Autodesk DirectConnect 2010 R1

Autodesk DirectConnect

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yajl
Author: Lloyd Hilaiel *http://www.lloydforge.org/projects/yajl/*
License: BSD

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zlib
http://www.libpng.org/pub/png/libpng.html
License: /* zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.3, July 18th, 2005
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libtiff
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Website: *http://www.libtiff.org/*
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DevIL
Author: Denton Woods
Website: *http://www.imagelib.org*
License: GNU LGPL

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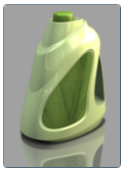

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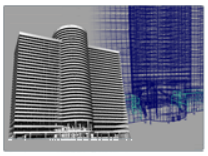

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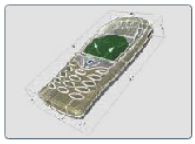

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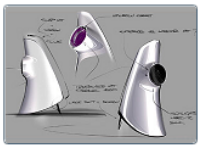

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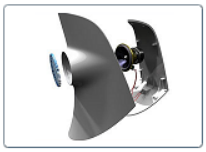

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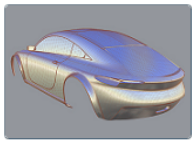

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What is Autodesk DirectConnect?

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Autodesk® DirectConnect's a family of data translators that lets you import and export CAD data into:

- Autodesk® Alias™
- Autodesk® Maya®
- Autodesk® Showcase™
- Autodesk® Opticore Studio

Each Autodesk DirectConnect translator lets you import a specific CAD file format into one or more of the Autodesk software products listed above. In addition, you can export some CAD file formats from some products with Autodesk® DirectConnect.

Supported products and translators

Click any of the following Autodesk products to find:

- File formats currently supported for import by Autodesk DirectConnect
- The Autodesk products and bit versions that support them at the time of this release
- Which file formats require additional Autodesk DirectConnect licenses on which products

Autodesk Alias 2010 Import

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
SolidWorks® on page 58 (1)	✓ No license required	Not available	✓ No license required	Not available	Not available
Pro/ENGINEER® on page 55	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
CATIA® V5 on page 30	✓ License required	✓ License required	✓ License required	✓ License required	Not available
CATIA® V4 on page 33	✓ License required	✓ License required	✓ License required	✓ License required	Not available
UGS NX on page 65	✓	✓	✓	✓	Not available

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
	License required	License required	License required	License required	
Autodesk Inventor (Requires Inventor or Inventor View. See Autodesk Inventor® on page 36)	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
STEP on page 60	✓ No license required	✓ No license required	✓ No license required	✓ No license required	✓ No license required
DWG DXF on page 39	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
IGES on page 46	✓ No license required	✓ No license required	✓ No license required	✓ No license required	✓ No license required
Open Inventor™	✓ No license required (2)	Not available	✓ No license required (2)	Not available	Not available
JT on page 53	✓	✓	✓	✓	Not available

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
(Autodesk DirectConnect for JT can be purchased.)	License required	License required	License required	License required	

NOTE (1) For importing SolidWorks® files, you do not need an Autodesk DirectConnect license. However, SolidWorks® 2005, 2006, 2007, or 2008 must be purchased, installed, licensed on the same machine, and running before importing the file.

Autodesk Alias 2010 Export

These file formats are currently supported for export by Autodesk DirectConnect and the following bit versions were supported at the time of this release. Some file formats require additional Autodesk DirectConnect licenses on Alias.

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
UGS NX on page 65	✓ License required	✓ License required	✓ License required	✓ License required	Not available
DWF on page 42	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
ZPR on page 44 (for Rapid Prototyping)	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
DWG DXF on page 39	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available

Autodesk Showcase 2010

File Format	Windows 32-bit	Windows 64-bit
SolidWorks® on page 58 (1)	✓ No license required	Not available
Pro/ENGINEER® on page 55	✓ No license required	✓ No license required
CATIA® V5 on page 30	✓ License required	✓ License required
CATIA® V4 on page 33	✓ License required	✓ License required
UGS NX on page 65	✓ License required	✓ License required
Autodesk Inventor (Requires Inventor or Inventor View. See Autodesk Inventor® on page 36)	✓	✓ No license required

File Format	Windows 32-bit	Windows 64-bit
	No license required	
Cosmo™	✓ No license required	Not available
STEP on page 60	✓ No license required	✓ No license required
STL on page 62	✓ No license required	✓ No license required
DWG DXF on page 39	✓ No license required	✓ No license required
IGES on page 46	✓ No license required	✓ No license required
Open Inventor™	✓ No license required	Not available
JT on page 53 (Autodesk DirectConnect for JT can be purchased.)	✓	✓ No license required

File Format	Windows 32-bit	Windows 64-bit
	No license required	

NOTE (1) For importing SolidWorks® files, you do not need an Autodesk DirectConnect license. However, SolidWorks® 2005, 2006, 2007, or 2008 must be purchased, installed, licensed on the same machine, and running before importing the file.

Autodesk Maya 2010

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
SolidWorks® on page 58 (1)	✓ No license required	Not available	✓ No license required	Not available	Not available
Pro/ENGINEER® on page 55	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
Autodesk Inventor (Requires Inventor or Inventor View. See Autodesk Inventor® on page 36)	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
Cosmo™	✓ No license required	Not available	✓ No license required	Not available	Not available

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit	Mac OS
STEP on page 60	✓ No license required	✓ No license required	✓ No license required	✓ No license required	✓ No license required
STL on page 62	✓ No license required	✓ No license required	✓ No license required	✓ No license required	✓ No license required
DWG DXF on page 39	✓ No license required	✓ No license required	✓ No license required	✓ No license required	Not available
IGES on page 46	✓ No license required	✓ No license required	✓ No license required	✓ No license required	✓ No license required
Open Inventor™	✓ No license required	Not available	✓ No license required	Not available	Not available
JT on page 53	Not available	Not available	Not available	Not available	Not available

IMPORTANT DirectConnect 2009 is used with the Mac version of Maya 2010.

NOTE (1) For importing SolidWorks® files, you do not need an Autodesk DirectConnect license. However, SolidWorks® 2005, 2006, 2007, or 2008 must be purchased, installed, licensed on the same machine, and running before importing the file.

Autodesk Opticore Studio 2010

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit
SolidWorks® on page 58 (1)	✓ No license required	Not available	✓ No license required	Not available
Pro/ENGINEER® on page 55	✓ No license required	✓ No license required	✓ No license required	✓ No license required
CATIA® V5 on page 30	✓ License required	✓ License required	✓ License required	✓ License required
CATIA® V4 on page 33	✓ License required	✓ License required	✓ License required	✓ License required
UGS NX on page 65	✓ License required	✓ License required	✓ License required	✓ License required
Autodesk Inventor (Requires Inventor or Inventor View. See Autodesk Inventor® on page 36)	✓ No license required	✓ No license required	✓ No license required	✓ No license required
Cosmo™	✓	Not available	✓	Not available

File Format	Windows 32-bit	Windows 64-bit	Vista 32-bit	Vista 64-bit
	No license required		No license required	
STEP on page 60	✓ No license required	✓ No license required	✓ No license required	✓ No license required
STL on page 62	✓ No license required	✓ No license required	✓ No license required	✓ No license required
DWG DXF on page 39	✓ No license required	✓ No license required	✓ No license required	✓ No license required
IGES on page 46	✓ No license required	✓ No license required	✓ No license required	✓ No license required
Open Inventor™	✓ No license required	Not available	✓ No license required	Not available
JT on page 53 (Autodesk DirectConnect for JT can be purchased.)	✓ License required	✓ License required	✓ License required	✓ License required

NOTE (1) For importing SolidWorks® files, you do not need an Autodesk DirectConnect license. However, SolidWorks® 2005, 2006, 2007, or 2008 must be purchased, installed, licensed on the same machine, and running before importing the file.

What's new this release

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This section outlines enhancements made and new features added to the 2010 R1 version (released 2009) of DirectConnect, along with various bug fixes.

