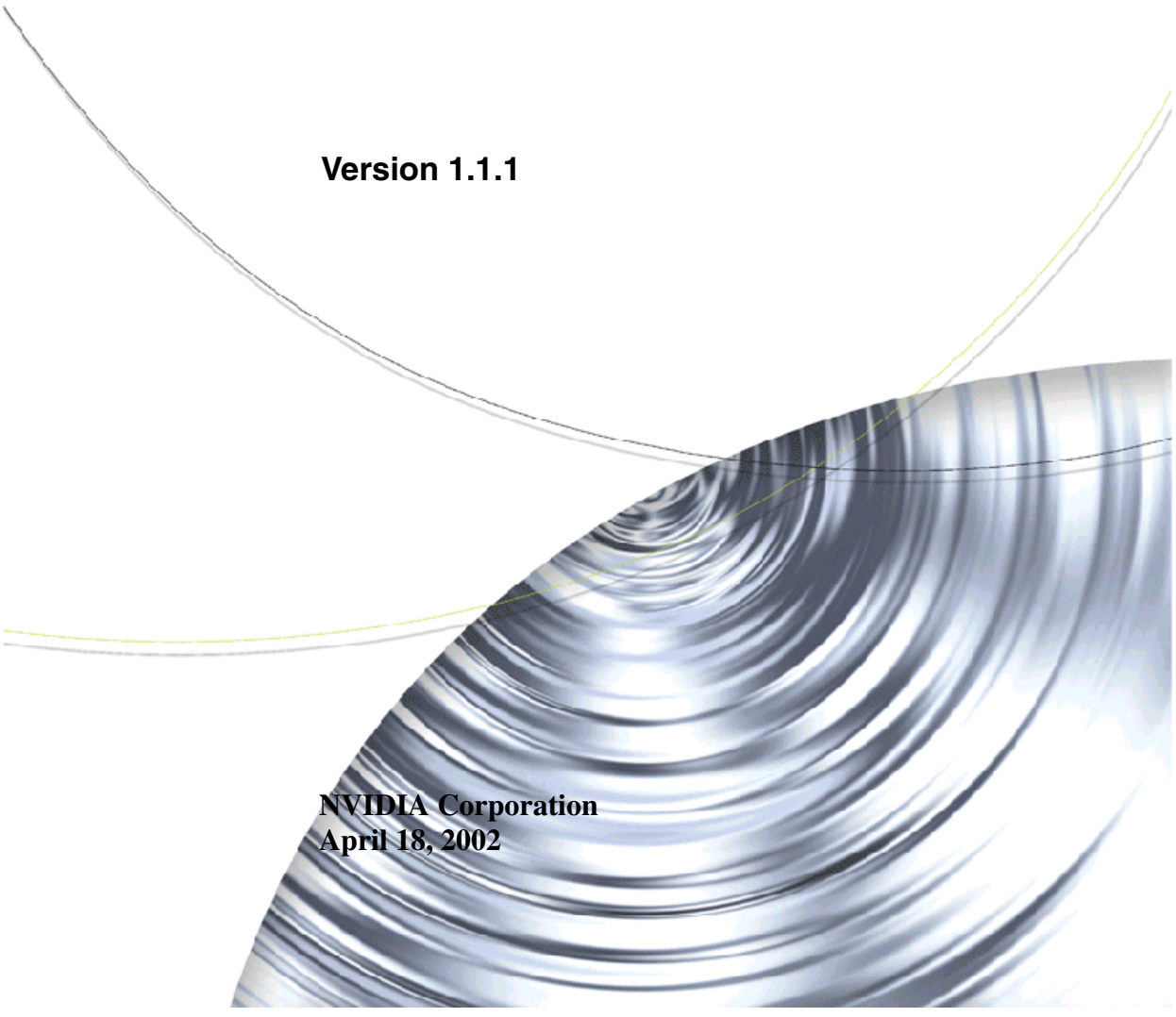
Workstation Applications

ELSA MAXtreme User's Guide

Version 1.1.1



NVIDIA Corporation
April 18, 2002

Confidential Information

Published by
NVIDIA Corporation
2701 San Tomas Expressway
Santa Clara, CA 95050

Table of Contents

CHAPTER

1

OVERVIEW OF ELSA MAXTREME

What Is ELSA MAXtreme?

