

XSI FBX Plugins Guide

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Chapter 1

Installing FBX Plugins

Overview

FBX plugins are used by XSI to import, export, and convert files using the *.fbx* file format. This document describes how to install XSI FBX plugins on Windows® systems.

Plugins for XSI are available for use with Windows 2000/XP.

Manual Installation

In order for your 3D software to use these plugins, you must manually move these files into the proper directories.

This section describes the naming conventions, supported software versions, and installation process for using the *.fbx* file format with SOFTIMAGE® XSI®.

SOFTIMAGE XSI FBX Plugin Naming Conventions

The SOFTIMAGE XSI plugin consists of the *fbxxsi40.xsiaddon* add-on.

Supported SOFTIMAGE XSI Versions

fbxxsi30.xsiaddon and *fbxxsi35.xsiaddon* work on SOFTIMAGE XSI versions 3.0 and higher.

Installing the SOFTIMAGE XSI FBX Plugins

We recommend that you remove all old versions of the SOFTIMAGE XSI FBX plugins before installing new plugins.

To install the XSI FBX Plugin:

1. Start XSI.
2. In XSI, select File>Add-on>Install.
3. The Install Add-On dialog box appears (fig 1-1).

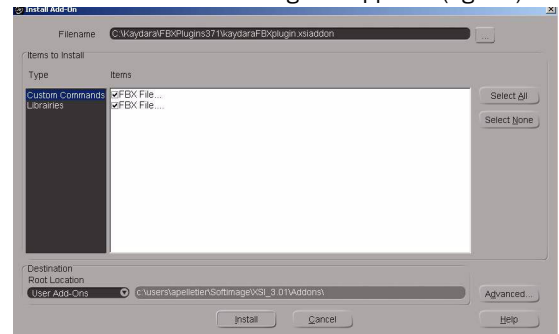


fig 1-1: Install Add-On dialog box

4. Click Browse (...). A file browser appears.
5. Select the file *fbxxsi-<xsi>.xsiaddon* in the directory where you downloaded the plugin and click Ok.
6. Click Install. You can install the Add-On to the User Add-Ons path.

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Renaming Plugins

The XSI plugin is now functional and can be accessed through File>Import/Export>FBX File (fig 1-2).

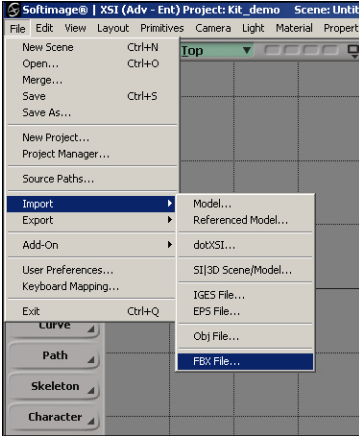


fig 1-2: The XSI Plugin can be accessed through File>Import/Export>FBX File

Removing the SOFTIMAGE XSI FBX Plugin

1. To remove the `fbxxsi<xsiver>.xsiaddon`, select File>Add On>Uninstall.
2. Select the FBX Plugin.
3. Click Uninstall.

Renaming Plugins

All plugins can be renamed as long as you do not change the file extension. However, it is only advisable to rename files when you want to keep more than one version of the FBX Plugins in the same directory.

If you choose to backup your files, all files with the same name as those you are installing should be renamed with the extension `.FBX_BAK`.

Note:

It is recommended that you always remove old versions of FBX plugins before installing newer versions.

Chapter 2

Softimage XSI Plugins

Overview

This document shows you how to export scenes from Softimage XSI, and how to import *.fbx* files into XSI.

This document also includes important information regarding the XSI features supported by this version of the FBX XSI plugin and MotionBuilder software.



Note:

For information on supported features between Softimage XSI and other 3D software (cross-package support), consult the Alias website (www.Alias.com).

Using the XSI Plugins

This section describes how to export models from XSI using the *.fbx* file format, and how to merge *.fbx* files back into XSI. This section also discusses the supported XSI features and the plugin's limitations.

Importing an FBX File to XSI

To import an *.fbx* file into XSI, select File>Import>FBX File. The Import FBX File dialog box opens (fig 2-1). Activate the appropriate import method from the Load Options area.