What's new

- Support for 2010 AutoCAD format
- Support of CATIA V4 components (.model files) for CATIA V5 assemblies
- Support for CATIA V5 materials
- Support for CATIA V4 in Showcase
- Per face style assignments are now supported in AutoCAD and CATIA V5
- Support of IGES plane surface (type 190)

- Support of IGES direction (type 123)
- Support of JPEG files on 64-bit machines

Improvements

- Enhanced interoperability between Inventor and Showcase, supporting the transfer of Inventor weld maps (bead only)
- UG file import quality
- IGES file import quality
- JT file import quality

Limitations

AutoCAD to Showcase

- The AutoCAD material attribute **Illumination** is not supported by Showcase.
- Only 3D hierarchical data is supported. Curves and 2D drawings are not supported.

AutoCAD to Alias

The AutoCAD material attribute **Illumination** is supported by Alias, but is called **Incandescence**.

Maya on the Mac OS X operating system

Maya 2010 on the Mac OS X operating system does not use DirectConnect 2010; however, it does use DirectConnect 2009. Please check the Autodesk web site for the documentation.

Inventor 2008 and Showcase

Before installing Showcase 2010, if you are using Inventor 2008, follow these steps to ensure a successful installation. Showcase 2010 cannot read the libraries from Inventor 2008, due to backward compatibility issues.

Install Inventor View 2009, opening it after you have used Inventor 2008. Then, install Showcase 2010. Showcase will use the correct version of DirectConnect, ensuring solids with different materials on patches are brought into Showcase without any issues.

Inventor to Showcase

UV mapping problems occur when using Auto Stitch. The texture from Inventor doesn't get placed correctly onto the surface in Showcase.

Find the latest information on the Web

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For the most up-to-date information on Autodesk DirectConnect (including which CAD formats are currently supported, system requirements, and how to purchase translator licenses), go to one of the following URLs:

For Autodesk Alias:

- ***http://www.autodesk.com/aliasstudio-directconnect***

For Autodesk Maya:

- ***http://www.autodesk.com/maya-directconnect***

For Autodesk Showcase:

- ***http://www.autodesk.com/showcase-directconnect***

Japanese documentation is also provided at these URLs.

Installing and Licensing 5

Installing Autodesk DirectConnect

IMPORTANT DirectConnect 2010 is compatible with the Autodesk 2010 products listed in Supported products and translators on page 4. To determine which version of DirectConnect is compatible with your version of Autodesk software, match the version numbers (i.e., DirectConnect 2009 is compatible with Autodesk Showcase 2009). The only exception is Autodesk Maya 2010 for Mac, which uses DirectConnect 2009.

Installing with host software

Autodesk DirectConnect software installs automatically when the following Autodesk software is installed:

- Autodesk Alias
- Autodesk Maya (Windows version)
- Autodesk Showcase

For information on installing these software products, refer to their respective installation guides.

Autodesk DirectConnect software is provided on the media with Autodesk Opticore Studio software, in the Autodesk DirectConnect 2010 folder, and must be installed manually:

NOTE When installing DirectConnect, ensure you install the same version, such as 32-bit or 64-bit, as your Autodesk Opticore Studio.

NOTE DirectConnect Help is only supported on Microsoft Internet Explorer. Performance on other browsers may not provide consistent results.

Support platforms

Autodesk DirectConnect runs on the same platform as the Autodesk product it installs with:

Autodesk Software	Microsoft® Windows® XP Professional 32-bit and 64-bit Editions	Microsoft Vista 32-bit and 64-bit Editions	Apple® Mac OS® X 10.5.2 or higher 64-bit
Autodesk Alias	✓	✓	✓
Autodesk Maya	✓	✓	✓
Autodesk Showcase	✓	✓	
Autodesk Opticore Studio	✓	✓	

Recommended system requirements

Autodesk DirectConnect requires the following amount of disk space:

- On Windows® XP, Windows 2000 Professional, or Vista, 260 megabytes of disk space available on a system drive or destination drive.
- On Mac OS® X 10.5 or greater, 30 megabytes of disk space, on an Apple Mac computer with 64-bit Intel processors. PowerPC (PPC) computers are no longer supported.

Autodesk DirectConnect 2010 R1 installs with other products, so your system must also accommodate the host product requirements. (For the system requirements of the host product, consult its installation guide.)

NOTE For the most up-to-date information on hardware qualifications, go to *http://www.alias.com/eng/support/qualified_hardware/*.

Setting up additional software (Autodesk Maya 2010)

NOTE Maya on the Mac OS X operating system does not support DirectConnect 2010; however, it does support DirectConnect 2009. See *http://www.autodesk.com/maya-directconnect*.

After you install your Maya 2010 software, load a plug-in to use Autodesk DirectConnect translators:

1. In Maya 2010, select **Window** > **Settings/Preferences** > **Plug-in Manager**.
2. Click the DirectConnect plug-in to enable all of the Autodesk DirectConnect translators:
   - Windows: `DirectConnect.mll`
   - Mac OS X: `DirectConnect.lib`

   A check mark appears in the box.

Installing upgrades

You can download and install newer versions of Autodesk DirectConnect as they become available on the Web.

1. Find the newest version on the Web and download its exe file. (See Find the latest information on the Web on page 19.)
2. Remove the older version of Autodesk DirectConnect from your system. (In Windows, select **Start** > **Settings** > **Control Panel** and click the **Add or Remove Programs** choice.
3. Double-click the exe file you downloaded.

Software deployment using group policies for Windows

Disclaimer

The description of methods presented here is provided to aid those looking for a straight forward, Microsoft supported means for deployment of software

over a Local Area Network. If the Microsoft Group Policy based mechanism does not provide sufficient control or features for the size or complexity of your network environment, we recommend that you consider more advanced Microsoft solutions, or other third party solutions.

Introduction

Microsoft's Active Directory technology provides the capability for software to be remotely installed from a server distribution point to client computers. The client computers must be members of an Organizational Unit (OU) in the Active Directory. Software deployment is controlled by configuring the Software Installation policy of the Group Policy Object (GPO) associated with that OU. The software installation occurs automatically at boot time; no user intervention is required.

Prerequisites

- Active Directory must be installed and properly configured.
- Client computers must have Microsoft Installer (MSI) version 3.0 or newer installed.

Configuration process

There are three main steps to deploying software using group policies:

1. Create a Distribution Point.
2. Assign the application to client computers.
3. Verify the installation.

> **NOTE** Consult Microsoft Knowledge Base Article #816102 for more details, including information on how to redeploy or remove a package.

Create a distribution point

A distribution point is a shared network location containing the package(s) to install.

To create a distribution list

1. Log on to the appointed server as Administrator.

2 Create a shared network folder.

3 Grant permissions as appropriate. Permission to modify the contents of this folder should typically be granted to an administrator or select group of users; all other users should be restricted to read access.

4 Copy the .msi files for the package(s) to be deployed into this folder.

Assign a package to client computers

The Software Installation section of the Group Policy object specifies the software packages to be deployed.

To assign a package for deployment

1 From the Windows **Start** menu on the server, click **All Programs (or Programs)** > **Administrative Tools** > **Active Directory Users and Computers**.

2 Browse to the desired Organizational Unit (OU) in the Active Directory tree, right-click, and click **Properties**. The Properties dialog box for the OU selected displays.

NOTE For the Group Policy Object to take effect, the desired client computer objects must be members of the OU selected.

---

3 Select the Group Policy tab and click **New**. Enter a name for the GPO. For example, "Alias Computer Assigned Installation". The GPO is created and added to the Group Policy Object Links list.

4 In the Group Policy Object Links list, click the GPO you just created, then **Edit**.

5 In the left pane of the Group Policy Object Editor, under computer Configuration, click the plus sign (+) next to the Software Settings folder to expand it.

6 Under Software Settings, right-click Software Installation, then click **New** > **Package**.

7 enter the UNC path to the desired package located in the distribution point created in the previous section, then click **Open**. For example, `\\server\share\Alias.msi`

NOTE Do not browse to the network location. You must type the UNC path into the "File name" text box.

