

TWL-System

Using NITRO-Viewer

2009/02/18

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Table of Contents

1	Introduction	6
2	Setup.....	7
2.1	NITRO-Viewer Package Contents	7
2.1.1	Software	7
2.1.2	Hardware	7
2.2	Installation	8
3	Functional Description	9
3.1	2D Preview Function.....	9
3.2	3D Preview Function.....	9
3.3	Simultaneous 2D/3D Preview Function	9
4	Operational Description	10
4.1	NITRO-Viewer Startup	10
4.1.1	Working with the IS-TWL-EMULATOR Hardware (red box)	10
4.1.2	IS-NITRO-EMULATOR Hardware (Blue Box)	10
4.1.3	Nintendo DS System Using IS-NITRO-UIC	10
4.1.4	ensata.....	11
4.2	2D Preview Operation.....	11
4.3	3D Preview Operation.....	12
4.3.1	Screen Information	12
4.3.2	Working with 3D Preview	15
4.4	Simultaneous 2D/3D Preview Operation	16
5	Limitations	18
5.1	3D Preview.....	18
5.2	2D/3D Simultaneous Preview	18

Tables

Table 4-1 2D Preview Operations.....	11
Table 4-2 Operation Icons	13
Table 4-3 3D Preview: Camera Operation Mode	15
Table 4-4 3D Preview: Light Operation Mode	16
Table 4-5 3D Preview: Animation Operation	16
Table 4-6 Simultaneous 2D and 3D Preview.....	16

Figures

Figure 2-1 Overview	7
Figure 4-1 2D Preview Screen	12
Figure 4-2 3D Preview Screen	13
Figure 4-3 Display of a Static Model.....	15
Figure 4-4 Simultaneous 2D/3D Preview Screen.....	17

Revision History

Revision Date	Description
2009/02/18	Deleted content related to IS-CGB-Emulator. Revised descriptions to include operation on IS-NITRO-UIC.
2008/10/08	Changed text specific to how IS-NITRO-UIC works, as it has yet to be made compatible with TWL-System.
2008/05/30	Revisions resulting from NITRO-System name change (updating to TWL-System).
2008/04/08	<ul style="list-style-type: none">• Changed the Revision History format.• Revised the document's subtitle and its page headers.
2007/04/20	<ul style="list-style-type: none">• Corrected typographical errors.• Changed dates in Revision History to international format C
2005/07/22	Added an operating method for the automatic movement feature in 2D Preview.
2005/06/20	<ul style="list-style-type: none">• Added a resident model display feature.• Added a feature for swapping the icons that display depending upon the camera operations mode.
2005/02/28	<ul style="list-style-type: none">• Added a feature to operate 3D animations with DS keys.• Added support for the screen capture feature of 3D Material Editor.
2005/01/31	<ul style="list-style-type: none">• Deleted descriptions regarding TEG due to the discontinuation of TEG support.• Standardized the notation of NITRO to Nintendo DS.• Added support for environment mapping and projection mapping.• Added support for changing multiple materials.
2004/12/13	Added a note in Limitations about the display of the process meter and animation bar.
2004/11/15	Added cautions regarding 3D material editor versions.
2004/10/06	Added IS-NITRO-UIC support.
2004/09/13	Added ensata support.
2004/09/02	<ul style="list-style-type: none">• Added feature that switches between top and bottom screen.• Support for preview with NITRO-CHARACTER
2004/08/17	<ul style="list-style-type: none">• Added animation bar and process meter.• Support for ima and ita animation preview.
2004/08/02	Initial release.

1 Introduction

NITRO-Viewer is an application that aids data creation by transferring data from 3D Material Editor and NITRO-CHARACTER to a TWL or Nintendo DS system to preview. The NITRO-Viewer package consists of the NITRO-Viewer, which operates on the TWL or Nintendo DS system, and the NITRO-Viewer Controller, which controls how data is received and processed from the PC.

When hardware resources are appropriately allocated to NITRO-Viewer, 2D and 3D previews can be displayed simultaneously on the screen of a Nintendo DS system.