The ELSA MAXtreme™ 3D application driver is a tool that enhances the productivity of 3D Studio® applications such as 3ds max™ 4, 3D Studio MAX®, and 3D Studio VIZ®.

The driver allows you to control the application's viewport display quality and rendering speed, as well as enable a variety of rendering enhancements.

The ELSA MAXtreme 3D driver is optimized for use with an NVIDIA® Quadro™ based graphics card, which increases the capabilities of the driver's interactive renderer.

ELSA MAXtreme Features

The following sections provide an overview of the key features in ELSA MAXtreme:

Wireframe Viewport Options

- Apply antialiasing to wireframes
- Render wireframes using triangle strips
- Customize the vertex dot size

Rendered (Shaded) Viewport Options

- Apply antialiasing to edged faces
- Render using the environmental background color
- Render fogging
- Customize the vertex dot size
- Configure magnification texture filtering for quality or speed
- Configure minification texture filtering for quality or speed
- Control anisotropic texture filtering
- Compress textures for quality or speed
- Control background texture size
- Control material texture size

MAXtremeStereo

ELSA MAXtreme supports stereo viewing within viewports through the MAXtremeStereo plug-in software, which can be installed with the ELSA MAXtreme driver software.

See "MAXtreme Stereo Requirements" on page 15 for a list of hardware required to view 3D stereo.

MAXtremeRender (for ELSA MAXtreme Release 3 *only*)

The ELSA MAXtremeRender feature is *only* available with ELSA MAXtreme Release 3 versions under 3D Studio Release 3 applications. This feature is part of the 3D Studio Release 4 applications (such as 3ds max 4) and, therefore, not available as a separate ELSA MAXtreme Release 4 feature.

See "MAXtremeRender for ELSA MAXtreme Release 3" on page 18.

Online Help

Within the 3D Studio application, when you have any ELSA MAXtreme dialog box open, press **F1** to display online Help, which provides user information about ELSA MAXtreme features and configuration options.

During ELSA MAXtreme installation, MAXtreme Help (a `.chm` file) is usually installed in the 3D Studio Help directory. You can also view the Help outside the application, if needed.

System Requirements

General Requirements

- **Hard Disk Space:** 2.5 MB free hard disk space
- **Graphics Card:** Workstation graphics card based on the NVIDIA Quadro™ , Quadro™2, Quadro™ DCC, or Quadro™4 product families.

  Table 1.1 lists the equivalent ELSA graphics cards.

Table 1.1 GPUs Supported by ELSA MAXtreme

ELSA Graphics Card	NVIDIA GPU
	Quadro™4 500 GoGL
	Quadro4 900 XGL
	Quadro4 750 XGL
	Quadro4 700 XGL
	Quadro4 550 XGL
	Quadro™2 Go
ELSA GLoria™ DCC	Quadro DCC™
ELSA GLoria III	Quadro2 Pro™
ELSA Synergy™ III	Quadro2 MXR™
ELSA Synergy 2000	Quadro2 EX™
ELSA GLoria II	Quadro

Note: ELSA MAXtreme 3.*xx* and later releases will not run with the ELSA Synergy II graphics card. Older versions (*earlier than Release 3*) of ELSA MAXtreme can run with ELSA Synergy II with ELSA driver software.

- **Operating System:** Windows® XP,Windows® 2000 or Windows NT® 4 (Service Pack 4 or higher)
- **3D Studio Application:** You must have one of the following 3D Studio applications installed on your computer *before* installing ELSA MAXtreme.[1]
  - 3ds max 4
  - 3D Studio MAX Release 3
  - 3D Studio VIZ Release 3i
  - 3D Studio VIZ Release 3
- **NVIDIA Driver:** The NVIDIA Detonator™ 3 (v6.46 or later) or Detonator XP driver for Windows XP, Windows 2000, or Windows NT 4.0 must be installed.