---

8. Select **Assigned** and click **OK**. Wait until an entry for the package is displayed in the right pane of the Group Policy window.
9. Repeat steps 7 and 8 for all packages to be deployed.
10. Close the Group Policy window and any other open Active Directory windows.

    The package is now assigned to all computers that are members of the OU for which the GPO has been created. The next time a computer in the OU is restarted, the program will be installed and available for all users of the computer.

NOTE Windows XP is shipped with Fast Logon Optimization enabled. Due to this feature, two reboots are required before the software will be installed. Microsoft Knowledge Base Article #305293 describes the Fast Logon Optimization feature, along with instructions on how to disable it.

Test and verify the deployment

When a computer is restarted, the operating system displays messages about group policy, generally just before or after the Windows Login dialog box is displayed. These messages include the following:

- Windows starting up
- Applying computer settings
- Installing managed software
- Applying software installation settings
- Loading your personal settings
- Applying your personal settings

To verify that the package has been correctly assigned to a computer, restart a computer that is in the OU for which the GPO was created. The program is installed during the boot sequence, before the login prompt is displayed. After logging in, the user should find the application under the Programs menu in the same location as if it had been locally installed.

NOTE If problems arise, an entry is logged in the system's Event Viewer under Applications.

References

- Microsoft Knowledge Base Article #816102: How to use Group Policy to Remotely Install Software in Windows Server 2003
- Microsoft Knowledge Base Article #305293: Description of Windows XP Professional Fast Logon Optimization Feature

Licensing Autodesk DirectConnect

1. To see if you need a license, go to Supported products and translators on page 4.
2. Purchase the Autodesk DirectConnect license, if necessary. For information on how to purchase a license, go to the DirectConnect Web sites. (See Find the latest information on the Web on page 19.)

   NOTE For details on licensing (including how to use hardware locks and install floating licenses), refer to the installation and licensing documentation for the Autodesk product you purchased.

3. From the Windows **Start** menu, select **Programs** > **Autodesk** > **DirectConnect** > **Licensing** and follow the instructions.

   NOTE For details on licensing (including how to use hardware locks and install floating licenses), refer to the installation and licensing documentation for the Autodesk product you purchased.

4. To verify the license installation, try to import a file (see the next topic).

Importing Files

When importing CAD files, the process is not always the same from one software package to another. This section provides instructions on how to do this in your Autodesk software.

1 In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2 Select the file from the file browser. If you cannot see the file, it is not supported or its translator is not licensed.

3 Click **OK**.

The translator automatically launches and the file imports into the scene.

Translator details

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CATIA® V5

CATIA® is computer-aided design software from Dassault Systèmes.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on the Autodesk products that support this format and whether you require a license, see Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files, using this format. (The Autodesk DirectConnect software installs at the same time.)
- The software typically requires a license to import CATIA V5 files. For more information on how to purchase a license, go to the DirectConnect Web sites. (See Find the latest information on the Web on page 19.)
  To install a license, refer to the *Install_DirectConnect.pdf* document found on the installation CD.

Importing CATIA V5 files

1 In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2 Select a CATIA V5 (`*.CATProduct` or `*.CATPart`) file from the file browser.

3 Click **OK**.
The translator launches automatically and the file imports into the scene.

Types of data imported

We support CATIA V5 releases R19 and earlier. We support importing the following types of data:

- Point
- Line
- Arc
- Ellipse
- Parabola
- Hyperbola
- BSpline curve
- Polynomial curve
- Plane
- Cylindrical surface
- Conical surface
- Spherical surface
- Toroidal surface

- BSpline surface
- Revolve surface
- Ruled surface
- Open body
- Solid body
- Layer
- Geometric set
- Part (from CATIA V5 release 6 and higher)
- Product (from CATIA V5 release 6 and higher)
- Attributes (RGB color, layer, name, visibility, and materials)
- Per face material assignments
- CATIA V4 component .model files referenced in a CATIA V5 assembly are now processed.

NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

NOTE For definitions on these data types, consult your CATIA documentation.

CATIA® V4

CATIA® is computer-aided design software from Dassault Systèmes. DirectConnect supports the importing of CATIA V4 geometric sets, attributes, such as names, layers, RGB colors, and visibility, as well as the following CATIA V4 file types:

- `.model`
- `.mdl`
- `.session`
- `.exp`
- `.dlv`
- `.dlv3`
- `.dlv4`

NOTE DirectConnect supports CATIA model and export files produced with CATIA V4.xx and earlier V3RX Levels.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on the Autodesk products that support this format and whether you require a license, see Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files, using this format. (The Autodesk DirectConnect software installs at the same time.)
- The software typically requires a license to import CATIA V4 files. For more information on how to purchase a license, go to the DirectConnect Web sites. (See Find the latest information on the Web on page 19.)
  To install a license, refer to the *Install_DirectConnect.pdf* document found on the installation CD.

Importing CATIA V4 files

1. In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Select a CATIA V4 (`*.model, *.mdl, *.session, *.exp, *.dlv`or `*.dlv3`) file from the file browser.
3. Click **OK**.
   The translator launches automatically and the file imports into the scene.

Types of entities imported

We support importing the following SPACE (SP) on page 78 entities:

- Point (Type 1)
- Line (Type 2)
- Parametric curve (Type 3)

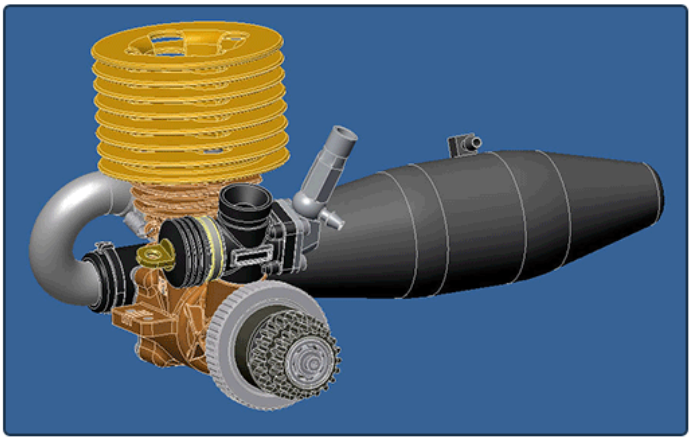
- Plane (Type 4)
- Parametric surface (Type 5)
- Face (Type 6)
- Volume (Type 7)
- Transformation (Type 9)
- Edge (Type 12)
- Circle (Type 20)
- Ellipse (Type 21)
- Parabola (Type 22)
- Hyperbola (Type 23)
- Polyhedral Surface (Type 16)
- Composite curve (Type 24)
- Solids - Mockup (Type 17, secondary type 1)
- Exact solid (Type 17, secondary type 2)
- Space Ditto (Type 28)
- Parametric Skin (Type 35)
- NURB Curve (Type 46)
- NURB Surface (Type 47)

NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

NOTE For definitions on these data types, consult your CATIA documentation.

Autodesk Inventor®



Autodesk DirectConnect lets you import Autodesk Inventor® part (`*.ipt`) and assembly (`*.iam`) files into supported Autodesk software, provided you have Inventor 2008, 2009, 2010 or the free Inventor View installed and licensed on your machine. We do not require an Autodesk DirectConnect license.