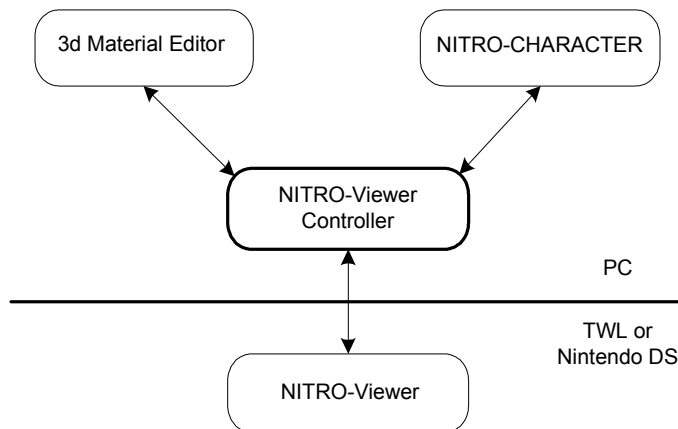
The following chapters describe NITRO-Viewer and its use.

2 Setup

2.1 NITRO-Viewer Package Contents

The NITRO-Viewer package consists of the following products.

Figure 2-1 Overview



2.1.1 Software

- NITRO-Viewer
Previews programs on Nintendo DS systems.
- NITRO-Viewer Controller
Receives and transfers data between the PC and NITRO-Viewer, and operates on data.
- Other Supported Applications
Displays data preview from applications such as 3D Material Editor and NITRO-CHARACTER on the NITRO-Viewer Controller.
- ensata
Emulates Nintendo DS hardware. This software is necessary when there is no TWL or Nintendo DS system.

2.1.2 Hardware

To use the NITRO-Viewer, one of the following development devices must be connected to the PC.

- IS-NITRO-EMULATOR Hardware (blue box)
- A Nintendo DS system that is connected to the IS-NITRO-UIC and the Nintendo DS Development Flash Card
- IS-TWL-EMULATOR Hardware (red box)

2.2 Installation

Use the following procedure to install and perform the initial configuration of NITRO-Viewer.

1. Expand TWL-System archives to appropriate folders on the PC.

NITRO-Viewer is included in the TWL-System package.

2. Run the following file within TWL-System to set the required environment variables:

```
TwlSystem\tools\NitroViewer\setup\setViewerRootEnv.wsf
```

To use NITRO-Viewer, the environment variables need to be set. You should run this program once when first setting up NITRO-Viewer.

Note: If you change the location of the NITRO-Viewer folder on your PC, you will need to run this program again.

This completes the setup of NITRO-Viewer.

To uninstall TWL-System, first run the following file to delete the environment settings. You can then delete the entire TWL-System folder.

```
TwlSystem\tools\NitroViewer\setup\removeViewerRootEnv.wsf
```


3 Functional Description

3.1 2D Preview Function

This function allows you to preview animation data, cells, and backgrounds on a Nintendo DS system while they are being created with NITRO-CHARACTER. Operations such as scrolling, moving, rotating, and scaling can be carried out on the display objects using the Nintendo DS system Controller. In addition, each frame of each operations target can be moved automatically in a fixed direction (up, down, left, and right).

See the *NITRO-Character* manual for more details on the 2D preview functions.

3.2 3D Preview Function

This function allows you to preview model and animation data on a Nintendo DS system while it is being created with 3D Material Editor. In addition to camera position, vector, and light vector functions executed by the Nintendo DS system Controller, a variety of settings can be made in 3D Material Editor to effect the data display on the Nintendo DS system.

See the *3D Material Editor* manual for more details on the 3D preview functions.

Caution: To allow 3D preview using this version of NITRO-Viewer, use version 2.7.0 (02/28/2005) or later of 3D Material Editor. Versions prior to 2.7.0 will not preview properly.

3.3 Simultaneous 2D/3D Preview Function

This function allows you to preview both 2D and 3D data on the Nintendo DS at the same time. You can allocate VRAM between 2D and 3D using the NITRO-Viewer Controller. Be aware that the desired results may not be displayed if you have not properly allocated VRAM.

For further details about Simultaneous 2D/3D Preview function, see the *NITRO-Viewer Controller* manual.

Notes

- Simultaneous preview mode is not supported in NITRO-CHARACTER Version 1.0x.
- We plan to support it starting with Version 1.1.
- If Simultaneous 2D/3D Preview is enabled when VRAM is not set appropriately, textures and 2D objects may not be entirely displayed or the display may be corrupted.

4 Operational Description

This section explains how to operate NITRO-Viewer.