Stereo Requirements

- MAXtremeStereo plug-in software installed during the ELSA MAXtreme driver installation
- Stereo shutter glasses

1. ELSA MAXtreme 4 (and 4.00.*xx* versions) works with 3ds max 4 but is not compatible with 3D Studio MAX 3.

CHAPTER

2

INSTALLING ELSA MAXTREME

This chapter contains the following sections:

Installation Files

The ELSA MAXtreme **Setup directory** contains the following files:

- **`Readme.txt`** file
- **`Setup.exe`** installation program for Windows

  The ELSA MAXtreme Setup program automatically installs the version of ELSA MAXtreme (Release 3 or Release 4) that is compatible with your installed version of the 3D Studio MAX/VIZ application. For details, see "System Requirements" on page 3.
- **Other files** required for installation

During ELSA MAXtreme installation, MAXtreme Help (`.chm` file) is usually installed in the 3D Studio Help directory.

Installing ELSA MAXtreme

1. Be sure you meet the requirements in "System Requirements" on page 3.
2. Be sure you have a 3D Studio application installed on your system; see "3D Studio Application" on page 5 for details.
3. From the Setup directory, click the **Setup.exe** program and follow the instructions that appear in the Install Shield prompts.

Note: If the installation program stops processing and generates an error message, try to run it with Administrator access rights.

Uninstalling ELSA MAXtreme

Uninstall MAXtreme using the Windows Control Panel Add/Remove function as follows:

1. From the Windows desktop, click **Start > Settings > Control Panel > Add/Remove Programs**.
2. Click the **Add/Remove Programs** icon.
3. Click **ELSA MAXtreme** from the list.
4. Click the **Change/Remove** button.
5. Follow the instructions from the Install Shield program to complete uninstallation.

CHAPTER 6

3

USING ELSA MAXTREME

ELSA MAXtreme Driver Configuration

Accessing ELSA MAXtreme Driver Settings

The first time that ELSA MAXtreme is used, the Driver Configuration dialog box appears when you start the 3D Studio application.

To access the ELSA MAXtreme Driver Configuration dialog box *after first-time use*, follow these steps:

For ELSA MAXtreme 3 -

If you are running ELSA MAXtreme 3 in a 3D Studio Release 3 application, click the **ELSA MAXtreme** menu, then click **Configuration**.

The ELSA MAXtreme Configuration dialog box appears, as shown in Figure 3.2

For ELSA MAXtreme 4 -

If you are running ELSA MAXtreme 4, follow the steps below.

1 From the application's main menu, click Customize->Preferences.

The 3D Studio Preferences dialog box appears (see Figure 3.1).

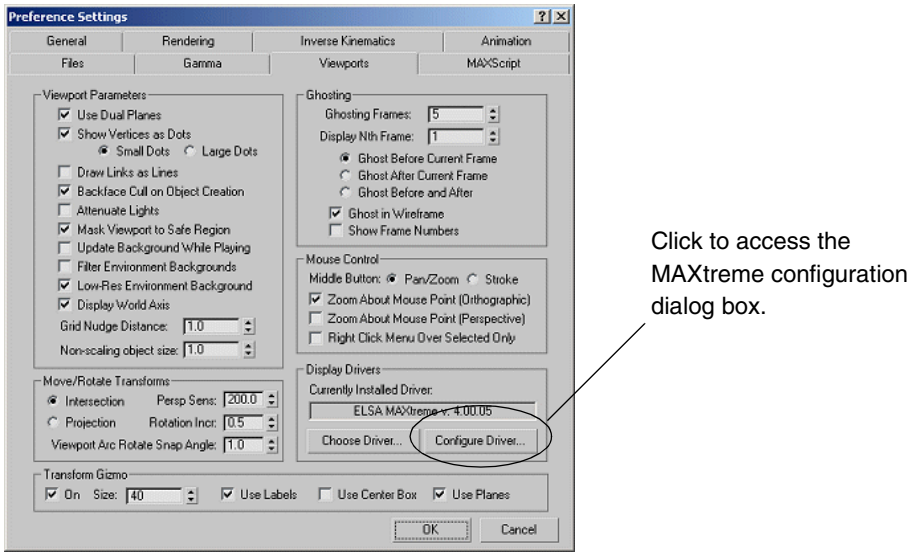


Figure 3.1 3ds max Preference Settings Page

2 In the Display Driver section, click Configure Driver.

The ELSA MAXtreme Configuration dialog box appears, as shown in Figure 3.2.