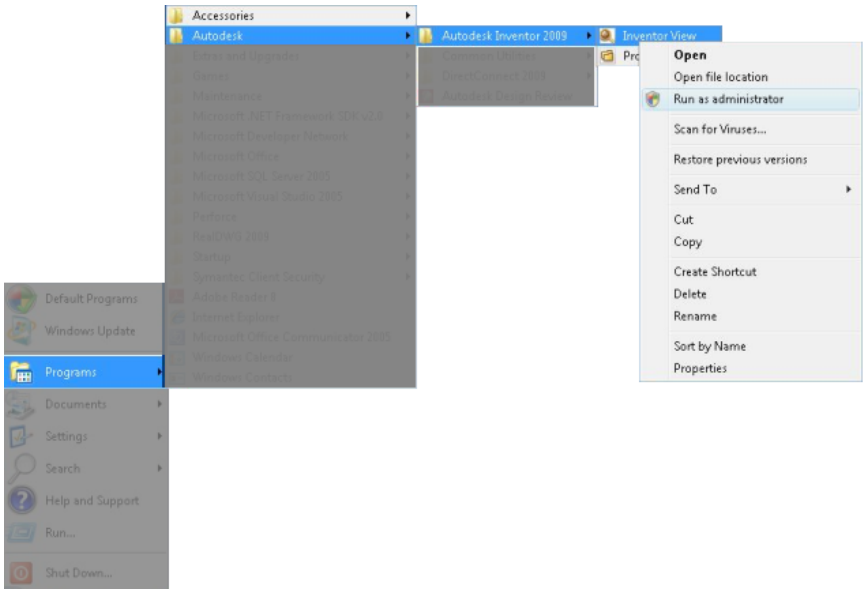
The software supports this format for Windows operating systems.

Notes

- To enable this translator on systems where no licensed Autodesk Inventor 2008, 2009, or 2010 product is available, download and install the free Inventor View 2010 product from *http://usa.autodesk.com/adsk/servlet/index?id=10535296&siteID=123112*.
- Once the DirectConnect Inventor translator is installed, run it and select **File** > **Open**, before using DirectConnect to translate your data. However, if working on Vista and using the DirectConnect Inventor translator, you must run the Inventor View as "administrator", before the data can be translated.

  #### Setting Inventor View as administrator

  From the **Start** menu, select **Autodesk** > **Autodesk Inventor 2010** > **Inventor View**, then right-click  to open a list and select **Run as administrator**.



Software Prerequisites

- Install the Autodesk product where you plan to import files, using this format. (The Autodesk DirectConnect software installs at the same time.)
- The software does not require an Autodesk DirectConnect license to import this file format. But, ensure that you have Inventor 2008, 2009, 2010 or Inventor View 2010 installed and licensed on the same machine.

Importing Autodesk Inventor® files

1 In your Autodesk software, choose the appropriate menu item. For example:

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Showcase	**File** > **Import Models**

To import a CAD file into...	Choose...
Autodesk Opticore Studio	**File** > **Import**

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2 Browse to and select an Autodesk Inventor part or assembly file (`*.ipt` or `*.iam`).

3 Click **OK**.

The translator automatically launches and imports the file.

NOTE To maintain the original positioning and orientation of part files in your scene, import the assembly file. Importing part files before the assembly file positions all of them at the origin (0,0,0) and removes the original positioning.

Types of data imported

We import NURBS for this file format. The software maintains following additional information on import:

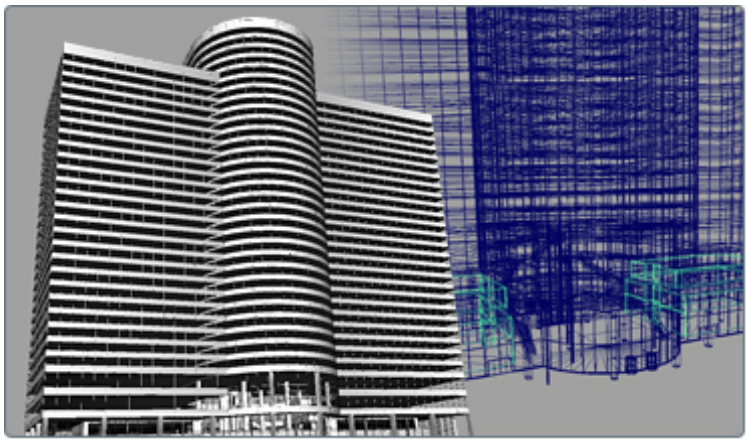
- BREP Bodies
- Data organization
- Tolerances and units
- Material Colors and simple transparency
- Weld maps (beads only)

NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

Limitations

- WorkSources, Display Meshes, and some 2D/3D Sketches are automatically excluded when importing an Autodesk Inventor® file.
- Some cylindrical surfaces (pipes) do not trim properly.

DWG DXF



Autodesk DirectConnect lets you import Autodesk AutoCAD drawing files (DWG) and Drawing eXchange File (DXF) files into supporting Autodesk products.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on Audodesk products that support these formats, see Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you to import files using this format. (The Autodesk DirectConnect software installs at the same time.)

- The software does not require a license to import this file format.
- For Maya, load a plug-in to use Autodesk DirectConnect 2010 R1 translators. See Recommended system requirements on page 22.

NOTE Maya on the Mac OS X operating system do not support DirectConnect 2010; however, it does support DirectConnect 2009. See *http://www.autodesk.com/maya-directconnect*.

Importing DWG/DXF files

1. In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Browse and select a DWG (`.dwg`) or DXF (`.dxf`) file.
3. Click **OK**.
   The translator automatically launches and imports the file.

Types of data imported

We support the following types of DWG and DXF data:

- Colors
- Materials
- Lines, arcs, and splines
- Extruded curves
- Extrusions
- Layers

- Meshes
- Surfaces
- Text
- 3D solids

IMPORTANT Showcase do not support the AutoCAD material attribute **Illumination**. Alias supports the AutoCAD material attribute **Illumination**; however, it is called **Incandescence**.

IMPORTANT Only 3D hierarchical data is supported by Showcase. Curves and 2D drawings are not.

NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

NOTE DWG and DXF both support curves and round trip data export when **want curves** is set to ON. If they are not coming in, please check to ensure that **want curves** is enabled.

Exporting DWG/DXF files (Autodesk Alias)

1 In your Autodesk software, choose the appropriate menu:

To export a CAD file from ...	Choose ...
Autodesk Alias	**File** > **Save As**

2 For details on the available options, use the Autodesk Alias help.

DWF

Design Web Format (DWF) is a file format developed by Autodesk for web viewing and printing. Autodesk DirectConnect 2010 R1 lets you export Alias tessellated model data to DWF format files (`*.dwf`) to view in Autodesk Design Review and Project Freewheel.

The software supports this format for Windows 32-bit and 64-bit operating systems.

For information on the Autodesk products that support this format, go to Supported products and translators on page 4.

Software prerequisites

- Install Alias. (The Autodesk DirectConnect software installs at the same time.)
- The software does not require a license to export this file format.

NOTE For information on additional software setup for Autodesk Alias, please see the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Exporting DWF files

1. In Alias, select a file to be exported as a DWF and choose **File** > **Export** > **Active As** or **File** > **Save As**.
2. From the **File Format** menu, select **DWF** (`.dwf`).
3. Set export options:

Option	Function
Export Curves	When ON, curves are exported.
Export Symmetry	If an Alias layer has symmetry **ON**, this information and the geometric objects resulting from symmetry can be merged and converted or left intact (unmerged) and converted. When **OFF**, layer symmetry is not exported.
Tessellator	When the tessellator is set to Fast, models are triangulated quickly and less accurately. When the tessellation is set to Accurate, models are triangulated slowly and more accurately. ■ **Tolerance** – The amount a polygonal surface can deviate from the original NURBS surface. The default value is 0.01. ■ **Limit Edge Length** – If checked, a Max edge length slider appears to control how large the triangles can get. If unchecked, there is no limit on the size of the triangles. ■ **Max Edge Length** – The maximum length of any triangle edge (in current linear units).

4. Click **Save**.

   The translator automatically launches and exports the file as a DWF.

Types of data exported

The Autodesk DirectConnect 2010 R1 for DWF translator exports only meshes. The Alias scene dag hierarchy is preserved. Associated color information is also exported.

NOTE Check the options in Alias to specify data importation. See the *Autodesk Alias Data Transfer* reference book and the Alias online help.