The options specified in the Import FBX File are saved when you exit the XSI application, with the exception of the Sampling rate, which is taken from the scene. See “Resample” on page 5.

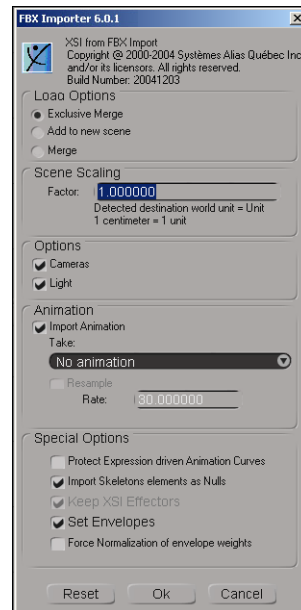


fig 2-1: The Import FBX File dialog box

Load Options

The Load Options area of the Import FBX File dialog box consists of the Exclusive Merge, Add New Scene and Merge options.

Exclusive Merge: Activate Exclusive Merge to merge solely the animation from the *.fbx* file with the corresponding XSI elements.



Note:

Any modifications to geometries, textures, materials or envelope weighting in your MotionBuilder software is not included in the Exclusive Merge process.

Add to New Scene: Activate Add to New Scene to clear the XSI workspace before importing all data from the *.fbx* file. Objects created include all applicable textures, materials, animation and envelope weighting.

Merge: Activate Merge to use a combination of the Exclusive Merge and Add to New Scene. When you activate Merge, the plugin merges the animation with the elements that are already present in the XSI scene, and creates any other objects that are defined in the *.fbx* file.

Scene Scaling

Lets you change the scale factor. The default XSI unit is assumed to be one centimeter (1 cm).

Options

Activate the following options if you want to include them in the import:

- Cameras
- Lights

Animation

Enable Import Animation, and select a take in the take menu in the Animation area of the Import FBX File dialog box to import all the animation in the specified take.

Resample: Activate Resample to enter a new resampling rate for the animation. The frame rate is used if the plugin needs to perform FCurve resampling.

Special Options

Protect Expression Driven Animation Curves: Lets you retain any expression-driven animation for mergeback.

Import Skeleton Elements As Nulls: Lets you convert all effectors and bones to nulls. Weighting on envelopes is not affected by this conversion.

Keep XSI Effectors: Lets you keep all effectors as they were created. The import process keeps the effectors under the root node of its respective chain.



Note:

This flag must match the export.

Set Envelopes: Lets you import envelopes for skinning.

Force Normalization of Envelope Weights: Lets you correct any corrupted envelopes caused by 3D software that does not have normalized weighting systems. This feature can perform a limited amount of correction and is not normally necessary.

Reset/Ok/Cancel

Reset: Restores the Import FBX File dialog box to its last saved values.

Ok: Starts the import process.

Cancel: Aborts the import process.

FBX to XSI Import

To import an *.fbx* file to an *.xsi* scene:

1. Select Exclusive Merge from the Import FBX File dialog box.
2. Select any applicable options from the Import FBX File dialog box. Geometries are always imported.
3. Activate Import Animation and specify a take in the Take menu.
4. Activate any special options applicable to the import. See “Resample” on page 5.
5. Click Ok.

Exporting from XSI

This section explains the Export FBX File dialog box, where you set the options for exporting a scene from XSI to an *.fbx* file.

The options specified in the Export FBX File are saved when you exit the XSI application, with the exception of the Sampling rate, which is taken from the scene. See “Resample” on page 5.



Note:

When you export using the XSI add-on, a dialog box appears asking you for a location to save your .fbx file. We recommend you create a new “FBX” folder as a default for all your saved .fbx files.

To export an .fbx file from XSI, select File>Export. The Export FBX File dialog box opens (“The Export FBX File dialog box” on page 5). Activate the following appropriate export options and click OK.

