

# Codec and Container Options

Digital Rapids encoding and transcoding solutions are renowned for their format flexibility. The optional modules below supplement the extensive standard codec and file format support included with our systems. These modules are available for all Digital Rapids ingest and encoding systems (including StreamZ™, StreamZHD™, DRC-Stream™ and Flux™-based systems) and the Digital Rapids Transcode Manager® enterprise-level transcoding software.

*Note that some modules may be included standard with select system configurations; please see our website for details of version compatibility and bundling. Select sets of modules may also be available in bundles for easy ordering; please ask your Digital Rapids representative for details.*

## Digital Rapids Studio AVC Encoder™

The Digital Rapids Studio AVC Encoder options provide premium-quality AVC/H.264 (MPEG-4 Part 10) live streaming or file-based encoding meeting the stringent requirements of professional applications and distribution platforms including VOD, IPTV and Blu-ray. The Studio AVC Encoder supports Baseline, Main and High AVC/H.264 profiles, with full configurability of levels and parameters, and interlaced or progressive output. Closed Caption data can be embedded in H.264 Elementary Streams with support for EIA-608, EIA-708 and SCC. Frame-compatible 3D encoding combines separate left-eye and right-eye source files for side-by-side or top/bottom frame-compatible stereoscopic 3D distribution, with the appropriate Frame Packing Arrangement SEI messages inserted during H.264 encoding. (SEI messages can also be inserted while encoding previously-combined, single-file frame-compatible 3D sources). Stream FE™ software or Digital Rapids Transcode Manager is required.

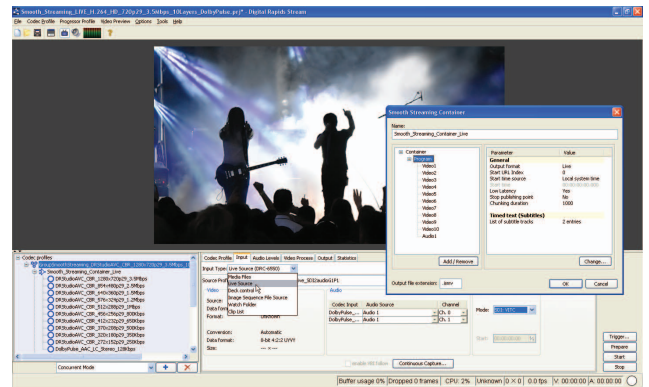
The Studio AVC Encoder is available by itself or as a bundle:

- **DRC Studio AVC Encoder** — AVC/H.264 video encoding to Elementary Streams (files or RTP streams); frame-compatible 3D encoding.
- **DRC Studio AVC Encoder Bundle** — AVC/H.264 video encoding to Elementary Streams (files or RTP streams); frame-compatible 3D encoding; output to .MP4 files; flexible multiplexing of H.264 video and audio streams into Transport Streams with muxing technology from Manzanita Systems.
  - o Flexible muxing architecture enables simultaneous output of multiple Elementary and Transport Streams in a single step while eliminating redundant encoding (e.g. multiple Transport Streams with the same video but differing audio such as languages).
  - o Muxing architecture supports insertion of SCTE 35 Cueing Messages for Digital Program Insertion (e.g. ad insertion).
  - o Dolby Pulse (AAC-LC, HE-AAC) and MPEG Layer 2 audio support included (*Dolby Digital/AC-3 and Dolby Digital Plus audio support is available as an additional option*).

## DRC AVC for Web

Two optional modules support the creation of premium-quality, progressive-scan H.264-based video for consumer electronics devices and the Web, including Adobe Flash Player (version 9 and higher), Microsoft Silverlight and Adobe AIR based applications. Both modules output progressive H.264 with Baseline or Main AVC/H.264 profiles, and include Dolby® Pulse (HE-AAC, AAC-LC) and Thomson MP3 audio support.

- **DRC AVC for Web, File Only** — encoding and transcoding to files for on-demand, progressive-scan applications from live, tape-based or media file inputs. Supports MPEG-4 (MP4, M4V for iTunes), Adobe Flash (F4V, FLV), 3GPP, Microsoft Silverlight (MP4, IIS Smooth Streaming) and QuickTime MOV.
- **DRC AVC for Web** — all of the features of the file-only version, plus live H.264 streaming over RTMP protocol to Adobe Flash Media Server; H.264 Microsoft IIS Smooth Streaming; and progressive H.264 streaming over RTP/RTSP. Supports simultaneous archive to file during live streaming.