ZPR

ZPrint CAD format (ZPR) is a proprietary file format developed by Z Corporation and used with ZPrint and ZEdit for printing on high definition color 3D printers. Autodesk DirectConnect 2010 R1 lets you export ZPR format files (`*.zpr`) to use in the Autodesk Rapid Prototyping solution.

The software supports this format for Windows 32-bit and 64-bit operating systems.

For information on the Autodesk products that support this format, go to Supported products and translators on page 4.

Software prerequisites

- Install any of the following Autodesk products:
  - Alias
  - Showcase
  - Maya
  - Opticore Studio

  (The Autodesk DirectConnect software installs at the same time.)
- The software does not require a license to export this file format.

NOTE For information on additional software setup for Autodesk Alias, please see the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Exporting ZPR files

Use the output command

1. In Alias, select a file to be exported as a ZPR file and choose **File** > **Export** > **Rapid Prototype ...❐**.
2. From the **File Format** menu, select **ZPR** (`.zpr`).
3. Depending on the entity selected for export, such as a shell, additional setup may be needed. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help for information on additional setup options.
4. Click **Save**.

Types of data exported

The Autodesk DirectConnect 2010 R1 for ZPR translator exports triangle meshes with simple colors and textures for use with ZEdit and Zprint software for rapid prototyping.

IGES

Initial Graphics Exchange Specification (IGES) is a file format for transferring graphics data between CAD/CAM systems. Autodesk DirectConnect 2010 R1 lets you import and export the neutral IGES format files (`*.iges` or `*.igs`) from any number of CAD or modeling packages.

The software supports this format for Windows 32-bit and 64-bit operating systems.

For information on the Autodesk products that support this format, go to Supported products and translators on page 4.

NOTE Maya supports this translator on the Mac OS X operating system.

Software prerequisites

- Install one of Autodesk Alias, Autodesk Maya (Windows version), or Autodesk Showcase. (The Autodesk DirectConnect software installs at the same time.)
- The software does not require a license to import this file format.
- For Autodesk Maya (Windows version), load a plug-in to use Autodesk DirectConnect 2010 R1 translators. See Recommended system requirements on page 22.

NOTE Maya on the Mac OS X operating system does not support DirectConnect 2010; however, it does support DirectConnect 2009. See *http://www.autodesk.com/maya-directconnect*.

NOTE For information on additional software setup for Autodesk Alias, please see the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Additional software setup (Autodesk Alias)

For Alias Version 13.0.2, set the IGES system environment variable to use the latest IGES translator:

1. From your Windows toolbar, select **Start** > **Settings** > **Control Panel**.
2. Double-click **System**. The **Systems Properties** window opens.
3. Click the **Advanced** tab.
4. Click the **Environment Variables** button.
5. Click **New** and enter the following information:
   - For **Variable name**, IGES
   - For **Variable value**, 1

Importing IGES files

1. In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Select a native IGES (`*.iges` or `.igs`) file from the file browser.
3. Click **OK**.

The translator automatically launches and imports the file into the scene.

Exporting IGES files

1 In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Export** >
Autodesk Maya	**File** > **Export All**or **File** > **Export Selected**
Autodesk Showcase	**File** > **Export Models**
Autodesk Opticore Studio	**File** > **Import**

2 Select a native IGES (`*.iges` or `.igs`) file from the file browser.

3 Click **OK**.
The translator automatically launches and imports the file into the scene.

Troubleshooting (Autodesk Alias)

If the files you import contain unsatisfactory data, try changing the following import options in Autodesk Alias:

Default Trim Curves Specifies the trim curves that the processor uses. You can select parameter space curves, model space curves, or use the flag that is present in the `.IGES` file. By default, the preference flag in the IGES files is used.

Shrink Surface When ON, Alias detects trimmed surfaces whose trim boundaries are the same as, or iso-parametric to, the natural boundaries of the untrimmed surface. It then converts these surfaces into Alias surfaces by shrinking the untrimmed surface to the trim boundaries.

When OFF, Alias converts all trimmed surfaces of this type to Alias trimmed surfaces.

Types of data imported

The Autodesk DirectConnect 2010 R1 for IGES translator imports ASCII format IGES files with or without linefeed characters at the end of each record. The software does not support Binary IGES files.

The software imports NURBS for this file format and maintains the following information on import:

- Surfaces and curves
- Data organization (groups, layers, visibility, and instances)
- Units
- Colors

NOTE For information on this data in your Autodesk software, see Where to find imported data on page 73.

NOTE Check the options in Alias to specify data importation. See the *Alias Data Transfer* reference book and the Alias online help.

Identifying IGES supported entities in log files

The following table shows IGES entities supported on import by Autodesk DirectConnect 2010 R1 for IGES.

NOTE The input translator ignores any entities with an entity use flag value 02 (Definition) except for entity use flag value with IGES Subfigure Definition entity (Type 308).

Type	Form	IGES Entity
100	0	circular arc
102	0	composite curve
104	0-3	conic arc, ellipse, parabola, hyperbola
106	1	copious data
106	2	copious data

Type	Form	IGES Entity
106	11	copious data
106	12	copious data
106	63	closed area
108	0	plane
108	+/- 1	bounded plane
110	0	line
112	0	parametric curve
114	0	parametric surface
116	0	point
118	0 - 1	ruled surface
120	0	surface of revolution
122	0	tabulated cylinder
123	0	direction
124	0	transformation matrix
126	0-5	rational B-spline curve
128	0-9	rational B-spline surface
130	0	offset curve
140	0	offset surface

Type	Form	IGES Entity
141	0	boundary entity
142	0	curve on surface
143	0	boundary surface
144	0	trimmed surface
190	0,1	plane surface
308	0	subfigure definition
402	7, 9	associativity instance
408	0	singular subfigure instance

IGES levels

The system adds all supported geometric IGES entities that are associated with IGES level <n> to an Alias layer called LEVEL<n>.

For example, if a 126 B-spline entity directory entry indicates that it is on level 42, then it is added as Layer LEVEL42.

Open Inventor and Cosmo

Autodesk DirectConnect 2010 R1 lets you import Open Inventor™ ASCII or binary files (`*.iv`) or Cosmo™ scene binary files (`*.csb`) into supported Autodesk software.

(Open Inventor is a 3D file format from Silicon Graphics Inc. with no relation to Autodesk Inventor® software.)

NOTE For information on the Autodesk products that support these formats, see the Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- The software does not require a license to import these file formats.

Importing Open Inventor or Cosmo files

1. Choose the appropriate menu choice.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Browse to and select an Open Inventor (`*.iv`) or Cosmo (`.csb`) file.
3. Click **OK**.
   The translator automatically launches and imports the file.

Type of data imported

The software imports polygons and NURBS for these file formats and maintains the following information on import:

- Data organization (parent, child, and groups)

- Units
- Materials
- Textures
- Polygonal Shapes
- Transformation nodes

NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

Limitations

- When importing Open Inventor files, the system automatically excludes lines, cameras, lights, manipulators, tolerances, and animation.
- The software only supports this format for Windows 32-bit operating systems.

JT

The JT Open Program develops and supports the DirectModel format JT. It is a format for the visualization of 3D models.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on the Autodesk products that support this format and if you need a license, go to Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- The software requires a license.
  For more information on how to purchase a license, go to the DirectConnect Web site. (See Find the latest information on the Web on page 19.) To install a license, refer to the *Install_DirectConnect.pdf* document found on the installation CD.

Importing JT files

1. In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Select a (`*.jt`) file from the file browser.
3. Click **OK**.
   The translator automatically launches and imports the file into the scene.

Type of data imported

The software maintains the following information when importing JT files:

- Precise geometric data conversion
- Data organization (parent and child hierarchal data, visibility, and instances)
- Units
- Levels of detail (degrees of tessellation)

- Materials (brightness (shininess), ambient color, specular color, diffuse color, and emission color)
- Textures (embedded image files)
- XTBREP and BREP topology

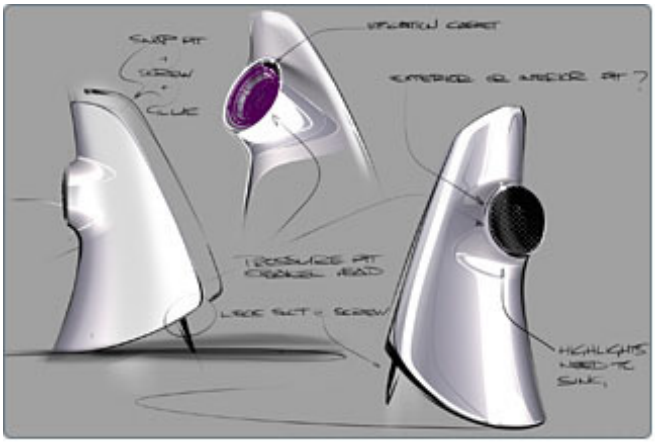
NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Limitations

- Import options are not available.
- The software automatically excludes curve geometry and animation when importing a JT file.

Pro/ENGINEER®



Autodesk DirectConnect lets you import Pro/ENGINEER® part, assembly, or PTC® Granite® files (`*.prt, *.asm, or *.g`) into supported Autodesk software.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on the Autodesk products that support this format and if you need a license, go to Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- The software may require a license.
  For more information on how to purchase a license, go to the DirectConnect Web site. (See Find the latest information on the Web on page 19.) To install a license, refer to the *Install_DirectConnect.pdf* document found on the installation CD.
- Export Pro/ENGINEER® files from your CAD software using Wildfire™ Release 4 (or lower) or PTC Granite Release 5 (or lower) specifications.

  NOTE For information on additional software setup for Autodesk Alias, please see the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

- For Maya (Windows version), load a plug-in to use Autodesk DirectConnect 2010 R1 translators. See Recommended system requirements on page 22.

  NOTE Maya on the Mac OS X operating system does not support DirectConnect 2010; however, it does support DirectConnect 2009. See *http://www.autodesk.com/maya-directconnect*.

Importing Pro/ENGINEER® files

1 In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Opticore Studio	**File** > **Import**

2 Select a Pro/ENGINEER® part, assembly, or Granite® file (`*.prt`, `.asm`, or`*.g`).

3 Click **OK**.

The translator automatically launches and imports the file.

NOTE If you cannot import the files, try setting up the license for Autodesk DirectConnect 2010 R1 for Pro/ENGINEER®. For licensing information, refer to Licensing Autodesk DirectConnect on page 27.

NOTE To maintain the original positioning and orientation of part files in your scene, import the assembly file. Importing part files before the assembly file positions all of them at the origin (0,0,0) and removes the original positioning.

Type of data imported

The software imports NURBS for this file format and maintains the following data on import:

- Precise geometric surface and topology information
- Data organization
- Tolerances and units.

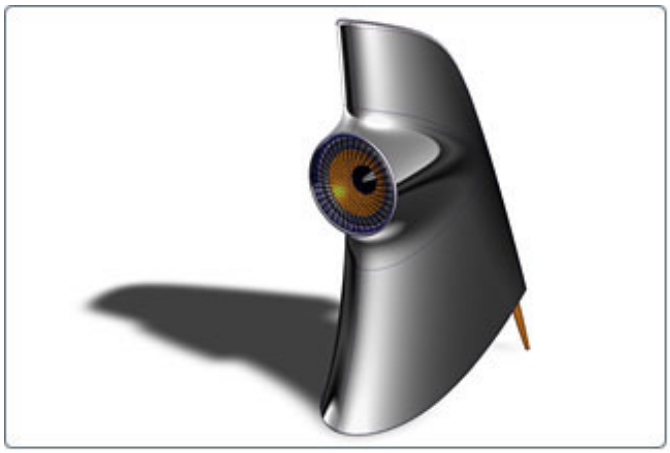
NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Limitations

- The software changes node names based on geometry, assembly, or part names.
- When importing a Pro/ENGINEER® file, the software automatically excludes construction history, lines, and animation.
- Granite does not support layers or curves.

SolidWorks®



Autodesk DirectConnect 2010 R1 lets you import SolidWorks® part and assembly files (`*.sldprt` and `*.sldasm`) into supported Autodesk software, provided you have SolidWorks® installed, licensed on your machine, and running. The software does not require an Autodesk DirectConnect license.

NOTE For information on the Autodesk products that support this format and if you need a license, go to Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- The software does not require an Autodesk DirectConnect license to import this file format. Install and license SolidWorks® Versions 2005, 2006, 2007, 2008, or 2009 on the same machine.

  NOTE For information on additional software setup for Autodesk Alias, please see the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

- For Maya 2010 (Windows version), load a plug-in to use Autodesk DirectConnect 2010 R1 translators. See Recommended system requirements on page 22.

NOTE Maya on the Mac OS X operating system does not support DirectConnect 2010; however, it does support DirectConnect 2009. See *http://www.autodesk.com/maya-directconnect*.

Importing SolidWorks® files

1 In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2 Select a SolidWorks® part or assembly file(`*.sldprt` or `*.sldasm`). (If you cannot see the files, start the SolidWorks® software, minimize its window, and then try again to open the files.)

3 Click **OK**.

The translator automatically launches and imports the file into the scene.

NOTE To maintain the original positioning and orientation of part files in your scene, import the assembly file. Importing part files before the assembly file positions all of them at the origin (0,0,0) and removes the original positioning.

Type of data imported

The software imports NURBS for this file format and maintains the following information on import:

- Precise geometric surface and topology information
- Data organization
- Tolerances and unit

- Colors

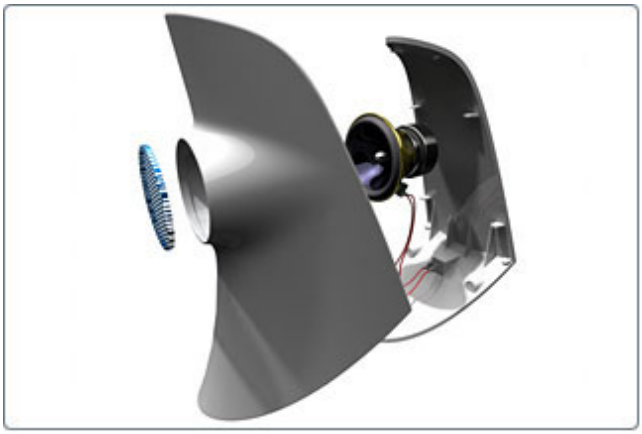
NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Limitations

- The software automatically excludes construction history, lines, and animation when importing a SolidWorks® file.
- The software only supports this format for Windows 32-bit operating systems.

STEP



Autodesk DirectConnect 2010 R1 lets you import STEP files (`*.stp` or `*.step`). The software does not require a Autodesk DirectConnect 2010 R1 license.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE Maya 2010 supports this translator on the Mac OS X operating system.

NOTE For information on the Autodesk products that support this format, go to Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- Export STEP files from the CAD software using AP203 or AP214 specifications.
- The software does not require a license to import this file format. For more information on how to purchase a license, go to the DirectConnect Web site. (See Find the latest information on the Web on page 19.) To install a license, refer to the *Install_DirectConnect.pdf* document found on the installation CD.

Importing STEP files

1. In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Select a native STEP (`*.stp` or `*.step`) file from the file browser.
3. Click **OK**.

   The translator automatically launches and imports the file into the scene.

Type of data imported

The software imports NURBS for this file format and maintains the following information on import:

- Precise geometric surface and topology information (ISO 10303:42)

- Data organization (layers)
- Tolerances and units
- Colors

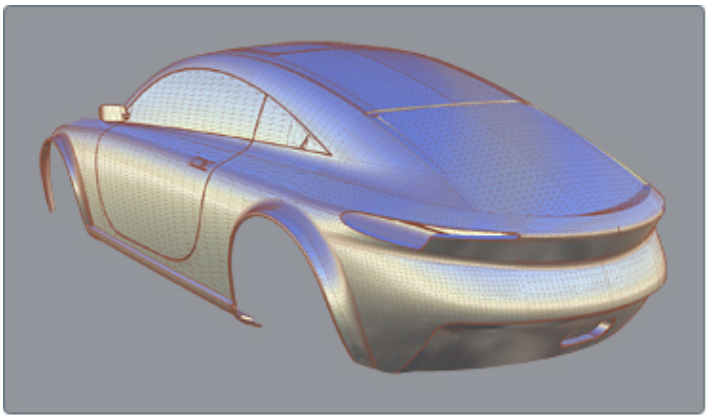
NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

NOTE In Autodesk Alias, look for options for specifying data importation. See the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

Limitations

- When importing a STEP file, the software automatically excludes construction lines, modeling curves, and animation.

STL



Autodesk DirectConnect 2010 R1 lets you import and export STL files. The software does not require a Autodesk DirectConnect 2010 R1 license.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on the Autodesk products that support this format and if you need a license, go to Installing and Licensing on page 1.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- The software does not require a license.
  For Maya 2010 (Windows version), load a plug-in to used Autodesk DirectConnect translator. See the *Setting up additional software* section of Recommended system requirements on page 22.

  NOTE Maya on the Mac OS X operating system does not support DirectConnect 2010; however, it does support DirectConnect 2009. See *http://www.autodesk.com/maya-directconnect*.

NOTE Maya 2010 supports this translator on the Mac OS X operating system.

Importing STL files

1. In your Autodesk software, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Maya (Windows version)	**File** > **Open Scene** or **File** > **Import**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2. Select a native STL (Stereolithography) file from the file browser.
3. Click **OK**.
   The translator automatically launches and imports the file into the scene.

Exporting STL files

1. In your Autodesk software, choose the appropriate menu item.

To export an STL file into...	Choose...
Autodesk Maya (Windows version)	**File** > **Export All** or **File** > **Export Selection**

To export an STL file into...	Choose...
Autodesk Alias	**File** > **Export and click the option box**

2 ■ For Maya users, you can specify:
   ■ the file format, (f bool) either ASCII or binary
   ■ the scaling factor (s float), which is set to 1 by default
   ■ if you want to process the colors for the STL file (w bool)

   Click **OK**.

   ■ For Alias users, you can specify:
   ■ the file format
   ■ the tolerance levels used in the export of the file

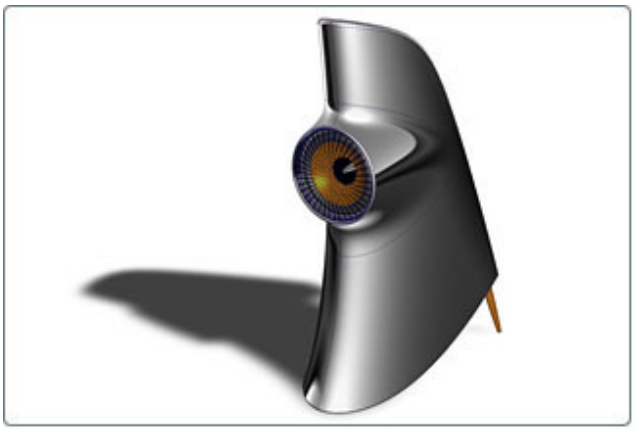
   Pick the meshes or shell to export, then click **Accept**.

Type of data imported

ASCII and binary STL files are supported.

NOTE For information on locating this data in your Autodesk software, see Where to find imported data on page 73.

UGS NX



Autodesk DirectConnect 2010 R1 lets you import UGS NX files (Version 6.0 and earlier) into supported Autodesk software.

The software supports this format for Windows 32-bit and 64-bit operating systems.

NOTE For information on the Autodesk products that support this format and if you need a license, go to Supported products and translators on page 4.

Software prerequisites

- Install the Autodesk product where you plan to import files using these formats. (The Autodesk DirectConnect software installs at the same time.)
- The software requires a DirectConnect license.
  For more information on how to purchase a license, go to the DirectConnect Web site. (See Installing and Licensing on page 1.) To install a license, refer to the *Install_DirectConnect.pdf* document found on the installation CD.

Importing UGS NX files

1 In your Autodesk import files, choose the appropriate menu item.

To import a CAD file into...	Choose...
Autodesk Alias	**File** > **Open** or **File** > **Import** > **File**
Autodesk Showcase	**File** > **Import Models**
Autodesk Opticore Studio	**File** > **Import**

2 Select a (`*.prt`) file from the file browser. (The software supports UGS NX part and assembly (`.prt`) files version V13.0 to NX 5.0.)

NOTE There are options in Alias for you to specify data importation. For details, see the *Alias Data Transfer* reference book and the Alias online help.

3 Click **OK**.
The translator automatically launches and imports the file into the scene.

Exporting UGS NX files (Autodesk Alias)

To export UGS NX files from Autodesk Alias:

1 In your Autodesk software, choose the appropriate menu:

To export a CAD file from...	Choose...
Autodesk Alias	**File** > **Save As**

2 Go to the Alias documentation for more details on how to build a model in for maximum compatibility between UGS NX and Alias.

Unigraphics proprietary format

Unigraphics is a solid modeling package based on the Parasolid kernel. The package contains many (mostly optional) modules, for example CAD, CAM, CAE, sheet metal applications, knowledge bases, quality control, and rapid prototyping. The file structure is binary.

The following table explains how both Autodesk Alias and Unigraphics call in common elements.

UG	Autodesk Alias
Segment	Span (curve)
Point	Point
Patch	Span (surface)
Pole	CV (control vertices)
Sew	Stitch
U/V grid	Patch precision
Parameters	History
Control polygon (display only)	Hull
Silhouette curve	Horizon curve
Blank	Invisible
Reference set	Set
Category	Category
Custom view	Bookmark
Knot point	Edit point

Supported Unigraphics geometry and data mapping

The following sections describe the mapping process used for geometry types and non-geometric data transfers between Alias and Unigraphics.

Supported Alias geometry types

The following Alias geometry types can be exported to Unigraphics. Non-geometry entities, such as lights, cameras, textures, windows, and animation, are not supported by the translator. The numbers in the table entries refer to *Notes for Unigraphics entities* below.

Alias Entity	Unigraphics Entity
Construction Plane	WCS
Polyset	Not supported at this time.
Conic	Rational Curve
Arc	Rational Curve
Circle	Rational Curves
Line	Line
Curve	BCurve
Surface	BSurface (1), (2)
Trimmed Surface	Face (1), (2)
Plane	Bounded Plane (1)
Shader	Colour Attribute (3)
Shell (Open)	Sheet Body
Set	Reference Set
Group	Group
Layer	Layer (4)

Alias Entity	Unigraphics Entity
Category	Category
Shell (Closed)	Solid Body

Notes for Unigraphics entities

1. Unigraphics cannot have free-standing surfaces, so it maps all surfaces to faces which must be attached to a sheet body.
2. Splits appear in surfaces having internal discontinuities at the discontinuities.
3. Mapped as a Display Attribute of the mapped surface or shell.
4. Layer name is not mapped.

Supported Unigraphics entity objects geometry types (Alias)

Alias imports the following Unigraphics geometry types. The letters and numbers in parentheses refer to *Notes for Unigraphics entities* below.

Unigraphics Entity Objects	Alias Entity
WCS	Construction Plane
BSurface	Surface
Bounded Plane	Surface
Cylindrical Surface	Surface
Conical Surface	Surface
Tabulated Cylinder	Surface
Rules Surface	Surface
Blended Face Surface	Surface

Unigraphics Entity Objects	Alias Entity
Surface of Revolution	Surface
Offset Surface	Surface
Sculptured Surface	Surface
BCurve	Curve
Line	Line (Curve)
Arc	Curve
Conic	Curve
Point	Point (Curve) (1)
Sheet Body	Shell (Open) (2)
Assembly	Groups/Instance (3)
Group	Group
Layer	Layer
Category	Category
Reference Set	Set
Part Attribute	Blind Data ()
Solid Body	Shell (Closed)

Notes for Alias Unigraphics (object) entities

- (1) A Unigraphics point converts to a degree 1 curve composed of two coincident points. On export to Unigraphics, this construction converts back to a Unigraphics point.