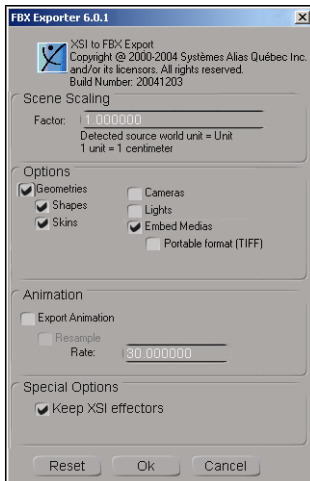


fig 2-2: The Export FBX File dialog box

Scene Scaling

Lets you change the scale factor. The XSI unit is assumed to be one centimeter (1 cm).

Options

Activate the following options that you want to include in the export:

- Geometries
- Shapes
- Skins
- Cameras

- Lights

Geometries: If you disable the Geometries option, the scene is exported with no models. Cameras and Lights are not considered models by the Export FBX File dialog box.

Shapes: If you disable the Shapes option, the scene is exported with no shapes.

Skins: If you disable the Skins option, the scene is exported without envelopes. The geometry is still exported but does not have weighting assigned to it.

Embed Media

Activate Embed Media in the Export FBX File dialog box Options area to embed the textures and images associated with the .fbx file when exporting.

Embedding Media is useful when sending the .fbx file somewhere where the path of the textures is inaccessible but keep in mind that embedding media creates a larger file size.

Animation

Enable Export Animation to export all the animation from your XSI scene.

The plugin may require that some FCurves are resampled in the export process. If this is the case, the plugin uses the specified Frame rate, which normally is the same as the scene’s Frame rate.

Resample

Activate Resample to enter a new resampling rate for the animation. The Resample option is only used if the plugin has to resample FCurves.

Special Options

Keep XSI Effectors: Lets you export the skeleton as defined in XSI. This lets you keep all effectors as they had been created, as the export process does not transfer them under the last bone of their chain. This does not let you characterize your skeleton in MotionBuilder, although keyframing is still available.

If this option is disabled, the plugin moves the effectors so that their parent becomes the last bone of their chain. This is required for characterizing in MotionBuilder.

You can enable this option to export a file that is readable by the QuickTime™ for FBX plugin, but do not forget to activate Embed Media in the Options area. See “Embed Media” on page 5.



Note:

When using XSI's Animation Mixer to animate your character, make sure that the animation is plotted and that there are no clips in the Animation Mixer; otherwise the file may not export correctly. Save your file before deleting your clips.

Reset/Ok/Cancel

Reset: Restores the Export FBX File dialog box to the last saved values.

Ok: Starts the export process.

Cancel: Aborts the export process.

XSI to FBX Export

To export a character with XSI animation to an *.fbx* file so it can be opened in QuickTime using the QuickTime for FBX plugin:

1. Make sure that all skeleton hierarchies are similar to the XSI BASIC skeleton. The effectors must be located under their chain root of their corresponding branch to be exported correctly. See “Default XSI Skeletons” in the XSI documentation.
2. If you used XSI's Animation Mixer, make sure that the animation is plotted and that there are no clips in the Animation Mixer.
3. Use the Export to FBX plugin in XSI. (File>Export>FBX...).

You can now open your *.fbx* file in MotionBuilder, or in QuickTime using the QuickTime for FBX plugin.

Merging Back FBX to XSI

Mergeback options are now contained in the Import FBX File dialog box. See “Importing an FBX File to XSI” on page 3.

Supported XSI Features

The following section contains the new features and bug fixes of the XSI plugin.

General

- Supports import/export of limits and RotationOrder. Limits are queried for every exported object (through the KinematicState) and set to the corresponding *.fbx* Node. On import, limits are applied even on mergeback, and overwrite anything that was previously set.
- Supports color vertex import and export.
- Supports embedded textures and their portable format (*.tiff*).
- Added a Convert2Tiff option in the user parameters and a script command for embedded textures. Use this option to save an embedded texture image that can be read on different platforms and by most applications. The script command is: *Convert2Tiff <True/False>*.
- Support for Limits. Limits support now requires the following warning to warn about non-supported features:

Modified rotation space:

UseLimitsForRotationSpaceOnly is enabled in the FBX file. Since the feature is not supported by this plugin, the rotation limits for the following node(s) will be dropped.

Custom Properties

Because of type limitations in *.fbx* files, the following conversions are applied.