4.1 NITRO-Viewer Startup

There are multiple ways to start up the NITRO-Viewer depending on the configuration of the connected hardware. Select one of the following methods, as appropriate for your hardware configuration.

4.1.1 Working with the IS-TWL-EMULATOR Hardware (red box)

1. Verify that the IS-TWL-EMULATOR (red box) hardware is correctly connected to the PC. If other applications connected to the IS-TWL-EMULATOR hardware are running, exit those applications before proceeding.
2. Start the NITRO-Viewer Controller on the PC. Run the following batch file.

```
TWL_NITRO-Viewer_Controller.bat
```

3. Start any compatible application and connect to NITRO-Viewer.

4.1.2 IS-NITRO-EMULATOR Hardware (Blue Box)

1. Verify that the IS-NITRO-EMULATOR hardware is correctly connected to the PC. If other applications connected to the IS-NITRO-EMULATOR hardware are running, exit those applications before proceeding.
2. Start NITRO-Viewer Controller from the PC. Run the following batch file.

```
TS_NITRO-Viewer_Controller.bat
```

3. Start up the supported application and connect to NITRO-Viewer.

4.1.3 Nintendo DS System Using IS-NITRO-UIC

1. To run NITRO-Viewer on a Nintendo DS system, write the NITRO-Viewer program to a development DS card beforehand.

The DS system NITRO-Viewer srl file is stored in `TwlSystem\tools\NitroViewer\bin\NTR\viewer.srl`. Use either IS-NITRO-DEBUGGER or IS-TWL-DEBUGGER to write the file to a development DS flash card.

2. Verify that the PC and DS system are connected properly via IS-NITRO-UIC. Disconnect other applications connected to the DS system if they are running.
3. Turn power ON to the DS system and start the NITRO-Viewer program. Verify that the NITRO-Viewer title is shown on the screen.
4. Start NITRO-Viewer Controller from the PC.

Run the following shortcut file.

```
UIC_NITRO-Viewer_Controller.bat
```

5. Start up the supported application and connect to NITRO-Viewer.

4.1.4 ensata

1. When previewing with ensata, it is not necessary to start ensata beforehand. However, if ensata has never been started, start up and quit ensata once.
2. Start NITRO-Viewer Controller from the PC. Run the following batch file.

```
ensata_NITRO-Viewer_Controller.bat
```

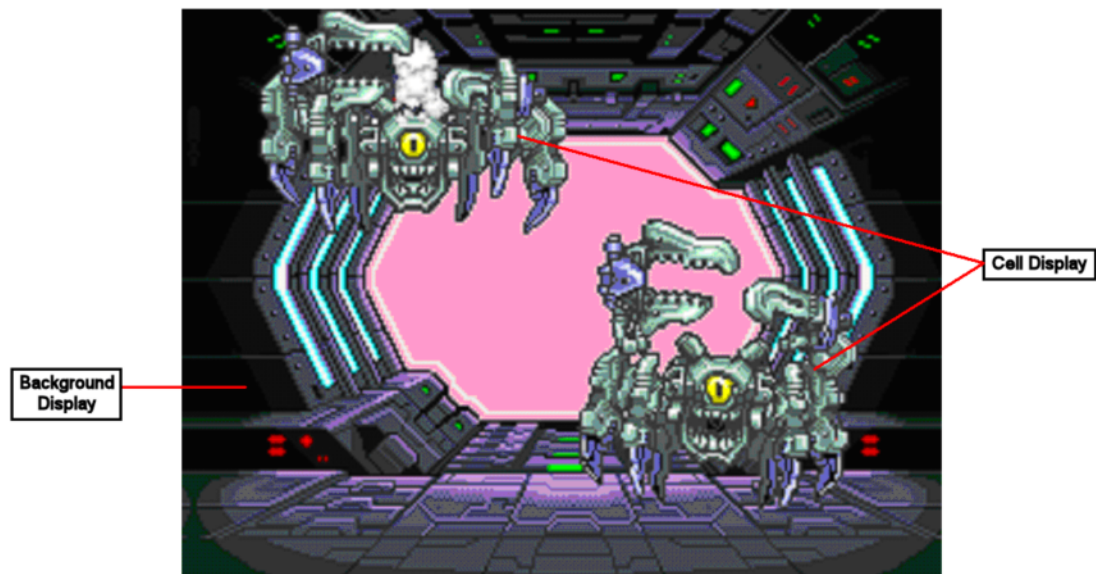
3. Start up the supported application and connect to NITRO-Viewer.

