

Maxedia Media Formats Version 4.x Software

Product Name: Maxedia

Platform: Maxedia

Project #: Media Files

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1. Introduction

Maxedia 4.0 has been optimized to playback the latest technology H.264 codec in video formats. Although Maxedia can play other formats as well, we strongly recommend to use this codec if possible. As the Software engine is tuned to play this H.264 format at it's best possible performance by using the CPU and GPU of the hardware.

1.1 Purpose of the Document

The purpose of this document is to outline the possible video and picture formats the Maxedia is able to import and play.

Please feel free to share your experiences and feedback to mc@rdinternational.com

Maxedia Media Formats

2.Video Formats

2.1 Overview

Important: To be able to play these mentioned codecs below, please check first your hardware revision of your Maxedia™. As Maxedia™ Revision A, B together with the Maxedia™ compact revision A are not supported anymore by version 4.x. Please contact your local dealer to ask for a fairly priced hardware upgrade!

Important we strongly recommend the usage of **H.264** for video files!

A complete list of supported codecs can be found below.

Recommended Video Codecs	File extension
Maxedia is optimized for efficient playback with optimal image quality. Please use these formats to achieve the best results and smooth playback from your Maxedia server.	
H.264/AVC	.mov/ .mkv
MPEG4	.mp4

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Other supported Video Codecs	File extension
<p>Maxedia playback is possible, but not as efficient and less files can be played back at the same time. Do not use these codecs unless you are experienced in video encoding, and use these formats for a very specific reasons. Evaluate the performance on Maxedia systems carefully.</p>	
MPEG2	.vob / .mp(e)g / .m2t(s) / .m2v / .m2p
DV	.avi
BlackMagic	.avi
Cineform	.avi

Not Recommended Video Codecs	File extension
<p>Maxedia playback is possible, but highly discouraged. Maxedia will not playback these files efficiently. And system resources will be consumed quickly. Please avoid using these file formats. We recommend to re-encode to H.264 for optimal results.</p>	
VC1/WMV	.wmv
Divx, Xvid, Cinepak	.avi
Flash	.swf

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Audio Codecs	File extention
These are the supported 16-bit audio codecs. Please note that 24-bit is NOT supported.	
MPEG1-Layer 3	.mp3
MPEG2 Audio	.m2a
MPEG4 Audio	.m4a
AAC, AC3, Vorbis, Integer *	

* Included in a Video Container

2.2 General Codec Settings.

- Resolution:

In general, it is advised to use standard video resolutions for optimum playback.

For SD resolutions: NTSC 720x480 pixels 30fr/sec, PAL 720x576 pixels 25fr/sec.

HD resolutions: 720P (1280x720) pixels, 1080P (1920x1080) pixels.

It is possible to play other resolutions settings, like often used for exact pixel match on LED screens on stage. As long as the pixel size does not exceed 2048x1080 pixels.

- Frames per second:

Default resolutions the DVI/VGA output are at 60Hz. For best playback results video files should be encoded in 30 frames/sec. This way the frames are perfectly in sync with the output display. When 25 frames/sec encoded files are played on the Maxedia system, there are multiple options available to frame-blend the image (default) or to playback at 30 frames (which give a slighter faster playback speed with no audio). This to avoid visible vertical sync issues which are non-existing in Maxedia Version 4.x software.

- Progressive/Interlaced

Analog SD video is commonly distributed as interlaced video due to the old analog transmission methods, by using odd and even frames. Computer displays always display full frames called 'Progressive frames'. Playing Interlaced video on a computer always shows both the odd and even frames. Fast moving objects will have the typical visible horizontal lines. Therefore it is strongly advised to properly de-interlace the footage before encoding into H.264 for example. The best de-interlace method is 'adaptive de-interlacing'.

- **GOP:**

For best results on playback for H.264, MP4 and MPEG files it is advised to use the GOP (Group of Pictures) with I-frames only 'Intra-encoding' with no B or P frames. It is also called 'Keyframes' which can be set per amount of frames. Set the amount Keyframes at '1' which forces an I-frame only encoding in your encoding package.

- **Datarate:**

H.264/AVC, MPEG2/4, Divx, WMV formats can be set at VBR (Variable Bit Rate) or CBR (Constant Bit Rate). Both options work to be able to play the files on the Maxedia. For best quality VBR is preferred as more data can be stored per frame when needed, depending on the complexity of the video frame. Like with fast motion pictures or panning of high contrast pictures. Constant Bit Rate is commonly used for media that needs to be played-back on CD or DVD media. As the disc needs to be read with a constant data rate to avoid changing in motor speeds due to data-rate changes.