## ***iPhone Encoder (AVC for Apple® iPhone®/iPad™ with integrated segmenting)***

The iPhone Encoder option module provides enhanced capabilities for encoding content for live and on-demand viewing on iPhone mobile devices, iPad tablets and iPod touch® personal media players. Includes Dolby® Pulse AAC audio support.

- Encodes simultaneously to multiple output streams at varying bit rates and resolutions, automatically dividing the outputs into discrete TS segments ready for adaptive delivery by a server or CDN.
- Eliminates the need for an external stream segmenter, simplifying encoding workflows and reducing overall system costs.

## ***MXF Import***

The MXF Import option adds the ability to import media packaged in the MXF (Material eXchange Format) file format.

- This option "extracts" the media essence stored within the MXF file; additional codecs may be required for decoding the compressed media itself.
- Includes support for the MXF AS02 application specification
- Powered by OpenCube technology.
- Compatible with Stream LE, Stream FE and Digital Rapids Transcode Manager.

## ***MXF Import/Export***

The MXF Import/Export option adds the ability to import and export media packaged in the MXF (Material eXchange Format) file format.

- This option "extracts" or "packages" the media essence stored within the MXF file; additional codecs may be required for encoding and decoding the compressed media itself.
- Includes support for the MXF AS02 application specification
- Powered by OpenCube technology.
- Requires Stream FE or Digital Rapids Transcode Manager.

## ***DNxHD Import/Export***

The DNxHD codec adds the ability to import Avid DNxHD® compressed media files, and encode or transcode to the DNxHD format from live, tape or file-based inputs. Supports DNxHD in MXF container.

- Requires MXF Import/Export option (sold separately, or as a bundle with DNxHD codec).
- Requires Stream FE or Digital Rapids Transcode Manager.

## ***GXF Import***

The GXF Import option adds the ability to import media packaged in the GXF file format (common with Grass Valley servers)

- This option "extracts" the media essence stored within the GXF file; additional codecs may be required for decoding the compressed media itself.
- Compatible with Stream LE, Stream FE and Digital Rapids Transcode Manager.

## ***GXF Import/Export***

The GXF Import/Export option adds the ability to import and export media packaged in the GXF file format (common with Grass Valley servers).

- This option "extracts" or "packages" the media essence stored within the GXF file; additional codecs may be required for encoding and decoding the compressed media itself.
- Requires Stream FE or Digital Rapids Transcode Manager.

## ***LXF Import***

The LXF Import option adds the ability to import media packaged in the LXF (Leitch/Harris server) file format.

- This option "extracts" the media essence stored within the LXF file; additional codecs may be required for decoding the compressed media itself.
- Compatible with Stream LE, Stream FE and Digital Rapids Transcode Manager.

## ***LXF Import/Export***

The LXF Import/Export option adds the ability to import and export media packaged in the LXF (Leitch/Harris server) file format.

- This option "extracts" or "packages" the media essence stored within the LXF file; additional codecs may be required for encoding and decoding the compressed media itself.
- Requires Stream FE or Digital Rapids Transcode Manager.

## ***Omneon Export***

The Omneon Export option adds the ability to output MOV and MXF-wrapped media files compatible with Omneon servers.

- This option packages the media essence into an Omneon-compatible MOV or MXF file; additional codecs may be required for encoding the compressed media itself.
- Compatible with Stream FE and Digital Rapids Transcode Manager.

## ***AVC Intra***

The AVC Intra option adds the ability to encode to the Panasonic AVC-Intra format (including 10-bit AVC-Intra 50 and AVC-Intra 100).

- Support for AVC Intra in P2 structure or MXF OP1a container requires MXF Import/Export option (sold separately).
- Requires Stream FE or Digital Rapids Transcode Manager.

## ***DVCPro Import/Export***

The DVCPro codec adds the ability to import DV, DVCPro 25, DVCPro 50 and DVCPro HD (also known as DVCPro 100) compressed media files, and encode or transcode to DV and DVCPro 25/50/HD from live, tape or file-based inputs. Supports DVCPro in AVI, MOV and MXF containers, with 608 Closed Caption support.

- Support for DVCPro in MXF container requires MXF Import/Export option (sold separately) and Stream FE or Digital Rapids Transcode Manager.
- Export to DVCPro in MOV container requires Stream FE or Digital Rapids Transcode Manager.

## XDCAM Support

Support for the Sony XDCAM format (up to XDCAM HD422 at 50Mb/s) in MOV or MXF containers does not require a specific XDCAM optional module, but does require MPEG-2 support (standard in Stream FE and Digital Rapids Transcode Manager; optional for Stream LE). Support for XDCAM in an MXF container requires optional MXF support (import and export available for Stream FE and Digital Rapids Transcode Manager; import also available for Stream LE).