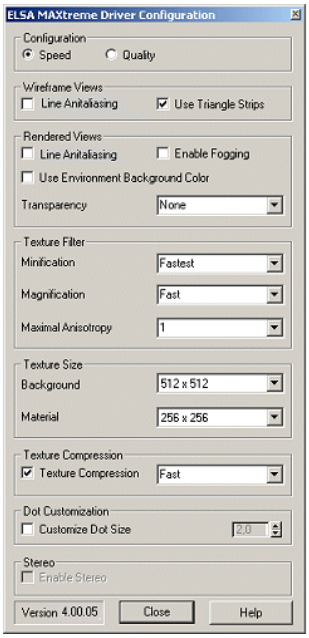


Figure 3.2 ELSA MAXtreme Driver Configuration Page

Auto-configuring for Speed or Quality

The Configuration section of the MAXtreme Driver Configuration panel allows you to choose between optimum speed or optimum quality (see Figure 3.3).

Choosing Speed or Quality automatically configures several control panel settings to achieve the desired optimization, as listed in Table 3.1.

Table 3.1 Speed and Quality Settings

Section	Option	Speed Setting	Quality Setting
Wireframe View	Line Antialiasing		X
	Use Triangle Strips	X	
Rendered Views	Line Antialiasing		X
	Use Environment Background Color		X
Texture Filter	Minification	Fastest	Nicest
	Magnification	Fast	Nice
Texture Compression		(X) Fast	

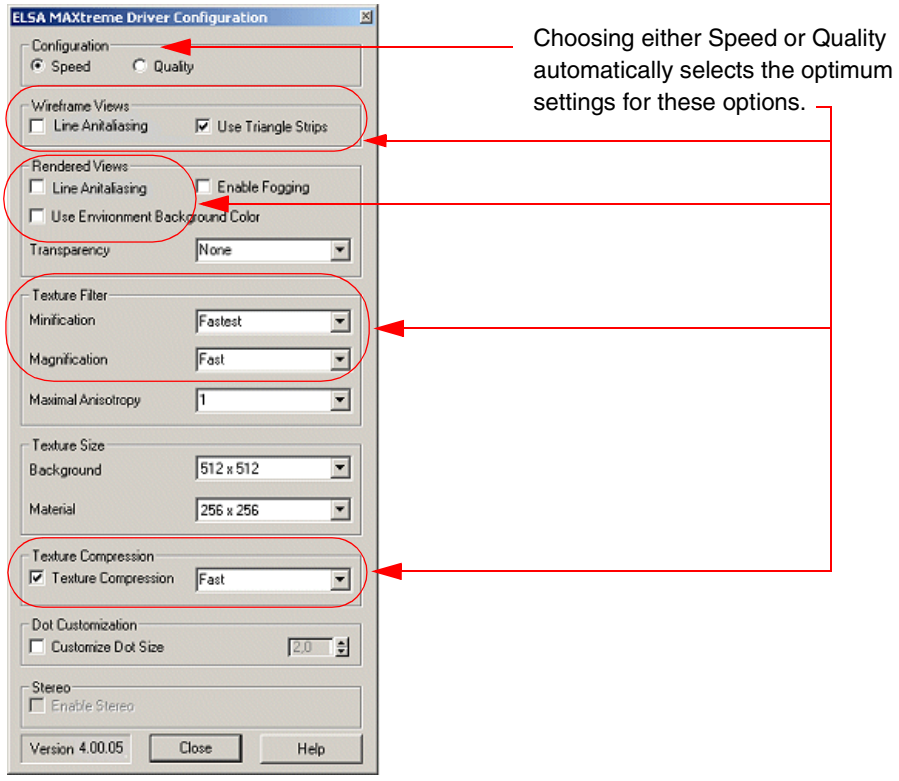
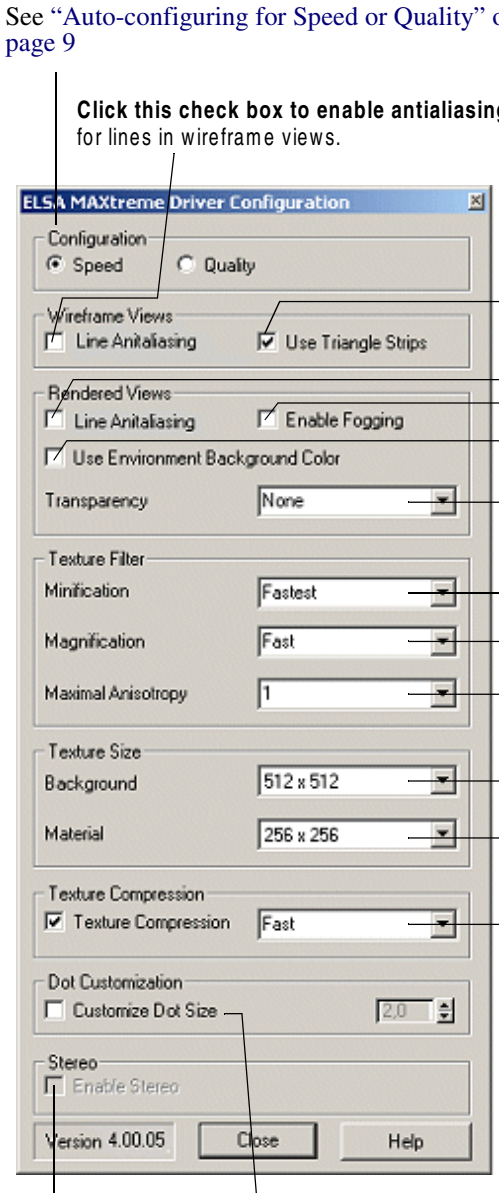