Export (XSI to FBX)

siEmpty	Ignored.
siDispatch	Ignored.
siString	Ignored.
siFloat	REAL
siDouble	REAL
siBool	BOOL
siByte	Ignored.
siUByte	Ignored.
siUInt2	Ignored.
siUInt4	Ignored.
SiInt	Ignored.
siInt2	Ignored.
siInt4	Ignored.



Note:

During export, the plugin tries to get the UI range and uses it as the minimum and maximum values.

Import (FBX to XSI)

REAL	siDouble
BOOL	siBool
INTEGER	siInt4
COLOR	4 siDouble
VECTOR	3 siDouble



Note:

If the minimum and maximum ranges in the .fbx property has any undefined (or identical) values, the plugin overwrites them using the arbitrary value of 400. In case of COLOR or VECTOR imports, these relationships are lost since 4 or 3 individual siDouble properties are created.

Default XSI Skeletons

The default XSI skeleton is not immediately compatible with the exporter. MotionBuilder software does not support effectors parented to the root of a chain.

In order to have a compatible skeleton usable in your MotionBuilder software, the plugin can be configured to automatically move the effector to the expected location: the child of the last joint of the chain (see fig 2-3).



Note:

This operation is performed automatically unless the Keep XSI Effectors option is activated.

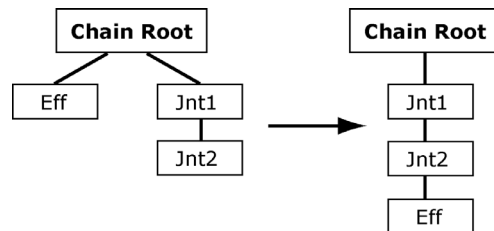


fig 2-3: Chain Root Effector

The above move can be done even when the effector is somewhere else in the hierarchy.



Note:

If you are planning to keyframe an XSI “Skeleton - Man/Woman - Complete/Basic” in MotionBuilder after exporting with the Keep XSI Effectors option active, MotionBuilder constraints must be used to animate the skeleton effectors.

Known Limitations

The following section contains bugs and limitations of the XSI plugin, as well as some advance notes for users.

General

The following are limitations that apply generally to the XSI plugin:

- Export and import of ambient color is supported, but not animated.
- Visibility properties are supported but not animated.

Geometry

The following are the Geometry limitations for the XSI plugin.

Implicit Prims: Implicit Prims are not supported in this version of the FBX for XSI plugin. A message appears on the status bar whenever you try to import/export/animate/mergeback Implicit Prims.

Instead, convert them to a polymesh or NURBS geometry type.

Polymeshes

Import and export of polymeshes is supported in this version of the FBX for XSI plugin.

Supported export of:

- geometry
- normals
- global material/polygon clusters with associated material
- single layered textures with associated material. (Only one image can be defined in a material channel.)

Envelopes: Export and Import supported. Mergeback does not affect any existing data.

Shapes: Animation, Export and Import supported. Mergeback does not affect any existing data.

During mergeback, if the number of found shape clips for the model is less than the number of shape FCurves, a message is logged and the clips are left unchanged. If the number of clips is more than the number of shape FCurves, the first nbShapes clips are affected (even if it may not be with the correct data).

During Export, cluster shapes work only if the cluster contains all the points of the mesh. If it does not, a message is displayed in the status bar.

Create Shape keys using the Save Shape Key option in the Animate Module under deform>Shape>Save Shape Key.

NURBS

Import and export of NURBS is supported in this version of the FBX for XSI plugin.

Envelopes: Export and Import supported. Mergeback does not affect any existing data.

Shapes: Animation, Export and Import supported.

During mergeback, if the number of found shape clips for the model is less than the number of shape FCurves, a message is logged and the clips are left unchanged. If the number of clips is more than the number of shape FCurves, the first nbShapes clips are affected (even if it may not be with the correct data).

During Export, cluster shapes work only if the cluster contains all the points of the mesh. If it does not, a message is displayed in the status bar.

Create Shape keys using the Save Shape Key option in the Animate Module under deform>Shape>Save Shape Key.