## Advanced Muxer for Sony PS3

This multiplexing option tailored to Sony specifications provides enhanced encoding of media compliant with the conformance requirements of Sony® PlayStation® 3, PSP® and other Sony consumer devices.

- Includes support for Sony BDN subtitling format and text-to-picture subtitling from RTF (Rich Text Files).
- Requires DRC Studio AVC Encoder and Dolby® Pulse audio module, or DRC Studio AVC Encoder Bundle.
- Requires Stream FE or Digital Rapids Transcode Manager.

## JPEG2000

The JPEG2000 option features the Kakadu JPEG2000 codec, enabling file-based encoding and decoding of the Motion JPEG2000 compression format. Supports import of JPEG2000 in MXF container, and encoding or transcoding to JPEG2000 wrapped in MXF (OP1A or OP-Atom) or output as image sequences.

- Full encoding support for the JPEG2000 format's ability to combine multiple layers at progressively higher quality – from visually 'lossy' to mathematically lossless – within a single output.
- Allows user to select which of the multiple embedded resolutions to decode when transcoding from JPEG2000 source content – avoiding time-consuming processing of the full frame size when transcoding to a lower-resolution deliverable.
- Support for JPEG2000 in MXF container requires MXF Import/Export option (sold separately, or as a bundle with the JPEG2000 option).
- Export to JPEG2000 in MXF container requires Stream FE or Digital Rapids Transcode Manager (import is also supported in Stream LE).

## 3GPP/Mobile Encoder

The 3GPP/Mobile option enables encoding to files and live streaming for 3GPP and other mobile devices.

- Includes H.263, H.264 and MPEG-4 Part 2 video with AAC-LC or AMR audio.
- Compatible with Stream LE, Stream FE and Digital Rapids Transcode Manager.

## RED Import

The RED Import option adds the ability to import R3D media files from RED Digital Cinema cameras.

- Compatible with Stream LE, Stream FE and Digital Rapids Transcode Manager.

## On2 VP6 Encoder (for Adobe Flash Player 8 and higher)

Two optional modules support the creation of On2 VP6-based video for Adobe Flash (commonly referred to as Flash 8 Video).

*Please note that On2 VP6 options are offered only in 'Legacy' support mode, with no ongoing development.*

- **On2 VP6 File Encoder** — supports encoding and transcoding to FLV or SWF files (including MP3 audio) from live, tape-based or media file inputs.
- **On2 VP6 File+Live Encoder** — all of the features of the On2 VP6 File Encoder, plus live Flash Video streaming with Adobe Flash Media Server. Supports simultaneous archive to file during live streaming.

## Dolby® Digital and Dolby Digital Plus Encoders

Four optional modules support the encoding of audio in the Dolby Digital (AC-3) and Dolby Digital Plus formats.



- **Dolby Digital Plus Stereo, File-Only** — supports file-based encoding and transcoding of Dolby Digital and aDolby Digital Plus stereo audio.
- **Dolby Digital Plus Stereo** — supports live streaming (multiplexed into Transport Stream with Stream FE) and file-based encoding/transcoding of Dolby Digital and Dolby Digital Plus stereo audio.
- **Dolby Digital Plus Surround, File-Only** — supports file-based encoding and transcoding of Dolby Digital and Dolby Digital Plus stereo or surround audio.
- **Dolby Digital Plus Stereo** — supports live streaming (multiplexed into Transport Stream with Stream FE) and file-based encoding/transcoding of Dolby Digital and Dolby Digital Plus stereo or surround audio.

## Dolby Digital AC3 Surround Decoder

The Dolby Digital AC3 Decoder option adds the ability to decode AC3 compressed audio (stereo or surround), including support for Dolby metadata in the input source.

## Dolby® Pulse (AAC)

Two optional modules enable Dolby Pulse AAC, HE-AAC and HE-AAC v.2 audio encoding (to files, or multiplexed into live streams). Dolby Pulse is a robust AAC based technology designed for delivering high-quality multi-channel content to TVs, computers, mobile phones, and other entertainment platforms, with metadata capabilities similar to those in Dolby Digital and Dolby Digital Plus.

- **Dolby Pulse AAC Stereo** — supports live streaming (multiplexed with video) and file-based encoding/transcoding of Dolby Pulse stereo audio.
- **Dolby Pulse AAC 5.1** — supports live streaming (multiplexed with video) and file-based encoding/transcoding of Dolby Pulse stereo or surround audio.

## Thomson MP3 Encoder

This option enables stereo and multi-channel surround encoding to MP3 audio files.

## Which H.264 Software Option Do I Need?

While H.264 is a standards-based format, there are many different H.264 codec implementations (essentially differing algorithms and methods for encoding H.264 content), each with its own unique characteristics. To ensure the best possible output quality and conformance for your needs, we offer multiple choices of H.264 codec implementation, each optimized for particular applications or target devices.

Protocol/Container	Example Application	Digital Rapids H.264 Option	Notes
<b>Live Streaming</b>			
Live Elementary Streams (RTP/RTSP)	Live streaming (to QuickTime and other PC-based players, and some set-top boxes) through Darwin, Wowza or other streaming server (excluding Flash Media Server)	DRC Studio AVC Encoder	Requires Stream FE software. Includes MPEG Layer II audio. Other Audio Formats optional.
		DRC Studio AVC Encoder Bundle	Requires Stream FE software. Includes MPEG Layer II and AAC audio. Other formats optional.
		DRC AVC for Web	Progressive H.264 output for Web and CE device playback only. AAC and MP3 audio included.
Live multiplexed Transport Streams	Live streaming, typically to a set-top box for IPTV, cable or satellite	DRC Studio AVC Encoder Bundle	Requires Stream FE software. Includes MPEG Layer II and AAC audio. Other audio formats optional.
Live RTMP streaming through Adobe Flash Media Server	Live streaming to Adobe Flash Player 9 or higher (including Adobe Dynamic Streaming) and Adobe AIR applications	DRC AVC for Web	Progressive H.264 output for Web and CE device playback only. AAC and MP3 audio included.
		DRC Studio AVC Encoder Bundle <i>plus</i> RTMP option	Requires Stream FE software. AAC audio included. Other audio formats optional.
Live Microsoft IIS Smooth Streaming	Live adaptive bit rate HTTP-based Smooth Streaming to Microsoft Silverlight Player through IIS Server	DRC AVC for Web	Progressive H.264 output for Web and CE device playback only. AAC and MP3 audio included.
		DRC Studio AVC Encoder Bundle	Requires Stream FE software. AAC audio included. Other audio formats optional.
Live delivery to Apple iPhone	Live adaptive bit rate HTTP streaming to Apple iPhone and iPod Touch with integrated stream segmenter	iPhone Encoder	Progressive H.264 in segmented TS for iPhone playback only. AAC audio included.
Live Elementary Streams (RTP/RTSP) for mobile devices	Live streaming to mobile devices such as cell phones	3GPP/Mobile Encoder	Includes AAC-LC and AMR audio.
<b>File Creation</b>			
Files in .MP4/.M4V/.F4V/.FLV/.MOV/.ISMV container	Playback on consumer devices (such as Apple iPod) and PCs (including Adobe Flash, Microsoft Silverlight and on-demand IIS Smooth Streaming, QuickTime, etc.)	DRC AVC for Web <i>or</i> DRC AVC for Web, file only	AAC and MP3 audio included.
Elementary Stream files	Files for subsequent repurposing or processing; Blu-ray authoring	DRC Studio AVC Encoder	Requires Stream FE software. Includes MPEG Layer II audio. Other audio formats optional. Dolby Digital audio option required for Blu-ray applications.
		DRC Studio AVC Encoder Bundle	Requires Stream FE software. Includes MPEG Layer II and AAC audio. Other audio formats optional. Dolby Digital audio option required for Blu-ray applications.
Multiplexed Transport Stream files	VOD (typically to set-top boxes)	DRC Studio AVC Encoder Bundle	Requires Stream FE software. Includes MPEG Layer II and AAC audio. Other audio formats optional.
Files for adaptive delivery to Apple iPhone	Files for on-demand adaptive HTTP streaming to Apple iPhone and iPod Touch with integrated stream segmenter	iPhone Encoder	Progressive H.264 in segmented TS for iPhone playback only. AAC audio included.
.MP4/.3GP files for mobile devices	Files optimized for playback on mobile devices such as cell phones	3GPP/Mobile Encoder	Includes AAC-LC and AMR audio.
Files for frame-compatible 3D distribution	Insertion of Frame Packing Arrangement SEI messages during encoding of single or two-file stereoscopic 3D content for side-by-side or top/bottom 3D distribution	DRC Studio AVC Encoder	Requires Stream FE software. Includes MPEG Layer II audio. Other audio formats optional. Dolby Digital option required for Blu-ray applications.
		DRC Studio AVC Encoder Bundle	Requires Stream FE software. Includes MPEG Layer II and AAC audio. Other audio formats optional. Dolby Digital option required for Blu-ray applications.



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