  (2) If the sheet body only points to one face, then Alias converts the face to a trimmed surface.

  (3) This is a one-way mapping. Assemblies cannot be exported.

  ( ) Added as blind data. Can be re-exported.

Types of data imported

Autodesk DirectConnect supports the following UGS NX geometry types. (It supports attributes such as name, color, layer, and visibility.)

- Point
- Line
- BCurve
- Ellipse
- Parabola
- Hyperbola
- Surface Parameter Curve
- Trimmed Curve
- Intersection Curve
- BSurface
- Planar Surface
- Spherical Surface
- Cylindrical Surface
- Conical Surface
- Surface of Revolution
- Spun Surface
- Offset Surface

- Ruled Surface
- Swept Surface
- Toroidal Surface
- Blended Edge Surface
- Blended Bound Surface
- Facet
- Sheet Body
- Solid Body
- Part
- Instance
- Assembly
- Category

Where to find imported data

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For Autodesk Alias

Data Organization	Tolerances and Units	Colors (Shaders)
Parts and assembly information is displayed in the **Windows** > **Information** > **Layer Categories** window.	Unit settings are visible from **Preferences** > **Construction Options**.	Colors are visible from the **Render** > **Multi-lister** > **Shaders** window.

For information on these settings, menu items, and options, see the *Autodesk Alias Data Transfer* reference book and the Autodesk Alias online help.

For Autodesk Maya (Windows version)

NOTE Maya 2010 for Mac does not support DirectConnect 2010; however, it does support DirectConnect 2009. See ***http://www.autodesk.com/maya-directconnect***.

Data Organization	Tolerances and Units	Colors (Shaders)
Layer information is visible from either the **Display** > **UI Elements** > **Channel Box/Layer Editor** menu or the **Window** > **Relationship Editors** > **Display Layers** menu. Part and assembly information is visible for either the **Window** > **Outliner** menu or the **Window** > **Hypergraph** menu.	Unit settings are visible from **Window** > **Settings/Preferences** > **Preferences**. Open the **Categories** tab and choose **Settings** to change the **Working Units** and **Tolerances**.	Colors are imported as shaders and are visible for either the **Window** > **Rendering Editors** > **Hypershade** or **Window** > **Rendering Editors** > **Multilister** window.

For more information on these setting and menu items, see the Autodesk Maya online help.

For Autodesk Showcase

Data Organization	Tolerances and Units	Colors (Shaders)
Layers, parts, and assembly hierarchies appear in the Organizer window (**Scene** > **Organizer**). This window shows the original file hierarchy and lets you create your own arrangements of objects. You can view and change the state of objects from visible to hidden to deleted.	Unit settings are visible from **Edit** > **Model settings**. Try setting the tessellation or number of levels of detail (LODs) on file import. To see the number of LODs for a loaded file, select **Options** > **Performance and Quality**. Next, click the **Lock display quality to** button and move the slider	Colors are imported as materials and are visible from **Material** > **Material Properties**.

Data Organization	Tolerances and Units	Colors (Shaders)
	back and forth to see the different LODs.	

For more information on these settings and menu items, see the Autodesk Showcase online help.

For Autodesk Opticore Studio

Data Organization	Tolerances and Units	Colors (Shaders)
The node structure is visible in the **Scene Graph Editor**, located in the **Window** > **Scene Graph Editor** menu. It opens by default.	There are no units to deal with in Studio. All imported data is considered the same unit. Tolerances for tessellation are set in the **File** > **Preferences** dialog, in the **GeomX** tab. **NOTE** GeomX is not available until the GeomX module is loaded in the **Modules** tab (in the same dialog) and Studio is restarted. To set tessellation tolerances, use the **Import tessellation** section of the **GeomX** tab. It is also possible to re-tessellate, using the **Window** > **GeomX** > **Tessellate** dialog and entering new settings.	Colors can be shaders or appearances. All colors are visible in the **appearance** field of a **shape node** in the **scenegraph** of the **Scene Graph Editor**. Appearances are only visible in the Scene Graph Editor. Shaders are visible both in the Scene Graph Editor and through the **Windows** > **Shader List** dialog.

For information on these settings, menu items, and options, see the Autodesk Opticore Studio online help.

Glossary

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assembly An organizational file that fits together a collection of manufactured parts into a complete model.

CATIA® V4 CATIA V4 is computer-aided design software from Dassault Systèmes. Autodesk DirectConnect allows the exchange of 3D model data from CATIA V4, using `.model`, `.session`, `.exp`, `.dlv`, and `.dlv3` files.

CATIA® V5 CATIA V5 is computer-aided design software from Dassault Systèmes. Autodesk DirectConnect allows the exchange of 3D model data from CATIA V5, using the native CATIA part (`.CATPart`) and product (`.CATProduct`) files.

Cosmo™ A legacy 3D file format from Silicon Graphics Inc. using efficient binary compression and *****`.csb` (Cosmo Scene Binary) files.

DRAW (DR) A two-dimensional entity defined in the drafting and detailing world.

DWG AutoCAD drawing file) A file format used by Autodesk® AutoCAD® software that contains lines, curves, and 3D data.

DXF (Drawing eXchange File) A file exchange format containing ASCII code and binary representations of the objects in a DWG file.

Granite® One A CAD technology platform for design collaboration using solid models.

IGES (Initial Graphics Exchange Specification) A file format for transferring graphics data between CAD/CAM systems. A neutral file format that can be imported into any number of CAD or modeling packages.

Inventor (Open Inventor™) Open Inventor™ is a legacy 3D file format from Silicon Graphics Inc. With no relation to Autodesk Inventor® software. Open Inventor is an object-oriented 3D toolkit that describes complete 3D scenes which can be made interactive and that are optimized for OpenGL. It is an ASCII or binary file format.

JT file The DirectModel format JT is developed and supported by the JT Open Program. It is a format for the visualization of 3D models.

parts Parts are organized into a collection of groups, which then forms a project hierarchy.

Pro/ENGINEER® A product from Parametric Technology Corporation. A solid modeling CAD/CAM/CAE software that requires positional construction tolerances.

SolidWorks® A product from SolidWorks Corporation. A solid modeling CAD/CAM/CAE software that requires positional construction tolerances.

SPACE (SP) A three-dimensional entity defined in the 3D modeling world.

STEP An international standard for the exchange of geometric product definitions. STEP formats that are relevant to Autodesk products are AP203 (general mechanical CAD) and AP214 (automotive CAD).

STL An STL ("StereoLithography") file is a triangular representation of 3D surface geometry. The surface is tessellated or broken down logically into a series of small triangles (facets). Each facet is described by a perpendicular direction and three points representing the vertices (corners) of the triangle.

V3Rx A file format generated by an older versions of CATIA, before CATIA V4.

ZPR ZPrint CAD format (ZPR) is a proprietary file format developed by Z Corporation and used with ZPrint and ZEdit for printing on high definition color 3D printers. Autodesk DirectConnect 2010 R1 lets you export ZPR format files (*.zpr) to use in the Autodesk Rapid Prototyping solution.

PCRE and BSD Licenses

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PCRE License

PCRE (Perl-compatible regular expressions) is a library of functions to support regular expressions whose syntax and semantics are as close as possible to those of the Perl 5 language.

Release 7 of PCRE is distributed under the terms of the "BSD" license, as specified below. The documentation for PCRE, supplied in the "doc" directory, is distributed under the same terms as the software itself.

The basic library functions are written in C and are freestanding. Also included in the distribution is a set of C++ wrapper functions.

The Basic library functions

Written by: Philip Hazel

Email local part: ph10

Email domain: cam.ac.uk

University of Cambridge Computing Service, Cambridge, England.

The C++ wrapper functions

Contributed by: Google Inc.

The BSD (Berkeley Software Distribution) license

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