Note:

When you create shapes, you must create them in “Local Reference Mode” and disable the Normalize state of the Animation Mixer. Do this by right-clicking one of the tracks under the compound track.

Bones

Import/export/animate/mergeback of Bones is supported in this version of the FBX for XSI plugin.

Materials

Import/export/mergeback of Materials is supported. Animation of Materials is not supported in this version of the FBX for XSI plugin. Mergeback does not affect any existing data.

Meshes export all materials assigned to polygon clusters. When NURBS are used, only the global material is exported.

Textures

Export of Textures is supported. Animation of Textures is not supported in this version of the FBX for XSI plugin. Mergeback does not affect any existing data.

No layered textures are currently supported.

Only one texture can be assigned with NURBs and its SwapUV flag is set.

When importing, the Texture file is connected to the diffuse properties of the Shader.

Lights

The following are the Light limitations for the XSI plugin.

General Lights Limitations

- Different Key interpolations for the same FCurve are not supported.
- When merging back, any earlier animations are deleted before being replaced by the new one. If there are no animations, the FCurves are still cleared.

The following Light types and properties are fully supported:

- Light Positions
- RGB Colors
- Cone Angles
- Intensity
- Interest/Rotation

XSI Light Conversion: The following XSI light types are converted into the MotionBuilder equivalents:

XSI Light Type	FBX Light Type
Box	Spot
Neon	Point
Sun	Infinite

Cameras

The following are the Camera limitations for the XSI plugin.

General Camera Limitations

- Different Key interpolations for the same FCurve are not supported.

- When merging back, any earlier animations are deleted before being replaced by the new one. If there are no animations, the FCurves are still cleared.

- The following Camera types and properties are fully supported:

- Camera Position
- Interest/Rotation
- Roll
- Vertical FOV

Near/Far Plane: Animation is not supported for the Camera Near/Far Plane in this version of the FBX for XSI plugin.

Advanced Notes

The following are notes for advanced users of the XSI plugin:

Skeletons

A skeleton template has been created as part of this add-on. If the add-on is installed, the template is found in a sub-directory called Templates under the Add-Ons installation path.

Access the skeleton template through the Skeleton Templates toolbar in View>Custom Toolbars.



Note:

The advantage of this template over the default XSI skeletons is that the skeleton template is a skeleton ready to be characterized in MotionBuilder with a simple drag and drop operation.

The Skeleton Template is a default Skeleton - Man - Complete model with some modifications, such as renamed nodes that match MotionBuilder's Character Settings naming conventions, and some re-parented nodes. The Model node is named Human_ Skeleton_A.

When you export to FBX, disable the Keep XSI Effectors option so the skeleton is correctly displayed and animated in MotionBuilder. If you do not disable the Keep XSI Effectors option, you must create parent-child constraints to create the correct bone movement.

Import

XSI skeletons typically use a COG constraint null. If this is the case, it must be deactivated or removed in order for the imported animation to function correctly.

Exporting NurbSurfaceMesh

In XSI, NurbSurfaceMesh can be used to define a collection of NurbSurfaces. The Plugin exports only the last element of the collection.

Batch Processing

The following new Batch Processing commands must be installed. See the packaging for further details about Batch Processing command installation.

- FBXExportScaleFactor
- FBXExportGeometries
- FBXExportShapes
- FBXExportSkins
- FBXExportCameras
- FBXExportLights
- FBXExportEmbedMedias
- FBXExportAnimation
- FBXExportFrameRate
- FBXExportKeepXSIEffectors
- FBXImportMode
- FBXImportScaleFactor
- FBXImportCameras
- FBXImportLights
- FBXImportAnimation
- FBXImportProtectExprDrivenFC
- FBXImportSkeletonsAsNull
- FBXImportKeepXSIEffectors
- FBXImportSetEnvelopes

- FBXImportForceNormEnvelope
- FBXImportNameSpaceReplace



Note:

The FBXImportNameSpaceReplace command is not a dialog box option. You can use to replace a namespace string with another during import. The format of the string argument is:

Current_name=new_name

Do not insert spaces around the "=" or they are considered part of the name.

This command lets you, for example, transfer the attributes of one character to another with the same topology. That is, the same hierarchy and the same node names - the only difference being the namespace.

