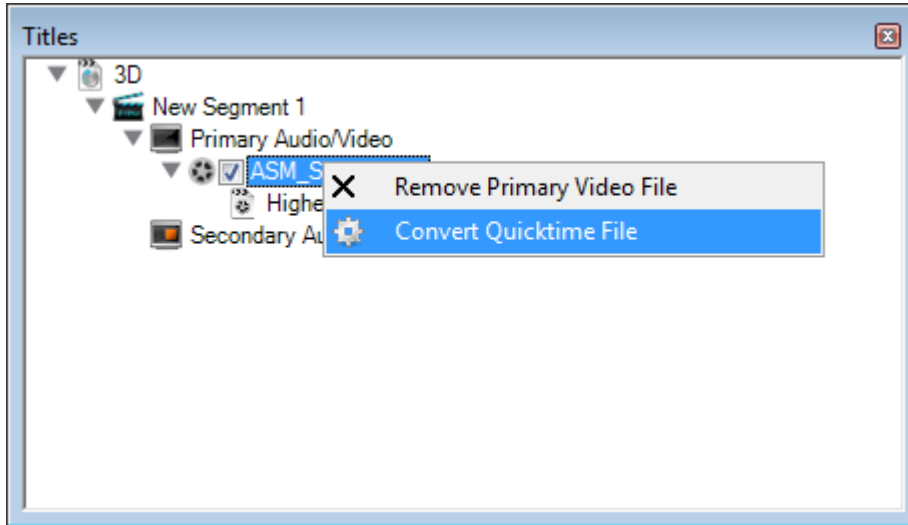
If your QuickTime file has embedded audio, you can export the audio to an uncompressed LPCM wave file. This LPCM file can be imported into DoStudio Authoring, or it can be imported into another audio application to transcode it into a Blu-ray compliant Dolby or DTS stream.



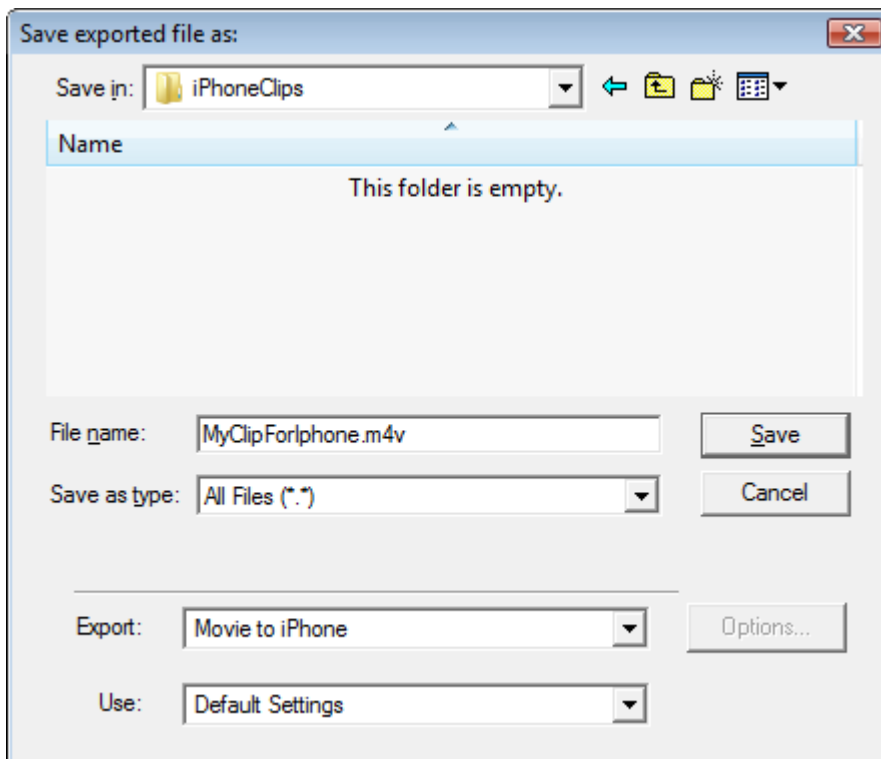
To export the LPCM wav file simply click the “Export Wav File” button found in the Control panel when you select your video stream. In the Export Wav File dialogue box, choose the folder where you would like to save the file and click “Save”.

Using the DoStudio QuickTime Converter

DSE includes a QuickTime Converter that lets you transcode your Primary or Secondary Audio/Video streams to other QuickTime formats such as .m4v for iPhone.



To use the QuickTime Converter, right-click on the source file for your Primary or Secondary Audio/Video and select “Convert QuickTime File” from the context menu.



Choose the destination folder for your converted QuickTime file and what type of export you would like to perform. All of the standard QuickTime conversion formats are supported.

Part V: Troubleshooting

The following guide will help you understand you how 3D MVC files were encoded and how to understand what the errors are if you run into issues.

Understanding the Encode Specific Log files

Setting up your output folder will automatically create a log folder under the output folder. Inside this folder are two log files per AVC/MVC file to encode. The two log files are:

1. *sourcefilename*_ServerLog.log
2. *sourcefilename*_DSWLog.log

The *sourcefilename*_ServerLog file contains the name of your source file followed by *_ServerLog.log*. This log file contains all the core information about the encoded file. This should be the first file to review if something goes wrong.

The *sourcefilename* DSWLog.log file contains the name of your source file followed by *_DSWLog.log*. This log file contains information that will be used to make sure the communication between the DSE Encoder Server and the DSE UI are ok.

The System.log file

The System.log file reviews the QuickTime installation and other details about your system that the encoder uses to as resources. This file is created once per batch encode.

The DSE Log file

The DSE Log file is used only by NetBlender and is found in My Documents -> NetBlender -> DSE -> log.txt

Trouble Shooting Steps

If the encode fails instantly...

1. Make sure you can play the video using Apple's QuickTime player.
2. Make sure the source files are in one of the acceptable sizes and frame rates for Blu-ray:

For AVC (2D Blu-ray):

Horizontal size of frame [pixels]	Vertical size of frame [pixels]	frame rate [Hz]	Progressive/ Interlace	Aspect Ratio
1920	1080	29.97	interlace	16:9
		25	interlace	
		23.976	progressive	
		24	progressive	
1280	720	59.94	progressive	16:9
		50	progressive	
		23.976	progressive	
		24	progressive	
720	480	29.97	interlace	4:3 or 16:9
720	576	25	interlace	4:3 or 16:9

For MVC (3D Blu-ray):

Horizontal size of frame [pixels]	Vertical size of frame [pixels]	frame rate [Hz]	Progressive/ Interlace	Aspect Ratio
1920	1080	23.976	progressive	16:9
1280	720	59.94	progressive	16:9
1280	720	50	progressive	16:9

3. Send All 3 types of log files to NetBlender at sales@netblender.com

If the encode fails after more than 1% is completed...

1. Make sure there is enough disc space.
2. Make sure there isn't any anti-virus software that will be scanning when the encoder is writing out the encoded files.
3. Send All 3 types of log files to NetBlender at sales@netblender.com

The first encode works but the second one fails...

1. Send All 3 types of log files to NetBlender at sales@netblender.com
2. Close DSE
3. Open DSE and then try to encode the second stream.
4. If this still fails let us know.

The video does not look ok...

1. Send All 3 types of log files to NetBlender at sales@netblender.com.
2. Indicate the specific visual issue you are seeing in your email to us.

Click on the Batch Encode does nothing...

1. Open the Batch Window if not already open then try again.
2. If this still fails.
3. Send All 3 types of log files to NetBlender at sales@netblender.com.