4.2 2D Preview Operation

In 2D preview, the System Controller can be used to move, scroll, rotate, scale, and adjust the automatic movement speed of backgrounds and cells. The following table describes 2D preview operations.

Table 4-1 2D Preview Operations

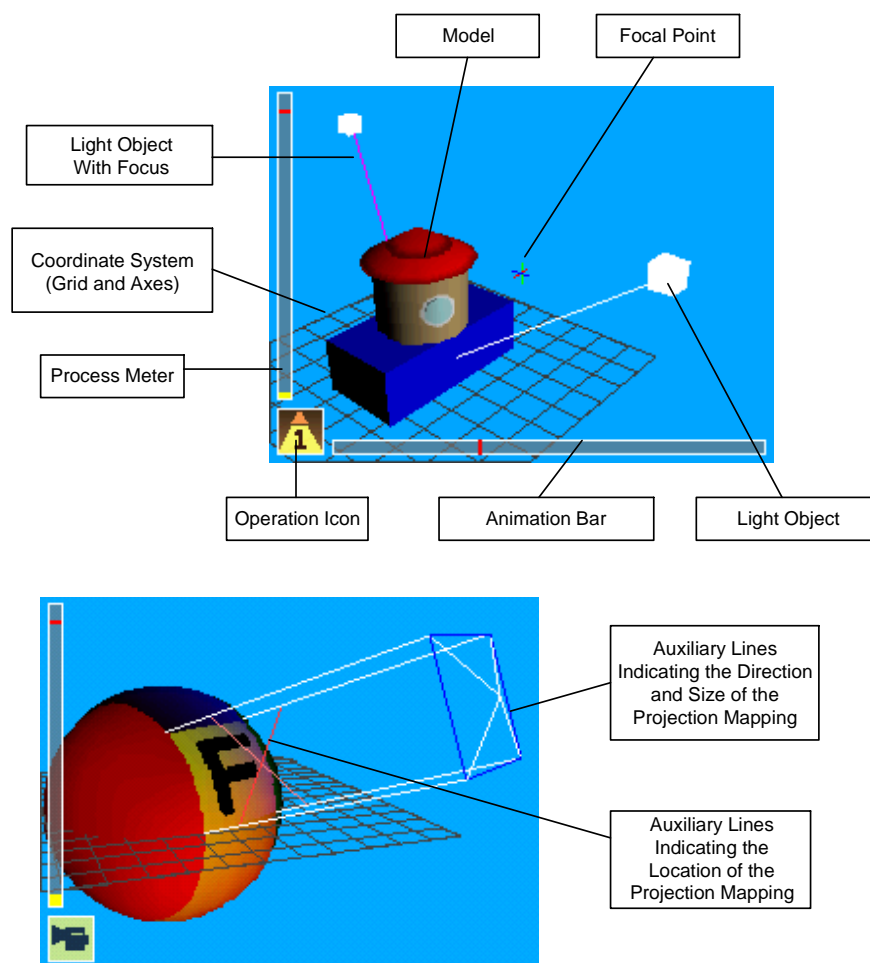
Operation	Description
SELECT	Resets the movement value and animation in the preview display. This operation takes priority over all other operations.
L Button	Changes the focus (the target on which operations are performed). Pressing the L Button successively rotates the focus from cell 0 to cell 1, cell 2, BG0, BG1, BG2, BG3 and then back to cell 0. Hidden objects do not receive focus.
+Control Pad	Moves the cell or BG with focus up, down, left, or right.
R Button & +Control Pad (Left/Right)	Rotates the cell or BG with focus. Note that only BG2 and BG3 can be rotated or scaled.
R Button & +Control Pad (Up/Down)	Scales the cell or BG with focus.
A Button	Holding down the A Button while performing an operation causes that operation to be applied to all cells. The A Button & +Control Pad move all cells. The A Button & R Button & +Control Pad rotate and scale all cells.
B Button	Holding down the B Button while performing an operation causes that operation to work on all backgrounds. The B Button & +Control Pad move all backgrounds. The B Button & R Button & +Control Pad rotate and scale all backgrounds capable of those respective actions. Note: Only BG2 and BG3 can be rotated or scaled.
X and Y Buttons	By operating the +Control Pad while holding down the X Button or the Y Button, you can adjust the automatic speed of the operations target. Pressing the +Control Pad in the same direction as the current automatic direction will speed it up, while pressing in the opposite direction will slow it down. Note: Key repeat does not function while performing this operation.
L Button & SELECT	Switches preview between the top and bottom screen.

Figure 4-1 2D Preview Screen

4.3 3D Preview Operation




4.3.1 Screen Information

3D preview displays a variety of information in addition to model data. The types of information displayed can be selected using the settings in 3D Material Editor.

Figure 4-2 3D Preview Screen**4.3.1.1 Operation Icons**

The Operation Icon indicates the operational mode that is active.

Table 4-2 Operation Icons

Icon	Description
 Camera Operation Mode	This icon indicates the mode when the 3D camera is activated. The camera operates in both rotational movement mode and translation mode, and the icon changes according to the operation mode.
 Light Operation Mode	This icon indicates the mode when lights are activated. The number in the light icon indicates which light (0 to 3) has the focus.
 2D Operation Mode	This icon indicates the mode when the 2D screen is activated. This icon is displayed only in Simultaneous 2D/3D Preview mode and does not appear in either regular 3D or 2D preview mode.

4.3.1.2 Focal Point

The focal point indicates the coordinates of the center point of the camera's line of vision.

4.3.1.3 Coordinate System

The coordinate system displays a grid, or coordinate axes, so that the orientation and size of the model data is more easily viewed. Set the selection of the coordinate system type and the size and gridline increments from the 3D Material Editor. See the *3D Material Editor* manual for further details.

4.3.1.4 Light Object

The light object visually represents the set light colors and vectors with a cube.

The color of the line of the light with focus is changed for easy identification. Although the distance from the center point and size of these light objects can be changed, those changes only improve visual recognition. The actual lighting effects are not changed.

4.3.1.5 Process Meter

The process meter displays the CPU processing time that is consumed by rendering a 3D model or a 3D animation. The red line indicates the total CPU processing time for one frame. The meter is not displayed if the model to be displayed is not loaded.

Note: The process meter is not displayed when Y sorting of translucent polygons is set to Auto Sort mode.

4.3.1.6 Animation Bar

The animation bar displays the currently displayed frame in a 3D animation. The animation bar is not displayed if an animation file is not loaded.

Note: The animation bar is not displayed when Y sorting of translucent polygons is set to Auto Sort mode.

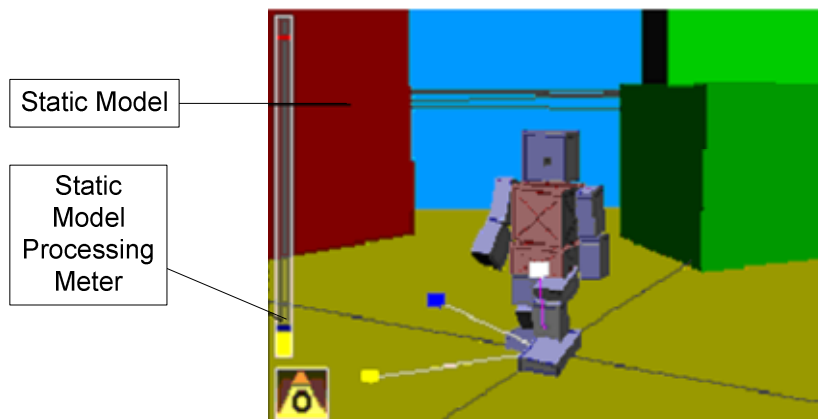
4.3.1.7 Projection Mapping Auxiliary Lines

When the projection mapping is set in 3D Material Editor, auxiliary lines are displayed to show the location, direction, and size.

The auxiliary lines are displayed only while the setting dialog box for projection mapping is open in 3D Material Editor, and the length of the auxiliary lines depends on the size set for the coordinate system (grid/coordinate axes).

4.3.1.8 Static Models

In versions 2.8.0 and later of the 3D Material Editor, static models other than those being edited can be displayed. Even when static models are set to *hide*, the textures are stored in VRAM, so if many static models are stored, textures may not be displayed correctly. The CPU processing time used for rendering static models is displayed on the processing meter as a different color.