To see the arguments and their type, go to the Views>Custom Toolbars>Customize dialog box and select one of the FBX commands. The arguments are displayed in the description section of the dialog box.

All dialog options are unavailable from the command line but, since they are stored, you can set them using the provided commands. Only these values can be set.

To run a batch:

```
ExecuteScriptCommand "FBX import", Array  
("x", 1)
```

Two arguments are currently supported:

- Filename (mandatory and with full path - not validated)
- TakeID (number of the take to be imported)

This imports x using take #1, where "x" is the name of the file. Specifying Take "0" is the equivalent of specifying no takes - it loads the last take in the file.

Any number greater than or equal to the number of takes in the file does not load the animation.

Special Notes

The following section describes the rationale of the FBX XSI plugin, as well as provides you with sample workflows and additional information.

Textures

MotionBuilder must use optimizing algorithms to minimize the texture memory usage because the current version of the FBX XSI plugin does not fully support texture properties such as scaling, rotation, translation, and swap of texture UVs, as well as projection modes other than UV.

The optimizing algorithms can sometimes cause two or more distinct textures in XSI to merge into a single texture in MotionBuilder.

Thus, when you modify certain texture properties in MotionBuilder, more than one object at the time may be affected.

If this is the case, it is always possible to prevent the textures from merging by using distinct image files. For example, one object may use a file called “myFile.jpg” and another object can use “myFile_Copy.jpg”, even though both files’ contents are the same.

This limitation causes problems only if the editing of the texture properties occurs in MotionBuilder.

Making Cluster Shapes

The FBX XSI plugin does not support the full functionality of the Animation Mixer.

For cluster shape animation, the FBX XSI plugin works best when it finds a Compound Shape Clip containing the Shape Clips, all with the same start-end interval.



Note:

When you create shapes, you must create them in “Local Reference Mode” and disable the Normalize state of the Animation Mixer. Do this by right-clicking one of the tracks under the compound track.

A sample workflow for creating a shape animation is as follows:

1. Select the working object, that is, the one for which we are making the shape animation.
2. Select the Save ShapeKey function. Do not use the Store ShapeKey.
3. Select a cluster of points and edit them.
4. Move the time cursor.

5. Select the whole set of points of the model
6. Select the Save ShapeKey function.
7. Repeat steps 3 to 7 for each shape.



Note:

Make sure that there us the same amount of Clip Shapes as Source Clips, or an error occurs.

Options

This version of the FBX XSI plugin allows you to transfer the animation recorded on the FBX file back to the corresponding element in the XSI scene.

As explained in the Export section, the Keep XSI Effectors and Import Skeletons as Null toggles affect the way the FBX XSI plugin imports the data. See “Exporting from XSI” on page 4.

Both the Keep XSI Effectors and Import Skeletons as Null toggles can be used when merging back. In every cases the plugin matches the elements from the FBX file to the elements in the scene regardless of the active toggles. However, the states of these toggles affect the way the data is processed.

When the Import Skeletons As Null toggle is active, the plugin does not try to perform any processing on the FCurves and simply transfers the FCurves to the XSI elements, without any further checks or data validation.

When the Import Skeletons As Null is inactive, then the Keep XSI Effectors toggle is examined and it behaves according to its state.

As explained in the Export section, the Keep XSI Effectors toggle must always be set to the same value that it had when the scene was exported to .fbx format.

If the Keep XSI Effectors toggle is not active, the FBX XSI plugin re-computes the animation on the effectors. This is because the plugin assumes that the effector is no longer a child of the last bone of the chain, as in the case of the .fbx file.

At the same time, to prevent the IK solver from trying to find a solution, the FBX XSI plugin verifies that there are no Translation FCurves on any bones and/or effectors. If Translation FCurves on bones or effectors are found, a message is displayed and the translation animation is cleared.

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Special Notes

If the Keep XSI Effectors toggle is active, the FBX XSI plugin still checks for Translation FCurves on bones. If Translation FCurves are present on effectors, they are not affected, nor is any warning issued.

If this is the case, the IK solver may compute a different solution, and the resulting animation may not correspond with the *.fbx* version.