For the VBR setting some packages have no data-rate settings which means the encoding package uses data rates depending on the Low-Medium-Best settings. Other encoding packages use a parameter for the maximum Bit rate.

One should not go lower than 12 Mbit/sec for the Maximum (20-25Mbps is better) VBR setting, no lower than 4Mbit/sec for the Minimum VBR setting. The higher the settings for the Maximum VBR setting, the better quality is preserved in the image.

When Using VBR make sure to set '2-Pass' ON. This way a second pass encoding is done with better image-quality as result, but encoding time will be longer.

For CBR settings use 10Mbit/sec - 15Mbit/sec datarates for good quality encoding. Results may vary depending on the encoded footage.

Please use high profile settings for quality conversions.

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- Video Stream Type:

When encoding MPEG2, one can use 'Program' or 'Transport' Video Stream. For playback on a computer 'Program' Video stream is better, as there is more room for the encoding to adjust data-rate depending on the complexity of the videoframe. While Transport stream is mainly used for tape recording which needs a constant data-stream.

Note: The Maxedia does playback original Transport streams with m2t extension, created with HDV and ProHD camera's without any conversion is needed before importing the files into the Maxedia Media Manager.

- Color-Space:

Maxedia supports 4:1:1, 4:2:0 and 4:2:2 8-bit formats. Depending on the chosen Codec different color-space formats apply.

- Audio:

Only use 16-bit 41KHz or 48KHz encoding for the Maxedia. 24-bit will result in no audio-playback.

To be more specific which settings need to be used per codec. Please read the following sections.

2.3 H.264/AVC Encoding settings (Recommended Codec):

H.264/AVC Encoding	Parameters
Resolution	SD resolution: NTSC 720x480 pixels 30fr/sec recommended. PAL 720x576 Pixels 25Fr/sec not recommended for 60Hz output displays. HD resolutions: 720P30 or 1080P30 recommended.
Framerate	30 fr/sec advised for 60Hz display outputs.
Data-rate	'Best' setting, or 12 Mbit/sec minimum (20 Mbps best)
Bit-rate	Variable Bit Rate (VBR) Dual Pass Encoding (2-Pass)
Output	Progressive output
GOP	Intra-frame only, Keyframes set at '1'
Color Space	4:2:0 (YV12)
Audio	Use 16-bit only, 48 KHz recommended On MAC use:Integer (Little Indian) codec

2.4 MPEG4 Encoding settings (Recommended Codec):

MPEG4 Encoding	Parameters
Resolution	SD resolution: NTSC 720x480 pixels 30fr/sec recommended. PAL 720x576 Pixels 25Fr/sec not recommended for 60Hz output displays. HD resolutions: 720P30 or 1080P30 recommended.
Framerate	30 fr/sec advised for 60Hz display outputs.
Data-rate	'Best' setting, or 12 Mbit/sec minimum (20 Mbps best)
Bit-rate	Variable Bit Rate (VBR) Dual Pass Encoding (2-Pass)
Output	Progressive output
GOP	Intra-frame only, Keyframes set at '1'
Color Space	4:2:0 (YV12)
Audio	16-bit only, 48KHz recommended

2.5 MPEG2 Encoding Settings:

MPEG2 Encoding	Parameters
Resolution	SD resolution: NTSC 720x480 pixels 30fr/sec recommended. PAL 720x576 Pixels 25Fr/sec not recommended for 60Hz output displays. HD resolutions: 720P30 or 1080P30 recommended.
Framerate	30 fr/sec advised for 60Hz display outputs.
Data-rate	Best' settings, or 20 Mbit/sec minimum (25 Mbps best)
Bit-rate	Variable Bit Rate (VBR) Dual Pass Encoding (2-Pass)
Output	Progressive output
GOP	Intra-frame only, Keyframes set at '1'
Stream	Program Stream recommended
Color Space	4:2:0
Audio	16-bit only, 48KHz recommended

2.6 DV Encoding settings:

DV Encoding	Parameters
Resolution	SD resolution: NTSC 720x480 pixels 30fr/sec recommended. PAL 720x576 Pixels 25Fr/sec not recommended for 60Hz output displays. HD resolutions: Not Available
Framerate	30 fr/sec advised for 60Hz display outputs.
Data-rate	Fixed at 25Mbit/sec (36Mbit/s with audio)
Bit-rate	Fixed at CBR
Output	Interlaced format
GOP	Not available
Color Space	Fixed at 4:1:1 for NTSC, 4:2:0 for PAL
Audio	16-bit, 48KHz PCM

Note: For best results use a dedicated codec to encode DV-files other than the standard Microsoft DV-codec.