Figure 4-3 Display of a Static Model

4.3.2 Working with 3D Preview

You can use the Nintendo DS system Controller to operate the camera and lights. The following table explains how to use the 3D preview.

Table 4-3 3D Preview: Camera Operation Mode

Operation	Description
SELECT	Resets the camera to the last state set by the PC.
L Button	Switches the operation mode. Pressing the L Button successively cycles through the following operation modes: camera, light 0, light 1, light 2, light 3, and then back to the camera. Hidden lights do not receive focus.
+Control Pad	Rotates the camera around the focal point. The Left/Right buttons rotate the camera horizontally about the Y axis, and the Up/Down buttons rotate the camera vertically around the X axis. The focal point position does not change.
R Button & +Control Pad	Moves the camera and focal point horizontally along the XZ plane. The movement speed is proportional to the distance between the focal point and the camera.
A Button	Moves the camera away from the focal point. The focal point coordinates do not change.
B Button	Moves the camera toward the focal point. The focal point coordinates do not change.
X Button	Moves the camera and focal point vertically along the positive Y axis. The movement speed is proportional to the distance between the focal point and the camera.
Y Button	Moves the camera and focal point vertically along the negative Y axis. The movement speed is proportional to the distance between the focal point and the camera.
L Button & SELECT	Switches preview between the top and bottom screen.

Table 4-4 3D Preview: Light Operation Mode

Operation	Description
SELECT	Switches the operation mode to camera operation mode, and resets the camera to the last state set by the PC.
L Button	Switches the operation mode. Pressing the L Button successively rotates the operation mode from the camera to light 0, light 1, light 2, light 3 and then back to the camera. Hidden lights do not receive focus.
+Control Pad	Rotates the light vector. +Control Pad Left/Right buttons rotate the light horizontally along the Y axis, and the Up/Down buttons rotate the light vertically.
A Button	Increases the size of the light object, and the display position moves away from the center point. The actual lighting effects do not change.
B Button	Decreases the size of the light object, and the display position moves toward the center point. The actual lighting effects do not change.
L Button & SELECT	Switches preview between the top and bottom screen.

4.3.2.1 Animation Operation (Common to Camera Operation Mode and Light Operation Mode)

If the animation has been set, it can be operated by holding down the R Button and pressing other buttons. The settings for amount of frame change and loop playback are based on the settings in 3D Material Editor.

Table 4-5 3D Preview: Animation Operation

Operation	Description
R Button & A Button	Starts and stops the animation playback.
R Button & B Button	Starts and stops the animation reverse playback.
R Button & X Button	Advances the current frame by the amount of frame change. The amount of frame change is based on the settings in 3D Material Editor.
R Button & Y Button	Rewinds the current frame by the amount of frame change. The amount of frame change is based on the settings in 3D Material Editor.
R Button & SELECT	Returns the current frame to the start frame.
R Button & START	Advances the current frame to the end frame.

4.4 Simultaneous 2D/3D Preview Operation

In addition to the operations possible with regular 2D Operation and 3D Operation modes, Simultaneous 2D/3D Preview allows the user to switch between the 2D Operation and 3D Operation.

Other operations work identically to those in the individual 2D and 3D preview modes.

Table 4-6 Simultaneous 2D and 3D Preview

Operation	Description
START	Switches between 2D and 3D operation
Other buttons	See the 2D and 3D preview operation instructions.

Figure 4-4 Simultaneous 2D/3D Preview Screen



5 Limitations

Some functions have limitations in the current version. These are described below.

5.1 3D Preview

Function	Description
ST component specification for the material texture conversion matrix	Support to specify the ST value in the material data is not yet provided. The ST value in the polygon data is used throughout.
Animation	Linear interpolation for fractional frames is not supported for ima or ita data. Even if the source animation data is configured with linear interpolation of fractional frames (interpolation = linear), fractional frames are discarded and only whole frames are played.
Display of animation bar and process meter	The setting for Y sorting of translucent polygons is supported in versions 2.5.0 and later of 3D Material Editor. However, the animation bar and process meter are not displayed while 3D Material Editor is set to auto sort mode

5.2 2D/3D Simultaneous Preview

Function	Description
Support for NITRO-CHARACTER	NITRO-CHARACTER Version 1.0x does not support Simultaneous 2D/3D Preview. Version 1.1 and later support this feature.

This converter uses software developed by the Apache Software Foundation (<http://www.apache.org/>).

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