Figure 3.3 Sections Affected by Speed and Quality Setting

Configuring Individual Settings

Figure 3.4 gives basic descriptions of the MAXtreme configuration settings. Additional information for these settings are given later in this section.



See "Auto-configuring for Speed or Quality" on page 9

Click this check box to enable antialiasing for lines in wireframe views.

Displays vertices as dots. Click the check box and choose a dot size from smallest(1) to largest (11).

See "MAXtreme Stereo" on page 15

Click this check box to enable the use of triangle strips in wireframe views.

Click this check box to enable antialiasing of wireframe lines in rendered views, when edged faces are enabled.

Click this check box to enable the display of fog in rendered camera views.

Click this check box to display environment background color in rendered views.

MAXTreme 3 only. See "Transparency Modes" on page 12

Choose the minification texture filter method::
Fastest - Provides the fastest rendering but can also result in severe aliasing artifacts.
Fast - Provides smoother results than the Fastest setting.
Medium - Can result in minor aliasing artifacts.
Nice - Provides smoother results than the Medium setting.
Nicest - Provides the smoothest results.

Choose the magnification texture filter method:
Fast - Provides fast rendering but can also result in aliasing artifacts
Nice - Provides smoother results than the Fast setting.

Choose the maximum degree of anisotropy needed to compensate for texture filtering.

Choose a background texture size. The 3D Studio application scales the image textures to the specified size. The larger the size, the better the image quality.

Choose a material texture size. The 3D Studio application scales the image textures to the specified size. The larger the size, the better the image quality.

Reduces texture memory usage. Click the check box and choose either Fast (more compression) or Nice (less compression).

Figure 3.4 MAXtreme Driver Configuration Settings

Explanation of Configuration Settings

This section provides additional information about the settings in the driver configuration control panel.

Configuring Wireframe Viewports

Wireframe viewports can be configured to display wireframes using antialiased lines and/or using triangle strips.

- **Antialiasing**

  This option is automatically chosen with the Quality configuration.

- **Triangle Strips**

  Triangle strips are a form of surface representation that renders efficiently using the graphics hardware, and results in faster rendering. This option is automatically chosen with the Speed configuration.

Configuring Rendered (Shaded) Viewports

The following are enhancements that can be made in Rendered Views.

- **Antialiasing**

  In rendered views with edged faces enabled, the shaded objects are overlaid by the wireframe mesh. The overlaid lines can be antialiased. This option is automatically chosen with the Quality configuration.

  On some hardware, antialiasing may slow down rendering performance.

- **Fogging**

  ELSA MAXtreme supports the display of fog under the following conditions:

  - Only one Linear or Exponential Standard Fog is supported; additional Standard Fogs and all Layered Fogs are ignored.
  - An Environment Color Map or Environment Opacity Map is not in use with this Standard fog.

  Fog thickness is controlled by the Camera Environment Range.

- **Environment Background Colors**

  ELSA MAXtreme supports the use of Environment Background Color. Check the *Use Environment Background Color* check box and then select the desired background color from the application's Environment page.

  Note: After you change the Environment Background Color, the viewport may not be immediately updated with the new color until the application redraws the image.

Transparency Modes

*The Transparency feature is an ELSA MAXtreme **Release 3 feature only**, and does not apply to ELSA MAXtreme Release 4.*

ELSA MAXtreme supports the display of various transparency modes for elements that have an opacity of less than 100.

- **None**

  Transparent elements are drawn opaque. This is the fastest mode, and is chosen automatically with the Speed configuration.

- **Screen Door**

  Transparent elements are drawn using varying concentrations of dots, allowing the elements behind to be visible. This is the standard mode.

- **Blended**

  Transparent elements are drawn transparent. The elements are not sorted, so the result depends on the camera position.

  When single-sided materials are used, differences between this mode and the Sorted Blended mode are not readily apparent.

  This mode is fairly fast using the current graphics hardware.

- **Sorted Blended**

  Transparent elements are first sorted and then drawn transparent from front to back, which produces an impressive transparency. This mode is fairly slow, and is automatically chosen with the Quality configuration.

Texture Filtering Options

Texture filters control the appearance of texture mapping. Following are the texture filter controls that can be controlled with MAXtreme.

Note: After changing the settings described here, the image may not reflect the changes until the application reloads the textures.

- **Minification**

  The Minification filter is used when the pixel being textured maps to an area in the texture greater than one texture element (texel). MAXtreme uses the following Minification texture-filtering methods:

  - **Fastest:** This method uses the texel closest to the center of the pixel to texture the entire pixel. Since only part of the texture is used, this method can result in severe aliasing artifacts.

    This method is automatically chosen with the Speed configuration.

  - **Fast:** This method uses a weighted linear average of the 2x2 array of texels that are closest to the center of the pixel. The results are smoother than the 'Fastest' method.

  - **Medium:** This method first selects the LOD from the mipmap pyramid where the mapped texel area is closest to the size of a pixel. From this LOD, the single texel that is closest to the center of the pixel is selected and mapped to the pixel.

    This method can result in minor aliasing artifacts.

  - **Nice:** This method first selects the LOD (from the mipmap pyramid) where the mapped texel area is closest to the size of a pixel. From this LOD, the 2x2 array of texels closest to the center of the pixel is selected. Finally, the weighted linear average of the texel array is computed and mapped to the pixel.

    This method provides smoother results than the Medium method.

  - **Nicest:** This method first selects the LODs (from the mipmap pyramid) where the mapped texel areas are closest to the size of a pixel. From each of the selected LODs, the weighted linear average of the 2x2 array of texels closest to the center of the pixel is computed. Finally, the linear interpolation between the two averages is determined and mapped to the pixel, resulting in true tri-linear filtering.

    This methods yields the best results, and is automatically chosen with the Quality configuration.

- **Magnification**

  The Magnification filter is used when the pixel being textured maps to an area in the texture less than or equal to one texture element (texel). MAXtreme uses the following Magnification texture-filtering methods:

  - **Fast:** This method uses the single texel closest to the center of a pixel. One texel may be mapped to more than one pixel.

    This method can result in aliasing artifacts, and is automatically chosen with the Speed configuration.

  - **Nice:** This method uses a weighted linear average of the 2x2 array of texels that are closest to the center of a pixel. The results are smoother than the 'Fast" method.

    This method is automatically chosen with the Quality configuration.

- **Maximal Anisotropy**

  This option provides a mechanism for supporting anisotropic texture filtering schemes. You can specify the maximum degree of anisotropy to account for texture filtering.

Texture Size Control

- **Background Texture Size**

  The background textures can be scaled to the selected size. The smaller the size, the less memory is required to render it. The larger the size, the more texture detail is visible.

- **Material Texture Size**

  The material textures can be scaled to the selected size. The smaller the size, the less memory is required to render it. The larger the size, the more texture detail is visible.

Texture Compression

Texture compression reduces the memory required for rendering. For example, the amount of memory required to render an image with a background texture size of 64x64 is similar to that required for an image with a background texture size of 256x256 with compression enabled. The 256x256 texture size results in a better quality image, while compression keeps the memory requirement down.