For example the free available Panasonic DV-codec:

http://www.free-codecs.com/download/Panasonic_DV_Codec.htm

Main Concept also offers a codec:

<http://www.mainconcept.com/site/prosumer-products-4/dv-codec-771/information-783.html>

2.7 BlackMagic Encoding settings:

BlackMagic Encoding	Parameters
Resolution	SD resolution: NTSC 720x480 pixels 30fr/sec recommended. PAL 720x576 Pixels 25Fr/sec not recommended for 60Hz output displays. HD resolutions: 720P30 or 1080P30 recommended.
Framerate	30 fr/sec advised for 60Hz display outputs.
Data-rate	Not available, Use '8-bit JPEG' setting
Bit-rate	Not available, use 'Highest Quality' setting
Output	Progressive output
GOP	Not available
Color Space	4:2:2 (UYUV)
Audio	16-bit only, 48KHz recommended

Note: The BlackMagic codec from BlackMagic Design can be downloaded and used in Adobe After Effects CS2-4 on PC.

Please make sure to use the **8-bit JPEG** setting only when encoding.

<http://www.blackmagic-design.com/support/software/>

Select the Decklink Series driver for PC to install the encoder.

2.8 Cineform Encoding settings:

Cineform Encoding	Parameters
Resolution	SD resolution: NTSC 720x480 pixels 30fr/sec recommended. PAL 720x576 Pixels 25Fr/sec not recommended for 60Hz output displays. HD resolutions: 720P30 or 1080P30 recommended.
Framerate	30 fr/sec advised for 60Hz display outputs.
Data-rate	Not available
Bit-rate	Not available
Output	Progressive output
GOP	Not available
Color Space	4:2:2
Audio	16-bit only, 48KHz recommended

The Cineform Codec info can be found at:

<http://www.cineform.com/prospecthd/>

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3. 3rd party Encoder packages

3.1 Encoding packages for PC:

- QuickTime Pro for PC

<http://www.apple.com/quicktime/pro/>

- TMPGEnc Express

<http://tmpgenc.pegasys-inc.com/en/product/te4xp.html>

- Canopus ProCoder

<http://desktop.grassvalley.com/products/ProCoderSW/index.php>

- Elecard Convertor Studio Pro

<http://www.elecard.com/products/products-pc/consumer/converter-studio/>

- Telestream Episode

<http://www.telestream.net/episode/overview.htm>

3.2 Encoding packages for MAC:

- QuickTime Pro for MAC

<http://www.apple.com/quicktime/pro/>

- QTAmateur (Free Batch encoding)

<http://www.mikeash.com/?page=software/qtamateur/>

- Telestream Episode

<http://www.telestream.net/episode/overview.htm>

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4. Image Formats

The Maxedia can import pictures from different formats.

Supported Image Formats	File extention
Maxedia is optimized for efficient playback up to 2K images. Performance and resources are used quickly when importing higher resolutions. And therefore not recommended. Resolutions does not need to be fixed at 4:3 or 16:9 aspect ratio.	
Portable Network Graphics	.png (supports Alpha Channel)
Bitmap	.bmp
Joint Photographic Experts Group	.jpg / .jpeg

5. 3D Object Format.

The Maxedia supports also 3D objects.

3D Objects	File extention
Maxedia can import DirectX 3D objects. These can be exported from the well known 3D packages like 3DS Studio Max, Blender, Maya, ...	
DirectX 3D Object	.x

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6. Text file Format.

The Maxedia ASCII text plug-in can use imported texts to display on a layer.

Text File Format	File extention
Maxedia can import text files to display through the ASCII Plug-in. Only pure ASCII formated text with no formating are supported. Recommended file editors are NotePad, WordPad. Words or sentences separated with a 'return' will trigger the Maxedia plug-in to start a new line while scrolling or fading.	
Text File Format	.txt

Comments: