Using the Matrox VFW Software Codecs

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Digital Video Solutions

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Supported formats: DV/DVCAM, DVCPRO, DVCPRO50, DVCPRO HD, MPEG-2 I-frame SD, MPEG-2 I-frame HD (includes 720p, full-size 1080i/p, and 1440x1080i/p), MPEG-2 I-frame SD + Alpha, MPEG-2 I-frame HD + Alpha, Offline HD, HDV and EZ-HDV (playback only), Uncompressed 8-bit and 10-bit SD, Uncompressed 8-bit and 10-bit HD, Uncompressed 8-bit and 10-bit SD + Alpha, Uncompressed 8-bit and 10-bit HD + Alpha, EZ-MXF (playback only), and Motion-JPEG (playback only).

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Overview

The Matrox Video for Windows (VFW) software codecs let you render and play back Matrox *.avi* files in your VFW programs without having Matrox video hardware installed. For example, you could use the Matrox VFW software codecs on a remote workstation to create a rough cut of your project, and then copy the project and assets to a Matrox video editing system, such as Matrox MXO2, to finish the job.

The following VFW software codecs are provided for use on Windows 32-bit and 64-bit operating systems:

- Matrox DV/DVCAM
- Matrox DVCPRO
- Matrox DVCPRO50
- Matrox DVCPRO HD
- Matrox MPEG-2 I-frame in SD and HD resolutions, with or without alpha
- Matrox Uncompressed in SD and HD resolutions, with or without alpha
- Matrox Offline HD (playback only)
- Matrox M-JPEG and HDV (playback only)[1]

When rendering compositions or animations that have an alpha channel, you can select a "+ Alpha" Matrox VFW codec to render to a Matrox uncompressed or MPEG-2 I-frame *.avi* file that contains the alpha-key information. This *.avi* file will be automatically keyed when you place the clip in an Adobe Premiere Pro sequence.

The following sections explain the various settings that you need to make to render material to a Matrox *.avi* file using a VFW program.

Note Although Matrox has tested many VFW programs, there may be certain operational limitations when using the Matrox VFW codecs with some of these programs (as well as with untested programs).

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[1] Support is also provided for playing back Matrox EZ-HDV and EZ-MXF reference *.avi* files.

Before you start rendering

Before you start rendering material to a Matrox *.avi* file, make the following settings in your VFW program:

- Set the frame size (width and height) of your rendered material to full-screen, depending on the codec that you'll be using.
  - DV/DVCAM, DVCPRO, DVCPRO50, or MPEG-2 I-frame SD:
    - 720×480 to render to NTSC or 480/486p format.
    - 720×576 to render to PAL or 576p format.
  - Uncompressed SD[1]:
    - 720×480 or 720×486 to render to NTSC or 480/486p format.
    - 720×576 to render to PAL or 576p format.
  - MPEG-2 I-frame HD:
    - 1280×720 to render to 720p format.
    - 1440×1080 to render to 1440×1080i/p format.
    - 1920×1080 to render to full-size 1080i/p format.
  - DVCPRO HD or Uncompressed HD:
    - 1280×720 to render to 720p format.
    - 1920×1080 to render to 1080i/p format.
- Set the appropriate frame rate for the video format to which you are rendering. For example, if you are rendering to PAL format, set the frame rate to 25 fps.
- If available, select the "Recompress" option. This allows you to render video using the same compression format, frame size, and frame rate as your source video but using a different data rate, scanning mode (interlaced or progressive), or bit depth (8-bit or 10-bit).
- If you'll be rendering audio, set the audio sample rate to 48 kHz and the sample size to 16-bit (mono or stereo).
- For best results, make sure that there is no data rate limit set in your program for rendered material. This ensures that your *.avi* files will be rendered at the particular data rate you select.

Note   Before rendering a lot of material, check that your rendered animations and transitions such as wipes and slides play back smoothly. If they appear jumpy, try adjusting the field dominance or field order for your rendered material.

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[1] The Matrox Uncompressed SD + Alpha codec does not support 720x480 clips. Refer to the documentation for your Matrox video editing system to determine the required frame size for creating Matrox Uncompressed SD clips for use on your system.

Selecting color space conversion options

When you render material to an *.avi* file using a Matrox VFW codec, you can determine how you want the luminance levels and chroma information to be processed during the color space conversion that's performed during the render.
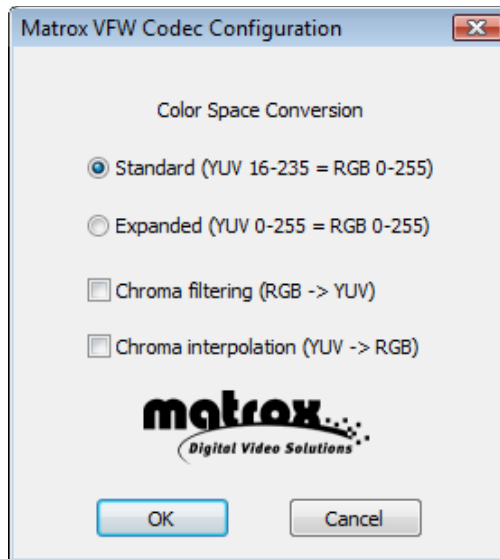
Note   The default settings for color space conversion provide good results for most applications. It's recommended that you change these settings only when needed for special purposes.

To select the color space conversion options you want:

1 Choose **Start > All Programs > Matrox VFW Software Codecs > Matrox VFW Codec Configuration**.

2 In the provided dialog box under **Color Space Conversion**, select the options you want:

   – **Standard**   Renders video using standard broadcast luminance levels. Super black and super white luminance levels are clipped.

   – **Expanded**   Renders video using the full range of luminance levels. Super black and super white luminance levels are retained. You may want to use this setting, for example, to render material on which you'll be applying luminance key effects.

Important   When rendering RGB graphics, selecting **Expanded** will create super black and/or white in your rendered images. For example, all black in your RGB graphics will become super black, and white will become super white. To render your RGB graphics with standard black and white levels, set your luminance range to **Standard**.

Before you start rendering

– **Chroma filtering** and **Chroma interpolation**   Select these options to adjust the chroma bandwidth of RGB graphics. This improves images that have abrupt changes between different colors, such as a blue box on a black or white background. You should select these options for most animation and compositing work (computer-generated material). For most video editing programs, however, it's best that you **not** select these options. If you find that your rendered images appear to be blurred, try clearing one or both of these options.

3   Click **OK** to save your settings. Any change you make to your selected luminance range setting (such as switching from **Standard** to **Expanded**) will only take effect the next time you start your VFW program.

Rendering material to a Matrox VFW .avi file

When you render material to an *.avi* file, such as when you render a finished video production or an animation, you must select the compressor (codec) you want to create the file. The compressor determines the quality of your rendered video. Refer to your program's documentation for instructions on how to select a compressor for your *.avi* file.

⟹ **To create a Matrox VFW .avi file:**

1   Select one of the following codecs from your program's list of available compressors:

– **Matrox DV/DVCAM**   Renders video to DV or DVCAM format.

– **Matrox DVCPRO**   Renders video to DVCPRO format.

– **Matrox DVCPRO50**   Renders video to DVCPRO50 or D-9 format.

– **Matrox DVCPRO HD**   Renders video to DVCPRO HD format (for 1080i and 720p video only).

– **Matrox MPEG-2 I-frame**   Renders video to MPEG-2 intra-frame format using the 4:2:2 Profile @ Main Level at a selected data rate (SD resolution only).

– **Matrox MPEG-2 I-frame + Alpha**   Renders video to MPEG-2 intra-frame format with alpha using the 4:2:2 Profile @ Main Level at a selected data rate (SD resolution only).

– **Matrox MPEG-2 I-frame HD**   Renders video to MPEG-2 intra-frame format using the 4:2:2 Profile @ High Level at a selected data rate.

– **Matrox MPEG-2 I-frame HD + Alpha**   Renders video to MPEG-2 intra-frame format with alpha using the 4:2:2 Profile @ High Level at a selected data rate.

– **Matrox Uncompressed SD**   Renders video to 8-bit or 10-bit uncompressed SD format.

 – **Matrox Uncompressed SD + Alpha**   Renders video to 8-bit or 10-bit
 uncompressed SD format with alpha.

 – **Matrox Uncompressed HD**   Renders video to 8-bit or 10-bit
 uncompressed HD format.

 – **Matrox Uncompressed HD + Alpha**   Renders video to 8-bit or 10-bit
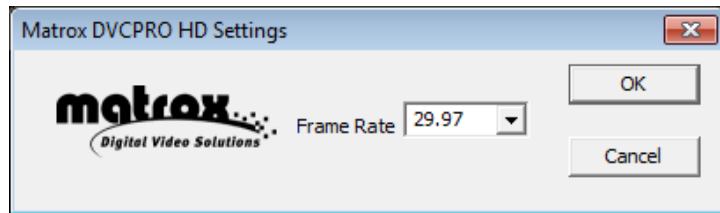 uncompressed HD format with alpha.

Note   The Matrox Offline HD codec is not supported for rendering clips.
This codec is provided only for playback of legacy Matrox Axio offline HD
projects.

2 If you've selected a Matrox codec that requires configuration, click the
button provided by your program that allows you to configure your codec
settings. For more details, see the following sections.

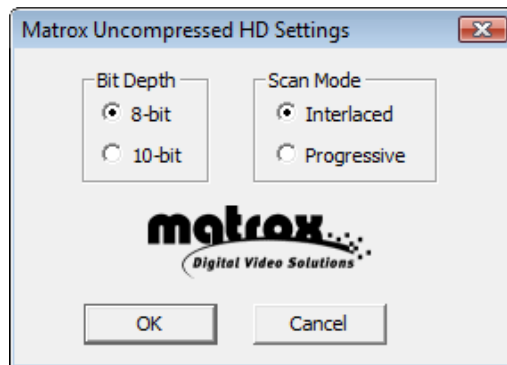## Configuring the Matrox DVCPRO HD codec

When you choose to configure the Matrox DVCPRO HD codec, a dialog box
similar to the following appears:

From the **Frame Rate** list, make sure that you select the frame rate that matches
the frame rate specified for rendering video in your editing application.

Configuring the Matrox Uncompressed codecs

When you choose to configure a Matrox Uncompressed codec (SD or HD
resolution), a dialog box similar to the following appears:

Rendering material to a Matrox VFW .avi file

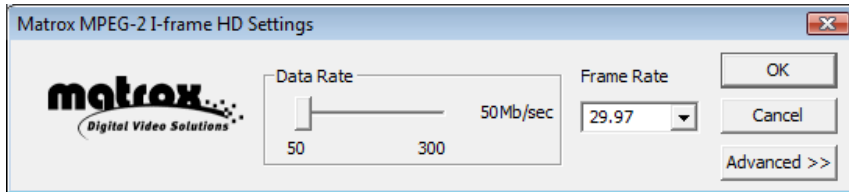1 Under **Bit Depth**, select the bit depth you want for your video.

✎ **Note** Matrox RT.X2 does not support 10-bit uncompressed video.

2 Under **Scan Mode**, select the scan mode of your video.

3 Click **OK** to save your selection. The settings you selected will be used each time you render material with your program, until you change the settings again.

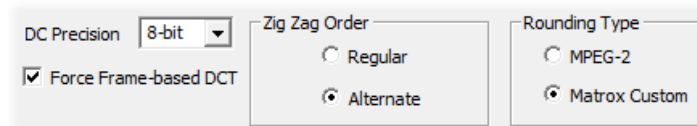## Configuring the Matrox MPEG-2 I-frame codecs

When you choose to configure a Matrox MPEG-2 I-frame codec (SD or HD resolution), a dialog box similar to the following appears:

1 Drag the **Data Rate** slider until your desired data rate is displayed. The higher the data rate you select, the better the video quality will be. Depending on the capabilities of your system, however, you may not be able to smoothly play back video at a high quality using your VFW program.

2 Beside **Frame Rate**, select a frame rate from the list. Make sure the frame rate you select is appropriate for the format to which you are rendering.

3 To apply advanced settings to your MPEG-2 I-frame file, click the **Advanced** button.

✎ **Note** The default advanced settings should provide good results for most applications. It's recommended that you change these settings only when needed for special purposes.

4 Beside **DC Precision**, select the bit-depth precision of the DC intra block. The higher the DC precision value that's used to render your video, the more likely that the DC content will be increased at the expense of the AC content in the encoded stream. This may result in lowering the overall quality of the compressed stream at a specified data rate.

5 Under **Zig Zag Order**, select one of the following:

- **Regular**   Sets the regular (default) zig zag scanning pattern of the AC coefficient of the DCT block as defined in the ISO/IEC 13818-2 (figure 7-2) specification documentation.

- **Alternate**   Sets an alternate zig zag scanning pattern of the AC coefficient of the DCT block as defined in the ISO/IEC 13818-2 (figure 7-3) specification documentation. Use this setting when capturing or rendering video at a high data rate (for example, at a data rate of 100 Mb/sec or higher).

6 Under **Rounding Type**, select one of the following:

- **MPEG-2**   Rounds the AC coefficients up to the nearest whole number when calculating the quantization coefficient.

- **Matrox Custom**   Truncates the AC coefficients to the lowest whole number when calculating the quantization coefficient. In some cases, this setting may yield less artifacts in graphics.

7 Select the **Force Frame-based DCT** setting to render macroblocks as frames rather than as fields. In some cases, graphics will yield less artifacts if this option is selected.

8 Click **OK** to save your settings. The settings you selected will be used each time you render material with your program, until you change the settings again.

Your notes

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