Customizing Dot Sizes

You can display vertices as dots and also control the dot size to a greater degree than what is provided in the 3D Studio applications. These applications offer a choice of small or large dots, which might not be adequate for the display resolution.

Through the MAXtreme configuration panel, the dot size can be adjusted from 1 to 11, in increments of 0.125.

MAXtreme Stereo

MAXtreme Stereo Requirements

To view your drawings and animations in true stereo, in addition to the "System Requirements" on page 3, you need:

- **NVIDIA Quadro GPU-based graphics card** in a resolution and color depth that is appropriate for stereo buffering.

  In Stereo mode, every frame is drawn twice; once for the left eye and once for the right eye. As a result, you only get half the refresh rate for each eye. Therefore, it is recommended that you use the highest refresh rate that your hardware supports.

- **Stereo shutter glasses**
- **MAXtremeStereo software** (part of the ELSA MAXtreme installation package)

Accessing ELSA MAXtreme Stereo Settings

1. Be sure you installed the MAXtreme Stereo Render software together with the ELSA MAXtreme driver installation.
2. Start the 3D Studio application from which you will access ELSA MAXtreme. On first-time use of ELSA MAXtreme, the Driver Configuration dialog box appears ().
3. Click the **Stereo** check box to enable the option; click **OK** to complete configuration.
4. To access the ELSA MAXtreme Stereo dialog box, follow these steps:

   For ELSA MAXtreme 3 -

   Click the **ELSA MAXtreme** menu, then click **Stereo**.

   For ELSA MAXtreme 4 -

   1. In the main 3D Studio application window, click the "hammer" icon on the right panel to display the **Utilities** tab.
   2. Click the **Utilities** tab, then click the **More** tab.

3 From the Utilities list box that appears, click **ELSA MAXtreme Stereo**, then click **OK**. The ELSA MAXtreme Stereo dialog box appears (3).

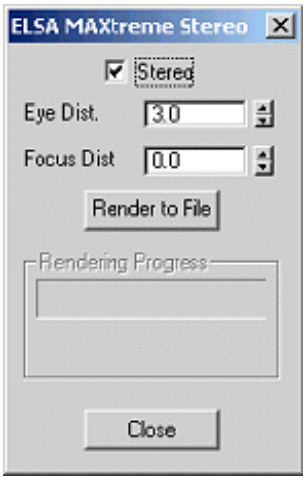


Figure 3.5 ELSA MAXtreme Stereo Settings

Using the MAXtreme Stereo Dialog Box

1 To display the current viewport in stereo, click the Stereo check box.

- MAXtreme Stereo settings correspond to the current viewport. Every Perspective View (and therefore every Camera View) can be switched to Stereo.
- If the current viewport is a parallel projection, the Stereo button and all other interface elements are disabled.

2 To optimize stereo viewing comfort, use the two Spinner Controls to adjust the eye distance and the focus distance.

3 To render the Stereoscopic View in two files or sequences of files, click the Render to File button.

Note: For ELSA MAXtreme Release 3 only: MAXtremeStereo can be used with MAXtremeRender to produce Stereoscopic Views. However, MAXtremeStereo does not work with the MAXtremeRender when used with Perspective Non-camera Views; those views cannot be switched to Stereo.

MAXtremeRender for ELSA MAXtreme Release 3

ELSA MAXtreme 3 comes with MAXtremeRender[1], a utility that allows you to use the current software production renderer to render into a viewport. This method of rendering may not be as fast as using the graphics card hardware engine, but it is easy to use and provides better control of the final rendering.

Accessing the MAXtremeRender Controls

To activate the MAXtremeRender plug-in software—

1. Be sure you have installed ELSA MAXtreme.
2. Start the 3D Studio application from which you will access ELSA MAXtreme.
3. Click the **ELSA MAXtreme** menu, then select **Render**.

   The ELSA MAXtreme Render dialog box appears (Figure 3.6).

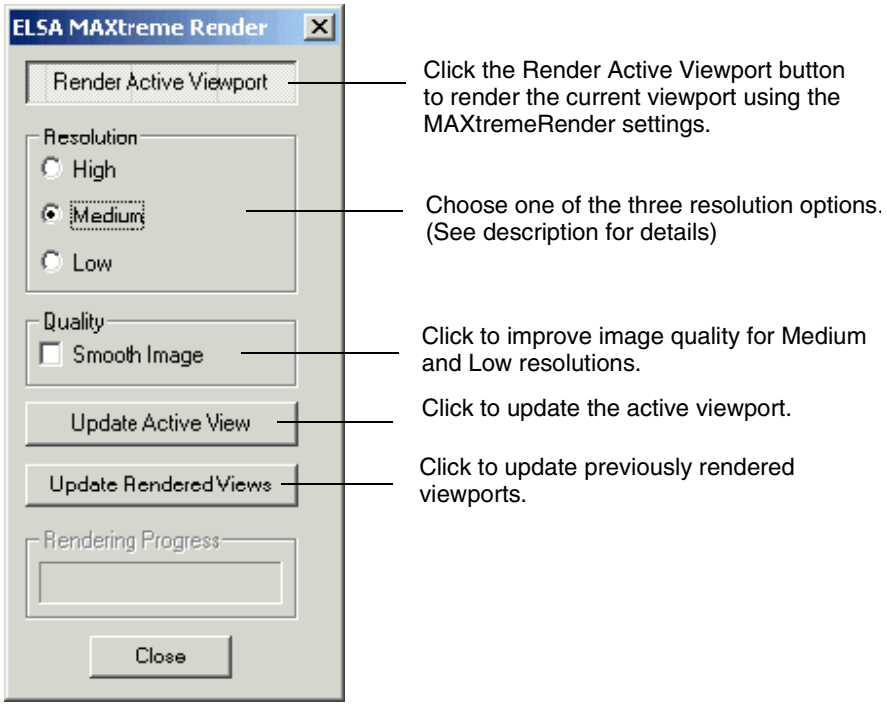


Figure 3.6 ELSA MAXtreme Render Controls

1. The ELSA MAXtremeRender feature is *only* available with ELSA MAXtreme Release 3 versions with 3D Studio Release 3 applications. This feature is part of 3D Studio Release 4 applications and is not available as a separate ELSA MAXtreme feature.

Using MAXtremeRender

As long as at least one viewport is rendered using the current software production renderer, the floating window containing the Update buttons and the progress indicator is open. The floating window remains on top even when the MAXtremeRender rollup is closed.

As soon as you switch off software rendering in all viewports, the MAXtreme dialog box closes. Note that when you close the dialog box, all viewports are switched to the interactive renderer.

Controlling the Active Viewport Rendering

The **Render Active Viewport** button controls the rendering in a viewport on a *per viewport* basis. When you change the active viewport, the button changes its state accordingly. Follow these steps to use the button as a **toggle**:

- Click the **Render Active Viewport** button to use the renderer in a viewport.
- Click the **Render Active Viewport** again to stop using the renderer in this viewport.

Controlling the Image Resolution

From the option buttons that appear in the dialog box, you can select the relative resolution to use in rendering—**High**, **Medium**, or **Low**.

Note: Higher resolutions take longer to render, but result in better image quality. The Low and Medium Resolution images can be improved by smoothing (see "Controlling the Image Quality" on page 19).

- **Resolution: High**

  In High Resolution, the image is created in the full viewport window size.

- **Resolution: Medium**

  In Medium Resolution, the image is created in half of the viewport width and height.

- **Resolution: Low**

  In Low Resolution, the image is created in a quarter of the viewport width and height.

Controlling the Image Quality

When using a Medium or Low Resolution to render into a viewport, blocks of 2x2 or 4x4 pixels represent one pixel of the rendered image.

In order to keep rendering time to a minimum and improve the image, select Smooth Image, which linearly interpolates the rendered image to the viewport window size.

- **Smoothing: Off**

  Without smoothing, an image rendered in low resolution shows severe aliasing effects. To turn smoothing off, uncheck the Smooth Image check box.

- **Smoothing: On**

  With smoothing, the same rendering is nearly as fast but the aliasing effects are less severe. To turn smoothing on, check the Smooth Image check box.

Updating the Images

Because the software production renderer is relatively slow, the viewports are not always updated automatically. To force an update, use one of two **Update** buttons to update either all rendered viewports or only the active viewport.

The **Rendering Progress** indicator shows activity when rendering with the software production renderer.